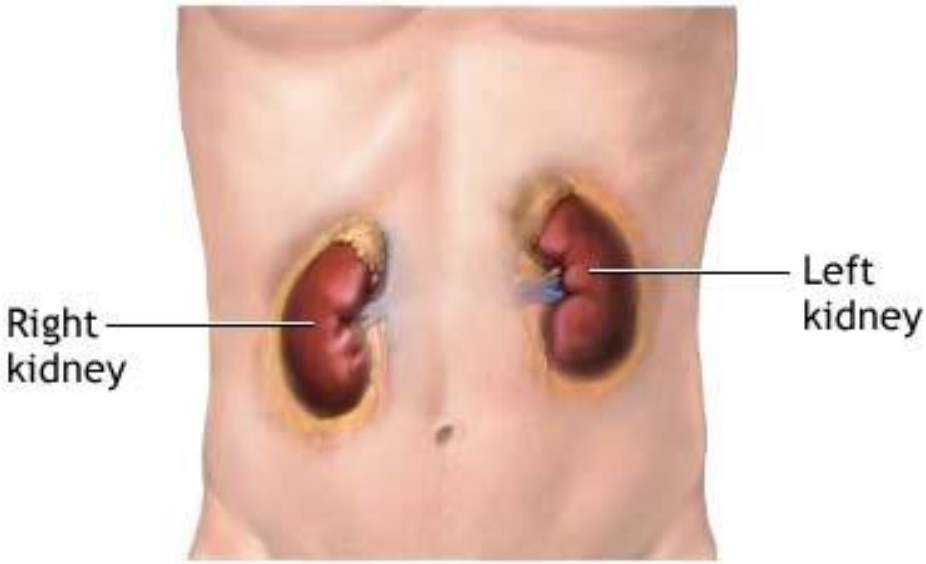
KIDNEY DISEASE



The kidneys are a pair of vital organs that perform many functions to keep the blood clean and chemically balanced.

The kidneys are bean-shaped organs, each about the size of a fist. They are located near the middle of the back, just below the rib cage, one on each side of the spine. The kidneys are sophisticated reprocessing machines. Every day, a person's kidneys process about 200 quarts of blood to sift out about 2 quarts of waste products and extra water. The wastes and extra water become urine.

WHY ARE KIDNEYS SO IMPORTANT

Kidneys Regulate Waste

For the body to work properly it must contain just the right amount of water. One of the important jobs of the kidneys is to remove excess water from the body or to retain water when the body needs more.

Kidneys Remove Wastes

Many of the substances in the blood and body fluid must be kept at the correct level for the body to function properly. When the kidneys are working properly excess minerals, such as sodium and potassium, are excreted from the body in the urine. The kidneys also help to regulate the levels of other minerals, such as calcium and phosphate, which are important for the formation of bone.

Kidneys Produce Hormones

Normal kidneys also make important chemical messengers called hormones. These hormones circulate in the bloodstream and regulate some body functions such as blood pressure, the making of red blood cells, and the uptake of calcium from the intestine.

WHAT IS KIDNEY DISEASE

Kidney disease describes a variety of disease and disorders that affect the kidneys. Most disease of the kidney attacks the filtering units of the kidneys and damages their ability to eliminate wastes and excess fluids.

Chronic Kidney Disease (CKD) is defined as the presence of kidney damage, or a decreased level of kidney function, for a period of three months or more. CKD can be divided into five stages, depending on how severe the damage is to the kidneys, or the level of decrease in kidney function.

Usually, kidney disease starts slowly and silently, and progresses over a number of years. Not everyone progresses from Stage 1 to Stage 5. Stage 5 is also known as End-stage Renal Disease (ESRD). It may also be called end-stage renal failure. It is important to remember that end-stage refers to the end of kidney function (kidneys are working at less than 15% of normal), not the end of life. To sustain life at this stage, dialysis or kidney transplantation is needed.

When the kidneys fail, wastes and fluids accumulate in the body and dialysis treatments (to clean your blood either by machine or in your abdomen), or a kidney transplant is needed.

Dialysis and kidney transplantation are known as renal replacement therapies (RRT) because they attempt to "replace" the normal functioning of the kidneys. Sometimes kidney failure occurs rapidly and this is called acute kidney failure. This may be a result of injury, infection, or other causes. For acute kidney failure, dialysis treatment may be urgently needed for a period of time, but kidney function often recovers.

The five stages of chronic kidney disease

	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
Amount of kidney function remaining at each stage	More than 90%	60 to 89%	30 to 59%	15 to 29%	Less than 15%
Description of each stage	Early kidney damage with normal or even increased function.	Worse kidney damage with reduced function.	Even worse kidney damage with less function.	Kidney damage is so severe with such poor function that the kidneys are barely able to keep the person alive.	End-stage Renal Disease: kidney function is severely impaired. The kidneys are not working well enough to keep the person alive.
Symptoms	No symptoms observed. Urea and creatinine levels are normal.	No symptoms observed. Urea and creatinine levels are normal, or mildly elevated.	Early symptoms occur and may include tiredness, poor appetite, and itching. Creatinine level rises, excess urea is present, and anemia may begin to occur.	Tiredness, poor appetite, and itching may get worse.	Symptoms may include poor sleeping at night, difficulty breathing, itchiness, and frequent vomiting. High levels of creatinine and urea are present.
eGFR (estimated Glomerular Filtration Rate)	90 ml/min or more	60 – 89 ml/min	30 – 59 ml/min	15 – 29 ml/min	15 ml/min or less
Treatment options*	Identify cause and try to reverse it.	Monitor creatinine level, blood pressure, and general health and well-being. Try to stop or slow the worsening kidney function.	Continue to try to stop or slow the worsening kidney function. Patient learns more about the disease and treatment options.	Plan and create access site for dialysis. Receive assessment for possible transplant.	Start renal replacement therapy: dialysis or transplantation.

Common Causes of Chronic Kidney Disease

There is no single cause of chronic kidney disease. Some forms of the disease may be inherited, while others are acquired.

Two most common causes are diabetes and high blood pressure. Others are glomerulonephritis, polycystic kidney disease, urinary track obstruction, reflux nephropathy, and drug – or medical – induced kidney problems. Bacteria such as E. coil and bacterial infections, such as strep throat are other culprits. Other problems can affect the kidney stones, Alport syndrome, Fabry disease, and Wilms' tumor.

Early Detection and Prevention

Simple laboratory tests such as urinalysis, which looks for protein and blood in the urine, are useful in detecting kidney damage at an early stage. A blood test, the serum creatinine level, is often used as a simple measure of kidney function. It may show a decrease in kidney function long before there are any other signs.

Doctors will often use the serum creatinine test along with other information to calculate the kidneys' creatinine clearance, or GFR (glomerular filtration rate). These results give more accurate information about how much the kidneys are working – specifically, the rate at which the glomeruli are filtering.

- Have blood pressure checked regularly. Uncontrolled high blood pressure can speed up the natural course of any underlying kidney disease.

- A growing number of kidney patients are people with diabetes. Make sure that diabetes is under control.

- Be very careful about taking non-prescription medications, particularly painkillers. It is wise to discuss all over-the-counter medications with a doctor or pharmacist before they are taken. Certain other medications, toxins, pesticides, and illegal drugs (such as heroin and cocaine) can also cause kidney damage.

Risk Factors

Kidney disease usually progresses silently, often destroying most of the kidney function before causing any symptoms. Therefore people at risk of developing kidney disease should be evaluated regularly. These people include those with diabetes, high blood pressure or blood vessel diseases, and close relatives of people with hereditary kidney disease.

Members of certain ethnic groups are also at high risk because of greater incidence of diabetes and high blood pressure. These include people of Aboriginal, Asian, south Asian, Pacific Island, African/Caribbean and Hispanic origin.

Kidney disease may develop even if someone does not fall into one of these groups. Recent estimates suggest that as many as two million Canadians have chronic kidney disease (CKD) or are at risk for it – most are unaware of it.

If someone is over the age of 50 or falls into any of the aforementioned risk categories, they should ask their doctor for a blood level test. One simple test will indicate what the estimated glomerular filtration rate or kidney function level.

Signs and Symptoms

Sometimes even people with serious kidney disease may not have any symptoms. That is why a blood or urine test may be necessary to check for kidney problems. However, the signs and symptoms listed below may indicate kidney disease and if they are present, a medical assessment to check out the kidneys would be advisable.

- High blood pressure
- Puffiness of the eyes, hands and feet
- Passage of bloody, cloudy or tea – colored urine
- Presence of protein in the urine
- Excessive foaming of the urine
- Frequent passing of urine during the night
- Passing less urine or difficulty passing urine
- Fatigue
- Loss of appetite or weight
- Persistent generalized itching

Treatment Options

The main treatment for kidney disease is a proper diet and medications, dialysis, transplantation and conservative care.

In the early stages of kidney disease, a proper diet and medications may help to maintain the critical balance in the body that your kidneys would normally control. However, when kidney function drops below about 10-15% of normal, diet and medications are no longer enough. If there is no further treatment at this stage, short-term and long-term complications develop, and death eventually occurs. Dialysis or a kidney transplant, combined with medications and a healthy diet is needed to stay alive.

Nutrition

When kidneys can no longer do their job well, types and amounts of food must be controlled. Dietitians can assist daily eating plans to:

- Meet nutritional needs
- Cut down the workload on the kidneys
- Help keep the kidney function that is left
- Control the build up of food wastes like urea
- Reduce symptoms like fatigue, nausea, itching, and bad taste in the mouth
- Control the effects of high blood sugar

Each person has different needs depending on their age, medical history, and kidney function. The dietitian will work to design an individual daily eating plan that is right.

Dialysis

Dialysis is a treatment: it does not cure kidney disease or make kidneys well again, and it does not fully replace the kidney function. Unless a kidney transplant is received, dialysis must continue. Two types of dialysis are used to treat the later stage of chronic kidney disease: hemodialysis and peritoneal dialysis.

Normal kidneys do a number of jobs besides removing wastes from the blood. They also regulate the levels of certain minerals like calcium and phosphorous. In addition, the kidneys produce hormones which control other functions in the body. Although dialysis treatment can remove wastes and excess water, medications are needed to control the levels of these minerals and to replace the hormones.

Transplantation

With advances in kidney transplant methods and improvement in transplant success, a kidney transplant is now widely considered to be the best way of treating chronic kidney disease for many people. A transplant may offer the best chance of returning to a more normal life, but it is not suitable for everyone.

Factors that can affect a person's suitability for a transplant include:

- General health
- History of heat disease
- History of blood circulation problems
- History of cancer
- Emotional / psychological factors
- Evidence that a person does not or will not follow the medical treatment suggested
- Obesity

There are two types of kidney transplants:

- Transplant from a live donor
- Transplant from a person who has died suddenly

Following a series of tests, a person found suitable for a transplant is put on a transplant waiting list until a compatible kidney is found. The length of time a person will have to wait is hard to predict and will depend on how hard the person is to match and how many kidneys become available.
Before any transplant, some of the recipient's blood an some of the donor's cells are mixed together to see it the recipient's blood will damage or kill the donor's cells. This is called a cross match and it is done to make sure there are no substances in the blood, called cytotoxic antibodies, that may cause the recipient's body to reject the transplanted kidney. A positive cross match test means that the donor (whether live or deceased) is not compatible with the recipient, and therefore cannot donate a kidney.

Overall, transplant success rates are very good. Transplants from deceased donors have an 85-90% success rate for the first year. That means that after one year, 85-90 out of every 100 transplanted kidneys are still functioning. Live donor transplants have a 90-95% success rate. Long-term success is good for people of all ages.

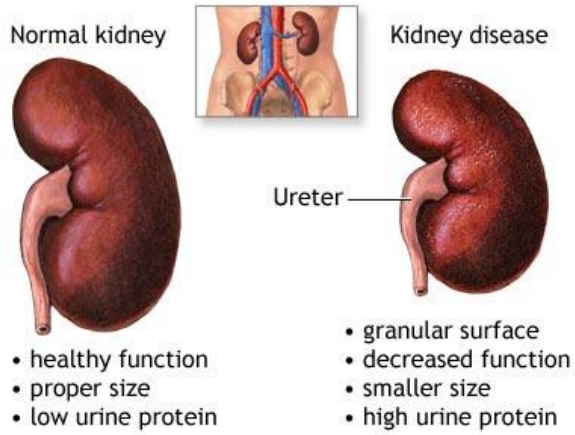
Living With Chronic Kidney Disease

Not everyone with CKD will progress to end-stage renal disease. There are some ways to prevent or slow down the progression of kidney disease. Many people with CKD find that taking a wellness approach improves their ability to stay fit and maintain a good quality of life.

Wellness is a state of physical, mental, and social well-being. Factors that help achieve wellness include:

- A well-balanced diet
- Regular physical activity (ideally 45-60 minutes four to five times per week)
- Good blood pressure control
- Good blood sugar control if you have diabetes
- Stopping smoking
- Maintaining a normal blood count
- Weight control
- Limited daily alcohol to two drinks or less
- Taking medications as prescribed

It is also important to learn as much about kidney disease as possible and to carefully follow instructions from the doctor and other members of the healthcare team.



PEI STATISTICS

- Currently there are close to 1000 kidney-patients who are being served by the renal clinic.
- There are 81 patients who are on dialysis treatment and 45 known people are on the brink of starting dialysis.
- Presently there are 150 people who are still waiting for their first appointment just to see the nephrologists.
- Prince Edward Island has two nephrologists, Dr. Bruce Jones and Dr. Derek Chaudhary.
- It is my understanding that the wait times to attend the renal clinic to see the nephrologists is 3 - 6 months.
- Our island has 4 hemodialysis units, located in Charlottetown, Summerside, Alberton and Souris.
- The new dialysis unit in Summerside opened in April and the new dialysis unit in Charlottetown is set to open in September.
- The government is trying to close down the Alberton and Souris units but The Kidney Foundation is fighting hard to keep these important treatment units open.
- The number of Islanders seeking medical assistance because of kidney failure is steadily increasing, 75% in the past three years.
- The number of transplants during 2011 was recorded at 7.

KIDNEY DISEASE QUIZ

1. The kidneys are a pair of _____ _____that perform many functions to keep the blood _____ and chemically _____.

2. For your body to work properly it must contain just the right amount of _____.

3. _____is defined as the presence of kidney damage, or a decreased level of kidney function, for a period of three months or more.

4. Two most common causes are _____ and _____.

5. In the early stages of kidney disease, a proper _____ and _____ may help to maintain the critical balance in the body that your kidneys would normally control.

6. _____ is a _____: it does not cure kidney disease or make kidneys well again, and it does not fully replace your kidney function.

7. Before any transplant, some of the recipient's _____ an some of the donor's _____ are mixed together to see it the recipient's blood will _____ or _____ the donor's cells.

8. Transplants from deceased donors have an _____ success rate for the first year.

9. Live donor transplants have a _____ success rate.

10. Wellness is a state of _____, _____, and _____ well-being.

KIDNEY DISEASE ANSWERS

1. Vital, organs, clean, balanced
2. Water
3. Chronic kidney disease (CKD)
4. Diabetes, high blood pressure
5. Diet, medication
6. Dialysis, treatment
7. Blood, cells, damage, kill
8. 85-90%
9. 90-95%
10. Physical, mental, social

Sources

http://www.kidney.ca

The Kidney Foundation of Canada