



## *X-Plain* *Chemotherapy - Introduction* **Reference Summary**

### **Introduction**

Chemotherapy is a common treatment for a variety of cancers. It has been proven to be both safe and effective.

Patients should, however, learn about the possible side effects of chemotherapy.

An understanding of this treatment helps patients better recognize and tolerate side effects, if they occur.

The body is made up of very small cells.

Normal cells in the body grow and die in a controlled way.

Cancer occurs when cells keep dividing and growing without the normal control.

Cancer cells may also spread to different parts of the body through blood vessels and lymph channels.

Cancer treatments are used to control and destroy these abnormally growing cells.

Cancers in the body are given names depending on where the cancer originates.

### **How Does Chemotherapy Work?**

Chemotherapy uses powerful drugs to stop the growth of cancer cells.

Cancer cells are more sensitive to chemotherapy than healthy cells because they divide more frequently.



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Healthy cells can also be affected by chemotherapy, especially the rapidly dividing cells of the skin, the lining of the stomach, the intestines, and the bladder.

The side effects of chemotherapy are usually caused by its effects on healthy cells.

The following lists the general side effects of chemotherapy.

Not all chemotherapy drugs cause all of the side effects discussed in this lesson.

In addition, some chemotherapy drugs can cause side effects that are NOT discussed in this lesson.

### **Blood-Related Side Effects**

One of the most important side effects of chemotherapy is its effect on the blood cells.

Blood has 3 important components, red blood cells or RBCs, white blood cells or WBCs, and platelets. Normally, blood cells are among the most rapidly dividing cells in the body and, therefore, the most sensitive to chemotherapy.

RBCs carry oxygen from the lungs to the rest of the body.

WBCs fight infections.

Platelets are important because they help the blood clot and prevent uncontrolled bleeding.

Chemotherapeutic agents may decrease the levels of these blood components. This decrease is usually temporary. Depending on the medication, a physician may be able to predict when the decrease of the blood components will occur. The time when blood components are at the lowest level is known as the “nadir,” and usually occurs one to two weeks after the chemotherapy has begun.



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When the RBCs decrease significantly, a condition known as **“anemia”** occurs. This makes patients feel very tired and sometimes short of breath. A blood transfusion may be necessary at this stage.

When the WBCs decrease significantly, a condition known as **“neutropenia”** occurs. This condition may make it difficult for patients to fight infections.

When the platelets decrease significantly, a condition known as **“thrombocytopenia”** occurs. Patients who have this condition may bleed from minor cuts. They may also have internal bleeding inside their brain, intestines, or urinary bladder.

Internal bleeding can make anemia (or low blood count) worse. Internal bleeding can also cause strokes and even death if it happens in the brain.

These side effects can be treated with blood transfusions and new medications that speed up the replacement of lost blood cells.

Even though physicians check blood counts regularly, patients must watch for symptoms of these side effects. To help in the treatment and prevention of potentially life-threatening complications, if any of the following symptoms occur, patients should contact their physician.

Increased tiredness, fatigue, shortness of breath, or chest pain may indicate anemia.

The following are signs of infection that may be caused by neutropenia (low count of white blood cells):

Fever, chills, cough, sore throat, skin or mouth rashes, burning during urination, severe diarrhea (more than three liquid stools).

The following are signs of thrombocytopenia, or low platelet count:

Easy bruising, bleeding from the skin that does not stop after applying pressure for 10 minutes, blood in the urine or stools, and severe headache.

Patients can help prevent some of these side effects.



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To decrease the chances of infections, good oral and body hygiene are essential. Patients should also stay away from people with colds or other infections.

Patients should also avoid activities that may increase the chance of bleeding, such as the use of razors, nail clippers, or flossing teeth. Brushing teeth regularly is okay with a soft bristle toothbrush. Patients with dentures should make sure their dentures fit properly.

Patients should avoid straining while going to the restroom. This can cause hemorrhoids and bleeding. Stool softener may be required.

Patients should check their temperature once or twice a day. This may help in early detection of infections. If the temperature is above 100°F, they should call their physician.

It is OK for patients undergoing chemotherapy to exercise. They should however avoid contact sports such as football and soccer.

## **Hair Loss**

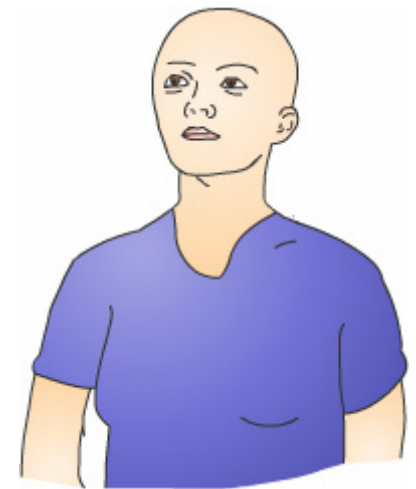
Hair loss is another side effect of chemotherapy. This is also known as “alopecia.”

Cells in the hair follicles are responsible for hair growth and maintenance. Because these cells divide rapidly, they are affected by chemotherapy drugs.

Hair loss may affect the scalp, face, and rest of the body. The rate of hair loss may be rapid.

Hair loss is usually temporary. When the hair re-grows, it may have a different color, texture, or style.

Even though hair loss cannot be prevented, patients may prepare for it. Some patients choose a wig or a hairpiece. Other patients decide to keep their head bare, or cover it with a bandana or hat.



The exposed scalp may be more sensitive than usual to sunlight. Patients should keep it covered when outdoors.

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## **Nausea and Vomiting**

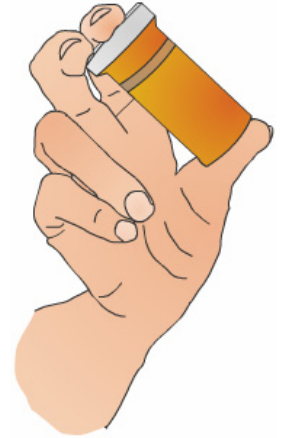
Some chemotherapeutic agents can lead to significant nausea and vomiting.

Patients should make sure to tell their physician or nurse if they experience such side effects.

Strong anti-nausea and anti-vomiting medications are available.

Drinking clear liquids before chemotherapy helps some patients decrease nausea.

Appetite may also decrease during chemotherapy. Unfortunately, food may also not taste as good for chemotherapy patients. However, patients should maintain a regular calorie intake even if it means eating smaller portions of food more frequently.



## **Sore Throat**

The cells lining the inside of the mouth and throat divide rapidly. They are also continuously exposed to infections from the food we eat.

Chemotherapy can cause inflammation and infections inside the mouth. This condition, known as “stomatitis,” makes swallowing difficult and painful.

Keeping good oral hygiene and frequently checking the inside of the mouth for problems, such as bleeding areas or white patches, can help decrease the chance of infections. This also helps detect infections early before they become a problem.

Avoiding very acidic and carbonated drinks, as well as hot, spicy food, is helpful.

Keeping the inside of the mouth moist by sucking on some hard candy should also be helpful.

## **Diarrhea**

Because the cells lining the intestines and colon divide constantly, they can be affected by chemotherapy.

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This can cause diarrhea. Increasing fluid intake usually keeps the patient hydrated.

Foods that are difficult to digest should be avoided during cases of diarrhea. These foods include milk products, vegetables of the cabbage and broccoli family, as well as spicy food. Clear liquids are usually okay.

If diarrhea becomes bloody or if there are more than 3 bowel movements a day, the patient should call the doctor. This can be a symptom of internal bleeding or infection and may require immediate medical attention.



### **Constipation**

Constipation is sometimes caused by chemotherapy.

Maintaining a high fiber diet can help decrease this side effect.

If constipation becomes a significant problem, a physician may recommend or prescribe stool softeners. This helps decrease the chances of hemorrhoid formation and bleeding.



### **Effect on the Skin**

Because the cells lining the skin divide fairly rapidly, they are susceptible to chemotherapy.

This can cause skin dryness and increased reaction to the sun.

Moisturizing lotions should be used. Patients should avoid exposure to the sun and tanning booths. Sunscreen should be used whenever patients leave the house because they can still sunburn on cloudy days.

### **Fertility and Sexuality**

Men wishing to father children may consider sperm banking prior to the start of chemotherapy. Chemotherapy may affect sperm count and viability.

Because chemotherapy may be very toxic to unborn children, women of a childbearing age should take birth control measures during chemotherapy. Some women may

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have changes in their menstrual cycle because of chemotherapy, which could result in total absence of periods. They should still take precautions against becoming pregnant.

Chemotherapy could also cause dryness of the vagina and increased pain with sexual intercourse. Lubricating, water-soluble jelly such as K-Y Jelly™ can help decrease such symptoms.

### **Other Possible Side Effects**

Besides the most common side effects of chemotherapy, other side effects can happen, depending on the type of cancer, the type of chemotherapy treatment, and the patient's medical condition.

For example, some chemotherapy drugs may adversely affect the heart, lungs, or nerves. In such cases your physician will monitor these vital organs.

### **Summary**

Chemotherapy is the careful use of very strong medications to treat cancer.

Side effects are common and uncomfortable. Knowing about these side effects can make chemotherapy a more tolerable, life-saving journey.



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