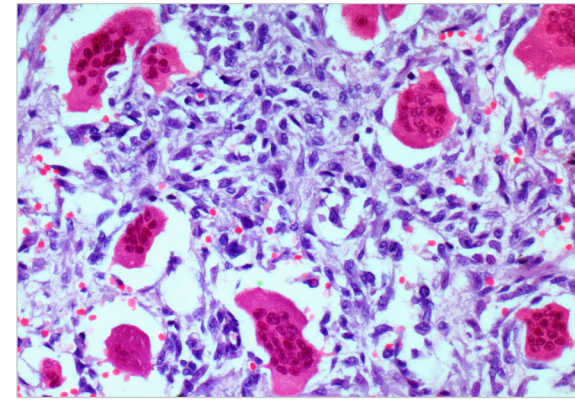
Bone Cancer



What is bone cancer?

Bone cancer is a malignant (cancerous) tumor of the bone that destroys normal bone tissue.[1] Not all bone tumors are malignant. In fact, benign (noncancerous) bone tumors are more common than malignant ones. Both malignant and benign bone tumors may grow and compress healthy bone tissue, but benign tumors do not spread, do not destroy bone tissue, and are rarely a threat to life.

Malignant tumors that begin in bone tissue are called primary bone cancer. Cancer that metastasizes (spreads) to the bones from other parts of the body, such as the breast, lung, or prostate, is called metastatic cancer, and is named for the organ or tissue in which it began. Primary bone cancer is far less common than cancer that spreads to the bones.

Are there different types of primary bone cancer?

Yes. Cancer can begin in any type of bone tissue. Bones are made up of osteoid (hard or compact), cartilaginous (tough, flexible), and fibrous (thread-like) tissue, as well as elements of bone marrow (soft, spongy tissue in the center of most bones).

Common types of primary bone cancer include the following:

Osteosarcoma, which arises from osteoid tissue in the bone. This tumor occurs most often in the knee and upper arm.[1]

Chondrosarcoma, which begins in cartilaginous tissue. Cartilage pads the ends of bones and lines the joints. Chondrosarcoma occurs most often in the pelvis (located between the hip bones), upper leg, and shoulder. Sometimes a chondrosarcoma contains cancerous bone cells. In that case, doctors classify the tumor as an osteosarcoma.

The *Ewing Sarcoma Family* of Tumors (ESFTs), which usually occur in bone but may also arise in soft tissue (muscle, fat, fibrous tissue, blood vessels, or other supporting tissue). Scientists think that ESFTs arise from elements of primitive nerve tissue in the bone or soft tissue.[2] ESFTs occur most commonly along the backbone and pelvis and in the legs and arms.[3]

Other types of cancer that arise in soft tissue are called soft tissue sarcomas. They are not bone cancer and are not described in this resource.

How often does bone cancer occur?

Primary bone cancer is rare. It accounts for much less than 1 percent of all cancers. About 2,300 new cases of primary bone cancer are diagnosed in the United States each year.[5] Different types of bone cancer are more likely to occur in certain populations:

Osteosarcoma occurs most commonly between ages 10 and 19. However, people over age 40 who have other conditions, such as Paget disease (a benign condition characterized by abnormal development of new bone cells), are at increased risk of developing this cancer. Chondrosarcoma occurs mainly in older adults (over age 40). The risk increases with advancing age. This disease rarely occurs in children and adolescents.

ESFTs occur most often in children and adolescents under 19 years of age. Boys are affected more often than girls. These tumors are extremely rare in African American children.

What are the symptoms of bone cancer?

Pain is the most common symptom of bone cancer, but not all bone cancers cause pain.[1] Persistent or unusual pain or swelling in or near a bone can be

caused by cancer or by other conditions. It is important to see a doctor to determine the cause.

How is bone cancer diagnosed?

To help diagnose bone cancer, the doctor asks about the patient's personal and family medical history. The doctor also performs a physical examination and may order other diagnostic tests. These tests may include x-rays, bone scans, CAT scans, MRI procedure, PET scans, angiogram, biopsy and/or blood tests.

What are the treatment options for bone cancer?

Treatment options depend on the type, size, location, and stage of the cancer, as well as the person's age and general health. Treatment options for bone cancer include surgery, chemotherapy, radiation therapy, and cryosurgery.

Surgery is the usual treatment for bone cancer. The surgeon removes the entire tumor with negative margins (no cancer cells are found at the edge or border of the tissue removed during surgery). The surgeon may also use special surgical techniques to minimize the amount of healthy tissue removed with the tumor.

Dramatic improvements in surgical techniques and preoperative tumor treatment have made it possible for most patients with bone cancer in an arm or leg to avoid radical surgical procedures (removal of the entire limb). However, most patients who undergo limb-sparing surgery need reconstructive surgery to maximize limb function.[1]

Chemotherapy is the use of anticancer drugs to kill cancer cells. Patients who have bone cancer usually receive a combination of anticancer drugs. However, chemotherapy is not currently used to treat chondrosarcoma.[1]

Radiation therapy, also called radiotherapy, involves the use of high-energy x-rays to kill cancer cells. This treatment may be used in combination with surgery. It is often used to treat chondrosarcoma, which cannot be treated with chemotherapy, as well as ESFTs.[1] It may also be used for patients who refuse surgery.

Cryosurgery is the use of liquid nitrogen to freeze and kill cancer cells. This technique can sometimes be used instead of conventional surgery to destroy the tumor.[1]

Selected References

1. Malawer MM, Helman LJ, O'Sullivan B. Sarcomas of bone. In: DeVita VT, Hellman S, Rosenberg SA, editors. *Cancer: Principles and Practice of Oncology*. Vol. 2. 7th ed. Philadelphia: Lippincott Williams and Wilkins, 2004.

2. Pizzo P, Poplack DG, editors. *Principles and Practice of Pediatric Oncology*. 4th ed. Philadelphia: Lippincott Williams and Wilkins, 2002.

3. Ries LAG, Smith MA, Gurney JG, et al., editors. *Cancer Incidence and Survival among Children and Adolescents: United States SEER Program 1975-1999*. Bethesda, MD: National Cancer Institute, 1999.

4. Miller RW, Boice JD, Curtis RE. Bone cancer. In: Schottenfeld D, Fraumeni JF, editors. *Cancer Epidemiology and Prevention*. 2nd ed. New York: Oxford University Press, 1996.

5. American Cancer Society (2008). *Cancer Facts and Figures 2008 Exit Disclaimer*. Atlanta, GA: American Cancer Society. Retrieved March 13, 2008.

6. Fischbach FT, Dunning MB. *A Manual of Laboratory and Diagnostic Tests*. 7th ed. Philadelphia: Lippincott Williams and Wilkins, 2004.

Source: National Cancer Insititute.

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