



## **Definition and diagnosis of chronic kidney disease.**

### **What is chronic kidney disease?**

- Chronic kidney disease is the inability of the kidneys to carry out their main functions and the gradual loss of their efficiency and ability over months or years.

### **What are the main functions of the kidneys?**

- Getting rid of waste and excess fluids from the body.
- Maintaining the level of ions and salts in the body (such as sodium, potassium, etc.).
- Participation of the parathyroid gland (PTH) in maintaining the level of calcium and phosphorus in the body.
- Maintaining the level of acid in the blood (hydrogen).
- The kidneys secrete the hormone erythropoietin, which is responsible for maintaining the level of hemoglobin in the blood.
- The kidneys are responsible for controlling and maintaining blood pressure in a normal range.

### **How is the total efficiency determined?**

- Total efficiency is determined by measuring the following:
  - o The level of creatinine and urea analysis in the blood.
  - o The value of the glomerular filtration rate (GFR): It is an examination to assess the work and function of the kidneys, as it reflects the ability of the kidneys to filter waste from the blood.
- The rise in the level of creatinine and urea analysis in the blood and the decrease in the value of the glomerular filtration rate (GFR) means a decrease in the function and efficiency of the kidneys.
- The symptoms of chronic kidney disease vary according to the level of efficiency of the kidney work. The lower the kidney efficiency, the more symptoms appear.



**What are the stages of chronic kidney disease?**

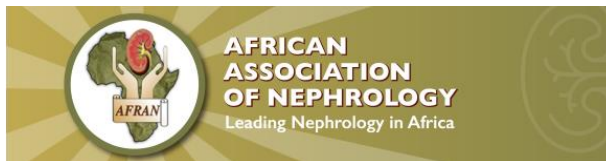
Chronic kidney disease is divided into five stages based on the glomerular filtration rate value:

| GFR Categories in CKD |   |                                  |
|-----------------------|---|----------------------------------|
| Stage                 | Description   | Glomerular Filtration Rate (GFR) |
| At increased risk     | With risk factors for CKD (diabetes, high blood pressure, family history, older age, etc) | More than 90                     |
| 1                     | Kidney damage (protein in the urine) and normal GFR                                       | More than 90                     |
| 2                     | Kidney damage and mildly decreased GFR  | 60-89                            |
| 3                     | 3a Mildly to moderately decreased GFR   | 45-59                            |
|                       | 3b Moderately to severely decreased GFR   | 30-44                            |
| 4                     | Severely decreased GFR  | 15-29                            |
| 5                     | Kidney failure  | Less than 15                     |

**Are there other important tests to determine the condition of the kidneys?**

- Yes, there is a very important analysis, which is the analysis of proteins (albumin) in urine. This analysis is done in one of two ways, and the doctor will determine, according to your condition, which of the two methods is more appropriate for you. The two methods are:

1. Collecting urine over 24 hours and measuring the percentage of its protein (24 hr urinary protein).
2. Calculating the percentage of protein or albumin (a type of protein in the body) in the urine from one urine sample using a specific equation (ACR or PCR urine analysis).



### **What is the importance of determining the amount of protein in urine and what is its treatment?**

- Theoretically, the higher the amount of protein (albumin) in the urine, the more deteriorating the efficiency of the kidneys. Therefore, you will find that the doctor is keen to implement treatments that reduce the amount of protein (albumin) in the urine.
- Treatments that reduce the amount of protein (albumin) in the urine are some types of pressure medications, and the doctor can use them even if you are not complaining of pressure disease.
- Note: It is not necessary that the rate of protein (albumin) in the urine decrease to a normal level with treatment, but the doctor will be keen to keep the quantity as low as possible.

## **Treatment and follow-up of cases of chronic kidney disease**

### **What are the methods available to treat a patient with chronic kidney disease?**

There are three methods available for treatment:

1. Medications and diet (used in all five stages of chronic kidney disease).
2. Dialysis (a patient may need it in the fifth stage of chronic kidney disease).
3. Kidney transplant (a patient may need it in the fifth stage of chronic kidney disease).

### **What are the importance and goals of drug therapy and diet (especially in the first four stages of chronic kidney disease)?**

There is no cure for chronic kidney disease, but the main goal of medication and diet is to stabilize the condition and prevent it from developing, trying not to reach the stage of dialysis or kidney transplantation, or at least trying to slow the progression of the disease to delay the need for dialysis or kidney transplantation.

This will be done through the following:

1. Treatment of the main cause of chronic kidney disease, such as pressure, diabetes, etc. Because not treating the main cause or not controlling it will lead to the rapid development of renal failure to the fifth and final stage.
2. Treatment of symptoms that may result from chronic kidney disease.
3. Treatment of anemia that may result from a lack of kidney secretion of the hormone erythropoietin and iron deficiency in the body (note: anemia by itself leads to a deterioration of the condition and the development of chronic kidney disease to advanced stages).
4. Treatment of electrolyte imbalances that may result from renal insufficiency, such as sodium and potassium imbalances in the body.
5. Treatment of parathyroid gland disorder and calcium and phosphorus level disturbances in the body resulting from chronic kidney disease. (Note: disruption of the parathyroid gland and the level of calcium and phosphorus by themselves lead to a deterioration of the condition and the development of chronic kidney disease to advanced stages).
6. Treatment of excess acid in the body (caused by chronic kidney disease), which in turn may lead to a deterioration in the condition and efficiency of the kidneys.



### **Why is it necessary to constantly follow up with the doctor?**

1. The doctor will prescribe a group of medications for a kidney patient based on the available analyzes and rumors and the patient's clinical condition. These medications will not be fixed throughout the history of the disease, as it is possible to change them every period depending on the changes in the result of the periodic analyzes and the change in the clinical condition of the patient. The drug and its doses and types are not fixed during the follow-up.
2. The increase in creatinine and urea and the decrease in its total efficiency during the follow-up may be a result of the natural development of the disease, or it may be a result of the occurrence of a new disease or problem (such as a urinary infection....etc.) that affected the kidneys. The doctor has an important role in follow-up to discover if there is a new cause that led to a sudden decrease in his overall efficiency and treatment in order to slow down the development of the disease.

### **What are the analyzes required for follow-up?**

- There are several follow-up tests that the doctor may request every month or more or less, depending on the patient's condition and response to treatment:
  - o There are blood analyzes, the most important of which (but not all): creatinine, urea, sodium, potassium, blood picture, indications of iron, calcium, phosphorus, parathyroid hormone (PTH).
  - o Also, the doctor may request a complete urine analysis, and a urine protein analysis.
- Important note: There are analyzes whose results must be at the normal level, but there are also a group of analyzes whose level is deliberately lower than normal, and there are also a group of analyzes whose level is deliberately higher than normal. This is because studies have shown that reaching the normal rate in some analyzes may lead to harm to a kidney patient. The most famous examples of these analyzes:
  - o Hemoglobin analysis: It is required to be less than the normal range (ask your doctor about the ideal rate for your condition). In rare cases, we may accept hemoglobin at the normal level, but after explaining the seriousness of the situation to the patient.



- o Analysis of the indications of iron in the body: it is required that it be more than the normal range.
- o Thyroid analysis: It is required that it be higher than the normal rate (ask your doctor about the ideal rate for your condition).

### **What are the medications (treatments)?**

The following medicines and treatments may be used in part or all under the supervision of a doctor:

| <b>Medication</b>                    | <b>Indications</b>   |
|--------------------------------------|--|
| Iron                                 | It may be in the form of tablets or injections, depending on the level of iron in the body and the percentage of hemoglobin.   |
| Erythropoietin hormone               | In the form of injections to improve the level of hemoglobin in the body   |
| Calcium                              | It is often in the form of tablets to compensate for the lack of calcium in the body.  |
| Phosphorous binding drugs            | To reduce phosphorus in the body resulting from renal insufficiency. These medicines may contain calcium or other ingredients.   |
| Sodium bicarbonate                   | To lower the acid level in the blood and maintain the blood acidity rate at the required level.  |
| Vitamin D and Vitamin D alternatives | To compensate for the lack of vitamin D in the body and improve the level of calcium.  |
| Some anti-hypertensive medications   | As mentioned before to reduce the amount of albumin in the urine, and the doctor can use it even if you are not complaining of pressure disease.<br>Note: It is not necessary that the rate of protein (albumin) in the urine reach the normal level, but the doctor will be keen to ensure that the amount is as low as possible. |

- It is possible for the doctor to prescribe a medication for you for a period, then stop it for another period, and then prescribe it again, according to the results of the analyzes and clinical examination during the follow-up.
- Medication doses are not fixed throughout the history of the disease. The doctor may change the dose of the same medication more than once, according to the results of the analyzes and clinical examination during the follow-up.



- It is possible to use medicines other than those mentioned in the previous table, according to the need of the body.

Important note: In addition to the use of the previous medications, medications will be used to treat the original disease that causes chronic kidney failure (such as medications for blood pressure, diabetes, etc.)

### **What is the importance of diet plan?**

- Excessive eating of some types of foods, such as proteins, may lead to a deterioration of the condition, and also not eating them or reducing their quantity more than necessary may lead to a deterioration of the condition as well.
- Excessive consumption of some foods rich in salts, such as potassium, may cause harm to the patient.
- Diet is also important to control the level of blood pressure and sugar.

Therefore, there is an important role for the nutritionist to develop a diet suitable for the stage of renal insufficiency of the patient.

### **Important alerts and instructions:**

- Treating and controlling the main cause of chronic kidney disease is the most important pillar of treatment for a kidney patient to prevent the deterioration of the condition.
- The diet prescribed to the patient must be followed, because adherence to the diet is a very important part of the treatment.
- A kidney patient should avoid dehydration, such as excessive sweating, diarrhea and vomiting. If any of the above occurs, you must drink enough water to compensate for what was lost from the body, and you must refer to the attending physician.
- Ask your doctor about the amount of water required of you to drink daily, because it is possible that he will ask you to drink water in large quantities or in small quantities, depending on the patient's clinical condition.
- Refer to your doctor if you notice that the amount of urine is less than previously.
- Refer to the kidney doctor before using any medicine prescribed by another doctor to ensure the safety of the medicine and its dosage on the kidneys.
- Avoid using painkillers, or consult your doctor if needed.
- You must quit smoking of all kinds, because it is possible to be committed to all of the above, but its overall efficiency is deteriorating due to smoking.





- Refer to your doctor before performing the fast, whether it is Ramadan or supererogatory fasting, in order to determine for you whether fasting is dangerous for you or not, based on clinical analyzes and examinations.

**When will dialysis treatment or kidney transplantation be resorted to and what is the most appropriate and best of them?**

- The chances of needing dialysis or a kidney transplant will increase if the patient is in the fifth stage of chronic kidney disease.
- There are patients who are not suitable for kidney transplantation, but they are suitable for dialysis, and there are patients who prefer kidney transplantation. On what basis is it determined what is appropriate for the patient or not? This is what the doctor will explain after discussing the advantages and disadvantages of each method with the patient to choose the most appropriate method for his condition.
- It is preferable to prepare for kidney transplantation before reaching the final stage of failure.
- A fifth-stage patient will undergo dialysis if some symptoms appear that do not respond to drug treatment (the doctor will explain these symptoms to you and warn you about them if you are a fifth-stage renal failure patient).

**There is no cure for chronic kidney disease, but the main goal of drug therapy and diet is to stabilize the condition and not develop it, trying not to reach the stage of dialysis or kidney transplantation, or at least trying to slow the progression of the disease to delay the need for dialysis or kidney transplantation**