

## Childhood Cancer: Nursing Implications

### What We Know

- ▶ Cancer is the second leading cause of death in children in developed nations; despite this, 80% of children with cancer survive at least 5 years. Although childhood cancers are often more aggressive than adult cancers, they are usually more responsive to therapy. Childhood cancers tend to originate from stem cells, in contrast to adult cancers, which typically originate from highly differentiated cells (e.g., epithelial cells)<sup>(1, 5, 6, 8, 10)</sup>
  - Leukemia and lymphoma account for more than 50% of childhood cancers<sup>(6)</sup>
    - Acute lymphocytic leukemia (ALL) accounts for more than 30% of childhood cancers, making it the most common cancer in children. Children aged 2–5 years are most commonly affected. Treatment includes several years of chemotherapy and, in some cases of relapse, hematopoietic stem cell transplantation (HSCT)<sup>(6, 10)</sup>
    - Hodgkin's disease (HD) accounts for roughly 5% of childhood cancers. HD is a cancer of the lymph nodes that is treated with chemotherapy and radiation<sup>(6, 10)</sup>
    - Non-Hodgkin's lymphoma (NHL), a cancer of lymph tissue outside of the lymph nodes (e.g., bone marrow, bowel), is almost always curable with chemotherapy<sup>(6, 10)</sup>
  - Brain tumors are the second most common childhood cancer. Almost half of children with brain tumors do not survive. Surgery is the primary mode of treatment, but surgery may be combined with chemotherapy or radiation therapy. Radiation therapy is avoided when possible, particularly in children under 3 years of age, because of the risk of neurocognitive dysfunction<sup>(6, 10)</sup>
  - Several types of cancer are found almost exclusively in children: neuroblastoma (i.e., a tumor of the sympathetic ganglia), retinoblastoma (i.e., a tumor of the retina), rhabdomyosarcoma (i.e., a tumor of the soft tissue), osteosarcoma (i.e., a tumor of the bone), and Wilms' tumor (i.e., nephroblastoma)<sup>(10)</sup>
    - Neuroblastoma is the most common cancer in children under 1 year<sup>(6)</sup>
    - Retinoblastoma is hereditary in 40% of patients and is 4 times more common in Asians than in Whites<sup>(6)</sup>
    - Osteosarcoma typically develops at the metaphysis of long bones during growth spurts<sup>(10)</sup>
    - Wilms' tumor rarely affects children over the age of 8 years<sup>(6)</sup>
- ▶ Nurses caring for children with cancer should keep in mind the following:<sup>(2, 3)</sup>
  - Patients with childhood cancer have described several qualities and behaviors that define “caring” nurses: authenticity; making small gestures (e.g., drawing smiley faces with the Povidine prep) to make painful procedures more bearable; demonstrating an interest in the patient's life outside of the hospital; and providing emotional support to family members<sup>(3, 9)</sup>
    - Siblings of children with cancer often become anxious regarding their own health and/or jealous of the attention given to the patient<sup>(2)</sup>
  - Children with cancer may develop altered body image as a result of side effects of therapy (e.g., hair loss, limb loss). Altered body image does not correlate with the severity of physical changes, but rather with the patient's perception of the physical changes<sup>(2, 4)</sup>
  - Metabolic requirements are increased in patients with cancer, and children with cancer are at risk of malnutrition as a result of insufficient caloric intake, which can be the result of side effects (e.g., vomiting, diarrhea, loss of appetite, mucositis) of cancer therapy and medications that decrease nutrient absorption. Chronic malnutrition can lead to stunted growth, cachexia (i.e., muscle wasting with severe weight loss), impaired wound healing, and immune dysfunction<sup>(7)</sup>
    - Laboratory tests may indicate malnutrition (e.g., serum albumin is typically decreased in patients with insufficient caloric intake)<sup>(7)</sup>
    - Patients who consume less than 80% of their estimated caloric requirements for more than 3 days are at risk for malnutrition<sup>(7)</sup>
    - Growth retardation often resolves after treatment with growth hormone<sup>(5)</sup>
- ▶ Childhood cancer survivors should ideally receive continued medical surveillance at a cancer center by clinicians with a thorough knowledge of the long-term complications of cancer therapy. If this is not possible, the Children's Oncology Group has established survivorship guidelines that outline the recommended clinician follow up for childhood cancer survivors. Potential long-term complications of cancer therapy include impaired growth and development, neurocognitive deficits, cardiotoxicity, pulmonary compromise, endocrine

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dysfunction, gastrointestinal dysfunction, gonadal dysfunction, and additional malignancies<sup>(4, 5, 8)</sup>

- The majority of individuals who survive childhood cancer develop at least one long-term side effect, and over 30% experience a severe or life-threatening side effect<sup>(1, 4, 5)</sup>
- Childhood cancer survivors are at a 6-fold higher risk than the general population of developing a second cancer. The most common second malignancies are breast, thyroid, and bone cancer; acute myeloid leukemia (AML); and therapy-related myelodysplasia<sup>(1, 5)</sup>
- Screening for long-term effects varies depending on cancer treatment history<sup>(5)</sup>
  - Fewer than one third of childhood cancer survivors receive appropriate screening for long-term effects of cancer therapy. The major barrier to screening is a lack of clinician knowledge regarding the long-term risks of cancer therapy<sup>(8)</sup>
  - Neurocognitive deficits (e.g., decreased IQ) can result from radiation of the brain or chemotherapy with methotrexate or cytarabine. A neuropsychological assessment should be performed at baseline and then yearly or as clinically indicated<sup>(1, 8)</sup>
  - Cardiotoxicity (e.g., cardiomyopathy) can result from chest radiation or chemotherapy with anthracyclines (e.g., doxorubicin). Exposed patients should have a baseline ECG, medical history, and physical exam, followed by periodic echocardiograms and a fasting glucose and lipid panel every 2 years. Female patients considering pregnancy should have a cardiac consultation<sup>(1, 8)</sup>
  - Pulmonary compromise (e.g., pulmonary fibrosis) can result from chest radiation or chemotherapy with carmustine, lomustine, busulfan, or bleomycin. Exposed patients should have a baseline medical history, physical exam, chest X-ray, and pulmonary function tests, which should be repeated as clinically indicated<sup>(1, 8)</sup>
  - Endocrine dysfunction (e.g., hypothyroidism, growth hormone deficiency, adrenal insufficiency, hyperprolactinemia) can result from radiation of the brain or thyroid. Exposed patients should have a yearly medical history, physical exam, and laboratory testing (e.g., thyroid stimulating hormone [TSH], cortisol) and as clinically indicated<sup>(1, 8)</sup>
  - Gonadal dysfunction (e.g., hypogonadism, infertility, premature menopause) can result from surgical removal of the gonads, radiation of the gonads, or chemotherapy with alkylating agents (e.g., cyclophosphamide). Exposed patients should have a yearly medical history, physical exam, and baseline laboratory testing (e.g., LH, FSH, estrogen, testosterone) at 13–14 years of age and as clinically indicated<sup>(1, 8)</sup>
  - Second malignancies can result from exposure to radiation therapy or chemotherapy with etoposide, teniposide, anthracyclines, or alkylating agents. Exposed patients should have a yearly medical history and physical exam. In addition, patients with exposure to these chemotherapy agents should have a yearly CBC with differential and platelets for 10 years following completion of chemotherapy. Patients exposed to radiation therapy in a field that includes the colon should have a colonoscopy every 5 years starting 10 years after the radiation exposure. Patients exposed to chest radiation should have yearly clinical breast exams until the age of 25 and every 6 months after age 25. Yearly mammograms and MRI should be initiated at the age of 25 or 8 years after exposure to radiation therapy to the chest<sup>(1, 8)</sup>

## What We Can Do

- ▶ Learn about nursing implications for childhood cancer so you can accurately assess your patients' personal characteristics and health education needs; share this knowledge with your colleagues
  - More information can be obtained at <http://www.survivorshipguidelines.org>
- ▶ Demonstrate caring behaviors (e.g., interest in patient's lives outside of the hospital)<sup>(3)</sup>
- ▶ Educate your patients and their families about the disease, procedures, and risks and benefits of therapies in an honest, age-appropriate manner. Involve the child life specialist (i.e., a professional trained in child development, pediatric education, and the design of developmentally appropriate care plans) on the pediatric unit in patient education if available<sup>(3)</sup>
- ▶ Request referral to a social worker and/or the nurse liaison in the pediatric unit to help parents communicate with and educate teachers about any special needs the patient has when returning to school<sup>(2)</sup>
- ▶ Provide patients and families with a cancer treatment summary and encourage them to provide copies of the summary to all of their health care providers<sup>(4, 5)</sup>

## Coding Matrix

References are rated in order of strength:

- M** Published meta-analysis
- SR** Published systematic or integrative literature review
- RCT** Published research (randomized controlled trial)
- R** Published research (**not** randomized controlled trial)
- C** Case histories, case studies
- G** Published guidelines
- RV** Published review of the literature
- RU** Published research utilization report
- QI** Published quality improvement report
- L** Legislation
- PGR** Published government report
- PFR** Published funded report
- PP** Policies, procedures, protocols
- X** Practice exemplars, stories, opinions
- GI** General or background information/texts/reports
- U** Unpublished research, reviews, poster presentations or other such materials
- CP** Conference proceedings, abstracts, presentations

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