



Definition of cancer:

There are many kinds of cancers, all share three key features:

1. Cancer cells grow more quickly and live longer than normal cells. Normal cells grow and then divide to form new cells when needed, and die when they become old or damaged. In contrast, cancer cells make new cells that aren't needed and don't die quickly when they become old or damaged. As a result, cancer cells can replace many normal cells and cause organs to stop working. Over time, cancer cells may form into a mass called the primary tumor. If not treated, the primary tumor can grow through the outer parts of an organ or structure and into other tissue. This is called invasion.
2. Invasion is the second key trait of many cancers.
3. Cancer cells can leave the tissue in where they started and spread to other sites in the body. This process is called metastasis. Cancer cells can spread through blood or lymph. Lymph is a clear fluid that gives cells water and food. It also has white blood cells that fight germs. Cancer cells that have spread can grow and replace many normal cells in the new site.

What to do when you are diagnosed with cancer?

The patient should not panic and immediately arrange a meeting with his oncologist to get more information about the cancer including type, stage, prognosis, and treatment.

How to reach a proper diagnosis?

The doctor has to investigate thoroughly to reach an accurate diagnosis. Most of the time all the following investigations are performed in the same order.

- Blood work: sometimes tumors secrete substances that can be measured in the blood and their presence can be used to detect cancer.
- For breast cancer: an ultrasound and mammogram of the breasts are very important steps for women to take. The breast mass can be clearly described to have malignant features with high certainty using both these techniques.
- CT Scan: CT images are very important to identify tumors and where they have spread. This is done by taking sequential images from inside the body.
- Nuclear Imaging: the patient is injected with radioactive material and imaged with a scanner camera. The radioactive material tends to concentrate near the cancer cell, due





- to cancer cell activity and speed of division that consumes the sugar attached to the radioactive material.
- Magnetic resonance image: it usually helps capture accurate details of the tumor in certain areas. It is very useful in head, neck, and soft tissue cancers
- Endoscopy: it is important for cancers of the gastrointestinal tract. It is used to obtain a biopsy or to relieve an obstruction.
- Histopathological examination: a needle is inserted by the doctor to pull the cells or liquid from inside the cancerous mass. If the needle sample was not sufficient to affirm the diagnosis, tissue could be excised in the operating room under general anesthesia. The extracted material is then examined by a pathologist physician under the microscope to reach a diagnosis based on the cells' type.

What does staging of cancer mean?

The TNM staging system is most often used by doctors to stage cancer. It is maintained by AJCC (American Joint Committee on Cancer) and UICC (Union for International Cancer Control). In this system, the letters T, N, and M describe a different area of cancer growth. Based on test results, your doctors will assign a score to each letter. However, not all cancers, such as Hodgkin lymphoma, are rated by TNM scores.

T = Tumor

The T score is a rating of the extent of the primary tumor. The primary tumor is the first mass of cancer cells in the body. If not treated, the primary tumor can grow large. It can also grow through the layers of tissue in which it started. This is called tumor extension. Once the tumor has grown through the outer edge of a structure, it can grow into other nearby structures. This is called invasion. T scores are based on the presence, size, and extension of the primary tumor. A TX score means that the primary tumor can't be assessed. A T0 score means there is no primary tumor. It is possible to have cancer but not have a primary tumor. A Tis score means there are abnormal or cancer cells, but there is no chance for the cells to spread to distant sites. Scores of T1, T2, and so on are based on the primary tumor's size, extension, or both. Higher values mean a greater extent of the cancer.

N = Nodes

The N category reflects the extent of cancer within nearby lymph nodes. Lymph nodes are small disease-fighting organs that filter lymph. Lymph is a clear fluid within tissue that gives cells water and food. It also collects waste from cells and has white blood cells that fight germs. Lymph drains from tissue into lymph vessels that transport it to the lymph nodes. Cancer cells can invade lymph vessels and travel to lymph nodes. Once in lymph nodes, the cancer cells can





multiply and form new tumors. N scores are based on whether there's cancer in nearby lymph nodes and the number or region of nodes with cancer. A NX score means that the lymph nodes can't be assessed. A N0 score means that no cancer was found in the lymph nodes. N1, N2, and N3 scores are based on the number of nodes with cancer or which nodal groups have cancer. Higher values mean a greater extent of the cancer.

M = Metastasis

The M letter tells you if the cancer has spread to distant sites, including distant lymph nodes beyond nearby lymph nodes. Cancer cells can break off the primary tumor and spread to distant sites. This process is called metastasis. Cancer cells can spread to distant sites through lymph vessels or blood. M0 means there is no cancer in distant sites. M1 means there is cancer in distant sites.

Treatment options:

1. **Surgery:** the surgeon removes the tumor and surrounding tissues to reduce the rate of growth in the same place. The process also includes the surgical removal of draining lymphatics (usually the first and second stations). For example, surgery for breast cancer lies in the removal of the tumor and the local lymph nodes in the armpit. However, not all tumors are treated with surgery (ex: lymphoma and leukemia). Some of them need to only be biopsied in order to reach a diagnosis. Afterwards, the patient begins with chemotherapy or radiation therapy.
2. **Chemotherapy:** is a drug that is given intravenously, or orally in some cases, that has the ability to kill cancer cells. It can reach all parts of the body through the bloodstream. Most times, patients start chemotherapy just a few weeks after the surgery. Patients sometimes begin chemotherapy before the surgery to shrink the tumor and make surgical resection of the tumor easier. Chemotherapy is not as frightening as before. Nowadays, most hospitals give patients drugs, alongside their chemotherapy, to reduce the side effects to the degree that some patients do not complain of any adverse symptoms and continue leading normal lives during therapy.

Side effects of chemotherapy:

Side effects depend on the amount and type of the chemotherapy.

- Fatigue
- Nausea
- Hair fall (does not necessarily occur with all types of treatment)





- Numbness in the extremities
 - Change in nails
 - Redness of the skin
 - Fever
 - Decreased immunity
3. Radiation Therapy: Radiation therapy is usually a part of the treatment plan. Radiation is given to increase the chance of cancer control. Radiation differs from chemotherapy in that it would be only for the area where the cancer was found in addition to draining lymph nodes.

Different types of radiation are given according to the type of cancer and the place of origin:

- Internal radiation: exposure to radioactive material through needles or cylinders inside the body
- External radiation: given from an external source directed to the cancer. The machine is called: linear accelerator.

Side effects of radiation therapy:

Generally it is lighter than chemical treatments. Side effects depend on the dose and the place in the body that will be exposed to radiation.

- Fatigue
- Nausea
- Diarrhea
- Redness of the skin
- Dry mouth
- Change in taste
- Hair loss in the same area of radiation
- Muscle stiffness

Signs of depression? How and when to seek help?

Depressive symptoms—may cause sleeplessness, lack of appetite, trouble concentrating and difficulty carrying on regular activities. Although some distress is normal, about a third of cancer patients experience significant distress. Only about five percent of those with cancer obtain psychological help. While distress doesn't affect the cancer itself, it does affect how patients cope with their cancer and their ability to follow treatment recommendations.





Nutrition:

1. Tips and recommendations to reduce the risk of cancer:

1. Maintain normal and average weight
 - Calories and moderate physical activity.
 - Avoid excess weight, especially in the abdominal area.
2. Increase physical activity
 - Adults: exercise moderate to intense for 30 minutes 5 times a week. (60 minutes if possible)
 - Children and adolescents: exercise moderate to intense 60 minutes five times a week at least.
3. Follow a healthy diet rich in plant governing food
 - Five or more servings of fruits and vegetables a day
 - Replace grain crust demilitarized manufacturer and whole grains
 - Reduce consumption of red and processed meat
 - Avoid rotten grains
4. Avoid smoking and alcohol

Reference: Krause food and nutrition therapy book

2. Nutrition during treatment:

1. When you are feeling sick during the period of chemotherapy
 - Avoid eating at least two hours before treatment.
 - Eat small meals, and eat slowly
 - Avoid foods and meals that have strong odors, or are greasy or fatty, or that cause gas
 - Consume fluids throughout the day to compensate for the loss of fluids during chemotherapy
2. When you lose appetite:
 - Eat small snacks at regular times each day
 - Eat the largest meal when you feel better
 - Eat nutrient-rich foods in your meals before other foods
 - Eat meals and foods you enjoy the most
 - Avoid drinking large amounts of fluids before or with meals





- Eat in a pleasant and comfortable environment with family and friends when possible
 - Listen to your favorite music or enjoy watching your favorite programs on television while eating
 - Walk before eating
3. If you feel that the taste of the food is unpalatable
- Brush your teeth or use mouthwash before eating
 - Consume food at room temperature or chilled
 - Choose eggs, fish, poultry, and dairy products instead of meat
 - Add sauces, spices, and herbs, to improve the flavor of food
 - Use plastic utensils instead of metal ones
 - Eat your favorite foods when you do not feel sick
4. When you have sores in your mouth that get in the way of eating
- Eat cold foods or frozen because they are often soothing.
 - Eat soft foods such as ice cream, milk shakes, banana, apple juice, mashed potatoes, cheese and pasta.
 - Avoid foods that cause frenzy of ulcers, such as: citrus fruits (lemons - oranges - tangerines - grapefruits - pineapples - apricots) and juices, tomatoes, tomato sauce, spicy foods, very salty foods, and foods with seeds (such as poppy seeds and sesame seeds) that can scratch the sores, and coarse foods such as raw vegetables.
 - Consult your doctor about using a local anesthetic before eating to reduce pain.
 - Use straw when you drink fluids to overcome sores.
5. When you encounter problems chewing and swallowing food:
- Morning is the best time to eat to avoid slowdown and fatigue, which increase as the day progresses.
 - Avoid light liquids, dry foods, sticky foods (like peanut butter), which is often what is difficult to swallow.
 - Add sauces and gravies to dry foods.
 - Drink liquids with meals to facilitate chewing and swallowing.
 - Use straw to drink liquids.
6. When there is a dry mouth:
- Rinse your mouth with water and salt
 - Avoid using mouthwash that contains alcohol
 - Drink small amounts of fluids frequently between meals
 - Consult your doctor or pharmacist about medications that can reduce drought
 - Eat sour candy or gum to stimulate saliva flow
 - Add sauces, gravies, mayonnaise, butter, margarine to dry foods





- Ensure the safety of toothbrush and floss regularly to prevent tooth decay and mouth infections.

7. When you encounter a problem with diarrhea:

- Drink a lot of fluids, gravy and salty soups, diluted fruit juices, sports drinks are
- Avoid foods and drinks that increase the gas (such as beans, onions, vegetables), and foods that contain artificial sweeteners (sorbitol or mannitol) and soft drinks
- Avoid milk and dairy products
- Avoid high-fat foods
- Avoid caffeine (tea, coffee, etc.)
- Eat small meals, frequently throughout the day
- Consult your doctor about using alternatives digestive medicine if diarrhea persists for a long time

