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Osteosarcoma - Childhood - Risk Factors [1]

This section has been reviewed and approved by the Cancer.Net Editorial Board [2], 07/2013

ON THIS PAGE: You will find out more about what factors increase the chance of developing this type of cancer. To see other pages, use the menu on the side of your screen.

A risk factor is anything that increases a person?s chance of developing cancer. Although risk factors often influence the development of a tumor, most do not directly cause cancer. Some people with several risk factors never develop a tumor, while others with no known risk factors do.

Most osteosarcoma begins sporadically, which means it appears in people who have no other diseases and no family history of bone cancer. Osteosarcoma may start because of overactive bone cells. Possible changes in genes that lead to this overactivity are being studied in a small number of families where siblings have developed osteosarcoma. Such changes, while very uncommon, may help doctors better understand how osteosarcoma begins in people with no family history of the disease, since similar genetic changes may occur in their cancer cells.

Osteosarcoma is probably caused by a combination of genetic changes that together cause immature bone cells to become tumor cells instead of developing into healthy bone. The same gene (called the *RB* gene) that is abnormal in many children with a rare type of eye cancer called retinoblastoma [3] may also be associated with osteosarcoma. *RB* is a tumor suppressor gene that normally controls the growth of cells. When it is mutated (changed), it can no longer control cell growth, and a tumor can form. In addition, many other changes occur in the genes of osteosarcoma cells.

There are several groups of people that are more likely to develop osteosarcoma:

- Teenagers who are having a growth spurt are most likely to develop osteosarcoma. Researchers are looking for a link between rapid bone growth and tumor development.
- Osteosarcoma is about 50% more common in boys than girls.
- People who have received radiation treatment for other types of cancer are more likely to develop osteosarcoma. Also, higher doses of radiation treatment at a younger age increase the risk.
- Children with an inherited form of retinoblastoma are more likely to develop osteosarcoma.
- Children with Li-Fraumeni syndrome [4] (a rare disorder of a gene, *p53*, which is responsible for getting rid of abnormal cells) have a higher risk of sarcoma [5], brain cancer [6], and breast cancer [7].

- Children with Werner syndrome [8] (a very rare disorder that may involve the *WRN* gene) have a higher risk of sarcoma, thyroid cancer [9], and melanoma [10].
- People with Rothmund-Thomson syndrome, an uncommon disorder characterized by short stature (height), rash, alopecia (hair loss), and skeletal dysplasia (noncancerous abnormalities of the bones) are more likely to develop osteosarcoma.

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