



Learn about secondary hyperparathyroidism (SHPT) and ways to prevent it

Secondary hyperparathyroidism (SHPT) is a common health problem in people with late-stage chronic kidney disease (CKD). It happens when your body's levels of calcium, vitamin D and phosphorus are out of balance. It is important to prevent SHPT to avoid other serious health problems, such as heart attack, stroke or bone disease.

What is hyperparathyroidism?

Hyperparathyroidism is a disease that causes your parathyroid glands to make too much parathyroid hormone. The parathyroid glands are 4 small glands in your neck. They are called parathyroid because they are located next to your thyroid gland.

What is the parathyroid hormone (PTH)?

The parathyroid hormone (PTH) controls how much calcium is in your blood and bones. Your body's levels of calcium, vitamin D and phosphorus all need to be in balance. If any of them are too high or too low, your parathyroid glands make more PTH to try to "fix" the balance. For example:

1. If phosphorus levels are too high, calcium levels drop, leading to an imbalance of calcium and phosphorus.
2. To fix the balance, your parathyroid glands make more PTH
3. More PTH pulls calcium from your bones to raise the level of calcium in your blood

What is secondary hyperparathyroidism (SHPT)?

Secondary hyperparathyroidism or SHPT, is a condition when another disease, like CKD, causes

low levels of calcium in the body. Over time, in order to correct the imbalance of calcium, the parathyroid makes too much (or overactive) parathyroid hormone (PTH) and can grow larger.

Why is it important to prevent and manage SHPT?

If untreated, SHPT can cause health problems, such as:

- Bone disease that causes your bones to become weak and break easily
- Bone infections
- A buildup of calcium under your skin, which can cause painful, open sores and infection
- Heart attack or stroke because of too much calcium around your blood vessels and heart

How does CKD cause SHPT?

Healthy kidneys change **inactive vitamin D** to **active vitamin D**. Your body uses active vitamin D to absorb calcium from the foods you eat to keep balance between calcium and phosphorus. Healthy kidneys also filter extra phosphorus from your body, so it doesn't build up.

How kidney failure causes SHPT

1. As your kidneys fail, they cannot make enough active vitamin D. This leads to low calcium levels in your body.
2. As your kidney function decreases, your kidneys become less able to filter phosphorus from your body. This can cause high phosphorus levels to build up in your blood.
3. This means the levels of calcium and phosphorus in your body are out of balance.
4. Because calcium and phosphorus are out of balance, your parathyroid gland starts to make more PTH to pull calcium from your bones.
5. When calcium is pulled out from your bones, your bones can become weak and break easily.
6. The extra calcium in your blood can also build up and lead to other health problems with your skin, blood vessels and heart.

How can I prevent and manage SHPT?

The best way to prevent and manage SHPT is to keep your phosphorus and calcium levels in the normal range, based on your stage of CKD. Your doctor will do blood tests for SHPT, which measure your levels of calcium, phosphorus and PTH. You may not have any symptoms of low or high phosphorus or calcium levels.

If your phosphorus or calcium levels are lower or higher than normal, work with your doctor or dietitian to manage them.

Make sure you get tested for SHPT

Ask your doctor to confirm what stage of CKD you have. Then, use the table below to know how often your doctor should do blood tests for SHPT. If you have missed a test, ask your doctor!

Stage of kidney disease	Normal range for phosphorus in milligrams per deciliter (mg/dL)	Normal range for calcium in milligrams per deciliter (mg/dL)	How often should I be tested for SHPT?
Stage 1 or 2	2.7 to 4.6	8.5 to 10.2	Your kidneys still work well enough to control the balance of phosphorus and calcium.
Stage 3	2.7 to 4.6	8.5 to 10.2	Every 12 months for: <ul style="list-style-type: none"> • PTH • Phosphorus • Calcium
Stage 4	2.7 to 4.6	8.5 to 10.2	Every 4 months for: <ul style="list-style-type: none"> • PTH • Phosphorus • Calcium
Stage 5 or on dialysis	3.5 to 5.5	8.5 to 10.2	Every 3 months for PTH Every month for: <ul style="list-style-type: none"> • Phosphorus • Calcium

If you have SHPT, your doctor or dietitian may recommend that you:

- Make some changes to what you eat to lower the amount of phosphorus in your body. Foods that are low in phosphorus include eggs whites, apples and broccoli. To learn about ways to manage phosphorus by what you eat and get a list of foods low in phosphorus, visit American Kidney Fund's Kidney Kitchen at **[Kitchen.KidneyFund.org/phosphorus/](https://www.kidneyfund.org/kitchen/kidneyfund.org/phosphorus/)**.

Remember, your dietitian is glad to work with you to create a meal plan low in phosphorus.

- Take medicines, such as:
 - Vitamin D or calcium supplements to help your body absorb calcium
 - Calcimimetics, which signals your parathyroid glands to make less PTH
- Have surgery to remove one or more of your parathyroid glands

Learn more about kidney disease at **[KidneyFund.org](https://www.kidneyfund.org)**
and about eating with kidney disease at **[Kitchen.KidneyFund.org](https://www.kidneyfund.org/kitchen)**



Medically reviewed by Aisling Whelan, MS, RDN, CDN
and Kathy Wong, BS, RD.