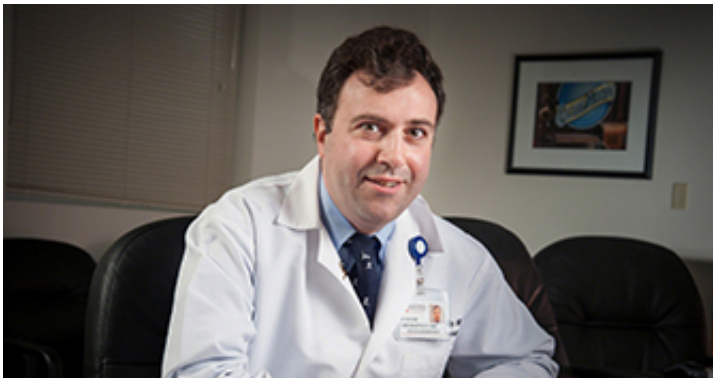


# Survivors of childhood cancer at risk for developing hormone deficiencies as adults

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Decades after undergoing cranial irradiation for childhood cancer, St. Jude Children's Research Hospital investigators found that adult survivors of pediatric cancer remain at risk for pituitary hormone deficiencies that may diminish their health and quality of life. The findings appear in the February 10 edition of the *Journal of Clinical Oncology*.

The study included 748 St. Jude survivors of leukemia, brain and other cancers whose treatment included brain irradiation. The research is the most comprehensive effort yet to assess the long-term impact of the treatment on pituitary function. The pituitary gland sits at the base of the brain and makes hormones involved in regulating growth, sexual development and reproduction, bone and muscle strength and other

important functions.

Researchers found that 51.4 percent of survivors were deficient in at least one of the hormones included in this study and 10.9 percent had multiple deficiencies.

The most common deficits involved growth hormone and pituitary hormones called gonadotropins that are involved in fertility and reproduction. Those were also the hormone deficiencies most likely to have gone undiagnosed. Untreated survivors with those deficiencies were also more likely than other survivors to experience muscle weakness, poor fitness, heart disease risk factors and other factors associated with an increased risk of frailty and early death.

"This study provides much needed long-term follow-up data and shows that the risk of pituitary problems follows these survivors into adulthood," said Wassim Chemaitilly, M.D., an assistant member of the St. Jude Department of Pediatric Medicine. He is the paper's first and corresponding author.

Chemaitilly estimated that a significant proportion of [childhood cancer survivors](#) exposed to cranial radiotherapy are at risk for hormone deficiencies as adults. While St. Jude has dropped cranial irradiation for treatment of acute lymphoblastic leukemia, the most common [childhood cancer](#), it remains important for treatment of pediatric brain tumors.

"The findings also underscore the need for the nation's growing population of childhood cancer survivors to get recommended health screenings, and the challenges they face in trying to navigate the health care system and follow that advice," he said. Guidelines developed by the Children's Oncology Group (COG) call for childhood cancer survivors treated with cranial irradiation to have pituitary function checked annually. COG is the world's largest organization devoted

exclusively to childhood and adolescent cancer research.

More than 46 percent of survivors in this study were diagnosed with growth hormone deficiency. In 212 survivors, almost 61 percent of those identified with the deficiency, the diagnosis was new. Of the 731 participants checked for low levels of gonadotropins and the resulting low levels of the hormones estrogen and testosterone, researchers identified deficiencies in 79 or nearly 11 percent. In 46 of the 79 survivors, the diagnosis was new. Obese white men were at greatest risk of having low testosterone levels.

COG guidelines recommend survivors treated with cranial irradiation have their pituitary function checked annually. Chemaitilly said the high percentage of survivors with previously undiagnosed hormone deficiencies highlights the need for new strategies to ensure survivors receive recommended health checks. St. Jude is testing a pilot program to help survivors at risk for endocrine problems transition seamlessly from pediatric to adult care.

Deficiencies in other pituitary hormones were less common. Blood tests showed that about 7 percent, or 56 of the 743 survivors included in the screening, had low levels of thyroid stimulating hormone. The deficit was previously unrecognized in about 14 percent of patients. Adrenocorticotrophic hormone deficiencies were found in almost 4 percent of survivors, or 29 of the 748 individuals screened.

Researchers also reported that the younger survivors were when they underwent [cranial irradiation](#) and the higher the radiation dose they received, the greater their risk for pituitary problems later.

Survivors were enrolled in the St. Jude Lifetime Cohort Study (St. Jude LIFE). The study goal is to improve medical care and the quality of life for current and future childhood cancer survivors. The average survivor

in this study was 34 years old and was an average of 27 years from the diagnosis of childhood cancer. They are among more than 4,000 [survivors](#) treated at St. Jude who are being invited to return to campus for several days of health screenings and other assessments.

This analysis found an association between untreated growth hormone deficiency and reduced strength and muscle size, low energy, poor fitness and abdominal obesity, which is tied to an increased risk of cardiovascular disease. Some of the same factors are associated with early aging and an increased risk of premature death. Untreated gonadotropin deficiencies were associated with reduced bone mineral density, reduced fitness, high blood pressure, abdominal obesity and elevated cholesterol and other blood lipids.

Additional research is needed to help guide management of adults with growth hormone deficiency. Treatment is expensive, and the long-term benefits in adults are uncertain, Chemaitilly said.

Provided by St. Jude Children's Research Hospital

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