

SURVIVING CHILDHOOD CANCER

A cancer diagnosis is upsetting at any age, but especially when the patient is a child. The care of children, adolescents, and young adults who survived cancer is complex. A 5 year survival rate is greater than 80% but various therapies used to treat cancer can throw off the endocrine and hormonal system. It is important to know the early and late endocrine symptoms that may develop and possible effects following cancer treatment in survivors.



CHILDHOOD CANCER SURVIVORS

One of the most frequently affected endocrine organs in cancer survivors are the hypothalamus and pituitary gland.

- The hypothalamus produces and releases hormones and links the nervous and endocrine systems through the pituitary glands.
- The pituitary gland is often referred to as the “master gland” and influences other organs in the body. It also produces the growth hormone.
- The growth hormone controls the body's growth. If survivors have too little of the growth hormone, it can lead to health problems, including weight gain and growth failure in young survivors.
- Other hormones that may be affected include fertility hormones released by the pituitary gland such as LH, FSH, and ACTH.





THE ENDOCRINE CONDITIONS

FACING CANCER SURVIVORS INCLUDE:

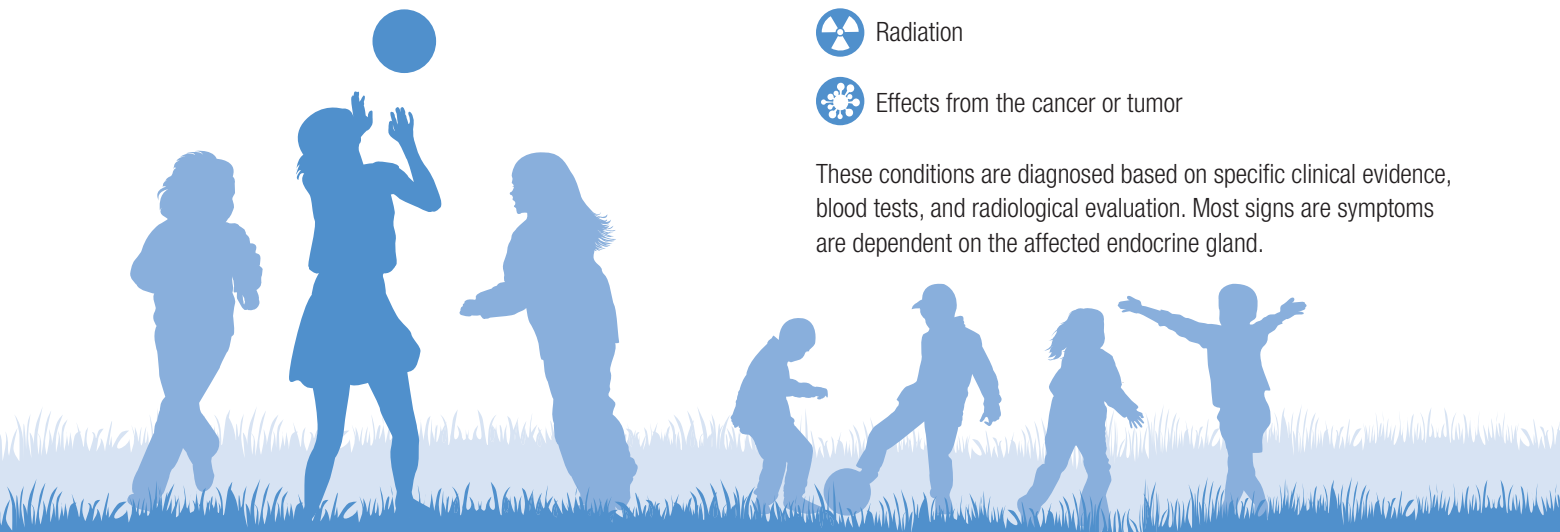
- Growth failure
- Growth hormones deficiency
- Delayed puberty
- Amenorrhea or loss of libido
- TSH deficiency
- ACTH deficiency, which is the hormone responsible for cortisol production

ENDOCRINE COMPLICATIONS IN

CANCER SURVIVORS MAY BE CAUSED BY:

-  Surgery
-  Chemotherapy
-  Radiation
-  Effects from the cancer or tumor

These conditions are diagnosed based on specific clinical evidence, blood tests, and radiological evaluation. Most signs are symptoms are dependent on the affected endocrine gland.






Visit endocrine.org for more information.

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Developed for patients based on *Hypothalamic-Pituitary and Growth Disorders in Survivors of Childhood Cancer, an Endocrine Society Clinical Practice Guideline*

GROWTH HORMONE DEFICIENCY FROM THE PITUITARY GLAND

-  Growth deceleration or lack of growth acceleration with puberty in older children
-  A decrease in growth rate or a lack of pubertal growth spurt in pre-pubertal children
-  Adults may experience fatigue, abnormal fat deposition, body composition of fat and lean mass, and elevated cholesterol

FSH AND LH DEFICIENCY FROM THE PITUITARY GLAND

- Delayed or absent puberty
- Secondary amenorrhea (no periods) or loss of libido in sexually mature adults

PRECOCIOUS PUBERTY

Breast development in girls before age 8 or testicular or penis enlargement in boys before age 9.

TSH DEFICIENCY

Fatigue, constipation, slow growth in growing children.

ACTH DEFICIENCY

Fatigue, abdominal pain, weight loss, low blood sugar or low blood pressure, particularly in times of acute illness.

TREATMENT RECOMMENDATIONS

Cancer survivors are encouraged to ask their health care providers about the early or late endocrine developments of their cancer and/or therapy. Based on the diagnosis that is made and the psychological and physical health of the patient, treatments can include thyroid hormone replacement, cortisol replacement, growth hormone therapy, and suppression or induction of puberty.

- Highlight the likelihood of endocrine disorders in CCS and how long of a latency period there can be between completion of treatment and the endocrine disorder and it is recommended that a skilled doctor monitors growth and puberty since each can impact final height outcomes of a child.
- Stimulating testing is a medical test that determines the way a child's endocrine system responds to different types of hormones.
- Childhood cancer survivors should also make sure their doctor has a summary of their treatment history and list of conditions they may be at risk for based on their medical history.



QUESTIONS TO ASK YOUR HEALTHCARE PROVIDER

Should any endocrine testing be preformed for the general non-cancer survivor?

Is there any medicine that can impact my child's condition post cancer?

What are the risk and the benefits of each treatment option?



Patients have questions. We have answers.

Endocrine Society is your trusted source for endocrine patient education.

Our free, online resources are available at endocrine.org/patient-engagement