



جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

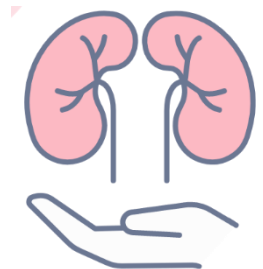
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Chronic kidney disease in children

Chronic kidney disease in children?

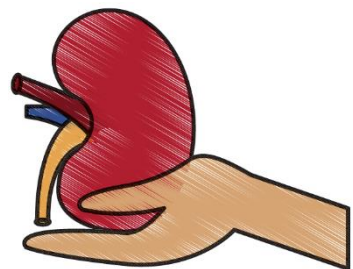
The kidney is an organ that has the shape of a bean, and the size of a hand fist. The 2 kidneys are located on the sides of the body below the ribcage. The kidney function include:

- Purification of the blood from the toxins, and producing urine.
- Balancing the level of electrolytes in the body, so the heart and muscles work properly.
- Maintaining control of blood pressure.
- Production of active form of Vitamin D, which is important for bone health.
- Production of erythropoietin, which stimulates red blood cell production.



What is acute renal insufficiency?

It happens acutely, and continues for a short period. It could resolve after treating its cause or persist with long term consequences.



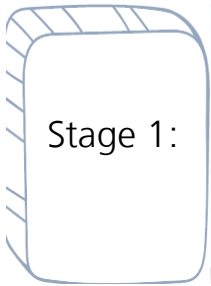
What is chronic kidney failure?

It is a gradual regression of the kidney function that persists for more than 3 months even with treatment.

The chronic kidney disease is described based on the glomerular filtration rate (GFR), which is the rate of blood filtration at the glomeruli (the functioning unit of the kidney)

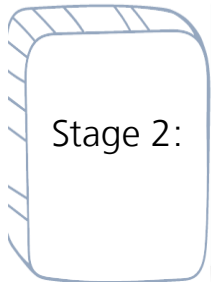
What are the stages of classification of chronic renal insufficiency according to the World Kidney Organization (KDIGO)?

Stages of Chronic kidney disease according to KDIGO:



Stage 1:

Normal GFR of 90 ml/min/1.73 m² or more



Stage 2:

GFR between 60-89 ml/min/1.73 m²

What are the stages of classification of chronic renal insufficiency according to the World Kidney Organization (KDIGO)?

Stage 3:

GFR between 30-59 ml/min/1.73 m²

Stage 4:

GFR between 15-29 ml/min/1.73 m²

Stage 5:

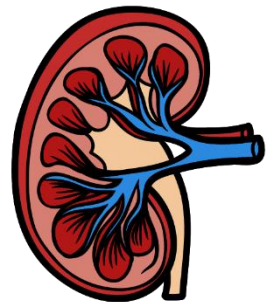
GFR less than 15 ml/min/1.73 m², and it indicates end stage kidney disease

What are the main causes of chronic kidney failure in children?

1-Primary kidney diseases:

Congenital anomalies of the urinary tract:

- Kidney agenesis
- Dysplastic Kidneys
- Ectopic kidneys
- Renal obstruction
- Polycystic kidney disease
- Glomerulonephritis (inflammation of the glomeruli)

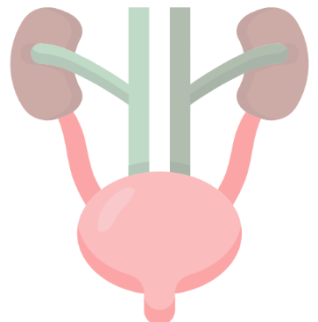


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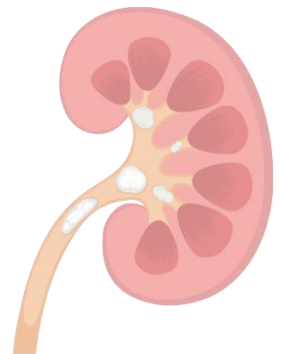
- Autoimmune diseases such as SLE
- Nephrotic syndrome (loss of proteins in the urine)
- Renal tubular acidosis (failure of the kidney to achieve acid base balance) Recurrent Urinary tract infections.



What are the main causes of chronic kidney failure in children?

2- Secondary diseases:

- Hypertension
- Diabetes
- Kidney stones
- Wilms' tumor (a kidney tumor commonly seen in children)



What are the symptoms of chronic kidney failure?

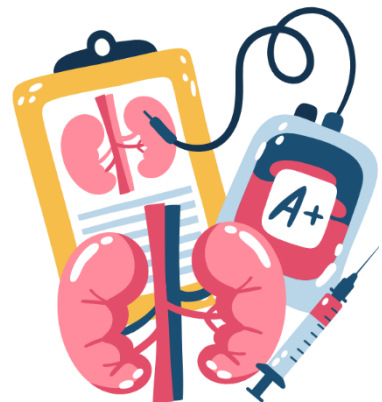
- Symptoms of the primary disease.
- Anemia and pallor.
- Decreased urine production.
- Body swelling (edema).
- Hypertension.
- Feeling tired.
- Bone problems.
- Growth problems.
- Altered mental state (encephalopathy).



What is the treatment for chronic kidney failure?

There is no ultimate cure for CKD, however, we can delay the development of complications, and prevent its progression through being compliant to the medications prescribed by the physician. Patients with end stage kidney disease will require one of the following therapies:

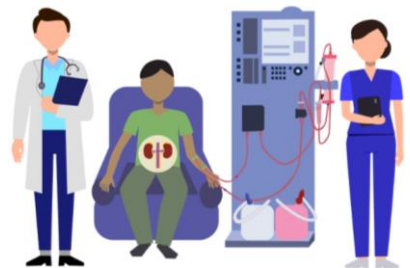
I-Kidney Dialysis: The aim of dialysis is to purify the blood from toxins and excess fluids when the kidneys are not able to do it by itself.



What are the types of dialysis?

There are two methods for dialysis:

- **Hemodialysis:** A catheter inserted into the patient's vein will carry the blood through a tube from the patient to the dialysis filter, where blood purification happens. The filtered blood goes back to the patient through another tube. This process takes about 3-4 hours, and happens 3 times a week.



What are the types of dialysis?

- Peritoneal dialysis:

The lining of the peritoneal cavity in the patient's abdomen is utilized as the filter instead of the hemodialysis filter. A peritoneal catheter will be inserted into the patient's abdomen, and it will be utilized to deliver the dialysis solution into the abdomen. The blood purification happens as it flows in the lining of the peritoneal cavity. The exchanged fluid will be emptied from the abdomen through the peritoneal catheter after few hours. Exchanging the fluids takes about 30-40 minutes, and the process will be repeated at least 4 times a day.

What is the treatment for chronic kidney failure?

2-Kidney Transplant:

The procedure includes implanting a healthy kidney and attaching it to the patient's vessels and urinary bladder.

Patient's original kidneys will be kept in their original place. Prior to the transplant, the patient will undergo few tests to avoid complications after the surgery.



How can I prevent chronic kidney disease?

We could minimize the intensity and complications of CKD by regular follow ups and treatment of the primary disease diabetes or hypertension.

The following includes the possible ways to prevent CKD:



How can I prevent chronic kidney disease?

Primary prevention:

It aims to minimize or eliminate factors that could harm the kidney:

- Avoiding medications that could harm the kidneys.
- Preventing infections during pregnancy.
- Preventing obesity.
- Early diagnosis and treatment of diabetes and hypertension.
- Genetic counselling to prevent inherited kidney disease.

Secondary prevention:

Preventing the progression of CKD from stage one to stage 5

Tertiary prevention:

Minimizing or delaying CKS complications by early kidney transplant.



References:

All the illustrations from [canva.com](https://www.canva.com)

Reviewed by:

The content of this booklet has been reviewed by consultant nephrologists in the pediatric department at King Fahd University Hospital

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