

## ENDOCRINE DISORDERS IN ADULT SURVIVORS OF CHILDHOOD CANCER: A REPORT FROM THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

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**Background:** The development of endocrinopathies in aging survivors many years following high-risk therapies, such as head and neck radiotherapy (RT), remains understudied.

**Methods:** Analyses of self-reported conditions in 14,290 5-year survivors from the CCSS; median age 6 years (range, <1 to 20) at diagnosis and 32 years (range, 5 to 58) at last follow up. Cumulative incidence curves and Cox regression were used to analyze and compare time to first onset for each endocrine disorder.

### Results:

Years post Cancer	Cumulative Incidence% (95% CI) of Endocrine Outcomes in Survivors Exposed to High-Risk Therapies*									
	Hyperthyroidism**		Thyroid Nodules		Primary Hypothyroidism		TSH Deficiency		Growth Hormone Deficiency	
5	2	(1-4)	1	(<1-2)	14	(13-16)	9	(7-11)	8	(7-9)
10	3	(2-5)	3	(2-3)	20	(18-22)	14	(11-16)	14	(13-15)
15	4	(3-6)	6	(5-7)	26	(24-29)	16	(14-19)	17	(15- 8)
20	5	(4-7)	11	(5-13)	31	(29-33)	18	(15-21)	17	(16-18)
25	7	(5-8)	17	(15-19)	35	(32-37)	20	(17-22)	17	(16-18)
30	8	(6-10)	22	(20-24)	37	(34-39)	21	(18-24)	17	(16-19)
35	8	(6-10)	27	(24-30)	40	(37-43)	21	(18-24)	17	(16-19)

\*Head & Neck RT ≥20 Gy; \*\*Neck RT ≥40 Gy

The risk of an endocrine disorder was significantly higher in adult survivors exposed to high-risk therapies as defined by the COG guidelines compared to survivors not exposed: primary hypothyroidism (HR 7.0; 95% CI, 5.8- 8.3), thyroid nodules (HR 7.0; 95% CI, 5.8-8.4), TSH deficiency (HR 3.6; 95% CI, 2.8- 4.7), and growth hormone deficiency (HR 5.3; 95% CI 4.3 to 6.4),  $p < 0.001$  for all.

**Conclusions:** Endocrinopathies in adult survivors exposed to high-risk therapies significantly increase over time, underscoring the need for life-long subspecialty follow-up for these survivors.

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