

## Cognitive Late Effects in Childhood Cancer Survivors

### What are "Late Effects"?

As the number of childhood cancer survivors continues to rise, increasing attention has centered on the late effects of cancer treatments. "Late effects" are the long-term complications that develop over time as a result of childhood cancer and its treatment. Cognitive late effects refer to changes in the ways children or adolescents think, remember, and learn.

### Types of Cognitive Late Effects

Common cognitive late effects can include:

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| <ul style="list-style-type: none"> <li>· Attention/concentration difficulties</li> <li>· Slowed processing speed</li> <li>· Decreased working memory capacity</li> <li>· Learning and memory problems</li> <li>· Problems with planning and organization</li> </ul> | <ul style="list-style-type: none"> <li>· Visual-motor integration problems</li> <li>· Difficulties with nonverbal reasoning</li> <li>· Difficulty writing quickly and accurately</li> <li>· Problems with math calculation skills</li> <li>· Increased difficulty with reading comprehension</li> </ul> |
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### Risk Factors for Developing Cognitive Late Effects

The effects of cancer treatments can vary greatly from child to child. Not all children will develop late effects. Some children will develop a few subtle difficulties and other children may develop multiple and life-altering late effects. Some of the factors that may increase the risk for developing cognitive problems include:

#### Demographic Variables:

- Diagnosis of cancer at a very young age
- Female gender – Girls may be more at risk for cognitive late effects

#### Specific Cancer & Treatment Variables:

- Brain tumors, tumors involving the head & neck, leukemia, lymphoma
- Higher doses of both radiation and chemotherapy

### Identifying Cognitive Late Effects

Cognitive difficulties usually develop gradually, beginning within a year or two of treatment and progressing over time. Any child at risk for late effects from cancer treatment should have a baseline Neuropsychological Evaluation completed as soon as possible after diagnosis. Repeat evaluations are recommended periodically thereafter to assess for changes in cognitive functioning and monitor effects from treatment.

### Educational Services

The effects of childhood cancer and its treatments can lead to unique educational needs. Children who have or had cancer may be eligible to receive educational support services or accommodations under the Individuals with Disabilities Education Act (IDEA) or under Section 504 of The Rehabilitation Act of 1973.

#### Special Education (IDEA)

- Provides special education services for students between 3 and 21 years of age who meet specific eligibility criteria. Services available include specialized classroom placements, physical, occupational, & speech/language therapy.
- An Individualized Education Plan (IEP) is a formal, written document that details the special education program designed to meet the identified educational needs.

#### Section 504

- Provides accommodation services for qualified students with a disability (i.e., any physical or mental impairment) that limits one or more major life activities, including learning.
- A 504 Plan can be developed to provide environmental or instructional accommodations within the general education program, such as a shortened school day, testing modifications, or an extra set of books at home.

### Resources

- American Childhood Cancer Organization: [www.acco.org](http://www.acco.org).
- Children's Oncology Group. (2008). *Health Link: Educational Issues Following Treatment for Childhood Cancer*. [www.survivorshipguidelines.org](http://www.survivorshipguidelines.org).

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## TEXAS CHILD STUDY CENTER

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