THE BASICS OF CANCER AND CANCER CARE

Abstract:

Cancer is a common but complex disease. The initiation and development of cancer involves a subtle interplay between environmental factors, lifestyle habits, genetics, individual susceptibility, and abnormalities in the natural processes of cell growth and death. Specific environmental substances that cause cancer are called carcinogens. Although the cause of certain cancers can be definitely identified, there are quite a number of cancers for which the etiology remains unknown, and many important questions about how, and to whom cancer occurs are still unanswered.

Learning Objectives:

1. Identify treatment options for different types of cancer.
2. Describe the common cancers and the screening guidelines for these cancers.
3. Explain the health care professional's role in caring for patients with cancer.

Introduction

Cancer is a very common disease and every year cancers cause approximately one out of four deaths in the United States. The number of cancer cases in the US has been declining since 1992 and the cure rate for some cancers is higher than it has ever been. The disease is becoming less common and more treatable, but cancer is still a major public health problem and a diagnosis of cancer is still very frightening news. The four most common cancers in the United States are lung cancer, breast cancer in women, prostate cancer in men, and colon cancer. Cancer is a disease that affects men and women equally although there are gender-based differences in the incidence of some cancers.

The word cancer is derived from the Latin word for crab, and there were two reasons that in those times, thousands of years ago, cancer was associated with the word crab. First, the tumors that ancient physicians could see and feel were hard (like a crab), and second (and perhaps more importantly) cancer at the time was a terminal and incurable condition that, like a crab, would "grab" onto the victim and not let go.

This explanation is not meant to make light of cancer but simply to illustrate how cancer was thought of before providers understood the disease and before cancers could be treated. And although cancer is now familiar to health care professionals and laypeople, some of these misconceptions along with others are still considered by many people to be true of cancer. For example:

1. A diagnosis of cancer is the worst of all possible news; it is equivalent to being told there is no hope for survival.
2. Many cancers are genetic; if someone in your family had cancer you are likely to develop it too.
3. Someone who has cancer will develop tumors, which are large lumps of abnormal tissue.
4. Cancers are malignant and very dangerous.
5. The disease of cancer essentially affects older adults.

6. Cancers, most of them, cannot be cured.
7. Many cancers are caused by exposure to "toxic" chemicals.
8. Cancer is a random and unexpected occurrence; it can happen to anyone.

These statements will be familiar to many people, and there is *some* truth to them but cancer is much more complex.

Example: Cancer is in a sense one disease but it is also many; the survival rates for some common cancers are now greater than 90%; not all cancers are malignant, and; few cancers can be clearly linked to genetics or toxic exposures.

What Is Cancer?

There are many types of cancer and there are many causes of the disease. Cancers can stay localized or they can spread far from their point of origin, and cancers can form solid tumors or affect the blood cells. They can be benign or cause death within months of the diagnosis. However, the one constant factor that characterizes all cancers is abnormal cell growth, and abnormal cell growth is essentially what cancer is. The following section will expand on this.

In order for our bodies to grow and to repair and replace damaged and/or old tissues, the cells that makeup tissues and organs are constantly dividing and growing. These processes are usually well controlled and well regulated. Once the goal has been reached, cell growth and division stop. For example, someone's liver is infected with hepatitis C. The infection causes inflammation that damages the liver cells and in response, some of these cells are repaired and new liver cells are formed.

Cancers upset the "control mechanisms" inside the cells that regulate cell/tissue division and growth and this has two effects. First, cell and tissue production isn't stopped; it just keeps going and going. And second, the cells

and tissues that are produced are abnormal and non-functional. The abnormal growth that is the definition of cancer is both a process and a result: endless growth *and* endless growth of non-functional and typically harmful cells and tissues. Deaths from cancer have many causes, but the replacement of functioning tissue with non-functioning tissue is one of the primary ways cancer kills.

Cancer of course is a complicated disease and there are other ways it starts, continues, and spreads. There is a concept called the six hallmarks of cancer and it explains much about the disease.

1. Our cells have a limited life span and when they get old and worn out they are programmed to die. Cancer cells do not have this mechanism in place or do not/cannot respond to it.
2. Cancers do not respond to "stop" signals that the body uses to control cell division. As mentioned previously cancers upset the "control mechanisms" inside the cells that regulate cell division and growth.
3. Unless they are interrupted, cancers continue to grow indefinitely.
4. Cancers have the ability to grow new blood vessels that supply the cancers themselves.
5. Many cancers can spread to other areas of the body, they metastasize and those that don't metastasize invade or "crowd out" and destroy the tissues and organs where they originate.
6. Cancers stimulate their own growth.

The Causes of Cancer

Environmental Causes of Cancer

The great majority of cancers are caused by environmental issues and a small percent are genetic. The environmental causes of cancer are listed in Table 1.

TABLE 1: ENVIRONMENTAL CAUSES OF CANCER

1. Alcohol abuse/use
2. Chemical exposures
3. Cigarette smoking/tobacco use
4. Diet
5. Environmental pollution
6. Infections: hepatitis C and the human papillomavirus that can cause cervical cancer
7. Obesity
8. Physical inactivity
9. Sunlight

Notice that in Table 1, lifestyle factors such as cigarette smoking, diet, obesity, and physical activity are considered to be environmental causes of cancer. Typically we consider the environment to be the air, water, etc. and we think of an environmental cause of cancer as coming from a toxic waste spill or air pollution. When the term environment is used to identify a cause of cancer, this indicates that the carcinogen is something that does not naturally occur in the body, and this is a very significant concept.

Many common cancers are caused by lifestyle choices

Although we would often like to think of cancer as a terrible disease that happens because of bad luck or genetics but many factors like alcohol abuse, cigarette smoking, a diet that is high in fat and low in fiber, obesity, a sedentary lifestyle, and excessive exposure to the sun are all environmental causes of cancer that can be avoided. In addition, environmental factors may not directly cause cancers, but there is convincing evidence they are powerful risk factors for developing certain forms of the disease. Examples are a high-fat diet and obesity are thought to increase the risk of developing prostate cancer, and a high alcohol intake, obesity, a high-fat diet, and smoking may contribute to the risk of developing breast cancer.

Genetic Causes of Cancer

Direct and clearly identifiable genetic causes of cancer are actually rare. Some cancers such as breast cancer and colon cancer may be caused in part by an inherited genetic mutation that increases susceptibility to cancer, but having the mutation does not mean that the cancer is inevitable. In many cases a certain type of cancer that seems to "run in the family" will, on closer examination, be caused by an environment or lifestyle factors that are shared by the relatives who get that cancer. Yet a positive family history of breast cancer is a widely recognized risk factor for the disease, and a woman whose mother and sister had breast cancer is four times more likely to get this cancer than someone whose female relatives were cancer-free. Adding to the complexity of the issue is the fact that in many of these families who have suffered multiple cases of breast cancer, the genetic testing is normal.

However, genetics do play an important role in the development of cancer. Human cells contain a type of gene called an oncogene. Genes are the part of the cell that have the instructions the cells use to repair themselves, to divide, and grow, or to simply stop functioning and die when the cell becomes too old. An oncogene is a type of gene that has "bad" instructions. Under normal circumstances, oncogenes are controlled by other genetic material called tumor suppressor genes. But if there is exposure to something like cigarette smoke, excessive sunlight, or any of the other causes of cancer listed in Table 1, the oncogene can be altered in a way that allows its damaging genetic instructions to dominate and cause abnormal cellular and tissue growth. Instead of producing normal cells and tissues, cancer cells and tissues are produced. Sometimes this process can be interrupted by the body's immune system but if it cannot, cancer can develop. The type of oncogene and the way it is altered will determine the type of cancer.

Why cancers develop after exposure to a carcinogen is not completely understood as not everyone exposed to sunlight, tobacco smoke, etc, will get cancer, even if the amount of exposure is the same. Clearly, there are individual susceptibilities to carcinogens but how these operate is unclear.

Unfortunately, the incidence of cancer also increases with age and despite routine screening and a healthy lifestyle, the risk of getting cancer increases significantly after the age of 60. For example:

1. 1 in 15 men and 1 in 17 women between the ages of 50 and 59 will develop cancer.
2. 1 in 6 men and 1 in 10 women between the ages of 60 and 69 will develop cancer.
3. After age 70, 1 in 3 men will develop cancer.
4. Age as a risk factor is particularly important for breast and prostate cancer.

Except in *very* rare circumstances, cancer is not contagious and cannot be spread from one person to another. In an article from PubMed, four people received different organ transplants in 2007 (liver, both lungs, and kidneys) from a 53-year-old woman who had recently died from intracranial bleeding. Before transplantation, the organ donor was deemed to have no signs of cancer upon medical examination. Unfortunately, the organ recipients developed metastatic breast cancer from the organs and three of them died from cancer between 2009 and 2017.

From the same PubMed article in 2007, a case of parasite-to-host cancer transmission occurred in 2014 with a 41-year-old man in Colombia with a compromised immune system due to HIV. The man's tumor cells were shown to have originated from a dwarf tapeworm. Then in the 1990s, an undifferentiated pleomorphic sarcoma was transmitted from a patient to a surgeon when he injured his hand during an operation. Again, the possibility of cancer being spread from one person to another or originating from a virus or parasite are extremely rare.

Diagnosis Of Cancer

Cancers are often difficult to detect because for many years if tumors are present they are very small, the patient is asymptomatic, or the patient has non-specific signs and symptoms like fatigue, pain, or weight loss. In

many cases, the patient's specific complaints and their health history will prompt a provider to suspect that cancer may be present and the appropriate diagnostic tests will be ordered.

Example:

The patient is complaining of cough and shortness of breath and she has been a heavy smoker for many years. With these facts in mind, there is a strong possibility that the patient has lung cancer, and the provider orders a CT scan of the chest, a sputum sample, and a bronchoscopy.

Some cancers produce a clear clinical picture and this, along with known risk factors, make discovering these forms of the disease early in their development relatively easy. Cancers such as pancreatic cancer however are only found when they are at a very advanced stage. Targeted screening for cancer is an important preventive tool and early detection of some cancers improves the five-year survival rate. Full details of the latest cancer screening recommendations are available at the American Cancer Society's website: American Cancer Society's Guidelines for the Early Detection of Cancer on the Society's website. Use this link.

https://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-046343.pdf.

Screening women for breast cancer and cervical cancer and screening for breast and prostate cancer in all men should be done. Men and women should be screened for colon cancer and lung cancer which is typically recommended. Screening for other cancers should be done on a case-by-case basis.

TABLE 1: CANCER SCREENING GUIDELINES FOR COMMON CANCERS

Breast Cancer:

1. Women aged 40-44 should be given the choice to have a mammogram. Women 45-54 should have mammograms every year.
2. Women 55 and older should have a mammogram every two years or can have yearly screening.
3. Screening should continue as long as a woman is in good health and is expected to live 10 more years or longer.

Breast cancer in men is rare, but it does happen, less than one percent of all breast cancer cases in the U.S. are diagnosed in men.

Breast cancer screening is not recommended for most men. It's only recommended for men at increased risk of breast cancer due to a BRCA2 or BRCA1 inherited gene mutation.

Starting at 35, men who have a *BRCA1/2* gene mutation should:

1. Have a clinical breast exam every year
2. Learn how to do breast self-exam

Cervical Cancer:

1. Testing should start at age 21.
2. Women under age 21 should not be tested.
3. Women between the ages of 21 and 29 should have a Pap test done every 3 years.
4. HPV testing should not be used in this age group unless it's needed after an abnormal Pap test result.
5. Women between the ages of 30 and 65 should have a PAP test and an HPV test every 5 years. Some women may only need the PAP test.

6. Women over age 65 who have had regular cervical cancer testing in the past 10 years with normal results should not be tested for cervical cancer.

Colon Cancer:

Men and women at age 50 should follow one of these two protocols.

1. Flexible sigmoidoscope every five years or colonoscopy every 10 years or double-contrast barium enema every five years or CT colonography every five years
2. A yearly guaiac-based fecal occult blood test *or* yearly fecal immunochemical test *or* a stool DNA test every 3 years.

Lung Cancer:

1. Screening for lung cancer is not needed unless someone has risk factors for the disease such as a long history of cigarette smoking. If screening is needed a low-dose CT scan of the chest should be done once a year.

Prostate Cancer:

The benefits of screening for prostate cancer are unproven.

1. Men who are 50 years of age or older ask their primary care provider about the pros and cons of screening for prostate cancer.

The term five-year survival rate is frequently used when discussing cancer. Five-year survival rate refers to the number of people who have a particular cancer who are still alive five years from the time the cancer was first diagnosed. The five-year survival rate depends on the type of cancer and on whether the cancer was discovered at an early or a late stage. A five-year

survival rate does not mean that if someone is still alive five years after diagnosis that they are cured or will not need further treatment.

Once cancer is detected it is classified and staged, usually using the TNM system:

1. **T**umor
2. **L**ymph node
3. **M**etastasis

The numbers after the letters indicate how big the tumor is and how far it has spread. The combination of letters and numbers describes the type of cancer, its size, characteristics, and extent. Providers often use this classification as a basis for making a prognosis and proposing an individual treatment plan.

TABLE 2: STAGING AND CHARACTERISTICS

Characteristic	Abbreviation	Meaning
Primary tumor	T0	No tumor has been found, or the original tumor cannot be detected (anymore).
	T1 to T4	The numbers 1 to 4 indicate increasing tumor size and extent: T1 describes a small tumor, and T3 describes a bigger tumor, for example.
Lymph nodes	N0	There are no tumors in the lymph nodes.
	N1 to N3	The numbers 1 to 3 stand for location and number of affected regional lymph nodes. Tumors found in lymph nodes that are not in the drainage area of the affected organ are regarded as distant metastases.
Metastases	M0	No distant metastases have been found.
	M1	There are distant metastases.

The size of the primary site tumor is determined; the level of involvement of the lymph nodes is assessed, and; the presence or absence of metastasis is established. Lymph node involvement and metastasis are important because they indicate how much and how far the cancer has spread.

Cancers can be stage 0, I, II, III, or IV. A stage 0 cancer is a localized tumor; a Stage IV cancer has spread to the lymph nodes and metastasized to other areas of the body.

Staging provides valuable information about the level of cancer severity, how long the patient is expected to live, and what treatments are appropriate. For example, if the primary tumor is determined to be stage T2, it is > 5 cm but ≤ 7 cm. If the lymph node involvement is determined to be stage N3, lymph nodes throughout the chest have evidence of cancer. Metastatic involvement that is stage M1 indicates that cancer has spread to many distant sites. The stages of the primary tumor, the lymph nodes, and the metastases would be combined to provide an overall score of stage IV. This would represent a very serious, advanced case of cancer.

A lymph node is a small structure (usually three-fourths of an inch or smaller) that is part of the lymphatic system. The lymphatic system and the lymph nodes are an important part of the body's immune system. They are also a very common route by which cancers metastasize.

Treatment Of Cancer

Oncology is the branch of medicine that specializes in the diagnosis and treatment of cancer. Each type of cancer and each person who has cancer will receive specific therapies, so it is not possible to make general statements about how cancer is managed. Treatment for cancer depends on the type of cancer, the stage of the cancer, how long the patient has had the cancer, the patient's co-existing medical problems, and the patient's preferences. Chemotherapy, surgery, radiation therapy, or a combination of these are typically used. Hormone therapy, immunotherapy, and stem cell therapy can also be used. Treatments for cancer can be curative or they may be intended to delay the progress of the cancer and provide relief from symptoms.

Medical and Surgical Treatments for Cancer

Chemotherapy:

Cancer chemotherapy uses drugs that attack rapidly growing and dividing cells, characteristics that are typical of most cancers. Unfortunately many of the body's cells, such as bone marrow cells, also grow and divide rapidly so chemotherapy can also kill these healthy cells. Anemia, fatigue, lack of appetite, nausea, vomiting, and weight loss are common side effects of cancer chemotherapy drugs.

Radiation therapy:

Radiation therapy uses high-energy radiation to destroy cancer cells or to shrink a tumor, and it is frequently combined with other cancer therapies. It can be curative or palliative, and it can be used to make cancer more manageable. Radiation therapy is like chemotherapy in that along with cancer cells normal cells can be damaged by this therapy. The side effects of radiation therapy are similar to those of chemotherapy, but patients can also suffer skin burns and can develop cancer from the radiation itself, but this is extremely rare.

Surgery:

Some cancers can be surgically removed if they are localized. Surgery is commonly used to treat breast cancer, colon cancer, lung cancer, and prostate cancer.

Hormone therapy:

A hormone is a naturally produced substance that is produced by a gland. Hormones are used by the body to initiate or sustain certain processes. Example: Testosterone is a hormone, it is produced (in men) by the testicles, and it stimulates muscle growth. Hormone therapy for cancer is used to treat breast or prostate cancer. These cancers need hormones to grow and spread, and hormone therapy prevents cancers from using the naturally occurring hormones in the body. Example: Prostate cancers are stimulated to grow by

a group of hormones called androgens so drugs that reduce the body's production of androgens are effective for treating this type of cancer.

Immunotherapy:

Immunotherapy uses the body's immune system to identify and target cancer cells, hopefully before they organize into large solid tumors.

Stem cell therapy:

A stem cell transplant replaces normal body cells that have been destroyed by chemotherapy or radiation therapy. The cells of the bone marrow that produce red blood cells and white blood cells are often damaged by chemotherapy or radiation therapy and a stem cell transplant can replace damaged/destroyed bone marrow cells, restoring the body's ability to produce red and white blood cells.

The success rates of some cancer therapies for some cancers are not very high and despite advances in treatment and increased public knowledge of the disease, a diagnosis of cancer is still very frightening. Some people will turn to alternative therapies in an attempt to find a cure, but it is important to remember that many "miracle cures" for cancer are untested and unproven and their risks are unknown. In addition, using alternative cancer treatments can prevent a patient from getting therapies that may be helpful.

Cancer cure rates depend on the stage, when the cancer was detected (earlier is better than later), the patient's age and co-existing medical conditions, and the type of cancer. Some cancers such as liver cancer and pancreatic cancer have a very grim prognosis while some forms of leukemia and skin cancer are highly treatable.

Symptomatic and Supportive Care

Because of the signs and symptoms caused by many cancers and because of the adverse effects of many cancer treatments, patients who have cancer are often ill. Anorexia, dehydration, fatigue, insomnia, nausea, pain, vomiting, and weakness are common complaints of people who have cancer. These signs and symptoms can be very debilitating and very depressing, and although some of them are unavoidable they *can* be managed by symptomatic and supportive care.

Symptomatic and supportive care is not intended to be curative; the medical and surgical therapies are used for that purpose. But a patient who has cancer is hoping for cancer therapies to be successful, they also simply want to feel better and alleviate symptoms. Life is important but *quality* of life is also important. The next section of the module will discuss the common signs and symptoms that make cancer such a difficult disease and practical steps that health care professionals can use to help patients feel better will be outlined.

Caring For A Patient Who Has Cancer: Symptomatic And Supportive Care

Caring for a patient who has cancer can require considerable effort. Pain and discomfort are very common, either as a result of the cancer or as a side effect from treatments. Basic functions and activities of daily living such as ambulating, drinking, eating, sleeping, and toileting can be very difficult and sometimes impossible.

Symptomatic and supportive care is designed to allow the patient to cope with having cancer. As previously mentioned this type of assistance is not curative but it improves the quality of life; it helps the patient tolerate cancer therapies; it may prevent the patient from stopping cancer therapies that cause distressing and uncomfortable side effects ("why go through these therapies if they make me sick and they may not work"), and it simply makes people feel better.

Primary issues of symptomatic and supportive care will be discussed. These address some of the most common problems that affect patients who have cancer:

1. nausea and vomiting
2. nutrition
3. pain management
4. psychosocial issues

Nausea and Vomiting

Nausea and vomiting are very common in patients who have cancer, either from the disease itself, as a side effect of therapies, or from a combination of the two. Nausea and vomiting are both demoralizing and debilitating, and many patients say that these symptoms are one of the worst parts of having cancer and getting cancer therapies. Being nauseated and vomiting all the time is quite depressing. The accompanying anorexia and decreased oral intake can lead to dehydration, lack of energy, and an inability to tolerate oral medications. These side effects can depress immune system function and cause weight loss and serious complications. The result is a vicious circle in which the patient does not eat and drink enough which leads to weakness and depression and the vicious cycle continues.

Nausea and vomiting caused by chemotherapy are very common and there are three types.

1. Acute nausea and vomiting (occurs within 24 hours of receiving chemotherapy)
2. Delayed nausea and vomiting (begins 24 hours or later after receiving chemotherapy)
3. Anticipatory nausea and vomiting (before and during chemotherapy treatment)

In the latter, the emotions associated with chemotherapy and the environment in which it is given can "trigger" this type of gastrointestinal distress.

Patients who are at risk for nausea and vomiting during cancer treatments are:

1. people < 50
2. women
3. people who are alcohol abstinent
4. anyone who has a high level of anxiety
5. a patient who had morning sickness during pregnancy
6. anyone who has a history of motion sickness
7. anyone who has a tendency to develop nausea and vomiting when they are ill.

The primary treatment for nausea and vomiting associated with cancer or cancer therapies is anti-emetic drugs, and there is a wide variety of these medications. Some of the more commonly used anti-emetics that can be effective at treating cancer-related nausea and vomiting are:

1. Zofran (ondansetron)
2. Gransisol (granisetron)
3. Reglan (metoclopramide)
4. Compazine (prochlorperazine)
5. Transderm Scop (scopolamine)
6. Phenergan (promethazine)

The choice of drug will depend on the patient's characteristics and other factors but the one that works is the best. Some patients require multiple anti-emetics. In addition, many patients find that shorting sedatives such as Ativan (lorazepam) or Valium (diazepam) can be very helpful, as well.

Other methods for preventing and treating nausea and vomiting in patients who have cancer are listed in Table 3. Patients should be encouraged to use anything that helps *provided they have discussed the issue with the oncologist or another appropriate health care provider*. Treatments for nausea and vomiting, especially "alternative therapies" and unregulated over-the-

counter supplements can interfere with the effectiveness of prescription medications. In addition, dependence on non-pharmacological can tempt a patient into skipping doses of anti-emetics and these drugs are the primary treatment for cancer-associated nausea and vomiting.

TABLE 2: NON-PHARMACOLOGICAL TREATMENTS FOR CANCER-ASSOCIATED NAUSEA AND VOMITING

1. Acupuncture
2. Diet manipulations
3. Distraction techniques
4. Meditation
5. Positive imagery techniques
6. Relaxation techniques

Diet manipulation is the technique that health care professionals will likely be involved with. Simple and easy methods for decreasing nausea and vomiting that you can suggest to the patient include:

1. Avoid spicy and highly salted foods.
2. Eat small portions and eat slowly.
3. Eat often during the day rather than having two or three large meals. Many people find this is easier than the traditional pattern of three meals a day.
4. Stay well hydrated.
5. Do not lie flat after eating.
6. Keep a list of foods that are tolerable and foods that upset the stomach.

Nutrition

Nutrition is vitally important for patients who have cancer. The body needs adequate nutrition to heal and repair itself and to tolerate the stress of the disease and the treatments.

Unfortunately, staying well-nourished is a big challenge for patients who have cancer. The issue of nausea and vomiting has already been discussed, but there are other problems that can arise that prevent a cancer patient from eating well and getting nutrients. These will be discussed below.

Anorexia:

Anorexia is a medical term that means loss of appetite, and anorexia is very common in patients who have cancer and as a side effect of cancer treatments. These people just don't feel like eating.

Anxiety:

Anxiety for many people is an appetite suppressant and anxiety often accompanies cancer.

Cancer:

Cancer of the head, neck, throat, intestinal tract, or stomach will most likely affect nutritional status and the ability to eat and digest food. In addition, some cancers can negatively affect how the body uses carbohydrates, fats, and proteins.

Depression:

It is understandable that many cancer patients are depressed or have periods of depression and depression, like anxiety, can be an appetite suppressant.

Fatigue:

A patient who has cancer and is being treated for cancer may feel too tired to eat and too tired to cook.

Diarrhea:

Another common problem for cancer patients is diarrhea. It can lead to dehydration and decreased absorption of nutrients.

Dry mouth:

Chemotherapy and radiation therapy can affect the ability of the salivary glands to make saliva. Eating is not as easy and much less pleasurable if you have a dry mouth.

Mouth sores:

Chemotherapy and radiation therapy can cause mouth sores, as can dehydration, smoking, and poor nutrition. Mouth sores can easily discourage a patient from eating solid food and if they become infected, this could lead to further issues.

Pain:

Pain is like anxiety and depression; it acts as an appetite suppressant as someone who is in a lot of pain will seldom be thinking about food.

This list is not all-inclusive but the message is clear. There are a lot of reasons why cancer patients have difficulty eating and attaining the proper nourishment. Poor nutrition can make patients feel terrible and this decreases the likelihood of good results during cancer treatment. Treatment for these problems includes:

1. Treatment for anxiety can include sedatives, meditation, relaxation techniques, traditional psychotherapy, and the use of support groups. Anything that provides the patient with a sense of calm.

2. Treatments for depression would include anti-depressants, distraction techniques, psychotherapy, group therapy, and the use of support groups. It is also helpful to determine the patient's knowledge base about their disease and the therapies; the patient may have a pessimistic outlook that is not based on fact.

3. Bulk-forming foods and anti-diarrheal medications can decrease the severity of diarrhea.

4. Good hydration, over-the-counter lozenges, medications that increase saliva production, good oral care (brushing and flossing), and eating soft, moist foods are just a few of the options that can be used to treat/prevent a dry mouth. Smoking and using other forms of tobacco should be avoided.

5. There are medications available that can help prevent mouth sores (Alkeran and Palifermin). Good hydration is always helpful and smoking cessation and a diet that contains lots of fruits and vegetables are recommended for preventing mouth sores. It is also recommended that patients get a complete dental examination before beginning chemotherapy or radiation therapy as dental problems can get worse after these treatments have begun. If mouth sores have developed, coating agents and/or topical painkillers can be prescribed, simple measures such as avoiding hot foods, spicy foods, and hard to chew foods will help mouth sores to heal.

6. Exercise, as tolerated, can help increase appetite.

7. The issue of pain will be discussed in the next section of the module.

The signs and symptoms and causes of poor nutrition, along with weight loss, a patient's self-reported lack of interest in food, an observed decrease in a patient's appetite, or any issue that interferes with eating or hydration should *always* be reported to the patient's provider or care coordinator. Patients should not have to tolerate anorexia or poor nutrition so it is important that they are instructed to tell a health care professional about any problems in this area. Many patients can also benefit from a consultation with a dietitian or a nutritionist.

Pain Management

Pain management is one of the biggest concerns for patients who have cancer but fortunately, they will respond well to pain medications. However,

pain management for oncology patients can be very challenging. Consider these issues.

Side effects:

The analgesics that are traditionally used to treat pain caused by cancer or cancer therapies can cause uncomfortable and at times, serious side effects. Opioid drugs such as hydrocodone, hydromorphone, and oxycodone are often constipating and make people drowsy, and hypotension and respiratory depression can occur with high doses. Over-the-counter analgesics such as acetaminophen and ibuprofen have fewer and less serious side effects and if these relieve pain they would be preferable.

Tolerance:

Tolerance is a well-known phenomenon that is associated with opioids. After a period of time, the patient needs higher and higher doses to achieve the same level of pain relief and this increases the risk for side effects.

Fear:

The issue of fear as it relates to pain relief for oncology patients can be very complex. Prescribers may be afraid of causing harm to patients if they prescribed strong analgesics. Patients may be afraid of side effects, especially of feeling over sedated and "out of it", they may be afraid of becoming addicted, or worried that the use of analgesics is a signal that there is no hope. And, it is not uncommon for oncology patients to be reluctant or fearful of telling someone that they are having pain as if pain and the need for medication represent a failure.

Variations of pain:

Pain in a patient who has cancer can be acute, chronic, or the type of pain that is called breakthrough pain. The last type of pain is a sudden flare-

up of intense pain that happens to people whose pain is normally well controlled.

Pain management for oncology patients (for any patient, actually) is complex, always changing to adapt to patient needs, and requires input from experienced pain management specialists. Pain management also requires patients to take an active role in the process, and patients who have cancer and are in pain should be aware of these points.

1. Pain can be managed; there is no need to suffer.
2. Adverse effects can be avoided and if they occur they can be managed.
3. Controlling pain is considered to be just as much a part of cancer treatment as any other therapy.
4. Pain control has many benefits aside from comfort. It helps people to sleep, it can improve appetite, it increases the tolerance for exercise, and it prevents anxiety and depression. All of these positive aspects of pain relief improve quality of life but they are also physiologically important.
5. The best ways to manage pain are to prevent it from happening or to treat it before it becomes too intense.

Psychosocial Issues

Psychosocial issues and cancer are intimately related. Patients who have cancer experience a wide range of intense emotions such as anxiety, fear, depression, feelings of hopelessness, loneliness, and regrets. They may also have feelings of completion, peace, and serenity, and if there is a remission or a cure great happiness. Mood swings and emotional lability are something that many patients that have cancer experience. Cancer can present a person with the proverbial emotional roller coaster.

It is impossible to supply a comprehensive outline that provides caregivers with a plan for how to give patients emotional and psychological support. Every patient has different needs and these needs are frequently

changing. In addition, mental health and psychiatric professionals, family members and friends, and other resources will be available to assist oncology patients with their psychosocial issues. Your responsibility is to know your patients, to recognize when they need emotional and psychological support, and to help ensure that support is delivered.

Summary

Cancer is both a process and a result: endless growth *and* endless growth of non-functional and typically harmful cells and tissues. Some cancers have easily identified causes, a small number are caused by genetic mutations, but most cancers are caused by an unidentified environmental trigger stimulus that happens to a susceptible person. Cancer treatments have evolved and some cancers can be cured, but it is still a feared disease and both the cancer and the treatments can produce very unpleasant clinical effects.

Cancer is a complex disease that requires a considerable amount of care from the health care team. Health care professionals have considerable contact with patients who have cancer and they often have the primary responsibility for delivering symptomatic and supportive care. Ensuring that oncology patients are free as much as possible from nausea and vomiting, have good nutrition, are receiving adequate pain management, and have the psychosocial support they need are vital parts of their wellbeing.