



This type of cancer analysis and immunotherapy-based treatment evaluation

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Abstract

Cancer is the second leading cause of death in humans after cardiovascular diseases, and the number of patients continues to increase. Cancer treatment includes removal of the tumor area using surgery, radiation therapy, chemotherapy, and targeted drug therapy, and in recent years, immunotherapy has created promising prospects in cancer treatment. The immune system plays an important role in maintaining the health of the body. the immune system combats damage to the body's health and destroys harmful cells. Colon cancer is one of the most common cancers that has different treatment methods. Treatment for This type of cancer varies from person to person and depends on the patient's condition. The treatment process for This type of cancer can be long and requires patience and cooperation from the patient and their companions. Bowel cancer or This type of cancer is one of the most common types of cancer that affects many people around the world. This type of cancer specifically affects the colon and rectum. The colon is located at the end of the digestive tract. It usually occurs in older people, but that doesn't mean other age groups don't get it. Treatment for bowel or colorectal cancer can include treatments such as surgery, chemotherapy, immunotherapy, and other treatment options. Which treatment method is right for you depends on the stage of your bowel cancer and its severity. In this article, we describe the treatment of This type of cancer using immunotherapy.

Keywords: Cancer, Colorectal, Therapy, Immunotherapy, Chemotherapy.

1. Introduction

This type of cancer or colon cancer occurs when the cells that cover the colon or rectum become abnormal and grow out of control. Because symptoms often don't appear until the cancer has progressed, regular This type of cancer screening is important.

Cancer that starts in the colon is called colon cancer, while cancer in the rectum is known as rectal cancer. Cancers that affect any of these organs may be called colorectal cancer. are created. Polyps can change after a series of mutations (abnormalities) develop in their cellular DNA. Some of the risk factors for colon cancer include a family history of colon or rectal cancer, diet, alcohol consumption, smoking, and inflammatory bowel disease.

Polyps are small in size and only show mild symptoms if symptoms occur. For this reason, gastroenterologists recommend regular screening tests to detect and remove polyps before they become cancerous. For the treatment of colon cancer, a variety of treatment methods such as surgery, radiation therapy, as well as drug treatments such as: There is chemotherapy, targeted treatment and immunotherapy.

It should be noted that if the colon and rectum become cancerous at the same time, the term "colorectal cancer" is used. This type of cancer starts in the rectum. The American Cancer Society estimates that 1 in 22 men and 1 in 24 women will develop This type of cancer in their lifetime.

Most colon cancers occur when abnormal growth of cells occurs on the inner surface of the colon or rectum, and this growth is called a polyp. Some polyps can develop into cancer over time, which can take years. Of course, it should be noted that not all polyps turn into cancer. The probability of polyp change depends on the type, and the two main types of polyps include:

1. Adenomatous polyps (endomas): These polyps sometimes turn into cancer, which is why endomes are called a precancerous condition.
2. Hyperplastic polyps and inflammatory polyps: These polyps are common, but they are generally not called precancerous.

Other factors that cause polyps and increase the risk of colon cancer are a person's colorectals, which include the following factors.

- If there is a polyp larger than 1 satimeter.
- If more than 2 polyps are found.
- If the dysplasia is seen in the polyp after removal. Dysplasia is another precancerous disease. This means that there are cancer cells in the colon that can be found with more accurate tests.

To better understand bowel cancer, we will look at the parts that make up the colon and rectum. The colon consists of a muscular tubule 1.5 meters long, with the following parts detailing the colon.

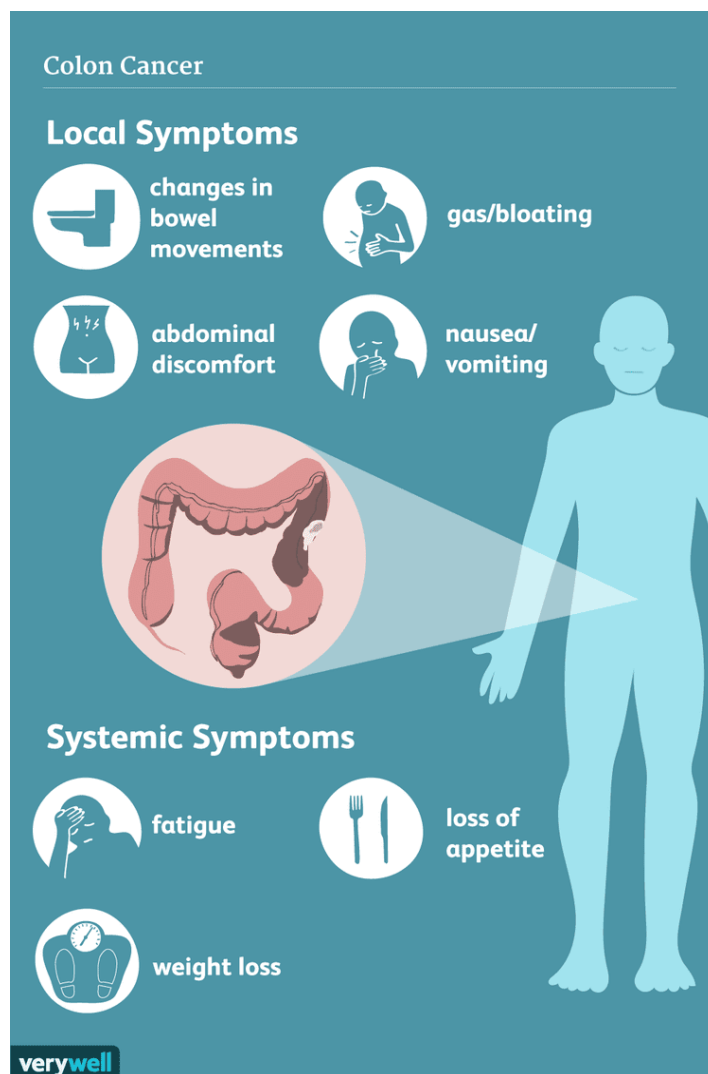
- The first part is called the ascending clone. A sac called a Secom, where undigested food enters from the small intestine, which extends upwards on the right side of the abdomen.
- The second part: which is called the transverse colon and throughtout the body from the right to the left side of the body.
- The third part: called the descending clone that comes down from the left side.
- Fourth section: Because it is S-shaped , it is called the sigmoid colon.

Previous studies have shown that immunotherapy is a viable option for dealing with advanced cancers. However, this will certainly change, as researchers have successfully used immune system cancer to kill T cells to shrink tumors in mice with colon cancer. This new method involves training the immune system. It is to detect and attack cancer and (basically) prevent the formation of additional tumors.

2. Signs and symptoms of bowel cancer

Symptoms of colon cancer include the following, although in many people with bowel cancer, none of these symptoms show themselves in the early stages of cancer. The appearance of symptoms depends on the size and location of the cancer in the intestine, and they appear differently in each person.

- Persistent changes in bowel habits, including diarrhea or constipation
- Feeling like your bowel hasn't emptied yet
- Feeling pain and discomfort in the abdomen
- Seeing blood in the stool
- Excessive weight loss
- Weakness or fatigue
- Anal bleeding



3. Types of colon cancer

Although This type of cancer seems well-known, there is actually more than one type of colorectal cancer. Such differences depend on the type of cells that have become cancerous and the location of these cells. The most common type of colon cancer is adenocarcinoma. According to the American Cancer Society, 96% of cases of colon cancer are adenocarcinomas. Unless your doctor diagnoses a different type of colon cancer, your colon cancer is likely to be adenocarcinoma. Adenocarcinoma forms in the mucous cells of the colon or rectum. Colorectal cancers may rarely be caused by other types of tumors, such as the following: Create:

- Lymphoma, which may initially form in lymph nodes or in the colon.
- Carcinoids, which start in hormone-producing intestinal cells.
- Sarcomas that develop in soft tissues such as the muscles of the colon.
- Stromal tumours of the gastrointestinal tract, which may be benign at first and then cancerous (these tumours usually form in the gastrointestinal tract, but rarely can also be seen in the colon)

4. Causes of Bowel Cancer

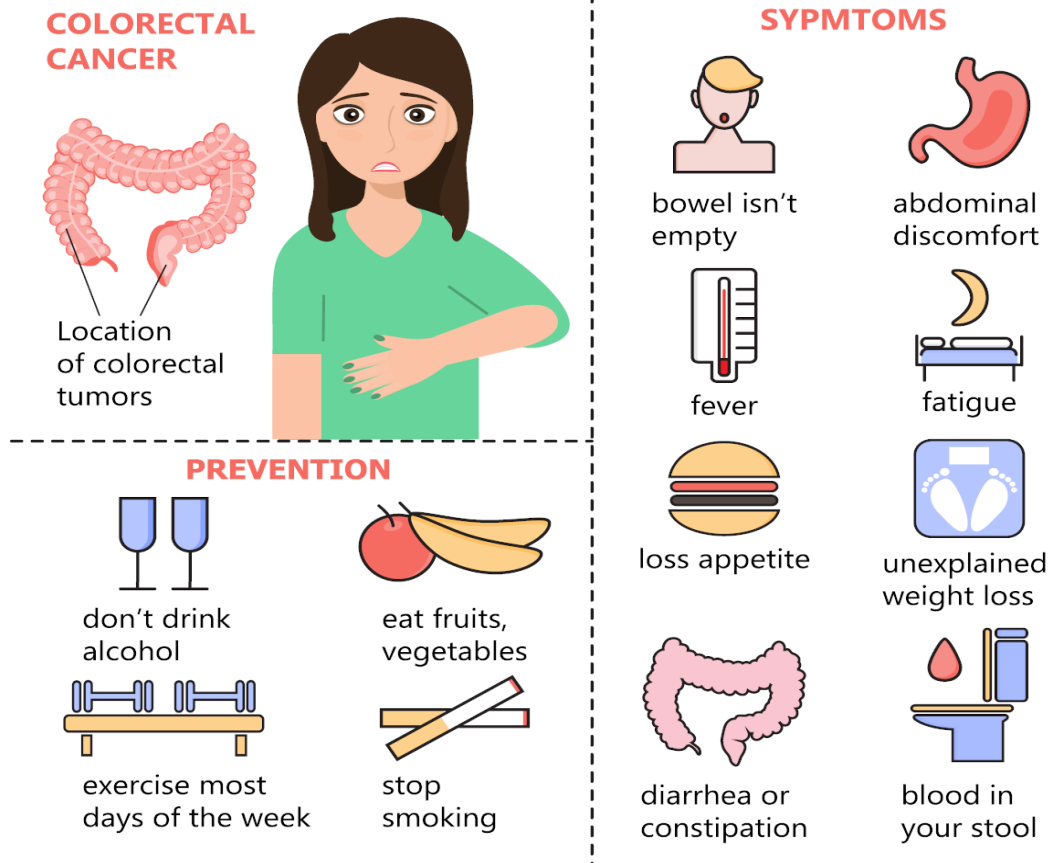
Researchers are still studying the cause of bowel cancer. The risk factors of this disease act alone or in combination with other risk factors and increase the risk of colon cancer.

- Precancerous growths

Abnormal cells build up in the lining of the colon to form polyps . These polyps are a collection of small, benign cells. One common way to prevent This type of cancer is to remove these polyps surgically. Untreated polyps may later become cancerous.

-Genome mutation

In some cases, members of a family develop colorectal cancer, which is due to mutations in a gene that is passed on to children by parents. These genetic mutations do not necessarily mean that you will develop colorectal cancer, but they do increase your chances of developing this cancer.



5. Bowel Cancer Diagnosis Methods

Early diagnosis of This type of cancer increases the chances of recovery. First, your gastroenterologist will learn about your medical and family history and perform a physical exam. Your gastroenterologist may compress your abdomen or examine your rectum to diagnose a lump or polyp.

-Clinical trials

Your doctor may order a blood test to find the cause of your symptoms. Although there are no blood tests to check for colon cancer, liver function tests and a complete blood cell count test can rule out the possibility of other diseases and disorders. A stool test is also done to find blood inside.

-Biopsy

Biopsy if you see a suspicious polyp or lesion

-Colonoscopy

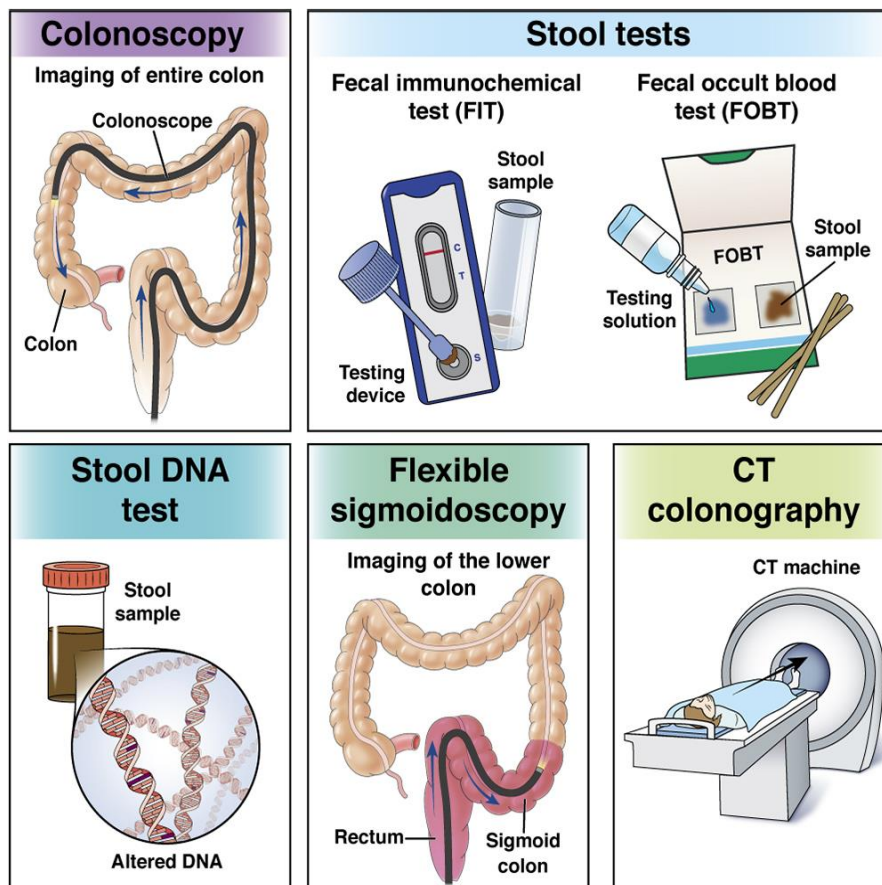
In a colonoscopy, the doctor is able to observe the space inside the colon and rectum using a long tube with a small camera attached to the end and examine them for abnormalities. During the colonoscopy, the gastroenterologist is able to remove the tissue from the abnormal areas and send the sample to the laboratory for examination.

-X-ray imaging

Your doctor may order X-ray imaging, using a radioactive contrast solution that contains the metal element barium. Your doctor uses an enema to pour this solution into your intestines. This way the barium solution covers the lining of the colon and improves the quality of the imaging.

-CT scan

A CT scan provides a detailed picture of the colon to the gastroenterologist. The process of using a CT scan in diagnosing This type of canceris also called a virtual colonoscopy.



6. This type of cancer Treatment Strategies

In this section, we will try to provide an appropriate answer to the important question that is asked if there is a cure for malignant colon cancer. The treatment of This type of cancer depends on many variables.

-Bowel cancer surgery

In the early stages of colorectal cancer, there is a possibility that the cancerous polyps will be surgically removed. If the cancer has not spread to the walls of the intestine, you will probably have a very good prospect. If the cancer has spread to the walls of the intestine, the surgeon may have to remove part of the patient's colon or rectum, along with the lymph nodes adjacent to that

part. If possible, the surgeon will reconnect the healthy parts of the intestine. Otherwise, the surgeon may have to perform a colonostomy. In this procedure, the surgeon creates an opening inside the abdominal wall and the stool is transported out of the body through this opening. The colonostomy may be temporary or lifelong.

Bowel cancer surgery is sometimes performed to determine whether a lump is malignant or not and to remove the cancerous gland from the body, and sometimes to find out if the cancer cells have spread to other parts of the body. Sometimes, surgery is performed primarily with the intention of opening an obstruction, such as removing a tumor that is blocking the bile ducts. be enclosed (localized or localized cancer). Malignant colon cancer surgery is performed by a general surgeon under the supervision of a gastroenterologist. Surgery of the colon is one of the ways to treat colon cancer.

-Chemotherapy for colon cancer

Chemotherapy is the widespread (systemic) use of anti-cancer drugs, usually given by injection or intravenously. Chemotherapy is most commonly used following surgery to remove the tumour, even if there are no obvious signs of the tumour spreading or encroachment. Chemotherapy can be used before surgery to shrink the cancerous gland and thus make the procedure easier and more successful. as well. In this method, drugs are used to kill cancer cells and treat the disease. Chemotherapy is a common treatment method used following surgery with the aim of destroying any remaining cancer cells. Chemotherapy also controls the growth of tumors. Although chemotherapy relieves symptoms of advanced cancer, it often leads to several side effects that need to be controlled with ancillary drugs.

-Radiation therapy for colon cancer

Radiation is another option for destroying cancer cells. Radiation therapy may be part of a treatment regimen or a form of treatment alone. Radiation only affects cancer cells located in the area of the body that receives radiation. For example, surgery, radiation therapy is usually not a cure if the cancer cells are spread throughout the body or outside the range of radiation. Of course, even if A complete recovery as a result of radiation therapy is not likely, but it can still be used, because by shrinking the cancerous gland, it will reduce the signs and symptoms that result from it, such as pain or bleeding. Therefore, radiation therapy can be used to destroy cancer cells before and after surgery. In radiation therapy, cancer cells, such as X-rays, are targeted by powerful energy beams. Radiation therapy is usually used in conjunction with chemotherapy.

-Medication for the treatment of bowel cancer

Regorafenib, brand name Stivarga, was approved by the U.S. Food and Drug Administration in September 2012 for the treatment of metastatic or advanced This type of cancer that has not responded to other types of treatment and has spread to other parts of the body. The drug works by blocking enzymes that promote the growth of cancer cells. Having This type of cancer may seem scary But the truth is that this type of cancer can be easily treated, especially if diagnosed early. Therapeutic measures have also made great progress in improving more advanced cases of cancer.

According to statistics released by the University of Texas Southwestern Medical Center, the average life expectancy of people with stage 4 This type of cancer is about 30 months. This figure

has increased significantly from an average of 6 to 8 months in the 1990s. In contrast, doctors are now seeing the disease occur in younger people as well. In recent decades, we have seen this more and more. According to the American Cancer Society, despite an overall decline in This type of cancer deaths from 2007 to 2016, the annual mortality rate for patients under 55 has increased by 1 percent.

-Immunotherapy for bowel cancer

Your immune system acts as a guardian system to fight off what it perceives as a foreigner. Using the immune system to destroy cancer cells is called immunotherapy. One form of immunotherapy is the administration of substances that stimulate the immune system (non-specific immune-modulating compounds). Another method of immunotherapy is the production of specific proteins and the immune system (cytokines) in the lab and then used in the treatment of cancer, these proteins, called biologic response modulators (BRMs), make up the bulk of the immunotherapy compounds that are currently being used or studied. BRMs are:

- Interferons
- Interlocking
- Monoclonal antibodies
- واکسن ها (Vaccines)

7. Immunotherapy and its methods

Cancer immunotherapy, also known as immuno-oncology, is a type of cancer treatment that uses the power of the immune system to prevent, control, and eliminate cancer.

This procedure can cause:

- Training the immune system to recognize and attack specific cancer cells
- Boosts immune cells to help them kill cancer
- Supply the immune system with additional components to boost the immune response

There are many types of cancer immunotherapy, including targeted antibodies, cancer vaccines, receptor cell transfers, tumor-infecting viruses, checkpoint inhibitors, cytokines, and adjuvants. Immunotherapy is a type of biotherapy (also called biological therapy or biological response modifier (BRM)) because it uses substances from living organisms to fight disease. Some treatments use genetic engineering to increase the capabilities of immune cells to fight cancer and may be known as gene therapy. to be used in combination with surgery, chemotherapy, radiotherapy or targeted therapies to improve their effectiveness.

One of the new methods for cancer treatment is immunotherapy. In this treatment, the immune system is generally supported and strengthened to be able to fight cancer cells and masses. This method is considered a type of biological therapy, which means that the materials used in this treatment for cancer are made from living organisms.

Different types of immunotherapy may be given to the body in different ways, including:

- Intravenous: Immunotherapy goes directly into a vein.
- Oral: Immunotherapy is given to the patient in the form of tablets or capsules.

- Topical Topical: Immunotherapy is applied to the skin in the form of a cream. This type of immunotherapy can be used for skin cancers.
- Intravesical: Immunotherapy is delivered directly into the bladder.

8. Types of immunotherapy for cancer treatment

There are different ways to treat cancer through immunotherapy. In the following, we will look at the types of immunotherapy:

Immunomodulators

There are drugs that increase the immune system's response to cancer. Some of these drugs have an effect on specific parts of the immune system, while others have a more general effect.

T-Cell Transfer Therapy

In this method, the T cells that are located in the tumor region are removed and those that have done well against cancer are modified in the laboratory to increase their strength, and then they grow and multiply in the laboratory. Finally, they are injected intravenously into the body to fight the cancer more strongly than before. The lab improves.

Monoclonal Antibodies

Antibodies are made in the lab by a bunch of cells and clones that bind to cancer cells for different purposes. For example, some of these antibodies mark cancer cells by binding to them so that they can be more easily recognized and destroyed by immune cells.

Regulatory cell inhibitors

Regulatory cells check that immune cells don't react more aggressively than normal. Inhibitors are drugs that block regulatory cells by acting on them and allow the immune system to function beyond normal. By doing so, the immune system can respond more strongly to cancer.

Therapeutic vaccines

These vaccines are different from those used to prevent disease. Therapeutic vaccines make the immune system's response to cancer stronger to increase the strength of immune cells.

9. Immunotherapy and Bowel Cancer Treatment

Immunotherapy, also called biologic therapy, is designed to strengthen the body's natural defenses in the fight against cancer. In this method, substances made in the body or in the lab are used to heal, target, or restore the immune system. Medications, known as checkpoint inhibitors, may be used to treat advanced This type of cancer that has certain genetic characteristics.

Pamprolizumab under the brand name Kay Truda. This drug targets PD-1, the tumor receptor or cells, and prevents tumor cells from hiding from the immune system. Pemprolizumab is used to treat metastatic bowel cancers that have a molecular characteristic of MSI-H or dMMR.

Newwolamp. It is used to treat people 12 years of age or older, or with metastatic bowel cancer (MSI-H), or dMMR, who have spread or spread the disease after treatment with chemotherapy with fluoropyrimidine drugs (such as capecitabine and fluorouracil), oxaliplatin, and irinotecan.

Combination of nivolab and ipilimumab. This combination of checkpoint inhibitors is suitable for the treatment of patients 12 years of age and older who have metastatic bowel cancer dMMR or MSI-H where the cancer has grown or spread after treatment with chemotherapy with fluoropyrimidine, oxaliplatin, and irinotecan., regardless of the location of the tumor. MSI-H is often found in colorectal tumors, especially in patients with Lynch syndrome.

Checkpoint inhibitors work by blocking specific checkpoint receptors. In fact, it is the immune cells that differentiate the good cells from the bad ones. Immunotherapy is not recommended for all patients, and the response to treatment varies from person to person. Immunotherapy may be used in combination with other therapies, such as surgery or chemotherapy.

-Immunotherapy in the treatment of colorectal cancer

Immunotherapy or immunotherapy is designed to strengthen the body's natural defense barriers in the fight against cancer. In this method, substances that have been made in the body or in a laboratory are used to improve, target, or restore the functions of the immune system.

As with Target Therapy drugs, your doctor will perform tests to predict the effect of these drugs on the patient's tumor.

-The most common immunotherapy drugs for bowel cancer

The most common immunotherapy drugs used in the treatment of colon cancer are:

- Pembrolizumab (I wrote the scientific name only, the common brand name is Keytruda and Zaccharia)
- Nivolumab

-Side effects of immunotherapy

Different types of immunotherapies can cause different side effects. The most common complications include fatigue, skin lesions, diarrhoea, nausea, fever, muscle pain, bone pain, joint pain, abdominal pain, itching, vomiting, cough, loss of appetite, and shortness of breath.

10. Duration of immunotherapy treatment

The length of immunotherapy depends on your physical condition. Your doctor will determine the length of treatment according to the following points and more:

- The type of immunotherapy you are receiving.
- How your body reacts to treatment.
- The type of cancer and the degree of progress it has made.

Many people are treated for two years, according to the doctor's opinion, and are only monitored after two years of treatment. Usually, the patient will be in good condition after the end of the treatment period. The effectiveness of some medications may take a few weeks to a few months. Usually, within a few weeks to a few months after the start of immunotherapy, the patient's body responds to the treatment. This should be longer. In many studies, patients can continue immunotherapy continuously as long as the disease is stable and there are no side effects. Some studies assess the effectiveness of short-term use. These treatments should be planned by a medical oncologist and given to the right patient at the right time.

11. Performing tests for immunotherapy

Before immunotherapy, you may need to undergo tests using some cancer cells or blood samples. Immunotherapy applications vary depending on the type and stage of the disease. To determine which patient is suitable for immunotherapy, certain molecular tests of patients' pathological blocks (such as PDL-1, MSI, or TMB) are required in some cancers should be done. It can be used in some tumors without the need for special testing. Based on these results and the results of the study, the patient's doctor will determine whether the person is suitable for immunotherapy.

12. Observing important points in immunotherapy

Your health care team can help you prevent or alleviate many side effects. Preventing and treating side effects is an important part of your overall cancer treatment. This is called palliative care or supportive care. Before you start immunotherapy, ask your health care team what complications your treatment may lead to. During treatment, inform them as soon as possible about new health problems, Inform differently or worse. Early detection of symptoms and stopping immunotherapy or treating side effects can prevent them from becoming severe.

Immunotherapy side effects can be mild, moderate, or even serious. Doctors grade side effects on a scale of 1 to 4, with 1 being mild and 4 being the most severe. For mild side effects, your treatment will likely continue and you will be monitored for changes in symptoms. If you have moderate or severe side effects, your doctor may stop treatment and may prescribe a type of medication called a corticosteroid for Stimulates the immune system.

Sometimes, other medications may also be prescribed after corticosteroids. If side effects go away, your doctor may try to restart immunotherapy or adjust your treatment regimen, especially if you're given a combination of medications. If side effects don't go away or get worse, your doctor may stop treatment with immunotherapy.

Conclusion

This type of cancer is one of the types of cancer related to diet, so that the right choice of food can prevent this disease. Factors such as high consumption of red meat, alcohol, fatty acids, and obesity increase a person's risk of developing this cancer. To prevent colon cancer, it is better to make fundamental changes in your lifestyle so that you do not get this disease. Bowel cancer is one of the most common cancers that affects the lower part of the gastrointestinal tract. By diagnosing

this disease early and determining the stage of the disease, you can proceed with the treatment process and increase the likelihood of treatment by taking quick action in this regard. . Immunotherapy is a relatively new method of treating cancer. It uses the body's immune system to fight cancer. FDA-approved immunotherapies treat a variety of cancers, including brain, colorectal, skin, and lung cancers, among many others. How immunotherapy is used depends on the type and stage of the cancer. Immunotherapy may be used alone or in combination with other cancer treatments. It should be noted that immunotherapy is a promising new treatment for cancer, but it is still under development. It is not always effective and is not suitable for all people with cancer.

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