Childhood Cancer Awareness Month
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. After 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 continue to grow and form 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 DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage 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 does not need. These new cells will all have the same damaged DNA as the first cell does.

People can inherit damaged DNA, but often the DNA damage is caused by mistakes that happen while a normal cell is reproducing or by something in our environment. In adults, sometimes the cause of the DNA damage is 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. Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. That is why children with cancer need treatment that is aimed at their particular kind of cancer.
What are the differences between cancers in adults and children?

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.

There are some exceptions, but childhood cancers tend to respond better to treatments such as chemotherapy (also called chemo). Children’s bodies also tend to handle chemotherapy better than adults’ bodies do. But cancer treatments such as chemo and radiation therapy can cause long-term side effects, so children who have had cancer will need careful follow-up for the rest of their lives.

Since the 1960s, most children and teens with cancer have been treated at specialized centers designed for them. Being treated in these centers offers the advantage of a team of specialists who know the differences between adult and childhood cancers, as well as the unique needs of children and teens with cancer and their families. This team usually includes pediatric oncologists, surgeons, radiation oncologists, pathologists, pediatric oncology nurses, and nurse practitioners. These centers also have psychologists, social workers, child life specialists, nutritionists, rehabilitation and physical therapists, and educators who can support and educate the entire family.
The most common types of Childhood Cancers & Associated Symptoms

The types of cancers that occur most often in children are different from those seen in adults. The most common cancers of children are as follows.

**Leukemia**
Leukemias, which are cancers of the bone marrow and blood, are the most common childhood cancers. They account for about 31% of all cancers in children. Leukemia may cause bone and joint pain, fatigue, weakness, pale skin, bleeding or bruising, fever, weight loss, and other symptoms.

**Brain and Central Nervous System Tumors**
Brain and central nervous system tumors are the second most common cancers in children, making up about 21% of childhood cancers. There are many types of brain tumors, and the treatment and outlook for each is different. Most brain tumors in children start in the lower parts of the brain, such as the cerebellum or brain stem. They can cause headaches, nausea, vomiting, blurred or double vision, dizziness, and trouble walking or handling objects.

**Neuroblastoma**
Neuroblastoma starts in early forms of nerve cells found in a developing embryo or fetus. About 7% of childhood cancers are neuroblastomas. This type of cancer occurs in infants and young children. It is rarely found in children older than 10. This tumor can start anywhere but is usually in the belly (abdomen) and is noticed as swelling. It can also cause bone pain and fever.
Wilms tumor
Wilms tumor starts in one, or rarely, both kidneys. It is most often found in children about 3 to 4 years old, and is uncommon in children older than age 6. It can show up as a swelling or lump in the belly (abdomen). Sometimes the child might have other symptoms, like fever, pain, nausea, or poor appetite. Wilms tumor accounts for about 5% of childhood cancers.

Lymphoma
These cancers start in certain cells of the immune system called lymphocytes. They most often grow in lymph nodes and other lymph tissues, like the tonsils or thymus. They can also affect the bone marrow and other organs, and can cause different symptoms depending on where the cancer is. Lymphomas can cause weight loss, fever, sweats, tiredness (fatigue), and lumps (swollen lymph nodes) under the skin in the neck, armpit, or groin. The 2 main types of lymphoma are: Hodgkin lymphoma (sometimes called Hodgkin disease) and non-Hodgkin lymphoma. Both types occur in children and adults.

Rhabdomyosarcoma
Rhabdomyosarcoma starts in cells that normally develop into skeletal muscles. (These are the muscles that we control to move parts of our body.) This type of cancer can start in the head and neck, groin, belly (abdomen), pelvis, or in an arm or leg. It may cause pain, swelling (a lump), or both. This is the most common type of soft tissue sarcoma in children. It makes up about 3% of childhood cancers.
Retinoblastoma
Retinoblastoma is a cancer of the eye. It accounts for about 3% of childhood cancers. It usually occurs in children around the age of 2, and is seldom found in children older than 6. Retinoblastomas are usually found because a parent or doctor notices a child’s eye looks unusual. Normally when you shine a light in a child’s eye, the pupil (the dark spot in the center of the eye) looks red because of the blood in vessels in the back of the eye. In an eye with retinoblastoma, the pupil often looks white or pink. This white glare of the eye may be noticed after a flash picture is taken.

Bone Cancers
Primary bone cancers (cancers that start in the bones) occur most often in older children and teens, but they can develop at any age. They account for about 4% of childhood cancers. Primary bone cancer is different from metastatic bone cancer, which is cancer that started somewhere else in the body and has spread to the bone. Metastatic bone cancer is more common than primary bone cancer because many types of cancer (including many cancers in adults) can spread to the bone.

Two main types of primary bone cancers occur in children:
Osteosarcoma is most common in teens, and usually develops in areas where the bone is growing quickly, such as near the ends of the long bones in the legs or arms. It often causes bone pain that gets worse at night or with activity. It can also cause swelling in the area around the bone. Ewing sarcoma is a less common type of bone cancer, which can also cause bone pain. It is most often found in young teens. The most common places for it 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.
Screening for Childhood Cancers

Screening is testing for a disease such as cancer in people who don’t have any symptoms. Childhood cancers are rare, and there are no widely recommended screening tests to look for cancer in children who are not at increased risk. Some children may have a higher chance of developing a specific type of cancer because of certain gene changes they inherit from a parent. These children may need careful, regular medical check-ups that include special tests to look for early signs of cancer.

Possible signs and symptoms of cancer in children

Many cancers in children are found early, either by a child’s doctor or by parents or relatives. But cancers in children can be hard to recognize right away because early symptoms often overlap with those caused by much more common illnesses or injuries. Parents should be sure that their children have regular medical check-ups and watch for any unusual signs or symptoms that do not go away. These include:

- An unusual lump or swelling
- Unexplained paleness and loss of energy
- Easy bruising
- An ongoing pain in one area of the body
- Limping
- Unexplained fever or illness that doesn’t go away
- Frequent headaches, often with vomiting
- Sudden eye or vision changes
- Sudden unexplained weight loss

Other symptoms are also possible, depending on the type of cancer. Most of these symptoms are much more likely to be caused by something other than cancer, such as an injury or infection. Still, if your child has any of these symptoms, see a doctor so that the cause can be found and treated, if needed.
How are Childhood Cancers Treated?

Treatments are chosen for childhood cancers based mainly on the type and stage (extent) of the cancer. Treatment options might include surgery, radiation therapy, chemotherapy, and/or other types of treatment. In many cases, more than one of these treatments is used.

There are exceptions, but childhood cancers usually respond well to chemotherapy because they tend to be cancers that grow fast. (Most forms of chemotherapy affect cells that are growing quickly.) Children’s bodies are also generally better able to recover from higher doses of chemotherapy than are adults’ bodies. Using more intensive treatments gives doctors a better chance of treating the cancer effectively, but it can also lead to more short- and long-term side effects. Doctors do their best to balance the need for intensive treatment with the desire to limit side effects as much as possible.