Cancer in Adolescents

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide to make new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. Once the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep growing and forming new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to their DNA. DNA is in every cell and directs all its actions. In a normal cell, damaged DNA must be repaired or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body doesn't need. These new cells will all have the same damaged DNA as the first cell does.

People can inherit damaged (mutated) DNA from their parents, but most DNA damage is caused by mistakes that happen while a normal cell is reproducing or by something in the environment. In adults the cause of the DNA damage may be something obvious, like cigarette smoking. But often no clear cause is found.

In most cases the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis*. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.

No matter where a cancer may spread, it's named (and treated) based on the place where it started. For example, breast cancer that has spread to the bones is still breast cancer, not bone cancer.

Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. That's why people need treatment that is aimed at their particular kind of cancer.

What are cancers in adolescents?

There is no strict definition of what separates "childhood cancers" from cancers in adolescents, or when exactly a person with cancer is considered an adult. But for statistics purposes, cancers in adolescents are often thought of as those that start between the ages of 15 and 19.

Cancer is not common in teens, but a wide variety of cancer types can occur in this age group, and treating these cancers can be challenging for a number of reasons.

The vast majority of cancers occur in older adults. The most common cancers in adults are skin, lung, colorectal, breast (in women), and prostate (in men). Many cancers in adults are linked to lifestyle-related risk factors (such as smoking, being overweight or obese, or lack of physical activity) or to other environmental factors. A small portion are strongly influenced by changes in a person's DNA (gene mutations) that they inherit from their parents.

Cancers that start in childhood (before age 15) are much less common. The types of cancers that develop in children are often different from the types that develop in adults. Childhood cancers are often the result of DNA changes in cells that take place very early in life, sometimes even before birth. Unlike many cancers in adults, childhood cancers are not strongly linked to lifestyle or environmental risk factors.

The types of cancers that occur in adolescents are a mix of many of the types that can develop in children and adults.

The most common cancers in adolescents

The types of cancers seen in adolescents (ages 15 to 19) are not unique to this age group, but the most common types are different from those in young children or adults.

The most common cancers in adolescents are:

- Lymphomas (Hodgkin lymphoma and non-Hodgkin lymphoma)

- Leukemias (mostly acute lymphocytic leukemia [ALL] and acute myeloid leukemia [AML])
- Thyroid cancer
- Brain and spinal cord tumors
- Testicular cancer
- Bone tumors (osteosarcoma and Ewing tumors)
- Soft tissue tumors (sarcomas)
- Melanoma
- Ovarian cancer

Many other types of cancer can occur in adolescents as well – these are just the most common types.

Lymphomas

Lymphomas start in certain cells of the immune system called *lymphocytes*. These cancers most often affect lymph nodes and other lymph tissues, like the tonsils or thymus (a small organ in front of the heart). They can also affect the bone marrow and other organs. They cause different symptoms depending on where the cancer is. Most common symptoms include weight loss, fever, sweats, tiredness, and lumps (swollen lymph nodes) under the skin in the neck, armpit, or groin.

There are 2 main types of lymphoma:

- Hodgkin lymphoma (Hodgkin disease)
- Non-Hodgkin lymphoma

Both types can occur in adolescents.

Hodgkin lymphoma is most common in 2 age groups: early adulthood (age 15 to 40, usually people in their 20s) and late adulthood (after age 55). This type of cancer is similar in all age groups, including which types of treatment work best.

Non-Hodgkin lymphoma (NHL) is less common than Hodgkin disease in teens, but the risk of NHL goes up as people get older. There are many types of NHL. Some of the types seen more often in adolescents tend to grow quickly and require intensive treatment, but they also tend to respond better to treatment than NHL in older adults.

For more information on these cancers, see our documents *Hodgkin Disease*, *Non-Hodgkin Lymphoma*, and *Non-Hodgkin Lymphoma in Children*.

Leukemias

Leukemias are cancers of the bone marrow and blood. They are the most common cancers in children, but they can occur at any age, and, in fact, most leukemias occur in older adults.

Most leukemias in adolescents are acute (fast growing) types such as acute lymphocytic leukemia (ALL) and acute myelogenous leukemia (AML). Leukemia can cause tiredness, weakness, pale skin, bleeding or bruising, fever, weight loss, bone and joint pain, and other symptoms.

The outlook for most acute leukemias tends to be better the younger a patient is.

For more information, see our documents *Childhood Leukemia*, *Leukemia – Acute Lymphocytic*, and *Leukemia – Acute Myeloid (Myelogenous)*.

Thyroid cancer

The risk of thyroid cancer tends to go up as people get older, but it's often found at a younger age than most other adult cancers. It's much more common in young women than in young men.

The most common symptom of thyroid cancer is a lump in the front of the neck. Most thyroid lumps are not cancer, but it's important to have them checked to be sure. Other symptoms of thyroid cancer can include pain or swelling in the neck, trouble breathing or swallowing, and voice changes.

The chance of curing these cancers is usually very good.

For more information, see our document *Thyroid Cancer*.

Brain and spinal cord tumors

There are many types of brain and spinal cord tumors, and the treatment and outlook for each is different. In children, most brain tumors start in the lower parts of the brain, such as the cerebellum (which coordinates movement) or brain stem (which connects the brain to the spinal cord). Adults are more likely to develop tumors in upper parts of the brain. Tumors in adolescents can occur in either area. Spinal cord tumors are less common than brain tumors in all age groups.

Brain tumors can cause headaches, nausea, vomiting, blurred or double vision, dizziness, seizures, trouble walking or handling objects, and other symptoms.

For more information, see our documents *Brain and Spinal Cord Tumors in Children* and *Brain and Spinal Cord Tumors in Adults*.

Testicular cancer

Testicular cancer most often develops in young men. About half of testicular cancers occur in men between the ages of 20 and 34, but it can occur at any age, including in teens.

Most often, the first symptom of testicular cancer is a lump on the testicle, or the testicle becomes swollen or larger. Some testicular tumors might be painful, but most of the time they are not. It's important to have any lumps checked by a doctor as soon as possible so that the cause can be found.

In general, the outlook for testicular cancers is very good, and most of these cancers can be cured.

For more information, see our document *Testicular Cancer*.

Bone and soft tissue tumors (sarcomas)

Sarcomas are cancers that start in connective tissues such as muscles, bones, or fat cells. There are 2 main types of sarcoma: bone sarcomas and soft tissue sarcomas (which start in muscles, fat, blood vessels or other some body tissues). Sarcomas can develop at any age, but some types occur most often in older children and teens.

Bone sarcomas: The 2 most common types of bone cancer, osteosarcoma and Ewing sarcoma, are most common in teens. They often cause bone pain that gets worse at night or with activity. They can also cause swelling in the area around the bone.

Osteosarcoma usually starts in areas where the bone is growing quickly, such as near the ends of the long bones in the legs or arms. The most common places for Ewing sarcoma to start are the bones in the pelvis, the chest wall (such as the ribs or shoulder blades), or in the middle of the long leg bones.

For more information, see our documents *Osteosarcoma* and *Ewing Family of Tumors*.

Soft tissue sarcomas: These cancers can start in any part of the body, but they often develop in the arms or legs. Rhabdomyosarcoma, a cancer that starts in cells that normally develop into skeletal muscles, is most common in children younger than 10, but it can also develop in teens and adults. Most other types of soft tissue sarcomas become more common as people age. Symptoms depend on where the sarcoma starts, and can include lumps (which might or might not cause pain), swelling, or bowel problems.

For more information, see our documents *Rhabdomyosarcoma* and *Sarcoma – Adult Soft Tissue Cancer*.

Melanoma

Although melanoma is more likely to occur in older adults, this is a cancer that's also found in younger people, including adolescents. In fact, melanoma is one of the most common cancers in people younger than 30 (especially younger women). Melanoma that runs in families can occur at a younger age.

The most important warning sign for melanoma is a new spot on the skin or a spot that's changing in size, shape, or color. A spot that looks different from all of the others on your skin can also be a warning and should be checked by a doctor.

The chance of curing a melanoma is often very good if it's found and treated early. But if left alone, it can grow and spread quickly, which can make it much harder to treat.

For more information, see our document *Skin Cancer – Melanoma*.

Ovarian cancer

Overall, ovarian cancer is much more common in older women. But some types of ovarian cancers, known as *germ cell tumors*, are more common in teens and young women.

Early ovarian cancer usually does not cause symptoms, but some teens and young women might feel full quickly when eating or have abnormal bloating, belly pain, or urinary symptoms. If such symptoms last more than a few weeks, they should be checked by a doctor.

For more information, see our document *Ovarian Cancer*.

What are the key statistics for cancers in adolescents?

About 5,000 teens aged 15 to 19 are diagnosed with cancer each year in the United States. Overall, this accounts for less than 1% of all cancers.

About 600 adolescents die from cancer each year. Cancer accounts for about 5% of deaths and is the 4th leading cause of death in this age group, behind only accidents, suicide, and homicide.

The chance of getting cancer is about equal for adolescent boys and girls, but cancer survival rates are slightly higher in girls than in boys. Overall, about 85% of girls are still alive 5 years after being diagnosed with cancer, compared to about 80% of boys. Some of this might be because of different mixes of cancer types in males and females. Survival rates can vary based on the type of cancer and other factors.

Survival rates for cancer in teens have not changed much in recent decades, unlike the improvements seen in many cancers in children and older adults. As with cancers in children, the progress in some cancers in adolescents has been greater than in others.

What are the risk factors and causes of cancers in adolescents?

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors.

In older adults, many cancers are linked to lifestyle-related risk factors such as smoking, being overweight, eating an unhealthy diet, not getting enough exercise, and drinking too much alcohol. Exposures to things in the environment, such as radon, air pollution, chemicals in the workplace, or radiation during medical tests or procedures, also play a role in some adult cancers. These types of risk factors usually take many years to influence cancer risk, so they are not thought to play much of a role in cancers in children or teens.

Cancer occurs as a result of changes (mutations) in the genes inside our cells. Genes, which are made of DNA, contain the instructions for nearly everything our cells do. Some genes contain instructions for controlling when our cells grow, divide into new cells, and die. Changes in these genes can cause cells to grow out of control.

Some people inherit gene changes from a parent that increase their risk of certain cancers. In people who inherit such a mutation, this can sometimes lead to cancer earlier in life than would normally be expected. But most cancers are not caused by inherited gene changes.

The causes of gene changes in certain adult cancers are sometimes known (such as the lifestyle-related and environmental risk factors mentioned above), but the reasons for gene changes that cause most cancers in children and teens are not known. Many are likely to just be random events that sometimes happen inside a cell, without having an outside cause.

Still, there are some known causes of cancer in teens. For instance:

- Exposure to ultraviolet (UV) light from the sun or from tanning beds can increase the risk of melanoma.
- Treatment with chemotherapy or radiation therapy for a childhood cancer can increase the risk of getting a second cancer, especially leukemia, later on.
- Infection with human immunodeficiency virus (HIV) can raise the risk of non-Hodgkin lymphoma and some other cancers.

Still, these and other known risk factors probably account for only a small portion of cancers in teens overall.

Can cancers in adolescents be prevented?

Most cancers in teens do not have a known cause, so it's not possible to prevent all of them. But some can be prevented.

Limiting lifestyle-related and environmental risk factors

Unlike with many cancers in older adults, lifestyle-related risk factors (such as smoking) are not thought to play much of a role in cancers in teens. A few environmental factors, such as radiation exposure, have been linked with cancer risk in teens. But some exposures may be unavoidable, such as if a child needs radiation therapy to treat cancer.

There are some things you can do to lower your risk of getting certain kinds of cancer, such as:

- Not smoking
- Limiting time spent in the sun and avoiding tanning salons
- If you are sexually active, limiting sex partners and using safe sex practices, which can lower the risk of infection with human papilloma virus (HPV) and human immunodeficiency virus (HIV)

While lifestyle-related and environmental risk factors don't have a large effect on cancers in teens, exposure to these risk factors during the teenage years can still increase a person's risk of getting cancer as they get older. It's important to develop and maintain healthy habits early in life, such as not smoking, staying at a healthy weight, keeping active, and eating a healthy diet. Healthy habits like these can also lower your risk for many other types of health problems later on.

Vaccines to help prevent cancer

Some vaccines might lower a person's risk of getting cancer. For instance, vaccines are available to help prevent infection with HPV (human papilloma virus), the group of viruses linked to cervical and some other cancers. Even though these cancers are more likely to develop later in life than in the teenage years, these vaccines work best if they are given before a person becomes sexually active. For more information, see our documents *HPV Vaccines* and *HPV and Cancer*.

Preventive surgery

Rarely, people inherit gene changes that make them very likely to get a certain kind of cancer at an early age. In such cases, some people and their doctors might decide on surgery to remove an organ before cancer has a chance to develop there. Again, this is not common.

Finding cancer in adolescents

Cancers in teens are often found later than they are in other age groups. There are a number of reasons why the diagnosis of cancer might be delayed:

- Most teens tend to be fairly healthy and might not go to the doctor unless they feel they really need to. This is especially true in young men.
- These years are often a time of growing independence, when young people begin to establish their own identity and lifestyle. Concerns other than health such as spending time with friends, dating, working, or getting ready for college are often higher on the priority list at this time. Many teens might not even have a regular doctor.
- Even when a young person does go to the doctor with a concern, cancer is not usually high on the list of probable causes because it’s not common in this age group. Doctors might be more likely to think symptoms like pain or feeling tired are due to other causes rather than cancer, which might delay the diagnosis.

Still, some cancers in teens can be found early, when treatment is more likely to be successful.

Screening for cancers in teens

Screening is testing for a disease such as cancer in people who don’t have any symptoms. Cancers are not common between ages 15 and 19, so there are no widely recommended screening tests to look for cancer in people in this age group who are not at increased risk.

Some people have a higher risk of developing certain types of cancer because of a strong family history or because of specific gene changes they inherit from a parent. These might put a person at higher risk for cancers such as melanoma of the skin or colorectal, thyroid, or other cancers. These people may need careful, regular exams or tests starting at an early age to look for signs of cancer.

Possible signs and symptoms of cancer in teens

As noted above, there are many reasons why cancers in teens and young adults might not be recognized right away. Sometimes the early symptoms of cancer can overlap with those from much more common illnesses or injuries. Young people might feel run down, get sick, or have bumps or bruises that could mask the early signs of cancer. But it's important to be aware of the common signs and symptoms of cancer. These can include:

- An unusual lump or swelling in the neck, belly, testicle, or elsewhere
- Unexplained tiredness and loss of energy
- Easy bruising
- Abnormal bleeding
- Ongoing pain in one part of the body
- Unexplained fever or illness that doesn't go away
- Frequent headaches, often with vomiting
- Sudden eye or vision changes
- Loss of appetite or unplanned weight loss
- A new mole or other spot on the skin, or one that changes in size, shape, or color

More information on common symptoms for specific cancers can be found in the section "What are cancers in adolescents?" Other symptoms are also possible, depending on the type of cancer.

Many of these symptoms are much more likely to be caused by something other than cancer. Still, if you have any of these symptoms – especially if they don't go away or they get worse – see a doctor.

Seeing a doctor

When you see the doctor, he or she will ask about your medical history and your symptoms and will examine you. Depending on your symptoms, special types of exams or tests might be needed. The doctor might order blood tests, imaging tests (like x-rays and CT scans), or other tests to help figure out if your symptoms are caused by cancer or something else.

If your doctor thinks your symptoms might be caused by cancer, you will probably be referred to a specialist for more exams and tests. The type of doctor you see will depend on your age and what type of cancer is suspected.

In some cases, if an abnormal lump or tumor is found, the doctor might need to remove some or all of it so that it can be checked under a microscope for cancer cells. This is known as a *biopsy*. For most types of cancer, a biopsy is needed to confirm the diagnosis. Biopsies can be done in many ways, ranging from removing a small number of cells with a thin, hollow needle to more extensive surgery. The type of biopsy used will depend on where the lump or tumor is.

How are cancers in adolescents treated?

Older people are much more likely than younger people to get cancer, so most doctors who treat cancer see mainly older adults. (Doctors who treat cancer are called *oncologists*.) Some doctors (called *pediatric oncologists*) specialize in treating childhood cancers. Each type of doctor tends to work in an office or cancer center geared toward treating either older adults or children. There are very few doctors who focus specifically on teens and young adults with cancer, so it's not always clear which type of doctor (or treatment center) might be best. It often depends on the patient's age and the type of cancer.

Cancers in teens and young adults that are more common in children, such as acute lymphocytic leukemia (ALL), bone sarcomas, and rhabdomyosarcoma, are often best treated by pediatric oncologists, who have more experience with these types of cancer. On the other hand, teens with "adult" cancers, such as melanoma or thyroid cancer, might benefit from doctors who treat older adults and see these types of cancers more often.

Doctors tend to use more intense treatments when treating children with cancer than when treating adults. Children's bodies are generally better able to recover from higher doses of chemotherapy than are adults' bodies. And in general, childhood cancers often respond better to chemo because they tend to be cancers that grow fast. (Most forms of chemo affect cells that are growing quickly.)

For some cancers (especially "childhood" cancers like ALL and bone sarcomas), the more aggressive treatments used for children have been found to improve outcomes for teens and young adults as well, but for other cancers the results are not as clear. Again, this can depend on the patient's age and the type of cancer.

Types of cancer treatments

The main types of treatment for cancers in teens are the same as those used in other age groups. The choice of treatment depends mainly on the type and stage (extent) of the cancer. Sometimes more than one type of treatment is used.

It's important to discuss all of your treatment options as well as their possible side effects with your doctors to help make the decision that best fits your needs.

Surgery

Surgery is a common treatment, especially for early stage cancers. The type and amount of surgery needed depends on the type and location of the cancer.

Teens have some advantages when it comes to surgery in that they usually have fewer health problems than older adults, and there are fewer concerns about anesthesia than there are with younger children. (Anesthesia is the use of drugs or gases to put you into a deep sleep and not feel pain.) But teens' bodies are often still growing, so in some cases they can be affected more by surgery than older adults.

For more information, see our document *A Guide to Cancer Surgery*.

Radiation therapy

Radiation therapy is the use of high-energy rays (such as x-rays) or particles to kill cancer cells. Teens are less likely to have major side effects from radiation than younger children because their bodies are no longer growing as quickly. But some parts of the body, such as the breast, ovaries, or testicles, can still be very sensitive to the effects of radiation if they are still developing. Radiation can cause some late or long-term side effects, which are discussed in the section "Late and long-term effects of cancer treatment in adolescents."

For more information, see the "Radiation Therapy" section of our website or our document *Understanding Radiation Therapy: A Guide for Patients and Families*.

Chemotherapy and targeted drugs

Chemotherapy (chemo) is the use of drugs to treat cancer. Some drugs can be swallowed in pill form, while others are injected by needle into a vein or muscle. Chemo is often used to treat cancers that have spread, but it can also be used for earlier stage cancers (usually along with other treatments).

Chemo drugs can cause side effects because they affect cells that are dividing quickly. Teens can usually withstand higher doses of chemo than older adults, but these higher doses can also cause more short- and long-term side effects.

For more information, see the "Chemotherapy" section of our website or our document *A Guide to Chemotherapy*.

For some types of cancer, newer targeted drugs can be used instead of or along with standard chemo drugs. These drugs work by attacking certain parts of cancer cells (or nearby cells) that help them grow. Targeted drugs sometimes work when standard chemo drugs don't, and they have different (and often less severe) side effects.

For more information, see our document *Targeted Therapy*.

Stem cell transplant

A stem cell transplant, formerly called a *bone marrow transplant*, is a way for doctors to give very high doses of chemotherapy (sometimes along with radiation therapy). It's an option for treating some cancers, usually if other treatments are not working.

Without a stem cell transplant, the doses of chemo drugs that can be given are limited because they could severely damage the bone marrow, where new blood cells are made. This could lead to life-threatening infections, bleeding, and other problems because of low blood cell counts.

When a stem cell transplant is done, blood-forming stem cells are first collected from the blood of either the patient or from a matched stem cell donor using a special machine. The stem cells are kept frozen while the patient gets very high doses of chemo (and sometimes radiation) to kill the cancer cells. Afterwards, the stem cells are infused into a vein much like a blood transfusion. They settle in the bone marrow and start making new blood cells over the next few weeks.

A stem cell transplant is a complex treatment that can cause life-threatening side effects. Stem cell transplants often require a lengthy hospital stay and cost a lot. It's important to understand the possible benefits, risks, and costs of this procedure if it's an option.

For more information, see our document *Stem Cell Transplant (Peripheral Blood, Bone Marrow, and Cord Blood Transplants).*

The cancer treatment team

Teens with cancer may have different types of doctors on their treatment team, depending on the type and stage of the cancer and their treatment options. These doctors may include:

- **Cancer surgeons (sometimes called surgical oncologists):** doctors who use surgery to treat cancer. Surgeons often specialize in treating a certain part of the body or a body system (such as the reproductive system or the digestive tract).
- **Medical oncologists:** doctors who use chemotherapy and other medicines to treat adults with cancer
- **Pediatric oncologists:** doctors who use medicines to treat children and teens with cancer
- **Radiation oncologists:** doctors who specialize in using radiation to treat cancer
- **Nurse practitioners** and **physician assistants (PAs):** nurses and other professionals who are specially trained and licensed to practice medicine alongside doctors

Many other specialists might be involved as well, including nurses, rehabilitation and physical therapists, nutritionists, social workers, and other health professionals. They can provide help and guidance with many issues facing teens and their families, such as treatment effects on fertility, education or employment needs, health insurance concerns, and financial issues.

Clinical trials

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are used to learn more about promising new treatments or procedures.

Clinical trials are one way to get state-of-the art cancer treatment. Sometimes they may be the only way to get some newer treatments. They are also the only way for doctors to learn better ways to treat cancer. Still, they are not right for everyone.

Children's cancer centers often conduct many clinical trials at any one time, and most children treated at these centers take part in a clinical trial as part of their treatment. This is one of the reasons why there has been great progress in treating many childhood cancers in recent decades.

Overall, teens are less likely to take part in clinical trials. There are many reasons for this, including the many different cancer types and treatment settings, lack of knowledge about clinical trials (from both doctors and patients), patient/family reluctance to enter clinical trials, and financial issues. Unfortunately, many experts believe this low enrollment in clinical trials is one of the main reasons for the lack of progress in treating cancers in teens and young adults.

If you would like to know more about clinical trials, start by asking your doctor if your clinic or hospital takes part in clinical trials. You can also call our clinical trials matching service for a list of studies that might be right for you (or your child). You can reach this service at 1-800-303-5691 or on our website at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website at www.cancer.gov/clinicaltrials.

To learn more about clinical trials, see our document *Clinical Trials: What You Need to Know*.

Late and long-term effects of cancer treatment in adolescents

Teens who have had cancer are at risk for late effects from their treatment. It's important to discuss what these possible effects might be with your medical team.

The risks depend on a number of factors, such as the type of cancer and the types and doses of treatments used. A person's age when getting treatment is also important. Some organs and body systems can still be growing and developing in teens, which can make them more sensitive to treatments like chemo and radiation therapy.

Late effects can involve more than one part of the body (or more than one organ system) and can range from mild to severe. They can include things like:

- Impaired fertility (ability to have children) in both women and men
- Increased risk of developing another cancer later in life
- Heart or lung problems (due to certain chemo drugs or radiation to the chest)
- Hearing or vision problems (due to certain chemo drugs or radiation to the head)
- Problems with other organs, such as the kidneys or bones
- Pain or swelling in parts of the body
- Hormone deficiencies

Just as the treatment of cancer in teens requires a specialized approach, so does aftercare and watching for late effects. Careful follow-up after cancer treatment allows doctors to find and treat any late effects as early as possible. The follow-up schedule depends on many things, including the type of cancer, the treatments used, and the risk of late effects from those treatments.

It's very important to discuss possible long-term complications of treatment with the health care team, and to make sure there's a plan to watch for these problems and treat them, if needed. The health care team can help you know what to watch for.

The Children's Oncology Group (COG) is the world's largest group of doctors and other health professionals devoted to treating cancer in children and teens. To help raise awareness of late effects of cancer treatment and improve follow-up care of childhood and teen cancer survivors throughout their lives, the COG has developed long-term follow-up guidelines for these survivors. The guidelines can help you know what to watch for, what type of screening tests should be done to look for problems, and how late effects can be treated.

To learn more, ask your doctors about the COG survivor guidelines. You can also find them online at www.survivorshipguidelines.org. The guidelines are written for health care professionals, but patient versions of some of the guidelines are available, too (as "Health Links").

The National Comprehensive Cancer Network (NCCN), a collection of many of the nation's leading cancer centers, also has follow-up test recommendations for teen and young adult cancer survivors. While the guidelines are written for health professionals, a

patient version (which includes information on many aspects of being diagnosed with cancer as a teen or young adult) is available at www.nccn.org/patients/guidelines/aya/index.html.

It's certainly normal to want to put the cancer and its treatment behind you and get back to a life that doesn't revolve around cancer. But it's very important to understand that continued follow-up with your health care team is a key part of this process and gives you the best chance for a full recovery and long-term survival.

Special issues for adolescents with cancer

Teens with cancer and their families face many challenges, from the first onset of problems through treatment and beyond.

Delays in diagnosis

As mentioned in the section "Finding cancer in adolescents," cancers in teens and young adults are often found later than they are in other age groups. Sometimes this can complicate treatment if the cancer has grown large or spread by the time it's found.

Treatment issues

As discussed in the section "How are cancers in adolescents treated?" people in this age group can sometimes be caught between seeing doctors who specialize in treating children with cancer and doctors who mainly treat older adults. Not all doctors are familiar with treating cancers in this middle age group, which can often have unusual features. Communication between patients and their doctors can also be an issue, as many cancer doctors are more comfortable dealing with other age groups.

Regardless of where they are being treated, teens and young adults can feel isolated and out of place. Most patients in doctor's offices or cancer centers are either older adults or younger children, so teens aren't likely to see many people their own age who are dealing with the same issues they are. It's very important for people to connect with others who understand what they're going through and can relate to them on their level. Many support groups – both in person and online – now exist for teens and young adults with cancer who are looking to connect with others in similar situations. (See the "Additional resources for cancer in adolescents" section to find one of these groups.)

Some teens themselves can be challenging as patients. They might place a higher priority on other things going on in their lives rather than treating the cancer, resulting in missed appointments for tests or treatments. This might be out of a misunderstanding of the seriousness of the cancer, resentment over having to deal with the cancer, or even fear of the unknown.

Social and emotional issues

Some of the greatest challenges faced by teens with cancer come from the fact that this tends to be a time of great change in a person's life, which comes with many of its own stresses. Teens are often establishing their own identities at this time and developing social, emotional, and financial independence. A diagnosis of cancer can throw all of these things into disarray.

During treatment, patients and their families tend to focus on the daily aspects of getting through it and beating the cancer. But a number of emotional concerns can come up both during and after treatment. Some of these may last a long time. They can include things like:

- Dealing with physical changes (hair loss, weight gain, scars from surgery, etc.) that can result from the cancer and/or its treatment
- Worrying about the cancer returning or developing new health problems
- Resenting having cancer and having to go through treatment when others do not
- Having to become more reliant on parents at a time when a person is normally becoming more independent
- Having concerns about what to tell others or being treated differently or discriminated against (by friends, classmates, co-workers, employers, etc.)
- Having concerns about dating and someday marrying and having children

No one would choose to have cancer, but for many cancer survivors, the experience can positive in the long term, allowing for clearer setting of priorities and helping to establish strong personal values. Other survivors may have a harder time recovering, adjusting to life after cancer, and moving on.

It's normal to have some anxiety or other emotional reactions after treatment, but feeling overly worried, depressed, or angry can affect many aspects of a young person's growth. It can get in the way of relationships, school, work, and other parts of life. With support from family, friends, mental health professionals, and others, many cancer survivors can thrive in spite of the challenges they've had to face.

Additional resources for cancer in adolescents

More information from your American Cancer Society

Here is more information you might find helpful. You can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our website, www.cancer.org.

For parents of teens with cancer

Children Diagnosed With Cancer: Dealing With Diagnosis (also in Spanish)

Children Diagnosed With Cancer: Understanding the Health Care System (also in Spanish)

Children Diagnosed With Cancer: Financial and Insurance Issues

Pediatric Cancer Centers (also in Spanish)

Children Diagnosed With Cancer: Returning to School

What It Takes to Be a Caregiver

What You Need to Know as a Cancer Caregiver

Dealing with a diagnosis of cancer

Health Professionals Associated With Cancer Care

Talking With Your Doctor (also in Spanish)

After Diagnosis: A Guide for Patients and Families (also in Spanish)

Coping With Cancer in Everyday Life (also in Spanish)

Talking With Friends and Relatives About Your Cancer (also in Spanish)

Anxiety, Fear, and Depression (also in Spanish)

Cancer treatment information

A Guide to Chemotherapy (also in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also in Spanish)

A Guide to Cancer Surgery (also in Spanish)

Targeted Therapy

Stem Cell Transplant (Peripheral Blood, Bone Marrow, and Cord Blood Transplants)

Clinical Trials: What You Need to Know

Cancer treatment side effects

Children Diagnosed With Cancer: Late Effects of Cancer Treatment

Fertility and Men With Cancer (also in Spanish)

Fertility and Women With Cancer (also in Spanish)

Second Cancers Caused by Cancer Treatment

Health insurance and financial issues

Family and Medical Leave Act (FMLA) (also in Spanish)

In Treatment: Financial Guidance for Cancer Survivors and Their Families (also in Spanish

Health Insurance and Financial Assistance for the Cancer Patient (also in Spanish)

Books from your American Cancer Society

The American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order:

National organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

National Cancer Institute
Toll-free number: 1-800-422-6237
TTY: 1-800-332-8615
Website: www.cancer.gov

> Provides accurate, up-to-date information about cancer to patients and their families, including clinical trials information

Stupid Cancer
Website: www.stupidcancer.org

A social networking organization for young adult cancer survivors (ages 15 to 40 years old) and their caregivers that offers support to help improve quality of life for young adults affected by cancer

Teens Living with Cancer
Website: www.teenslivingwithcancer.org

Dedicated to teens coping with a cancer diagnosis and treatment, this online resource focuses on teen issues and provides resources to support teens, their families, and friends

2bMe
Website: www.2bme.org/2bMe.html

Provides information on a wide range of appearance-related, social, and nutritional side effects of treatment for teens (ages 13 through 17) with cancer

Critical Mass: The Young Adult Cancer Alliance
Phone number: 1-512-553-3556
Website: www.criticalmass.org

Has information on the unique needs of adolescents and young adults with cancer, as well as advocacy information and opportunities

Fertile Hope
Toll-free number: 1-888-994-4673
Website: www.fertilehope.org

Provides information on having children in the future to cancer patients whose medical treatments raise the risk of infertility; also offers "Live:On," a use-at-home sperm banking kit

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit www.cancer.org .

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For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org