

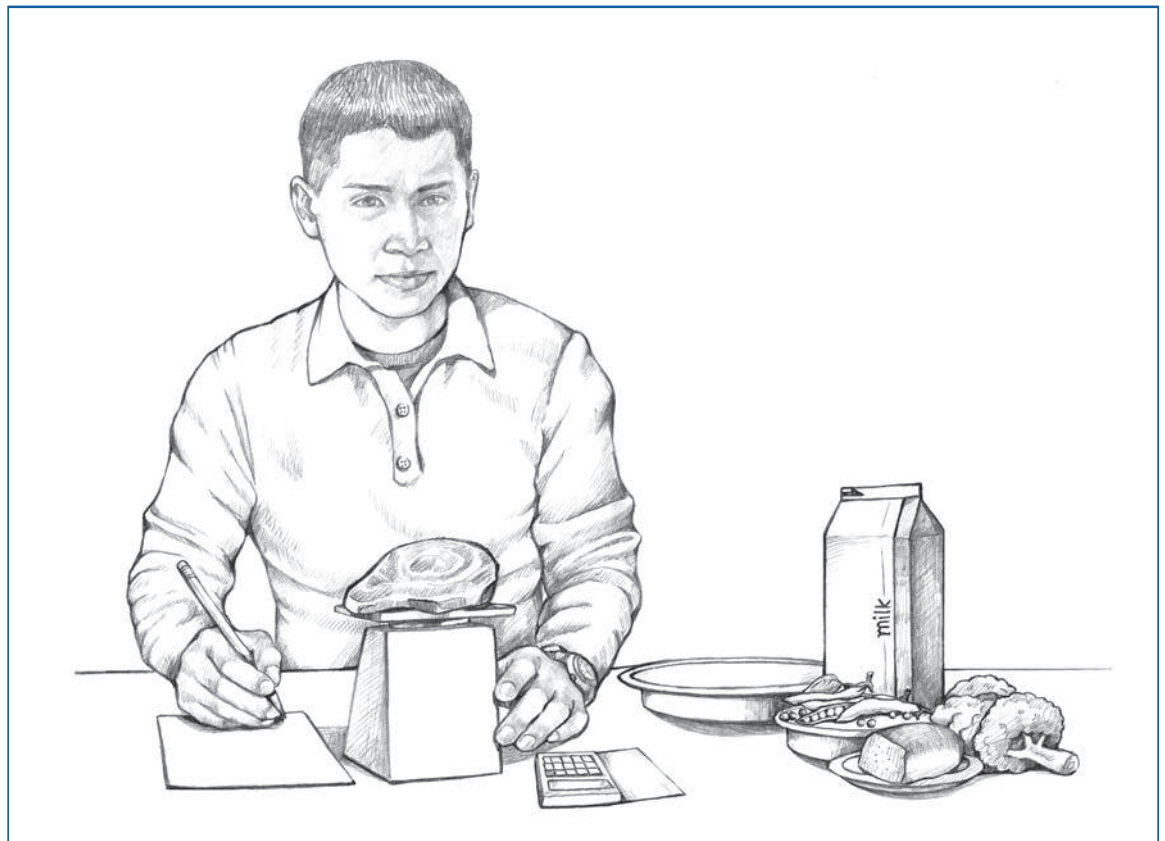


# Growth Failure in Children With Kidney Disease

**T**he kidneys play an important role in a child's growth. In addition to removing wastes and extra fluid from the blood, the kidneys produce hormones that promote red blood cell production. The kidneys also help regulate the amounts and interactions of nutrients from food, including minerals like calcium, phosphorus, and vitamin D, that are necessary for growth. Finally, the kidneys may also play a role in

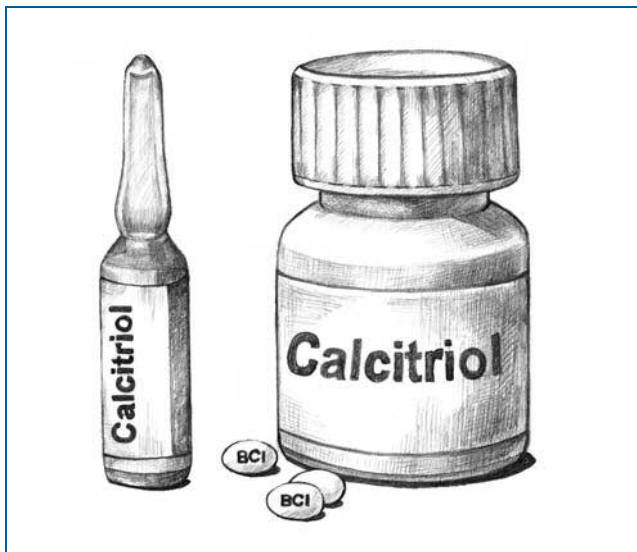
the metabolism of growth hormone, also called somatotropin.

Calcium and vitamin D are essential for normal bone growth. The kidneys turn vitamin D into an active hormone called calcitriol that helps bones absorb the right amount of calcium from blood. If the kidneys are impaired, bones do not get enough calcium either because the kidneys fail to turn vitamin D into calcitriol or because they let too much



Your child's doctor may recommend limiting foods that are high in phosphorus, like milk and other dairy products (except cream cheese and cottage cheese), meat, fish, and poultry. High-phosphorus foods also include some vegetables like broccoli, peas, and beans. A dietitian can help you learn to control phosphorus intake by measuring foods and keeping track of their phosphorus content.





The kidneys turn vitamin D into an active hormone called calcitriol that helps bones absorb the right amount of calcium from blood. Children with chronic kidney disease may need to take a synthetic form of calcitriol or a similar vitamin D hormone. These supplements may be administered by injection or taken orally in pill form.

phosphorus build up in the blood. The excess phosphorus draws calcium into the blood and blocks it from getting to the bones.

The child's doctor may recommend dietary changes and food supplements to treat growth failure. Dietary changes involve limiting foods that are high in phosphorus, like milk and other dairy products (except cream cheese and cottage cheese), meat, fish, and poultry. High-phosphorus foods also include some vegetables like broccoli, peas, and beans. Dark breads, like whole wheat and pumpernickel, and many cereals are also high in phosphorus. Since avoiding all of these foods is impossible, caregivers must work with a dietitian to find a healthy way to limit the phosphorus in the

child's diet while still providing enough calories and other nutrients for growth and health.

In addition to limiting phosphorus in the child's diet, the doctor may recommend a phosphate binder. This medicine binds some of the phosphorus in the bowel so that it is excreted in the child's stool. Phosphate binders come in the form of chewable tablets, liquids, capsules, and pills. Some people can use over-the-counter antacid tablets as phosphate binders because they contain calcium. Your child's doctor, however, may prescribe a newer calcium-free binder if calcium buildup in the blood is a concern. Give your child the phosphate binder with meals and only according to the doctor's recommendations.

Children with chronic kidney disease may also need to take vitamin D medications to help the bones absorb calcium and help build bones. These medications also help in the growth process.

If the child is very short as a result of kidney disease, some doctors prescribe injections of human growth hormone. Questions remain about the usefulness and safety of using growth hormone in patients with kidney disease. Most studies suggest that growth hormone stimulates growth in children with chronic renal conditions or children undergoing maintenance dialysis treatment or transplantation. While some questions remain, almost all pediatric nephrologists believe that the availability of growth hormone has been an important advance in our ability to treat small children with chronic kidney disease.

# National Kidney and Urologic Diseases Information Clearinghouse

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The National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health under the U.S. Department of Health and Human Services. Established in 1987, the Clearinghouse provides information about diseases of the kidneys and urologic system to people with kidney and urologic disorders and to their families, health care professionals, and the public. The NKUDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about kidney and urologic diseases.

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