Renal Failure, Kidney Failure

In renal failure, the kidneys lose their ability to filter enough waste products from the blood. They also lose the ability to regulate the body's balance of salt and water. Eventually, the kidneys slow their production of urine or stop producing it completely. Waste products and water gather in the body. This can lead to a life-threatening overload of fluids (such as heart failure). It can also lead to a dangerous buildup of waste products in the blood. These extreme changes in blood chemistry can affect the function of the heart and brain.

TYPES OF RENAL FAILURE

Acute renal failure. In this form of kidney failure, the kidneys stop working properly because of a sudden illness, a medicine, or a medical condition that causes one of the following:

- A severe drop in blood pressure or an interruption in the normal blood flow to the kidneys. This can occur during:
  - Major surgery.
  - Severe burns with fluid loss.
  - Massive bleeding.
  - A heart attack that severely affects heart function.
- Blood clots that travel to the kidney.
- Direct damage to kidney cells or to the kidneys' filtering units. This can be caused by:
  - An inflammation of the kidneys.
  - Toxic chemicals.
  - Medicines and/or infections.
- Blocked urine flow from the kidney. This can occur because of obstructions outside the kidney, such as:
  - Kidney stones.
  - Bladder tumors.
  - An enlarged prostate.

Blockage of urine flow within the kidney can also cause sudden kidney failure, as can occur with large muscle injuries.

Chronic renal failure. In this form of kidney failure, the kidney gradually loses function. This happens over a period of years. It is a slow and gradual loss of the ability of the kidneys to send out wastes, concentrate urine, and conserve the salts in your blood. Some of the causes of chronic kidney failure are:

- Diabetes (very common cause).
- Polycystic kidney disease.
- Glomerulonephritis.
- Alport syndrome.
- The flow of urine out of the kidney is blocked (*obstructive uropathy*).
- High blood pressure (very common).
- Long-term exposure to lead, mercury, and other chemicals and medicines.
- Kidney stones with infection.
- Reflux nephropathy.
- Pain medicine overuse.

Some forms of chronic renal failure run in families. Your caregiver will ask you about family medical problems.

End-stage renal disease (ESRD). This is also called end-stage renal failure. In end-stage renal disease, kidney function worsens until the person dies. This is usually the result of longstanding chronic renal failure, but sometimes it follows acute renal failure.

SYMPTOMS

Symptoms vary depending on the type of renal failure.

- **Acute renal failure.** Symptoms include:

- Swelling (*edema*) resulting from salt and water overload.
- High blood pressure.
- Vomiting.
- Tiredness (*lethargy*) caused by the toxic effects of waste products on brain function.
- Feeling sick to your stomach (*nauseous*).
- Decreased urine output.

- **Chronic renal failure and end-stage renal disease.** Because the kidney damage in chronic renal failure occurs slowly over a long time, symptoms develop slowly. Symptoms can include:
  - Headache.
  - Weakness.
  - Itching.
  - Vomiting.
  - Pale skin.
  - Slowing of growth in children.
  - Fatigue.
  - Tiredness (*lethargy*).
  - Poor appetite.
  - Increased thirst.
  - High blood pressure.
  - Bone damage in adults.

DIAGNOSIS

If you have an illness or medical condition that increases the risk of acute renal failure, your caregivers will watch you closely. You may have blood and urine tests that measure the amount of urine you produce. If you have a long-term (*chronic*) medical condition that increases the risk of long-term kidney damage, your caregiver will check your blood pressure and look for symptoms of chronic renal failure during rechecks.

TREATMENT

Treatment depends on the type of kidney failure.

- **Acute renal failure.** Treatment begins with measures to correct the cause of renal failure (shock, hemorrhage, burns, heart attack). After this has begun, more specific kidney treatment may include:
  - Fluids given into a vein (*intravenously*) to correct any abnormal fluid loss.
  - Medicines called diuretics that increase urine output.
  - Limited fluids by mouth.
  - A diet low in protein and high in carbohydrates.
  - Medicines to adjust high or low levels of blood chemicals, such as potassium and medicines to control high blood pressure.
  - Short-term dialysis may be necessary if the patient develops severe high blood pressure, severe fluid overload, heart failure, symptoms of altered brain function, or severe abnormalities in blood chemistry.
- **Chronic renal failure.** People with chronic renal failure are watched closely. They receive frequent physical exams, blood pressure checks, and blood testing. Treatment includes:
  - A low-protein and low-salt diet.
  - Medicines to adjust blood chemical levels.
  - Medicines to treat high blood pressure.
  - Sometimes, a hormonal medicine called erythropoietin is given to correct a low level of red blood cells (*anemia*).
- **End-stage renal disease.** Treatment includes:
  - Dialysis until a donor can be found for a kidney transplant. Dialysis mechanically removes waste products from the blood.
  - Both kidneys may need to be removed surgically before a transplant in patients with severe high blood pressure or chronic pyelonephritis.

PROGNOSIS

- **Acute renal failure** may go away on its own. Some people recover within a matter of days. Exactly how long the illness lasts varies greatly from person to person. The duration depends on the cause of the kidney problem. In rare cases, acute renal failure progresses to end-stage renal disease.
- **Chronic renal failure** is a lifelong problem that can worsen over time to become end-stage renal disease.
- **End-stage renal disease** is a permanent condition that can be treated only with dialysis or a kidney

transplant.

- Most children with acute renal failure have a good outlook for recovering their kidney function. In rare cases, end-stage renal disease can develop.
- Among adults, the chances of recovery depend primarily on the reason for acute renal failure. Among people who recover, about 50% have some permanent kidney damage. In most cases, this is not severe enough to prevent you from living a normal life.
- People with chronic renal failure may have a continuing decrease in kidney function. Not everyone develops end-stage renal disease. For those who do, the time it takes for end-stage renal disease to develop varies from person to person.

PREVENTION

Many forms of kidney failure cannot be prevented. People who have diabetes, high blood pressure, or coronary artery disease should try to control the illness with:

- Appropriate diet.
- Medicine.
- Lifestyle changes.

If you have chronic kidney failure, you should tell all caregivers who treat you.

HOME CARE INSTRUCTIONS

- Follow your diet and take your medicines as instructed.
- If dialysis is scheduled, keep all appointments. Call if you are unable to keep an appointment so your time can be used by another dialysis patient.

SEEK MEDICAL CARE IF:

- The amount of urine you produce either distinctly increases or decreases.
- You develop swelling of the face and/or ankles.
- You develop shortness of breath.
- You develop nausea and vomiting.

FOR MORE INFORMATION:

National Institute of Diabetes and Digestive and Kidney Diseases
Phone: (301) 496-3583
www2.niddk.nih.gov

National Kidney Foundation
Phone: (800) 622-9010
www.kidney.org

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