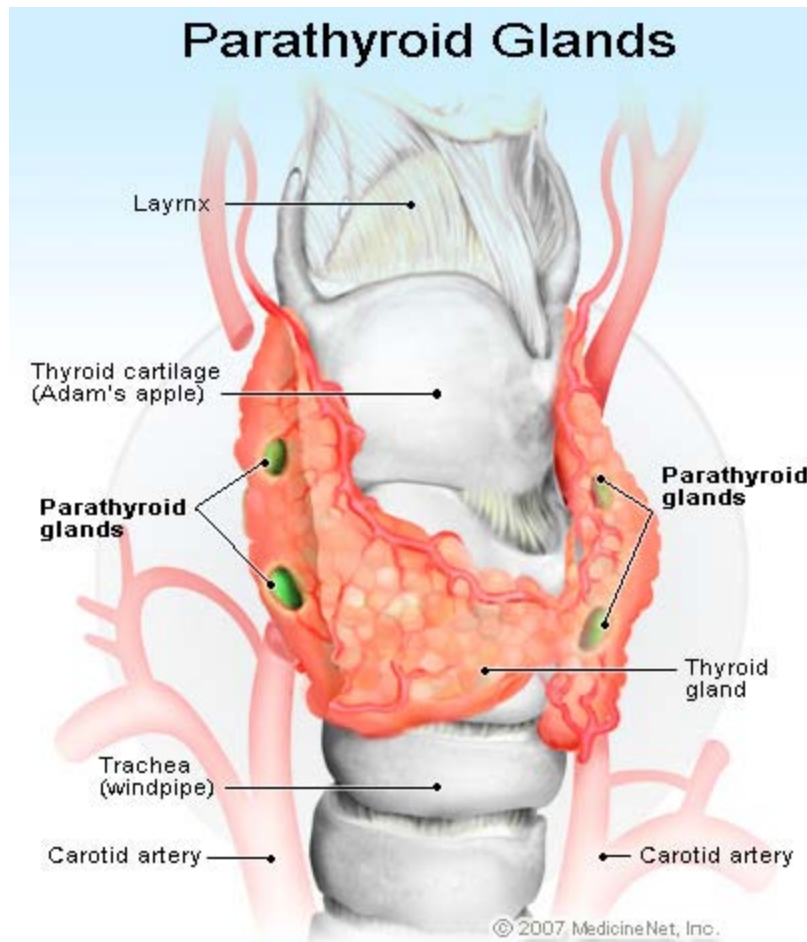


What are the parathyroid glands?

The parathyroid glands are four, small, pea-shaped glands that are located in the neck on either side of the [trachea](#) (the main airway) and next to the [thyroid gland](#). In most cases there are two glands on each side of the trachea, an [inferior](#) and a [superior](#) gland. Fewer than four or more than four glands may be present, and sometimes a gland(s) may be in an unusual location. The function of the parathyroid glands is to produce [parathyroid hormone](#) (PTH), a hormone that helps regulate calcium within the body.



What is a parathyroidectomy?

Parathyroidectomy is the removal of one or more of the parathyroid glands, and it is used to treat [hyperparathyroidism](#).

What is hyperparathyroidism?

Hyperparathyroidism is a condition in which the parathyroid glands produce too much PTH. If there is too much PTH, calcium is removed from the bones and goes into the blood, and there is increased [absorption](#) of calcium from the intestine into the blood. This results in increased levels of calcium in the blood and an excess of calcium in the urine. (If there is too little PTH, the blood calcium level can fall to dangerously low levels.) In more serious cases, the [bone density](#) will diminish and kidney stones can form. Other non-specific symptoms of hyperparathyroidism include [depression](#), muscle weakness, and [fatigue](#). Every effort is made to medically treat or control these conditions prior to surgery. These efforts include avoiding calcium rich foods, proper hydration (intake of fluids), and medications to avoid [osteoporosis](#).

What causes hyperparathyroidism?

There are two types of hyperparathyroidism, primary and secondary. The most common disorder of the parathyroid glands and one that causes primary hyperparathyroidism, is a small, [tumor](#) called a parathyroid [adenoma](#). A parathyroid adenoma is a benign condition in which one parathyroid gland increases in size and produces PTH in excess. (As opposed to parathyroid adenoma, it should be noted that malignant tumors of the parathyroid glands, that is, cancer, is very rare.) In most situations patients are unaware of the adenoma, and they are found when routine blood test results show an elevated blood calcium and PTH level. Less commonly, primary hyperparathyroidism may be caused by overactivity of all of the parathyroid glands, referred to as parathyroid hyperplasia.

With secondary hyperparathyroidism, the secretion of PTH is caused by a nonparathyroid disease, usually [kidney failure](#).

When is a parathyroidectomy necessary and how is it performed?

Parathyroidectomy is necessary when calcium levels are elevated, if there is a complication of hyperparathyroidism, or if a patient is relatively young. During a parathyroidectomy, the surgeon delicately removes one or more of the tiny parathyroid glands. In some situations, both sides of the neck are explored, while in other cases a direct approach is made through a small incision (referred to as a minimally invasive parathyroidectomy). Tests such as a high-resolution [ultrasound](#) or a nuclear medicine scan (called a sestamibi scan) help to direct the approach preoperatively or intra-operatively by identifying the location of the overactive, enlarged gland. In rare situations, the offending gland cannot be found. (A portion of a gland also may be transplanted to another site in the neck or the arm to preserve parathyroid function.)

Whereas [preoperative](#) tests help to identify hyperparathyroidism and to direct the surgical approach, PTH levels obtained during parathyroidectomy help to guarantee the successful [resection](#) of the abnormal gland by demonstrating a return of the PTH levels to normal after the suspected parathyroid adenoma is removed. Using this method, a PTH determination is obtained immediately prior to the resection and compared to a PTH determination done ten minutes after the resection.

What are the risks of parathyroidectomy?

The anatomy of the parathyroid glands is complicated by two important structures: the [recurrent laryngeal nerve](#) and the thyroid gland. The recurrent laryngeal nerve is a very important nerve that runs very close to or through the thyroid gland next to the parathyroid glands. This nerve controls movement of the vocal cord on that side of the [larynx](#), and damage to the nerve can weaken or paralyze the vocal cord. Weakness or paralysis of one vocal cord causes a breathy weak voice, and difficulty swallowing thin liquids. Weakness or paralysis of both vocal cords causes difficulty breathing. In most situations, a special breathing tube is used that rests in the larynx (voice box) between the vocal cords and is designed to allow for the continued monitoring of their function. In rare situations, the parathyroid adenoma is found within the thyroid gland, and it is necessary to remove the thyroid gland as well. The main goal of the parathyroidectomy operation is to remove the offending gland(s) while protecting the remaining normal parathyroid glands as well as the recurrent laryngeal nerves and the thyroid gland.

Surgery may be unsuccessful, that is, the hyperparathyroidism may not be cured and there may be complications of the surgery. Because individuals differ in their response to surgery, their reaction to the [anesthetic](#) and their healing following surgery, there can be no guarantee made as to the results or the lack of complications. Furthermore, the outcome of surgery may depend on preexisting or concurrent medical conditions.

What are the possible complications of parathyroidectomy?

The following complications have been reported in the medical literature. This list is not meant to be inclusive of every possible complication. They are listed here for your information only, not to frighten you, but to make you aware and more knowledgeable concerning parathyroidectomy. Although many of these complications are rare, all have occurred at one time or another in the hands of experienced surgeons practicing community standards of care. Anyone who is contemplating surgery must weigh the potential risks and complications against the potential benefits of the surgery or any alternative to surgery.

- 1. Damage to the recurrent laryngeal nerve with resultant weakness or paralysis of the vocal cord or cords:** This is a rare but serious complication. [Unilateral](#) weakness results in a weak, breathy voice, and there will be problems swallowing. A second surgical procedure can alleviate many of the symptoms of unilateral [vocal cord paralysis](#). [Bilateral](#) vocal cord paralysis results in a relative normal voice; however, there is difficulty breathing, and the patient may ultimately require a tracheotomy. Every effort is made to protect the recurrent laryngeal nerve. Temporary vocal cord weakness occurs much more frequently than permanent vocal cord weakness, and it usually will resolve after several days or within a few weeks. Rarely, a malignant tumor has already invaded the nerve and has caused vocal cord weakness or paralysis.
- 2. Bleeding or [hematoma](#):** In rare situations, a [blood transfusion](#) may be necessary because blood is lost during surgery. Patients can choose to have [autologous](#) blood (their own blood) or blood from a friend or relative collected in advance of the surgery in case a transfusion is necessary. The surgeon can make arrangements for patients interested in these options.
- 3. Damage to the remaining parathyroid glands with resultant problems in maintaining calcium levels in the blood:** In most situations, you only need one functioning gland to have normal calcium levels. In the rare event that all glands are removed, blood calcium levels may fall, and patients may need to take [calcium supplementation](#) for the rest of their lives.

4. **Need for further and more aggressive surgery:** In some cases, surgical exploration fails to identify the abnormal parathyroid gland or multiple abnormal glands may be present. Further and more aggressive surgery may be necessary, such as an extensive surgical exploration of the neck or chest.
5. **Need for a limited or total [thyroidectomy](#):** In rare situations, the abnormal parathyroid gland is within the thyroid gland itself or an unexpected thyroid [carcinoma](#), a malignant cancer, is identified. In such situations, much or all of the thyroid gland must be removed, and there may be a need for life-long thyroid hormone treatment.
6. **Prolonged pain, impaired healing, need for prolonged hospitalization, permanent numbness of the neck skin, poor cosmetic result, and/or scar formation.**
7. **Recurrence of the tumor or failure to cure the tumor despite effective therapy**

What about care after parathyroidectomy?

After surgery, patients go to the recovery room where nurses monitor them for about one hour. In most situations patients spend one night in the hospital, although some patients undergoing a minimally invasive parathyroidectomy may go home the same day. A friend or family member usually is required to pick patients up from the surgical facility if they are going directly home. It is a good idea for someone to be at home with the patient for the first night.

Patients' necks may be swollen and bruised after surgery, and in most instances there will be a bandage wrapped around the neck. Bandages usually are removed one or two days following surgery. There may be a small plastic drain exiting through the skin. If so, the drainage of fluid from the drain will be monitored in the recovery room or hospital. Sometimes patients may even go home with a drain in place after the nursing staff teaches them how to manage the drain. Sutures taped to the neck should not be cut or trimmed.

Starting several hours after surgery and possibly for several days, blood calcium levels usually are monitored. It is not uncommon for there to be a fall in the blood calcium level following surgery. (The remaining parathyroid glands are "sleepy" following surgery.) As a result, patients may need to take supplemental oral calcium for several days or weeks following surgery. Permanent calcium problems are rare. **If patients experience numbness and tingling of the lips, arms, or feet, and or twitching of the muscles--symptoms of low blood calcium--they should contact their surgeon or endocrinologist immediately.** In most situations in which these symptoms occur, surgeons will ask patients to take supplemental calcium, such as in Tums-Extra Strength, after surgery. This helps to replenish calcium that is moving back into the bones.

Numbness, slight swelling, tingling, discoloration, bumpiness, hardness, crusting, tightness, and a small amount of redness around the incision are a normal findings after surgery and should improve with time. It is usually alright for patients to wash their face, neck, and hair after the bandages have been removed. Excessive scrubbing of the wound should be avoided, and a gentle soap and shampoo should be used.

In the hospital and after going home, patients generally lie in bed and rest with their head elevated on 2-3 pillows. By keeping their head elevated above their heart, swelling of the neck due to [edema](#) may be lessened. Patients get out of bed with assistance to use the bathroom, however. It is good to avoid straining when having a bowel movement, and, if constipation is a problem, a [stool](#) softener or a gentle [laxative](#) is a good idea.

It may be better to eat a light, soft, and cool diet as tolerated after recovery from the anesthetic. Even though patients may be hungry immediately after surgery, it may be best to go slowly to prevent postoperative [nausea](#) and vomiting. Occasionally, patients may [vomit](#) one or two times immediately after surgery. If vomiting persists, the doctor may prescribe medications to settle the stomach. A good overall diet with ample rest promotes healing.

Antibiotics often are prescribed after surgery. Patients should finish all the pills that have been ordered. Some form of a narcotic pain medication usually will be prescribed and is to be taken as needed. Patients who take narcotics should not drive. If there is nausea or vomiting postoperatively, patients may be prescribed medications such as [promethazine](#) (Phenergan). If patients have any questions or feel that they are developing a reaction to any of the medications, it is important that they consult with their doctor. Patients should not take any other medication, prescribed or over-the-counter, unless they have discussed it with their doctor.

Sutures are removed approximately 7 days after surgery. If not already scheduled, patients should call the surgeon's office to arrange for a follow-up visit. Routine follow-up care depends on the nature of any problems that develop. After healing has occurred, patients usually return to their endocrinologist for long-term monitoring of their calcium levels.

Patients may go back to work or school only when their doctors say they may. Patients probably should rest for the first week following surgery and avoid excessive talking, smiling, hard chewing, strenuous activities, lifting heavy objects, and bending over. Alcohol and tobacco should be avoided because they may prolong swelling and healing.

After 3 weeks, if there are not problems with bleeding or excessive swelling, it is reasonable to resume exercise and swimming. To allow for [postoperative care](#), it is probably a good idea not to travel out of town for three weeks after surgery.