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# AAP News

## News Articles, Focus on Subspecialties, Hematology/Oncology

### Look for red flags that raise index of suspicion for childhood cancer

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Each year, approximately 16,000 U.S. children between birth and age 19 are diagnosed with cancer, and more than 40,000 children undergo cancer treatment. Cancer remains the leading cause of death from disease in childhood.

The signs and symptoms of childhood cancer are nonspecific, and initial recognition often is difficult. Paying attention to clinical red flags increases the index of suspicion for childhood cancers.

September is Childhood Cancer Awareness Month, providing an opportunity to reinforce the importance of early diagnosis. Following is a review of the epidemiology of childhood cancer, important signs and symptoms that should raise concern for cancer, and guidance for primary care pediatricians in the recognition and diagnosis of common pediatric malignancies. Finally, suggestions are offered on how to support patients and families in the event of a possible cancer diagnosis.

#### Epidemiology of childhood cancer

Cancer in children can occur at any age, with peaks of incidence during infancy when neuroblastoma is most common and between the ages of 2 and 4 when leukemia is the most common. The incidence drops through the school-age years and then begins to increase during adolescence.

Leukemia/lymphoma and cancers of the central nervous system represent the most frequent cancers in childhood. The frequency of other childhood cancers is shown in the figure.



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Types of Childhood Cancer*	Birth to age 14 (percentage of cases)	15-19 years old (percentage of cases)
Lymphoid leukemia	22%	7%
Acute myeloid leukemia	4%	4%
Hodgkin lymphoma	3%	12%
Non-Hodgkin lymphoma	5%	7%
Brain/central nervous system neoplasms	26%	21%
Neuroblastoma & other peripheral nerve tumors	6%	<1%
Nephroblastoma & other nonepithelial renal (kidney) tumors, including Wilms' tumor	5%	<1%
Hepatic (liver) tumors	2%	<1%
Osteosarcoma	2%	3%
Ewing tumor & related bone sarcomas	1%	2%
Rhabdomyosarcoma	3%	<1%
Germ cell & gonadal tumors	3%	11%
Thyroid carcinoma	2%	11%
Malignant melanoma	1%	4%

\*United States, 2011-2015

### Red flags

Signs and symptoms of childhood cancer are nonspecific and include many findings observed in a variety of childhood disorders. These include fever, musculoskeletal symptoms, pain, fatigue, pallor, bruising, bleeding, headaches, lymphadenopathy, and loss of appetite, vomiting and weight loss.

Any symptom in isolation is less likely to be associated with a childhood cancer diagnosis than if multiple symptoms are present or if the symptoms have persisted over time and resulted in multiple medical visits.

Some symptoms considered red flags are more specific but still not diagnostic of malignancy. Red flags include lymphadenopathy of greater than 2 centimeters (particularly if firm, non-tender, fixed or in the supraclavicular area), morning vomiting (especially if associated with headache or other neurologic symptoms), rapid vision changes with or without papilledema, painless swelling, fever associated with pallor or persistent fevers associated with night sweats.

Abdominal, bone or soft tissue masses, scrotal masses that do not trans-illuminate, and urinary retention especially if associated with lower extremity weakness or flaccidity are other red flag symptoms that should raise a high index of suspicion for a malignancy.

### Lab, imaging studies

Initial screening laboratory studies for suspected childhood cancer include a complete blood count with differential and reticulocyte count to assess for cytopenias or bone marrow production problems; a



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comprehensive metabolic panel (or electrolytes, renal and hepatic function) as well as a lactate dehydrogenase and uric acid levels (nonspecific measures of increased cell turnover). Other laboratory studies can be tailored to the specific disorder in question and should be done in the referral center.

Radiographic studies most frequently will begin with plain chest X-rays to evaluate for mediastinal adenopathy or pulmonary metastasis or X-rays of a painful or affected extremity or spine to evaluate for bony destruction. More specific radiography may include an ultrasound of the abdomen or scrotum for initial evaluation of a suspected mass.

Computerized tomography and/or magnetic resonance imaging for more definitive assessment are best performed in the referral center where oncology-specific protocols are followed. Indeed, it often is preferable for primary care providers to do less testing and/or imaging and to consult an oncologist early about concerns and make a mutually agreeable decision about how to proceed.

### Supporting patients and families

The suspected diagnosis of cancer in a child causes significant anxiety for the patient, the family and the pediatrician. It is critical to speak to the parent, and patient if age appropriate, honestly about your concerns. Use the words cancer, tumor and leukemia as appropriate; avoid vague expressions of "bad cells" or "mass."

When referring to an oncologist for initial consultation, reassure the family that you still are their child's pediatrician and that you will remain involved throughout the process.

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