

# Visual complications in childhood cancer survivors: A Childhood Cancer Survivor Study report.

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Abstract:

**Background:** The Childhood Cancer Survivor Study (CCSS) is an NIH funded project (U01-CA 55727) designed to study the effects of childhood cancer treatment on long- term survivors. Previous studies have found associations between certain cancer therapies and visual complications. **Methods:** The CCSS is a retrospective cohort study investigating health outcomes of long-term survivors (> 5 years) diagnosed and treated between 1970 and 1986 compared to a randomly selected sibling cohort. Questionnaires were completed by 14,362 survivors of childhood cancer and 3,901 sibling controls. Analysis determined the first occurrence of 8 visual conditions in 3 time periods: during therapy, end of therapy to 5 years post diagnosis, and greater than or equal to 5 years post diagnosis. Multivariate analyses, adjusting for current age and gender, determined the relative risks (RR) and 95% confidence interval (CI) of visual conditions by treatment exposure. **Results:** Survivors had statistically significant increases in the RR of cataracts, glaucoma, legal blindness, double vision, retinal condition, and dry eyes, across all time periods, when compared to siblings. During the time period of 5 or more years post-diagnosis, statistically significant positive associations were present for cataracts and other head radiation, craniospinal radiation, total body radiation, and prednisone; glaucoma and craniospinal radiation; double vision and craniospinal radiation; legally blind and other head radiation and craniospinal radiation; and dry eyes and other head radiation, total body radiation, and dexamethasone. There were no statistically significant associations between treatment factors and retinal conditions. **Conclusions:** Childhood cancer survivors are at risk of developing

visual complications and treatment related factors are important determinants of this risk. Follow-up is needed to evaluate the impact of visual conditions on quality of life.

<b>RR (95% CI) for Visual Complications and Treatment Factors Complication</b>	<b>Other head radiation</b>	<b>Craniospinal radiation</b>	<b>Total body radiation</b>	<b>Prednisone</b>	<b>Dexamethasone</b>
<b>Cataracts</b>	5.0 (3.1-8.0)	2.7 (1.8-4.3)	7.3 (3.5-15.5)	2.0 (1.4-2.7)	0.9 (0.5-1.4)
<b>Double vision</b>	1.4 (0.8-2.4)	2.9 (1.9-4.4)	0.4 (0.1-1.3)	0.6 (0.4-0.8)	1.4 (0.7-2.5)
<b>Dry eyes</b>	2.4 (1.6-3.4)	1.0 (0.6-1.5)	3.3 (1.6-6.6)	1.1 (0.9-1.4)	1.8 (1.3-2.6)
<b>Glaucoma</b>	1.3 (0.4-4.5)	3.3 (1.2-9.4)	0.8 (0.1-9.2)	0.4 (0.2-0.9)	1.3 (0.2-8.4)
<b>Legally blind</b>	4.6 (2.7-8.0)	2.8 (1.5-4.9)	0.6 (0.2-1.9)	0.5 (0.3-0.7)	0.9 (0.4-2.2)