

# Chapter 10

## New Malignancies Following Cancer of the Male Genital Tract

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### Synopsis

The risk of subsequent primary cancer was evaluated in more than 308,000 men diagnosed between 1973 and 2000 with cancer of the prostate, testis, or penis. The overall risk for new cancers was significantly increased among survivors of testis cancer ( $O/E=1.62$ ,  $O=803$ ,  $EAR=21$  per 10,000 person-years), but not of penile cancer ( $O/E=1.12$ ,  $O=293$ ,  $EAR=26$ ). The overall risk for new cancers was significantly decreased among survivors of prostate cancer ( $O/E=0.90$ ,<sup>1</sup>  $O=27,112$ ). Prostate cancer was associated with excess melanoma and subsequent cancers of the small intestine, soft tissue, bladder, thyroid, and thymus. The risk of new malignancies varied by age at prostate cancer diagnosis, with significant excesses seen only among younger men (ages <50 years). Treatment for prostate cancer with radiotherapy may have contributed to the observed excess of certain solid tumors occurring within the abdominal and pelvic fields, particularly bladder cancer. Risks for subsequent acute non-lymphocytic leukemia (ANLL) and cancers of the rectum, pancreas, testis, bladder, and kidney were significantly increased following testis cancer. Men with seminoma of the testis had substantially higher increased risks of new malignancies, excluding contralateral testis, than men with non-seminoma. Radiation treatment for testis cancer appeared to contribute to the increased risk for certain solid tumors, while chemotherapy and radiotherapy appeared largely responsible for the elevated risk of ANLL. Smoking may have contributed to the elevated risks for subsequent buccal cavity and lung cancers among patients with penile cancer, although alcohol consumption and infection with human papillomavirus may also have played a role in new cancers of the buccal cavity.

### Prostate Cancer

Prostate carcinoma, the most common malignancy among American men, constitutes 33% of all new cancer cases and 10% of all cancer deaths among males (Jemal et al, 2005). The introduction of prostate-specific antigen (PSA) screening in the late 1980s was associated with a

doubling of the observed incidence of prostate cancer; approximately 75% of prostate cancer cases are now diagnosed while the disease is still clinically organ-confined, whereas only 25% of prostate cancers were localized prior to PSA screening (Catalona et al, 1993). The incidence of prostate cancer varies with race, with low rates among Asians and the highest rates among blacks, who typically present with more advanced disease, and may have a poorer prognosis within each stage category, than white patients (Pienta et al, 1995). Overall, the 5- and 10-year relative survival rates are 99.3% and 88.7%, respectively. Therapy for prostate cancer is not standardized for any stage, and treatment decisions are based on tumor stage and grade combined with an assessment of patient age and performance status (Bahnsen et al, 2000). Approximately 26% of patients are treated initially with radiotherapy to a pelvic field encompassing a portion of the rectum and dome of the bladder. More recent radiation strategies, including interstitial brachytherapy and 3-dimensional conformational radiotherapy, produce lower radiation doses to adjacent normal tissue. Radical prostatectomy is frequently the initial therapy in younger patients, who may present with higher-grade tumors. Hormonal therapy and chemotherapy are generally reserved for patients with metastatic disease.

Established risk factors for prostate cancer include age, family history, and ethnicity (Key, 1995). Diet, including fat intake, is also associated with prostate cancer risk (Giovannucci et al, 1993), while the roles of smoking, body weight, and vasectomy remain uncertain (Key, 1995).

### Results and Discussion

We observed a significant overall deficit of subsequent primary cancers, excluding subsequent prostate cancer, among 292,029 patients at risk ( $O/E=0.90$ ,  $O=27,112$ , 95%  $CI=0.89-0.91$ ). The cumulative incidence of developing any second cancer following prostate cancer, adjusted for the competing risk of death due to other causes, was 15.2% at 25 years (95%  $CI=15.0\%-15.4\%$ ). The deficit in relative risk ( $O/E$ ) of subsequent cancers was observed only for whites and persisted throughout 20 years of follow-up. In contrast, no significant overall deficit or excess was observed among blacks ( $O/E=1.00$

<sup>1</sup>Observed-to-expected ratios for prostate cancer exclude subsequent primary prostate cancers.

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  $[(O-E)/PYR] \times 10,000$ ).

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excluding subsequent prostate cancers,  $O=2,817$ ). Significantly elevated risks were observed for subsequent cancers of the small intestine, soft tissue, bladder, thyroid, and thymus, as well as for melanoma. Significant deficits in risk were seen for cancers of the buccal cavity (specifically tongue, tonsil, mouth, and pharynx), digestive system (particularly esophagus, stomach, colon, rectum, liver, and gallbladder), and respiratory system (larynx and lung), as well as for chronic lymphocytic leukemia and Kaposi sarcoma. A significantly high overall risk for new malignancies (excluding prostate cancer) was seen among men diagnosed with prostate cancer at a young age ( $O/E=1.30$ , ages <50 years). In contrast, those diagnosed at ages 50 to 59 years had no increase in cancer risk ( $O/E=0.95$ ), and significant deficits in risk were observed for all age groups older than 60 years. Other large surveys (Kleinerman et al, 1985; Osterlind et al, 1985; Levi et al, 1999), including a previous SEER survey (Brenner et al, 2000), have noted overall deficits in second cancers following prostate cancer, particularly at older ages, suggesting that medical surveillance may be reduced among older men diagnosed with prostate cancer.

Radiation treatment may contribute to the excess risk at certain sites. Increased risks for cancers of the bladder (53%) and rectum excluding rectosigmoid junction (37%) among 10-year survivors, and a 2-fold excess of cancers of the soft tissues among 5-year survivors, were observed for patients receiving radiation during their initial course of therapy. At these new cancer sites, risk increased with time since initial radiation, consistent with a radiogenic effect. In contrast, patients who did not receive radiation had significant deficits of subsequent bladder and rectal cancers after 10 years of observation. Similar patterns of subsequent bladder cancers (Neugut et al, 1997; Brenner et al, 2000) and rectal cancers (Brenner et al, 2000; Baxter et al, 2005) have been linked to radiotherapy in earlier surveys of prostate cancer in the SEER Program. A prior study also revealed that the risk of developing sarcoma was significantly higher (2-fold) after radiotherapy compared with surgery (Brenner et al, 2000). In addition, we observed a 31% increase in risk for acute myeloid leukemia among patients receiving radiation as part of their initial therapy, with elevated risk concentrated in the first 10 years of follow-up. A similar temporal pattern has been shown in previous studies linking excess leukemia to pelvic radiotherapy for cancers of the uterine corpus (Curtis et al, 1994) and cervix (Boice et al, 1988).

Among the excess malignancies occurring in men diagnosed with early-onset prostate cancer was pancreatic cancer, with a 2.6-fold increase in risk for men younger than 50 years, based on 6 cases. Among older patients, there were 4 cases in which prostate cancer was followed by both melanoma and pancreatic cancer. Genetic factors may have been involved, because this pattern of tumors has been described in some individuals with BRCA2 mutations (Breast Cancer Linkage Consortium, 1999). The risk for melanoma was most

pronounced in the first year of follow-up, suggesting the influence of increased medical surveillance.

The significant excess risks for cancers of the small intestine, thyroid, and thymus cancers after prostate cancer appear to be new findings. As more than 50% of small intestinal tumors were carcinoid, it is possible that hormonal factors were involved (Quaedvlieg et al, 2001; Thellenberg et al, 2003). In addition, an increased reciprocal risk for prostate cancer following an initial diagnosis of thyroid cancer ( $O/E=1.31$ ,  $O=257$ ) also points to shared hormonal or other risk factors. Genetic factors may have been involved, particularly because mutations in *RET* have been described in prostate cancer as well as thyroid cancer (Dawson et al, 1998).

## Testis Cancer

Testicular cancer is rare, accounting for only 1% of all incident cancers and 0.1% of all deaths in males (Jemal et al, 2005). It is the most common cancer in white men ages 20 to 35 years, but it occurs less frequently among blacks. The incidence, which is age-dependent, has been increasing since the mid-twentieth century, a trend related to birth cohort (McKiernan et al, 1999). Germ cell tumors are the most common histology and are categorized as seminoma (56%) or non-seminoma (44%). Treatment depends on histology and usually consists of surgery followed by radiotherapy for seminoma, or surgery followed by combination chemotherapy for non-seminoma. The 5- and 10-year relative survival rates (95.8% and 94.8%, respectively) improved dramatically following introduction of platinum-based combination chemotherapy in the late 1970s. During the 25-year period of this survey, most patients with seminoma were initially treated with radiation, and only a small percentage received chemotherapy as part of their initial treatment. In contrast, substantially more patients in the SEER cohort diagnosed with non-seminoma received chemotherapy during their initial treatment, and many likely had chemotherapy as part of their subsequent treatment, whereas only 3% received radiation alone as initial therapy.

Cryptorchidism and family history of testis cancer are well-established risk factors for testis cancer (Schottenfeld, 1996). A variety of perinatal factors, such as genitourinary anomalies (e.g., hydrocele, inguinal hernia, testicular atrophy), hormone use during pregnancy, and increased maternal body weight, as well as postnatal factors (e.g., higher socioeconomic status, infertility, late-age puberty, testicular trauma) have been related to testis cancer with variable levels of confirmation. Environmental endocrine modulators, particularly exposure to certain organochlorines, may increase risk by binding estrogen and androgen receptors, but definitive data are lacking.

## Results and Discussion

A total of 803 subsequent primary cancers were observed among 14,984 2-month survivors of testicular cancer

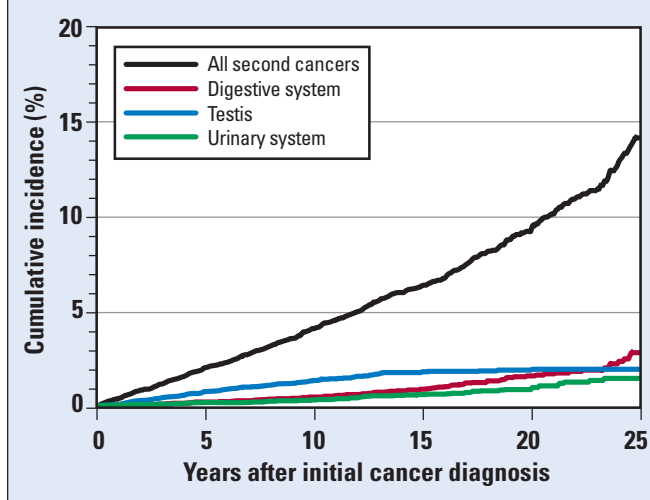
(O/E=1.62, O=803, 95% CI=1.51-1.74, EAR=21 per 10,000 person-years). The cumulative incidence of developing a second cancer following testis cancer was 14.1% at 25 years (95% CI=12.6%-15.7%), with new malignancies of the testis accounting for 1.9% of the incidence (Figure 10.1). Significantly elevated risks occurred only in whites, appeared early, and persisted throughout follow-up. Overall increases in relative risk were higher in patients diagnosed at ages younger than 35 years (O/E=2.80, EAR=21) as compared with older patients (O/E=1.31, EAR=23). Elevated risks were highest in the first year following diagnosis (O/E=2.58) but persisted among 20-year survivors (O/E=1.47, O=76).

Approximately 25% of the subsequent cancers were metachronous tumors in the contralateral testis. When subsequent primary testis cancers were excluded, however, the significant elevations in risk persisted, with an overall relative risk of 1.29 (95% CI=1.19-1.39, EAR=10). Significantly increased risks were seen for acute non-lymphocytic leukemia (ANLL) as well as cancers of the rectum, pancreas, testis, bladder, kidney, and thyroid. These findings are generally consistent with previous surveys of testicular cancer that revealed elevated risks for subsequent cancers of the stomach, rectum, pancreas, testis, bladder, and kidney, as well as for melanoma, non-Hodgkin lymphoma, and leukemia (Kaldor et al, 1987; Jacobsen et al, 1993; Moller et al, 1993; Travis et al, 1997, 2005).

Risk for all subsequent cancers combined (excluding testicular cancer) differed by histologic type of testicular cancer, with significant excesses following seminoma (O/E=1.33, O=458), but not non-seminoma (O/E=1.14, O=136). Among men with seminoma, significantly elevated risks were seen for ANLL and new malignancies of the esophagus, rectum, pancreas, and bladder, and for the combination of renal pelvis, ureters, and other urinary sites. Those with non-seminoma had increased risks for ANLL and cancers of the buccal cavity and kidney. In an international survey (Travis et al, 1997), the overall risks of second cancers were similar for seminoma (O/E=1.42) and non-seminoma (O/E=1.50), and both tumor types showed elevated risks for melanoma as well as cancers of the stomach, bladder, thyroid, and soft tissue. In this earlier study, however, there were substantial numbers of patients diagnosed in the prechemotherapy era (thus more likely to be treated with radiation) and greater numbers of long-term survivors, which may help explain the differences between studies.

There was a tendency for risks to increase with time for specific sites, with significant elevations observed for cancers of the rectum (excluding rectosigmoid junction) and pancreas among 15-year survivors and for bladder cancer among 20-year survivors. In contrast, significantly elevated risks for ANLL and renal cancer were confined to the first 10 years of follow-up. Among patients with seminoma who received initial radiotherapy, the excess risk for all subsequent solid tumors (excluding contralateral testis) increased significantly to 67% (O=128) among 15-year survivors. These late-onset

**Figure 10.1:** Cumulative incidence of developing a second cancer among patients with cancer of the testis, males, SEER 1973-2000.



risks affected several sites within or near the radiation field, including a 2-fold or greater increase in risks for cancers of the digestive tract (O=32), especially the stomach, rectum, and pancreas. Among 20-year survivors of seminoma treated initially with radiation, a 3-fold excess risk was seen for bladder cancer. The radiation-related risks for bladder cancer and other pelvic sites are consistent with findings from large international studies of cervical cancer implicating pelvic radiotherapy (Boice et al, 1985, 1988). For ANLL, the risks were increased up to 3-fold in both the irradiated and nonirradiated seminoma groups, with the 2 nonirradiated cases known to have received chemotherapy.

Among patients with non-seminoma, the overall risk for subsequent solid tumors (excluding testis) following radiation was not increased among 15- or 20-year survivors. Significant excesses for ANLL were confined to the first 10 years of follow-up and were likely related to chemotherapy, specifically alkylating agents and platinum-based chemotherapy (Travis et al, 2000). Increased risks of cancers of the buccal cavity, pancreas, and kidney occurred among men not known to have received radiotherapy.

Among patients initially diagnosed with a testicular germ cell tumor, new cancers arising in the contralateral testis were the most common new malignancies (O/E=13.44, EAR=12). In patients diagnosed with testis cancer at ages younger than 20 years, tumors of the contralateral testis accounted for about 90% of the excess subsequent cancer risk. The increased risk of contralateral testis cancer is well established (Bokemeyer et al, 1993; Fossà et al, 2005) and may reflect genetic susceptibility (Rapley et al, 2000).

## Penis Cancer

Cancer of the penis, while uncommon in the U.S., is of major significance worldwide, accounting for 10% to 20% of cancers in males in Asia, Africa, and South America.

More than 90% of reported penile cancers are squamous cell carcinomas. The wide population variation in incidence appears related to circumcision and hygienic practices, and preexisting inflammatory states, including phimosis (Brinton et al, 1991). The risk of penile cancer has been associated in some studies with smoking and psoralen-plus-ultraviolet-A therapy (Stern 1990; Tseng et al, 2001). It seems likely that human papillomavirus (HPV) is involved in many cases, although further work is needed to clarify the risk. The 5-year relative survival rate is 76.9%, decreasing to 63.5% at 10 years. Treatment is based on tumor extent at diagnosis; surgery is the mainstay, with radiation usually reserved for smaller lesions.

## Results and Discussion

There was a borderline significant increase in overall subsequent primary cancer risk among 1,808 men surviving at least 2 months following diagnosis of penile cancer (O/E=1.12, O=293, 95% CI=0.99-1.25, EAR=26). For these patients, the cumulative incidence of developing a second cancer following penis cancer was 19.7% at 20 years (95% CI=17.5%-22.1%). Only a small percentage of patients received radiotherapy as part of their initial treatment. The excess risk of subsequent cancers was most pronounced for cancers of the buccal cavity (especially the tongue) and respiratory tract, more than half of which were squamous cell cancers, and these risks remained elevated for up to 10 years after initial diagnosis. Cancers of the tonsil, tongue, and mouth constituted the majority of buccal cavity tumors. Smoking probably contributed to both buccal and respiratory cancers, while alcohol and HPV may have played a role in buccal cancers, particularly those of the tonsil and tongue (Herrero et al, 2003). Interestingly, there were no cases of subsequent anal cancer, which might have been expected from a field effect involving HPV infections of the anogenital epithelium (Peters et al, 1984).

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## Prostate Males

**Table 10.1.1:** Characteristics of patients with an initial cancer of the prostate gland, males, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	292,029	100.0	—	—	292,029	100.0
<b>Initial treatment</b>						
Any radiation	90,538	31.0	—	—	90,538	31.0
With surgery	23,513	8.1	—	—	23,513	8.1
Without surgery	67,025	23.0	—	—	67,025	23.0
No radiation	201,491	69.0	—	—	201,491	69.0
With surgery	132,941	45.5	—	—	132,941	45.5
Without surgery	68,550	23.5	—	—	68,550	23.5
<b>Race</b>						
White	245,375	84.0	—	—	245,375	84.0
Black	32,026	11.0	—	—	32,026	11.0
Other	12,490	4.3	—	—	12,490	4.3
Unknown	2,138	0.7	—	—	2,138	0.7
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	43	0.0	—	—	43	0.0
30–49	3,410	1.2	—	—	3,410	1.2
50–69	127,466	43.6	—	—	127,466	43.6
70–79	113,625	38.9	—	—	113,625	38.9
≥ 80	47,485	16.3	—	—	47,485	16.3
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	266,741	91.3	—	—	266,741	91.3
1st and 2nd cancers	23,570	8.1	—	—	23,570	8.1
1st, 2nd, and 3rd cancers	1,579	0.5	—	—	1,579	0.5
1st, 2nd, 3rd, and additional cancers	139	0.0	—	—	139	0.0
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	71.2	—	—	—	71.2	—
Median year of 1st cancer diagnosis	1992.0	—	—	—	1992.0	—
Median person-years at risk	4.4	—	—	—	4.4	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	93.1	—	—	—	93.1
1st, 2nd, and additional cancers	—	92.7	—	—	—	92.7
1st cancer only	—	5.4	—	—	—	5.4

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

**Table 10.1.2:** Risk of subsequent primary cancers after cancer of the prostate gland, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	3,769	0.63*	12,624	0.59*	7,706	0.60*	3,057	0.59*	27,156	45,242.80	0.60*	-115.18
All excluding same site	3,765	0.96*	12,611	0.89*	7,690	0.90*	3,046	0.88*	27,112	30,057.55	0.90*	-18.76
<b>Buccal cavity, pharynx</b>	118	0.76*	421	0.80*	243	0.83*	85	0.78*	867	1,086.53	0.80*	-1.40
Lip	21	0.71	92	0.91	53	0.90	21	0.90	187	213.24	0.88	-0.17
Tongue	18	0.61*	71	0.71*	39	0.72*	16	0.83	144	202.24	0.71*	-0.37
Salivary gland	11	0.82	51	1.03	35	1.09	17	1.20	114	109.27	1.04	0.03
Mouth	36	0.99	77	0.64*	53	0.81	11	0.46*	177	247.19	0.72*	-0.45
Nasopharynx	3	0.56	9	0.51*	10	1.09	5	1.58	27	35.24	0.77	-0.05
Tonsil	10	0.72	40	0.87	14	0.60	6	0.78	70	91.14	0.77*	-0.13
Oropharynx	3	0.66	15	0.99	4	0.50	0	0.00	22	30.41	0.72	-0.05
Hypopharynx	14	0.79	51	0.87	24	0.79	7	0.68	96	116.56	0.82	-0.13
<b>Digestive system</b>	1,208	0.95	4,267	0.94*	2,474	0.89*	980	0.86*	8,929	9,762.64	0.91*	-5.31
Esophagus	78	1.00	232	0.84*	133	0.83*	53	0.85	496	575.62	0.86*	-0.51
Stomach	144	0.95	427	0.80*	247	0.77*	103	0.79*	921	1,135.58	0.81*	-1.37
Small intestine	25	1.46	74	1.19	54	1.40*	21	1.33	174	134.07	1.30*	0.25
Colon	513	0.93	1,994	0.99	1,115	0.89*	437	0.83*	4,059	4,349.55	0.93*	-1.85
Rectum, rectosigmoid junction	187	0.84*	743	0.96	452	0.99	143	0.81*	1,525	1,629.58	0.94*	-0.67
Anus, anal canal	14	1.81	18	0.66	17	1.07	15	2.46*	64	57.22	1.12	0.04
Liver	28	0.55*	126	0.69*	76	0.69*	39	0.91	269	385.76	0.70*	-0.74
Gallbladder	8	0.72	24	0.60*	19	0.76	7	0.66	58	86.92	0.67*	-0.18
Bile ducts, other biliary	23	0.84	85	0.82	66	0.96	30	0.98	204	230.26	0.89	-0.17
Pancreas	179	1.23*	503	0.97	268	0.86*	122	0.96	1,072	1,103.09	0.97	-0.20
<b>Respiratory system</b>	842	0.76*	3,075	0.79*	1,865	0.82*	697	0.80*	6,479	8,156.00	0.79*	-10.68
Nose, nasal cavity, ear	10	1.21	23	0.79	11	0.63	7	1.00	51	61.90	0.82	-0.07
Larynx	62	0.75*	253	0.91	120	0.80*	44	0.84	479	561.92	0.85*	-0.53
Lung, bronchus	768	0.76*	2,793	0.78*	1,729	0.82*	644	0.80*	5,934	7,513.30	0.79*	-10.06
<b>Male breast</b>	13	1.19	36	0.91	29	1.18	12	1.19	90	85.19	1.06	0.03
<b>Male genital system</b>	18	0.01*	47	0.01*	43	0.01*	26	0.02*	134	15,296.30	0.01*	-96.56
Prostate	4	0.00*	13	0.00*	16	0.00*	11	0.01*	44	15,185.25	0.00*	-96.43
Testis	2	0.62	6	0.61	2	0.44	1	0.72	11	19.04	0.58	-0.05
<b>Urinary system</b>	749	1.34*	2,063	1.01	1,248	0.97	542	1.02	4,602	4,418.29	1.04*	1.17
Urinary bladder	448	1.10	1,560	1.04	975	1.02	429	1.06	3,412	3,276.74	1.04*	0.86
Kidney parenchyma	255	2.16*	372	0.88*	203	0.80*	84	0.86	914	894.17	1.02	0.13
Renal pelvis, other urinary	46	1.43*	131	1.14	70	0.99	29	1.00	276	247.38	1.12	0.18
Ureter	10	0.92	27	0.69	30	1.26	8	0.84	75	83.10	0.90	-0.05
<b>Bone, joints</b>	5	1.21	15	1.05	14	1.72	6	1.89	40	29.74	1.35	0.07
<b>Soft tissue including heart</b>	22	1.05	75	0.98	74	1.54*	25	1.23	196	165.62	1.18*	0.19
<b>Kaposi sarcoma</b>	4	0.68	15	0.75	3	0.25*	5	0.94	27	43.20	0.62*	-0.10
<b>Melanoma of skin</b>	153	1.31*	494	1.12*	330	1.15*	123	1.03	1,100	966.30	1.14*	0.85
<b>Eye, orbit</b>	6	0.81	32	1.22	14	0.89	5	0.82	57	55.40	1.03	0.01
<b>Brain, central nervous system</b>	46	0.93	187	1.07	105	1.02	40	1.02	378	366.98	1.03	0.07
<b>Thyroid</b>	27	1.70*	56	1.03	34	1.16	16	1.51	133	110.04	1.21*	0.15
<b>Lymphatic, hematopoietic</b>	433	1.04	1,416	0.93*	958	1.00	379	0.96	3,186	3,286.63	0.97	-0.64
Hodgkin lymphoma	15	1.35	23	0.62*	19	0.94	4	0.54	61	75.97	0.80	-0.10
Non-Hodgkin lymphoma	210	1.22*	589	0.92	396	0.97	161	0.95	1,356	1,385.79	0.98	-0.19
Myeloma	74	0.98	265	0.97	187	1.10	64	0.91	590	590.05	1.00	0.00
Leukemia	134	0.85	539	0.94	356	1.00	150	1.00	1,179	1,234.82	0.95	-0.36
Acute lymphocytic	4	1.01	12	0.88	14	1.78	2	0.65	32	28.57	1.12	0.02
Chronic lymphocytic	60	0.94	160	0.70*	142	1.01	70	1.19	432	493.28	0.88*	-0.39
Acute non-lymphocytic	40	0.77	212	1.11	125	1.03	45	0.88	422	416.29	1.01	0.04
Chronic myeloid	16	0.75	94	1.21	48	0.98	18	0.86	176	168.89	1.04	0.05

\*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.

**Prostate**  
**Males, Long-term Follow-up**

**Table 10.1.3:** Risk of subsequent primary cancers after cancer of the prostate gland, males, long-term follow-up, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	292,029		41,363		11,503		2,837		292,029			
<b>Person-years in interval</b>	1,415,781		115,960		31,647		6,867		1,570,255			
<b>All subsequent cancers</b>	24,099	0.60*	2,238	0.58*	665	0.61*	154	0.67*	27,156	45,242.80	0.60*	-115.18
All excluding same site	24,066	0.90*	2,231	0.87*	662	0.91*	153	0.94	27,112	30,057.55	0.90*	-18.76
<b>Buccal cavity, pharynx</b>	782	0.80*	64	0.78*	17	0.77	4	0.85	867	1,086.53	0.80*	-1.40
Lip	166	0.87	16	0.92	3	0.62	2	1.95	187	213.24	0.88	-0.17
Tongue	128	0.70*	13	0.89	3	0.78	0	0.00	144	202.24	0.71*	-0.37
Salivary gland	97	1.02	12	1.17	5	1.59	0	0.00	114	109.27	1.04	0.03
Mouth	166	0.74*	7	0.38*	2	0.41	2	1.94	177	247.19	0.72*	-0.45
Nasopharynx	22	0.69	3	1.26	2	3.15	0	0.00	27	35.24	0.77	-0.05
Tonsil	64	0.77*	5	0.84	1	0.68	0	0.00	70	91.14	0.77*	-0.13
Oropharynx	22	0.80	0	0.00	0	0.00	0	0.00	22	30.41	0.72	-0.05
Hypopharynx	89	0.84	7	0.88	0	0.00	0	0.00	96	116.56	0.82	-0.13
<b>Digestive system</b>	7,949	0.92*	728	0.86*	209	0.87*	43	0.79	8,929	9,762.64	0.91*	-5.31
Esophagus	443	0.86*	43	0.93	9	0.69	1	0.35	496	575.62	0.86*	-0.51
Stomach	818	0.81*	68	0.70*	31	1.12	4	0.64	921	1,135.58	0.81*	-1.37
Small intestine	153	1.29*	15	1.28	6	1.77	0	0.00	174	134.07	1.30*	0.25
Colon	3,622	0.95*	335	0.86*	79	0.70*	23	0.90	4,059	4,349.55	0.93*	-1.85
Rectum, rectosigmoid junction	1,382	0.95	106	0.80*	33	0.90	4	0.51	1,525	1,629.58	0.94*	-0.67
Anus, anal canal	49	0.96	11	2.43*	4	3.10	0	0.00	64	57.22	1.12	0.04
Liver	230	0.67*	29	0.92	7	0.77	3	1.49	269	385.76	0.70*	-0.74
Gallbladder	51	0.67*	4	0.52	1	0.44	2	3.70	58	86.92	0.67*	-0.18
Bile ducts, other biliary	174	0.87	22	1.00	7	1.02	1	0.60	204	230.26	0.89	-0.17
Pancreas	950	0.97	90	0.96	29	1.08	3	0.49	1,072	1,103.09	0.97	-0.20
<b>Respiratory system</b>	5,782	0.79*	522	0.80*	143	0.80*	32	0.84	6,479	8,156.00	0.79*	-10.68
Nose, nasal cavity, ear	44	0.80	6	1.16	0	0.00	1	2.94	51	61.90	0.82	-0.07
Larynx	435	0.85*	31	0.77	11	1.07	2	0.99	479	561.92	0.85*	-0.53
Lung, bronchus	5,290	0.79*	483	0.80*	132	0.79*	29	0.82	5,934	7,513.30	0.79*	-10.06
<b>Male breast</b>	78	1.04	9	1.22	2	0.92	1	2.02	90	85.19	1.06	0.03
<b>Male genital system</b>	108	0.01*	14	0.01*	8	0.02*	4	0.06*	134	15,296.30	0.01*	-96.56
Prostate	33	0.00*	7	0.01*	3	0.01*	1	0.01*	44	15,185.25	0.00*	-96.43
Testis	10	0.57	0	0.00	1	3.90	0	0.00	11	19.04	0.58	-0.05
<b>Urinary system</b>	4,060	1.04*	374	0.96	141	1.24*	27	1.04	4,602	4,418.29	1.04*	1.17
Urinary bladder	2,983	1.04*	297	1.00	109	1.26*	23	1.15	3,412	3,276.74	1.04*	0.86
Kidney parenchyma	830	1.04	58	0.79	23	1.12	3	0.67	914	894.17	1.02	0.13
Renal pelvis, other urinary	247	1.13	19	0.89	9	1.46	1	0.69	276	247.38	1.12	0.18
Ureter	67	0.91	6	0.84	2	1.01	0	0.00	75	83.10	0.90	-0.05
<b>Bone, joints</b>	34	1.28	4	1.70	1	1.47	1	6.87	40	29.74	1.35	0.07
<b>Soft tissue including heart</b>	171	1.18*	16	1.08	8	1.80	1	0.95	196	165.62	1.18*	0.19
<b>Kaposi sarcoma</b>	22	0.58*	4	1.04	1	0.84	0	0.00	27	43.20	0.62*	-0.10
<b>Melanoma of skin</b>	977	1.15*	89	1.02	24	0.91	10	1.56	1,100	966.30	1.14*	0.85
<b>Eye, orbit</b>	52	1.05	3	0.66	2	1.58	0	0.00	57	55.40	1.03	0.01
<b>Brain, central nervous system</b>	338	1.03	31	1.05	9	1.10	0	0.00	378	366.98	1.03	0.07
<b>Thyroid</b>	117	1.18	14	1.75	1	0.46	1	2.20	133	110.04	1.21*	0.15
<b>Lymphatic, hematopoietic</b>	2,807	0.97	278	0.95	78	0.91	23	1.17	3,186	3,286.63	0.97	-0.64
Hodgkin lymphoma	57	0.83	4	0.71	0	0.00	0	0.00	61	75.97	0.80	-0.10
Non-Hodgkin lymphoma	1,195	0.98	124	1.00	32	0.88	5	0.59	1,356	1,385.79	0.98	-0.19
Myeloma	526	1.01	43	0.83	10	0.66	11	3.24*	590	590.05	1.00	0.00
Leukemia	1,029	0.95	107	0.97	36	1.12	7	0.94	1,179	1,234.82	0.95	-0.36
Acute lymphocytic	30	1.18	1	0.42	0	0.00	1	8.80	32	28.57	1.12	0.02
Chronic lymphocytic	362	0.83*	48	1.11	18	1.44	4	1.41	432	493.28	0.88*	-0.39
Acute non-lymphocytic	377	1.03	36	0.96	7	0.64	2	0.77	422	416.29	1.01	0.04
Chronic myeloid	158	1.07	11	0.71	7	1.55	0	0.00	176	168.89	1.04	0.05

\*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 10.1.4:** Risk of subsequent primary cancers after cancer of the prostate gland, males, <60 years of age, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	203	0.91	644	0.66*	538	0.66*	447	0.57*	1,832	2,801.23	0.65*	-50.03
All excluding same site	203	1.22*	642	0.94	538	0.99	446	0.89*	1,829	1,896.27	0.96	-3.47
<b>Buccal cavity, pharynx</b>	15	1.32	28	0.66*	27	0.95	22	1.11	92	102.27	0.90	-0.53
Lip	0	0.00	5	1.19	9	2.62*	3	0.98	17	11.76	1.45	0.27
Tongue	2	0.80	9	0.96	4	0.66	2	0.48	17	22.17	0.77	-0.27
Salivary gland	0	0.00	0	0.00	5	2.74	4	2.41	9	6.70	1.34	0.12
Mouth	5	1.75	5	0.47	6	0.86	5	1.11	21	24.96	0.84	-0.20
Nasopharynx	1	1.87	1	0.56	0	0.00	3	4.39	5	4.13	1.21	0.05
Tonsil	4	2.41	3	0.53	1	0.30	0	0.00	8	12.65	0.63	-0.24
Oropharynx	1	2.55	0	0.00	1	0.96	0	0.00	2	3.64	0.55	-0.08
Hypopharynx	2	1.52	5	1.01	1	0.28	3	1.24	11	12.23	0.90	-0.06
<b>Digestive system</b>	49	1.09	160	0.84*	132	0.85	110	0.74*	451	539.81	0.84*	-4.58
Esophagus	4	0.89	20	1.11	13	0.97	11	1.00	48	46.89	1.02	0.06
Stomach	7	1.46	12	0.59	13	0.80	13	0.82	45	57.24	0.79	-0.63
Small intestine	0	0.00	5	1.35	4	1.54	5	2.08	14	9.67	1.45	0.22
Colon	14	0.89	63	0.92	48	0.80	39	0.62*	164	207.40	0.79*	-2.24
Rectum, rectosigmoid junction	9	1.01	29	0.77	18	0.60*	17	0.65	73	103.03	0.71*	-1.55
Anus, anal canal	0	0.00	2	0.93	1	0.68	1	0.91	4	5.31	0.75	-0.07
Liver	1	0.37	6	0.56	5	0.63	10	1.42	22	28.49	0.77	-0.33
Gallbladder	0	0.00	1	0.98	0	0.00	1	0.95	2	3.23	0.62	-0.06
Bile ducts, other biliary	0	0.00	3	0.85	7	2.35	3	0.91	13	10.64	1.22	0.12
Pancreas	13	2.37*	17	0.75	23	1.26	9	0.52*	62	63.86	0.97	-0.10
<b>Respiratory system</b>	43	0.90	182	0.89	151	0.90	128	0.85	504	569.18	0.89*	-3.36
Nose, nasal cavity, ear	2	4.26	0	0.00	1	0.80	1	1.00	4	4.53	0.88	-0.03
Larynx	5	0.93	19	0.88	9	0.57	12	1.05	45	54.21	0.83	-0.48
Lung, bronchus	36	0.86	163	0.91	141	0.94	114	0.83*	454	509.17	0.89*	-2.85
<b>Male breast</b>	1	1.77	5	2.21	3	1.87	2	1.41	11	5.85	1.88	0.27
<b>Male genital system</b>	3	0.05*	5	0.02*	3	0.01*	4	0.01*	15	913.96	0.02*	-46.40
Prostate	0	0.00*	2	0.01*	0	0.00*	1	0.00*	3	904.96	0.00*	-46.56
Testis	1	1.36	1	0.49	0	0.00	1	2.66	3	4.03	0.74	-0.05
<b>Urinary system</b>	43	2.12*	104	1.21	95	1.32*	65	0.89	307	251.06	1.22*	2.89
Urinary bladder	22	1.83*	59	1.12	60	1.26	52	1.01	193	164.24	1.18*	1.48
Kidney parenchyma	18	2.44*	36	1.23	31	1.48*	11	0.64	96	74.87	1.28*	1.09
Renal pelvis, other urinary	3	3.64	9	2.38*	4	1.13	2	0.53	18	11.95	1.51	0.31
Ureter	0	0.00	2	1.73	3	2.51	0	0.00	5	3.85	1.30	0.06
<b>Bone, joints</b>	1	3.29	1	0.91	0	0.00	0	0.00	2	2.66	0.75	-0.03
<b>Soft tissue including heart</b>	1	0.87	2	0.47	3	1.02	8	2.98*	14	11.03	1.27	0.15
<b>Kaposi sarcoma</b>	0	0.00	2	0.85	0	0.00	1	1.83	3	4.75	0.63	-0.09
<b>Melanoma of skin</b>	11	1.27	36	1.09	28	1.22	17	0.89	92	83.70	1.10	0.43
<b>Eye, orbit</b>	0	0.00	1	0.63	3	2.71	1	1.02	5	4.10	1.22	0.05
<b>Brain, central nervous system</b>	4	1.16	21	1.61	6	0.65	13	1.83	44	32.76	1.34	0.58
<b>Thyroid</b>	2	1.23	9	1.58	3	0.84	4	1.76	18	13.14	1.37	0.25
<b>Lymphatic, hematopoietic</b>	23	1.28	68	0.97	62	1.13	61	1.14	214	196.62	1.09	0.90
Hodgkin lymphoma	3	3.12	0	0.00	4	2.03	1	0.74	8	7.53	1.06	0.02
Non-Hodgkin lymphoma	12	1.38	27	0.80	25	0.99	21	0.88	85	91.64	0.93	-0.34
Myeloma	2	0.66	14	1.16	14	1.46	13	1.34	43	34.43	1.25	0.44
Leukemia	6	1.15	27	1.26	19	1.07	26	1.40	78	63.03	1.24	0.77
Acute lymphocytic	0	0.00	3	3.73	0	0.00	1	2.24	4	2.01	1.99	0.10
Chronic lymphocytic	4	1.76	2	0.21*	9	1.16	15	1.97*	30	27.06	1.11	0.15
Acute non-lymphocytic	1	0.67	12	1.90	7	1.26	5	0.79	25	19.68	1.27	0.27
Chronic myeloid	1	1.39	7	2.47	3	1.28	4	1.62	15	8.37	1.79*	0.34

\*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.

**Prostate**  
**Males, 60-69 Years of Age**

**Table 10.1.5:** Risk of subsequent primary cancers after cancer of the prostate gland, males, 60-69 years of age, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	96,647		88,716		52,254		18,753		96,647			
<b>Person-years in interval</b>	77,104		277,494		172,290		76,621		603,508			
<b>All subsequent cancers</b>	1,126	0.71*	3,924	0.59*	2,985	0.59*	1,597	0.61*	9,632	15,951.86	0.60*	-104.72
All excluding same site	1,123	1.07*	3,919	0.91*	2,977	0.91*	1,590	0.91*	9,609	10,365.45	0.93*	-12.53
<b>Buccal cavity, pharynx</b>	30	0.58*	160	0.84*	100	0.83	47	0.86	337	416.73	0.81*	-1.32
Lip	4	0.55	33	1.14	19	0.92	12	1.07	68	68.26	1.00	0.00
Tongue	7	0.68	26	0.67*	20	0.81	11	1.08	64	83.68	0.76*	-0.33
Salivary gland	1	0.31	22	1.64*	9	0.87	11	1.70	43	33.48	1.28	0.16
Mouth	9	0.72	21	0.47*	18	0.67	4	0.33*	52	95.87	0.54*	-0.73
Nasopharynx	0	0.00	2	0.28	5	1.24	1	0.64	8	14.83	0.54	-0.11
Tonsil	3	0.56	18	0.94	7	0.62	4	1.02	32	39.70	0.81	-0.13
Oropharynx	0	0.00	8	1.24	3	0.79	0	0.00	11	13.53	0.81	-0.04
Hypopharynx	6	0.89	20	0.82	12	0.83	4	0.74	42	50.95	0.82	-0.15
<b>Digestive system</b>	344	1.11	1,192	0.92*	884	0.89*	500	0.89*	2,920	3,159.28	0.92*	-3.96
Esophagus	29	1.16	73	0.75*	48	0.71*	27	0.84	177	222.33	0.80*	-0.75
Stomach	35	1.02	110	0.77*	89	0.80*	43	0.69*	277	350.68	0.79*	-1.22
Small intestine	5	1.09	29	1.48	19	1.24	11	1.35	64	47.68	1.34*	0.27
Colon	149	1.22*	505	0.96	391	0.92	210	0.81*	1,255	1,333.60	0.94*	-1.30
Rectum, rectosigmoid junction	59	1.00	227	0.95	176	1.01	87	0.97	549	561.38	0.98	-0.21
Anus, anal canal	7	2.90*	4	0.41	6	0.91	10	3.42*	27	21.60	1.25	0.09
Liver	7	0.47*	43	0.71*	31	0.69*	21	0.95	102	142.45	0.72*	-0.67
Gallbladder	1	0.48	6	0.65	6	0.77	6	1.21	19	24.20	0.79	-0.09
Bile ducts, other biliary	6	1.03	19	0.73	18	0.82	16	1.12	59	68.05	0.87	-0.15
Pancreas	45	1.24	163	1.08	95	0.83	64	1.02	367	364.61	1.01	0.04
<b>Respiratory system</b>	260	0.78*	1,052	0.78*	827	0.86*	370	0.80*	2,509	3,106.08	0.81*	-9.89
Nose, nasal cavity, ear	4	1.74	6	0.67	6	0.96	4	1.15	20	20.94	0.96	-0.02
Larynx	20	0.68	91	0.83	56	0.81	20	0.71	187	237.07	0.79*	-0.83
Lung, bronchus	236	0.78*	951	0.78*	763	0.86*	345	0.81*	2,295	2,841.41	0.81*	-9.05
<b>Male breast</b>	5	1.78	9	0.77	13	1.45	7	1.37	34	28.50	1.19	0.09
<b>Male genital system</b>	4	0.01*	16	0.01*	13	0.01*	18	0.02*	51	5,621.72	0.01*	-92.31
Prostate	3	0.01*	5	0.00*	8	0.00*	7	0.01*	23	5,586.41	0.00*	-92.18
Testis	0	0.00	4	1.11	0	0.00	0	0.00	4	7.31	0.55	-0.05
<b>Urinary system</b>	233	1.67*	637	1.07	461	0.97	285	1.07	1,616	1,475.73	1.10*	2.32
Urinary bladder	132	1.39*	450	1.08	358	1.05	219	1.09	1,159	1,053.89	1.10*	1.74
Kidney parenchyma	90	2.48*	145	0.99	79	0.74*	53	1.04	367	340.51	1.08	0.44
Renal pelvis, other urinary	11	1.44	42	1.26	24	0.92	13	0.90	90	81.33	1.11	0.14
Ureter	5	1.94	7	0.62	9	1.02	5	1.02	26	27.60	0.94	-0.03
<b>Bone, joints</b>	1	0.82	6	1.23	9	2.63*	3	1.99	19	11.05	1.72*	0.13
<b>Soft tissue including heart</b>	5	0.97	25	1.14	33	1.95*	11	1.11	74	53.82	1.38*	0.33
<b>Kaposi sarcoma</b>	0	0.00	6	1.41	0	0.00	2	0.93	8	10.74	0.74	-0.05
<b>Melanoma of skin</b>	56	1.57*	174	1.18*	134	1.20*	70	1.18	434	354.60	1.22*	1.32
<b>Eye, orbit</b>	1	0.50	9	1.07	1	0.16*	3	0.94	14	19.84	0.71	-0.10
<b>Brain, central nervous system</b>	20	1.25	72	1.15	42	0.97	18	0.87	152	142.59	1.07	0.16
<b>Thyroid</b>	9	1.61	17	0.82	14	1.08	9	1.69	49	44.59	1.10	0.07
<b>Lymphatic, hematopoietic</b>	125	1.22*	415	0.95	341	0.98	194	0.98	1,075	1,082.30	0.99	-0.12
Hodgkin lymphoma	4	1.18	10	0.80	5	0.61	2	0.52	21	27.89	0.75	-0.11
Non-Hodgkin lymphoma	71	1.58*	172	0.90	168	1.11	80	0.93	491	472.91	1.04	0.30
Myeloma	16	0.85	79	0.98	55	0.88	38	1.08	188	197.70	0.95	-0.16
Leukemia	34	0.97	154	1.01	113	0.91	74	1.03	375	383.79	0.98	-0.15
Acute lymphocytic	1	1.08	1	0.26	6	2.13	1	0.67	9	9.06	0.99	0.00
Chronic lymphocytic	20	1.33	48	0.75*	47	0.93	36	1.29	151	157.60	0.96	-0.11
Acute non-lymphocytic	9	0.81	59	1.16	34	0.79	21	0.83	123	130.07	0.95	-0.12
Chronic myeloid	2	0.42	31	1.54*	14	0.86	9	0.89	56	51.17	1.09	0.08

\*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 10.1.6:** Risk of subsequent primary cancers after cancer of the prostate gland, males, ≥70 years of age, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	2,440	0.59*	8,056	0.59*	4,183	0.60*	1,013	0.59*	15,692	26,489.71	0.59*	-139.68
All excluding same site	2,439	0.90*	8,050	0.88*	4,175	0.88*	1,010	0.84*	15,674	17,795.83	0.88*	-27.45
<b>Buccal cavity, pharynx</b>	73	0.78*	233	0.79*	116	0.81*	16	0.46*	438	567.53	0.77*	-1.68
Lip	17	0.80	54	0.79	25	0.73	6	0.67	102	133.21	0.77*	-0.40
Tongue	9	0.55	36	0.70*	15	0.64	3	0.61	63	96.40	0.65*	-0.43
Salivary gland	10	1.05	29	0.87	21	1.05	2	0.33	62	69.09	0.90	-0.09
Mouth	22	1.05	51	0.77	29	0.92	2	0.27*	104	126.36	0.82*	-0.29
Nasopharynx	2	0.72	6	0.70	5	1.26	1	1.10	14	16.28	0.86	-0.03
Tonsil	3	0.43	19	0.90	6	0.67	2	1.09	30	38.79	0.77	-0.11
Oropharynx	2	0.86	7	0.98	0	0.00	0	0.00	9	13.23	0.68	-0.05
Hypopharynx	6	0.63	26	0.90	11	0.90	0	0.00	43	53.38	0.81	-0.13
<b>Digestive system</b>	815	0.89*	2,915	0.95*	1,458	0.89*	370	0.87*	5,558	6,063.54	0.92*	-6.54
Esophagus	45	0.92	139	0.87	72	0.90	15	0.79	271	306.40	0.88*	-0.46
Stomach	102	0.91	305	0.82*	145	0.75*	47	0.90	599	727.66	0.82*	-1.66
Small intestine	20	1.73*	40	1.02	31	1.49*	5	0.95	96	76.72	1.25*	0.25
Colon	350	0.84*	1,426	1.01	676	0.88*	188	0.91	2,640	2,808.55	0.94*	-2.18
Rectum, rectosigmoid junction	119	0.78*	487	0.98	258	1.03	39	0.64*	903	965.17	0.94*	-0.80
Anus, anal canal	7	1.48	12	0.77	10	1.27	4	1.94	33	30.31	1.09	0.03
Liver	20	0.60*	77	0.69*	40	0.70*	8	0.60	145	214.82	0.67*	-0.90
Gallbladder	7	0.79	17	0.57*	13	0.79	0	0.00*	37	59.50	0.62*	-0.29
Bile ducts, other biliary	17	0.82	63	0.85	41	0.93	11	0.85	132	151.58	0.87	-0.25
Pancreas	121	1.17	323	0.94	150	0.83*	49	1.05	643	674.63	0.95	-0.41
<b>Respiratory system</b>	539	0.74*	1,841	0.78*	887	0.78*	199	0.77*	3,466	4,480.74	0.77*	-13.13
Nose, nasal cavity, ear	4	0.73	17	0.92	4	0.40	2	0.78	27	36.43	0.74	-0.12
Larynx	37	0.78	143	0.98	55	0.86	12	0.91	247	270.64	0.91	-0.31
Lung, bronchus	496	0.74*	1,679	0.77*	825	0.78*	185	0.77*	3,185	4,162.71	0.77*	-12.65
<b>Male breast</b>	7	0.92	22	0.85	13	0.93	3	0.85	45	50.84	0.89	-0.08
<b>Male genital system</b>	11	0.01*	26	0.01*	27	0.01*	4	0.01*	68	8,760.62	0.01*	-112.45
Prostate	1	0.00*	6	0.00*	8	0.00*	3	0.01*	18	8,693.88	0.00*	-112.24
Testis	1	0.73	1	0.24	2	1.10	0	0.00	4	7.70	0.52	-0.05
<b>Urinary system</b>	473	1.18*	1,322	0.97	692	0.94	192	1.01	2,679	2,691.50	1.00	-0.16
Urinary bladder	294	0.98	1,051	1.01	557	0.98	158	1.05	2,060	2,058.61	1.00	0.02
Kidney parenchyma	147	1.97*	191	0.77*	93	0.74*	20	0.68	451	478.79	0.94	-0.36
Renal pelvis, other urinary	32	1.36	80	1.02	42	1.02	14	1.30	168	154.10	1.09	0.18
Ureter	5	0.62	18	0.68	18	1.31	3	0.89	44	51.64	0.85	-0.10
<b>Bone, joints</b>	3	1.16	8	0.96	5	1.26	3	2.65	19	16.03	1.19	0.04
<b>Soft tissue including heart</b>	16	1.10	48	0.96	38	1.35	6	0.77	108	100.78	1.07	0.09
<b>Kaposi sarcoma</b>	4	1.05	7	0.52	3	0.38	2	0.75	16	27.71	0.58*	-0.15
<b>Melanoma of skin</b>	86	1.18	284	1.09	168	1.10	36	0.87	574	528.00	1.09	0.60
<b>Eye, orbit</b>	5	1.02	22	1.36	10	1.19	1	0.52	38	31.47	1.21	0.08
<b>Brain, central nervous system</b>	22	0.73	94	0.94	57	1.13	9	0.78	182	191.63	0.95	-0.12
<b>Thyroid</b>	16	1.84*	30	1.08	17	1.32	3	0.99	66	52.32	1.26	0.18
<b>Lymphatic, hematopoietic</b>	285	0.96	933	0.92*	555	1.00	124	0.85	1,897	2,007.72	0.94*	-1.43
Hodgkin lymphoma	8	1.19	13	0.61	10	0.98	1	0.44	32	40.55	0.79	-0.11
Non-Hodgkin lymphoma	127	1.08	390	0.94	203	0.88	60	1.01	780	821.24	0.95	-0.53
Myeloma	56	1.04	172	0.95	118	1.21*	13	0.52*	359	357.93	1.00	0.01
Leukemia	94	0.80*	358	0.90	224	1.04	50	0.85	726	788.00	0.92*	-0.80
Acute lymphocytic	3	1.07	8	0.89	8	1.78	0	0.00	19	17.49	1.09	0.02
Chronic lymphocytic	36	0.77	110	0.71*	86	1.03	19	0.82	251	308.62	0.81*	-0.75
Acute non-lymphocytic	30	0.76	141	1.05	84	1.15	19	0.99	274	266.54	1.03	0.10
Chronic myeloid	13	0.82	56	1.03	31	1.01	5	0.60	105	109.35	0.96	-0.06

\*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.

**Prostate**  
**Males, Radiotherapy**

**Table 10.1.7:** Risk of subsequent primary cancers after cancer of the prostate gland, males, with initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	90,538		81,681		44,522		13,657		90,538			
<b>Person-years in interval</b>	71,646		247,334		138,888		50,767		508,635			
<b>All subsequent cancers</b>	1,055	0.57*	4,350	0.63*	2,920	0.68*	1,155	0.69*	9,480	14,724.07	0.64*	-103.10
All excluding same site	1,054	0.87*	4,347	0.96*	2,915	1.02	1,155	1.03	9,471	9,744.29	0.97*	-5.37
<b>Buccal cavity, pharynx</b>	34	0.70*	133	0.78*	90	0.92	31	0.87	288	351.95	0.82*	-1.26
Lip	3	0.36	30	0.97	16	0.84	5	0.67	54	65.72	0.82	-0.23
Tongue	3	0.32*	22	0.67	13	0.72	7	1.10	45	67.05	0.67*	-0.43
Salivary gland	2	0.51	17	1.11	14	1.31	4	0.87	37	34.58	1.07	0.05
Mouth	16	1.41	25	0.64*	16	0.73	6	0.76	63	80.37	0.78	-0.34
Nasopharynx	0	0.00	1	0.17*	4	1.30	1	0.96	6	11.62	0.52	-0.11
Tonsil	4	0.89	11	0.73	11	1.42	3	1.17	29	29.92	0.97	-0.02
Oropharynx	1	0.66	3	0.59	2	0.75	0	0.00	6	10.20	0.59	-0.08
Hypopharynx	5	0.87	18	0.93	10	0.98	3	0.88	36	38.80	0.93	-0.06
<b>Digestive system</b>	284	0.75*	1,406	0.98	885	0.96	356	0.97	2,931	3,107.99	0.94*	-3.48
Esophagus	16	0.64	79	0.87	50	0.92	11	0.54*	156	190.58	0.82*	-0.68
Stomach	37	0.85	136	0.83*	95	0.91	41	0.99	309	353.16	0.87*	-0.87
Small intestine	3	0.55	28	1.35	16	1.21	8	1.55	55	44.51	1.24	0.21
Colon	137	0.85	650	1.04	403	0.97	164	0.97	1,354	1,376.37	0.98	-0.44
Rectum, rectosigmoid junction	42	0.63*	241	0.98	161	1.07	65	1.13	509	520.80	0.98	-0.23
Anus, anal canal	7	2.90*	7	0.80	7	1.35	6	3.03*	27	18.38	1.47	0.17
Liver	3	0.18*	60	0.98	23	0.62*	12	0.86	98	128.61	0.76*	-0.60
Gallbladder	2	0.65	5	0.42*	5	0.61	3	0.89	15	26.65	0.56*	-0.23
Bile ducts, other biliary	2	0.25*	24	0.74	22	0.95	12	1.21	60	73.77	0.81	-0.27
Pancreas	34	0.79	165	1.01	86	0.83	33	0.80	318	351.63	0.90	-0.66
<b>Respiratory system</b>	249	0.70*	1,121	0.86*	710	0.92*	262	0.92	2,342	2,707.89	0.86*	-7.19
Nose, nasal cavity, ear	3	1.21	9	0.97	3	0.51	3	1.31	18	19.88	0.91	-0.04
Larynx	23	0.86	97	1.05	42	0.84	12	0.69	174	186.93	0.93	-0.25
Lung, bronchus	222	0.69*	1,010	0.85*	663	0.93	247	0.93	2,142	2,495.22	0.86*	-6.94
<b>Male breast</b>	1	0.30	10	0.79	13	1.57	4	1.22	28	27.60	1.01	0.01
<b>Male genital system</b>	3	0.00*	17	0.01*	15	0.01*	7	0.01*	42	5,014.40	0.01*	-97.76
Prostate	1	0.00*	3	0.00*	5	0.00*	0	0.00*	9	4,979.78	0.00*	-97.73
Testis	0	0.00	3	0.99	2	1.37	0	0.00	5	5.93	0.84	-0.02
<b>Urinary system</b>	227	1.33*	747	1.13*	537	1.24*	233	1.34*	1,744	1,434.40	1.22*	6.09
Urinary bladder	118	0.96	581	1.21*	444	1.38*	201	1.53*	1,344	1,057.63	1.27*	5.63
Kidney parenchyma	93	2.44*	136	0.96	77	0.90	23	0.71	329	297.34	1.11	0.62
Renal pelvis, other urinary	16	1.67	30	0.82	16	0.67	9	0.95	71	79.43	0.89	-0.17
Ureter	4	1.22	5	0.40*	5	0.62	1	0.32	15	26.89	0.56*	-0.23
<b>Bone, joints</b>	1	0.78	5	1.10	2	0.75	2	1.95	10	9.52	1.05	0.01
<b>Soft tissue including heart</b>	8	1.27	32	1.32	36	2.22*	15	2.26*	91	53.44	1.70*	0.74
<b>Kaposi sarcoma</b>	2	1.31	3	0.53	2	0.53	1	0.60	8	12.58	0.64	-0.09
<b>Melanoma of skin</b>	64	1.68*	159	1.08	105	1.07	52	1.30	380	322.70	1.18*	1.13
<b>Eye, orbit</b>	2	0.88	12	1.41	3	0.56	2	0.99	19	18.14	1.05	0.02
<b>Brain, central nervous system</b>	11	0.68	66	1.12	44	1.25	15	1.14	136	122.98	1.11	0.26
<b>Thyroid</b>	10	1.97	21	1.20	12	1.24	7	2.00	50	35.81	1.40*	0.28
<b>Lymphatic, hematopoietic</b>	126	1.00	480	0.99	363	1.13*	127	0.98	1,096	1,062.07	1.03	0.67
Hodgkin lymphoma	2	0.60	7	0.59	10	1.49	1	0.41	20	24.33	0.82	-0.09
Non-Hodgkin lymphoma	58	1.07	214	1.02	155	1.12	55	0.99	482	458.22	1.05	0.47
Myeloma	17	0.74	89	1.01	62	1.09	25	1.10	193	190.90	1.01	0.04
Leukemia	49	1.07	170	0.96	136	1.16	46	0.95	401	388.62	1.03	0.24
Acute lymphocytic	0	0.00	6	1.45	9	3.60*	0	0.00	15	8.75	1.72	0.12
Chronic lymphocytic	26	1.40	34	0.48*	52	1.13	19	1.01	131	154.64	0.85	-0.46
Acute non-lymphocytic	15	0.97	83	1.37*	50	1.23	15	0.91	163	133.21	1.22*	0.59
Chronic myeloid	3	0.49	28	1.16	14	0.85	8	1.18	53	53.32	0.99	-0.01

\*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 10.1.8:** Risk of subsequent primary cancers after cancer of the prostate gland, males, without initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	2,714	0.66*	8,274	0.57*	4,786	0.56*	1,902	0.55*	17,676	30,518.73	0.58*	-120.97
All excluding same site	2,711	0.99	8,264	0.86*	4,775	0.84*	1,891	0.81*	17,641	20,313.26	0.87*	-25.17
<b>Buccal cavity, pharynx</b>	84	0.78*	288	0.80*	153	0.78*	54	0.74*	579	734.57	0.79*	-1.47
Lip	18	0.84	62	0.88	37	0.94	16	1.02	133	147.52	0.90	-0.14
Tongue	15	0.76	49	0.74*	26	0.72	9	0.70	99	135.19	0.73*	-0.34
Salivary gland	9	0.95	34	1.00	21	0.98	13	1.35	77	74.69	1.03	0.02
Mouth	20	0.80	52	0.63*	37	0.85	5	0.31*	114	166.82	0.68*	-0.50
Nasopharynx	3	0.83	8	0.68	6	0.99	4	1.89	21	23.61	0.89	-0.02
Tonsil	6	0.63	29	0.94	3	0.19*	3	0.58	41	61.22	0.67*	-0.19
Oropharynx	2	0.66	12	1.19	2	0.38	0	0.00	16	20.21	0.79	-0.04
Hypopharynx	9	0.76	33	0.85	14	0.70	4	0.58	60	77.76	0.77*	-0.17
<b>Digestive system</b>	924	1.03	2,861	0.92*	1,589	0.85*	624	0.81*	5,998	6,654.65	0.90*	-6.19
Esophagus	62	1.17	153	0.83*	83	0.78*	42	1.01	340	385.04	0.88*	-0.42
Stomach	107	0.99	291	0.79*	152	0.71*	62	0.69*	612	782.42	0.78*	-1.61
Small intestine	22	1.89*	46	1.10	38	1.49*	13	1.22	119	89.56	1.33*	0.28
Colon	376	0.96	1,344	0.97	712	0.85*	273	0.76*	2,705	2,973.18	0.91*	-2.53
Rectum, rectosigmoid junction	145	0.94	502	0.95	291	0.96	78	0.65*	1,016	1,108.78	0.92*	-0.87
Anus, anal canal	7	1.31	11	0.59	10	0.93	9	2.19	37	38.84	0.95	-0.02
Liver	25	0.73	66	0.54*	53	0.73*	27	0.94	171	257.15	0.66*	-0.81
Gallbladder	6	0.74	19	0.68	14	0.83	4	0.56	43	60.27	0.71*	-0.16
Bile ducts, other biliary	21	1.09	61	0.86	44	0.96	18	0.87	144	156.49	0.92	-0.12
Pancreas	145	1.42*	338	0.95	182	0.87	89	1.04	754	751.45	1.00	0.02
<b>Respiratory system</b>	593	0.79*	1,954	0.75*	1,155	0.77*	435	0.75*	4,137	5,448.11	0.76*	-12.35
Nose, nasal cavity, ear	7	1.21	14	0.70	8	0.69	4	0.85	33	42.01	0.79	-0.08
Larynx	39	0.70*	156	0.84*	78	0.79*	32	0.91	305	374.99	0.81*	-0.66
Lung, bronchus	546	0.79*	1,783	0.74*	1,066	0.77*	397	0.73*	3,792	5,018.08	0.76*	-11.55
<b>Male breast</b>	12	1.57	26	0.97	16	0.99	8	1.18	62	57.58	1.08	0.04
<b>Male genital system</b>	15	0.01*	30	0.01*	28	0.01*	19	0.02*	92	10,281.90	0.01*	-95.98
Prostate	3	0.00*	10	0.00*	11	0.00*	11	0.01*	35	10,205.47	0.00*	-95.80
Testis	2	0.88	3	0.44	0	0.00	1	1.08	6	13.11	0.46*	-0.07
<b>Urinary system</b>	522	1.35*	1,316	0.95	711	0.83*	309	0.87*	2,858	2,983.89	0.96*	-1.19
Urinary bladder	330	1.16*	979	0.96	531	0.83*	228	0.84*	2,068	2,219.11	0.93*	-1.42
Kidney parenchyma	162	2.02*	236	0.83*	126	0.75*	61	0.93	585	596.83	0.98	-0.11
Renal pelvis, other urinary	30	1.33	101	1.28*	54	1.15	20	1.02	205	167.95	1.22*	0.35
Ureter	6	0.79	22	0.83	25	1.59*	7	1.09	60	56.20	1.07	0.04
<b>Bone, joints</b>	4	1.40	10	1.03	12	2.19*	4	1.86	30	20.22	1.48*	0.09
<b>Soft tissue including heart</b>	14	0.96	43	0.83	38	1.19	10	0.73	105	112.18	0.94	-0.07
<b>Kaposi sarcoma</b>	2	0.46	12	0.84	1	0.12*	4	1.09	19	30.62	0.62*	-0.11
<b>Melanoma of skin</b>	89	1.13	335	1.13*	225	1.19*	71	0.89	720	643.60	1.12*	0.72
<b>Eye, orbit</b>	4	0.79	20	1.13	11	1.06	3	0.74	38	37.26	1.02	0.01
<b>Brain, central nervous system</b>	35	1.05	121	1.04	61	0.90	25	0.95	242	244.00	0.99	-0.02
<b>Thyroid</b>	17	1.57	35	0.96	22	1.12	9	1.27	83	74.23	1.12	0.08
<b>Lymphatic, hematopoietic</b>	307	1.06	936	0.91*	595	0.94	252	0.94	2,090	2,224.56	0.94*	-1.27
Hodgkin lymphoma	13	1.68	16	0.63	9	0.66	3	0.60	41	51.64	0.79	-0.10
Non-Hodgkin lymphoma	152	1.29*	375	0.88*	241	0.90	106	0.94	874	927.57	0.94	-0.50
Myeloma	57	1.08	176	0.94	125	1.11	39	0.82	397	399.15	0.99	-0.02
Leukemia	85	0.76*	369	0.94	220	0.92	104	1.03	778	846.19	0.92*	-0.64
Acute lymphocytic	4	1.42	6	0.63	5	0.93	2	0.95	17	19.82	0.86	-0.03
Chronic lymphocytic	34	0.75	126	0.80*	90	0.95	51	1.28	301	338.64	0.89*	-0.35
Acute non-lymphocytic	25	0.68	129	0.98	75	0.93	30	0.87	259	283.07	0.91	-0.23
Chronic myeloid	13	0.86	66	1.24	34	1.04	10	0.70	123	115.56	1.06	0.07

\*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.

# Prostate

## Males, Long-term Follow-up, Radiotherapy

**Table 10.1.9:** Risk of subsequent primary cancers after cancer of the prostate gland, males, long-term follow-up, with initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	90,538		13,657		3,750		888		90,538			
<b>Person-years in interval</b>	457,868		38,421		10,353		1,993		508,635			
<b>All subsequent cancers</b>	8,325	0.64*	838	0.67*	252	0.72*	65	0.98	9,480	14,724.07	0.64*	-103.10
All excluding same site	8,316	0.96*	838	1.00	252	1.07	65	1.39*	9,471	9,744.29	0.97*	-5.37
<b>Buccal cavity, pharynx</b>	257	0.81*	26	0.96	4	0.55	1	0.73	288	351.95	0.82*	-1.26
Lip	49	0.84	3	0.53	1	0.65	1	3.43	54	65.72	0.82	-0.23
Tongue	38	0.63*	6	1.23	1	0.78	0	0.00	45	67.05	0.67*	-0.43
Salivary gland	33	1.10	4	1.19	0	0.00	0	0.00	37	34.58	1.07	0.05
Mouth	57	0.79	5	0.83	1	0.63	0	0.00	63	80.37	0.78	-0.34
Nasopharynx	5	0.47	1	1.26	0	0.00	0	0.00	6	11.62	0.52	-0.11
Tonsil	26	0.95	3	1.52	0	0.00	0	0.00	29	29.92	0.97	-0.02
Oropharynx	6	0.65	0	0.00	0	0.00	0	0.00	6	10.20	0.59	-0.08
Hypopharynx	33	0.93	3	1.13	0	0.00	0	0.00	36	38.80	0.93	-0.06
<b>Digestive system</b>	2,575	0.94*	264	0.96	73	0.95	19	1.23	2,931	3,107.99	0.94*	-3.48
Esophagus	145	0.85	10	0.65	1	0.24	0	0.00	156	190.58	0.82*	-0.68
Stomach	268	0.86*	30	0.97	8	0.92	3	1.71	309	353.16	0.87*	-0.87
Small intestine	47	1.19	7	1.82	1	0.92	0	0.00	55	44.51	1.24	0.21
Colon	1,190	0.99	120	0.95	33	0.92	11	1.52	1,354	1,376.37	0.98	-0.44
Rectum, rectosigmoid junction	444	0.96	49	1.12	14	1.19	2	0.88	509	520.80	0.98	-0.23
Anus, anal canal	21	1.28	5	3.37*	1	2.40	0	0.00	27	18.38	1.47	0.17
Liver	86	0.75*	8	0.76	3	1.02	1	1.71	98	128.61	0.76*	-0.60
Gallbladder	12	0.52*	2	0.80	0	0.00	1	6.60	15	26.65	0.56*	-0.23
Bile ducts, other biliary	48	0.75*	10	1.38	2	0.92	0	0.00	60	73.77	0.81	-0.27
Pancreas	285	0.92	23	0.75	10	1.16	0	0.00	318	351.63	0.90	-0.66
<b>Respiratory system</b>	2,080	0.86*	196	0.90	53	0.91	13	1.18	2,342	2,707.89	0.86*	-7.19
Nose, nasal cavity, ear	15	0.85	2	1.17	0	0.00	1	10.19	18	19.88	0.91	-0.04
Larynx	162	0.96	8	0.60	4	1.18	0	0.00	174	186.93	0.93	-0.25
Lung, bronchus	1,895	0.85*	186	0.93	49	0.90	12	1.16	2,142	2,495.22	0.86*	-6.94
<b>Male breast</b>	24	0.99	3	1.24	1	1.44	0	0.00	28	27.60	1.01	0.01
<b>Male genital system</b>	35	0.01*	4	0.01*	2	0.02*	1	0.05*	42	5,014.40	0.01*	-97.76
Prostate	9	0.00*	0	0.00*	0	0.00*	0	0.00*	9	4,979.78	0.00*	-97.73
Testis	5	0.91	0	0.00	0	0.00	0	0.00	5	5.93	0.84	-0.02
<b>Urinary system</b>	1,511	1.20*	156	1.21*	64	1.74*	13	1.74	1,744	1,434.40	1.22*	6.09
Urinary bladder	1,143	1.23*	132	1.35*	57	2.03*	12	2.09*	1,344	1,057.63	1.27*	5.63
Kidney parenchyma	306	1.15*	18	0.74	4	0.59	1	0.76	329	297.34	1.11	0.62
Renal pelvis, other urinary	62	0.89	6	0.85	3	1.50	0	0.00	71	79.43	0.89	-0.17
Ureter	14	0.59*	1	0.42	0	0.00	0	0.00	15	26.89	0.56*	-0.23
<b>Bone, joints</b>	8	0.94	2	2.60	0	0.00	0	0.00	10	9.52	1.05	0.01
<b>Soft tissue including heart</b>	76	1.62*	9	1.84	6	4.15*	0	0.00	91	53.44	1.70*	0.74
<b>Kaposi sarcoma</b>	7	0.64	1	0.82	0	0.00	0	0.00	8	12.58	0.64	-0.09
<b>Melanoma of skin</b>	328	1.16*	36	1.23	10	1.14	6	3.22*	380	322.70	1.18*	1.13
<b>Eye, orbit</b>	17	1.05	2	1.31	0	0.00	0	0.00	19	18.14	1.05	0.02
<b>Brain, central nervous system</b>	121	1.10	12	1.21	3	1.11	0	0.00	136	122.98	1.11	0.26
<b>Thyroid</b>	43	1.33	6	2.25	1	1.42	0	0.00	50	35.81	1.40*	0.28
<b>Lymphatic, hematopoietic</b>	969	1.04	96	1.00	25	0.91	6	1.07	1,096	1,062.07	1.03	0.67
Hodgkin lymphoma	19	0.87	1	0.54	0	0.00	0	0.00	20	24.33	0.82	-0.09
Non-Hodgkin lymphoma	427	1.06	43	1.04	11	0.92	1	0.41	482	458.22	1.05	0.47
Myeloma	168	1.00	17	1.01	4	0.83	4	4.11*	193	190.90	1.01	0.04
Leukemia	355	1.04	35	0.98	10	0.97	1	0.48	401	388.62	1.03	0.24
Acute lymphocytic	15	1.93*	0	0.00	0	0.00	0	0.00	15	8.75	1.72	0.12
Chronic lymphocytic	112	0.82*	12	0.85	6	1.51	1	1.25	131	154.64	0.85	-0.46
Acute non-lymphocytic	148	1.27*	14	1.14	1	0.28	0	0.00	163	133.21	1.22*	0.59
Chronic myeloid	45	0.97	5	1.00	3	2.06	0	0.00	53	53.32	0.99	-0.01

\*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 10.1.10:** Risk of subsequent primary cancers after cancer of the prostate gland, males, long-term follow-up, without initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	15,774	0.58*	1,400	0.54*	413	0.56*	89	0.54*	17,676	30,518.73	0.58*	-120.97
All excluding same site	15,750	0.88*	1,393	0.81*	410	0.83*	88	0.76*	17,641	20,313.26	0.87*	-25.17
<b>Buccal cavity, pharynx</b>	525	0.79*	38	0.69*	13	0.87	3	0.89	579	734.57	0.79*	-1.47
Lip	117	0.89	13	1.11	2	0.61	1	1.36	133	147.52	0.90	-0.14
Tongue	90	0.74*	7	0.72	2	0.78	0	0.00	99	135.19	0.73*	-0.34
Salivary gland	64	0.98	8	1.16	5	2.33	0	0.00	77	74.69	1.03	0.02
Mouth	109	0.72*	2	0.16*	1	0.31	2	2.73	114	166.82	0.68*	-0.50
Nasopharynx	17	0.79	2	1.25	2	4.69	0	0.00	21	23.61	0.89	-0.02
Tonsil	38	0.68*	2	0.50	1	1.02	0	0.00	41	61.22	0.67*	-0.19
Oropharynx	16	0.87	0	0.00	0	0.00	0	0.00	16	20.21	0.79	-0.04
Hypopharynx	56	0.79	4	0.75	0	0.00	0	0.00	60	77.76	0.77*	-0.17
<b>Digestive system</b>	5,374	0.91*	464	0.82*	136	0.83*	24	0.62*	5,998	6,654.65	0.90*	-6.19
Esophagus	298	0.87*	33	1.07	8	0.92	1	0.50	340	385.04	0.88*	-0.42
Stomach	550	0.79*	38	0.58*	23	1.20	1	0.22	612	782.42	0.78*	-1.61
Small intestine	106	1.34*	8	1.02	5	2.18	0	0.00	119	89.56	1.33*	0.28
Colon	2,432	0.93*	215	0.82*	46	0.60*	12	0.66	2,705	2,973.18	0.91*	-2.53
Rectum, rectosigmoid junction	938	0.95	57	0.64*	19	0.77	2	0.35	1,016	1,108.78	0.92*	-0.87
Anus, anal canal	28	0.81	6	1.97	3	3.44	0	0.00	37	38.84	0.95	-0.02
Liver	144	0.63*	21	1.00	4	0.66	2	1.40	171	257.15	0.66*	-0.81
Gallbladder	39	0.73	2	0.38	1	0.65	1	2.57	43	60.27	0.71*	-0.16
Bile ducts, other biliary	126	0.93	12	0.81	5	1.07	1	0.84	144	156.49	0.92	-0.12
Pancreas	665	1.00	67	1.06	19	1.04	3	0.69	754	751.45	1.00	0.02
<b>Respiratory system</b>	3,702	0.76*	326	0.75*	90	0.75*	19	0.71	4,137	5,448.11	0.76*	-12.35
Nose, nasal cavity, ear	29	0.78	4	1.16	0	0.00	0	0.00	33	42.01	0.79	-0.08
Larynx	273	0.80*	23	0.86	7	1.01	2	1.40	305	374.99	0.81*	-0.66
Lung, bronchus	3,395	0.76*	297	0.74*	83	0.74*	17	0.68	3,792	5,018.08	0.76*	-11.55
<b>Male breast</b>	54	1.06	6	1.21	1	0.67	1	2.84	62	57.58	1.08	0.04
<b>Male genital system</b>	73	0.01*	10	0.01*	6	0.02*	3	0.06*	92	10,281.90	0.01*	-95.98
Prostate	24	0.00*	7	0.01*	3	0.01*	1	0.02*	35	10,205.47	0.00*	-95.80
Testis	5	0.41*	0	0.00	1	5.89	0	0.00	6	13.11	0.46*	-0.07
<b>Urinary system</b>	2,549	0.97	218	0.83*	77	1.01	14	0.76	2,858	2,983.89	0.96*	-1.19
Urinary bladder	1,840	0.94*	165	0.83*	52	0.89	11	0.77	2,068	2,219.11	0.93*	-1.42
Kidney parenchyma	524	0.99	40	0.82	19	1.38	2	0.63	585	596.83	0.98	-0.11
Renal pelvis, other urinary	185	1.25*	13	0.91	6	1.43	1	0.96	205	167.95	1.22*	0.35
Ureter	53	1.06	5	1.05	2	1.49	0	0.00	60	56.20	1.07	0.04
<b>Bone, joints</b>	26	1.44	2	1.27	1	2.16	1	9.60	30	20.22	1.48*	0.09
<b>Soft tissue including heart</b>	95	0.96	7	0.70	2	0.66	1	1.33	105	112.18	0.94	-0.07
<b>Kaposi sarcoma</b>	15	0.56*	3	1.13	1	1.21	0	0.00	19	30.62	0.62*	-0.11
<b>Melanoma of skin</b>	649	1.15*	53	0.92	14	0.80	4	0.88	720	643.60	1.12*	0.72
<b>Eye, orbit</b>	35	1.05	1	0.33	2	2.36	0	0.00	38	37.26	1.02	0.01
<b>Brain, central nervous system</b>	217	1.00	19	0.97	6	1.10	0	0.00	242	244.00	0.99	-0.02
<b>Thyroid</b>	74	1.10	8	1.50	0	0.00	1	3.11	83	74.23	1.12	0.08
<b>Lymphatic, hematopoietic</b>	1,838	0.94*	182	0.93	53	0.92	17	1.21	2,090	2,224.56	0.94*	-1.27
Hodgkin lymphoma	38	0.81	3	0.79	0	0.00	0	0.00	41	51.64	0.79	-0.10
Non-Hodgkin lymphoma	768	0.94	81	0.98	21	0.85	4	0.66	874	927.57	0.94	-0.50
Myeloma	358	1.02	26	0.75	6	0.58	7	2.88*	397	399.15	0.99	-0.02
Leukemia	674	0.90*	72	0.97	26	1.19	6	1.13	778	846.19	0.92*	-0.64
Acute lymphocytic	15	0.85	1	0.62	0	0.00	1	12.30	17	19.82	0.86	-0.03
Chronic lymphocytic	250	0.84*	36	1.23	12	1.41	3	1.48	301	338.64	0.89*	-0.35
Acute non-lymphocytic	229	0.92	22	0.88	6	0.81	2	1.08	259	283.07	0.91	-0.23
Chronic myeloid	113	1.11	6	0.58	4	1.30	0	0.00	123	115.56	1.06	0.07

\*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 10.2.1:** Characteristics of patients with an initial cancer of the testis, males, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	14,984	100.0	—	—	14,984	100.0
<b>Initial treatment</b>						
Any radiation	6,751	45.1	—	—	6,751	45.1
With surgery	6,658	44.4	—	—	6,658	44.4
Without surgery	93	0.6	—	—	93	0.6
No radiation	8,233	54.9	—	—	8,233	54.9
With surgery	7,884	52.6	—	—	7,884	52.6
Without surgery	349	2.3	—	—	349	2.3
<b>Race</b>						
White	13,979	93.3	—	—	13,979	93.3
Black	317	2.1	—	—	317	2.1
Other	580	3.9	—	—	580	3.9
Unknown	108	0.7	—	—	108	0.7
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	5,893	39.3	—	—	5,893	39.3
30–49	7,822	52.2	—	—	7,822	52.2
50–69	1,113	7.4	—	—	1,113	7.4
70–79	120	0.8	—	—	120	0.8
≥ 80	36	0.2	—	—	36	0.2
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	14,246	95.1	—	—	14,246	95.1
1st and 2nd cancers	679	4.5	—	—	679	4.5
1st, 2nd, and 3rd cancers	54	0.4	—	—	54	0.4
1st, 2nd, 3rd, and additional cancers	5	0.0	—	—	5	0.0
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	32.6	—	—	—	32.6	—
Median year of 1st cancer diagnosis	1989.6	—	—	—	1989.6	—
Median person-years at risk	8.4	—	—	—	8.4	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	98.0	—	—	—	98.0
1st, 2nd, and additional cancers	—	97.4	—	—	—	97.4
1st cancer only	—	1.6	—	—	—	1.6

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



**Table 10.2.2:** Risk of subsequent primary cancers after cancer of the testis, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	14,984		13,764		10,011		6,602		14,984			
<b>Person-years in interval</b>	11,930		46,730		41,264		44,290		144,214			
<b>All subsequent cancers</b>	56	2.58*	208	2.07*	197	1.59*	342	1.38*	803	494.61	1.62*	21.38
All excluding same site	44	2.15*	127	1.33*	141	1.18	308	1.26*	620	480.99	1.29*	9.64
<b>Buccal cavity, pharynx</b>	2	2.21	1	0.24	6	1.15	16	1.70	25	19.74	1.27	0.36
Lip	0	0.00	0	0.00	1	1.33	2	1.66	3	2.78	1.08	0.02
Tongue	1	5.21	1	1.09	1	0.86	4	1.80	7	4.50	1.56	0.17
Salivary gland	0	0.00	0	0.00	1	2.40	2	2.67	3	1.61	1.87	0.10
Mouth	1	5.03	0	0.00	2	1.73	3	1.47	6	4.32	1.39	0.12
Nasopharynx	0	0.00	0	0.00	0	0.00	1	2.20	1	1.08	0.92	-0.01
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	2.65	0.00	-0.18
Oropharynx	0	0.00	0	0.00	0	0.00	1	3.76	1	0.52	1.91	0.03
Hypopharynx	0	0.00	0	0.00	0	0.00	3	3.49	3	1.72	1.75	0.09
<b>Digestive system</b>	4	1.07	29	1.65*	24	1.07	69	1.50*	126	89.74	1.40*	2.51
Esophagus	0	0.00	3	2.61	2	1.29	6	1.73	11	6.41	1.72	0.32
Stomach	1	2.28	2	1.00	1	0.41	7	1.51	11	9.53	1.15	0.10
Small intestine	0	0.00	2	5.58	0	0.00	1	1.07	3	1.83	1.64	0.08
Colon	1	0.69	9	1.33	7	0.81	18	1.02	35	34.47	1.02	0.04
Rectum, rectosigmoid junction	1	1.34	8	2.27	7	1.55	12	1.32	28	17.84	1.57*	0.70
Anus, anal canal	0	0.00	0	0.00	1	2.84	1	1.53	2	1.34	1.49	0.05
Liver	0	0.00	1	1.17	1	0.87	4	1.55	6	4.76	1.26	0.09
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.55	0.00	-0.04
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	2	1.96	2	1.92	1.04	0.01
Pancreas	0	0.00	3	1.52	5	1.98	17	3.25*	25	10.14	2.47*	1.03
<b>Respiratory system</b>	3	0.88	13	0.81	21	1.02	56	1.34*	93	82.01	1.13	0.76
Nose, nasal cavity, ear	0	0.00	1	4.52	0	0.00	1	2.16	2	0.99	2.01	0.07
Larynx	0	0.00	0	0.00	2	0.95	5	1.24	7	8.16	0.86	-0.08
Lung, bronchus	3	1.01	12	0.86	19	1.05	50	1.34	84	72.37	1.16	0.81
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.01	0.00	-0.07
<b>Male genital system</b>	21	4.67*	102	4.83*	91	3.28*	91	1.29*	305	124.15	2.46*	12.54
Prostate	9	2.80*	20	1.25	35	1.50*	56	0.84	120	109.54	1.10	0.73
Testis	12	9.73*	81	16.53*	56	13.61*	34	10.10*	183	13.62	13.44*	11.75
<b>Urinary system</b>	9	4.87*	13	1.48	13	1.14	42	1.76*	77	45.92	1.68*	2.16
Urinary bladder	3	2.53	7	1.24	10	1.37	27	1.75*	47	29.51	1.59*	1.21
Kidney parenchyma	6	10.57*	6	2.19	3	0.83	10	1.34	25	14.36	1.74*	0.74
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	5	4.91*	5	2.04	2.45	0.20
Ureter	0	0.00	0	0.00	0	0.00	2	6.24	2	0.63	3.19	0.10
<b>Bone, joints</b>	0	0.00	1	2.61	0	0.00	0	0.00	1	1.25	0.80	-0.02
<b>Soft tissue including heart</b>	0	0.00	1	1.03	4	3.96*	3	1.97	8	3.73	2.15	0.30
<b>Kaposi sarcoma</b>	4	4.13*	3	0.68	3	0.66	3	0.74	13	13.94	0.93	-0.06
<b>Melanoma of skin</b>	5	3.33*	13	1.88*	6	0.75	13	0.98	37	29.73	1.24	0.50
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.13	0.00	-0.08
<b>Brain, central nervous system</b>	3	4.67	4	1.44	4	1.35	7	1.61	18	10.72	1.68	0.50
<b>Thyroid</b>	0	0.00	4	2.48	3	1.78	5	2.09	12	6.06	1.98*	0.41
<b>Lymphatic, hematopoietic</b>	5	1.76	22	1.75*	19	1.35	25	1.07	71	52.86	1.34*	1.26
Hodgkin lymphoma	0	0.00	0	0.00	3	1.77	2	1.19	5	5.94	0.84	-0.07
Non-Hodgkin lymphoma	4	2.98	8	1.29	8	1.09	11	0.90	31	27.14	1.14	0.27
Myeloma	0	0.00	0	0.00	0	0.00	5	1.79	5	5.29	0.95	-0.02
Leukemia	1	1.33	14	4.24*	8	2.12	7	1.05	30	14.49	2.07*	1.08
Acute lymphocytic	0	0.00	1	3.03	0	0.00	0	0.00	1	1.05	0.95	0.00
Chronic lymphocytic	1	5.33	2	2.23	1	0.85	2	0.82	6	4.72	1.27	0.09
Acute non-lymphocytic	0	0.00	10	8.88*	6	4.86*	3	1.40	19	4.76	3.99*	0.99
Chronic myeloid	0	0.00	0	0.00	1	1.55	0	0.00	1	2.39	0.42	-0.10

\*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.

## Testis

### Males, Long-term Follow-up

**Table 10.2.3:** Risk of subsequent primary cancers after cancer of the testis, males, long-term follow-up, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	461	1.87*	147	1.32*	119	1.39*	76	1.47*	803	494.61	1.62*	21.38
All excluding same site	312	1.32*	119	1.09	115	1.36*	74	1.44*	620	480.99	1.29*	9.64
<b>Buccal cavity, pharynx</b>	9	0.87	7	1.56	5	1.57	4	2.30	25	19.74	1.27	0.36
Lip	1	0.63	2	3.36	0	0.00	0	0.00	3	2.78	1.08	0.02
Tongue	3	1.32	1	0.96	2	2.64	1	2.35	7	4.50	1.56	0.17
Salivary gland	1	1.17	1	2.81	1	3.98	0	0.00	3	1.61	1.87	0.10
Mouth	3	1.31	1	1.02	1	1.46	1	2.73	6	4.32	1.39	0.12
Nasopharynx	0	0.00	0	0.00	1	6.73	0	0.00	1	1.08	0.92	-0.01
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	2.65	0.00	-0.18
Oropharynx	0	0.00	1	8.09	0	0.00	0	0.00	1	0.52	1.91	0.03
Hypopharynx	0	0.00	1	2.47	0	0.00	2	12.43*	3	1.72	1.75	0.09
<b>Digestive system</b>	57	1.30	27	1.31	26	1.65*	16	1.66	126	89.74	1.40*	2.51
Esophagus	5	1.70	1	0.67	2	1.65	3	3.94	11	6.41	1.72	0.32
Stomach	4	0.82	3	1.40	3	1.92	1	1.09	11	9.53	1.15	0.10
Small intestine	2	2.23	1	2.36	0	0.00	0	0.00	3	1.83	1.64	0.08
Colon	17	1.01	8	1.02	4	0.66	6	1.61	35	34.47	1.02	0.04
Rectum, rectosigmoid junction	16	1.82*	4	0.97	6	1.94	2	1.08	28	17.84	1.57*	0.70
Anus, anal canal	1	1.45	1	3.23	0	0.00	0	0.00	2	1.34	1.49	0.05
Liver	2	0.92	3	2.71	1	1.11	0	0.00	6	4.76	1.26	0.09
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.55	0.00	-0.04
Bile ducts, other biliary	0	0.00	0	0.00	2	5.68	0	0.00	2	1.92	1.04	0.01
Pancreas	8	1.63	6	2.60	8	4.45*	3	2.69	25	10.14	2.47*	1.03
<b>Respiratory system</b>	37	0.92	20	1.06	28	1.95*	8	0.92	93	82.01	1.13	0.76
Nose, nasal cavity, ear	1	1.88	0	0.00	1	6.45	0	0.00	2	0.99	2.01	0.07
Larynx	2	0.48	2	1.06	2	1.46	1	1.28	7	8.16	0.86	-0.08
Lung, bronchus	34	0.97	18	1.08	25	1.95*	7	0.90	84	72.37	1.16	0.81
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.01	0.00	-0.07
<b>Male genital system</b>	214	4.01*	42	1.47*	25	0.98	24	1.44	305	124.15	2.46*	12.54
Prostate	64	1.50*	13	0.50*	21	0.86	22	1.34	120	109.54	1.10	0.73
Testis	149	14.54*	28	12.73*	4	4.42*	2	7.66	183	13.62	13.44*	11.75
<b>Urinary system</b>	35	1.59*	19	1.80*	10	1.22	13	2.55*	77	45.92	1.68*	2.16
Urinary bladder	20	1.42	11	1.63	6	1.13	10	2.98*	47	29.51	1.59*	1.21
Kidney parenchyma	15	2.17*	6	1.79	2	0.78	2	1.32	25	14.36	1.74*	0.74
Renal pelvis, other urinary	0	0.00	2	4.38	2	5.77	1	4.65	5	2.04	2.45	0.20
Ureter	0	0.00	1	7.12	1	9.16	0	0.00	2	0.63	3.19	0.10
<b>Bone, joints</b>	1	1.21	0	0.00	0	0.00	0	0.00	1	1.25	0.80	-0.02
<b>Soft tissue including heart</b>	5	2.27	3	3.93	0	0.00	0	0.00	8	3.73	2.15	0.30
<b>Kaposi sarcoma</b>	10	1.01	2	0.71	0	0.00	1	5.15	13	13.94	0.93	-0.06
<b>Melanoma of skin</b>	24	1.46	7	1.08	5	1.13	1	0.42	37	29.73	1.24	0.50
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.13	0.00	-0.08
<b>Brain, central nervous system</b>	11	1.72	4	1.80	2	1.42	1	1.39	18	10.72	1.68	0.50
<b>Thyroid</b>	7	1.91	1	0.80	4	5.18*	0	0.00	12	6.06	1.98*	0.41
<b>Lymphatic, hematopoietic</b>	46	1.56*	10	0.88	10	1.29	5	1.17	71	52.86	1.34*	1.26
Hodgkin lymphoma	3	0.70	1	1.02	0	0.00	1	5.00	5	5.94	0.84	-0.07
Non-Hodgkin lymphoma	20	1.34	5	0.83	4	0.99	2	0.92	31	27.14	1.14	0.27
Myeloma	0	0.00	2	1.64	3	3.10	0	0.00	5	5.29	0.95	-0.02
Leukemia	23	2.94*	2	0.64	3	1.34	2	1.54	30	14.49	2.07*	1.08
Acute lymphocytic	1	1.42	0	0.00	0	0.00	0	0.00	1	1.05	0.95	0.00
Chronic lymphocytic	4	1.76	0	0.00	1	1.19	1	1.97	6	4.72	1.27	0.09
Acute non-lymphocytic	16	6.10*	1	1.01	2	2.79	0	0.00	19	4.76	3.99*	0.99
Chronic myeloid	1	0.72	0	0.00	0	0.00	0	0.00	1	2.39	0.42	-0.10

\*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 10.2.4:** Risk of subsequent primary cancers after cancer of the testis, males, <35 years of age, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	17	4.27*	80	4.14*	71	2.90*	124	2.19*	292	104.47	2.80*	20.70
All excluding same site	9	2.87*	20	1.27	26	1.23	95	1.77*	150	93.83	1.60*	6.20
<b>Buccal cavity, pharynx</b>	0	0.00	1	1.92	1	1.17	7	2.40	9	4.39	2.05	0.51
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.61	0.00	-0.07
Tongue	0	0.00	1	8.13	1	4.76	2	2.64	4	1.11	3.60	0.32
Salivary gland	0	0.00	0	0.00	0	0.00	2	8.07	2	0.47	4.24	0.17
Mouth	0	0.00	0	0.00	0	0.00	1	1.83	1	0.76	1.31	0.03
Nasopharynx	0	0.00	0	0.00	0	0.00	1	5.38	1	0.37	2.73	0.07
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.70	0.00	-0.08
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.08	0.00	-0.01
Hypopharynx	0	0.00	0	0.00	0	0.00	1	5.68	1	0.20	4.95	0.09
<b>Digestive system</b>	1	4.08	2	1.39	4	1.57	22	2.34*	29	13.64	2.13*	1.70
Esophagus	0	0.00	0	0.00	0	0.00	2	2.74	2	0.92	2.18	0.12
Stomach	0	0.00	0	0.00	0	0.00	3	3.08	3	1.47	2.04	0.17
Small intestine	0	0.00	0	0.00	0	0.00	1	3.61	1	0.43	2.32	0.06
Colon	0	0.00	1	1.81	1	1.11	4	1.31	6	4.61	1.30	0.15
Rectum, rectosigmoid junction	1	23.17	0	0.00	1	2.09	4	2.06	6	2.72	2.20	0.36
Anus, anal canal	0	0.00	0	0.00	1	9.37	1	3.61	2	0.45	4.40	0.17
Liver	0	0.00	0	0.00	0	0.00	0	0.00	0	0.98	0.00	-0.11
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.01
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.31	0.00	-0.03
Pancreas	0	0.00	0	0.00	1	4.12	6	5.73*	7	1.42	4.94*	0.62
<b>Respiratory system</b>	0	0.00	0	0.00	1	0.73	11	1.68	12	8.68	1.38	0.37
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.26	0.00	-0.03
Larynx	0	0.00	0	0.00	0	0.00	2	2.37	2	1.10	1.82	0.10
Lung, bronchus	0	0.00	0	0.00	1	0.93	9	1.64	10	7.06	1.42	0.32
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-0.02
<b>Male genital system</b>	8	9.35*	60	16.49*	45	12.84*	40	4.46*	153	16.96	9.02*	15.02
Prostate	0	0.00	0	0.00	0	0.00	10	1.69	10	6.12	1.63	0.43
Testis	8	9.45*	60	16.73*	45	13.66*	29	9.95*	142	10.64	13.34*	14.50
<b>Urinary system</b>	2	14.98*	1	1.28	3	2.15	16	3.15*	22	7.39	2.98*	1.61
Urinary bladder	0	0.00	0	0.00	2	2.58	6	2.20	8	4.06	1.97	0.44
Kidney parenchyma	2	44.09*	1	3.46	1	1.75	6	2.76*	10	3.08	3.25*	0.76
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	4	24.25*	4	0.25	16.08*	0.41
Ureter	0	0.00	0	0.00	0	0.00	2	55.04*	2	0.05	37.38*	0.21
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.70	0.00	-0.08
<b>Soft tissue including heart</b>	0	0.00	1	2.44	3	6.92*	1	1.46	5	1.62	3.08	0.37
<b>Kaposi sarcoma</b>	2	4.11	2	0.74	2	0.58	3	0.87	9	10.05	0.90	-0.12
<b>Melanoma of skin</b>	1	2.14	5	2.09	2	0.63	4	0.66	12	12.03	1.00	0.00
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.04
<b>Brain, central nervous system</b>	1	4.01	1	0.90	2	1.64	6	3.18*	10	4.46	2.24*	0.61
<b>Thyroid</b>	0	0.00	2	2.76	2	2.40	2	1.51	6	3.03	1.98	0.33
<b>Lymphatic, hematopoietic</b>	2	2.10	5	1.16	6	1.21	7	0.82	20	18.81	1.06	0.13
Hodgkin lymphoma	0	0.00	0	0.00	1	0.89	2	1.83	3	3.92	0.76	-0.10
Non-Hodgkin lymphoma	2	5.21	0	0.00	3	1.10	1	0.20	6	10.10	0.59	-0.45
Myeloma	0	0.00	0	0.00	0	0.00	1	1.70	1	0.80	1.25	0.02
Leukemia	0	0.00	5	5.56*	2	2.03	3	1.59	10	3.99	2.51*	0.66
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.60	0.00	-0.07
Chronic lymphocytic	0	0.00	0	0.00	0	0.00	1	2.10	1	0.62	1.61	0.04
Acute non-lymphocytic	0	0.00	5	13.97*	2	5.38	1	1.63	8	1.43	5.60*	0.73
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.89	0.00	-0.10

\*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.

# Testis

## Males, ≥35 Years of Age

**Table 10.2.5:** Risk of subsequent primary cancers after cancer of the testis, males, ≥35 years of age, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	39	2.20*	128	1.58*	126	1.27*	218	1.14	511	390.14	1.31*	22.54
All excluding same site	35	2.02*	107	1.34*	115	1.17	213	1.11	470	387.17	1.21*	15.45
<b>Buccal cavity, pharynx</b>	2	2.47	0	0.00*	5	1.15	9	1.38	16	15.36	1.04	0.12
Lip	0	0.00	0	0.00	1	1.68	2	2.27	3	2.17	1.38	0.15
Tongue	1	5.84	0	0.00	0	0.00	2	1.37	3	3.39	0.89	-0.07
Salivary gland	0	0.00	0	0.00	1	3.29	0	0.00	1	1.14	0.88	-0.03
Mouth	1	5.37	0	0.00	2	1.95	2	1.34	5	3.56	1.41	0.27
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.72	0.00	-0.13
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.95	0.00	-0.36
Oropharynx	0	0.00	0	0.00	0	0.00	1	5.04	1	0.44	2.25	0.10
Hypopharynx	0	0.00	0	0.00	0	0.00	2	2.93	2	1.51	1.32	0.09
<b>Digestive system</b>	3	0.86	27	1.67*	20	1.00	47	1.29	97	76.10	1.27*	3.90
Esophagus	0	0.00	3	2.74	2	1.40	4	1.46	9	5.50	1.64	0.65
Stomach	1	2.44	2	1.09	1	0.46	4	1.10	8	8.06	0.99	-0.01
Small intestine	0	0.00	2	6.58	0	0.00	0	0.00	2	1.40	1.43	0.11
Colon	1	0.74	8	1.29	6	0.78	14	0.96	29	29.86	0.97	-0.16
Rectum, rectosigmoid junction	0	0.00	8	2.46*	6	1.49	8	1.12	22	15.12	1.45	1.28
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.89	0.00	-0.17
Liver	0	0.00	1	1.28	1	1.01	4	2.18	6	3.78	1.59	0.41
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-0.09
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	2	2.48	2	1.61	1.24	0.07
Pancreas	0	0.00	3	1.61	4	1.75	11	2.63*	18	8.72	2.06*	1.73
<b>Respiratory system</b>	3	0.91	13	0.84	20	1.04	45	1.27	81	73.33	1.10	1.43
Nose, nasal cavity, ear	0	0.00	1	5.66	0	0.00	1	3.19	2	0.73	2.74	0.24
Larynx	0	0.00	0	0.00	2	1.03	3	0.94	5	7.07	0.71	-0.39
Lung, bronchus	3	1.04	12	0.89	18	1.06	41	1.29	74	65.31	1.13	1.62
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.83	0.00	-0.15
<b>Male genital system</b>	13	3.57*	42	2.40*	46	1.90*	51	0.82	152	107.19	1.42*	8.36
Prostate	9	2.80*	20	1.25	35	1.51*	46	0.75	110	103.42	1.06	1.23
Testis	4	10.37*	21	15.96*	11	13.38*	5	11.06*	41	2.98	13.78*	7.09
<b>Urinary system</b>	7	4.09*	12	1.50	10	1.00	26	1.38	55	38.53	1.43*	3.07
Urinary bladder	3	2.71	7	1.36	8	1.23	21	1.66*	39	25.46	1.53*	2.53
Kidney parenchyma	4	7.66*	5	2.04	2	0.66	4	0.76	15	11.28	1.33	0.69
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	1	1.17	1	1.79	0.56	-0.15
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.57	0.00	-0.11
<b>Bone, joints</b>	0	0.00	1	6.33	0	0.00	0	0.00	1	0.54	1.84	0.09
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	1.73	2	2.39	3	2.10	1.43	0.17
<b>Kaposi sarcoma</b>	2	4.16	1	0.59	1	0.90	0	0.00	4	3.89	1.03	0.02
<b>Melanoma of skin</b>	4	3.87*	8	1.77	4	0.82	9	1.24	25	17.71	1.41	1.36
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.79	0.00	-0.15
<b>Brain, central nervous system</b>	2	5.08	3	1.79	2	1.15	1	0.41	8	6.26	1.28	0.32
<b>Thyroid</b>	0	0.00	2	2.26	1	1.17	3	2.81	6	3.02	1.98	0.56
<b>Lymphatic, hematopoietic</b>	3	1.60	17	2.07*	13	1.43	18	1.21	51	34.05	1.50*	3.16
Hodgkin lymphoma	0	0.00	0	0.00	2	3.51	0	0.00	2	2.02	0.99	0.00
Non-Hodgkin lymphoma	2	2.09	8	1.90	5	1.08	10	1.38	25	17.04	1.47	1.48
Myeloma	0	0.00	0	0.00	0	0.00	4	1.81	4	4.48	0.89	-0.09
Leukemia	1	1.84	9	3.74*	6	2.16	4	0.84	20	10.50	1.90*	1.77
Acute lymphocytic	0	0.00	1	8.08	0	0.00	0	0.00	1	0.45	2.23	0.10
Chronic lymphocytic	1	5.49	2	2.34	1	0.92	1	0.51	5	4.10	1.22	0.17
Acute non-lymphocytic	0	0.00	5	6.51*	4	4.63*	2	1.31	11	3.33	3.30*	1.43
Chronic myeloid	0	0.00	0	0.00	1	2.53	0	0.00	1	1.50	0.67	-0.09

\*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 10.2.6:** Risk of subsequent primary cancers after cancer of the testis, males, with initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	31	2.60*	126	2.19*	119	1.61*	227	1.47*	503	297.77	1.69*	29.88
All excluding same site	25	2.20*	71	1.28*	93	1.29*	212	1.39*	401	292.02	1.37*	15.87
<b>Buccal cavity, pharynx</b>	0	0.00	1	0.39	5	1.56	5	0.87	11	12.07	0.91	-0.16
Lip	0	0.00	0	0.00	1	2.19	0	0.00	1	1.68	0.59	-0.10
Tongue	0	0.00	1	1.82	0	0.00	2	1.48	3	2.72	1.10	0.04
Salivary gland	0	0.00	0	0.00	1	4.13	0	0.00	1	0.94	1.07	0.01
Mouth	0	0.00	0	0.00	2	2.74	1	0.79	3	2.70	1.11	0.04
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.65	0.00	-0.09
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.60	0.00	-0.23
Oropharynx	0	0.00	0	0.00	0	0.00	1	5.95	1	0.33	3.01	0.10
Hypopharynx	0	0.00	0	0.00	0	0.00	1	1.82	1	1.10	0.91	-0.01
<b>Digestive system</b>	4	1.87	17	1.61	15	1.07	48	1.67*	84	55.43	1.52*	4.16
Esophagus	0	0.00	2	2.86	1	1.03	5	2.28	8	4.01	2.00	0.58
Stomach	1	4.02	2	1.67	0	0.00	6	2.09	9	5.84	1.54	0.46
Small intestine	0	0.00	2	9.48*	0	0.00	0	0.00	2	1.11	1.81	0.13
Colon	1	1.22	6	1.49	3	0.56	12	1.08	22	21.34	1.03	0.10
Rectum, rectosigmoid junction	1	2.31	4	1.87	6	2.12	7	1.23	18	11.09	1.62	1.01
Anus, anal canal	0	0.00	0	0.00	1	4.94	1	2.67	2	0.77	2.60	0.18
Liver	0	0.00	0	0.00	1	1.40	3	1.88	4	2.92	1.37	0.16
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.05
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	2	3.16	2	1.18	1.70	0.12
Pancreas	0	0.00	1	0.84	3	1.90	11	3.35*	15	6.30	2.38*	1.27
<b>Respiratory system</b>	0	0.00	6	0.60	18	1.36	45	1.67*	69	52.14	1.32*	2.45
Nose, nasal cavity, ear	0	0.00	1	7.80	0	0.00	1	3.58	2	0.59	3.39	0.21
Larynx	0	0.00	0	0.00	2	1.48	5	1.95	7	5.18	1.35	0.26
Lung, bronchus	0	0.00	5	0.57	16	1.37	39	1.63*	60	46.13	1.30	2.02
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.62	0.00	-0.09
<b>Male genital system</b>	11	4.66*	69	5.84*	51	3.05*	57	1.25	188	76.37	2.46*	16.25
Prostate	5	2.80	14	1.47	25	1.68*	41	0.94	85	70.01	1.21	2.18
Testis	6	10.93*	55	25.69*	26	15.27*	15	10.99*	102	5.76	17.72*	14.01
<b>Urinary system</b>	6	5.66*	7	1.32	9	1.27	26	1.74*	48	28.43	1.69*	2.85
Urinary bladder	2	2.95	6	1.77	7	1.54	17	1.74*	32	18.36	1.74*	1.99
Kidney parenchyma	4	12.13*	1	0.60	2	0.90	5	1.09	12	8.79	1.37	0.47
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	4	6.19*	4	1.28	3.13	0.40
Ureter	0	0.00	0	0.00	0	0.00	2	9.71*	2	0.40	5.05	0.23
<b>Bone, joints</b>	0	0.00	1	5.70	0	0.00	0	0.00	1	0.60	1.65	0.06
<b>Soft tissue including heart</b>	0	0.00	0	0.00	3	5.56*	1	1.17	4	2.00	2.00	0.29
<b>Kaposi sarcoma</b>	3	6.19*	1	0.47	0	0.00	2	1.09	6	6.49	0.92	-0.07
<b>Melanoma of skin</b>	3	3.73	8	2.12	5	1.13	7	0.93	23	16.54	1.39	0.94
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.66	0.00	-0.10
<b>Brain, central nervous system</b>	1	3.03	3	2.04	3	1.87	4	1.62	11	5.88	1.87	0.75
<b>Thyroid</b>	0	0.00	1	1.19	1	1.14	4	3.11	6	3.20	1.88	0.41
<b>Lymphatic, hematopoietic</b>	3	2.05	12	1.79	8	1.02	20	1.47	43	29.63	1.45*	1.95
Hodgkin lymphoma	0	0.00	0	0.00	1	1.30	1	1.22	2	2.73	0.73	-0.11
Non-Hodgkin lymphoma	3	4.17	6	1.77	3	0.74	10	1.42	22	15.22	1.45	0.99
Myeloma	0	0.00	0	0.00	0	0.00	3	1.71	3	3.27	0.92	-0.04
Leukemia	0	0.00	6	3.30*	4	1.83	6	1.49	16	8.41	1.90*	1.10
Acute lymphocytic	0	0.00	1	7.18	0	0.00	0	0.00	1	0.49	2.02	0.07
Chronic lymphocytic	0	0.00	1	1.83	1	1.34	1	0.65	3	2.95	1.02	0.01
Acute non-lymphocytic	0	0.00	3	4.93	2	2.85	3	2.35	8	2.72	2.94*	0.77
Chronic myeloid	0	0.00	0	0.00	1	2.83	0	0.00	1	1.33	0.75	-0.05

\*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.

## Testis

### Males, No Radiotherapy

**Table 10.2.7:** Risk of subsequent primary cancers after cancer of the testis, males, without initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	8,233		7,456		5,292		3,468		8,233			
<b>Person-years in interval</b>	6,501		24,950		21,739		22,342		75,532			
<b>All subsequent cancers</b>	25	2.55*	82	1.91*	78	1.56*	115	1.22*	300	196.84	1.52*	13.66
All excluding same site	19	2.08*	56	1.40*	48	1.01	96	1.04	219	188.98	1.16*	3.97
<b>Buccal cavity, pharynx</b>	2	5.31	0	0.00	1	0.50	11	3.02*	14	7.67	1.82	0.84
Lip	0	0.00	0	0.00	0	0.00	2	4.26	2	1.10	1.82	0.12
Tongue	1	12.44	0	0.00	1	2.20	2	2.29	4	1.77	2.25	0.29
Salivary gland	0	0.00	0	0.00	0	0.00	2	6.62	2	0.67	2.99	0.18
Mouth	1	12.41	0	0.00	0	0.00	2	2.62	3	1.62	1.85	0.18
Nasopharynx	0	0.00	0	0.00	0	0.00	1	5.53	1	0.44	2.30	0.07
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.05	0.00	-0.14
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.03
Hypopharynx	0	0.00	0	0.00	0	0.00	2	6.47	2	0.62	3.23	0.18
<b>Digestive system</b>	0	0.00	12	1.70	9	1.06	21	1.22	42	34.31	1.22	1.02
Esophagus	0	0.00	1	2.23	1	1.73	1	0.78	3	2.41	1.25	0.08
Stomach	0	0.00	0	0.00	1	1.07	1	0.57	2	3.69	0.54	-0.22
Small intestine	0	0.00	0	0.00	0	0.00	1	2.75	1	0.73	1.38	0.04
Colon	0	0.00	3	1.10	4	1.23	6	0.92	13	13.13	0.99	-0.02
Rectum, rectosigmoid junction	0	0.00	4	2.89	1	0.59	5	1.48	10	6.75	1.48	0.43
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.57	0.00	-0.08
Liver	0	0.00	1	2.93	0	0.00	1	1.02	2	1.84	1.09	0.02
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.21	0.00	-0.03
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.75	0.00	-0.10
Pancreas	0	0.00	2	2.58	2	2.13	6	3.09*	10	3.83	2.61*	0.82
<b>Respiratory system</b>	3	2.16	7	1.15	3	0.40	11	0.73	24	29.87	0.80	-0.78
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.40	0.00	-0.05
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	2.98	0.00	-0.39
Lung, bronchus	3	2.48	7	1.33	3	0.46	11	0.83	24	26.25	0.91	-0.30
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.39	0.00	-0.05
<b>Male genital system</b>	10	4.68*	33	3.54*	40	3.64*	34	1.34	117	47.78	2.45*	9.16
Prostate	4	2.79	6	0.93	10	1.18	15	0.65	35	39.53	0.89	-0.60
Testis	6	8.77*	26	9.42*	30	12.43*	19	9.49*	81	7.86	10.31*	9.68
<b>Urinary system</b>	3	3.82	6	1.72	4	0.93	16	1.80*	29	17.49	1.66*	1.52
Urinary bladder	1	1.96	1	0.44	3	1.10	10	1.77	15	11.15	1.35	0.51
Kidney parenchyma	2	8.41	5	4.60*	1	0.72	5	1.75	13	5.57	2.33*	0.98
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	1	2.69	1	0.77	1.31	0.03
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.23	0.00	-0.03
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.64	0.00	-0.08
<b>Soft tissue including heart</b>	0	0.00	1	2.14	1	2.12	2	2.99	4	1.72	2.32	0.30
<b>Kaposi sarcoma</b>	1	2.07	2	0.88	3	1.20	1	0.45	7	7.45	0.94	-0.06
<b>Melanoma of skin</b>	2	2.88	5	1.60	1	0.28	6	1.04	14	13.19	1.06	0.11
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.47	0.00	-0.06
<b>Brain, central nervous system</b>	2	6.39	1	0.76	1	0.74	3	1.60	7	4.85	1.44	0.29
<b>Thyroid</b>	0	0.00	3	3.90	2	2.48	1	0.90	6	2.86	2.10	0.42
<b>Lymphatic, hematopoietic</b>	2	1.46	10	1.72	11	1.75	5	0.51	28	23.22	1.21	0.63
Hodgkin lymphoma	0	0.00	0	0.00	2	2.16	1	1.17	3	3.22	0.93	-0.03
Non-Hodgkin lymphoma	1	1.60	2	0.71	5	1.52	1	0.19	9	11.92	0.76	-0.39
Myeloma	0	0.00	0	0.00	0	0.00	2	1.92	2	2.01	0.99	0.00
Leukemia	1	2.78	8	5.38*	4	2.53	1	0.38	14	6.07	2.30*	1.05
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.56	0.00	-0.07
Chronic lymphocytic	1	12.69	1	2.84	0	0.00	1	1.11	3	1.77	1.70	0.16
Acute non-lymphocytic	0	0.00	7	13.53*	4	7.50*	0	0.00	11	2.03	5.41*	1.19
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	1.06	0.00	-0.14

\*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 10.2.8:** Risk of subsequent primary cancers after cancer of the testis, males, long-term follow-up, with initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	276	1.92*	85	1.24	91	1.70*	51	1.58*	503	297.77	1.69*	29.88
All excluding same site	189	1.36*	75	1.11	88	1.65*	49	1.52*	401	292.02	1.37*	15.87
<b>Buccal cavity, pharynx</b>	6	0.95	2	0.73	1	0.51	2	1.86	11	12.07	0.91	-0.16
Lip	1	1.05	0	0.00	0	0.00	0	0.00	1	1.68	0.59	-0.10
Tongue	1	0.73	0	0.00	1	2.20	1	3.83	3	2.72	1.10	0.04
Salivary gland	1	2.05	0	0.00	0	0.00	0	0.00	1	0.94	1.07	0.01
Mouth	2	1.40	1	1.62	0	0.00	0	0.00	3	2.70	1.11	0.04
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.65	0.00	-0.09
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.60	0.00	-0.23
Oropharynx	0	0.00	1	12.74	0	0.00	0	0.00	1	0.33	3.01	0.10
Hypopharynx	0	0.00	0	0.00	0	0.00	1	9.84	1	1.10	0.91	-0.01
<b>Digestive system</b>	36	1.35	16	1.25	20	2.02*	12	1.99*	84	55.43	1.52*	4.16
Esophagus	3	1.66	1	1.05	1	1.31	3	6.26*	8	4.01	2.00	0.58
Stomach	3	1.01	2	1.51	3	3.08	1	1.75	9	5.84	1.54	0.46
Small intestine	2	3.76	0	0.00	0	0.00	0	0.00	2	1.11	1.81	0.13
Colon	10	0.98	3	0.61	4	1.04	5	2.14	22	21.34	1.03	0.10
Rectum, rectosigmoid junction	11	2.04*	3	1.16	3	1.54	1	0.86	18	11.09	1.62	1.01
Anus, anal canal	1	2.53	1	5.69	0	0.00	0	0.00	2	0.77	2.60	0.18
Liver	1	0.75	2	2.93	1	1.80	0	0.00	4	2.92	1.37	0.16
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.34	0.00	-0.05
Bile ducts, other biliary	0	0.00	0	0.00	2	9.04*	0	0.00	2	1.18	1.70	0.12
Pancreas	4	1.32	4	2.76	6	5.29*	1	1.43	15	6.30	2.38*	1.27
<b>Respiratory system</b>	24	0.95	15	1.24	23	2.48*	7	1.27	69	52.14	1.32*	2.45
Nose, nasal cavity, ear	1	3.22	0	0.00	1	10.64	0	0.00	2	0.59	3.39	0.21
Larynx	2	0.77	2	1.66	2	2.29	1	2.03	7	5.18	1.35	0.26
Lung, bronchus	21	0.95	13	1.21	20	2.42*	6	1.21	60	46.13	1.30	2.02
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.62	0.00	-0.09
<b>Male genital system</b>	131	4.24*	21	1.16	20	1.20	16	1.50	188	76.37	2.46*	16.25
Prostate	44	1.68*	10	0.58	17	1.05	14	1.34	85	70.01	1.21	2.18
Testis	87	19.81*	10	11.42*	3	8.12*	2	16.71*	102	5.76	17.72*	14.01
<b>Urinary system</b>	22	1.63*	9	1.36	9	1.73	8	2.51*	48	28.43	1.69*	2.85
Urinary bladder	15	1.74	5	1.18	5	1.48	7	3.32*	32	18.36	1.74*	1.99
Kidney parenchyma	7	1.66	2	0.97	2	1.27	1	1.06	12	8.79	1.37	0.47
Renal pelvis, other urinary	0	0.00	2	6.92	2	8.99*	0	0.00	4	1.28	3.13	0.40
Ureter	0	0.00	1	11.15	1	13.99	0	0.00	2	0.40	5.05	0.23
<b>Bone, joints</b>	1	2.61	0	0.00	0	0.00	0	0.00	1	0.60	1.65	0.06
<b>Soft tissue including heart</b>	3	2.60	1	2.41	0	0.00	0	0.00	4	2.00	2.00	0.29
<b>Kaposi sarcoma</b>	4	0.86	1	0.79	0	0.00	1	10.28	6	6.49	0.92	-0.07
<b>Melanoma of skin</b>	16	1.78*	5	1.39	2	0.79	0	0.00	23	16.54	1.39	0.94
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.66	0.00	-0.10
<b>Brain, central nervous system</b>	7	2.05	2	1.63	1	1.24	1	2.32	11	5.88	1.87	0.75
<b>Thyroid</b>	2	1.05	0	0.00	4	9.61*	0	0.00	6	3.20	1.88	0.41
<b>Lymphatic, hematopoietic</b>	23	1.44	9	1.39	8	1.74	3	1.16	43	29.63	1.45*	1.95
Hodgkin lymphoma	1	0.52	1	2.16	0	0.00	0	0.00	2	2.73	0.73	-0.11
Non-Hodgkin lymphoma	12	1.47	4	1.18	4	1.69	2	1.52	22	15.22	1.45	0.99
Myeloma	0	0.00	2	2.62	1	1.64	0	0.00	3	3.27	0.92	-0.04
Leukemia	10	2.28*	2	1.08	3	2.19	1	1.26	16	8.41	1.90*	1.10
Acute lymphocytic	1	3.23	0	0.00	0	0.00	0	0.00	1	0.49	2.02	0.07
Chronic lymphocytic	2	1.43	0	0.00	1	1.87	0	0.00	3	2.95	1.02	0.01
Acute non-lymphocytic	5	3.46*	1	1.72	2	4.58	0	0.00	8	2.72	2.94*	0.77
Chronic myeloid	1	1.34	0	0.00	0	0.00	0	0.00	1	1.33	0.75	-0.05

\*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.

## Testis

### Males, Long-term Follow-up, No Radiotherapy

**Table 10.2.9:** Risk of subsequent primary cancers after cancer of the testis, males, long-term follow-up, without initial radiotherapy, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<10 years		10-14 years		15-19 years		≥20 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	8,233		3,468		1,903		815		8,233			
<b>Person-years in interval</b>	53,190		13,273		6,649		2,419		75,532			
<b>All subsequent cancers</b>	185	1.80*	62	1.44*	28	0.88	25	1.30	300	196.84	1.52*	13.66
All excluding same site	123	1.27*	44	1.05	27	0.86	25	1.31	219	188.98	1.16*	3.97
<b>Buccal cavity, pharynx</b>	3	0.74	5	2.89	4	3.21	2	3.00	14	7.67	1.82	0.84
Lip	0	0.00	2	8.53	0	0.00	0	0.00	2	1.10	1.82	0.12
Tongue	2	2.22	1	2.46	1	3.30	0	0.00	4	1.77	2.25	0.29
Salivary gland	0	0.00	1	6.83	1	10.00	0	0.00	2	0.67	2.99	0.18
Mouth	1	1.16	0	0.00	1	3.87	1	7.26	3	1.62	1.85	0.18
Nasopharynx	0	0.00	0	0.00	1	16.84	0	0.00	1	0.44	2.30	0.07
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.05	0.00	-0.14
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.03
Hypopharynx	0	0.00	1	6.99	0	0.00	1	16.88	2	0.62	3.23	0.18
<b>Digestive system</b>	21	1.22	11	1.42	6	1.03	4	1.11	42	34.31	1.22	1.02
Esophagus	2	1.78	0	0.00	1	2.24	0	0.00	3	2.41	1.25	0.08
Stomach	1	0.52	1	1.22	0	0.00	0	0.00	2	3.69	0.54	-0.22
Small intestine	0	0.00	1	6.01	0	0.00	0	0.00	1	0.73	1.38	0.04
Colon	7	1.06	5	1.70	0	0.00	1	0.71	13	13.13	0.99	-0.02
Rectum, rectosigmoid junction	5	1.48	1	0.66	3	2.61	1	1.43	10	6.75	1.48	0.43
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.57	0.00	-0.08
Liver	1	1.17	1	2.35	0	0.00	0	0.00	2	1.84	1.09	0.02
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.21	0.00	-0.03
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.75	0.00	-0.10
Pancreas	4	2.11	2	2.33	2	3.02	2	4.77	10	3.83	2.61*	0.82
<b>Respiratory system</b>	13	0.87	5	0.74	5	0.98	1	0.31	24	29.87	0.80	-0.78
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.40	0.00	-0.05
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	2.98	0.00	-0.39
Lung, bronchus	13	1.00	5	0.85	5	1.11	1	0.35	24	26.25	0.91	-0.30
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.39	0.00	-0.05
<b>Male genital system</b>	83	3.70*	21	2.03*	5	0.56	8	1.32	117	47.78	2.45*	9.16
Prostate	20	1.22	3	0.34*	4	0.48	8	1.36	35	39.53	0.89	-0.60
Testis	62	10.58*	18	13.60*	1	1.86	0	0.00	81	7.86	10.31*	9.68
<b>Urinary system</b>	13	1.51	10	2.53*	1	0.33	5	2.62	29	17.49	1.66*	1.52
Urinary bladder	5	0.91	6	2.40	1	0.52	3	2.40	15	11.15	1.35	0.51
Kidney parenchyma	8	2.95*	4	3.09	0	0.00	1	1.74	13	5.57	2.33*	0.98
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	1	12.46	1	0.77	1.31	0.03
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.23	0.00	-0.03
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.64	0.00	-0.08
<b>Soft tissue including heart</b>	2	1.90	2	5.74	0	0.00	0	0.00	4	1.72	2.32	0.30
<b>Kaposi sarcoma</b>	6	1.14	1	0.64	0	0.00	0	0.00	7	7.45	0.94	-0.06
<b>Melanoma of skin</b>	8	1.08	2	0.69	3	1.58	1	1.04	14	13.19	1.06	0.11
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.47	0.00	-0.06
<b>Brain, central nervous system</b>	4	1.34	2	2.02	1	1.68	0	0.00	7	4.85	1.44	0.29
<b>Thyroid</b>	5	2.85	1	1.68	0	0.00	0	0.00	6	2.86	2.10	0.42
<b>Lymphatic, hematopoietic</b>	23	1.71*	1	0.20	2	0.63	2	1.20	28	23.22	1.21	0.63
Hodgkin lymphoma	2	0.85	0	0.00	0	0.00	1	11.13	3	3.22	0.93	-0.03
Non-Hodgkin lymphoma	8	1.19	1	0.38	0	0.00	0	0.00	9	11.92	0.76	-0.39
Myeloma	0	0.00	0	0.00	2	5.60	0	0.00	2	2.01	0.99	0.00
Leukemia	13	3.79*	0	0.00	0	0.00	1	2.00	14	6.07	2.30*	1.05
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.56	0.00	-0.07
Chronic lymphocytic	2	2.31	0	0.00	0	0.00	1	5.23	3	1.77	1.70	0.16
Acute non-lymphocytic	11	9.34*	0	0.00	0	0.00	0	0.00	11	2.03	5.41*	1.19
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	1.06	0.00	-0.14

\*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 10.2.10:** Risk of subsequent primary cancers after seminoma of the testis, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	41	2.70*	142	1.96*	135	1.50*	242	1.39*	560	351.71	1.59*	26.60
All excluding same site	35	2.41*	88	1.26*	110	1.25*	225	1.30*	458	345.12	1.33*	14.42
<b>Buccal cavity, pharynx</b>	2	3.02	1	0.32	4	1.04	6	0.94	13	14.04	0.93	-0.13
Lip	0	0.00	0	0.00	1	1.84	1	1.21	2	1.97	1.01	0.00
Tongue	1	7.15	1	1.47	0	0.00	2	1.34	4	3.16	1.26	0.11
Salivary gland	0	0.00	0	0.00	1	3.44	0	0.00	1	1.10	0.91	-0.01
Mouth	1	6.76	0	0.00	2	2.31	1	0.71	4	3.13	1.28	0.11
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.74	0.00	-0.09
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.85	0.00	-0.24
Oropharynx	0	0.00	0	0.00	0	0.00	1	5.36	1	0.39	2.59	0.08
Hypopharynx	0	0.00	0	0.00	0	0.00	1	1.63	1	1.28	0.78	-0.04
<b>Digestive system</b>	4	1.45	23	1.72*	20	1.17	51	1.56*	98	65.85	1.49*	4.11
Esophagus	0	0.00	3	3.40	2	1.68	5	2.02	10	4.73	2.12*	0.67
Stomach	1	3.11	2	1.31	1	0.54	7	2.14	11	6.97	1.58	0.51
Small intestine	0	0.00	2	7.59	0	0.00	0	0.00	2	1.29	1.55	0.09
Colon	1	0.94	6	1.16	4	0.61	12	0.94	23	25.48	0.90	-0.32
Rectum, rectosigmoid junction	1	1.80	7	2.60*	6	1.75	8	1.25	22	13.10	1.68*	1.14
Anus, anal canal	0	0.00	0	0.00	1	4.08	1	2.41	2	0.90	2.21	0.14
Liver	0	0.00	0	0.00	1	1.16	4	2.24	5	3.43	1.46	0.20
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.41	0.00	-0.05
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	2	2.76	2	1.40	1.42	0.08
Pancreas	0	0.00	3	1.98	5	2.60	11	2.95*	19	7.48	2.54*	1.47
<b>Respiratory system</b>	2	0.78	9	0.72	19	1.19	47	1.54*	77	61.42	1.25	1.99
Nose, nasal cavity, ear	0	0.00	1	6.29	0	0.00	1	3.22	2	0.69	2.90	0.17
Larynx	0	0.00	0	0.00	2	1.24	5	1.74	7	6.04	1.16	0.12
Lung, bronchus	2	0.90	8	0.73	17	1.21	41	1.51*	68	54.42	1.25	1.73
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.73	0.00	-0.09
<b>Male genital system</b>	11	3.55*	69	4.50*	53	2.54*	61	1.17	194	91.32	2.12*	13.11
Prostate	5	2.08	15	1.19	28	1.50	44	0.87	92	84.02	1.10	1.02
Testis	6	9.03*	54	21.12*	25	12.76*	17	12.04*	102	6.59	15.47*	12.19
<b>Urinary system</b>	7	5.14*	9	1.35	12	1.39	31	1.83*	59	33.59	1.76*	3.25
Urinary bladder	2	2.28	7	1.63	9	1.62	21	1.89*	39	21.81	1.79*	2.20
Kidney parenchyma	5	11.97*	2	0.97	3	1.12	5	0.98	15	10.26	1.46	0.61
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	5	6.78*	5	1.52	3.29*	0.44
Ureter	0	0.00	0	0.00	0	0.00	2	8.45	2	0.47	4.23	0.20
<b>Bone, joints</b>	0	0.00	1	4.77	0	0.00	0	0.00	1	0.69	1.44	0.04
<b>Soft tissue including heart</b>	0	0.00	0	0.00	3	4.69	2	2.12	5	2.33	2.14	0.34
<b>Kaposi sarcoma</b>	4	6.57*	1	0.38	2	0.84	2	1.09	9	7.44	1.21	0.20
<b>Melanoma of skin</b>	4	4.00*	8	1.73	5	0.95	7	0.84	24	19.17	1.25	0.62
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.77	0.00	-0.10
<b>Brain, central nervous system</b>	2	4.94	3	1.68	3	1.59	4	1.48	12	6.79	1.77	0.67
<b>Thyroid</b>	0	0.00	1	0.98	2	1.93	4	2.87	7	3.69	1.90	0.42
<b>Lymphatic, hematopoietic</b>	5	2.73	16	1.92*	10	1.07	20	1.32	51	34.71	1.47*	2.08
Hodgkin lymphoma	0	0.00	0	0.00	2	2.27	1	1.15	3	3.11	0.97	-0.01
Non-Hodgkin lymphoma	4	4.42*	8	1.89	5	1.03	10	1.28	27	17.79	1.52	1.18
Myeloma	0	0.00	0	0.00	0	0.00	3	1.51	3	3.88	0.77	-0.11
Leukemia	1	2.02	8	3.53*	3	1.14	6	1.32	18	9.92	1.81*	1.03
Acute lymphocytic	0	0.00	1	5.98	0	0.00	0	0.00	1	0.57	1.76	0.06
Chronic lymphocytic	1	7.09	1	1.44	1	1.10	1	0.57	4	3.50	1.14	0.06
Acute non-lymphocytic	0	0.00	5	6.63*	1	1.18	3	2.08	9	3.21	2.80*	0.74
Chronic myeloid	0	0.00	0	0.00	1	2.37	0	0.00	1	1.56	0.64	-0.07

\*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.

# Testis

## Testicular Non-seminoma, Males

**Table 10.2.11:** Risk of subsequent primary cancers after non-seminoma of the testis, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>Number starting interval</b>	6,459		5,893		4,270		2,932		6,459			
<b>Person-years in interval</b>	5,125		19,805		17,906		20,042		62,878			
<b>All subsequent cancers</b>	9	1.78	54	2.35*	58	1.95*	93	1.35*	214	126.59	1.69*	13.90
All excluding same site	3	0.67	29	1.40	27	0.98	77	1.15	136	119.80	1.14	2.58
<b>Buccal cavity, pharynx</b>	0	0.00	0	0.00	2	1.62	10	3.51*	12	5.19	2.31*	1.08
Lip	0	0.00	0	0.00	0	0.00	1	2.83	1	0.72	1.39	0.04
Tongue	0	0.00	0	0.00	1	3.49	2	2.87	3	1.23	2.45	0.28
Salivary gland	0	0.00	0	0.00	0	0.00	2	8.57	2	0.46	4.32	0.24
Mouth	0	0.00	0	0.00	0	0.00	2	3.39	2	1.07	1.86	0.15
Nasopharynx	0	0.00	0	0.00	0	0.00	1	6.75	1	0.32	3.15	0.11
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.74	0.00	-0.12
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.13	0.00	-0.02
Hypopharynx	0	0.00	0	0.00	0	0.00	2	8.64	2	0.39	5.15	0.26
<b>Digestive system</b>	0	0.00	5	1.57	4	0.87	18	1.48	27	20.61	1.31	1.02
Esophagus	0	0.00	0	0.00	0	0.00	1	1.08	1	1.48	0.67	-0.08
Stomach	0	0.00	0	0.00	0	0.00	0	0.00	0	2.19	0.00	-0.35
Small intestine	0	0.00	0	0.00	0	0.00	1	3.60	1	0.48	2.06	0.08
Colon	0	0.00	3	2.53	3	1.77	6	1.34	12	7.60	1.58	0.70
Rectum, rectosigmoid junction	0	0.00	1	1.58	1	1.08	4	1.63	6	4.14	1.45	0.30
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.41	0.00	-0.06
Liver	0	0.00	0	0.00	0	0.00	0	0.00	0	1.18	0.00	-0.19
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.02
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.44	0.00	-0.07
Pancreas	0	0.00	0	0.00	0	0.00	6	4.37*	6	2.29	2.62	0.59
<b>Respiratory system</b>	0	0.00	1	0.37	1	0.25	9	0.86	11	17.78	0.62	-1.08
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.04
Larynx	0	0.00	0	0.00	0	0.00	0	0.00	0	1.89	0.00	-0.30
Lung, bronchus	0	0.00	1	0.43	1	0.30	9	0.97	11	15.42	0.71	-0.70
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24	0.00	-0.04
<b>Male genital system</b>	7	7.13*	28	6.45*	35	6.28*	27	1.57*	97	28.06	3.46*	10.96
Prostate	1	2.34	3	1.47	4	1.17	10	0.66	18	21.02	0.86	-0.48
Testis	6	11.00*	25	11.06*	31	14.81*	16	8.46*	78	6.79	11.49*	11.33
<b>Urinary system</b>	1	2.88	4	2.43	1	0.42	9	1.41	15	10.75	1.39	0.68
Urinary bladder	0	0.00	0	0.00	1	0.69	5	1.27	6	6.60	0.91	-0.10
Kidney parenchyma	1	8.64	4	7.13*	0	0.00	4	1.82	9	3.71	2.43*	0.84
Renal pelvis, other urinary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.44	0.00	-0.07
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.13	0.00	-0.02
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.52	0.00	-0.08
<b>Soft tissue including heart</b>	0	0.00	1	3.07	1	2.89	1	1.82	3	1.30	2.31	0.27
<b>Kaposi sarcoma</b>	0	0.00	2	1.18	1	0.47	1	0.47	4	6.28	0.64	-0.36
<b>Melanoma of skin</b>	0	0.00	5	2.39	1	0.39	6	1.25	12	9.93	1.21	0.33
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.33	0.00	-0.05
<b>Brain, central nervous system</b>	1	4.64	1	1.09	1	1.00	2	1.29	5	3.69	1.36	0.21
<b>Thyroid</b>	0	0.00	1	1.80	1	1.62	1	1.04	3	2.26	1.33	0.12
<b>Lymphatic, hematopoietic</b>	0	0.00	6	1.59	9	2.08	5	0.65	20	16.66	1.20	0.53
Hodgkin lymphoma	0	0.00	0	0.00	1	1.28	1	1.30	2	2.71	0.74	-0.11
Non-Hodgkin lymphoma	0	0.00	0	0.00	3	1.31	1	0.24	4	8.64	0.46	-0.74
Myeloma	0	0.00	0	0.00	0	0.00	2	2.70	2	1.21	1.65	0.12
Leukemia	0	0.00	6	6.76*	5	4.95*	1	0.51	12	4.09	2.94*	1.26
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-0.07
Chronic lymphocytic	0	0.00	1	6.65	0	0.00	1	1.56	2	1.05	1.90	0.15
Acute non-lymphocytic	0	0.00	5	15.50*	5	14.31*	0	0.00	10	1.39	7.21*	1.37
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.76	0.00	-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 10.3.1:** Characteristics of patients with an initial cancer of the penis, males, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	1,808	100.0	—	—	1,808	100.0
<b>Initial treatment</b>						
Any radiation	212	11.7	—	—	212	11.7
With surgery	157	8.7	—	—	157	8.7
Without surgery	55	3.0	—	—	55	3.0
No radiation	1,596	88.3	—	—	1,596	88.3
With surgery	1,517	83.9	—	—	1,517	83.9
Without surgery	79	4.4	—	—	79	4.4
<b>Race</b>						
White	1,547	85.6	—	—	1,547	85.6
Black	174	9.6	—	—	174	9.6
Other	72	4.0	—	—	72	4.0
Unknown	15	0.8	—	—	15	0.8
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	13	0.7	—	—	13	0.7
30–49	241	13.3	—	—	241	13.3
50–69	816	45.1	—	—	816	45.1
70–79	480	26.5	—	—	480	26.5
≥ 80	258	14.3	—	—	258	14.3
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	1,545	85.5	—	—	1,545	85.5
1st and 2nd cancers	233	12.9	—	—	233	12.9
1st, 2nd, and 3rd cancers	30	1.7	—	—	30	1.7
1st, 2nd, 3rd, and additional cancers	0	0.0	—	—	0	0.0
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	66.8	—	—	—	66.8	—
Median year of 1st cancer diagnosis	1986.6	—	—	—	1986.6	—
Median person-years at risk	4.6	—	—	—	4.6	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	92.8	—	—	—	92.8
1st, 2nd, and additional cancers	—	92.8	—	—	—	92.8
1st cancer only	—	4.9	—	—	—	4.9

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

**Table 10.3.2:** Risk of subsequent primary cancers after cancer of the penis, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	O	O/E	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
<b>All subsequent cancers</b>	52	1.94*	96	1.02	78	1.07	67	0.98	293	262.20	1.12	25.88
All excluding same site	51	1.91*	94	1.00	78	1.07	66	0.96	289	261.78	1.10	22.87
<b>Buccal cavity, pharynx</b>	4	4.85*	4	1.45	6	3.01*	3	1.73	17	7.31	2.33*	8.14
Lip	0	0.00	0	0.00	1	2.59	0	0.00	1	1.41	0.71	-0.35
Tongue	1	6.67	2	3.96	1	2.68	1	2.99	5	1.36	3.67*	3.06
Salivary gland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.64	0.00	-0.54
Mouth	1	5.08	1	1.53	1	2.14	1	2.53	4	1.71	2.34	1.92
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24	0.00	-0.21
Tonsil	0	0.00	0	0.00	2	11.13*	0	0.00	2	0.66	3.02	1.12
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.17
Hypopharynx	1	10.99	0	0.00	1	4.55	0	0.00	2	0.80	2.49	1.01
<b>Digestive system</b>	7	1.15	19	0.91	15	0.94	18	1.27	59	57.15	1.03	1.55
Esophagus	0	0.00	2	1.61	0	0.00	2	2.23	4	3.44	1.16	0.47
Stomach	0	0.00	0	0.00	2	1.09	2	1.29	4	6.61	0.61	-2.19
Small intestine	0	0.00	0	0.00	1	4.65	0	0.00	1	0.77	1.29	0.19
Colon	5	1.90	11	1.20	4	0.56	5	0.79	25	25.17	0.99	-0.15
Rectum, rectosigmoid junction	1	0.91	3	0.80	2	0.72	5	2.08	11	9.99	1.10	0.85
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.36	0.00	-0.30
Liver	0	0.00	0	0.00	2	3.44	2	3.47	4	2.14	1.87	1.57
Gallbladder	0	0.00	0	0.00	2	14.42*	0	0.00	2	0.50	4.03	1.26
Bile ducts, other biliary	0	0.00	0	0.00	1	2.88	0	0.00	1	1.25	0.80	-0.21
Pancreas	1	1.43	3	1.26	1	0.55	1	0.63	6	6.49	0.93	-0.41
<b>Respiratory system</b>	13	2.46*	30	1.64*	24	1.74*	18	1.47	85	49.55	1.72*	29.79
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.38	0.00	-0.32
Larynx	2	4.79	1	0.71	2	1.94	1	1.13	6	3.75	1.60	1.89
Lung, bronchus	11	2.29*	29	1.74*	22	1.74*	17	1.51	79	45.30	1.74*	28.32
<b>Male breast</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.50	0.00	-0.42
<b>Male genital system</b>	15	1.87*	25	0.87	14	0.60	20	0.86	74	83.46	0.89	-7.95
Prostate	13	1.64	23	0.81	14	0.60	19	0.82	69	82.66	0.83	-11.48
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24	0.00	-0.20
<b>Urinary system</b>	6	2.29	6	0.65	5	0.70	4	0.59	21	25.76	0.82	-4.00
Urinary bladder	2	1.04	5	0.74	2	0.38	4	0.81	13	18.92	0.69	-4.98
Kidney parenchyma	4	7.39*	1	0.53	1	0.67	0	0.00	6	5.38	1.12	0.52
Renal pelvis, other urinary	0	0.00	0	0.00	2	4.92	0	0.00	2	1.46	1.37	0.45
Ureter	0	0.00	0	0.00	0	0.00	0	0.00	0	0.49	0.00	-0.41
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.20	0.00	-0.17
<b>Soft tissue including heart</b>	1	9.74	0	0.00	0	0.00	0	0.00	1	0.99	1.01	0.01
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	1	8.65	0	0.00	1	0.41	2.43	0.49
<b>Melanoma of skin</b>	1	1.87	3	1.54	2	1.25	1	0.58	7	5.80	1.21	1.01
<b>Eye, orbit</b>	0	0.00	0	0.00	1	10.21	0	0.00	1	0.35	2.83	0.54
<b>Brain, central nervous system</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	2.39	0.00	-2.01
<b>Thyroid</b>	1	12.31	1	3.61	0	0.00	0	0.00	2	0.75	2.65	1.05
<b>Lymphatic, hematopoietic</b>	3	1.53	5	0.73	8	1.49	2	0.40	18	19.27	0.93	-1.06
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.56	0.00	-0.47
Non-Hodgkin lymphoma	1	1.27	3	1.07	4	1.78	0	0.00	8	8.04	0.99	-0.04
Myeloma	0	0.00	1	0.83	0	0.00	1	1.14	2	3.37	0.59	-1.15
Leukemia	2	2.61	1	0.38	4	1.96	1	0.54	8	7.29	1.10	0.59
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-0.15
Chronic lymphocytic	1	3.20	0	0.00	2	2.41	0	0.00	3	2.97	1.01	0.03
Acute non-lymphocytic	0	0.00	1	1.16	2	2.99	0	0.00	3	2.39	1.26	0.52
Chronic myeloid	0	0.00	0	0.00	0	0.00	1	3.94	1	0.99	1.01	0.01

\*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.