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).¹⁻⁵,⁸⁻¹⁰,¹⁴

• Leukemia and lymphoma account for more than 50% of childhood cancers.⁸
  – Acute lymphocytic leukemia (ALL) accounts for more than 30% of childhood cancers and 80% of childhood leukemias, 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).⁸⁻¹²,¹⁴
  – Hodgkin’s disease (HD) accounts for about 5% of childhood cancers. HD is a cancer of the lymph nodes that is treated with chemotherapy and radiation.⁸⁻¹⁴
  – 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.⁸⁻¹⁴

• Brain and spinal tumors are the second most common childhood cancer, representing 25% of childhood cancers. Almost half of children with brain tumors do not survive. Surgery is the primary mode of treatment and might be combined with chemotherapy or radiation therapy in some cases. Radiation therapy is avoided when possible, particularly in children under 3 years of age, because of the risk of neurocognitive dysfunction.⁸⁻¹²,¹⁴

• 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).¹⁴
  – Neuroblastoma is the most common cancer in children under 1 year of age.⁸
  – Retinoblastoma is hereditary in 40% of patients and is 4 times more common in Asians than in Whites.⁸
  – Osteosarcoma typically develops at the metaphysis of long bones during growth spurts.¹⁴
  – Wilms’ tumor rarely affects children over the age of 8 years.⁸

› Nurses caring for children with cancer should be aware of the following nursing implications;²⁻³

• Patients who have cancer during childhood have described several qualities and behaviors that define “caring” nurses: authenticity, performing 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.³⁻¹³
  – Siblings of children with cancer often become anxious regarding their own health and/or jealous of the attention given to the patient.²
• Children with cancer can develop an altered body image as a result of side effects of therapy (e.g., hair loss, loss of a limb). Altered body image does not correlate with the severity of physical changes but rather with the patient’s perception of the physical changes.

• Many cancer therapies can affect fertility, particularly treatment for Hodgkin's lymphoma and radiation to the abdomen and pelvis. The use of fertility preserving techniques is considered in some cases (e.g., children that have begun puberty).
  – Older girls have a higher risk of ovarian failure than younger girls
  – In some cases, boys recover fertility several years after completing treatment

• Children undergoing chemotherapy or receiving high-dose steroids are at risk for developing osteonecrosis (i.e., death of the bone tissue due to decreased blood flow), particularly in weight-bearing joints. Osteonecrosis can cause chronic pain and decreased mobility.

• Metabolic requirements are increased in patients with cancer, and children with cancer are at risk of malnutrition as a result of insufficient caloric intake. Malnutrition 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.
  – Laboratory tests can be performed to assess for malnutrition (e.g., serum albumin is typically decreased in patients with insufficient caloric intake)
  – Patients who consume less than 80% of their recommended caloric requirement for more than 3 days are at risk for malnutrition
  – Growth retardation often resolves after treatment with growth hormone

Childhood cancer survivors should ideally receive continued medical surveillance at a cancer center by clinicians who have 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 dysfunction, gastrointestinal dysfunction, gonadal dysfunction, and additional malignancies.

• More than 95% of individuals who survive childhood cancer develop at least one long-term side effect, and over 80% experience a serious, disabling, or life-threatening side effect.
  – Approximately 65% have abnormal pulmonary function
  – Approximately 62% have some hearing loss
  – Endocrine or reproductive dysfunction occurs in 62%
  – Cardiac conditions develop in 56.4%
  – Neurocognitive impairment occurs in 48%
  – Other long-term effects include liver dysfunction, kidney dysfunction, abnormal blood cell counts, and osteoporosis

• Childhood cancer survivors are at a 6-fold higher risk than the general population of developing a second cancer. Eighteen percent of survivors will have a second malignancy during adulthood, which can occur at any site. The most common second malignancies are breast, thyroid, and bone cancer; acute myeloid leukemia (AML); and therapy-related myelodysplasia.

• Screening for long-term effects varies depending on the patient’s history of cancer treatment.
  – 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.
  – Neurocognitive deficits (e.g., decreased IQ) and cerebrovascular disease can result from radiation of the brain or chemotherapy with methotrexate or cytarabine. A neuropsychological assessment should be performed at baseline and yearly thereafter or as clinically indicated.
  – Cardiotoxicity (e.g., cardiomyopathy, arrhythmias, myocardial ischemia) can result from chest radiation or chemotherapy with anthracyclines (e.g., doxorubicin), cyclophosphamide, cytarabine, cisplatin, and ifosfamide. Exposed patients should have a baseline EKG, medical history, and physical examination followed by periodic echocardiograms and a fasting glucose and lipid panel every 2 years. Female patients considering pregnancy should be evaluated by a cardiac specialty clinician.
What We Can Do

› Learn about nursing implications for childhood cancer so we can accurately assess our patients’ personal characteristics and health education needs; share this knowledge with our colleagues
  • More information can be obtained at http://www.survivorshipguidelines.org

› Demonstrate caring behaviors (e.g., interest in patients’ lives outside of the hospital) for our pediatric patients with cancer and their family members.¹¹ When appropriate, obtain assent, encourage patient collaboration (e.g., have patient remove adhesive strip or countdown to procedure), and offer encouragement and praise¹¹

› Educate our patients and their parents about the cancer diagnosis, what to expect during diagnostic and treatment-related procedures, and the risks and benefits of therapies in an honest, age-appropriate manner. If available, 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 education¹²
  • Fertility is often a major concern for patients and their families. Verify that their questions are answered regarding the effects of treatment on future fertility and the availability of appropriate fertility preserving techniques. Reassure that if the patient has children, his or her offspring are not at increased risk of congenital abnormalities¹²
  • Educate patients and their parents/families regarding healthy lifestyle recommendations (e.g., good nutrition, regular exercise, tobacco cessation)¹²

› Offer age-appropriate resources (e.g., the Stupid Cancer website for adolescents, http://stupidcancer.org)⁴⁻⁷,¹²

› 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 he/she returns to school²

› Provide patients and parents/families with a cancer treatment summary and information on the treating clinician’s recommended follow-up. Encourage them to provide copies of the information to all of their healthcare providers⁴⁻⁷,¹²
Recent review of the literature has found no updated research evidence on this topic since previous publication on October 9, 2015.

---

**Coding Matrix**

References are rated using the following codes, listed in order of strength:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV</td>
<td>Published review of the literature</td>
</tr>
<tr>
<td>SR</td>
<td>Published systematic or integrative literature review</td>
</tr>
<tr>
<td>RCT</td>
<td>Published research (randomized controlled trial)</td>
</tr>
<tr>
<td>R</td>
<td>Published research (not randomized controlled trial)</td>
</tr>
<tr>
<td>C</td>
<td>Case histories, case studies</td>
</tr>
<tr>
<td>G</td>
<td>Published guidelines</td>
</tr>
<tr>
<td>M</td>
<td>Published meta-analysis</td>
</tr>
<tr>
<td>L</td>
<td>Legislation</td>
</tr>
<tr>
<td>PFR</td>
<td>Published funded report</td>
</tr>
<tr>
<td>P</td>
<td>Policies, procedures, protocols</td>
</tr>
<tr>
<td>X</td>
<td>Practice exemplars, stories, opinions</td>
</tr>
<tr>
<td>GI</td>
<td>General or background information/texts/reports</td>
</tr>
<tr>
<td>U</td>
<td>Unpublished research, reviews, poster presentations or other such materials</td>
</tr>
<tr>
<td>CP</td>
<td>Conference proceedings, abstracts, presentation</td>
</tr>
</tbody>
</table>

---

**References**


