

National Kidney  
Foundation™

# What You Need to Know About Your Access

Getting the Most From Your Treatment



## National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-KDOQI™)

The National Kidney Foundation is developing guidelines for clinical care to improve patient outcomes. The information in this booklet is based on the KDOQI™ recommended guidelines for nutrition. All KDOQI™ guidelines provide information and assist your doctor or health care team in making decisions about your treatment. The guidelines are available to doctors and other members of the health care team. If you have any questions about these guidelines, you should speak to your doctor or the health care team at your treatment center.

### Stages of Chronic Kidney Disease (CKD)

In February 2002, the National Kidney Foundation published clinical care guidelines for chronic kidney disease. These help your doctor determine your stage of kidney disease based on the presence of kidney damage and your glomerular filtration rate, which is a measure of your level of kidney function. Your treatment is based on your stage of kidney disease. (See the table below.) Speak to your doctor if you have any questions about your stage of kidney disease or your treatment.

Stages of Kidney Disease		
Stage	Description	Glomerular Filtration Rate (GFR)*
1	Kidney damage (e.g., protein in the urine) with normal GFR	90 or above
2	Kidney damage with mild decrease in GFR	60 to 89
3	Moderate decrease in GFR	30 to 59
4	Severe reduction in GFR	15 to 29
5	Kidney failure	Less than 15

\*Your GFR number tells your doctor how much kidney function you have. As chronic kidney disease progresses, your GFR number decreases.

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## What You Need To Know About Your Access

Whether you already receive hemodialysis treatment, or you will need to start dialysis soon, this booklet is written to help you better understand your treatment and how to take care of your health. This booklet tells you:

- how to choose the access that is best for you
- about the pros and cons of the different types of access
- why your access is important to getting the most from your treatment
- how to care for your access
- how to keep your access working well.

The information in this booklet is based on the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI)<sup>™</sup>, a program developed to help you get the most from your treatment, feel better and live longer. You may also be interested in reading some other booklets from the National Kidney Foundation, including:

- *What You Need to Know About Hemodialysis*
- *What You Need to Know About Chronic Kidney Disease*
- *What You Need to Know About Anemia*

## Hemodialysis and Your Access

Hemodialysis is a treatment that removes wastes and extra fluid from your blood when your own kidneys have failed. Before hemodialysis can be done, a connection must be made to the blood inside your blood vessels. Your hemodialysis access, or vascular access, is a way to make it easier to reach your blood for hemodialysis. The access allows your blood to travel through soft tubes to the dialysis machine where it is cleaned as it passes through a special filter, called a dialyzer.

## Choosing an Access

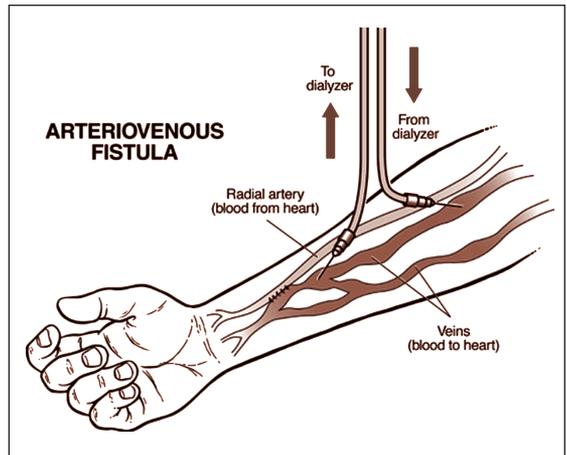
### Different Types of Access

Three different types of access can be placed for hemodialysis. They are called a **fistula**, a **graft** and a **catheter**. Your doctor will refer you to a special surgeon, called a **vascular surgeon**, for placement of your access. Once your doctor tells you that you will need dialysis, you should protect the arm where the surgery will be done. Don't allow anyone to draw blood or give you an injection in this arm. Also, never let anyone use a cuff to take your blood pressure from this arm. You should wear a medical alert bracelet to inform hospital staff about your arm.

You should see the vascular surgeon for placement of your access **within a year before you will need to start hemodialysis**. This will help to ensure that you have plenty of time to receive the best type of access for your needs, and that your access will be ready to use when you need to start dialysis. To decide what type of access is best for you, the doctor will examine you and may order some special x-ray tests.

### Fistula

A fistula is the best choice for most patients. It is preferred because it usually lasts longer and has fewer problems like clotting and infections. Minor surgery is needed to create a fistula. It is made by connecting a vein to a nearby artery, usually in your arm. This creates a large blood vessel that has a fast flow of blood. Your wrist or elbow is the preferred location for your fistula. A fistula will usually last for



many years. A fistula usually takes one to four months to mature before it is used for dialysis. If you are already receiving hemodialysis and you do not have a fistula, ask your doctor or dialysis care team whether it would be possible for you to change to a fistula.

### Graft

**A graft is the second best choice for an access.** Minor surgery is done in which an artificial tube is sewn between a vein and a nearby artery, usually in the inside bend of your arm or in your upper arm. Sometimes, grafts may be placed in your leg or chest wall. Blood flows rapidly through the graft from the artery to the vein. Grafts generally need at least two weeks after surgery before they are ready to use.

### Catheter

**Catheters are generally used for a temporary access.** For example, they are sometimes used for a while in people who receive a fistula and need to start dialysis before the fistula is ready to use. When the fistula is ready, the catheter will be removed. Some people may need to have a permanent catheter if no other type of access works for them.

Catheters are made of soft plastic tubing with two parts, one for removing your blood and the other for returning the cleaned blood to you. They are not placed in advance, but only when you need to start dialysis. They are placed in a large vein, usually in your neck but sometimes in your upper chest. Catheters tend to have more problems (like clotting and infections) than fistulas or grafts. In addition, they may not have the blood flow needed for good dialysis treatment. However, some newer types of catheters are being developed that may hold promise for the future.

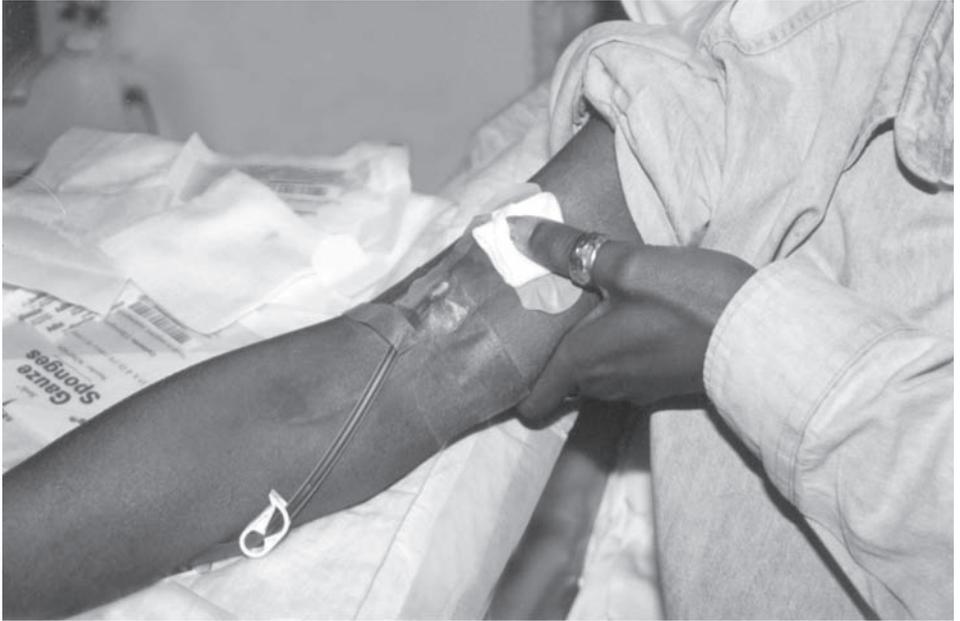
## Pros (+) and Cons (-) of Different Kinds of Access

Fistula	Graft	Catheter
(+) Lasts longer	(-) Lasts less time than a fistula	(-) Usually a temporary access
(+) Not prone to infection	(-) More prone to infection than a fistula	(-) Most prone to infection
(+) Routine cleaning is needed before each treatment.	(-) Strict cleaning by the staff is needed to avoid infections.	(-) Strict care must be taken during treatment to avoid infection.
(+) Provides excellent blood flow once it is ready to use.	(+) Provides excellent blood flow once it is ready to use.	(-) May not have the blood flow needed for a dialysis treatment.
(-) Needs to mature 1 to 4 months before using; can be used in 1 month in some patients.	(-) Needs at least two weeks before using.	(+) Can be used right away.
(+) Less likely to develop blood clots and become blocked.	(-) Clotting can be a problem that may require surgery or other treatment to correct.	(-) May develop blood clots that block the flow of blood through your catheter.
(+) You can take showers once the access heals after surgery.	(+) You can take showers once the access heals after surgery.	(-) You cannot take showers but you can take baths.

## After Your Access Surgery

After your access is placed, you should follow your doctor's orders about caring for your new access. Here are some tips to help you:

- Keep the dressing dry.
- If you have a catheter, you should not take showers but you may take baths. If you have a fistula or graft, you can take showers once the access is healed. Check the dressing for bright red blood. If present, call your doctor at once.
- Take all the medications prescribed for you.
- Get enough rest.
- Call your doctor if you:
  - notice redness, pain, swelling or a feeling of warmth at the access site
  - feel short of breath
  - have flu-like symptoms
  - have a temperature of 99 degrees or higher.
- If you have a fistula or graft:
  - Keep your arm straight and elevated (above your heart) while the access is healing.
  - Ask the nurse at the hospital to show you how to check your access at home for a vibration (called a thrill) or for a sound (called a bruit, pronounced brew ee). If the thrill or bruit is absent, call your doctor at once.
- If you have a fistula, ask when you can start doing exercises, such as squeezing a rubber ball, to help your access mature and be ready to use.



### When You Start Hemodialysis

If you have a **fistula** or **graft**, your nurse or technician will place two needles into your access at the beginning of each dialysis. These needles are connected to soft plastic tubes that go to the dialysis machine. Your blood travels to the machine through one of these tubes, passes through the dialyzer, or artificial kidney, where it is cleaned, and returns to you through the other tube. If you have a **catheter**, it can be connected directly to the dialysis tubes, and no needles are used.

## Taking Care of Your Access

Taking good care of your access is important to:

- keep your access **working well**
- help your access **last longer**
- **prevent problems** like infections and clotting.

If your access is not working well, it can **decrease the amount of dialysis** you receive. Getting enough dialysis is important to:

- improve your **overall health**
- help you **live longer**
- improve your **quality of life**
- keep you out of the **hospital**.

To make sure you are getting enough dialysis, your dialysis care team will measure your **delivered dose of dialysis**. This tells them if enough wastes are being removed from your blood. Your delivered dose of dialysis will be checked by doing a blood test to measure your **Kt/V** (pronounced kay tee over vee) or your **URR** (urea reduction ratio). If you are getting enough dialysis, your **Kt/V should be 1.2 or more**, or your **URR should be 65 percent or more**. If your numbers are too low, one possible cause may be that your access is not working well. To make sure your access is working well, you and your dialysis care team will check for:

- **swelling** of your access arm
- **clotting** of your access
- **absence of the vibration (thrill) or sound (bruit)** in your access.

Your dialysis care team will also do some **special tests** that tell them if your access is working well. The best test for this is to measure the **blood flow** in your access. Your dialysis care team may also:

- measure the **pressure** in your access
- do a test to see if blood is **recirculating** in your access.

### Your Role in Caring for Your Access

Your dialysis care team will teach you the steps of good access care. You should follow these **every day** to help prevent problems.

### Caring for Your Fistula or Graft

- Wash your access every day with an antibacterial soap. Ask your dialysis care team to recommend a good soap to use.
- Wash your access before your dialysis treatment. Your dialysis center has handwashing sinks and antibacterial soaps.
- Do not scratch your access. Your fingernails could be a source of infection.
- Be sure your nurse or technician properly disinfects your access before putting the needles in.



- Do not touch your access area after it has been disinfected.
- Avoid coughing or sneezing on your access.
- Always wear a glove or use a clean gauze pad if you are holding your own access site after the needles are pulled.
- Apply only gentle pressure to stop bleeding after the needles are pulled. Press only where the needle was and just below. Never press above where the needle was.
- Make sure your nurse or technician wears a surgical mask or face shield and clean gloves when working near your access.
- Make sure different sites are used for your needles during each dialysis treatment.
- Do not let anyone measure your blood pressure on your access arm. Your other arm should be used instead.
- Do not let anyone take blood from your access arm when you are not on dialysis.
- If the area of the access is sore, swollen, red or feels hot, call your dialysis care team at once.
- If the vibration (thrill) or sound (bruit) of your access is absent or seems changed, call your dialysis care team at once.

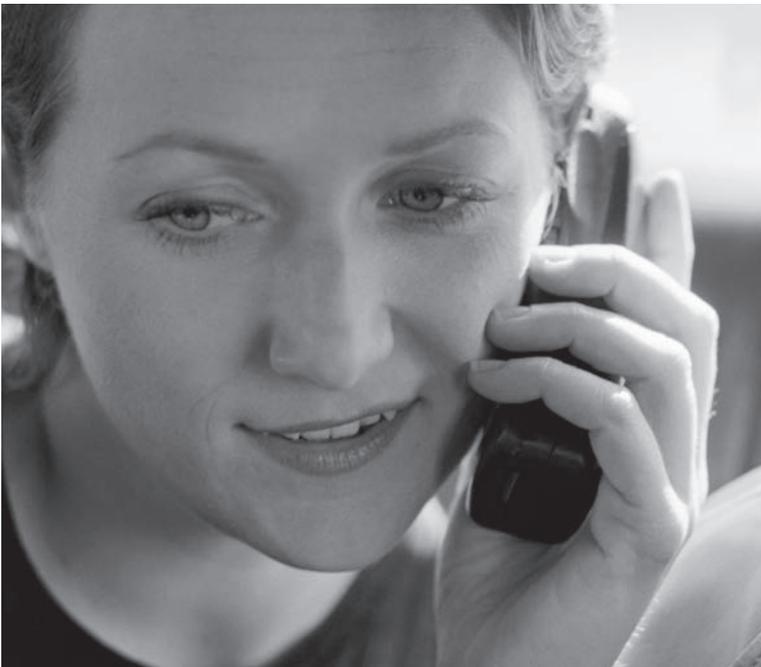
### Caring for Your Catheter

- Be sure your catheter has a clean dressing during and after every dialysis. Make sure your nurse or technician checks your catheter for signs of infection at every dialysis.
- Make sure you wear a surgical mask when you are being connected to or disconnected from the dialysis machine.
- Make sure your nurse or technician wears a surgical mask or face shield and clean gloves when working near your catheter.
- If the area around your catheter feels unusually sore, call your dialysis care team

- Do not shower or swim. You may take baths.
- Ask your nurse or technician to teach you or your family how to change the dressing.
- Keep extra dressings at home in case you need to replace your dressing.

### When Access Problems Occur

Sometimes, even when you take the best care of your access, you may develop some problems. Some of the most common ones are **infections** or **clotting** of the access. If an infection occurs, your doctor will order **antibiotics** for you. If your access develops a clot, you may need to go to the hospital for treatment. Removing the clot can usually be done on an **outpatient basis**, and you will not need to stay overnight. Your dialysis care team will check your access for potential problems. You can help spot the possible problems listed in the following chart by learning the warning signs. Contact your doctor or dialysis center right away if you notice any of them.



## Warning Signs of Access Problems

Access Problems	Signs of Problems	What You Should Do
Infection	Redness, swelling, soreness and/or a feeling of excess warmth around your access site; fever, chills, and/or an achy feeling.	Call your doctor or dialysis dialysis care team at once. You'll need to take antibiotic medications until the infection is gone.
Bleeding from your access	Bleeding from a fistula or graft that lasts more than 30 minutes after your dialysis treatment is over; any bleeding from a catheter site or catheter tube.	For bleeding from a fistula or graft, gently press your access with a clean gauze pad to stop the blood; if bleeding lasts more than 30 minutes, call your doctor or dialysis center at once. For bleeding from a catheter site or tube, call your doctor or dialysis center at once, or go to the emergency room at your hospital.
Clotting or poor blood flow in your access	Absence of the vibration (thrill) or sound (bruit) at your fistula or graft site; swelling of your whole arm; lower skin temperature around the access site; a decrease in your delivered dose of dialysis (Kt/V or URR); or changes in other lab values.	Call your doctor or dialysis center if the vibration (thrill) or sound (bruit) at your access site is absent, or if your skin feels cooler than usual around the access area or if your whole arm is swollen. Keep a record of your Kt/V or URR, and speak to your dialysis care team if you see any changes.
Decreased blood flow in your access arm	Feelings of numbness, tingling, coldness or weakness in your access arm; blue fingers or sores at the tips of your fingers.	Call your doctor or dialysis center right away; this must be treated at once to prevent nerve damage in your access arm.

## Checklist of Key Points to Remember

- Keeping your **access working well** will help you feel your best on hemodialysis.
- If your access is not working well, it can **decrease the amount of dialysis you receive**. This will affect your overall health and how long you live on dialysis.
- A fistula is the **preferred type of access**. If you are already receiving hemodialysis and you do not have a fistula, ask why. Some patients may be able to change to a fistula from another type of access.
- Make sure your dialysis care team **checks your access** often; they should do some special tests to make sure your access is working well.
- Do not let anyone measure your blood pressure on your access arm, or take blood from your access arm when you are not on dialysis. The other arm should be used to measure blood pressure and do blood tests.
- Make sure your needles are placed in different sites during each dialysis treatment.
- **Track your important test results**, such as your Kt/V and your URR. You may get a copy of the Dialysis Report Card from your dialysis care team, or you can obtain a copy by calling the National Kidney Foundation at 800.622.9010.
- **Ask your dialysis care team** if you have any questions about your access or any other aspects of your hemodialysis care.

## Other Resources

Here are some other resources from the National Kidney Foundation you may find helpful:

Brochures and Fact Sheets (single copies available free):

General:

- *Keeping Bones Healthy in Chronic Kidney Disease*
- *What You Need to Know About Chronic Kidney Disease*
- *What You Need to Know About Hemodialysis*

- *What You Need to Know About Anemia*
- *If You Choose Not to Start Dialysis Treatment*
- *Kidney Transplant*
- *Planning for Natural Disasters: A Guide for Kidney Patients*
- *What You Should Know About Dialyzer Reuse:  
A Guide for Hemodialysis Patients*
- *When Stopping Dialysis Treatment Is Your Choice*

#### **Nutrition:**

- *Dining Out With Confidence*
- *Nutrition and Chronic Kidney Disease*
- *Nutrition and Hemodialysis*
- *How to Increase Calories When You Have Chronic Kidney Disease*
- *Phosphorus and Your Kidney Diet*
- *Potassium and Your Kidney Diet*
- *Keep Sodium Under Control: How to Spice Up Your Cooking*
- *Vitamins and Minerals in Chronic Kidney Disease*

#### **Coping and Rehabilitation:**

- *Coping Effectively: A Guide for Patients and Their Families*
- *Financial Resources for Kidney Patients*
- *Sexuality and Chronic Kidney Disease*
- *Staying Fit With Kidney Disease*
- *Travel Tips: A Guide for Kidney Patients and Their Families*
- *Working With Kidney Disease: Rehabilitation and Employment*



### Quarterly Newsletter (available free)

- NKF Family Focus

### 7-Part Video Series (available at your dialysis center):

- *People Like Us*

### NKF Patient and Family Council (free membership):

- Join other kidney patients around the country and belong to the largest voluntary health organization committed to helping people with kidney disease present a strong and unified voice in legislative and public policy issues that affect your health care.
- Membership in the council is a service of the National Kidney Foundation and there is no charge to you.
- For more information about the benefits of membership and to receive a membership application, call 800.622.9010, or write the National Kidney Foundation, 30 East 33rd Street, New York, NY 10016.

## Understanding Your Lab Values

Some or all of the following tests and measurements may be used to check your nutrition and general health. Ask your doctor which ones you will have and how often they will be done. Speak to your doctor about your results. If your numbers are not on target, ask how to improve them.

**Serum Albumin:** Albumin is a type of protein made from the protein you eat each day. A low albumin level may be caused by not getting enough protein or calories from your diet. A low level of albumin may lead to health problems such as difficulty fighting off infections. Ask your dietitian how to get the right amount of protein and calories from your diet.

**Blood Pressure:** Ask your doctor what your blood pressure should be. If your blood pressure is elevated, make sure to follow all the steps in your prescribed treatment. These steps may include taking high blood pressure medications, cutting down on the amount of salt in your diet, losing weight if you are overweight and following a regular exercise program. Too much fluid in your body can also cause high blood pressure. If this happens, your doctor and dietitian will ask you to cut down on the fluids you are drinking.

**Blood Urea Nitrogen (BUN):** Urea nitrogen is a normal waste product in your blood that comes from the breakdown of protein from foods you eat and from your own body stores of protein. Healthy kidneys remove BUN from your blood, but when kid-

ney function is lost, your BUN goes up. BUN is also removed from your blood by your dialysis treatments. Your BUN goes up from not getting enough dialysis or from eating more protein. It can go down from getting more dialysis treatment or from eating less protein.

### Body Weight:

Maintaining a healthy weight is important to your overall health. If you are losing weight without even trying, you may not be getting the right nutrition to stay healthy. Your dietitian can suggest how to safely add extra calories to your diet. A sudden weight gain may also be a problem. If it is accompanied by swelling, shortness of breath and increased blood pressure, it is a sign of too much fluid in your body. You will be weighed before and after your dialysis treatments. You should also check your weight at home between treatments. Speak to your doctor if your weight changes noticeably.

### Calcium:

Calcium is a mineral that is important for strong bones. Ask your doctor what your calcium level should be. To help balance the amount of calcium in your blood, your doctor may ask you to take calcium supplements or may order a special form of vitamin D. Take only the medications recommended by your doctor.

## Cholesterol:

### Total

Cholesterol is a fat-like substance found in your blood. A high cholesterol level may increase your risk of having heart and circulation problems. However, a cholesterol level that is too low may mean you are not eating well enough to stay healthy. Ask your doctor if your cholesterol level is in the right range.

### HDL

HDL cholesterol is a type of “good” cholesterol that protects your heart. For many dialysis patients, the target level for HDL cholesterol is above 35.

### LDL

LDL cholesterol is a type of “bad” cholesterol. A high LDL level may increase your chance of having heart and circulation problems. For many dialysis patients, the target level for LDL cholesterol is below 100. If your LDL level is too high, your doctor may recommend changes in your diet and an increased exercise level.

## Serum Creatinine:

Creatinine is a waste product in your blood that comes from the normal function of your muscles. Healthy kidneys remove creatinine from your blood, but when kidney function is lost, your creatinine level goes up. Your dialysis treatments also remove creatinine from your blood. Not getting enough dialysis can cause your creatinine level to go up, while getting more dialysis causes it to go down. Your creatinine level can also decrease from not eating well over a long period of time.

**Creatinine  
Clearance:**

Creatinine clearance is another measure of how well your dialysis clears wastes from your blood. Your dialysis care team will check your weekly creatinine clearance about once every four months to make sure you are getting the right amount of dialysis.

**Hematocrit:**

Your hematocrit is a measure of the red blood cells your body is making. A low hematocrit can mean you have anemia and need treatment with EPO and extra iron. You will feel less tired and have more energy when your hematocrit is at least 33 to 36 percent.

**Hemoglobin:**

Hemoglobin is the part of red blood cells that carries oxygen from your lungs to all the tissues in your body. Measuring your hemoglobin level tells your doctor if you have anemia, which makes you feel tired and have little energy. To treat your anemia, you may need to take a hormone called EPO along with iron. The goal of anemia treatment is to reach and maintain a hemoglobin level of at least 11 to 12.

**Iron:**

**TSAT and  
Serum Ferritin**

Your TSAT (pronounced tee sat) and serum ferritin (pronounced ferry tin) are measures of iron in your body. Your TSAT should be above 20 percent, and your serum ferritin should be above 100. This will help you build red blood cells. Your doctor will recommend iron when needed to reach your target levels.

**Kt/V:**

Kt/V (pronounced kay tee over vee) is a measure of the amount of dialysis you receive. Getting the right amount of dialysis is important to your overall health and can also affect how well you eat. Your target weekly Kt/V should be at least 2.0 for CAPD, 2.1 for CCPD and 2.2 for NIPD.

**nPNA:**

Your nPNA (normalized protein nitrogen appearance) is a test to tell if you are eating enough protein. This measurement comes from complex lab studies that include urine collection and blood work. Your dietitian may ask for an accurate food record to go with this test.

**Parathyroid  
Hormone (PTH):**

High levels of parathyroid hormone (PTH) may result from a poor balance of calcium and phosphorus in your blood. This can cause bone disease. Ask your doctor if your PTH level is in the right range. Your doctor may order a special form of vitamin D to help lower your PTH. Caution: Do not take over-the-counter vitamin D unless ordered by your kidney doctor.

**Phosphorus:**

A high phosphorus level can lead to weak bones, itching, bone pain and hardening of blood vessels. Ask your doctor what your phosphorus level should be. If your level is too high, your doctor may ask you to reduce your intake of foods that are high in phosphorus and take a phosphate binder with all your meals and snacks.

**Potassium:**

Potassium is a mineral that helps your heart and muscles work properly. Too high or too low a level of potassium in your blood can weaken muscles and change your heartbeat. You will probably need to limit the amount of high-potassium foods in your diet. Ask your doctor or dietitian what your potassium level should be. Your dietitian can help you plan your meals to get the right amount of potassium.

**Subjective Global Assessment (SGA):**

Your dietitian may use SGA to help evaluate your nutritional health. The dietitian will ask you some questions about your daily diet and check your weight and the fat and muscle stores in your face, hands, arms, shoulders and legs. Ask your dietitian about your score on the SGA. If your score is too low, ask how to improve it.

**Triglyceride:**

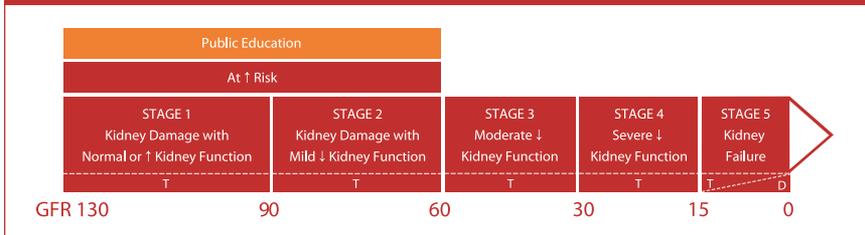
Triglyceride is another type of fat found in your blood. A high triglyceride level, along with high levels of total and LDL cholesterol, may increase your chance of having heart and circulation problems.

**Urea Reduction Ratio (URR):**

URR is another measure of how well your dialysis treatments are working to clear wastes from your blood. It uses blood tests but does not include urine collection. Your target URR should be 65 percent or higher.

More than 20 million Americans—one in nine adults—have chronic kidney disease, and most don't even know it. More than 20 million others are at increased risk. The National Kidney Foundation, a major voluntary health organization, seeks to prevent kidney and urinary tract diseases, improve the health and well-being of individuals and families affected by these diseases, and increase the availability of all organs for transplantation. Through its 47 affiliates nationwide, the foundation conducts programs in research, professional education, patient and community services, public education and organ donation. The work of the National Kidney Foundation is funded by public donations.

## Education Along the Continuum of Care



This arrow illustrates the potential scope of content for KLS resources. Lightshaded boxes indicate the scope of content targeted in this resource. GFR = Glomerular Filtration Rate; T = Kidney Transplant; D = Dialysis

## PARTNERS IN EDUCATION



United Resource Networks



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National Kidney Foundation  
30 East 33rd Street  
New York, NY 10016  
800.622.9010

[www.kidney.org](http://www.kidney.org)