

REAL WORLD EVIDENCE OF THE RISK OF A SECOND CANCER AMONG TESTICULAR CANCER PATIENTS AFTER CISPLATIN-BASED TREATMENT



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OBJECTIVES

The aims of this study were to:

1. Examine the risk of a second cancer (SC) in testicular cancer (TC) patients treated with cisplatin; and
2. To describe differences in the risk of a SC following one or more than one line of treatment (LOT).

METHODS

TC patients were identified in a US-based EMR network. Patients selected were males ≥ 16 years of age with no other recorded neoplasm prior to the diagnosis of TC. Patients diagnosed with a SC or deceased in the year following the first TC diagnosis were excluded. For aim one, patients first treated with cisplatin therapy following the first TC diagnosis were compared to patients only treated with surgery, and separately to patients treated with chemotherapy and radiation (CT/RT). For aim two, TC patients with a single LOT were compared to patients with 2+ LOTs. All comparisons were adjusted for baseline confounders using a 1:1 matched propensity score model. Risk ratios, 95% confidence intervals, and Kaplan-Meier survival curves were calculated. Patient characteristics were defined by ICD, CPT, LOINC, and RxNorm terminology.

RESULTS

For aim one, the mean age at index was 31.9 ± 9.6 (N=719), 35.0 ± 11.6 (N=1,685), and 41.6 ± 14.4 (N=97) for cisplatin-, surgery-, and CT/RT-treated patients. For aim two, the mean age at index was 35.3 ± 12.4 (N=1,221) and 38.2 ± 13.5 (N=135) for patients with one and 2+ LOTs. The risk of SC was higher in cisplatin-treated patients than surgery patients [RR=1.70 (1.55,1.87)], and lower in cisplatin-treated patients than CT/RT-treated patients [RR=0.82 (0.72,0.94)] and in patients with one LOT than with 2+ LOTs [RR=0.84 (0.75,0.93)]. Comparable results were seen in the crude and matched analyses.

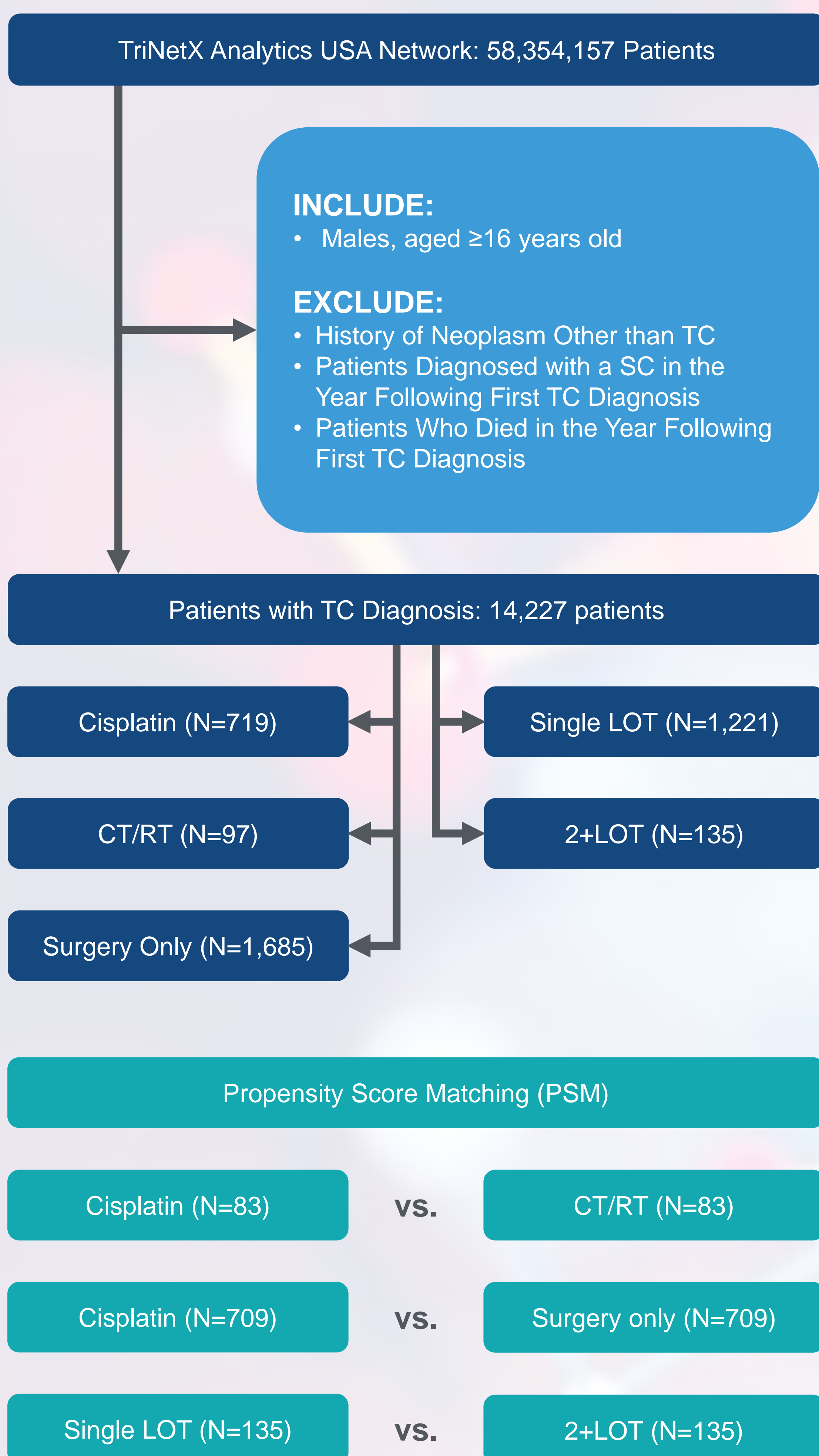


Figure 1. Patient flow diagram

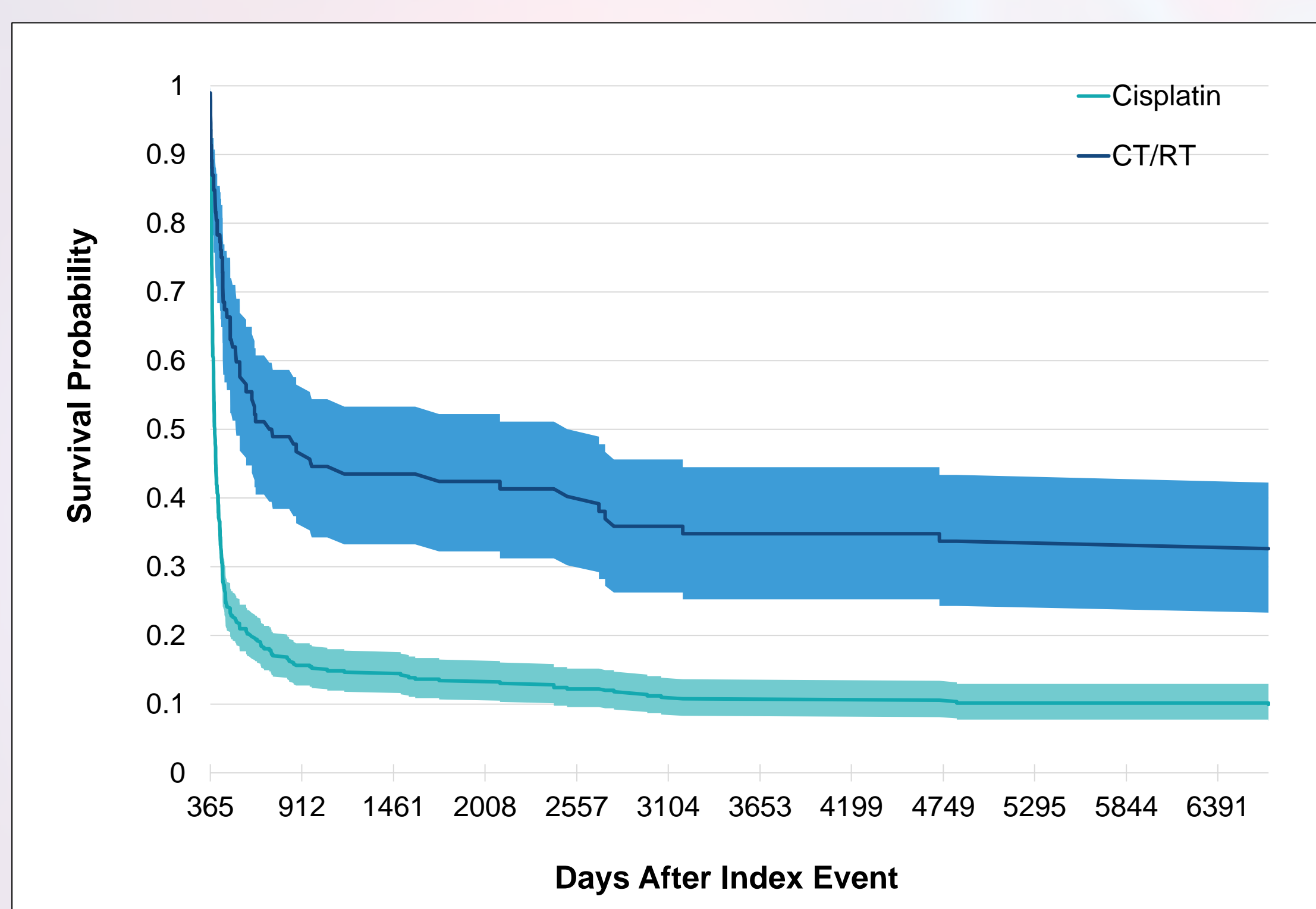


Figure 2. Kaplan-Meier survival analysis of second cancer in patients treated with cisplatin vs. CT/RT

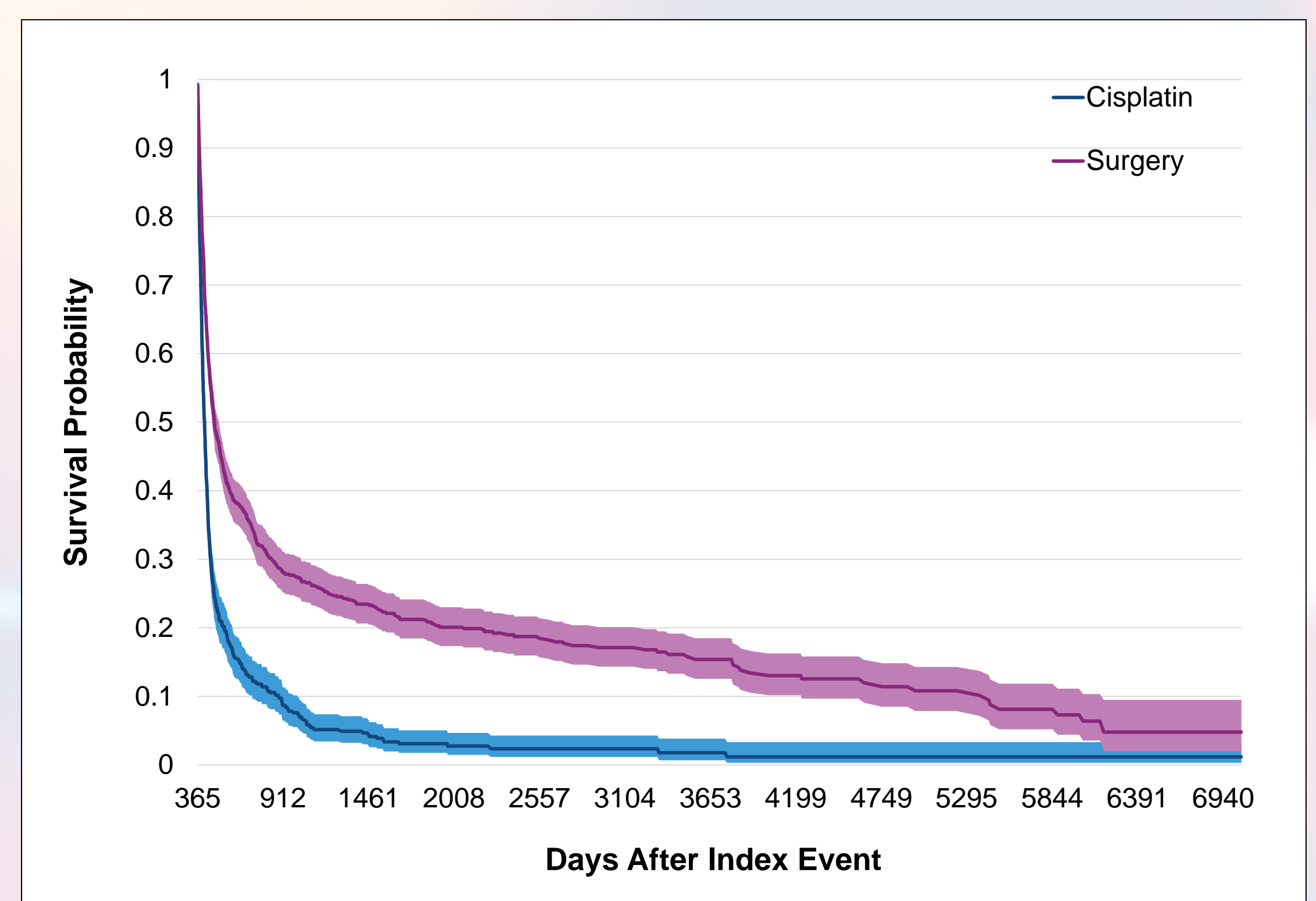


Figure 3. Kaplan-Meier survival analysis of second cancer in patients treated with cisplatin vs surgery

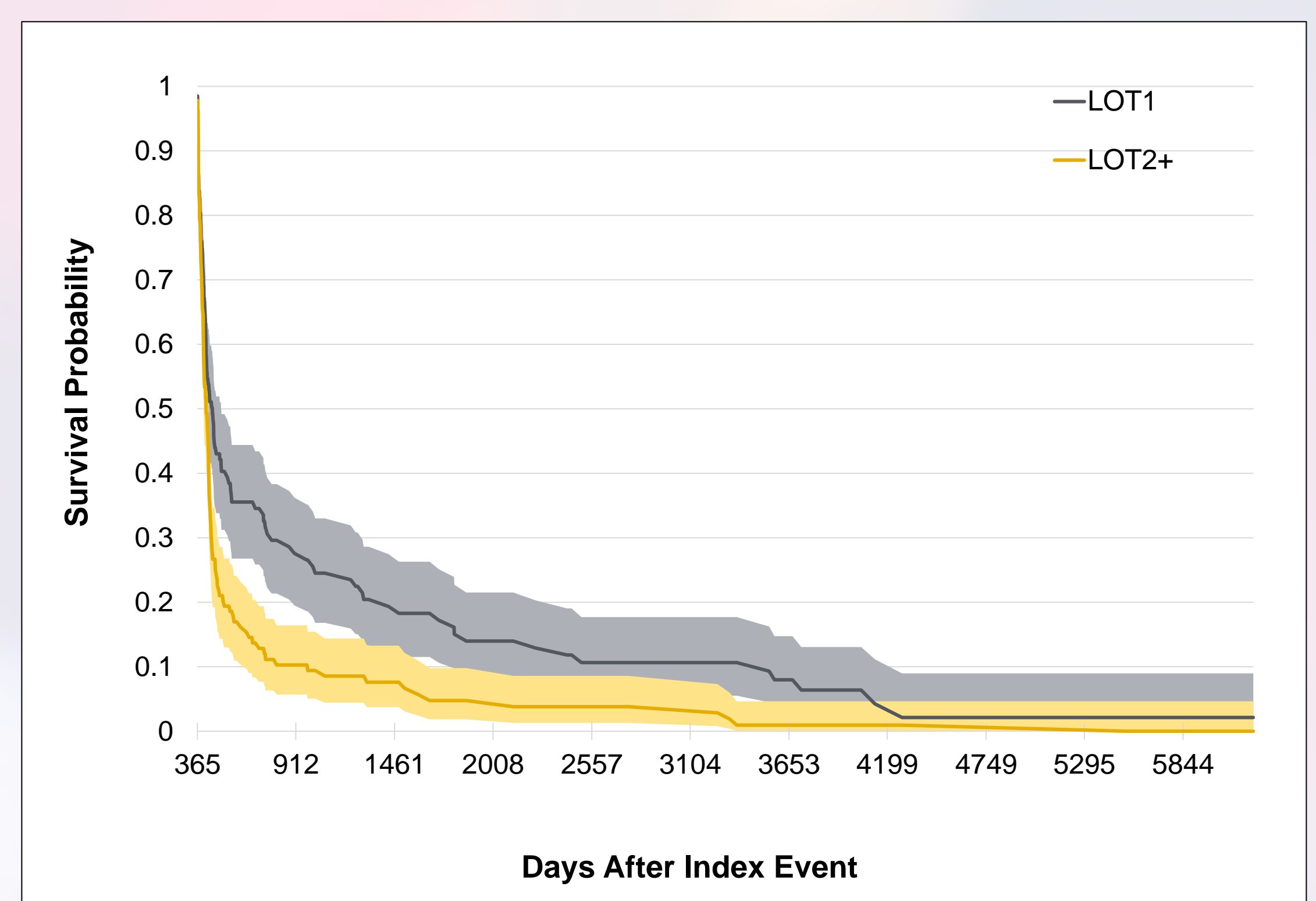


Figure 4. Kaplan-Meier survival analysis of second cancer in patients treated with one line of therapy vs. two+

Table 1. Baseline demographic and clinical characteristics (before PSM)

Characteristics	Cisplatin (N=719)		CT/RT (N=97)		Surgery (N=1,685)	
	N / Mean	% / SD	N / Mean	% / SD	N / Mean	% / SD
Age at index (Mean \pm SD)	31.9	9.6	41.6	14.4	35.0	11.6
Race						
White	608	84.6%	83	85.0%	1,226	72.8%
Black or African American	30	4.2%	10	10.0%	62	3.7%
American Indian or Alaska Native	10	1.4%	0	0.0%	20	1.2%
Asian	10	1.4%	0	0.0%	34	2.0%
Native Hawaiian or Other Pacific Islander	10	1.4%	0	0.0%	10	0.6%
Unknown Race	71	9.9%	10	10.0%	339	20.1%
Ethnicity						
Hispanic or Latino	84	11.7%	20	20.6%	234	13.9%
Not Hispanic or Latino	501	69.7%	60	61.9%	920	54.6%
Unknown Ethnicity	134	18.6%	17	17.5%	531	31.5%
Diseases of the musculoskeletal system and connective tissue	86	12.0%	24	24.7%	230	13.6%
Diseases of the respiratory system	67	9.3%	21	21.6%	190	11.3%
Diseases of the digestive system	64	8.9%	19	19.6%	200	11.9%
Diseases of the circulatory system	52	7.2%	20	20.6%	213	12.6%
Metabolic disorders	26	3.6%	19	19.6%	101	6.0%

Table 2. Propensity score matching characteristics

PSM covariates	
Cisplatin vs CT/RT Analysis	
Code	Description
AI	Age at Index
2186-5	Not Hispanic or Latino
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
J00-J99	Diseases of the respiratory system
E00-E89	Endocrine, nutritional and metabolic diseases
CN000	Central nervous system medications
Cisplatin vs Surgery Analysis	
Code	Description
Age	Current Age
AI	Age at Index
2106-3	White
N00-N99	Diseases of the genitourinary system
1013625	Evaluation and Management Services
1011136	Pathology and Laboratory Procedures
1010251	Radiology Procedures
CN000	Central nervous system medications
1 LOT vs LOT+ Analysis	
Code	Description
Age	Current Age
AI	Age at Index
2186-5	Not Hispanic or Latino
UN	Unknown Ethnicity
2135-2	Hispanic or Latino
2106-3	White
2131-1	Unknown Race
2054-5	Black or African American
1010251	Radiology Procedures
1006056	Surgical Procedures on the Cardiovascular System
1011136	Pathology and Laboratory Procedures
MS100	Antirheumatics
Z00-Z13	Persons encountering health services for examinations
Z77-Z99	Persons with potential health hazards related to family and personal history and certain conditions influencing health status
Z80	Family history of primary malignant neoplasm

CONCLUSIONS

This analysis found that patients treated with cisplatin-based therapy were more likely to develop a SC than those who underwent surgery. Multiple LOTs did not appear to reduce the risk of developing a SC. These results align with other findings in published literature.