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## About Anal Cancer

### Overview and Types

If you've been diagnosed with anal cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Anal Cancer?](#)

### Research and Statistics

See the latest estimates for new cases of anal cancer and deaths in the US and what research is currently being done.

- [Key Statistics for Anal Cancer](#)
  - [What's New in Anal Cancer Research?](#)
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## What Is Anal Cancer?

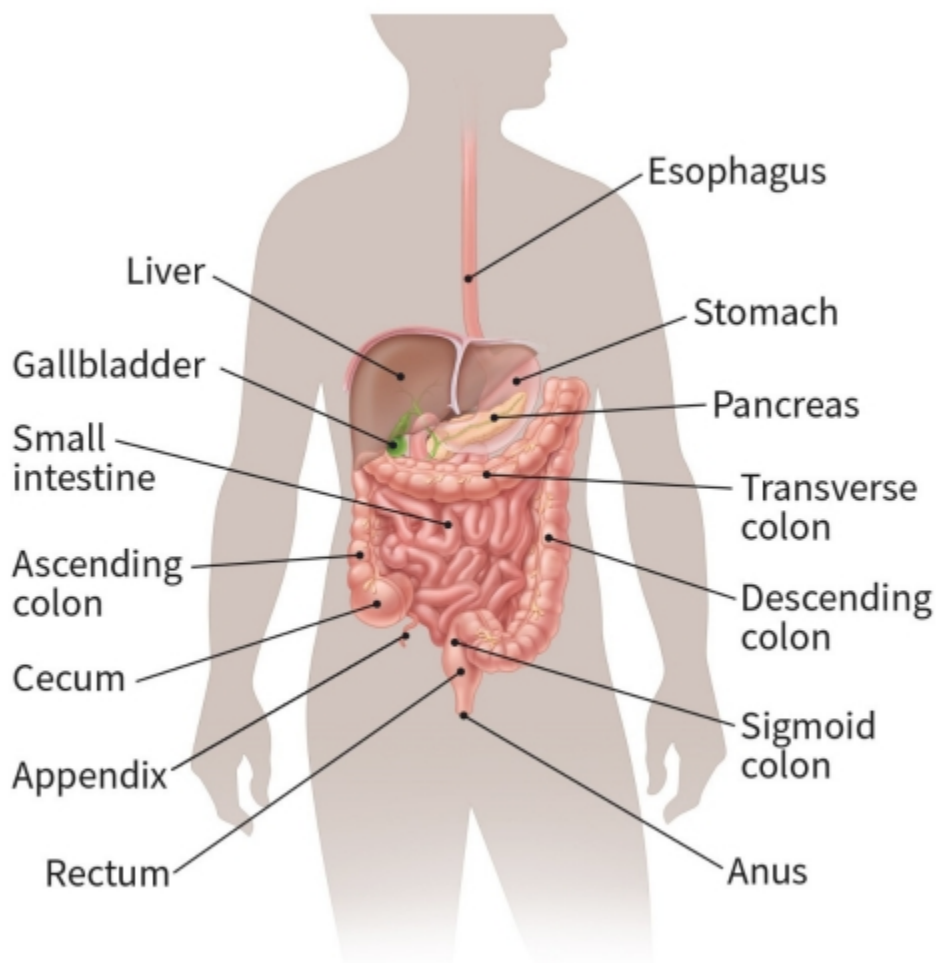
Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other parts of the body. To learn more about how cancers start and spread, see [What Is Cancer?](#)<sup>1</sup>

Anal cancer starts in the anus. To understand anal cancer, it helps to know about the anus and how it works.

## The anus

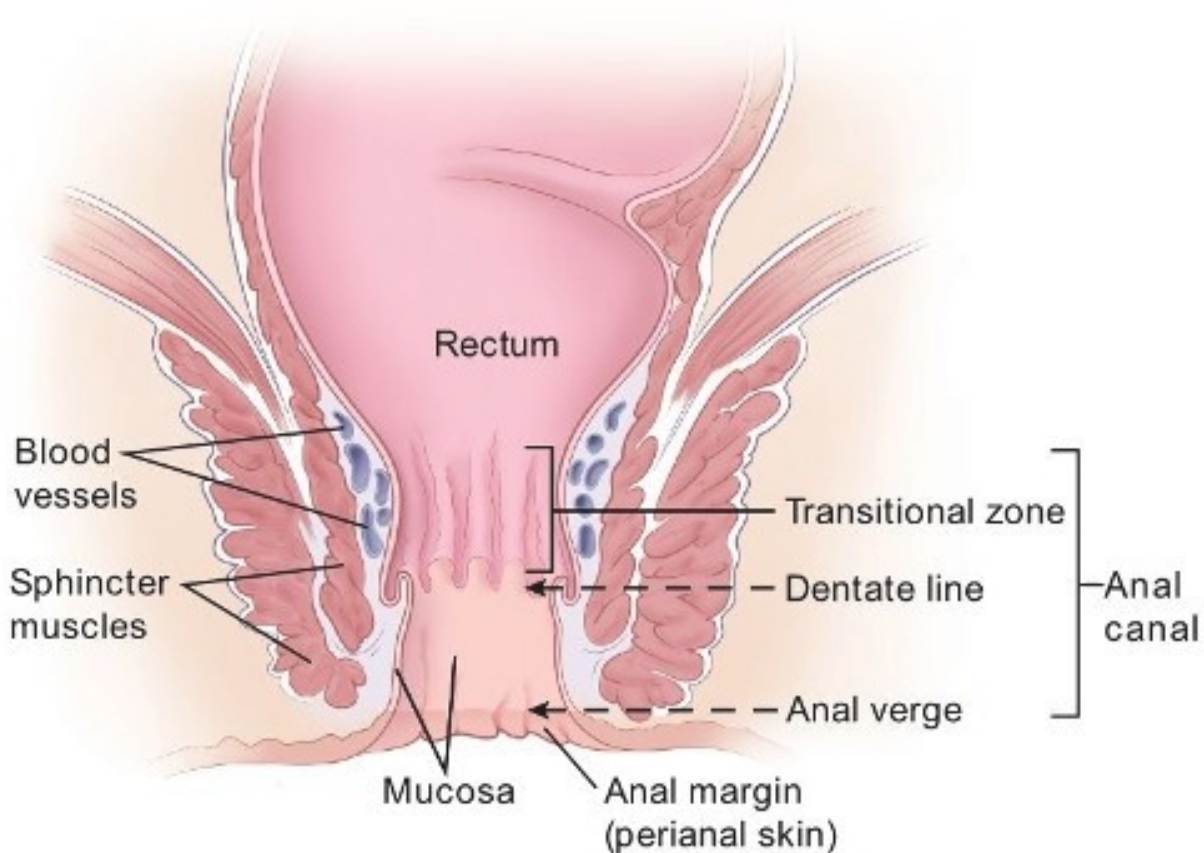
The anus is the opening at the lower end of the intestines. It's where the end of the intestines connect to the outside of the body.

As food is digested, it passes from the stomach to the small intestine. It then moves from the small intestine into the main part of the large intestine (called the *colon*). The colon absorbs water and salt from the digested food. The waste matter that's left after going through the colon is known as *feces* or *stool*. Stool is stored in the last part of the large intestine, called the *rectum*. From there, stool is passed out of the body through the anus as a bowel movement. The anal sphincter (SFINK-ter) muscles control the passing of stool. These are ring-shaped muscles around the anus that keep stool from coming out until they are relaxed during a bowel movement.



The anal opening is connected to the rectum by the *anal canal*. The anal canal is about

1-1/2 inches long. It goes from the rectum to the *anal verge*. This is where the canal connects to the outside skin at the anus.



The inner lining of the anal canal is the *mucosa*. Most anal cancers start from cells in the mucosa.

Glands and ducts (tubes leading from the glands) are found under the mucosa. The glands make mucus, which acts as a lubricating fluid. Anal cancers that start from cells in the glands are called *adenocarcinomas*.

The anal canal changes as it goes from the rectum to the anal verge:

- Cells above the anal canal (in the rectum) and in the part of the anal canal close to the rectum are shaped like tiny columns.
- Most cells near the middle of the anal canal are shaped like cubes and are called *transitional cells*. This area is called the *transitional zone*.
- About midway down the anal canal is the *dentate line*, which is where most of the anal glands empty into the anus.

- Below the dentate line are flat (squamous) cells.
- At the anal verge, the squamous cells of the lower anal canal merge with the skin just outside the anus. This skin around the anal verge (called the *perianal skin* or the *anal margin*) is also made up of squamous cells, but it also contains sweat glands and hair follicles, which are not found in the lining of the lower anal canal.

### **Anal cancers are often divided into 2 groups, which are sometimes treated differently:**

- Cancers of the anal canal (above the anal verge)
- Cancers of the anal margin (below the anal verge)

Sometimes anal cancers extend from one area into the other, so it's hard to know exactly where they started.

The anal canal is surrounded by 2 sphincter muscles that keep the anus closed and prevent stool leakage.

## **Anal tumors**

Many types of tumors can develop in the anus. Not all of these tumors are cancers – some are *benign* (not cancer).

## **Polyps**

Polyps are small, bumpy, or mushroom-like growths that form in the mucosa or just under it. There are many kinds.

- **Inflammatory polyps** start because of irritation from injury or infection.
- **Lymphoid polyps** are caused by an overgrowth of lymph tissue (which is part of the immune system). Lymph tissue under the anal inner lining (mucosa) is normal, but these overgrowths are not.
- **Hypertrophied anal papillae** are benign growths of connective tissue that are covered by squamous cells. They are simply enlarged normal papillae, which are small folds of mucosa found at the dentate line. Hypertrophied anal papillae are also called *fibroepithelial polyps*.

## Skin tags

Skin tags are benign growths of connective tissue that are covered by squamous cells. Skin tags are often mistaken for hemorrhoids (swollen veins inside the anus or rectum), but they're not the same.

## Anal warts

Anal warts (also called *condylomas*) are growths that form just outside the anus and in the lower anal canal below the dentate line. Sometimes they can be found just above the dentate line. They're caused by infection with [human papilloma virus<sup>2</sup>](#) (HPV). People who have or had anal warts are more likely to get anal cancer. (See “Potentially pre-cancerous anal conditions” below and [Risk Factors for Anal cancer<sup>3</sup>](#))

## Other benign tumors

In rare cases, benign tumors can grow in other tissues of the anus. These include:

- **Adnexal tumors:** Usually benign growths that start in hair follicles or sweat glands of the skin just outside of the anus. These tumors stay in the perianal skin area and do not grow into the anal region.
- **Leiomyomas:** Benign tumors that develop from smooth muscle cells
- **Granular cell tumors:** Tumors that develop from nerve cells and are composed of cells that contain lots of tiny spots (granules)
- **Hemangiomas:** Tumors that start in the cells lining blood vessels
- **Lipomas:** Benign tumors that start from fat cells
- **Schwannomas:** Tumors that develop from cells that cover nerves

## Potentially pre-cancerous anal conditions

Some changes in the anal mucosa are harmless at first, but might later develop into a cancer. These are called *pre-cancerous* conditions. A common term for these potentially pre-cancerous conditions is *dysplasia*. Some warts, for example, contain areas of dysplasia that can develop into cancer.

Dysplasia in cells of the anus is also called *anal intraepithelial neoplasia* (AIN) or *anal squamous intraepithelial lesions* (SILs). Depending on how the cells look, AIN or anal SIL can be divided into 2 groups:

## **Low-grade AIN (sometimes called AIN1 or low-grade anal SIL)**

The cells in low-grade AIN look like normal cells in many ways.

Low-grade AIN often goes away without treatment. It has a low chance of turning into cancer.

## **High-grade AIN (sometimes called AIN2 or AIN3, or high-grade anal SIL)**

The cells in high-grade AIN look much more abnormal.

High-grade AIN is less likely to go away without treatment and, with time, could become cancer. It needs to be watched closely. Some cases of high-grade AIN need to be treated.

## **Types of anal cancer**

### **Carcinoma in situ**

Sometimes abnormal cells on the inner surface layer of the anus look like cancer cells but have not grown into any of the deeper layers. This is known as *carcinoma in situ*, (pronounced in SY-too), or *CIS*. Another name for this is *Bowen disease*.

Some doctors see this as the earliest form of anal cancer. Others consider it the most advanced type of AIN, which is a pre-cancer (see above), but not a true cancer.

### **Invasive anal cancers**

These are the different types of cancer that can start in the anal region:

#### ***Squamous cell carcinomas***

Most anal cancers in the United States are squamous cell carcinomas. (Nearly 9 out of 10 cases.) These tumors start in the squamous cells that line most of the anal canal and the anal margin.

Squamous cell carcinomas in the anal canal have grown beyond the surface and into the deeper layers of the lining (as opposed to carcinoma in situ which is only in the surface cells).

**Cloacogenic carcinomas** (also called *basaloid* or *transitional cell carcinomas*) are a type of squamous cell cancer. They develop in the transitional zone, also called the *cloaca*. These cancers look slightly different under a microscope, but they behave and are treated like other squamous cell carcinomas of the anal canal.

Squamous cell carcinomas of the anal margin (perianal skin) are treated much like squamous cell carcinomas of the skin elsewhere. For more on this, see [Skin Cancer: Basal and Squamous Cell](#)<sup>4</sup>.

### **Adenocarcinomas**

A small number of anal cancers are known as *adenocarcinomas*. These start in cells that line the upper part of the anus near the rectum. They can also start in the glands under the anal mucosa that release secretions into the anal canal. Most anal adenocarcinomas are treated the same as rectal carcinomas. For more information, see [Colorectal Cancer](#)<sup>5</sup>.

Adenocarcinomas can also start in apocrine glands (a type of sweat gland of the perianal skin). *Paget's disease* is a type of apocrine gland carcinoma that spreads through the surface layer of the skin. Paget's disease can affect skin anywhere in the body but most often affects skin of the perianal area, [vulva](#)<sup>6</sup>, or [breast](#)<sup>7</sup>. This should not be confused with Paget's disease of the bone, which is not cancer and a different disease.

### **Basal cell carcinomas**

Basal cell carcinomas are a type of skin cancer that can develop in the perianal skin. These tumors are much more common in areas of skin exposed to the sun, such as the face and hands, and account for very few anal cancers. They are often treated with surgery to remove the cancer. For more information, see [Skin Cancer: Basal and Squamous Cell](#)<sup>8</sup>.

### **Melanomas**

These cancers start in cells in the skin or anal lining that make the brown pigment called *melanin*. Only a very small portion of anal cancers are melanomas. Melanomas are far more common on the skin in other parts of the body. If melanomas are found at an early stage (before they have grown deeply into the skin or spread to lymph nodes) they can be removed with surgery, and the outlook for long-term survival is very good. But because anal melanomas are hard to see, most are found at a later stage. If possible, the entire tumor is removed with surgery. If all of the tumor can be removed, a cure is

possible. If the melanoma has spread too far to be removed completely, other treatments may be given. For more on this, see [Melanoma Skin Cancer](#)<sup>9</sup>.

### ***Gastrointestinal stromal tumors (GISTs)***

These cancers are much more common in the stomach or small intestine, but rarely they can start in the anal region. When these tumors are found at an early stage, they are removed with surgery. If they have spread beyond the anus, they can be treated with drug therapy. For more information, see [Gastrointestinal Stromal Tumor \(GIST\)](#)<sup>10</sup>.

**The anal cancer information on our web site focuses mainly on anal squamous cell carcinoma, which is, by far, the most common type of anal cancer.**

### **Hyperlinks**

1. [www.cancer.org/cancer/cancer-basics/what-is-cancer.html](http://www.cancer.org/cancer/cancer-basics/what-is-cancer.html)
2. [www.cancer.org/cancer/cancer-causes/infectious-agents/hpv.html](http://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv.html)
3. [www.cancer.org/cancer/anal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/anal-cancer/causes-risks-prevention/risk-factors.html)
4. [www.cancer.org/cancer/basal-and-squamous-cell-skin-cancer.html](http://www.cancer.org/cancer/basal-and-squamous-cell-skin-cancer.html)
5. [www.cancer.org/cancer/colon-rectal-cancer.html](http://www.cancer.org/cancer/colon-rectal-cancer.html)
6. [www.cancer.org/cancer/vulvar-cancer/about/what-is-vulvar-cancer.html](http://www.cancer.org/cancer/vulvar-cancer/about/what-is-vulvar-cancer.html)
7. [www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/types-of-breast-cancer/paget-disease-of-the-nipple.html](http://www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/types-of-breast-cancer/paget-disease-of-the-nipple.html)
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9. [www.cancer.org/cancer/melanoma-skin-cancer.html](http://www.cancer.org/cancer/melanoma-skin-cancer.html)
10. [www.cancer.org/cancer/gastrointestinal-stromal-tumor.html](http://www.cancer.org/cancer/gastrointestinal-stromal-tumor.html)

### **References**

See all references for Anal Cancer ([www.cancer.org/cancer/anal-cancer/references.html](http://www.cancer.org/cancer/anal-cancer/references.html))

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# Key Statistics for Anal Cancer

Anal cancer is fairly rare – much less common than cancer of the colon or rectum. The American Cancer Society estimates for anal cancer in the United States for 2020 are:

- About 8,590 new cases (5,900 in women and 2,690 in men)
- About 1,350 deaths (810 in women and 540 in men)

The number of new anal cancer cases has been rising for many years. Anal cancer is rare in people younger than 35 and is found mainly in older adults, with an average age being in the early 60s.

The risk of being diagnosed with anal cancer during one's lifetime is about 1 in 500. The risk is slightly higher in women than in men. The risk is also higher in people with certain [risk factors](#)<sup>1</sup> for anal cancer.

Treatment for anal cancer is often very effective, and many patients with this cancer can be cured. But anal cancer can be a serious condition. For information on survival, see [Survival Rates by Stage of Anal Cancer](#)<sup>2</sup>.

Visit the American Cancer Society's [Cancer Statistics Center](#)<sup>3</sup> for more key statistics

## Hyperlinks

1. [www.cancer.org/cancer/anal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/anal-cancer/causes-risks-prevention/risk-factors.html)
2. [www.cancer.org/cancer/anal-cancer/detection-diagnosis-staging/survival-rates.html](http://www.cancer.org/cancer/anal-cancer/detection-diagnosis-staging/survival-rates.html)
3. [cancerstatisticscenter.cancer.org/](http://cancerstatisticscenter.cancer.org/)

## References

American Cancer Society. *Cancer Facts & Figures 2020*. Atlanta, Ga: American Cancer Society; 2020.

See all references for Anal Cancer ([www.cancer.org/cancer/anal-cancer/references.html](http://www.cancer.org/cancer/anal-cancer/references.html))

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# What's New in Anal Cancer Research?

Important research into anal cancer is now under way in many hospitals, medical centers, and other institutions around the world. Each year, scientists use [clinical trials](#)<sup>1</sup> to find out more about what causes this disease, how to prevent it, and how to better treat it.

## Looking at changes in anal cancer cells

We know that [human papillomavirus](#)<sup>2</sup> (HPV) is a major [cause of anal cancer](#)<sup>3</sup>. Researchers are now looking at how HPV affects molecules inside anal cells to cause them to become cancer. Improved understanding of the molecular changes inside anal cancer cells may lead to ways to prevent it and is also expected to help scientists find treatments using drugs that target these changes. Targeted drugs are different from standard chemotherapy drugs. They sometimes work when chemo drugs don't, and they often have different (and less severe) side effects.

## Screening for anal cancer

Ongoing research is being done on the value of [screening tests](#)<sup>4</sup> for anal cancer, especially in people with major risk factors, such as [HIV infection](#)<sup>5</sup>. (Screening is checking for a disease in people who don't have symptoms of it.) The test studied most is anal cytology, sometimes called the *anal Pap test*. This test may help find anal cancer when it's small, before it's causing symptoms and when it's easier to treat. Studies are also looking at whether the anal Pap test can help find anal pre-cancer (called *anal intraepithelial neoplasia*, or AIN), so it can be treated before cancer even develops.

## Treatment

Better treatments for anal cancer with fewer side effects and long-term changes in body function are areas of active research. For instance, [photodynamic therapy](#)<sup>6</sup> is being looked at to see if it can help treat small tumors and pre-cancer changes. Drugs like 5-FU and imiquimod cream are also being used. These treatments are focused on the changed cells in the anus. They don't harm healthy cells in the anus or the rest of the body.

[Immunotherapy](#)<sup>7</sup> is treatment that boosts the body's immune response against cancer cells. Different kinds of immunotherapy are being study for use against anal cancer. Pembrolizumab (Keytruda<sup>®</sup>) is one example that's already used to treat other types of

cancer. It's now being studied for use in treating anal cancers that have spread to other parts of the body and don't respond to other forms of treatment.

Radiation therapy is a common treatment for anal cancer. Doctors are looking at ways to give external radiation more accurately and effectively to decrease the effects on normal healthy tissues. Other research is being done to learn about the possible benefits of combining external radiation and internal radiation therapy to treat anal cancer.

Combining chemotherapy and radiation is another area of interest. Giving these treatments together might allow people to get lower doses of each one, which could lessen side effects. Different drug combinations, with different forms of radiation are being tested in clinical trials.

[HPV vaccines](#)<sup>8</sup> are recommended for children and certain young adults to help prevent HPV infection that can cause some types of cancer, but the vaccines don't treat HPV infections that people already have. Doctors are looking at whether HPV vaccines might be used to help treat high-grade pre-cancers and keep them from becoming cancer. Researchers are also working on new vaccines to treat women and men who already have HPV infections and [HPV-related cancers](#)<sup>9</sup> like anal cancer or cervical cancer. These vaccines may help the immune system attack pre-cancers and even cancers that contain HPV.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
2. [www.cancer.org/cancer/cancer-causes/infectious-agents/hpv.html](http://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv.html)
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4. [www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines.html](http://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines.html)
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7. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html)
8. [www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-vaccines.html](http://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-vaccines.html)
9. [www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-and-cancer-info.html](http://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-and-cancer-info.html)

## References

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