Chapter 13
New Malignancies Following Melanoma of the Skin, Eye Melanoma, and Non-melanoma Eye Cancer

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Synopsis

The risk of subsequent primary cancer was assessed in 66,059 patients with cutaneous melanoma and 4,393 patients with cancers of the eye diagnosed between 1973 and 2000. The overall risk of new malignancies was significantly elevated among survivors of cutaneous melanoma (O/E=1.24, O=7,260, EAR=27 per 10,000 person-years), but no overall increase in new malignancies was observed (O/E=1.00) when subsequent cutaneous melanomas were excluded. There were also elevated risks of new malignancies among survivors of ocular melanoma (O/E=1.16, O=436, EAR=24), other ocular cancers (excluding retinoblastoma) (O/E=1.35, O=87, EAR=51), and retinoblastoma (O/E=14.59, O=15, EAR=24). More than 20% of new malignancies after cutaneous melanoma were melanomas. The excess risk of subsequent primary breast and prostate cancers, the next most common subsequent tumors after cutaneous melanoma, may reflect higher socioeconomic status (SES), increased diagnostic surveillance, or shared risk factors, including endogenous hormones or genetic factors such as BRCA2. Also elevated were subsequent non-Hodgkin lymphoma and soft tissue sarcomas, which may reflect underlying immunological deficiencies. The lower risk associated with new tobacco-related cancers (e.g., lung and bronchus, larynx, gum and mouth, esophagus, pancreas, stomach, and cervix) may be due in part to lower smoking rates and other correlates of higher SES among melanoma survivors. The excess risk of cutaneous melanoma subsequent to ocular melanoma may reflect shared risk factors, such as light eye color, exposure to ultraviolet radiation, and susceptibility genes. The very high risk of new malignancies—particularly bone and soft tissue sarcomas—observed in children with retinoblastoma is consistent with the effects of genetic susceptibility combined with radiotherapy. Several subsequent cancer sites, including the salivary gland, lung, and kidney, had elevated risks following non-melanoma eye cancers (excluding retinoblastoma), and excesses of kidney cancer were also seen after cutaneous and ocular melanomas; but the mechanisms for these associations are unclear.

Abbreviations: O=observed number of subsequent (2nd, 3rd, etc.) primary cancers; O/E=ratio of observed to expected cancers; CI=confidence interval; PYR=person-years at risk; EAR=excess absolute risk (excess cancers per 10,000 person-years, calculated as [(O-E)/PYR]×10,000).

Cutaneous Malignant Melanoma

Although cutaneous malignant melanoma is a relatively uncommon tumor, representing 4% of all incident cancers and a little more than 1% of cancer deaths in the U.S. (Jemal et al, 2005), melanoma incidence rates have been increasing over time. Cutaneous melanoma occurs predominantly in the white population; it affects more women than men under age 40 years but more men than women at older ages. Relative survival rates are high, with 5- and 10-year rates of 90.5% and 87.5%, respectively. The primary treatment for melanoma is surgical excision, with only about 2% of patients receiving initial radiotherapy and 3% receiving chemotherapy.

The major environmental risk factor for cutaneous melanoma is ultraviolet radiation from sunlight exposure (Tucker and Goldstein, 2003). Host susceptibility factors include dysplastic nevi, increased numbers of nevi, freckling, a family history of melanoma, fair complexion, light eyes, blond or red hair, and immunosuppression. High socioeconomic status (SES) has also been associated with elevated melanoma rates (Harrison et al, 1998). Studies of melanoma risk in relation to anthropometric and hormonal/reproductive factors have reported inconsistent results.

Results and Discussion

The overall risk of subsequent primary cancers was increased by 24% among the 66,059 men and women who survived 2 months or more following a diagnosis of cutaneous melanoma (O/E=1.24, O=7,260, 95% CI=1.21-1.27, EAR=27 per 10,000 person-years), due primarily to excesses of subsequent primary melanoma (O/E=8.80). In analyses adjusted for the competing risk of death due to other causes, the cumulative incidence of developing a second cancer following cutaneous melanoma was 19.6% at 25 years (95% CI=19.0%-20.3%), which included a 3.7% incidence of second melanomas (Figure 13.1). When subsequent cutaneous melanomas were excluded, no overall increase in risk of new malignancies was observed

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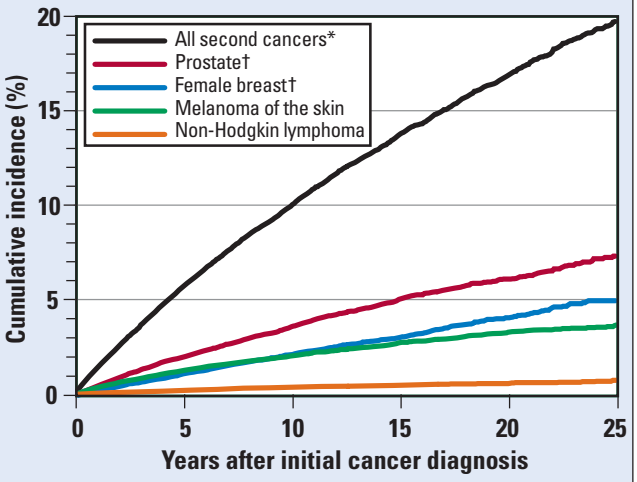
Figure 13.1: Cumulative incidence of developing a second cancer among patients with melanoma of the skin, both sexes, SEER 1973-2000.



* Cumulative incidence for all second cancers at 25 years is 22.2% for males and 16.9% for females.
† Prostate and female breast cancer curves are based on male and female melanoma patients, respectively.

(O/E=1.00). There was, however, a slight excess risk of cancers other than melanoma during the initial 5 years following diagnosis of melanoma. The risk of developing a new malignancy varied by age at diagnosis (Figure 13.2), but there were no substantial differences by gender or histologic type of melanoma. The risks were significantly increased for new malignancies of the salivary gland, small intestine, female breast, prostate, kidney, thyroid, and soft tissue, as well as for non-Hodgkin lymphoma (NHL). Deficits in risk were seen for subsequent cancers of the gum and mouth, esophagus, stomach, pancreas, larynx, lung, and cervix. Several of these findings have been reported in previous surveys of cancer risk following melanoma (Osterlind et al, 1985; Tucker et al, 1985a; Gutman et al, 1991; Swerdlow et al, 1995; Wassberg et al, 1996, 1999; Levi et al, 1997; Schmid-Wendtner et al, 2001; Crocetti and Carli, 2004), including several SEER surveys (Neugut and Santos, 1993; Goggins et al, 2001, 2004; Goggins and Tsao, 2003).

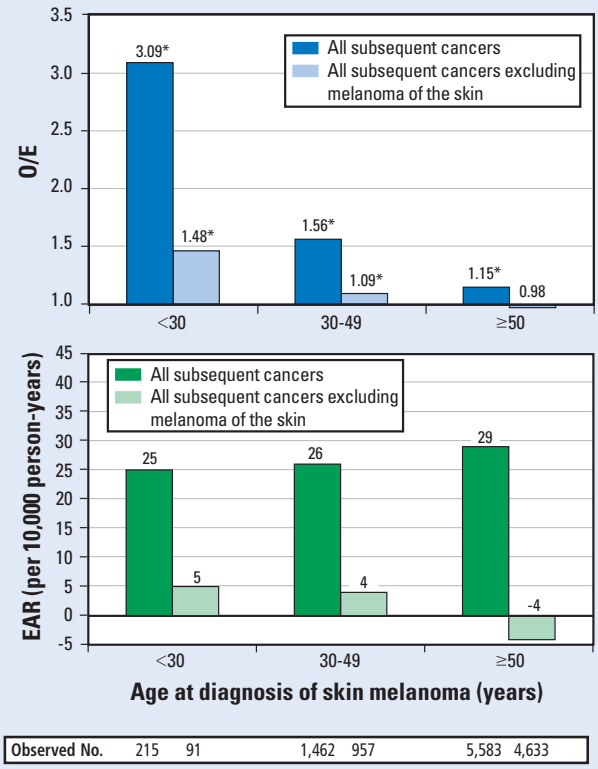
More than 20% of subsequent cancers in the current survey were cutaneous melanomas. The relative risk was similar in men and women (about 9-fold), although excess absolute risks of new melanomas were greater in men. Markedly higher relative risks (15-fold) of developing a subsequent melanoma were seen for those initially diagnosed at ages less than 30 years, while absolute risks were highest in those more than 50 years of age at first diagnosis.

Subsequent breast and prostate cancers were the next most frequent cancers after an initial cutaneous melanoma. Although the risk of these tumors was fairly constant across most latency periods, there was some decline in prostate cancer risk among long-term survivors (≥10 years), suggesting that early medical surveillance may have increased short-term risks by shortening the lead time. The reciprocal increases in cutaneous melanoma risk were seen following primary prostate and breast cancers, suggesting that the tumors may share hormonal or genetic mechanisms such as BRCA2 mutations (Breast Cancer Linkage Consortium, 1999; Goggins et al, 2004). Although epidemiologic evidence of a hormonal role in melanoma is inconsistent (Tucker and Goldstein, 2003), the changing ratio of female to male incidence after menopause has suggested that endogenous estrogens may be involved as a promoting agent. It is also possible the relationships with breast and prostate cancer may partly reflect correlates of higher SES, including increased diagnostic surveillance.

The excess of subsequent NHL was most pronounced in the first year after initial diagnosis but remained nonsignificantly elevated among 20-year survivors. As reciprocal increases in subsequent primary cutaneous melanoma are seen after NHL (Travis et al, 1993; Goggins et al, 2001), there may be shared causal factors, especially immunologic defects, as suggested by the excess risks of both tumors in a variety of immunosuppressed populations (Greene et al, 1981; Curtis et al, 1997).

The risk of soft tissue sarcoma generally was increased over time, with somewhat higher risk among women. Although differentiating melanoma from soft tissue sarcoma may pose diagnostic difficulties, previous reports suggest that the association remains after careful histo-

Figure 13.2: Observed-to-expected ratio (O/E) and excess absolute risk (EAR) of subsequent primary cancers after melanoma of the skin, both sexes, SEER 1973-2000.



Observed No.	215	91	1,462	957	5,583	4,633

*P <0.05.
Note: EAR = Excess number of subsequent cancers per 10,000 person-years.

logic review (Tucker et al, 1985a; Dunbar et al, 1994). Radiation does not appear to explain the increased risk of soft tissue sarcoma, because the excess was not seen among those receiving initial radiotherapy. Immunologic defects, which have been linked to soft tissue sarcoma (Zahm and Fraumeni, 1997), may contribute to the association with melanoma. Also noteworthy was the disproportionately high number of nerve sheath tumors among subsequent soft tissue sarcomas (13%), a finding that has been observed previously (Berking and Brady, 1997) and may reflect common embryological origins from the neural crest (Swerdlow et al, 1995; Wassberg et al, 1996) or genetic susceptibility (Randerson-Moor et al, 2001). The excess risk of small intestine tumors appeared to be partly due to the high percentage of soft tissue sarcomas (27%) in this diagnostic category.

The excess risks of kidney, salivary gland, and thyroid cancers were highest in the early years, at least partly due to increased medical surveillance and early cancer detection. However, the associations may provide clues to unrecognized risk factors, particularly for subsequent primary thyroid cancer, which remained elevated for 20 years.

The lower than expected risks associated with several tobacco-related cancers, such as those of the lung and bronchus, larynx, gum and mouth, esophagus, pancreas, stomach, and cervix, suggest lower smoking rates and other correlates of higher SES among melanoma survivors.

Cancers of the Eye

Cancers of the eye include ocular melanomas (of the uveal tract, iris, ciliary body, and choroid) and other histologic types, particularly conjunctival squamous cell carcinomas and retinoblastomas. Together these eye cancers represent just 0.2% of all incident cancers in the U.S. and 0.04% of all cancer deaths (Jemal et al, 2005). In adults, ocular melanoma is the most common malignancy of the eye, and, after the skin, the eye is the predominant site for melanoma. Among children under age 15 years, most eye tumors are retinoblastomas. The 5-year (and 10-year) relative survival rates for cancers of the eye are about 78.7% (65.3%) for ocular melanoma, 81.4% (73.6%) for other eye cancers excluding retinoblastoma, and 97.3% (95.2%) for retinoblastoma. The most common treatments for cancers of the eye are surgical removal of the eye and irradiation. About one-fourth of SEER patients received initial radiotherapy, with or without surgery.

Both cutaneous and ocular melanomas derive from melanocytes, although risk factors for ocular melanomas are less well characterized (Vajdic et al, 2002; Hurst et al, 2003). Although sunlight appears to be a causal factor for some types of ocular melanoma (Tucker et al, 1985b; Vajdic et al, 2002), the geographic and temporal patterns of incidence differ from those of cutaneous melanomas. Nonetheless, ocular melanomas, like cutaneous melanomas, arise mainly in the white population and share host susceptibility factors, such as light eye and hair color. Occupational exposures to welding, possibly due to artificial ultraviolet radiation, may also be etiologically relevant (Hurst et al, 2003). Genetic factors that increase susceptibility to ocular melanoma are not clearly defined (Vajdic et al, 2003).

The largest group of adult ocular cancers other than melanomas are squamous cell carcinomas of the conjunctiva, which may be due in part to ultraviolet-B (UVB) radiation exposure, as well as to infection by human papillomavirus (HPV) and human immunodeficiency virus (HIV) (Newton, 1996; Sun et al, 1997; Gillison and Shah, 2003). Approximately 30% to 40% of retinoblastomas, which are tumors of the retina occurring mainly in the first years of life, are hereditary and bilateral and involve germline mutations of the tumor suppressor gene RB1 (Friend et al, 1986).

Results and Discussion

Ocular Melanoma

A 16% elevated risk of subsequent primary cancers was observed among 3,217 2-month survivors of ocular melanoma (O/E=1.16, O=436, 95% CI=1.05-1.27, EAR=24). The cumulative incidence of developing a second cancer following ocular melanoma was 19.2% at 25 years (95% CI=17.2%-21.3%). The excess was primarily observed among women (O/E=1.26, O=190 for women versus O/E=1.09, O=246 for men), due partly to excesses in cutaneous melanoma and female genital tumors, especially nonsignificant increases in ovarian cancer. Risk was also higher among patients diagnosed under 50 years of age compared with older patients (O/E=1.72, O=57, EAR=32 versus O/E=1.11, O=379, EAR=21). Overall risk was highest in the first year following diagnosis (O/E=1.29), then declined over time (O/E=1.09 among 10-year survivors). Significantly elevated risks were observed for subsequent primary cancer of the kidney, soft tissue sarcoma, and cutaneous melanoma, as well as subsequent ocular melanoma.

The 4-fold increased risk of cutaneous melanoma following ocular melanoma is consistent with previous studies from Denmark (Swerdlow et al, 1995) and the SEER registries (Shors et al, 2002), and with shared host factors (light skin and eye color), UVB radiation exposure, and possibly susceptibility genes. The heightened risks of kidney cancer and soft tissue sarcoma resemble the patterns of risk following cutaneous melanoma, but the underlying mechanisms are obscure. However, in contrast to the reciprocal excess of cutaneous melanoma after kidney cancer and soft tissue sarcoma, no increase in ocular melanoma was seen after these tumors. Risks of these subsequent primary cancers did not show any particular temporal pattern and were not related to initial radiotherapy.

The excess of ovarian cancer, although nonsignificant, is interesting, because an elevated risk of ocular melanoma has been observed previously among ovarian cancer patients (Travis et al, 1996), suggesting that genetic and/or hormonal factors may be involved. Although the role of hormonal factors in ocular melanoma is limited

Table 13.A: Selected observed (O) subsequent primary cancers and observed-to-expected (O/E) ratios among children with retinoblastoma, by initial radiotherapy (1973-2000).

Subsequent primary cancer	O	O/E	95% Confidence interval
All subsequent cancers	15	14.59*	8.16-24.07
Radiotherapy	12	43.76*	22.59-76.45
No radiotherapy	3	3.98	0.80-11.63
Osteosarcoma	7	297.97*	119.37-613.95
Soft tissue sarcoma	3	40.75*	8.19-119.06
Acute lymphocytic leukemia	3	17.51*	3.52-51.17

Notes: Included in the total are 1 subsequent primary retinoblastoma and 1 pineoblastoma; expected values for osteosarcoma and soft tissue sarcomas were based on the International Classification of Childhood Cancer (ICCC) coding scheme (based on histology rather than site); osteosarcomas include 5 osteosarcomas of the bone, 1 osteosarcoma of the soft tissues, and 1 osteosarcoma of the eye; soft tissue sarcomas include 1 rhabdomyosarcoma, 1 liposarcoma of the soft tissues, and 1 neurofibrosarcoma of the nasal cavity.

*P <0.05.

(Hartge et al, 1989), BRCA2 mutations have been described in family-based studies (Sinilnikova et al, 1999). However, the risk of breast cancer was not elevated in our survey of ocular melanoma.

Non-melanoma Cancers of the Eye (Excluding Retinoblastoma)

The risk of subsequent primary cancers was elevated by 35% among 594 2-month survivors of cancers of the eye other than melanoma and retinoblastoma (O/E=1.35, O=87, 95% CI=1.08-1.66, EAR=51). The cumulative incidence of developing a second cancer following non-melanoma cancers of the eye (excluding retinoblastoma) was 15.6% at 15 years (95% CI=12.2%-19.4%). Subsequent primary cancer risk was highest in the 5 years following initial diagnosis and decreased thereafter almost to population levels. Excess risks were due entirely to new malignancies after squamous cell carcinoma of the eye (O/E=1.47). Significantly elevated risks were observed for new malignancies of the salivary gland, kidney, and lung.

Risks for subsequent lung and kidney cancers were increased primarily in the first 5 years following non-melanoma ocular cancer. There is no evidence that radiation played a role in subsequent salivary gland or kidney cancers, as excess risks were not seen in those receiving initial radiotherapy. In addition, the role of radiotherapy seemed limited in the subsequent lung cancers, because the early excess risk is inconsistent with the longer latency period expected for radiation-induced lung cancer. The increased risk of subsequent kidney cancers may be an incidental finding, because 2 out of 6 of these tumors were diagnosed at autopsy. It is also possible that smoking, which is a causal factor for lung and kidney cancers, and possibly for salivary gland cancer, may have played an etiologic role.

Retinoblastoma

The risk of subsequent primary cancers was increased 15-fold among 582 children who were 2-month survivors of retinoblastoma (O/E=14.59, O=15, 95% CI=8.16-24.07, EAR=24) (Table 13.A). The cumulative incidence of developing a second cancer following retinoblastoma was 5.6% at 25 years (95% CI=2.9%-9.4%). Overall risks were especially high in patients receiving initial radiotherapy (O/E=43.76, O=12), compared with nonirradiated children (O/E=3.98, O=3). In particular, elevated risks were seen for osteosarcomas, soft tissue sarcomas, and acute lymphocytic leukemia (Table 13.A). New malignancies also included a pineoblastoma, which occurred in an irradiated patient. Our findings are generally consistent with other surveys of second cancers following retinoblastoma (Draper et al, 1986; Eng et al, 1993; Moll et al, 1996; Wong et al, 1997; Kleinerman et al, 2005).

Previous studies have documented that hereditary retinoblastoma patients are prone to sarcomas and that high-dose radiotherapy further increases the risk (Tucker et al, 1987; Hawkins et al, 1996; Wong et al, 1997). In our survey, the excesses of soft tissue and bone cancers were limited to irradiated patients, with 9 of the 10 sarcomas occurring in the radiotherapy group. A high incidence of pineoblastoma, often referred to as trilateral retinoblastoma, has previously been reported for hereditary retinoblastoma (Moll et al, 1996; Wong et al, 1997). The excess of acute leukemia, based on 3 cases, has also been noted in other studies, although risk has not been quantified (Moll et al, 1997).

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Table 13.1.1: Characteristics of patients with an initial melanoma of the skin, both sexes, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
Number of patients with 1st primary cancer						
Total	34,949	100.0	31,110	100.0	66,059	100.0
Initial treatment						
Any radiation	948	2.7	452	1.5	1,400	2.1
With surgery	440	1.3	227	0.7	667	1.0
Without surgery	508	1.5	225	0.7	733	1.1
No radiation	34,001	97.3	30,658	98.5	64,659	97.9
With surgery	32,133	91.9	29,124	93.6	61,257	92.7
Without surgery	1,868	5.3	1,534	4.9	3,402	5.1
Race						
White	33,607	96.2	29,709	95.5	63,316	95.8
Black	164	0.5	204	0.7	368	0.6
Other	285	0.8	264	0.8	549	0.8
Unknown	893	2.6	933	3.0	1,826	2.8
Age at 1st primary cancer diagnosis, years						
< 30	2,271	6.5	3,696	11.9	5,967	9.0
30–49	11,233	32.1	12,112	38.9	23,345	35.3
50–69	14,291	40.9	9,555	30.7	23,846	36.1
70–79	5,050	14.4	3,454	11.1	8,504	12.9
≥ 80	2,104	6.0	2,293	7.4	4,397	6.7
Number of patients with one or more primary cancers						
One primary cancer only	31,047	88.8	28,624	92.0	59,671	90.3
1st and 2nd cancers	3,414	9.8	2,218	7.1	5,632	8.5
1st, 2nd, and 3rd cancers	426	1.2	244	0.8	670	1.0
1st, 2nd, 3rd, and additional cancers	62	0.2	24	0.1	86	0.1
Other statistics						
Median age at 1st cancer diagnosis	55.6	—	49.5	—	52.9	—
Median year of 1st cancer diagnosis	1991.0	—	1990.3	—	1990.6	—
Median person-years at risk	5.3	—	6.6	—	5.8	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	96.7	—	97.4	—	97.0
1st, 2nd, and additional cancers	—	96.3	—	97.1	—	96.6
1st cancer only	—	2.7	—	2.2	—	2.5

*Percent histologically confirmed among patients who developed a subsequent primary cancer.

Melanoma of Skin
Both Sexes

Table 13.1.2: Risk of subsequent primary cancers after melanoma of the skin, both sexes, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	66,059		59,553		37,037		21,240		66,059			
Person-years in interval	51,979		188,371		141,971		131,391		513,712			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	800	1.55*	2,571	1.32*	1,933	1.20*	1,956	1.09*	7,260	5,857.52	1.24*	27.30
All excluding same site	558	1.12*	2,001	1.06*	1,554	0.99	1,568	0.90*	5,681	5,678.02	1.00	0.06
Buccal cavity, pharynx	16	1.15	46	0.90	31	0.77	37	0.91	130	145.96	0.89	-0.31
Lip	8	3.61*	11	1.39	4	0.67	4	0.70	27	21.80	1.24	0.10
Tongue	1	0.35	8	0.76	7	0.83	7	0.80	23	30.60	0.75	-0.15
Salivary gland	2	1.57	10	2.11*	4	1.04	8	1.89	24	14.10	1.70*	0.19
Mouth	2	0.56	10	0.76	5	0.48	9	0.86	26	37.62	0.69	-0.23
Nasopharynx	2	4.05	0	0.00	3	2.17	0	0.00	5	5.04	0.99	0.00
Tonsil	0	0.00	4	0.80	4	1.02	6	1.52	14	14.22	0.98	0.00
Oropharynx	0	0.00	2	1.42	1	0.90	1	0.90	4	4.01	1.00	0.00
Hypopharynx	1	0.76	1	0.21	3	0.80	2	0.55	7	13.56	0.52	-0.13
Digestive system	97	0.91	401	1.02	294	0.91	274	0.78*	1,066	1,173.64	0.91*	-2.10
Esophagus	2	0.38	12	0.61	9	0.56	8	0.45*	31	58.44	0.53*	-0.53
Stomach	9	0.88	32	0.86	23	0.79	20	0.66	84	107.01	0.78*	-0.45
Small intestine	1	0.64	15	2.53*	7	1.40	7	1.21	30	18.27	1.64*	0.23
Colon	41	0.85	188	1.05	154	1.05	145	0.89	528	536.67	0.98	-0.17
Rectum, rectosigmoid junction	24	1.25	73	1.03	46	0.81	37	0.62*	180	206.88	0.87	-0.52
Anus, anal canal	1	0.91	9	2.15	4	1.13	4	0.98	18	12.91	1.39	0.10
Liver	3	0.88	12	0.94	6	0.57	5	0.41*	26	38.95	0.67*	-0.25
Gallbladder	2	1.46	4	0.79	3	0.73	4	0.89	13	14.99	0.87	-0.04
Bile ducts, other biliary	4	1.73	11	1.27	7	0.96	9	1.05	31	26.81	1.16	0.08
Pancreas	9	0.72	40	0.86	32	0.84	33	0.77	114	140.00	0.81*	-0.51
Respiratory system	62	0.72*	255	0.79*	205	0.77*	225	0.77*	747	964.43	0.77*	-4.23
Nose, nasal cavity, ear	0	0.00	2	0.70	3	1.30	4	1.62	9	8.41	1.07	0.01
Larynx	5	0.82	12	0.54*	8	0.46*	7	0.41*	32	62.85	0.51*	-0.60
Lung, bronchus	57	0.72*	240	0.81*	193	0.79*	212	0.78*	702	890.68	0.79*	-3.67
Female breast	57	1.04	246	1.14	214	1.10	248	1.06	765	699.65	1.09*	2.50
Female genital system	27	1.10	84	0.88	76	0.94	73	0.78*	260	294.36	0.88*	-1.31
Cervix uteri	2	0.57	8	0.60	3	0.29*	3	0.31*	16	37.02	0.43*	-0.80
Corpus uteri	18	1.52	40	0.87	43	1.09	35	0.74	136	144.49	0.94	-0.32
Ovary	5	0.69	30	1.05	24	0.96	32	1.09	91	89.97	1.01	0.04
Vagina	0	0.00	0	0.00	1	0.95	1	0.82	2	3.83	0.52	-0.07
Vulva	1	0.97	4	1.00	3	0.85	1	0.23	9	12.90	0.70	-0.15
Male genital system	131	1.30*	480	1.27*	370	1.18*	348	1.01	1,329	1,137.17	1.17*	7.62
Prostate	126	1.27*	472	1.27*	363	1.18*	345	1.01	1,306	1,118.90	1.17*	7.43
Testis	4	2.92	5	1.07	4	1.30	1	0.47	14	11.25	1.24	0.11
Urinary system	55	1.31	168	1.07	123	0.96	134	0.95	480	468.43	1.02	0.23
Urinary bladder	30	1.03	107	0.99	82	0.93	85	0.88	304	322.01	0.94	-0.35
Kidney parenchyma	22	2.10*	54	1.36*	37	1.12	41	1.11	154	119.79	1.29*	0.67
Renal pelvis, other urinary	3	1.22	7	0.77	4	0.55	8	1.02	22	26.63	0.83	-0.09
Ureter	0	0.00	0	0.00	1	0.42	2	0.79	3	8.75	0.34	-0.11
Bone, joints	0	0.00	2	0.97	0	0.00	3	1.83	5	5.88	0.85	-0.02
Soft tissue including heart	3	1.34	22	2.65*	10	1.48	19	2.57*	54	24.66	2.19*	0.57
Kaposi sarcoma	2	1.29	9	1.60	6	1.43	1	0.32	18	14.50	1.24	0.07
Melanoma of skin	242	15.41*	570	9.55*	379	7.65*	388	7.12*	1,579	179.50	8.80*	27.24
Eye, orbit	0	0.00	4	1.26	4	1.58	8	2.97*	16	9.25	1.73	0.13
Brain, central nervous system	5	0.81	27	1.18	22	1.19	17	0.88	71	66.90	1.06	0.08
Thyroid	20	4.70*	32	2.00*	21	1.64*	20	1.52	93	46.19	2.01*	0.91
Lymphatic, hematopoietic	65	1.63*	168	1.13	127	1.03	126	0.92	486	448.14	1.08	0.74
Hodgkin lymphoma	4	2.06	6	0.87	2	0.40	5	1.12	17	18.29	0.93	-0.03
Non-Hodgkin lymphoma	39	2.13*	84	1.21	75	1.28*	69	1.03	267	213.13	1.25*	1.05
Myeloma	5	0.84	27	1.21	11	0.59	15	0.72	58	67.74	0.86	-0.19
Leukemia	17	1.25	51	1.02	39	0.96	37	0.83	144	148.98	0.97	-0.10
Acute lymphocytic	1	2.19	1	0.60	5	3.77*	0	0.00	7	4.78	1.46	0.04
Chronic lymphocytic	11	2.07*	24	1.22	17	1.06	15	0.86	67	58.57	1.14	0.16
Acute non-lymphocytic	3	0.66	15	0.89	7	0.51	17	1.10	42	50.69	0.83	-0.17
Chronic myeloid	2	1.07	3	0.43	5	0.89	2	0.33	12	20.52	0.58	-0.17

*$P < 0.05$. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 261,817 PYR and for male cancers on 251,895 PYR.

Table 13.1.3: Risk of subsequent primary cancers after melanoma of the skin, both sexes, long-term follow-up, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
Number starting interval	66,059		21,240		11,047		4,663		66,059			
Person-years in interval	382,322		79,064		37,834		14,493		513,712			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	5,304	1.30*	1,145	1.13*	561	1.03	250	1.07	7,260	5,857.52	1.24*	27.30
All excluding same site	4,113	1.04*	903	0.92*	458	0.87*	207	0.92	5,681	5,678.02	1.00	0.06
Buccal cavity, pharynx	93	0.88	18	0.76	12	0.99	7	1.42	130	145.96	0.89	-0.31
Lip	23	1.43	2	0.59	2	1.20	0	0.00	27	21.80	1.24	0.10
Tongue	16	0.73	4	0.79	1	0.38	2	1.84	23	30.60	0.75	-0.15
Salivary gland	16	1.62	3	1.25	4	3.14	1	1.80	24	14.10	1.70*	0.19
Mouth	17	0.63	3	0.49	3	0.96	3	2.35	26	37.62	0.69	-0.23
Nasopharynx	5	1.37	0	0.00	0	0.00	0	0.00	5	5.04	0.99	0.00
Tonsil	8	0.78	5	2.16	0	0.00	1	2.17	14	14.22	0.98	0.00
Oropharynx	3	1.04	0	0.00	1	3.03	0	0.00	4	4.01	1.00	0.00
Hypopharynx	5	0.50	1	0.46	1	0.94	0	0.00	7	13.56	0.52	-0.13
Digestive system	792	0.96	162	0.81*	76	0.71*	36	0.77	1,066	1,173.64	0.91*	-2.10
Esophagus	23	0.56*	3	0.30*	4	0.75	1	0.43	31	58.44	0.53*	-0.53
Stomach	64	0.84	12	0.69	5	0.55	3	0.78	84	107.01	0.78*	-0.45
Small intestine	23	1.84*	4	1.24	2	1.13	1	1.25	30	18.27	1.64*	0.23
Colon	383	1.02	86	0.94	41	0.84	18	0.83	528	536.67	0.98	-0.17
Rectum, rectosigmoid junction	143	0.97	19	0.55*	11	0.61	7	0.91	180	206.88	0.87	-0.52
Anus, anal canal	14	1.58	2	0.88	1	0.80	1	1.84	18	12.91	1.39	0.10
Liver	21	0.78	3	0.45	1	0.27	1	0.58	26	38.95	0.67*	-0.25
Gallbladder	9	0.86	3	1.19	0	0.00	1	1.68	13	14.99	0.87	-0.04
Bile ducts, other biliary	22	1.21	8	1.70	1	0.38	0	0.00	31	26.81	1.16	0.08
Pancreas	81	0.83	21	0.88	9	0.69	3	0.52	114	140.00	0.81*	-0.51
Respiratory system	522	0.77*	127	0.77*	69	0.78*	29	0.76	747	964.43	0.77*	-4.23
Nose, nasal cavity, ear	5	0.84	2	1.42	1	1.35	1	3.14	9	8.41	1.07	0.01
Larynx	25	0.55*	5	0.49	2	0.40	0	0.00	32	62.85	0.51*	-0.60
Lung, bronchus	490	0.79*	119	0.78*	65	0.79	28	0.78	702	890.68	0.79*	-3.67
Female breast	517	1.11*	129	0.99	88	1.21	31	0.98	765	699.65	1.09*	2.50
Female genital system	187	0.93	40	0.76	21	0.73	12	0.97	260	294.36	0.88*	-1.31
Cervix uteri	13	0.48*	3	0.50	0	0.00	0	0.00	16	37.02	0.43*	-0.80
Corpus uteri	101	1.04	15	0.58*	13	0.89	7	1.10	136	144.49	0.94	-0.32
Ovary	59	0.97	20	1.23	8	0.88	4	1.03	91	89.97	1.01	0.04
Vagina	1	0.38	1	1.48	0	0.00	0	0.00	2	3.83	0.52	-0.07
Vulva	8	0.93	1	0.43	0	0.00	0	0.00	9	12.90	0.70	-0.15
Male genital system	981	1.24*	208	1.06	95	0.91	45	1.05	1,329	1,137.17	1.17*	7.62
Prostate	961	1.23*	206	1.06	94	0.91	45	1.06	1,306	1,118.90	1.17*	7.43
Testis	13	1.42	0	0.00	1	1.87	0	0.00	14	11.25	1.24	0.11
Urinary system	346	1.06	85	1.06	33	0.78	16	0.86	480	468.43	1.02	0.23
Urinary bladder	219	0.97	55	1.01	19	0.66	11	0.86	304	322.01	0.94	-0.35
Kidney parenchyma	113	1.36*	24	1.16	12	1.07	5	1.03	154	119.79	1.29*	0.67
Renal pelvis, other urinary	14	0.74	6	1.35	2	0.85	0	0.00	22	26.63	0.83	-0.09
Ureter	1	0.16*	1	0.69	1	1.32	0	0.00	3	8.75	0.34	-0.11
Bone, joints	2	0.47	2	2.12	0	0.00	1	4.89	5	5.88	0.85	-0.02
Soft tissue including heart	35	2.03*	8	1.92	7	3.13*	4	4.13*	54	24.66	2.19*	0.57
Kaposi sarcoma	17	1.49	0	0.00	1	1.30	0	0.00	18	14.50	1.24	0.07
Melanoma of skin	1,191	9.53*	242	7.83*	103	6.25*	43	6.00*	1,579	179.50	8.80*	27.24
Eye, orbit	8	1.22	5	3.25*	2	2.47	1	2.92	16	9.25	1.73	0.13
Brain, central nervous system	54	1.13	10	0.90	6	1.04	1	0.42	71	66.90	1.06	0.08
Thyroid	73	2.21*	13	1.70	6	1.54	1	0.64	93	46.19	2.01*	0.91
Lymphatic, hematopoietic	360	1.16*	75	0.97	31	0.75	20	1.10	486	448.14	1.08	0.74
Hodgkin lymphoma	12	0.87	4	1.48	1	0.78	0	0.00	17	18.29	0.93	-0.03
Non-Hodgkin lymphoma	198	1.35*	37	0.99	18	0.88	14	1.55	267	213.13	1.25*	1.05
Myeloma	43	0.92	10	0.85	5	0.78	0	0.00	58	67.74	0.86	-0.19
Leukemia	107	1.02	24	0.95	7	0.52	6	1.03	144	148.98	0.97	-0.10
Acute lymphocytic	7	2.02	0	0.00	0	0.00	0	0.00	7	4.78	1.46	0.04
Chronic lymphocytic	52	1.26	10	1.01	2	0.38	3	1.34	67	58.57	1.14	0.16
Acute non-lymphocytic	25	0.71	10	1.16	4	0.86	3	1.44	42	50.69	0.83	-0.17
Chronic myeloid	10	0.69	2	0.58	0	0.00	0	0.00	12	20.52	0.58	-0.17

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 261,817 PYR and for male cancers on 251,895 PYR.

Melanoma of Skin
Females

Table 13.1.4: Risk of subsequent primary cancers after melanoma of the skin, females, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	31,110		28,461		18,659		11,190		31,110			
Person-years in interval	24,678		92,363		73,085		71,692		261,817			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	279	1.56*	933	1.33*	722	1.17*	855	1.14*	2,789	2,246.66	1.24*	20.71
All excluding same site	192	1.11	710	1.05	595	0.99	699	0.96	2,196	2,182.33	1.01	0.52
Buccal cavity, pharynx	2	0.63	14	1.14	8	0.75	12	0.96	36	38.69	0.93	-0.10
Lip	1	4.72	1	1.23	1	1.40	1	1.14	4	2.62	1.53	0.05
Tongue	0	0.00	3	1.09	3	1.24	3	1.05	9	8.74	1.03	0.01
Salivary gland	0	0.00	5	3.31*	0	0.00	2	1.30	7	4.73	1.48	0.09
Mouth	0	0.00	4	0.96	1	0.28	5	1.19	10	13.00	0.77	-0.11
Nasopharynx	1	8.38	0	0.00	1	2.55	0	0.00	2	1.42	1.40	0.02
Tonsil	0	0.00	1	0.91	0	0.00	1	0.95	2	3.39	0.59	-0.05
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.95	0.00	-0.04
Hypopharynx	0	0.00	0	0.00	2	2.86	0	0.00	2	2.51	0.80	-0.02
Digestive system	42	1.16	137	0.98	99	0.82*	124	0.84	402	444.96	0.90*	-1.64
Esophagus	0	0.00	0	0.00*	1	0.31	2	0.49	3	11.98	0.25*	-0.34
Stomach	1	0.37	7	0.70	8	0.95	5	0.51	21	30.98	0.68	-0.38
Small intestine	1	1.85	5	2.35	2	1.04	2	0.79	10	7.13	1.40	0.11
Colon	22	1.21	73	1.04	52	0.86	68	0.92	215	222.41	0.97	-0.28
Rectum, rectosigmoid junction	9	1.50	23	1.00	18	0.91	16	0.69	66	71.95	0.92	-0.23
Rectum	7	1.78	15	0.99	14	1.08	10	0.65	46	47.50	0.97	-0.06
Anus, anal canal	1	1.83	4	1.85	2	1.03	3	1.25	10	7.04	1.42	0.11
Liver	2	2.79	2	0.72	2	0.81	1	0.31	7	9.23	0.76	-0.09
Gallbladder	0	0.00	3	0.98	1	0.39	2	0.68	6	9.43	0.64	-0.13
Bile ducts, other biliary	2	2.53	2	0.66	1	0.37	5	1.40	10	10.13	0.99	-0.01
Pancreas	3	0.65	15	0.84	10	0.64	18	0.92	46	57.80	0.80	-0.45
Respiratory system	21	0.97	79	0.91	79	0.98	94	0.89	273	295.58	0.92	-0.86
Nose, nasal cavity, ear	0	0.00	1	1.09	2	2.49	3	3.14	6	2.91	2.06	0.12
Larynx	0	0.00	2	0.68	3	1.15	2	0.65	7	9.36	0.75	-0.09
Lung, bronchus	21	1.02	76	0.91	73	0.95	88	0.87	258	282.53	0.91	-0.94
Female breast	57	1.04	246	1.14	214	1.10	248	1.06	765	699.65	1.09*	2.50
Female genital system	27	1.10	84	0.88	76	0.94	73	0.78*	260	294.36	0.88*	-1.31
Cervix uteri	2	0.57	8	0.60	3	0.29*	3	0.31*	16	37.02	0.43*	-0.80
Corpus uteri	18	1.52	40	0.87	43	1.09	35	0.74	136	144.49	0.94	-0.32
Ovary	5	0.69	30	1.05	24	0.96	32	1.09	91	89.97	1.01	0.04
Vagina	0	0.00	0	0.00	1	0.95	1	0.82	2	3.83	0.52	-0.07
Vulva	1	0.97	4	1.00	3	0.85	1	0.23	9	12.90	0.70	-0.15
Urinary system	9	1.13	38	1.22	30	1.08	32	0.91	109	102.17	1.07	0.26
Urinary bladder	4	0.86	17	0.94	17	1.06	16	0.79	54	59.03	0.91	-0.19
Kidney parenchyma	4	1.50	20	1.88*	12	1.24	15	1.20	51	35.48	1.44*	0.59
Renal pelvis, other urinary	1	1.62	1	0.42	1	0.48	1	0.39	4	7.66	0.52	-0.14
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	2.31	0.00	-0.09
Bone, joints	0	0.00	1	1.24	0	0.00	0	0.00	1	2.43	0.41	-0.05
Soft tissue including heart	1	1.29	11	3.67*	6	2.32	9	2.92*	27	9.44	2.86*	0.67
Kaposi sarcoma	0	0.00	1	4.38	0	0.00	0	0.00	1	0.70	1.42	0.01
Melanoma of skin	87	16.55*	223	10.81*	127	7.09*	156	7.60*	593	64.33	9.22*	20.19
Eye, orbit	0	0.00	2	1.78	3	3.14	6	5.39*	11	3.48	3.16*	0.29
Brain, central nervous system	2	0.96	9	1.10	5	0.71	7	0.86	23	25.44	0.90	-0.09
Thyroid	10	3.66*	16	1.53	13	1.51	15	1.66	54	30.87	1.75*	0.88
Lymphatic, hematopoietic	18	1.36	57	1.10	47	1.03	64	1.14	186	166.66	1.12	0.74
Hodgkin lymphoma	2	2.70	3	1.11	1	0.49	3	1.56	9	7.39	1.22	0.06
Non-Hodgkin lymphoma	6	0.94	30	1.19	30	1.32	39	1.34	105	83.56	1.26*	0.82
Myeloma	2	1.02	6	0.78	3	0.44	6	0.70	17	25.02	0.68	-0.31
Leukemia	8	1.93	18	1.13	13	0.94	16	0.96	55	50.68	1.09	0.16
Acute lymphocytic	1	6.33	1	1.66	3	5.90*	0	0.00	5	1.84	2.72	0.12
Chronic lymphocytic	4	2.63	8	1.36	5	0.97	4	0.64	21	18.82	1.12	0.08
Acute non-lymphocytic	2	1.34	4	0.69	2	0.40	10	1.63	18	18.43	0.98	-0.02
Chronic myeloid	1	1.68	1	0.44	1	0.51	1	0.43	4	7.17	0.56	-0.12

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.

Table 13.1.5: Risk of subsequent primary cancers after melanoma of the skin, males, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	34,949		31,092		18,378		10,050		34,949			
Person-years in interval	27,302		96,008		68,887		59,699		251,895			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	521	1.54*	1,638	1.32*	1,211	1.22*	1,101	1.06	4,471	3,610.86	1.24*	34.15
All excluding same site	366	1.12*	1,291	1.07*	959	1.00	869	0.87*	3,485	3,495.69	1.00	-0.42
Buccal cavity, pharynx	14	1.30	32	0.83	23	0.78	25	0.89	94	107.28	0.88	-0.53
Lip	7	3.49*	10	1.41	3	0.57	3	0.62	23	19.18	1.20	0.15
Tongue	1	0.47	5	0.64	4	0.66	4	0.67	14	21.86	0.64	-0.31
Salivary gland	2	2.27	5	1.55	4	1.56	6	2.22	17	9.37	1.81*	0.30
Mouth	2	0.80	6	0.67	4	0.59	4	0.63	16	24.62	0.65	-0.34
Nasopharynx	1	2.67	0	0.00	2	2.03	0	0.00	3	3.61	0.83	-0.02
Tonsil	0	0.00	3	0.77	4	1.34	5	1.73	12	10.84	1.11	0.05
Oropharynx	0	0.00	2	1.82	1	1.18	1	1.23	4	3.07	1.30	0.04
Hypopharynx	1	0.90	1	0.25	1	0.33	2	0.70	5	11.05	0.45	-0.24
Digestive system	55	0.79	264	1.04	195	0.98	150	0.73*	664	728.68	0.91*	-2.57
Esophagus	2	0.46	12	0.76	8	0.63	6	0.44*	28	46.46	0.60*	-0.73
Stomach	8	1.06	25	0.92	15	0.72	15	0.73	63	76.03	0.83	-0.52
Small intestine	0	0.00	10	2.63*	5	1.64	5	1.54	20	11.13	1.80*	0.35
Colon	19	0.63*	115	1.05	102	1.18	77	0.87	313	314.27	1.00	-0.05
Rectum, rectosigmoid junction	15	1.14	50	1.05	28	0.75	21	0.57*	114	134.93	0.84	-0.83
Anus, anal canal	0	0.00	5	2.45	2	1.24	1	0.60	8	5.86	1.36	0.08
Liver	1	0.37	10	1.00	4	0.49	4	0.45	19	29.72	0.64*	-0.43
Gallbladder	2	3.63	1	0.51	2	1.32	2	1.30	7	5.56	1.26	0.06
Bile ducts, other biliary	2	1.31	9	1.61	6	1.32	4	0.80	21	16.68	1.26	0.17
Pancreas	6	0.76	25	0.87	22	0.98	15	0.65	68	82.20	0.83	-0.56
Respiratory system	41	0.64*	176	0.75*	126	0.68*	131	0.71*	474	668.85	0.71*	-7.74
Nose, nasal cavity, ear	0	0.00	1	0.51	1	0.66	1	0.66	3	5.49	0.55	-0.10
Larynx	5	0.94	10	0.52*	5	0.34*	5	0.36*	25	53.49	0.47*	-1.13
Lung, bronchus	36	0.62*	164	0.77*	120	0.72*	124	0.73*	444	608.16	0.73*	-6.52
Male breast	2	3.08	3	1.26	3	1.58	1	0.50	9	6.94	1.30	0.08
Male genital system	131	1.30*	480	1.27*	370	1.18*	348	1.01	1,329	1,137.17	1.17*	7.62
Prostate	126	1.27*	472	1.27*	363	1.18*	345	1.01	1,306	1,118.90	1.17*	7.43
Testis	4	2.92	5	1.07	4	1.30	1	0.47	14	11.25	1.24	0.11
Urinary system	46	1.35	130	1.03	93	0.92	102	0.96	371	366.26	1.01	0.19
Urinary bladder	26	1.06	90	1.00	65	0.90	69	0.90	250	262.98	0.95	-0.52
Kidney parenchyma	18	2.30*	34	1.17	25	1.08	26	1.07	103	84.31	1.22	0.74
Renal pelvis, other urinary	2	1.08	6	0.90	3	0.58	7	1.33	18	18.97	0.95	-0.04
Ureter	0	0.00	0	0.00	1	0.56	2	1.12	3	6.44	0.47	-0.14
Bone, joints	0	0.00	1	0.79	0	0.00	3	3.37	4	3.44	1.16	0.02
Soft tissue including heart	2	1.37	11	2.07*	4	0.96	10	2.33*	27	15.21	1.77*	0.47
Kaposi sarcoma	2	1.34	8	1.48	6	1.50	1	0.35	17	13.79	1.23	0.13
Melanoma of skin	155	14.84*	347	8.88*	252	7.96*	232	6.82*	986	115.17	8.56*	34.57
Eye, orbit	0	0.00	2	0.98	1	0.63	2	1.26	5	5.77	0.87	-0.03
Brain, central nervous system	3	0.74	18	1.22	17	1.49	10	0.90	48	41.45	1.16	0.26
Thyroid	10	6.57*	16	2.90*	8	1.90	5	1.23	39	15.33	2.54*	0.94
Lymphatic, hematopoietic	47	1.77*	111	1.14	80	1.03	62	0.77*	300	281.49	1.07	0.73
Hodgkin lymphoma	2	1.66	3	0.72	1	0.34	2	0.78	8	10.90	0.73	-0.12
Non-Hodgkin lymphoma	33	2.77*	54	1.22	45	1.26	30	0.80	162	129.57	1.25*	1.29
Myeloma	3	0.75	21	1.44	8	0.68	9	0.73	41	42.72	0.96	-0.07
Leukemia	9	0.96	33	0.96	26	0.96	21	0.76	89	98.30	0.91	-0.37
Acute lymphocytic	0	0.00	0	0.00	2	2.44	0	0.00	2	2.95	0.68	-0.04
Chronic lymphocytic	7	1.84	16	1.16	12	1.10	11	0.99	46	39.75	1.16	0.25
Acute non-lymphocytic	1	0.33	11	0.99	5	0.57	7	0.76	24	32.26	0.74	-0.33
Chronic myeloid	1	0.78	2	0.43	4	1.10	1	0.26	8	13.35	0.60	-0.21

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.

Melanoma of Skin
Both Sexes, <30 Years of Age

Table 13.1.6: Risk of subsequent primary cancers after melanoma of the skin, both sexes, <30 years of age, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	5,967		5,542		3,927		2,678		5,967			
Person-years in interval	4,767		18,664		16,254		19,065		58,749			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	20	8.46*	54	4.59*	41	2.63*	100	2.50*	215	69.66	3.09*	24.74
All excluding same site	4	1.98	17	1.70	14	1.04	56	1.55*	91	61.63	1.48*	5.00
Buccal cavity, pharynx	1	24.12	0	0.00	1	3.72	4	4.41*	6	1.42	4.23*	0.78
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.16	0.00	-0.03
Tongue	0	0.00	0	0.00	1	15.39	2	8.33	3	0.36	8.43*	0.45
Salivary gland	1	67.13	0	0.00	0	0.00	0	0.00	1	0.29	3.39	0.12
Mouth	0	0.00	0	0.00	0	0.00	0	0.00	0	0.27	0.00	-0.05
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.02
Tonsil	0	0.00	0	0.00	0	0.00	2	14.64*	2	0.16	12.45*	0.31
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	0.00
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.04	0.00	-0.01
Digestive system	0	0.00	1	1.90	2	2.27	7	1.90	10	5.19	1.93	0.82
Esophagus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.03
Stomach	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-0.08
Small intestine	0	0.00	0	0.00	2	58.59*	2	16.59*	4	0.18	22.22*	0.65
Colon	0	0.00	0	0.00	0	0.00	2	1.48	2	1.96	1.02	0.01
Rectum, rectosigmoid junction	0	0.00	0	0.00	0	0.00	1	1.24	1	1.10	0.91	-0.02
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.21	0.00	-0.04
Liver	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.04
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.04	0.00	-0.01
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.12	0.00	-0.02
Pancreas	0	0.00	1	27.97	0	0.00	2	5.45	3	0.48	6.29*	0.43
Respiratory system	0	0.00	1	4.86	0	0.00	2	0.81	3	3.13	0.96	-0.02
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.02
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.05
Lung, bronchus	0	0.00	1	7.11	0	0.00	2	0.93	3	2.65	1.13	0.06
Female breast	0	0.00	1	0.70	3	0.95	15	1.23	19	16.98	1.12	0.55
Female genital system	1	3.09	5	2.96	2	0.90	8	1.64	16	9.12	1.75*	1.86
Cervix uteri	0	0.00	2	2.09	0	0.00	1	0.60	3	3.95	0.76	-0.26
Corpus uteri	0	0.00	0	0.00	1	3.44	2	1.46	3	1.82	1.65	0.32
Ovary	0	0.00	3	6.01*	1	1.56	4	2.55	8	2.81	2.84*	1.40
Vagina	0	0.00	0	0.00	0	0.00	1	24.93	1	0.07	13.95	0.25
Vulva	1	150.16*	0	0.00	0	0.00	0	0.00	1	0.28	3.61	0.20
Male genital system	1	4.91	1	1.14	2	2.42	2	1.22	6	3.54	1.69	1.13
Prostate	0	0.00	0	0.00	0	0.00	2	2.44	2	0.83	2.41	0.54
Testis	1	4.95	1	1.15	2	2.46	0	0.00	4	2.68	1.49	0.61
Urinary system	0	0.00	0	0.00	1	2.54	4	2.49	5	2.29	2.19	0.46
Urinary bladder	0	0.00	0	0.00	1	4.92	3	3.82	4	1.15	3.48	0.49
Kidney parenchyma	0	0.00	0	0.00	0	0.00	1	1.29	1	1.07	0.94	-0.01
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.07	0.00	-0.01
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.01	0.00	0.00
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.39	0.00	-0.07
Soft tissue including heart	0	0.00	1	4.57	0	0.00	0	0.00	1	0.84	1.19	0.03
Kaposi sarcoma	0	0.00	2	4.10	2	2.64	0	0.00	4	2.26	1.77	0.30
Melanoma of skin	16	45.99*	37	21.42*	27	12.70*	44	11.48*	124	8.03	15.44*	19.74
Eye, orbit	0	0.00	1	25.62	0	0.00	1	11.21	2	0.18	11.12*	0.31
Brain, central nervous system	0	0.00	0	0.00	0	0.00	0	0.00	0	2.20	0.00	-0.37
Thyroid	1	3.57	2	1.57	0	0.00	4	2.00	7	4.90	1.43	0.36
Lymphatic, hematopoietic	0	0.00	2	0.99	1	0.49	9	2.45*	12	8.21	1.46	0.64
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	1	1.61	1	2.50	0.40	-0.25
Non-Hodgkin lymphoma	0	0.00	1	1.54	0	0.00	4	2.01	5	3.64	1.37	0.23
Myeloma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.26	0.00	-0.04
Leukemia	0	0.00	1	2.36	1	2.28	4	4.69*	6	1.82	3.30*	0.71
Acute lymphocytic	0	0.00	0	0.00	1	12.41	0	0.00	1	0.31	3.26	0.12
Chronic lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-0.03
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	3	8.59*	3	0.80	3.73	0.37
Chronic myeloid	0	0.00	1	11.39	0	0.00	1	5.72	2	0.38	5.21	0.28

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 36,967 PYR and for male cancers on 21,783 PYR.

Table 13.1.7: Risk of subsequent primary cancers after melanoma of the skin, both sexes, 30-49 years of age, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	23,345		21,503		14,469		8,777		23,345			
Person-years in interval	18,595		70,899		57,024		57,398		203,916			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	120	3.01*	383	2.01*	349	1.53*	610	1.28*	1,462	934.36	1.56*	25.88
All excluding same site	55	1.52*	215	1.22*	232	1.08	455	1.00	957	881.81	1.09*	3.69
Buccal cavity, pharynx	4	3.33	4	0.67	3	0.41	10	0.76	21	27.80	0.76	-0.33
Lip	2	13.22*	0	0.00	0	0.00	0	0.00	2	2.84	0.70	-0.04
Tongue	0	0.00	1	0.71	1	0.57	2	0.63	4	6.61	0.60	-0.13
Salivary gland	0	0.00	2	2.98	0	0.00	1	0.85	3	2.69	1.12	0.02
Mouth	0	0.00	1	0.70	0	0.00	4	1.19	5	6.92	0.72	-0.09
Nasopharynx	2	29.87*	0	0.00	1	2.93	0	0.00	3	1.25	2.41	0.09
Tonsil	0	0.00	0	0.00	1	0.96	2	1.17	3	3.74	0.80	-0.04
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.73	0.00	-0.04
Hypopharynx	0	0.00	0	0.00	0	0.00	1	0.84	1	2.22	0.45	-0.06
Digestive system	5	1.15	26	1.14	31	1.01	65	0.88	127	132.08	0.96	-0.25
Esophagus	0	0.00	4	3.53	1	0.59	4	0.90	9	7.47	1.20	0.08
Stomach	1	2.22	3	1.35	0	0.00	5	0.84	9	11.45	0.79	-0.12
Small intestine	0	0.00	0	0.00	0	0.00	2	1.26	2	3.13	0.64	-0.06
Colon	3	1.81	8	0.92	13	1.09	31	1.02	55	52.50	1.05	0.12
Rectum, rectosigmoid junction	1	1.09	4	0.82	8	1.20	8	0.53	21	27.45	0.76	-0.32
Anus, anal canal	0	0.00	0	0.00	1	1.31	2	1.46	3	2.92	1.03	0.00
Liver	0	0.00	1	1.04	1	0.80	1	0.34	3	5.38	0.56	-0.12
Gallbladder	0	0.00	0	0.00	1	3.09	0	0.00	1	1.42	0.71	-0.02
Bile ducts, other biliary	0	0.00	2	4.29	0	0.00	3	1.87	5	2.78	1.80	0.11
Pancreas	0	0.00	2	0.79	6	1.69	8	0.90	16	15.46	1.03	0.03
Respiratory system	1	0.28	18	0.90	31	1.06	61	0.82	111	127.46	0.87	-0.81
Nose, nasal cavity, ear	0	0.00	1	2.88	0	0.00	0	0.00	1	1.50	0.67	-0.02
Larynx	0	0.00	2	1.04	1	0.38	3	0.54	6	10.45	0.57	-0.22
Lung, bronchus	1	0.32	15	0.86	29	1.11	58	0.85	103	115.04	0.90	-0.59
Female breast	9	0.86	54	1.08	60	1.05	103	1.12	226	209.78	1.08	1.47
Female genital system	3	0.70	22	1.11	22	1.02	29	0.81	76	81.33	0.93	-0.48
Cervix uteri	1	0.70	4	0.72	2	0.44	0	0.00*	7	16.06	0.44*	-0.82
Corpus uteri	1	0.79	5	0.73	10	1.12	16	0.88	32	35.12	0.91	-0.28
Ovary	1	0.75	12	1.93	8	1.16	13	1.17	34	25.52	1.33	0.77
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.74	0.00	-0.07
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	2.45	0.00	-0.22
Male genital system	3	1.83	12	1.28	26	1.56*	83	1.16	124	99.39	1.25*	2.62
Prostate	0	0.00	8	1.26	24	1.63*	82	1.17	114	92.09	1.24*	2.33
Testis	3	3.56	3	1.06	2	1.16	1	1.00	9	6.39	1.41	0.28
Urinary system	6	2.98*	22	2.13*	9	0.66	23	0.72	60	58.20	1.03	0.09
Urinary bladder	3	2.83	11	1.98	5	0.66	8	0.41*	27	33.52	0.81	-0.32
Kidney parenchyma	3	3.44	10	2.27*	4	0.71	15	1.32	32	22.25	1.44	0.48
Renal pelvis, other urinary	0	0.00	1	2.51	0	0.00	0	0.00	1	2.43	0.41	-0.07
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.66	0.00	-0.03
Bone, joints	0	0.00	1	2.09	0	0.00	1	1.74	2	1.60	1.25	0.02
Soft tissue including heart	1	2.85	6	4.04*	2	1.38	9	4.15*	18	5.46	3.30*	0.62
Kaposi sarcoma	2	2.01	6	1.69	4	1.66	1	0.76	13	8.27	1.57	0.23
Melanoma of skin	65	18.39*	168	11.25*	117	8.16*	155	7.85*	505	52.55	9.61*	22.19
Eye, orbit	0	0.00	0	0.00	0	0.00	1	1.17	1	1.93	0.52	-0.05
Brain, central nervous system	1	1.01	7	1.64	5	1.17	5	0.78	18	15.93	1.13	0.10
Thyroid	10	6.27*	12	1.89	8	1.46	13	2.11*	43	19.59	2.19*	1.15
Lymphatic, hematopoietic	9	2.36*	24	1.41	25	1.36	44	1.30	102	73.12	1.39*	1.42
Hodgkin lymphoma	4	6.76*	2	0.94	0	0.00	3	1.85	9	5.95	1.51	0.15
Non-Hodgkin lymphoma	4	1.97	17	1.85*	18	1.80*	22	1.23	61	39.15	1.56*	1.07
Myeloma	1	4.12	3	2.24	1	0.53	6	1.30	11	8.06	1.36	0.14
Leukemia	0	0.00	2	0.46	6	1.22	13	1.34	21	19.96	1.05	0.05
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	1.22	0.00	-0.06
Chronic lymphocytic	0	0.00	1	0.94	3	1.92	7	1.86	11	6.59	1.67	0.22
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	5	1.53	5	6.96	0.72	-0.10
Chronic myeloid	0	0.00	0	0.00	1	1.20	0	0.00	1	3.23	0.31	-0.11

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 110,042 PYR and for male cancers on 93,874 PYR.

Melanoma of Skin
Both Sexes, ≥50 Years of Age

Table 13.1.8: Risk of subsequent primary cancers after melanoma of the skin, both sexes, ≥50 years of age, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	36,747		32,508		18,641		9,785		36,747			
Person-years in interval	28,617		98,808		68,694		54,928		251,047			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	660	1.39*	2,134	1.23*	1,543	1.13*	1,246	0.98	5,583	4,853.49	1.15*	29.06
All excluding same site	499	1.08	1,769	1.04	1,308	0.98	1,057	0.85*	4,633	4,734.58	0.98	-4.05
Buccal cavity, pharynx	11	0.87	42	0.94	27	0.83	23	0.86	103	116.74	0.88	-0.55
Lip	6	2.91*	11	1.53	4	0.77	4	0.92	25	18.79	1.33	0.25
Tongue	1	0.39	7	0.77	5	0.75	3	0.56	16	23.63	0.68	-0.30
Salivary gland	1	0.91	8	2.00	4	1.29	7	2.40	20	11.12	1.80*	0.35
Mouth	2	0.61	9	0.77	5	0.59	5	0.72	21	30.43	0.69	-0.38
Nasopharynx	0	0.00	0	0.00	2	1.97	0	0.00	2	3.70	0.54	-0.07
Tonsil	0	0.00	4	0.96	3	1.04	2	0.95	9	10.32	0.87	-0.05
Oropharynx	0	0.00	2	1.58	1	1.08	1	1.39	4	3.26	1.23	0.03
Hypopharynx	1	0.80	1	0.23	3	0.94	1	0.41	6	11.31	0.53	-0.21
Digestive system	92	0.90	374	1.01	261	0.90	202	0.74*	929	1,036.36	0.90*	-4.28
Esophagus	2	0.40	8	0.43*	8	0.56	4	0.31*	22	50.79	0.43*	-1.15
Stomach	8	0.82	29	0.83	23	0.87	15	0.62	75	95.08	0.79*	-0.80
Small intestine	1	0.70	15	2.85*	5	1.20	3	0.74	24	14.95	1.60*	0.36
Colon	38	0.82	180	1.06	141	1.04	112	0.86	471	482.22	0.98	-0.45
Rectum, rectosigmoid junction	23	1.26	69	1.05	38	0.76	28	0.63*	158	178.33	0.89	-0.81
Anus, anal canal	1	1.04	9	2.55*	3	1.09	2	0.79	15	9.78	1.53	0.21
Liver	3	0.93	11	0.93	5	0.54	4	0.44	23	33.31	0.69	-0.41
Gallbladder	2	1.50	4	0.83	2	0.53	4	1.11	12	13.52	0.89	-0.06
Bile ducts, other biliary	4	1.80	9	1.10	7	1.06	6	0.87	26	23.91	1.09	0.08
Pancreas	9	0.74	37	0.84	26	0.75	23	0.69	95	124.06	0.77*	-1.16
Respiratory system	61	0.74*	236	0.78*	174	0.74*	162	0.76*	633	833.84	0.76*	-8.00
Nose, nasal cavity, ear	0	0.00	1	0.40	3	1.59	4	2.33	8	6.80	1.18	0.05
Larynx	5	0.87	10	0.49*	7	0.48*	4	0.35*	26	52.13	0.50*	-1.04
Lung, bronchus	56	0.74*	224	0.80*	164	0.75*	152	0.76*	596	772.99	0.77*	-7.05
Female breast	48	1.09	191	1.16	151	1.13	130	1.00	520	472.89	1.10*	4.10
Female genital system	23	1.15	57	0.78	52	0.91	36	0.68*	168	203.91	0.82*	-3.13
Cervix uteri	1	0.52	2	0.30	1	0.21	2	0.54	6	17.00	0.35*	-0.96
Corpus uteri	17	1.61	35	0.90	32	1.05	17	0.62*	101	107.56	0.94	-0.57
Ovary	4	0.68	15	0.69	15	0.86	15	0.91	49	61.63	0.80	-1.10
Vagina	0	0.00	0	0.00	1	1.18	0	0.00	1	3.02	0.33	-0.18
Vulva	0	0.00	4	1.18	3	1.06	1	0.33	8	10.17	0.79	-0.19
Male genital system	127	1.28*	467	1.27*	342	1.15*	263	0.97	1,199	1,034.24	1.16*	12.09
Prostate	126	1.28*	464	1.27*	339	1.15*	261	0.97	1,190	1,025.98	1.16*	12.04
Testis	0	0.00	1	1.00	0	0.00	0	0.00	1	2.18	0.46	-0.09
Urinary system	49	1.22	146	1.00	113	0.99	107	1.00	415	407.94	1.02	0.28
Urinary bladder	27	0.96	96	0.94	76	0.94	74	0.97	273	287.35	0.95	-0.57
Kidney parenchyma	19	1.98*	44	1.25	33	1.22	25	1.01	121	96.47	1.25*	0.98
Renal pelvis, other urinary	3	1.26	6	0.69	4	0.59	8	1.26	21	24.13	0.87	-0.12
Ureter	0	0.00	0	0.00	1	0.44	2	0.95	3	8.07	0.37	-0.20
Bone, joints	0	0.00	1	0.68	0	0.00	2	2.14	3	3.88	0.77	-0.04
Soft tissue including heart	2	1.09	15	2.27*	8	1.58	10	2.06	35	18.36	1.91*	0.66
Kaposi sarcoma	0	0.00	1	0.63	0	0.00	0	0.00	1	3.96	0.25	-0.12
Melanoma of skin	161	13.62*	365	8.48*	235	7.10*	189	6.11*	950	118.91	7.99*	33.10
Eye, orbit	0	0.00	3	1.13	4	2.01	6	3.42*	13	7.14	1.82	0.23
Brain, central nervous system	4	0.80	20	1.10	17	1.25	12	1.00	53	48.76	1.09	0.17
Thyroid	9	3.78*	18	2.15*	13	2.17*	3	0.60	43	21.70	1.98*	0.85
Lymphatic, hematopoietic	56	1.58*	142	1.09	101	0.99	73	0.74*	372	366.80	1.01	0.21
Hodgkin lymphoma	0	0.00	4	1.05	2	0.74	1	0.45	7	9.85	0.71	-0.11
Non-Hodgkin lymphoma	35	2.16*	66	1.11	57	1.20	43	0.92	201	170.34	1.18*	1.22
Myeloma	4	0.70	24	1.14	10	0.60	9	0.56	47	59.41	0.79	-0.49
Leukemia	17	1.36	48	1.06	32	0.90	20	0.59*	117	127.21	0.92	-0.41
Acute lymphocytic	1	2.94	1	0.83	4	4.37*	0	0.00	6	3.26	1.84	0.11
Chronic lymphocytic	11	2.14*	23	1.23	14	0.96	8	0.59	56	51.81	1.08	0.17
Acute non-lymphocytic	3	0.73	15	0.99	7	0.59	9	0.77	34	42.93	0.79	-0.36
Chronic myeloid	2	1.20	2	0.33	4	0.85	1	0.22	9	16.91	0.53	-0.32

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 114,809 PYR and for male cancers on 136,238 PYR.

Table 13.2.1: Characteristics of patients with an initial ocular melanoma, both sexes, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
Number of patients with 1st primary cancer						
Total	1,671	100.0	1,546	100.0	3,217	100.0
Initial treatment						
Any radiation	432	25.9	368	23.8	800	24.9
With surgery	98	5.9	87	5.6	185	5.8
Without surgery	334	20.0	281	18.2	615	19.1
No radiation	1,239	74.1	1,178	76.2	2,417	75.1
With surgery	1,087	65.1	1,037	67.1	2,124	66.0
Without surgery	152	9.1	141	9.1	293	9.1
Race						
White	1,622	97.1	1,513	97.9	3,135	97.5
Black	17	1.0	8	0.5	25	0.8
Other	14	0.8	8	0.5	22	0.7
Unknown	18	1.1	17	1.1	35	1.1
Age at 1st primary cancer diagnosis, years						
< 30	62	3.7	64	4.1	126	3.9
30–49	359	21.5	275	17.8	634	19.7
50–69	821	49.1	702	45.4	1,523	47.3
70–79	327	19.6	323	20.9	650	20.2
≥ 80	102	6.1	182	11.8	284	8.8
Number of patients with one or more primary cancers						
One primary cancer only	1,450	86.8	1,369	88.6	2,819	87.6
1st and 2nd cancers	197	11.8	164	10.6	361	11.2
1st, 2nd, and 3rd cancers	23	1.4	13	0.8	36	1.1
1st, 2nd, 3rd, and additional cancers	1	0.1	0	0.0	1	0.0
Other statistics						
Median age at 1st cancer diagnosis	60.1	—	64.3	—	62.1	—
Median year of 1st cancer diagnosis	1987.4	—	1987.4	—	1987.4	—
Median person-years at risk	5.5	—	5.7	—	5.6	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	81.0	—	79.1	—	80.2
1st, 2nd, and additional cancers	—	80.1	—	79.1	—	79.6
1st cancer only	—	0.5	—	7.3	—	3.5

*Percent histologically confirmed among patients who developed a subsequent primary cancer.

Ocular Melanoma
Both Sexes

Table 13.2.2: Risk of subsequent primary cancers after ocular melanoma, both sexes, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	3,217		3,018		1,780		993		3,217			
Person-years in interval	2,602		9,352		6,664		6,569		25,186			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	43	1.29	149	1.20*	114	1.15	130	1.09	436	375.67	1.16*	23.96
All excluding same site	43	1.30	147	1.19*	113	1.14	128	1.08	431	375.18	1.15*	22.16
Buccal cavity, pharynx	0	0.00	3	0.90	2	0.80	2	0.76	7	9.40	0.75	-0.95
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	1.51	0.00	-0.60
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	1.89	0.00	-0.75
Salivary gland	0	0.00	2	7.03	0	0.00	1	3.59	3	0.87	3.46	0.85
Mouth	0	0.00	0	0.00	1	1.49	1	1.43	2	2.51	0.80	-0.20
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.30	0.00	-0.12
Tonsil	0	0.00	1	3.24	0	0.00	0	0.00	1	0.85	1.18	0.06
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.10
Hypopharynx	0	0.00	0	0.00	1	4.17	0	0.00	1	0.89	1.13	0.04
Digestive system	7	0.95	29	1.06	22	1.00	17	0.66	75	82.43	0.91	-2.95
Esophagus	1	3.02	3	2.44	1	1.01	0	0.00	5	3.75	1.33	0.50
Stomach	0	0.00	0	0.00	2	0.99	0	0.00	2	7.61	0.26*	-2.23
Small intestine	0	0.00	1	2.72	1	3.34	1	2.64	3	1.15	2.62	0.74
Colon	5	1.48	14	1.10	10	0.97	12	0.98	41	38.70	1.06	0.91
Rectum, rectosigmoid junction	0	0.00	4	0.81	3	0.78	1	0.24	8	14.30	0.56	-2.50
Anus, anal canal	0	0.00	0	0.00	1	4.72	1	4.02	2	0.80	2.50	0.48
Liver	0	0.00	1	1.29	2	3.16	1	1.24	4	2.42	1.65	0.63
Gallbladder	0	0.00	1	2.47	0	0.00	0	0.00	1	1.18	0.85	-0.07
Bile ducts, other biliary	1	6.61	0	0.00	0	0.00	0	0.00	1	1.82	0.55	-0.32
Pancreas	0	0.00	5	1.52	2	0.77	1	0.32	8	9.89	0.81	-0.75
Respiratory system	6	1.06	16	0.76	18	1.07	21	1.08	61	62.89	0.97	-0.75
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.54	0.00	-0.22
Larynx	1	2.55	1	0.70	0	0.00	0	0.00	2	4.01	0.50	-0.80
Lung, bronchus	5	0.96	15	0.77	18	1.16	21	1.16	59	58.18	1.01	0.33
Female breast	4	1.03	8	0.55	7	0.62	17	1.31	36	42.59	0.85	-5.39
Female genital system	3	1.61	6	0.89	8	1.63	12	2.29*	29	18.78	1.54*	8.35
Cervix uteri	2	9.74*	0	0.00	1	2.07	0	0.00	3	1.84	1.63	0.95
Corpus uteri	0	0.00	2	0.57	5	1.98	6	2.27	13	9.68	1.34	2.72
Ovary	0	0.00	2	1.02	2	1.35	6	3.63*	10	5.63	1.77	3.57
Vagina	0	0.00	1	10.41	0	0.00	0	0.00	1	0.28	3.60	0.59
Vulva	0	0.00	1	3.28	0	0.00	0	0.00	1	0.93	1.07	0.05
Male genital system	5	0.89	29	1.36	19	1.04	22	0.91	75	69.41	1.08	4.32
Prostate	5	0.90	28	1.33	19	1.05	22	0.92	74	68.53	1.08	4.23
Testis	0	0.00	1	5.78	0	0.00	0	0.00	1	0.43	2.33	0.44
Urinary system	5	1.89	17	1.72*	8	0.99	11	1.13	41	30.32	1.35	4.24
Urinary bladder	4	2.19	7	1.02	5	0.89	7	1.02	23	21.15	1.09	0.73
Kidney parenchyma	1	1.56	10	4.17*	3	1.55	4	1.73	18	7.29	2.47*	4.25
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	1.88	0.00	-0.75
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.63	0.00	-0.25
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.13
Soft tissue including heart	0	0.00	3	6.13*	1	2.62	2	4.24	6	1.48	4.07*	1.80
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.60	0.00	-0.24
Melanoma of skin	5	6.29*	14	4.65*	8	3.29*	10	3.30*	37	9.27	3.99*	11.01
Eye, orbit	1	17.50	2	9.74*	1	6.50	2	11.76*	6	0.59	10.23*	2.15
Brain, central nervous system	1	2.66	1	0.72	3	2.81	2	1.71	7	4.00	1.75	1.19
Thyroid	1	4.91	2	2.67	2	3.67	0	0.00	5	2.07	2.41	1.16
Lymphatic, hematopoietic	5	1.98	12	1.27	8	1.05	8	0.86	33	28.88	1.14	1.64
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.96	0.00	-0.38
Non-Hodgkin lymphoma	4	3.54	4	0.94	3	0.86	3	0.69	14	13.26	1.06	0.29
Myeloma	0	0.00	5	3.34*	1	0.82	2	1.34	8	4.60	1.74	1.35
Leukemia	1	1.12	3	0.91	4	1.50	3	0.94	11	10.05	1.09	0.38
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.11
Chronic lymphocytic	1	2.77	1	0.75	2	1.85	1	0.78	5	4.06	1.23	0.37
Acute non-lymphocytic	0	0.00	0	0.00	1	1.13	2	1.85	3	3.36	0.89	-0.14
Chronic myeloid	0	0.00	2	4.52	0	0.00	0	0.00	2	1.35	1.48	0.26

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 12,241 PYR and for male cancers on 12,945 PYR.

Table 13.2.3: Risk of subsequent primary cancers after ocular melanoma, females, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	1,546		1,463		872		474		1,546			
Person-years in interval	1,256		4,552		3,220		3,213		12,241			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	22	1.61*	60	1.18	47	1.19	61	1.31*	190	150.94	1.26*	31.91
All excluding same site	22	1.61*	60	1.18	46	1.16	60	1.29	188	150.73	1.25*	30.45
Buccal cavity, pharynx	0	0.00	1	1.07	0	0.00	1	1.28	2	2.68	0.75	-0.55
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.16
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	0.59	0.00	-0.48
Salivary gland	0	0.00	1	9.74	0	0.00	0	0.00	1	0.30	3.32	0.57
Mouth	0	0.00	0	0.00	0	0.00	1	3.61	1	0.94	1.06	0.05
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.07
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.22	0.00	-0.18
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.07	0.00	-0.05
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.17	0.00	-0.14
Digestive system	4	1.28	14	1.19	12	1.29	9	0.81	39	35.23	1.11	3.08
Esophagus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.91	0.00	-0.75
Stomach	0	0.00	0	0.00	1	1.50	0	0.00	1	2.53	0.39	-1.25
Small intestine	0	0.00	0	0.00	1	8.07	1	6.18	2	0.48	4.13	1.24
Colon	3	1.90	6	1.01	4	0.84	5	0.87	18	18.02	1.00	-0.01
Rectum, rectosigmoid junction	0	0.00	2	1.04	3	2.03	0	0.00	5	5.54	0.90	-0.44
Rectum	0	0.00	1	0.80	2	2.08	0	0.00	3	3.64	0.82	-0.52
Anus, anal canal	0	0.00	0	0.00	1	8.14	1	6.88	2	0.47	4.29	1.25
Liver	0	0.00	1	4.61	1	5.78	1	4.50	3	0.67	4.48	1.90
Gallbladder	0	0.00	1	3.60	0	0.00	0	0.00	1	0.80	1.26	0.17
Bile ducts, other biliary	1	15.31	0	0.00	0	0.00	0	0.00	1	0.79	1.27	0.17
Pancreas	0	0.00	4	2.66	1	0.84	1	0.68	6	4.57	1.31	1.17
Respiratory system	3	1.76	4	0.62	5	0.96	8	1.24	20	19.84	1.01	0.13
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.17
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.60	0.00	-0.49
Lung, bronchus	3	1.85	4	0.65	5	1.00	8	1.29	20	18.98	1.05	0.84
Female breast	4	1.03	8	0.55	7	0.62	17	1.31	36	42.59	0.85	-5.39
Female genital system	3	1.61	6	0.89	8	1.63	12	2.29*	29	18.78	1.54*	8.35
Cervix uteri	2	9.74*	0	0.00	1	2.07	0	0.00	3	1.84	1.63	0.95
Corpus uteri	0	0.00	2	0.57	5	1.98	6	2.27	13	9.68	1.34	2.72
Ovary	0	0.00	2	1.02	2	1.35	6	3.63*	10	5.63	1.77	3.57
Vagina	0	0.00	1	10.41	0	0.00	0	0.00	1	0.28	3.60	0.59
Vulva	0	0.00	1	3.28	0	0.00	0	0.00	1	0.93	1.07	0.05
Urinary system	2	3.07	4	1.63	1	0.51	2	0.84	9	7.44	1.21	1.27
Urinary bladder	1	2.55	2	1.36	0	0.00	0	0.00	3	4.48	0.67	-1.21
Kidney parenchyma	1	4.88	2	2.59	1	1.63	2	2.64	6	2.35	2.56	2.99
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.62	0.00	-0.51
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.16
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.12
Soft tissue including heart	0	0.00	2	10.15*	0	0.00	1	5.35	3	0.59	5.09*	1.97
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.05
Melanoma of skin	3	10.53*	9	8.31*	4	4.79*	5	5.00*	21	3.20	6.56*	14.54
Eye, orbit	0	0.00	0	0.00	1	16.45	1	14.82	2	0.24	8.45	1.44
Brain, central nervous system	0	0.00	0	0.00	0	0.00	0	0.00	0	1.60	0.00	-1.30
Thyroid	1	7.82	1	2.12	2	5.93	0	0.00	4	1.29	3.11	2.22
Lymphatic, hematopoietic	2	1.92	7	1.79	1	0.32	3	0.78	13	11.87	1.10	0.92
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.37	0.00	-0.30
Non-Hodgkin lymphoma	1	2.02	3	1.60	0	0.00	0	0.00	4	5.79	0.69	-1.46
Myeloma	0	0.00	3	4.75	1	2.00	2	3.31	6	1.90	3.15*	3.35
Leukemia	1	2.97	1	0.79	0	0.00	1	0.82	3	3.80	0.79	-0.65
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.09
Chronic lymphocytic	1	7.54	1	2.01	0	0.00	1	2.11	3	1.50	2.01	1.23
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	1.33	0.00	-1.08
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.52	0.00	-0.42

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.

Ocular Melanoma
Males

Table 13.2.4: Risk of subsequent primary cancers after ocular melanoma, males, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	1,671		1,555		908		519		1,671			
Person-years in interval	1,346		4,799		3,444		3,355		12,945			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	21	1.07	89	1.22	67	1.12	69	0.95	246	224.72	1.09	16.44
All excluding same site	21	1.07	87	1.19	67	1.12	68	0.94	243	224.45	1.08	14.33
Buccal cavity, pharynx	0	0.00	2	0.84	2	1.11	1	0.54	5	6.72	0.74	-1.33
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	1.31	0.00	-1.01
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	1.30	0.00	-1.00
Salivary gland	0	0.00	1	5.49	0	0.00	1	5.38	2	0.57	3.54	1.11
Mouth	0	0.00	0	0.00	1	2.36	0	0.00	1	1.57	0.64	-0.44
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.21	0.00	-0.17
Tonsil	0	0.00	1	4.41	0	0.00	0	0.00	1	0.63	1.59	0.29
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.15
Hypopharynx	0	0.00	0	0.00	1	5.18	0	0.00	1	0.71	1.40	0.22
Digestive system	3	0.71	15	0.96	10	0.79	8	0.54	36	47.20	0.76	-8.65
Esophagus	1	3.99	3	3.24	1	1.33	0	0.00	5	2.84	1.76	1.67
Stomach	0	0.00	0	0.00	1	0.73	0	0.00	1	5.08	0.20	-3.15
Small intestine	0	0.00	1	4.71	0	0.00	0	0.00	1	0.66	1.51	0.26
Colon	2	1.11	8	1.19	6	1.08	7	1.07	23	20.68	1.11	1.79
Rectum, rectosigmoid junction	0	0.00	2	0.67	0	0.00	1	0.39	3	8.76	0.34	-4.45
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.26
Liver	0	0.00	0	0.00	1	2.18	0	0.00	1	1.75	0.57	-0.58
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.38	0.00	-0.29
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	1.03	0.00	-0.80
Pancreas	0	0.00	1	0.56	1	0.71	0	0.00	2	5.32	0.38	-2.57
Respiratory system	3	0.76	12	0.82	13	1.12	13	1.01	41	43.06	0.95	-1.59
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.26
Larynx	1	3.00	1	0.82	0	0.00	0	0.00	2	3.41	0.59	-1.09
Lung, bronchus	2	0.56	11	0.83	13	1.23	13	1.10	39	39.20	0.99	-0.16
Male breast	0	0.00	1	7.27	0	0.00	0	0.00	1	0.42	2.36	0.45
Male genital system	5	0.89	29	1.36	19	1.04	22	0.91	75	69.41	1.08	4.32
Prostate	5	0.90	28	1.33	19	1.05	22	0.92	74	68.53	1.08	4.23
Testis	0	0.00	1	5.78	0	0.00	0	0.00	1	0.43	2.33	0.44
Urinary system	3	1.51	13	1.75	7	1.15	9	1.22	32	22.88	1.40	7.04
Urinary bladder	3	2.09	5	0.93	5	1.12	7	1.29	20	16.68	1.20	2.57
Kidney parenchyma	0	0.00	8	4.92*	2	1.52	2	1.28	12	4.94	2.43*	5.45
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	1.26	0.00	-0.98
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.43	0.00	-0.34
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.15
Soft tissue including heart	0	0.00	1	3.43	1	4.34	1	3.51	3	0.89	3.38	1.63
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.54	0.00	-0.42
Melanoma of skin	2	3.92	5	2.59	4	2.51	5	2.47	16	6.07	2.64*	7.67
Eye, orbit	1	29.86	2	16.58*	0	0.00	1	9.75	4	0.35	11.43*	2.82
Brain, central nervous system	1	4.43	1	1.20	3	4.67	2	2.84	7	2.40	2.91*	3.55
Thyroid	0	0.00	1	3.61	0	0.00	0	0.00	1	0.79	1.27	0.16
Lymphatic, hematopoietic	3	2.02	5	0.91	7	1.55	5	0.91	20	17.01	1.18	2.31
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.59	0.00	-0.46
Non-Hodgkin lymphoma	3	4.73	1	0.42	3	1.51	3	1.22	10	7.47	1.34	1.96
Myeloma	0	0.00	2	2.31	0	0.00	0	0.00	2	2.70	0.74	-0.54
Leukemia	0	0.00	2	0.98	4	2.39	2	1.01	8	6.25	1.28	1.35
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.17	0.00	-0.13
Chronic lymphocytic	0	0.00	0	0.00	2	2.90	0	0.00	2	2.56	0.78	-0.44
Acute non-lymphocytic	0	0.00	0	0.00	1	1.84	2	3.05	3	2.04	1.47	0.74
Chronic myeloid	0	0.00	2	7.37	0	0.00	0	0.00	2	0.83	2.40	0.90

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.

Table 13.2.5: Risk of subsequent primary cancers after ocular melanoma, both sexes, <50 years of age, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	760		737		518		324		760			
Person-years in interval	625		2,519		2,021		2,343		7,509			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	2	1.64	9	1.45	17	2.31*	29	1.58*	57	33.17	1.72*	31.74
All excluding same site	2	1.64	9	1.45	17	2.32*	27	1.47	55	33.11	1.66*	29.16
Buccal cavity, pharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	1.12	0.00	-1.49
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.12	0.00	-0.16
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	0.26	0.00	-0.34
Salivary gland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.13
Mouth	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.37
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.07
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.19
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.04
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.13
Digestive system	0	0.00	0	0.00	3	2.71	2	0.67	5	5.08	0.98	-0.11
Esophagus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.32	0.00	-0.43
Stomach	0	0.00	0	0.00	1	9.19	0	0.00	1	0.47	2.12	0.70
Small intestine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.15
Colon	0	0.00	0	0.00	0	0.00	1	0.83	1	2.00	0.50	-1.33
Rectum, rectosigmoid junction	0	0.00	0	0.00	0	0.00	0	0.00	0	1.04	0.00	-1.39
Anus, anal canal	0	0.00	0	0.00	0	0.00	1	20.09	1	0.10	10.42	1.20
Liver	0	0.00	0	0.00	1	22.04	0	0.00	1	0.21	4.69	1.05
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.06
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.14
Pancreas	0	0.00	0	0.00	1	7.74	0	0.00	1	0.60	1.68	0.54
Respiratory system	0	0.00	2	2.54	1	0.89	4	1.29	7	5.14	1.36	2.48
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.08
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.46	0.00	-0.61
Lung, bronchus	0	0.00	2	2.90	1	1.01	4	1.42	7	4.61	1.52	3.19
Female breast	0	0.00	0	0.00	1	0.71	6	2.33	7	5.60	1.25	4.30
Female genital system	0	0.00	0	0.00	1	1.76	2	1.96	3	2.26	1.33	2.27
Cervix uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-1.39
Corpus uteri	0	0.00	0	0.00	1	4.23	1	1.97	2	0.98	2.04	3.13
Ovary	0	0.00	0	0.00	0	0.00	1	3.17	1	0.70	1.42	0.91
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.06
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	0.07	0.00	-0.20
Male genital system	0	0.00	1	2.90	1	1.63	6	1.72	8	4.51	1.77	8.20
Prostate	0	0.00	0	0.00	1	1.90	6	1.76	7	4.18	1.67	6.63
Testis	0	0.00	1	8.89	0	0.00	0	0.00	1	0.29	3.42	1.66
Urinary system	1	14.54	0	0.00	1	1.99	1	0.73	3	2.32	1.30	0.91
Urinary bladder	1	26.76	0	0.00	1	3.48	1	1.18	3	1.38	2.17	2.16
Kidney parenchyma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.83	0.00	-1.11
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.13
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.04
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.08
Soft tissue including heart	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.26
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.33	0.00	-0.44
Melanoma of skin	0	0.00	4	8.60*	2	4.41	2	2.60	8	1.79	4.47*	8.27
Eye, orbit	0	0.00	0	0.00	0	0.00	2	60.85*	2	0.07	28.48*	2.57
Brain, central nervous system	0	0.00	0	0.00	0	0.00	1	3.91	1	0.59	1.70	0.55
Thyroid	1	22.36	0	0.00	2	12.53*	0	0.00	3	0.61	4.92	3.18
Lymphatic, hematopoietic	0	0.00	1	1.69	3	4.66	2	1.46	6	2.73	2.20	4.36
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.33
Non-Hodgkin lymphoma	0	0.00	0	0.00	2	5.94	1	1.41	3	1.41	2.12	2.12
Myeloma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.31	0.00	-0.41
Leukemia	0	0.00	1	6.42	1	5.69	1	2.51	3	0.76	3.94	2.98
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.06
Chronic lymphocytic	0	0.00	0	0.00	1	17.55	0	0.00	1	0.26	3.88	0.99
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	1	7.58	1	0.26	3.85	0.99
Chronic myeloid	0	0.00	1	34.44	0	0.00	0	0.00	1	0.12	8.27	1.17

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 3,254 PYR and for male cancers on 4,255 PYR.

Ocular Melanoma
Both Sexes, ≥50 Years of Age

Table 13.2.6: Risk of subsequent primary cancers after ocular melanoma, both sexes, ≥50 years of age, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	2,457		2,281		1,262		669		2,457			
Person-years in interval	1,977		6,833		4,643		4,225		17,678			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	41	1.28	140	1.19	97	1.05	101	1.01	379	342.49	1.11	20.65
All excluding same site	41	1.28	138	1.17	96	1.04	101	1.01	376	342.07	1.10	19.19
Buccal cavity, pharynx	0	0.00	3	0.97	2	0.90	2	0.96	7	8.28	0.85	-0.72
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	1.38	0.00	-0.78
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	1.63	0.00	-0.92
Salivary gland	0	0.00	2	7.64	0	0.00	1	4.30	3	0.77	3.90	1.26
Mouth	0	0.00	0	0.00	1	1.67	1	1.79	2	2.23	0.90	-0.13
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.14
Tonsil	0	0.00	1	3.59	0	0.00	0	0.00	1	0.70	1.42	0.17
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.22	0.00	-0.13
Hypopharynx	0	0.00	0	0.00	1	4.65	0	0.00	1	0.79	1.27	0.12
Digestive system	7	0.97	29	1.09	19	0.91	15	0.66	70	77.35	0.90	-4.16
Esophagus	1	3.09	3	2.54	1	1.09	0	0.00	5	3.43	1.46	0.89
Stomach	0	0.00	0	0.00	1	0.52	0	0.00	1	7.14	0.14*	-3.47
Small intestine	0	0.00	1	2.88	1	3.65	1	3.15	3	1.03	2.90	1.11
Colon	5	1.50	14	1.13	10	1.01	11	0.99	40	36.70	1.09	1.87
Rectum, rectosigmoid junction	0	0.00	4	0.84	3	0.83	1	0.28	8	13.26	0.60	-2.97
Anus, anal canal	0	0.00	0	0.00	1	5.29	0	0.00	1	0.71	1.42	0.17
Liver	0	0.00	1	1.35	1	1.70	1	1.47	3	2.21	1.36	0.45
Gallbladder	0	0.00	1	2.52	0	0.00	0	0.00	1	1.13	0.89	-0.07
Bile ducts, other biliary	1	6.74	0	0.00	0	0.00	0	0.00	1	1.71	0.58	-0.40
Pancreas	0	0.00	5	1.57	1	0.40	1	0.36	7	9.30	0.75	-1.30
Respiratory system	6	1.09	14	0.69	17	1.09	17	1.05	54	57.76	0.93	-2.12
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-0.27
Larynx	1	2.64	1	0.74	0	0.00	0	0.00	2	3.56	0.56	-0.88
Lung, bronchus	5	0.98	13	0.69	17	1.17	17	1.12	52	53.57	0.97	-0.89
Female breast	4	1.11	8	0.61	6	0.61	11	1.06	29	36.99	0.78	-8.89
Female genital system	3	1.72	6	0.97	7	1.61	10	2.36*	26	16.51	1.57*	10.55
Cervix uteri	2	11.91*	0	0.00	1	2.77	0	0.00	3	1.39	2.16	1.79
Corpus uteri	0	0.00	2	0.60	4	1.74	5	2.34	11	8.69	1.27	2.56
Ovary	0	0.00	2	1.12	2	1.53	5	3.74*	9	4.93	1.83	4.53
Vagina	0	0.00	1	10.95	0	0.00	0	0.00	1	0.26	3.89	0.83
Vulva	0	0.00	1	3.46	0	0.00	0	0.00	1	0.87	1.15	0.15
Male genital system	5	0.90	28	1.33	18	1.02	16	0.78	67	64.90	1.03	2.42
Prostate	5	0.91	28	1.34	18	1.02	16	0.78	67	64.35	1.04	3.05
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.16
Urinary system	4	1.56	17	1.79*	7	0.93	10	1.19	38	28.01	1.36	5.65
Urinary bladder	3	1.68	7	1.06	4	0.75	6	1.00	20	19.77	1.01	0.13
Kidney parenchyma	1	1.63	10	4.46*	3	1.73	4	2.15	18	6.45	2.79*	6.53
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	1.78	0.00	-1.01
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.60	0.00	-0.34
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.16
Soft tissue including heart	0	0.00	3	6.85*	1	3.01	2	5.18	6	1.28	4.70*	2.67
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.27	0.00	-0.15
Melanoma of skin	5	7.21*	10	3.92*	6	3.03*	8	3.54*	29	7.48	3.88*	12.17
Eye, orbit	1	18.67	2	10.59*	1	7.32	0	0.00	4	0.52	7.75*	1.97
Brain, central nervous system	1	2.92	1	0.81	3	3.27	1	1.09	6	3.41	1.76	1.46
Thyroid	0	0.00	2	3.58	0	0.00	0	0.00	2	1.46	1.37	0.30
Lymphatic, hematopoietic	5	2.09	11	1.24	5	0.72	6	0.76	27	26.15	1.03	0.48
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.72	0.00	-0.41
Non-Hodgkin lymphoma	4	3.75*	4	1.01	1	0.32	2	0.55	11	11.85	0.93	-0.48
Myeloma	0	0.00	5	3.45*	1	0.87	2	1.54	8	4.29	1.86	2.10
Leukemia	1	1.16	2	0.63	3	1.21	2	0.72	8	9.29	0.86	-0.73
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.23	0.00	-0.13
Chronic lymphocytic	1	2.83	1	0.77	1	0.97	1	0.89	4	3.80	1.05	0.11
Acute non-lymphocytic	0	0.00	0	0.00	1	1.21	1	1.05	2	3.10	0.64	-0.62
Chronic myeloid	0	0.00	1	2.42	0	0.00	0	0.00	1	1.23	0.81	-0.13

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 8,988 PYR and for male cancers on 8,690 PYR.

Eye (Non-melanoma)
Both Sexes

Table 13.3.1: Characteristics of patients with an initial cancer of the eye (non-melanoma, excluding retinoblastoma), both sexes, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
Number of patients with 1st primary cancer						
Total	388	100.0	206	100.0	594	100.0
Initial treatment						
Any radiation	98	25.3	74	35.9	172	29.0
With surgery	65	16.8	53	25.7	118	19.9
Without surgery	33	8.5	21	10.2	54	9.1
No radiation	290	74.7	132	64.1	422	71.0
With surgery	259	66.8	108	52.4	367	61.8
Without surgery	31	8.0	24	11.7	55	9.3
Race						
White	338	87.1	167	81.1	505	85.0
Black	25	6.4	16	7.8	41	6.9
Other	18	4.6	16	7.8	34	5.7
Unknown	7	1.8	7	3.4	14	2.4
Age at 1st primary cancer diagnosis, years						
< 30	54	13.9	52	25.2	106	17.8
30–49	56	14.4	37	18.0	93	15.7
50–69	121	31.2	46	22.3	167	28.1
70–79	88	22.7	31	15.0	119	20.0
≥ 80	69	17.8	40	19.4	109	18.4
Number of patients with one or more primary cancers						
One primary cancer only	333	85.8	191	92.7	524	88.2
1st and 2nd cancers	44	11.3	11	5.3	55	9.3
1st, 2nd, and 3rd cancers	10	2.6	3	1.5	13	2.2
1st, 2nd, 3rd, and additional cancers	1	0.3	1	0.5	2	0.3
Other statistics						
Median age at 1st cancer diagnosis	65.8	—	58.0	—	63.5	—
Median year of 1st cancer diagnosis	1988.3	—	1987.9	—	1988.3	—
Median person-years at risk	5.3	—	5.3	—	5.3	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	87.3	—	100.0	—	90.0
1st, 2nd, and additional cancers	—	87.3	—	100.0	—	90.0
1st cancer only	—	7.3	—	0.0	—	5.7

*Percent histologically confirmed among patients who developed a subsequent primary cancer.

Eye (Non-melanoma)
Both Sexes

Table 13.3.2: Risk of subsequent primary cancers after cancer of the eye (non-melanoma, excluding retinoblastoma), both sexes, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	594		535		315		167		594			
Person-years in interval	469		1,650		1,167		1,069		4,354			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	13	1.88	37	1.49*	18	0.99	19	1.30	87	64.65	1.35*	51.32
All excluding same site	13	1.88	37	1.49*	18	0.99	19	1.30	87	64.63	1.35*	51.38
Buccal cavity, pharynx	1	5.50	4	6.25*	2	4.59	1	3.12	8	1.58	5.07*	14.75
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.30	0.00	-0.70
Tongue	0	0.00	0	0.00	0	0.00	1	16.48	1	0.29	3.39	1.62
Salivary gland	1	58.86	3	48.55*	2	45.10*	0	0.00	6	0.16	37.10*	13.41
Mouth	0	0.00	0	0.00	0	0.00	0	0.00	0	0.39	0.00	-0.89
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.13
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.13	0.00	-0.30
Oropharynx	0	0.00	1	60.24	0	0.00	0	0.00	1	0.04	24.99	2.20
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.15	0.00	-0.34
Digestive system	3	1.83	4	0.70	4	0.98	3	0.93	14	14.63	0.96	-1.45
Esophagus	1	13.01	0	0.00	0	0.00	0	0.00	1	0.70	1.43	0.69
Stomach	0	0.00	0	0.00	0	0.00	0	0.00	0	1.55	0.00	-3.56
Small intestine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.44
Colon	1	1.33	2	0.76	3	1.58	2	1.32	8	6.79	1.18	2.78
Rectum, rectosigmoid junction	0	0.00	2	2.04	1	1.46	0	0.00	3	2.46	1.22	1.24
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.25
Liver	1	19.07	0	0.00	0	0.00	0	0.00	1	0.48	2.07	1.19
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-0.41
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.35	0.00	-0.80
Pancreas	0	0.00	0	0.00	0	0.00	1	2.68	1	1.69	0.59	-1.59
Respiratory system	4	3.39	11	2.59*	4	1.30	5	2.12	24	10.85	2.21*	30.19
Nose, nasal cavity, ear	0	0.00	0	0.00	1	37.38	0	0.00	1	0.09	10.66	2.08
Larynx	0	0.00	1	3.48	0	0.00	1	7.42	2	0.70	2.86	2.99
Lung, bronchus	4	3.69	10	2.55*	3	1.06	4	1.83	21	10.03	2.09*	25.19
Female breast	0	0.00	4	2.98	1	1.00	1	0.96	6	3.77	1.59	14.45
Female genital system	0	0.00	0	0.00	0	0.00	0	0.00	0	1.63	0.00	-10.51
Cervix uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-1.21
Corpus uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.79	0.00	-5.08
Ovary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-3.19
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.17
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.59
Male genital system	0	0.00	6	0.97	3	0.64	5	1.41	14	16.08	0.87	-7.40
Prostate	0	0.00	6	0.98	3	0.65	5	1.43	14	15.89	0.88	-6.72
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.29
Urinary system	2	3.19	4	1.76	3	1.81	2	1.53	11	5.87	1.87	11.79
Urinary bladder	0	0.00	1	0.60	2	1.65	2	2.10	5	4.29	1.16	1.62
Kidney parenchyma	2	15.51*	3	6.38*	1	2.89	0	0.00	6	1.22	4.90*	10.97
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.35	0.00	-0.80
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.12	0.00	-0.27
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.14
Soft tissue including heart	0	0.00	0	0.00	0	0.00	0	0.00	0	0.26	0.00	-0.61
Kaposi sarcoma	0	0.00	1	26.15	0	0.00	0	0.00	1	0.11	9.20	2.05
Melanoma of skin	0	0.00	1	1.83	0	0.00	0	0.00	1	1.49	0.67	-1.12
Eye, orbit	0	0.00	1	27.54	0	0.00	0	0.00	1	0.09	10.85	2.08
Brain, central nervous system	0	0.00	0	0.00	0	0.00	0	0.00	0	0.62	0.00	-1.42
Thyroid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.65
Lymphatic, hematopoietic	2	3.74	1	0.52	1	0.71	2	1.70	6	5.03	1.19	2.24
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	1	22.39	1	0.17	5.98	1.91
Non-Hodgkin lymphoma	1	4.46	1	1.23	1	1.63	1	1.89	4	2.18	1.84	4.18
Myeloma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.81	0.00	-1.86
Leukemia	1	4.87	0	0.00	0	0.00	0	0.00	1	1.87	0.53	-2.00
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.15
Chronic lymphocytic	1	12.46	0	0.00	0	0.00	0	0.00	1	0.73	1.37	0.61
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.62	0.00	-1.42
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.58

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 1,547 PYR and for male cancers on 2,808 PYR.

Table 13.3.3: Risk of subsequent primary cancers after cancer of the eye (non-melanoma, excluding retinoblastoma), females, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	206		184		105		60		206			
Person-years in interval	163		564		395		425		1,547			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	2	1.39	9	1.82	3	0.83	6	1.59	20	13.77	1.45	40.26
All excluding same site	2	1.39	9	1.82	3	0.83	6	1.59	20	13.77	1.45	40.28
Buccal cavity, pharynx	0	0.00	1	11.20	0	0.00	0	0.00	1	0.24	4.13	4.90
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.12
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.35
Salivary gland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.19
Mouth	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.54
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.01	0.00	-0.06
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.12
Oropharynx	0	0.00	1	†	0	0.00	0	0.00	1	0.01	184.28*	6.43
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.01	0.00	-0.10
Digestive system	0	0.00	0	0.00	1	1.13	2	2.28	3	3.40	0.88	-2.56
Esophagus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.57
Stomach	0	0.00	0	0.00	0	0.00	0	0.00	0	0.27	0.00	-1.75
Small intestine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.30
Colon	0	0.00	0	0.00	0	0.00	1	2.23	1	1.73	0.58	-4.70
Rectum, rectosigmoid junction	0	0.00	0	0.00	1	7.58	0	0.00	1	0.51	1.98	3.20
Rectum	0	0.00	0	0.00	1	11.44	0	0.00	1	0.34	2.98	4.30
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.04	0.00	-0.27
Liver	0	0.00	0	0.00	0	0.00	0	0.00	0	0.07	0.00	-0.47
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.50
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.53
Pancreas	0	0.00	0	0.00	0	0.00	1	8.51	1	0.44	2.26	3.61
Respiratory system	0	0.00	2	3.37	0	0.00	2	3.88	4	1.73	2.31	14.69
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.12
Larynx	0	0.00	0	0.00	0	0.00	1	69.92	1	0.05	19.73	6.14
Lung, bronchus	0	0.00	2	3.53	0	0.00	1	2.02	3	1.65	1.81	8.70
Female breast	0	0.00	4	2.98	1	1.00	1	0.96	6	3.77	1.59	14.45
Female genital system	0	0.00	0	0.00	0	0.00	0	0.00	0	1.63	0.00	-10.51
Cervix uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-1.21
Corpus uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.79	0.00	-5.08
Ovary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-3.19
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.17
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.59
Urinary system	0	0.00	2	8.22	1	5.55	0	0.00	3	0.68	4.40	14.99
Urinary bladder	0	0.00	0	0.00	1	9.10	0	0.00	1	0.41	2.41	3.78
Kidney parenchyma	0	0.00	2	27.29*	0	0.00	0	0.00	2	0.21	9.50*	11.57
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.37
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.12
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.10
Soft tissue including heart	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.38
Kaposi sarcoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.01	0.00	-0.04
Melanoma of skin	0	0.00	0	0.00	0	0.00	0	0.00	0	0.29	0.00	-1.88
Eye, orbit	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.13
Brain, central nervous system	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.92
Thyroid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.88
Lymphatic, hematopoietic	2	17.05*	0	0.00	0	0.00	1	3.20	3	1.12	2.67	12.13
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.04	0.00	-0.28
Non-Hodgkin lymphoma	1	18.86	0	0.00	0	0.00	1	6.66	2	0.53	3.77	9.50
Myeloma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-1.15
Leukemia	1	24.27	0	0.00	0	0.00	0	0.00	1	0.37	2.69	4.06
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.02	0.00	-0.11
Chronic lymphocytic	1	66.61	0	0.00	0	0.00	0	0.00	1	0.14	7.28	5.58
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.13	0.00	-0.84
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.33

*P < 0.05. †O/E > 500. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.

Eye (Non-melanoma)
Males

Table 13.3.4: Risk of subsequent primary cancers after cancer of the eye (non-melanoma, excluding retinoblastoma), males, SEER 1973-2000.

	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
Number starting interval	388		351		210		107		388			
Person-years in interval	306		1,085		773		644		2,808			
Subsequent primary cancer	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
All subsequent cancers	11	2.00	28	1.40	15	1.03	13	1.20	67	50.88	1.32*	57.42
All excluding same site	11	2.01	28	1.40	15	1.03	13	1.20	67	50.86	1.32*	57.49
Buccal cavity, pharynx	1	6.40	3	5.45*	2	5.37	1	3.89	7	1.34	5.24*	20.17
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-1.01
Tongue	0	0.00	0	0.00	0	0.00	1	21.38	1	0.24	4.15	2.70
Salivary gland	1	71.77	3	58.13*	2	54.28*	0	0.00	6	0.13	45.16*	20.90
Mouth	0	0.00	0	0.00	0	0.00	0	0.00	0	0.31	0.00	-1.09
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.16
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.40
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.03	0.00	-0.12
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.13	0.00	-0.48
Digestive system	3	2.40	4	0.90	3	0.94	1	0.43	11	11.24	0.98	-0.85
Esophagus	1	14.80	0	0.00	0	0.00	0	0.00	1	0.61	1.64	1.39
Stomach	0	0.00	0	0.00	0	0.00	0	0.00	0	1.28	0.00	-4.55
Small intestine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.15	0.00	-0.52
Colon	1	1.80	2	1.00	3	2.07	1	0.94	7	5.06	1.38	6.90
Rectum, rectosigmoid junction	0	0.00	2	2.52	0	0.00	0	0.00	2	1.96	1.02	0.16
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.07	0.00	-0.24
Liver	1	22.70	0	0.00	0	0.00	0	0.00	1	0.41	2.43	2.10
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.36
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.27	0.00	-0.95
Pancreas	0	0.00	0	0.00	0	0.00	0	0.00	0	1.25	0.00	-4.45
Respiratory system	4	3.92*	9	2.46*	4	1.53	3	1.63	20	9.13	2.19*	38.73
Nose, nasal cavity, ear	0	0.00	0	0.00	1	46.03	0	0.00	1	0.07	13.43	3.30
Larynx	0	0.00	1	3.71	0	0.00	0	0.00	1	0.65	1.54	1.25
Lung, bronchus	4	4.29*	8	2.39*	3	1.25	3	1.77	18	8.38	2.15*	34.27
Male breast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.33
Male genital system	0	0.00	6	0.97	3	0.64	5	1.41	14	16.08	0.87	-7.40
Prostate	0	0.00	6	0.98	3	0.65	5	1.43	14	15.89	0.88	-6.72
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.29
Urinary system	2	3.60	2	0.98	2	1.35	2	1.79	8	5.19	1.54	10.03
Urinary bladder	0	0.00	1	0.66	1	0.90	2	2.38	4	3.88	1.03	0.43
Kidney parenchyma	2	18.43*	1	2.52	1	3.44	0	0.00	4	1.01	3.95*	10.64
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.29	0.00	-1.05
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.10	0.00	-0.36
Bone, joints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.04	0.00	-0.16
Soft tissue including heart	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.73
Kaposi sarcoma	0	0.00	1	27.87	0	0.00	0	0.00	1	0.10	9.80	3.20
Melanoma of skin	0	0.00	1	2.23	0	0.00	0	0.00	1	1.20	0.83	-0.71
Eye, orbit	0	0.00	1	35.06	0	0.00	0	0.00	1	0.07	13.98	3.31
Brain, central nervous system	0	0.00	0	0.00	0	0.00	0	0.00	0	0.47	0.00	-1.69
Thyroid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.15	0.00	-0.52
Lymphatic, hematopoietic	0	0.00	1	0.66	1	0.90	1	1.16	3	3.90	0.77	-3.21
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	1	33.48	1	0.12	8.09	3.12
Non-Hodgkin lymphoma	0	0.00	1	1.60	1	2.12	0	0.00	2	1.65	1.21	1.25
Myeloma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.63	0.00	-2.25
Leukemia	0	0.00	0	0.00	0	0.00	0	0.00	0	1.50	0.00	-5.33
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.05	0.00	-0.17
Chronic lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.60	0.00	-2.12
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-1.75
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.72

*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000.