

# Chapter 11

## New Malignancies Following Cancer of the Urinary Tract

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### Synopsis

The risk of subsequent primary cancer was assessed in 137,571 patients with a first primary cancer of the urinary tract diagnosed during 1973-2000. Overall risk of new malignancy was significantly increased among patients with an initial cancer of the bladder (O/E=1.17,<sup>1</sup> O=14,568, EAR=34 per 10,000 person-years), kidney (O/E=1.13, O=3,570, EAR=23), and renal pelvis/ureter (O/E=1.29,<sup>1</sup> O=935, EAR=55). Patients with cancers of the urinary bladder and renal pelvis/ureter had elevated risks of subsequent cancers of the respiratory tract, probably related to tobacco smoking, and pronounced excesses of tumors of the urinary tract due to the multifocal nature of transitional cell carcinomas. Bladder cancer was also associated with significant excesses of cancers of the pancreas, prostate, vagina, and kidney, as well as acute leukemia. Some of these cancers may be related to increased medical surveillance (e.g., prostate, kidney) or a rare consequence of treatment (e.g., leukemia). Patients with an initial cancer of the kidney parenchyma were at increased risk for a variety of subsequent primary cancers, including cancers of the kidney, ureter, bladder, prostate, and thyroid, as well as melanoma and leukemia. Increased medical and urologic surveillance, and shared risk factors, including genetic predisposition, may contribute in various degrees to these patterns. Patients with renal pelvis/ureter cancers were also prone to develop cancers of the breast and colon. The excess of colon tumors was concentrated among younger patients in a pattern suggesting the syndrome of hereditary nonpolyposis colorectal cancer.

### Bladder Cancer

Cancers of the urinary bladder (including both invasive and *in situ* tumors) constitute nearly 5% of all incident cancers and 2% of cancer deaths, with approximately 63,000 new cases diagnosed annually in the U.S. (Jemal et al, 2005). Bladder cancer occurs about 3 times more fre-

quently among men than women and is the fourth most commonly diagnosed cancer among men. The overall 5-year and 10-year relative survival rates are 81.6% and 76.5%, with higher survival rates in men compared with women, and among whites compared with blacks. Standard initial treatment for superficial lesions is a complete cystoscopic resection (Herr et al, 2001). Intravesical treatments with chemotherapeutic or immunologic agents are frequently used to prevent recurrences. Typical therapy for muscle-infiltrating tumors is radical cystectomy, which may be combined with chemotherapy or radiation in selected cases.

The overwhelming majority of cancers of the bladder and renal pelvis/ureter are transitional cell carcinomas. Multifocal cancers tend to develop along the transitional epithelial lining, with new tumors sometimes occurring several decades after the initial cancer diagnosis (Sharir and Jewett, 1999; Rabbani et al, 2001). SEER rules prohibit reporting of a subsequent bladder cancer following a diagnosis of an initial bladder cancer (with the exception of invasive bladder cancer following *in situ* bladder cancer), but subsequent tumors of the renal pelvis or ureter following an initial bladder cancer are recorded in the SEER database. Because assessment of subsequent cancer risk is complicated by the different methods of recording multifocal tumors, we present the overall O/E ratios for bladder cancer and cancers of the renal pelvis/ureter excluding the observed and expected numbers of subsequent primary cancers of the renal pelvis, ureter, bladder, urethra, and other urinary organs (except kidney parenchyma).

Tobacco smoking and occupational exposure to aromatic amines are the main risk factors for bladder cancer (Silverman et al, 1999). Tobacco use accounts for the greatest share of cases—approximately 50% to 65% among men and 20% to 30% among women. Much less common risk factors include cyclophosphamide chemotherapy, phenacetin-containing analgesics, ionizing radiation, and high levels of inorganic arsenic in drinking water.

### Results and Discussion

A total of 14,568 subsequent primary cancers (excluding cancers of the renal pelvis/ureter, bladder, and other

<sup>1</sup>Observed-to-expected ratios for patients with cancers of the renal pelvis/ureter and urinary bladder exclude subsequent primary cancers of the renal pelvis, ureter, bladder, urethra, and other and unspecified urinary organs.

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

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urinary organs) were observed among 94,383 patients who had survived 2 months or more after an invasive or *in situ* bladder cancer (O/E=1.17, 95% CI=1.15-1.19, EAR=34 per 10,000 person-years). The cumulative incidence of all second cancers combined was 22.6% at 25 years (competing risk analyses, 95% CI=22.2%-23.0%), with a 1.1% incidence seen for new cancers of the renal pelvis/ureter and other urinary organs. Subsequent cancer risks were significantly elevated during the first 10 years of follow-up but then decreased among long-term survivors. Risks were somewhat higher among blacks (O/E=1.31, EAR=66) than whites (O/E=1.17, EAR=33) but were similar among males and females. Although relative risks were greater for those diagnosed at ages less than 50 years compared with patients age 70 years or older (O/E=1.30 versus 1.11), excess absolute risks were lower (EAR=16 versus 31). In addition to the pronounced excesses seen for subsequent cancers of the renal pelvis/ureter, we found significantly increased risks for subsequent cancers of the pancreas, larynx, lung, vagina, prostate, and kidney, as well as for acute non-lymphocytic leukemia (ANLL). Significant deficits of subsequent non-Hodgkin lymphoma and bladder cancer were seen, the latter reflecting SEER rules for reporting multiple tumors of the bladder. These results are generally consistent with previous studies (Jensen et al, 1985; Kantor and McLaughlin, 1985; Greven et al, 1992; Salminen et al, 1994; Crocetti et al, 2001; Dong and Hemminki, 2001; Rabbani et al, 2001), including previous SEER analyses (Ahsan et al, 1995; Neugut et al, 1995).

It is not surprising that the cancer risks were significantly elevated for several smoking-related sites, such as the lung, larynx, pancreas, and kidney. New tumors of the respiratory tract constituted 67% of the excess cancers outside the urinary tract, with risks for lung cancer being significantly increased for more than 2 decades following initial diagnosis of bladder cancer ( $\geq 20$  years, O/E=1.57). Consistent with previous reports, we found higher relative risks for subsequent cancers of the lung among women compared with men (Teppo et al, 1985; Salminen et al, 1994; Crocetti et al, 2001), but risks were similar when measured on an absolute scale. Differences in the relative risk by gender may be due to the historically lower smoking rates among women and consequent lower baseline risks for respiratory tract cancers in the female population.

A total of 838 subsequent tumors of the renal pelvis, ureter, urethra, and other urinary organs were reported following cancer of the bladder, with increased risks persisting at a high level for more than 20 years. The well-known tendency to develop multifocal tumors affecting the renal pelvis, ureter, and bladder has been attributed to smoking-related field defects of the transitional cell epithelium (Sharir and Jewett, 1999), although several molecular studies have implicated the seeding and implantation of a single transformed epithelial cell clone (Muto et al, 2000; Vriesema et al, 2001). In addition, close medical surveillance may have contributed to the ele-

vated risks seen for subsequent kidney cancer and other cancers of the urinary tract.

Increased risk for ANLL following bladder cancer is consistent with reports implicating cisplatin-based chemotherapy combined with radiotherapy (Theodore et al, 2002). Increased medical surveillance may explain the 3-fold risk of subsequent prostate cancer seen in the first year of follow-up, which declined to below-normal levels in later time intervals. The reasons for the elevated risk of subsequent vaginal cancer are unclear; risk rose over time to reach 3- to 4-fold among survivors of 5 or more years, but the excess did not appear to be associated with initial treatment.

## Cancer of the Kidney Parenchyma

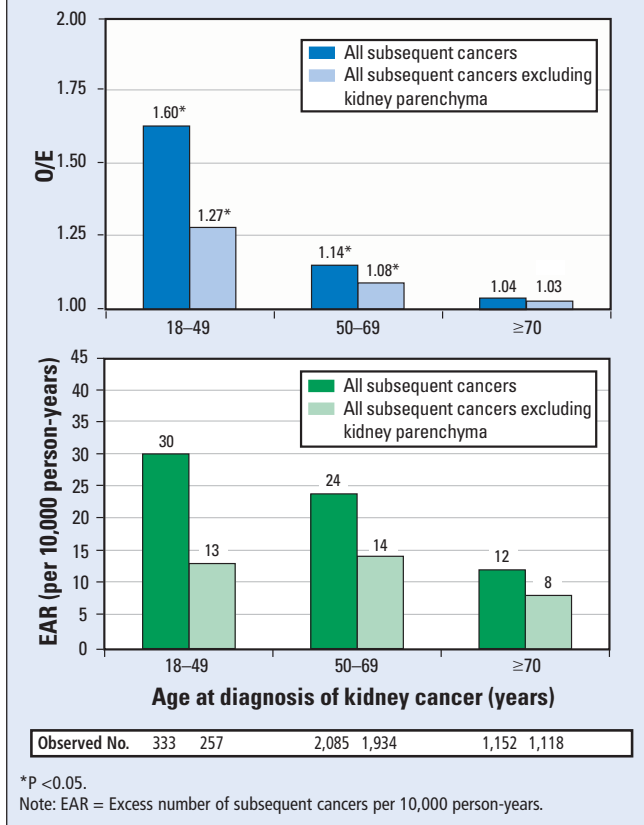
Cancers of the kidney parenchyma are the most fatal of adult cancers of the urinary tract. Incidence rates have been increasing over the last 30 years in the U.S., particularly among blacks (Chow et al, 1999). Kidney cancer patients represent about 2% of all cancer diagnoses and 2% of cancer deaths (Jemal et al, 2005). Excluding Wilms tumor and other childhood tumors of the kidney, discussed elsewhere in this volume, the 5-year relative survival rate for patients with cancers of the kidney parenchyma is 64.6%. Nearly all cancers originating in the kidney parenchyma are renal cell carcinomas (RCC). An estimated 85% of RCC are classified as the clear cell type, and another 10% are papillary (Linehan et al, 2001). Radical nephrectomy is standard treatment for renal cancer (Linehan et al, 2001). RCC is generally considered resistant to most chemotherapeutic agents; however, biologic therapy (interferon, interleukin-2) is widely used, particularly in the treatment of metastatic disease. Radiotherapy is infrequently used as an initial treatment (12% in SEER).

The major risk factors for RCC include smoking, obesity, and hypertension (McLaughlin et al, 1995, 1996; Benichou et al, 1998; Chow et al, 2000). An estimated 20% to 40% of RCC among men and 10% to 20% among women are caused by tobacco smoking, while an estimated 20% are attributable to excess weight. Although an uncommon risk factor, dialysis has been associated with a 3- to 26-fold excess risk compared with the general population (Stewart et al, 2003). Several heritable syndromes account for approximately 5% of cases of RCC, most notably von Hippel-Lindau (VHL) syndrome; nearly half of VHL patients develop multifocal or bilateral RCC in addition to a constellation of other tumors and cystic lesions (Linehan et al, 2003).

## Results and Discussion

Overall, 3,570 subsequent primary cancers were observed among 36,835 patients who survived 2 months or more after cancer of the kidney parenchyma (excluding childhood cancers, ages <18 years), reflecting an overall 13% elevated risk compared with the general population (O/E=1.13, 95% CI=1.10-1.17, EAR=23). This

**Figure 11.1:** Observed-to-expected ratio (O/E) and excess absolute risk (EAR) of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, SEER 1973-2000.

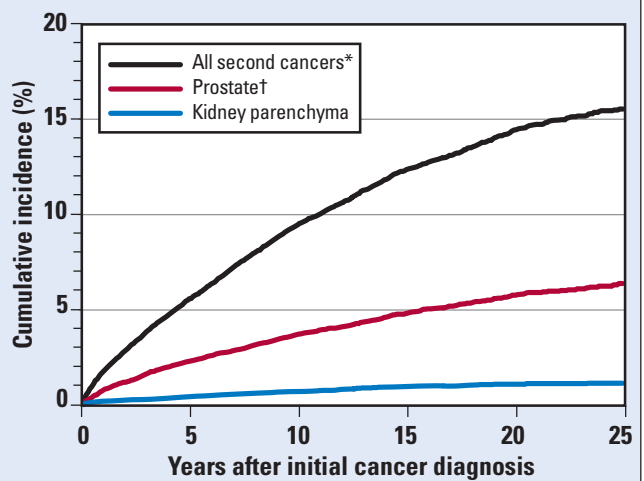


overall risk decreased after subsequent cancers of the kidney parenchyma were excluded (O/E=1.07, 95% CI=1.04-1.11, EAR=12), and an increased risk of only 5% was seen when the index cancer was limited to RCC (O/E=1.05 excluding subsequent kidney cancers, 95% CI=1.01-1.09, EAR=8). Relative risks were highest among those diagnosed with kidney cancer from ages 18 to 49 years for all new malignancies (O/E=1.60) and for all cancers excluding kidney cancer (O/E=1.27), although excess risks on an absolute scale were similar across age groups (excluding subsequent kidney cancer) (Figure 11.1). Overall risks of new malignancies were not substantially different by gender, but risks were slightly higher for blacks compared with whites (O/E=1.17 versus 1.06, excluding subsequent kidney cancer). The cumulative incidence of developing any subsequent cancer following cancer of the kidney parenchyma was 15.3% at 25 years (95% CI=14.7%-15.9%), including a 1.1% incidence of second kidney cancer (Figure 11.2). Our results are similar to previous studies indicating an elevated risk of subsequent cancers of the prostate, bladder, kidney, ureter, and thyroid, as well as melanoma, and overall deficits of cancers of the oral cavity and pharynx, larynx, and ovary (Jensen et al, 1985; Kantor and McLaughlin, 1985; Teppo et al, 1985; Kantor et al, 1986; Begg et al, 1995; McCredie et al, 1996; Rabbani et al, 1998, 2000), including an earlier SEER report (Rabbani et al, 2002).

Subsequent cancers of the kidney parenchyma accounted for the largest excess of new malignancies among patients with an initial kidney cancer. Risks of new malignancies of the kidney, including the contralateral kidney, were substantially higher among blacks (O/E=9.85, EAR=30) than whites (O/E=3.49, EAR=9), a finding attributed in earlier studies to the higher prevalence of obesity, hypertension, and end-stage renal disease among blacks than whites (Martins et al, 2002; Rabbani et al, 2002). Patients diagnosed with kidney cancer at ages 18 to 49 were particularly prone to develop a new kidney cancer (O/E=13.25), suggesting the influence of genetic susceptibility (Linehan et al, 2003). Among all patients combined, the risk of developing a new kidney cancer was greatest in the first year of follow-up (more than 7-fold), presumably related to heightened screening, but the increased risk remained elevated (3- to 4-fold) for more than 20 years after initial diagnosis. Increased urologic surveillance may have contributed to the excess of cancers of the bladder and ureter, because elevated risks were limited to the early years of follow-up.

Kidney cancer patients experienced a 3-fold elevated risk of subsequent thyroid cancer, consistent with a previous survey (Teppo et al, 1985). Heightened medical surveillance may be involved, since 20% of the thyroid tumors were first diagnosed at autopsy. In addition, risk was increased, especially in the first year of follow-up (O/E=7.57, O=15), then decreased to near-normal levels among survivors of 10 years or more. However, reciprocal increases in the risk of subsequent kidney cancer were seen following thyroid cancer in the SEER data (Ronckers et al, 2005) and in other studies (Hemminki and Jiang, 2001; Rubino et al, 2003), suggesting a role of shared risk factors, such as described with the heritable syndrome of papillary thyroid cancer and papillary

**Figure 11.2:** Cumulative incidence of developing a second cancer among patients with cancer of the kidney parenchyma, both sexes, ages ≥18 years, SEER 1973-2000.



\* Cumulative incidence for all second cancers at 25 years is 16.9% for males and 12.3% for females.

† Prostate cancer curve is based on male kidney cancer patients only.

RCC (Takahashi et al, 2002). Another consideration is that kidney cancers occasionally metastasize to the thyroid (Koo et al, 2004), even decades after initial RCC diagnosis.

It is difficult to explain the elevated risk for other cancers. Risks for subsequent melanoma of the skin were highest in the first year after kidney cancer diagnosis (O/E=1.89). Although significant excesses of melanoma have not been reported in previous studies of kidney cancer (Jensen et al, 1985; Kantor and McLaughlin, 1985; Levi et al, 1993), a reciprocal excess risk of kidney cancer was seen following melanoma in the SEER data, mainly in the early years of follow-up. In addition, an increased incidence of subsequent leukemia was found among patients with RCC, especially 1-4 years after initial diagnosis (O/E=1.63, O=45), but the risks were related to several subtypes of leukemia. The excess of prostate cancer was mainly in the first year of follow-up, consistent with urologic surveillance and detection of early-stage tumors.

The decreased risk of subsequent ovarian cancers we observed among kidney cancer patients has been reported in previous surveys, although based on small numbers (Jensen et al, 1985; Kantor et al, 1986; McCredie et al, 1996). Epidemiologic studies linking RCC to hormonal factors are inconclusive, but a small excess of renal cell cancer has been associated in some studies with increased parity (Chow et al, 1995), which reduces the risk of ovarian cancer. We also found deficits of several smoking-related cancers (e.g., buccal cavity and larynx) following kidney cancer, as seen in earlier studies (Jensen et al, 1985; Teppo et al, 1985; Kantor et al, 1986; McCredie et al, 1996). These results are surprising because smoking increases the risk of kidney cancer, although the relative risk is less than that seen for cancers of the bladder and renal pelvis.

## Cancers of the Renal Pelvis and Ureter

Cancers of the renal pelvis and ureter are rare, constituting only 5% to 7% of urinary tract cancers in SEER. About 90% of cancers of the renal pelvis/ureter arise from the transitional cell epithelium. Incidence is 2.5 times higher in men than women and is greater among whites than blacks. The 5-year relative survival rate is 55.3%. Because of the recurrent and multifocal nature of these tumors, nephroureterectomy (excision of the kidney, renal pelvis, and ureter) with bladder cuff excision is considered standard treatment (Kirkali and Tuzel, 2003). Chemotherapy and radiotherapy are used less frequently.

Established risk factors for renal pelvis cancer include tobacco use and heavy use of phenacetin-containing analgesics (McLaughlin et al, 1996). Smoking is thought to explain 70% to 80% of cases in men and 40% to 60% in women. Moreover, ionizing radiation has been shown to induce cancers of the renal pelvis and ureter (Boice et al, 1989).

## Results and Discussion

Among 6,353 patients who survived 2 months or more following diagnosis of cancers of the renal pelvis or ureter, 935 subsequent primary cancers (excluding cancers of the renal pelvis/ureter, bladder, and other urinary organs) were observed (O/E=1.29, 95% CI=1.21-1.38, EAR=55). The cumulative incidence of developing any second cancer at 25 years was 31.1% (95% CI=29.8%-32.5%), with a 16.2% incidence attributable to new tumors of the bladder and other urinary organs. Observed-to-expected ratios of subsequent cancers remained elevated over 15 years of follow-up and then decreased. Blacks appeared to be more prone to develop new malignancies than whites (O/E=2.06 versus 1.27), and females had slightly greater risks than males (O/E=1.44 versus 1.23). Relative risks were somewhat higher among those diagnosed at ages less than 60 years, although excess absolute risks of subsequent cancers were not appreciably different. Significantly increased risks were seen for new cancers of the colon, lung, and female breast, in addition to exceptionally high risks for subsequent tumors of the bladder and other urinary tract organs—a pattern generally consistent with previous reports (Kantor et al, 1986; McCredie et al, 1996).

The 2-fold increased risk of subsequent lung cancer following cancers of the renal pelvis/ureter can be attributed to cigarette smoking, a potent risk factor for both cancer sites (Kantor et al, 1986). The excess lung cancer risk did not decrease with time and persisted among long-term survivors ( $\geq 10$  years, O/E=2.11).

The elevated risk for subsequent cancers of the renal pelvis, ureter, and bladder varied from 19- to 27-fold, consistent with the multicentric nature of urothelial tumors. The relative risk of subsequent bladder cancer was higher among females than males (O/E=46.81 versus 15.31), a finding resembling other studies (Kirkali and Tuzel, 2003), whereas the excess absolute risks were similar (EAR=223 for females and 251 for males).

The excess of subsequent colon cancer was greater among renal pelvis/ureter patients diagnosed at less than 60 years of age (O/E=3.06, EAR=19), as compared with those at older ages (O/E=1.32, EAR=9). Reciprocally increased risks of renal pelvis/ureter cancer were also seen among younger colon cancer patients in SEER (ages <60 years, O/E=3.63), and similar elevations in risk have been reported in at least one other registry-based study (McCredie et al, 1997). This association is possibly related to the syndrome of hereditary nonpolyposis colon cancer, which predisposes to certain extra-colonic tumors, including cancers of the renal pelvis and ureter (Umar et al, 2004).

In women, risk of breast cancer among renal pelvis/ureter cancer patients was elevated (O/E=1.28, EAR=11), making up 17% of the excess subsequent cancers among women (excluding cancers of the bladder, renal pelvis/ureter, and other urinary organs). This association has not been reported previously. Since

reciprocally elevated risks of renal pelvis/ureter cancer were not seen following breast cancer, this observation may be due to chance.

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**Table 11.1.1:** Characteristics of patients with an initial cancer of the urinary bladder, both sexes, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	70,354	100.0	24,029	100.0	94,383	100.0
<b>Initial treatment</b>						
Any radiation	6,515	9.3	2,692	11.2	9,207	9.8
With surgery	5,761	8.2	2,272	9.5	8,033	8.5
Without surgery	754	1.1	420	1.7	1,174	1.2
No radiation	63,839	90.7	21,337	88.8	85,176	90.2
With surgery	60,692	86.3	19,963	83.1	80,655	85.5
Without surgery	3,147	4.5	1,374	5.7	4,521	4.8
<b>Race</b>						
White	65,498	93.1	21,885	91.1	87,383	92.6
Black	2,473	3.5	1,319	5.5	3,792	4.0
Other	2,068	2.9	723	3.0	2,791	3.0
Unknown	315	0.4	102	0.4	417	0.4
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	417	0.6	202	0.8	619	0.7
30–49	5,172	7.4	1,596	6.6	6,768	7.2
50–69	31,687	45.0	9,100	37.9	40,787	43.2
70–79	22,057	31.4	7,287	30.3	29,344	31.1
≥ 80	11,021	15.7	5,844	24.3	16,865	17.9
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	58,790	83.6	21,336	88.8	80,126	84.9
1st and 2nd cancers	10,373	14.7	2,454	10.2	12,827	13.6
1st, 2nd, and 3rd cancers	1,072	1.5	218	0.9	1,290	1.4
1st, 2nd, 3rd, and additional cancers	119	0.2	21	0.1	140	0.1
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	69.2	—	71.5	—	69.7	—
Median year of 1st cancer diagnosis	1988.4	—	1988.3	—	1988.4	—
Median person-years at risk	4.8	—	4.6	—	4.8	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	95.0	—	93.4	—	94.7
1st, 2nd, and additional cancers	—	94.5	—	93.1	—	94.2
1st cancer only	—	4.5	—	6.0	—	4.8

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

## Bladder Both Sexes

**Table 11.1.2:** Risk of subsequent primary cancers after cancer of the urinary bladder, both sexes, 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>	2,529	1.78*	5,953	1.18*	4,123	1.08*	3,236	1.02	15,841	13,460.89	1.18*	38.33
All excluding same site	2,247	1.71*	5,454	1.17*	3,827	1.08*	3,040	1.03	14,568	12,478.28	1.17*	33.65
<b>Buccal cavity, pharynx</b>	32	0.83	141	1.06	93	0.99	63	0.88	329	336.93	0.98	-0.13
Lip	5	0.66	27	1.05	14	0.78	10	0.76	56	64.30	0.87	-0.13
Tongue	2	0.28	18	0.72	21	1.17	18	1.30	59	63.81	0.92	-0.08
Salivary gland	2	0.60	13	1.09	6	0.65	8	1.01	29	32.33	0.90	-0.05
Mouth	7	0.73	41	1.25	24	1.04	15	0.87	87	82.59	1.05	0.07
Nasopharynx	1	0.77	6	1.37	3	0.99	4	1.79	14	10.96	1.28	0.05
Tonsil	1	0.30	15	1.32	8	1.02	3	0.52	27	28.25	0.96	-0.02
Oropharynx	3	2.91	3	0.85	5	1.98	1	0.52	12	9.02	1.33	0.05
Hypopharynx	6	1.52	14	1.03	10	1.06	2	0.30	32	33.74	0.95	-0.03
<b>Digestive system</b>	384	1.19*	1,172	1.03	854	1.00	678	0.98	3,088	3,003.90	1.03	1.35
Esophagus	14	0.86	45	0.78	41	0.95	43	1.19	143	152.94	0.93	-0.16
Stomach	48	1.35	145	1.19*	79	0.89	67	0.96	339	315.71	1.07	0.38
Small intestine	8	1.97	11	0.76	12	1.06	12	1.21	43	39.82	1.08	0.05
Colon	170	1.16	506	0.98	418	1.06	316	0.98	1,410	1,379.00	1.02	0.50
Rectum, rectosigmoid junction	51	0.89	215	1.08	126	0.87	103	0.91	495	514.99	0.96	-0.32
Anus, anal canal	1	0.43	12	1.45	7	1.12	6	1.15	26	22.10	1.18	0.06
Liver	15	1.41	44	1.17	21	0.73	20	0.80	100	102.28	0.98	-0.04
Gallbladder	5	1.29	10	0.76	11	1.13	7	0.90	33	34.60	0.95	-0.03
Bile ducts, other biliary	8	1.16	24	0.97	24	1.23	15	0.85	71	68.81	1.03	0.04
Pancreas	58	1.54*	147	1.12	111	1.13	81	1.00	397	347.71	1.14*	0.79
<b>Respiratory system</b>	333	1.30*	1,448	1.61*	1,081	1.62*	899	1.68*	3,761	2,359.11	1.59*	22.58
Nose, nasal cavity, ear	3	1.43	5	0.68	8	1.48	6	1.36	22	19.23	1.14	0.04
Larynx	23	1.26	83	1.32*	59	1.32*	44	1.34	209	158.34	1.32*	0.82
Lung, bronchus	306	1.31*	1,357	1.64*	1,013	1.64*	848	1.70*	3,524	2,175.69	1.62*	21.71
<b>Female breast</b>	68	1.04	217	0.96	168	0.95	154	0.98	607	625.24	0.97	-1.16
<b>Female genital system</b>	39	1.30	94	0.93	65	0.86	69	1.08	267	270.39	0.99	-0.22
Cervix uteri	4	1.25	5	0.49	4	0.58	3	0.59	16	25.20	0.63	-0.58
Corpus uteri	20	1.31	45	0.87	24	0.63*	38	1.20	127	136.63	0.93	-0.61
Ovary	12	1.37	30	1.00	22	0.96	17	0.85	81	81.79	0.99	-0.05
Vagina	0	0.00	3	1.75	5	3.87*	4	3.59	12	4.63	2.59*	0.47
Vulva	1	0.64	7	1.29	8	1.84	5	1.22	21	15.44	1.36	0.35
<b>Male genital system</b>	1,083	3.01*	1,459	1.11*	901	0.88*	638	0.73*	4,081	3,567.57	1.14*	11.08
Prostate	1,079	3.03*	1,444	1.11*	891	0.87*	634	0.73*	4,048	3,536.05	1.14*	11.05
Testis	2	1.78	5	1.35	3	1.27	2	1.31	12	8.73	1.37	0.07
<b>Urinary system</b>	360	2.76*	653	1.41*	380	1.07	277	0.93	1,670	1,246.06	1.34*	6.83
Urinary bladder	118	1.24*	186	0.55*	71	0.27*	60	0.28*	435	909.02	0.48*	-7.63
Kidney parenchyma	78	2.84*	154	1.57*	84	1.12	81	1.29*	397	263.45	1.51*	2.15
Renal pelvis, other urinary	164	20.45*	313	11.15*	225	10.82*	136	8.14*	838	73.59	11.39*	12.31
Ureter	62	22.77*	118	12.35*	104	14.68*	55	9.83*	339	24.96	13.58*	5.06
<b>Bone, joints</b>	4	3.45	7	1.75	3	1.04	1	0.44	15	10.32	1.45	0.08
<b>Soft tissue including heart</b>	6	1.12	12	0.64	17	1.18	26	2.09*	61	50.97	1.20	0.16
<b>Kaposi sarcoma</b>	3	1.71	2	0.32	1	0.22	4	1.16	10	15.97	0.63	-0.10
<b>Melanoma of skin</b>	27	0.91	111	1.02	80	0.92	69	0.88	287	303.23	0.95	-0.26
<b>Eye, orbit</b>	2	0.97	7	0.98	4	0.76	4	0.94	17	18.77	0.91	-0.03
<b>Brain, central nervous system</b>	13	0.97	54	1.14	37	1.05	19	0.67	123	124.43	0.99	-0.02
<b>Thyroid</b>	9	1.72	16	0.89	11	0.84	9	0.85	45	47.03	0.96	-0.03
<b>Lymphatic, hematopoietic</b>	112	1.06	369	0.98	282	0.97	226	0.92	989	1,017.03	0.97	-0.45
Hodgkin lymphoma	5	1.55	13	1.20	14	1.86*	5	0.88	37	27.26	1.36	0.16
Non-Hodgkin lymphoma	48	1.07	153	0.95	112	0.88	89	0.80*	402	443.90	0.91*	-0.67
Myeloma	14	0.78	55	0.87	44	0.91	39	0.96	152	169.87	0.89	-0.29
Leukemia	45	1.12	148	1.05	112	1.05	93	1.06	398	376.01	1.06	0.35
Acute lymphocytic	0	0.00	1	0.28	3	1.11	5	2.38	9	9.41	0.96	-0.01
Chronic lymphocytic	17	1.04	50	0.87	33	0.76	30	0.86	130	151.84	0.86	-0.35
Acute non-lymphocytic	17	1.29	57	1.22	49	1.38*	36	1.20	159	125.23	1.27*	0.54
Chronic myeloid	5	0.93	22	1.17	17	1.19	14	1.16	58	50.60	1.15	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. EAR for female cancers is based on 157,730 PYR and for male cancers on 463,222 PYR.



**Table 11.1.3:** Risk of subsequent primary cancers after cancer of the urinary bladder, females, 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>	400	1.63*	1,086	1.28*	779	1.18*	689	1.16*	2,954	2,341.29	1.26*	38.85
All excluding same site	328	1.39*	994	1.22*	730	1.15*	655	1.15*	2,707	2,257.40	1.20*	28.50
<b>Buccal cavity, pharynx</b>	3	0.69	14	0.94	13	1.15	9	0.92	39	40.18	0.97	-0.07
Lip	0	0.00	1	0.88	2	2.20	2	2.35	5	3.23	1.55	0.11
Tongue	1	1.06	3	0.93	3	1.21	1	0.47	8	8.81	0.91	-0.05
Salivary gland	0	0.00	1	0.60	0	0.00	1	0.86	2	4.60	0.43	-0.16
Mouth	2	1.30	5	0.95	5	1.24	3	0.85	15	14.35	1.05	0.04
Nasopharynx	0	0.00	0	0.00	0	0.00	1	3.08	1	1.39	0.72	-0.02
Tonsil	0	0.00	3	2.56	1	1.18	0	0.00	4	3.02	1.32	0.06
Oropharynx	0	0.00	1	2.80	0	0.00	0	0.00	1	0.94	1.07	0.00
Hypopharynx	0	0.00	0	0.00	2	2.89	0	0.00	2	2.46	0.81	-0.03
<b>Digestive system</b>	94	1.48*	242	1.12	175	1.04	141	0.94	652	599.15	1.09*	3.35
Esophagus	0	0.00	3	0.55	6	1.40	6	1.54	15	15.31	0.98	-0.02
Stomach	10	1.92	25	1.45	8	0.62	10	0.90	53	46.48	1.14	0.41
Small intestine	1	1.27	2	0.73	5	2.25	6	2.81*	14	7.89	1.78	0.39
Colon	47	1.46*	111	1.01	97	1.12	72	0.92	327	307.17	1.06	1.26
Rectum, rectosigmoid junction	19	1.94*	35	1.05	20	0.80	13	0.61	87	89.36	0.97	-0.15
Rectum	11	1.71	24	1.10	16	0.97	10	0.70	61	58.93	1.04	0.13
Anus, anal canal	1	1.34	5	1.93	2	0.99	3	1.65	11	7.19	1.53	0.24
Liver	0	0.00	4	0.94	3	0.89	2	0.63	9	12.08	0.74	-0.20
Gallbladder	2	1.31	4	0.78	5	1.31	3	0.96	14	13.58	1.03	0.03
Bile ducts, other biliary	1	0.73	6	1.26	3	0.78	2	0.53	12	13.80	0.87	-0.11
Pancreas	12	1.46	43	1.53*	25	1.13	20	0.99	100	78.75	1.27*	1.35
<b>Respiratory system</b>	60	2.00*	240	2.25*	189	2.20*	175	2.16*	664	303.64	2.19*	22.85
Nose, nasal cavity, ear	0	0.00	0	0.00	2	2.19	2	2.41	4	3.25	1.23	0.05
Larynx	2	2.16	8	2.51*	6	2.50	4	2.01	20	8.50	2.35*	0.73
Lung, bronchus	58	2.02*	232	2.27*	180	2.18*	168	2.16*	638	291.12	2.19*	21.99
<b>Female breast</b>	68	1.04	217	0.96	168	0.95	154	0.98	607	625.24	0.97	-1.16
<b>Female genital system</b>	39	1.30	94	0.93	65	0.86	69	1.08	267	270.39	0.99	-0.22
Cervix uteri	4	1.25	5	0.49	4	0.58	3	0.59	16	25.20	0.63	-0.58
Corpus uteri	20	1.31	45	0.87	24	0.63*	38	1.20	127	136.63	0.93	-0.61
Ovary	12	1.37	30	1.00	22	0.96	17	0.85	81	81.79	0.99	-0.05
Vagina	0	0.00	3	1.75	5	3.87*	4	3.59	12	4.63	2.59*	0.47
Vulva	1	0.64	7	1.29	8	1.84	5	1.22	21	15.44	1.36	0.35
<b>Urinary system</b>	84	6.79*	114	2.66*	59	1.74*	47	1.51*	304	120.16	2.53*	11.66
Urinary bladder	22	2.88*	28	1.07	13	0.63	11	0.58	74	73.70	1.00	0.02
Kidney parenchyma	12	3.27*	22	1.72*	10	0.98	13	1.36	57	36.28	1.57*	1.31
Renal pelvis, other urinary	50	46.53*	64	17.36*	36	12.58*	23	8.97*	173	10.19	16.98*	10.32
Ureter	16	47.23*	32	27.46*	19	21.05*	10	12.57*	77	3.20	24.05*	4.68
<b>Bone, joints</b>	2	8.90	3	3.94	0	0.00	0	0.00	5	2.04	2.45	0.19
<b>Soft tissue including heart</b>	0	0.00	2	0.61	1	0.39	6	2.50	9	9.21	0.98	-0.01
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	2	6.56	2	1.16	1.73	0.05
<b>Melanoma of skin</b>	2	0.47	20	1.32	12	1.00	10	0.87	44	42.91	1.03	0.07
<b>Eye, orbit</b>	1	2.70	2	1.59	0	0.00	0	0.00	3	3.37	0.89	-0.02
<b>Brain, central nervous system</b>	4	1.68	6	0.72	9	1.40	3	0.53	22	22.69	0.97	-0.04
<b>Thyroid</b>	2	1.12	7	1.16	5	1.12	3	0.79	17	16.06	1.06	0.06
<b>Lymphatic, hematopoietic</b>	28	1.43	79	1.16	52	0.96	48	0.96	207	191.47	1.08	0.98
Hodgkin lymphoma	1	1.82	3	1.63	2	1.47	1	0.88	7	4.89	1.43	0.13
Non-Hodgkin lymphoma	12	1.32	30	0.94	25	0.97	17	0.69	84	91.34	0.92	-0.47
Myeloma	1	0.29	14	1.20	6	0.66	10	1.22	31	32.39	0.96	-0.09
Leukemia	14	2.13*	32	1.42	19	1.08	20	1.24	85	62.86	1.35*	1.40
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	2.34	1	1.68	0.60	-0.04
Chronic lymphocytic	4	1.54	13	1.46	7	1.01	5	0.80	29	24.67	1.18	0.27
Acute non-lymphocytic	6	2.65	16	2.06*	5	0.82	8	1.41	35	21.82	1.60*	0.84
Chronic myeloid	3	3.36	2	0.66	4	1.67	3	1.37	12	8.53	1.41	0.22

\*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 11.1.4:** Risk of subsequent primary cancers after cancer of the urinary bladder, 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>	2,129	1.82*	4,867	1.16*	3,344	1.05*	2,547	0.98	12,887	11,119.60	1.16*	38.15
All excluding same site	1,919	1.78*	4,460	1.16*	3,097	1.06*	2,385	1.00	11,861	10,220.88	1.16*	35.41
<b>Buccal cavity, pharynx</b>	29	0.85	127	1.08	80	0.96	54	0.88	290	296.75	0.98	-0.15
Lip	5	0.69	26	1.06	12	0.70	8	0.65	51	61.07	0.84	-0.22
Tongue	1	0.16*	15	0.69	18	1.17	17	1.46	51	55.01	0.93	-0.09
Salivary gland	2	0.70	12	1.17	6	0.76	7	1.04	27	27.73	0.97	-0.02
Mouth	5	0.62	36	1.31	19	1.00	12	0.87	72	68.24	1.06	0.08
Nasopharynx	1	0.88	6	1.55	3	1.13	3	1.57	13	9.57	1.36	0.07
Tonsil	1	0.34	12	1.18	7	1.00	3	0.59	23	25.23	0.91	-0.05
Oropharynx	3	3.23	2	0.63	5	2.21	1	0.59	11	8.08	1.36	0.06
Hypopharynx	6	1.63	14	1.11	8	0.91	2	0.32	30	31.28	0.96	-0.03
<b>Digestive system</b>	290	1.11	930	1.01	679	0.99	537	0.99	2,436	2,404.76	1.01	0.67
Esophagus	14	0.95	42	0.81	35	0.90	37	1.15	128	137.63	0.93	-0.21
Stomach	38	1.25	120	1.15	71	0.94	57	0.97	286	269.23	1.06	0.36
Small intestine	7	2.13	9	0.76	7	0.77	6	0.77	29	31.93	0.91	-0.06
Colon	123	1.08	395	0.97	321	1.05	244	0.99	1,083	1,071.83	1.01	0.24
Rectum, rectosigmoid junction	32	0.67*	180	1.09	106	0.88	90	0.98	408	425.63	0.96	-0.38
Anus, anal canal	0	0.00	7	1.23	5	1.18	3	0.88	15	14.91	1.01	0.00
Liver	15	1.60	40	1.20	18	0.70	18	0.83	91	90.20	1.01	0.02
Gallbladder	3	1.28	6	0.74	6	1.01	4	0.86	19	21.03	0.90	-0.04
Bile ducts, other biliary	7	1.26	18	0.90	21	1.34	13	0.94	59	55.01	1.07	0.09
Pancreas	46	1.56*	104	1.01	86	1.13	61	1.01	297	268.96	1.10	0.61
<b>Respiratory system</b>	273	1.21*	1,208	1.53*	892	1.53*	724	1.59*	3,097	2,055.47	1.51*	22.48
Nose, nasal cavity, ear	3	1.71	5	0.81	6	1.33	4	1.12	18	15.99	1.13	0.04
Larynx	21	1.21	75	1.26	53	1.26	40	1.30	189	149.84	1.26*	0.85
Lung, bronchus	248	1.21*	1,125	1.55*	833	1.56*	680	1.62*	2,886	1,884.57	1.53*	21.62
<b>Male breast</b>	2	0.91	10	1.30	7	1.20	1	0.21	20	20.59	0.97	-0.01
<b>Male genital system</b>	1,083	3.01*	1,459	1.11*	901	0.88*	638	0.73*	4,081	3,567.57	1.14*	11.08
Prostate	1,079	3.03*	1,444	1.11*	891	0.87*	634	0.73*	4,048	3,536.05	1.14*	11.05
Testis	2	1.78	5	1.35	3	1.27	2	1.31	12	8.73	1.37	0.07
<b>Urinary system</b>	276	2.34*	539	1.28*	321	1.00	230	0.87*	1,366	1,125.90	1.21*	5.18
Urinary bladder	96	1.10	158	0.51*	58	0.24*	49	0.25*	361	835.32	0.43*	-10.24
Kidney parenchyma	66	2.77*	132	1.55*	74	1.14	68	1.27	340	227.17	1.50*	2.44
Renal pelvis, other urinary	114	16.41*	249	10.21*	189	10.54*	113	7.99*	665	63.40	10.49*	12.99
Ureter	46	19.29*	86	10.25*	85	13.75*	45	9.38*	262	21.75	12.04*	5.19
<b>Bone, joints</b>	2	2.14	4	1.23	3	1.30	1	0.56	10	8.27	1.21	0.04
<b>Soft tissue including heart</b>	6	1.37	10	0.64	16	1.36	20	1.99*	52	41.76	1.25	0.22
<b>Kaposi sarcoma</b>	3	1.83	2	0.35	1	0.24	2	0.64	8	14.81	0.54	-0.15
<b>Melanoma of skin</b>	25	0.99	91	0.98	68	0.91	59	0.88	243	260.32	0.93	-0.37
<b>Eye, orbit</b>	1	0.59	5	0.84	4	0.92	4	1.17	14	15.40	0.91	-0.03
<b>Brain, central nervous system</b>	9	0.82	48	1.23	28	0.97	16	0.70	101	101.74	0.99	-0.02
<b>Thyroid</b>	7	2.03	9	0.75	6	0.69	6	0.88	28	30.98	0.90	-0.06
<b>Lymphatic, hematopoietic</b>	84	0.97	290	0.94	230	0.98	178	0.91	782	825.56	0.95	-0.94
Hodgkin lymphoma	4	1.49	10	1.11	12	1.95*	4	0.89	30	22.37	1.34	0.16
Non-Hodgkin lymphoma	36	1.01	123	0.95	87	0.86	72	0.83	318	352.56	0.90	-0.75
Myeloma	13	0.90	41	0.80	38	0.97	29	0.89	121	137.47	0.88	-0.36
Leukemia	31	0.93	116	0.98	93	1.04	73	1.01	313	313.15	1.00	0.00
Acute lymphocytic	0	0.00	1	0.34	3	1.35	4	2.39	8	7.73	1.03	0.01
Chronic lymphocytic	13	0.95	37	0.77	26	0.72	25	0.87	101	127.17	0.79*	-0.56
Acute non-lymphocytic	11	1.01	41	1.06	44	1.50*	28	1.15	124	103.42	1.20	0.44
Chronic myeloid	2	0.45	20	1.27	13	1.09	11	1.11	46	42.08	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 11.1.5:** Risk of subsequent primary cancers after cancer of the urinary bladder, both sexes, <50 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>	69	5.28*	117	1.76*	126	1.33*	313	1.14*	625	448.72	1.39*	22.84
All excluding same site	56	4.49*	99	1.56*	109	1.22	287	1.11	551	424.29	1.30*	16.42
<b>Buccal cavity, pharynx</b>	2	3.13	1	0.30	5	1.13	5	0.55	13	17.36	0.75	-0.57
Lip	1	11.94	0	0.00	2	4.20	1	0.98	4	1.97	2.03	0.26
Tongue	1	7.13	1	1.37	0	0.00	2	0.97	4	3.93	1.02	0.01
Salivary gland	0	0.00	0	0.00	0	0.00	1	1.46	1	1.30	0.77	-0.04
Mouth	0	0.00	0	0.00	1	0.90	0	0.00	1	4.27	0.23	-0.42
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.87	0.00	-0.11
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	2.28	0.00	-0.30
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.51	0.00	-0.07
Hypopharynx	0	0.00	0	0.00	2	4.72	0	0.00	2	1.69	1.19	0.04
<b>Digestive system</b>	5	2.47	17	1.55	16	0.96	56	1.15	94	78.30	1.20	2.03
Esophagus	0	0.00	0	0.00	2	1.65	4	1.12	6	5.69	1.05	0.04
Stomach	1	4.20	0	0.00	0	0.00	7	1.55	8	7.71	1.04	0.04
Small intestine	0	0.00	1	3.68	0	0.00	0	0.00	1	1.64	0.61	-0.08
Colon	1	1.40	7	1.78	12	1.96*	29	1.51*	49	30.00	1.63*	2.46
Rectum, rectosigmoid junction	0	0.00	3	1.32	2	0.57	7	0.72	12	15.93	0.75	-0.51
Anus, anal canal	0	0.00	0	0.00	0	0.00	1	1.54	1	1.21	0.83	-0.03
Liver	0	0.00	4	7.08*	0	0.00	2	0.85	6	3.86	1.56	0.28
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.61	0.00	-0.08
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	1.59	0.00	-0.21
Pancreas	3	12.87*	2	1.54	0	0.00	6	1.05	11	9.20	1.20	0.23
<b>Respiratory system</b>	8	4.25*	21	1.96*	34	2.00*	89	1.79*	152	79.43	1.91*	9.40
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	1	2.30	1	0.83	1.20	0.02
Larynx	0	0.00	1	0.82	3	1.63	5	1.15	9	7.61	1.18	0.18
Lung, bronchus	8	4.95*	20	2.15*	31	2.08*	83	1.85*	142	70.73	2.01*	9.23
<b>Female breast</b>	2	1.13	6	0.72	4	0.40	19	0.96	31	39.82	0.78	-4.71
<b>Female genital system</b>	1	1.41	3	0.89	1	0.25	5	0.63	10	16.08	0.62	-3.25
Cervix uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	2.73	0.00	-1.46
Corpus uteri	1	4.16	1	0.76	0	0.00	3	0.73	5	7.49	0.67	-1.33
Ovary	0	0.00	2	1.93	0	0.00	1	0.41	3	4.94	0.61	-1.04
Vagina	0	0.00	0	0.00	1	27.31	0	0.00	1	0.15	6.47	0.45
Vulva	0	0.00	0	0.00	0	0.00	1	4.02	1	0.47	2.14	0.28
<b>Male genital system</b>	25	28.05*	18	3.16*	18	1.46	52	0.74*	113	88.79	1.27*	4.14
Prostate	25	47.53*	16	3.68*	17	1.51	51	0.74*	109	84.89	1.28*	4.12
Testis	0	0.00	2	1.62	1	1.11	1	1.38	4	3.19	1.25	0.14
<b>Urinary system</b>	15	15.27*	21	3.98*	20	2.54*	37	1.61*	93	37.17	2.50*	7.23
Urinary bladder	8	14.85*	7	2.36	4	0.87	5	0.34*	24	22.81	1.05	0.15
Kidney parenchyma	2	4.99	3	1.43	3	1.02	11	1.51	19	12.74	1.49	0.81
Renal pelvis, other urinary	5	118.70*	11	50.42*	13	40.59*	21	20.30*	50	1.62	30.96*	6.27
Ureter	3	357.71*	5	103.14*	3	35.85*	9	27.07*	20	0.47	42.29*	2.53
<b>Bone, joints</b>	0	0.00	1	5.79	0	0.00	0	0.00	1	0.70	1.44	0.04
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	1.59	2	1.67	3	2.52	1.19	0.06
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	1	1.04	1	4.00	0.25	-0.39
<b>Melanoma of skin</b>	4	3.83*	7	1.48	5	0.93	14	1.35	30	21.54	1.39	1.10
<b>Eye, orbit</b>	0	0.00	0	0.00	1	4.39	0	0.00	1	0.92	1.08	0.01
<b>Brain, central nervous system</b>	2	5.45	6	3.57*	4	2.08	1	0.28	13	7.58	1.71	0.70
<b>Thyroid</b>	1	2.93	2	1.38	3	2.08	3	1.36	9	5.43	1.66	0.46
<b>Lymphatic, hematopoietic</b>	4	2.70	8	1.14	11	1.26	22	1.08	45	37.53	1.20	0.97
Hodgkin lymphoma	0	0.00	3	3.80	1	1.41	1	1.10	5	2.61	1.92	0.31
Non-Hodgkin lymphoma	3	3.81	2	0.54	6	1.32	8	0.78	19	19.33	0.98	-0.04
Myeloma	0	0.00	1	1.51	0	0.00	6	2.01	7	4.78	1.46	0.29
Leukemia	1	2.64	2	1.07	4	1.65	7	1.14	14	10.81	1.29	0.41
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	4.11	1	0.56	1.78	0.06
Chronic lymphocytic	1	10.74	1	1.83	1	1.13	3	1.19	6	4.05	1.48	0.25
Acute non-lymphocytic	0	0.00	1	1.61	2	2.65	3	1.52	6	3.49	1.72	0.33
Chronic myeloid	0	0.00	0	0.00	1	2.67	0	0.00	1	1.61	0.62	-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. EAR for female cancers is based on 18,715 PYR and for male cancers on 58,464 PYR.

## Bladder Both Sexes, 50-69 Years of Age

**Table 11.1.6:** Risk of subsequent primary cancers after cancer of the urinary bladder, both sexes, 50-69 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>All subsequent cancers</b>	992	2.22*	2,593	1.31*	2,352	1.13*	2,328	1.02	8,265	6,790.48	1.22*	44.13
All excluding same site	887	2.12*	2,378	1.28*	2,173	1.12*	2,190	1.04	7,628	6,323.91	1.21*	39.03
<b>Buccal cavity, pharynx</b>	18	1.10	67	1.03	47	0.83	45	0.90	177	188.30	0.94	-0.34
Lip	2	0.82	9	0.90	4	0.43	6	0.66	21	30.86	0.68	-0.30
Tongue	0	0.00	9	0.68	14	1.22	13	1.31	36	37.80	0.95	-0.05
Salivary gland	1	0.99	7	1.61	4	0.91	5	0.96	17	14.95	1.14	0.06
Mouth	3	0.72	19	1.16	12	0.86	11	0.91	45	46.46	0.97	-0.04
Nasopharynx	1	1.53	5	2.03	1	0.51	4	2.60	11	6.61	1.66	0.13
Tonsil	1	0.58	4	0.61	5	0.94	3	0.74	13	17.66	0.74	-0.14
Oropharynx	2	3.82	2	0.98	3	1.73	1	0.71	8	5.72	1.40	0.07
Hypopharynx	4	2.07	10	1.30	4	0.61	1	0.20	19	21.25	0.89	-0.07
<b>Digestive system</b>	126	1.39*	402	1.00	412	0.98	460	0.96	1,400	1,388.82	1.01	0.33
Esophagus	5	0.82	25	0.97	23	0.91	33	1.26	86	83.31	1.03	0.08
Stomach	11	1.15	45	1.09	41	0.97	40	0.85	137	140.29	0.98	-0.10
Small intestine	2	1.51	6	1.02	6	0.98	8	1.15	22	20.31	1.08	0.05
Colon	58	1.57*	160	0.96	190	1.04	202	0.92	610	606.78	1.01	0.10
Rectum, rectosigmoid junction	18	0.98	80	1.01	62	0.79	72	0.90	232	255.51	0.91	-0.70
Anus, anal canal	1	1.15	4	1.09	3	0.85	5	1.42	13	11.59	1.12	0.04
Liver	5	1.42	14	0.91	12	0.74	16	0.88	47	53.32	0.88	-0.19
Gallbladder	0	0.00	1	0.27	3	0.73	5	0.99	9	13.71	0.66	-0.14
Bile ducts, other biliary	3	1.77	7	0.91	11	1.27	10	0.86	31	29.71	1.04	0.04
Pancreas	22	2.03*	55	1.16	59	1.21	62	1.11	198	162.59	1.22*	1.06
<b>Respiratory system</b>	131	1.38*	717	1.76*	660	1.64*	667	1.66*	2,175	1,306.63	1.66*	25.99
Nose, nasal cavity, ear	1	1.35	2	0.67	3	1.06	5	1.65	11	9.60	1.15	0.04
Larynx	11	1.29	50	1.47*	40	1.35	36	1.47*	137	96.61	1.42*	1.21
Lung, bronchus	119	1.39*	664	1.79*	617	1.67*	625	1.68*	2,025	1,197.43	1.69*	24.77
<b>Female breast</b>	29	1.23	105	1.10	101	1.08	101	0.98	336	316.56	1.06	2.49
<b>Female genital system</b>	14	1.18	45	0.97	35	0.83	50	1.18	144	142.32	1.01	0.21
Cervix uteri	0	0.00	1	0.22	2	0.56	1	0.33	4	12.41	0.32*	-1.08
Corpus uteri	7	1.05	21	0.81	16	0.69	29	1.31	73	77.68	0.94	-0.60
Ovary	5	1.55	16	1.23	10	0.81	12	0.91	43	41.71	1.03	0.17
Vagina	0	0.00	2	3.72	2	3.61	4	5.78*	8	1.92	4.18*	0.78
Vulva	1	3.09	2	1.39	4	2.45	3	1.25	10	5.78	1.73	0.54
<b>Male genital system</b>	458	4.45*	645	1.28*	546	0.93	491	0.75*	2,140	1,846.13	1.16*	11.47
Prostate	455	4.48*	637	1.28*	538	0.93	489	0.75*	2,119	1,831.71	1.16*	11.22
Testis	2	4.02	1	0.61	2	1.85	1	1.39	6	3.94	1.52	0.08
<b>Urinary system</b>	141	3.60*	288	1.65*	231	1.25*	198	0.94	858	610.93	1.40*	7.39
Urinary bladder	40	1.51*	63	0.52*	31	0.24*	41	0.27*	175	431.41	0.41*	-7.67
Kidney parenchyma	36	3.46*	73	1.64*	52	1.18	60	1.32*	221	144.35	1.53*	2.29
Renal pelvis, other urinary	65	28.68*	152	14.83*	148	13.79*	97	8.14*	462	35.16	13.14*	12.77
Ureter	19	24.91*	58	16.59*	73	19.64*	38	9.35*	188	12.04	15.61*	5.27
<b>Bone, joints</b>	1	2.32	3	1.69	1	0.61	1	0.65	6	5.39	1.11	0.02
<b>Soft tissue including heart</b>	3	1.79	4	0.57	9	1.26	18	2.14*	34	24.28	1.40	0.29
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	1	0.66	1	0.63	2	5.33	0.38	-0.10
<b>Melanoma of skin</b>	11	0.96	45	0.93	40	0.83	43	0.80	139	162.18	0.86	-0.69
<b>Eye, orbit</b>	1	1.33	2	0.64	1	0.34	3	1.00	7	9.88	0.71	-0.09
<b>Brain, central nervous system</b>	4	0.71	28	1.22	24	1.13	15	0.73	71	70.30	1.01	0.02
<b>Thyroid</b>	5	2.12	8	0.88	5	0.64	5	0.72	23	26.33	0.87	-0.10
<b>Lymphatic, hematopoietic</b>	35	1.12	155	1.13	153	1.05	168	0.98	511	484.79	1.05	0.78
Hodgkin lymphoma	3	2.35	7	1.43	7	1.68	4	1.04	21	14.17	1.48	0.20
Non-Hodgkin lymphoma	15	1.06	61	0.98	63	0.96	65	0.83	204	220.35	0.93	-0.49
Myeloma	5	0.97	23	1.00	21	0.86	26	0.90	75	81.38	0.92	-0.19
Leukemia	12	1.13	64	1.35*	62	1.22	73	1.22	211	168.89	1.25*	1.26
Acute lymphocytic	0	0.00	1	0.76	2	1.53	2	1.47	5	4.30	1.16	0.02
Chronic lymphocytic	4	0.87	22	1.08	21	0.98	23	0.96	70	70.27	1.00	-0.01
Acute non-lymphocytic	7	2.10	24	1.56*	27	1.58*	29	1.39	87	56.56	1.54*	0.91
Chronic myeloid	1	0.73	11	1.83	8	1.24	12	1.48	32	21.97	1.46	0.30

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 77,985 PYR and for male cancers on 256,160 PYR.

**Table 11.1.7:** Risk of subsequent primary cancers after cancer of the urinary bladder, both sexes, ≥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>	1,468	1.53*	3,243	1.09*	1,645	0.99	595	0.95	6,951	6,221.69	1.12*	34.79
All excluding same site	1,304	1.47*	2,977	1.09*	1,545	1.01	563	0.97	6,389	5,730.08	1.11*	31.43
<b>Buccal cavity, pharynx</b>	12	0.56*	73	1.14	41	1.23	13	1.07	139	131.27	1.06	0.37
Lip	2	0.40	18	1.18	8	0.98	3	1.01	31	31.47	0.99	-0.02
Tongue	1	0.27	8	0.73	7	1.27	3	1.60	19	22.09	0.86	-0.15
Salivary gland	1	0.44	6	0.82	2	0.45	2	0.99	11	16.08	0.68	-0.24
Mouth	4	0.76	22	1.42	11	1.36	4	1.32	41	31.86	1.29	0.44
Nasopharynx	0	0.00	1	0.58	2	2.38	0	0.00	3	3.48	0.86	-0.02
Tonsil	0	0.00	11	2.57*	3	1.54	0	0.00	14	8.31	1.68	0.27
Oropharynx	1	2.03	1	0.71	2	2.99	0	0.00	4	2.79	1.43	0.06
Hypopharynx	2	1.02	4	0.72	4	1.60	1	1.35	11	10.80	1.02	0.01
<b>Digestive system</b>	253	1.10	753	1.04	426	1.02	162	0.97	1,594	1,536.78	1.04	2.73
Esophagus	9	0.89	20	0.65	16	0.96	6	0.95	51	63.94	0.80	-0.62
Stomach	36	1.40	100	1.26*	38	0.85	20	1.11	194	167.72	1.16	1.25
Small intestine	6	2.23	4	0.48	6	1.24	4	2.05	20	17.87	1.12	0.10
Colon	111	1.02	339	0.98	216	1.06	85	1.01	751	742.22	1.01	0.42
Rectum, rectosigmoid junction	33	0.86	132	1.12	62	0.97	24	1.02	251	243.55	1.03	0.36
Anus, anal canal	0	0.00	8	1.83	4	1.63	0	0.00	12	9.30	1.29	0.13
Liver	10	1.43	26	1.20	9	0.75	2	0.45	47	45.10	1.04	0.09
Gallbladder	5	1.65	9	0.96	8	1.45	2	0.86	24	20.28	1.18	0.18
Bile ducts, other biliary	5	0.96	17	1.01	13	1.23	5	1.02	40	37.51	1.07	0.12
Pancreas	33	1.24	90	1.09	52	1.10	13	0.67	188	175.92	1.07	0.58
<b>Respiratory system</b>	194	1.22*	710	1.48*	387	1.55*	143	1.69*	1,434	973.05	1.47*	21.99
Nose, nasal cavity, ear	2	1.51	3	0.72	5	2.09	0	0.00	10	8.80	1.14	0.06
Larynx	12	1.26	32	1.16	16	1.22	3	0.77	63	54.11	1.16	0.42
Lung, bronchus	179	1.21*	673	1.51*	365	1.56*	140	1.76*	1,357	907.53	1.50*	21.44
<b>Female breast</b>	37	0.92	106	0.86	63	0.87	34	1.02	240	268.86	0.89	-4.73
<b>Female genital system</b>	24	1.37	46	0.89	29	0.99	14	1.06	113	111.99	1.01	0.17
Cervix uteri	4	2.36	4	0.84	2	0.79	2	1.84	12	10.06	1.19	0.32
Corpus uteri	12	1.43	23	0.94	8	0.61	6	1.11	49	51.45	0.95	-0.40
Ovary	7	1.32	12	0.75	12	1.28	4	0.90	35	35.14	1.00	-0.02
Vagina	0	0.00	1	0.87	2	2.85	0	0.00	3	2.56	1.17	0.07
Vulva	0	0.00	5	1.28	4	1.54	1	0.69	10	9.19	1.09	0.13
<b>Male genital system</b>	600	2.34*	796	1.00	337	0.78*	95	0.65*	1,828	1,632.65	1.12*	13.15
Prostate	599	2.36*	791	1.00	336	0.79*	94	0.65*	1,820	1,619.45	1.12*	13.50
Testis	0	0.00	2	2.37	0	0.00	0	0.00	2	1.60	1.25	0.03
<b>Urinary system</b>	204	2.26*	344	1.21*	129	0.80*	42	0.67*	719	597.96	1.20*	5.77
Urinary bladder	70	1.03	116	0.54*	36	0.29*	14	0.29*	236	454.79	0.52*	-10.44
Kidney parenchyma	40	2.40*	78	1.52*	29	1.03	10	0.98	157	106.36	1.48*	2.42
Renal pelvis, other urinary	94	16.46*	150	8.52*	64	6.57*	18	4.80*	326	36.81	8.86*	13.80
Ureter	40	20.49*	55	9.15*	28	8.53*	8	6.70*	131	12.44	10.53*	5.66
<b>Bone, joints</b>	3	4.37	3	1.46	2	1.88	0	0.00	8	4.23	1.89	0.18
<b>Soft tissue including heart</b>	3	0.85	8	0.71	7	1.06	6	2.12	24	24.17	0.99	-0.01
<b>Kaposi sarcoma</b>	3	3.33	2	0.67	0	0.00	2	2.24	7	6.63	1.06	0.02
<b>Melanoma of skin</b>	12	0.70	59	1.07	35	1.06	12	0.84	118	119.51	0.99	-0.07
<b>Eye, orbit</b>	1	0.79	5	1.30	2	0.96	1	1.32	9	7.97	1.13	0.05
<b>Brain, central nervous system</b>	7	0.94	20	0.88	9	0.74	3	0.70	39	46.55	0.84	-0.36
<b>Thyroid</b>	3	1.19	6	0.80	3	0.78	1	0.70	13	15.27	0.85	-0.11
<b>Lymphatic, hematopoietic</b>	73	1.00	206	0.89	118	0.87	36	0.66*	433	494.71	0.88*	-2.94
Hodgkin lymphoma	2	1.14	3	0.58	6	2.27	0	0.00	11	10.48	1.05	0.02
Non-Hodgkin lymphoma	30	1.01	90	0.94	43	0.76	16	0.70	179	204.22	0.88	-1.20
Myeloma	9	0.72	31	0.79	23	1.01	7	0.78	70	83.71	0.84	-0.65
Leukemia	32	1.10	82	0.89	46	0.86	13	0.59	173	196.30	0.88	-1.11
Acute lymphocytic	0	0.00	0	0.00	1	0.80	2	4.05	3	4.55	0.66	-0.07
Chronic lymphocytic	12	1.03	27	0.74	11	0.52*	4	0.46	54	77.51	0.70*	-1.12
Acute non-lymphocytic	10	1.03	32	1.04	20	1.13	4	0.56	66	65.18	1.01	0.04
Chronic myeloid	4	1.02	11	0.88	8	1.07	2	0.64	25	27.02	0.93	-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. EAR for female cancers is based on 61,031 PYR and for male cancers on 148,597 PYR.

## Kidney Parenchyma

### Both Sexes, ≥18 Years of Age

**Table 11.2.1:** Characteristics of patients with an initial cancer of the kidney parenchyma, both sexes, ≥18 years of age, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	23,211	100.0	13,624	100.0	36,835	100.0
<b>Initial treatment</b>						
Any radiation	3,022	13.0	1,495	11.0	4,517	12.3
With surgery	1,415	6.1	664	4.9	2,079	5.6
Without surgery	1,607	6.9	831	6.1	2,438	6.6
No radiation	20,189	87.0	12,129	89.0	32,318	87.7
With surgery	16,955	73.0	9,794	71.9	26,749	72.6
Without surgery	3,234	13.9	2,335	17.1	5,569	15.1
<b>Race</b>						
White	20,071	86.5	11,685	85.8	31,756	86.2
Black	1,961	8.4	1,320	9.7	3,281	8.9
Other	1,122	4.8	575	4.2	1,697	4.6
Unknown	57	0.2	44	0.3	101	0.3
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	163	0.7	182	1.3	345	0.9
30–49	3,779	16.3	2,031	14.9	5,810	15.8
50–69	12,557	54.1	6,288	46.2	18,845	51.2
70–79	5,030	21.7	3,452	25.3	8,482	23.0
≥ 80	1,682	7.2	1,671	12.3	3,353	9.1
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	20,892	90.0	12,701	93.2	33,593	91.2
1st and 2nd cancers	2,107	9.1	839	6.2	2,946	8.0
1st, 2nd, and 3rd cancers	194	0.8	76	0.6	270	0.7
1st, 2nd, 3rd, and additional cancers	18	0.1	8	0.1	26	0.1
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	62.8	—	65.7	—	63.8	—
Median year of 1st cancer diagnosis	1990.0	—	1990.5	—	1990.2	—
Median person-years at risk	2.8	—	2.8	—	2.8	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	95.1	—	94.1	—	94.8
1st, 2nd, and additional cancers	—	94.9	—	94.1	—	94.7
1st cancer only	—	3.1	—	3.9	—	3.3

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

**Table 11.2.2:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, ≥18 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>	568	1.53*	1,288	1.09*	960	1.11*	754	1.05	3,570	3,145.79	1.13*	22.88
All excluding same site	510	1.40*	1,205	1.04	898	1.06	696	0.99	3,309	3,081.60	1.07*	12.27
<b>Buccal cavity, pharynx</b>	11	1.05	17	0.53*	19	0.87	10	0.61	57	80.82	0.71*	-1.28
Lip	1	0.62	2	0.41	5	1.51	7	2.81*	15	12.25	1.22	0.15
Tongue	3	1.44	3	0.47	2	0.45	0	0.00	8	16.28	0.49*	-0.45
Salivary gland	1	1.18	2	0.74	3	1.53	1	0.60	7	7.17	0.98	-0.01
Mouth	5	1.85	3	0.36	6	1.08	1	0.24	15	20.64	0.73	-0.30
Nasopharynx	1	2.35	3	2.36	0	0.00	0	0.00	4	3.10	1.29	0.05
Tonsil	0	0.00	1	0.32	2	0.97	1	0.68	4	7.68	0.52	-0.20
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	2.34	0.00	-0.13
Hypopharynx	0	0.00	1	0.30	1	0.44	0	0.00	2	8.40	0.24*	-0.35
<b>Digestive system</b>	77	0.95	227	0.89	220	1.18*	157	1.02	681	678.14	1.00	0.15
Esophagus	5	1.13	10	0.72	6	0.60	4	0.49	25	36.64	0.68	-0.63
Stomach	8	0.94	18	0.68	19	1.01	20	1.32	65	68.85	0.94	-0.21
Small intestine	4	3.45	4	1.08	3	1.09	3	1.28	14	9.97	1.40	0.22
Colon	31	0.86	113	0.99	109	1.29*	68	0.96	321	305.21	1.05	0.85
Rectum, rectosigmoid junction	11	0.77	36	0.81	37	1.17	23	0.92	107	115.80	0.92	-0.47
Anus, anal canal	1	1.36	3	1.29	4	2.41	1	0.74	9	6.06	1.49	0.16
Liver	3	1.02	5	0.53	7	1.03	3	0.52	18	24.89	0.72	-0.37
Gallbladder	1	0.98	3	0.96	3	1.34	2	1.09	9	8.21	1.10	0.04
Bile ducts, other biliary	2	1.18	6	1.10	3	0.72	4	1.07	15	15.10	0.99	-0.01
Pancreas	10	1.03	26	0.85	27	1.22	29	1.57*	92	81.00	1.14	0.59
<b>Respiratory system</b>	53	0.79	192	0.90	146	0.96	121	0.98	512	555.97	0.92	-2.37
Nose, nasal cavity, ear	0	0.00	4	2.29	1	0.81	0	0.00	5	4.54	1.10	0.02
Larynx	1	0.21	9	0.60	9	0.88	5	0.66	24	37.63	0.64*	-0.74
Lung, bronchus	52	0.84	179	0.92	136	0.96	116	1.02	483	512.47	0.94	-1.59
<b>Female breast</b>	27	0.88	77	0.80	75	1.09	48	0.86	227	251.28	0.90	-3.50
<b>Female genital system</b>	18	1.29	42	0.99	28	0.96	17	0.75	105	107.91	0.97	-0.42
Cervix uteri	1	0.61	8	1.69	4	1.35	3	1.49	16	11.33	1.41	0.67
Corpus uteri	11	1.55	26	1.20	16	1.08	10	0.88	63	54.97	1.15	1.16
Ovary	4	0.99	6	0.48	6	0.68	4	0.57	20	32.28	0.62*	-1.77
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	1.68	0.00	-0.24
Vulva	1	1.65	1	0.53	2	1.40	0	0.00	4	5.19	0.77	-0.17
<b>Male genital system</b>	154	1.91*	313	1.17*	213	1.05	189	1.06	869	730.19	1.19*	11.97
Prostate	152	1.91*	312	1.18*	212	1.05	187	1.06	863	723.04	1.19*	12.07
Testis	1	2.29	1	0.81	1	1.49	1	2.70	4	2.71	1.48	0.11
<b>Urinary system</b>	145	4.73*	221	2.25*	118	1.63*	102	1.67*	586	262.61	2.23*	17.44
Urinary bladder	82	3.87*	126	1.85*	52	1.03	42	0.98	302	182.95	1.65*	6.42
Kidney parenchyma	58	7.59*	83	3.41*	62	3.51*	58	3.98*	261	64.20	4.07*	10.61
Renal pelvis, other urinary	5	2.68	12	2.04*	4	0.94	2	0.57	23	15.47	1.49	0.41
Ureter	4	6.50*	6	3.10*	3	2.13	0	0.00	13	5.10	2.55*	0.43
<b>Bone, joints</b>	1	3.02	0	0.00	0	0.00	2	3.72	3	2.59	1.16	0.02
<b>Soft tissue including heart</b>	3	2.05	6	1.31	5	1.51	3	1.08	17	12.16	1.40	0.26
<b>Kaposi sarcoma</b>	0	0.00	2	1.10	1	0.89	0	0.00	3	4.31	0.70	-0.07
<b>Melanoma of skin</b>	16	1.89*	37	1.35	29	1.43	14	0.81	96	73.52	1.31*	1.21
<b>Eye, orbit</b>	0	0.00	1	0.59	1	0.84	1	1.06	3	4.37	0.69	-0.07
<b>Brain, central nervous system</b>	6	1.54	9	0.74	7	0.82	8	1.20	30	31.22	0.96	-0.07
<b>Thyroid</b>	15	7.57*	17	2.80*	8	1.96	5	1.64	45	15.19	2.96*	1.61
<b>Lymphatic, hematopoietic</b>	34	1.23	102	1.16	64	0.99	61	1.12	261	234.03	1.12	1.45
Hodgkin lymphoma	0	0.00	4	1.40	2	1.07	1	0.74	7	7.04	0.99	0.00
Non-Hodgkin lymphoma	16	1.30	35	0.89	26	0.89	31	1.24	108	106.14	1.02	0.10
Myeloma	12	2.53*	17	1.12	14	1.26	8	0.85	51	40.29	1.27	0.58
Leukemia	6	0.63	46	1.52*	22	0.99	21	1.13	95	80.57	1.18	0.78
Acute lymphocytic	0	0.00	1	1.18	1	1.66	2	4.26	4	2.19	1.83	0.10
Chronic lymphocytic	3	0.78	11	0.90	8	0.90	11	1.50	33	32.31	1.02	0.04
Acute non-lymphocytic	3	0.94	16	1.57	6	0.80	4	0.63	29	27.24	1.06	0.09
Chronic myeloid	0	0.00	10	2.44*	3	1.00	1	0.39	14	10.93	1.28	0.17

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 69,480 PYR and for male cancers on 115,924 PYR.

# Kidney Parenchyma

## Both Sexes, Long-term Follow-up, ≥18 Years of Age

**Table 11.2.3:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, long-term follow-up, ≥18 years of age, 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>	36,835		6,603		2,894		1,080		36,835			
<b>Person-years in interval</b>	150,259		22,557		9,410		3,177		185,404			
<b>All subsequent cancers</b>	2,816	1.16*	473	1.06	204	1.00	77	1.08	3,570	3,145.79	1.13*	22.88
All excluding same site	2,613	1.10*	431	0.99	193	0.97	72	1.03	3,309	3,081.60	1.07*	12.27
<b>Buccal cavity, pharynx</b>	47	0.73*	7	0.67	2	0.45	1	0.66	57	80.82	0.71*	-1.28
Lip	8	0.82	5	3.17*	1	1.46	1	4.30	15	12.25	1.22	0.15
Tongue	8	0.62	0	0.00	0	0.00	0	0.00	8	16.28	0.49*	-0.45
Salivary gland	6	1.09	1	0.98	0	0.00	0	0.00	7	7.17	0.98	-0.01
Mouth	14	0.85	0	0.00	1	0.90	0	0.00	15	20.64	0.73	-0.30
Nasopharynx	4	1.59	0	0.00	0	0.00	0	0.00	4	3.10	1.29	0.05
Tonsil	3	0.48	1	1.05	0	0.00	0	0.00	4	7.68	0.52	-0.20
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	2.34	0.00	-0.13
Hypopharynx	2	0.30	0	0.00	0	0.00	0	0.00	2	8.40	0.24*	-0.35
<b>Digestive system</b>	524	1.00	97	1.02	40	0.92	20	1.29	681	678.14	1.00	0.15
Esophagus	21	0.74	2	0.39	1	0.43	1	1.21	25	36.64	0.68	-0.63
Stomach	45	0.84	10	1.06	4	0.94	6	4.03*	65	68.85	0.94	-0.21
Small intestine	11	1.44	2	1.39	0	0.00	1	4.08	14	9.97	1.40	0.22
Colon	253	1.08	47	1.08	14	0.70	7	0.97	321	305.21	1.05	0.85
Rectum, rectosigmoid junction	84	0.93	12	0.76	8	1.16	3	1.24	107	115.80	0.92	-0.47
Anus, anal canal	8	1.70	0	0.00	1	2.66	0	0.00	9	6.06	1.49	0.16
Liver	15	0.79	2	0.57	1	0.60	0	0.00	18	24.89	0.72	-0.37
Gallbladder	7	1.10	1	0.89	1	1.93	0	0.00	9	8.21	1.10	0.04
Bile ducts, other biliary	11	0.97	2	0.89	1	0.91	1	2.41	15	15.10	0.99	-0.01
Pancreas	63	1.01	19	1.67*	9	1.73	1	0.53	92	81.00	1.14	0.59
<b>Respiratory system</b>	391	0.90*	83	1.08	28	0.82	10	0.83	512	555.97	0.92	-2.37
Nose, nasal cavity, ear	5	1.41	0	0.00	0	0.00	0	0.00	5	4.54	1.10	0.02
Larynx	19	0.63*	5	1.03	0	0.00	0	0.00	24	37.63	0.64*	-0.74
Lung, bronchus	367	0.92	78	1.10	28	0.88	10	0.89	483	512.47	0.94	-1.59
<b>Female breast</b>	179	0.91	30	0.86	17	1.10	1	0.18	227	251.28	0.90	-3.50
<b>Female genital system</b>	88	1.03	11	0.77	5	0.80	1	0.47	105	107.91	0.97	-0.42
Cervix uteri	13	1.40	1	0.76	2	3.74	0	0.00	16	11.33	1.41	0.67
Corpus uteri	53	1.22	7	0.97	2	0.64	1	0.93	63	54.97	1.15	1.16
Ovary	16	0.63	3	0.69	1	0.51	0	0.00	20	32.28	0.62*	-1.77
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	1.68	0.00	-0.24
Vulva	4	1.02	0	0.00	0	0.00	0	0.00	4	5.19	0.77	-0.17
<b>Male genital system</b>	680	1.23*	108	0.99	60	1.16	21	1.22	869	730.19	1.19*	11.97
Prostate	676	1.24*	107	0.99	59	1.15	21	1.23	863	723.04	1.19*	12.07
Testis	3	1.29	0	0.00	1	11.22	0	0.00	4	2.71	1.48	0.11
<b>Urinary system</b>	484	2.40*	68	1.82*	24	1.39	10	1.57	586	262.61	2.23*	17.44
Urinary bladder	260	1.86*	25	0.95	12	0.98	5	1.10	302	182.95	1.65*	6.42
Kidney parenchyma	203	4.09*	42	4.66*	11	2.69*	5	3.39*	261	64.20	4.07*	10.61
Renal pelvis, other urinary	21	1.75*	1	0.47	1	1.03	0	0.00	23	15.47	1.49	0.41
Ureter	13	3.28*	0	0.00	0	0.00	0	0.00	13	5.10	2.55*	0.43
<b>Bone, joints</b>	1	0.49	0	0.00	2	13.43*	0	0.00	3	2.59	1.16	0.02
<b>Soft tissue including heart</b>	14	1.49	0	0.00	3	3.78	0	0.00	17	12.16	1.40	0.26
<b>Kaposi sarcoma</b>	3	0.84	0	0.00	0	0.00	0	0.00	3	4.31	0.70	-0.07
<b>Melanoma of skin</b>	82	1.46*	10	0.95	2	0.41	2	1.05	96	73.52	1.31*	1.21
<b>Eye, orbit</b>	2	0.58	1	1.71	0	0.00	0	0.00	3	4.37	0.69	-0.07
<b>Brain, central nervous system</b>	22	0.90	6	1.44	2	1.09	0	0.00	30	31.22	0.96	-0.07
<b>Thyroid</b>	40	3.30*	1	0.52	2	2.41	2	7.00	45	15.19	2.96*	1.61
<b>Lymphatic, hematopoietic</b>	200	1.11	38	1.14	14	0.91	9	1.59	261	234.03	1.12	1.45
Hodgkin lymphoma	6	1.05	1	1.16	0	0.00	0	0.00	7	7.04	0.99	0.00
Non-Hodgkin lymphoma	77	0.95	18	1.18	8	1.12	5	1.87	108	106.14	1.02	0.10
Myeloma	43	1.39*	5	0.87	2	0.75	1	1.05	51	40.29	1.27	0.58
Leukemia	74	1.19	14	1.23	4	0.76	3	1.58	95	80.57	1.18	0.78
Acute lymphocytic	2	1.16	2	6.69	0	0.00	0	0.00	4	2.19	1.83	0.10
Chronic lymphocytic	22	0.88	7	1.54	2	0.97	2	2.74	33	32.31	1.02	0.04
Acute non-lymphocytic	25	1.20	3	0.77	0	0.00	1	1.48	29	27.24	1.06	0.09
Chronic myeloid	13	1.55	1	0.64	0	0.00	0	0.00	14	10.93	1.28	0.17

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 69,480 PYR and for male cancers on 115,924 PYR.



**Table 11.2.4:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, females, ≥18 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>	165	1.54*	369	1.11	277	1.14*	204	1.01	1,015	884.60	1.15*	18.77
All excluding same site	152	1.44*	342	1.04	257	1.08	187	0.95	938	870.21	1.08*	9.76
<b>Buccal cavity, pharynx</b>	2	1.04	5	0.84	5	1.19	2	0.60	14	15.40	0.91	-0.20
Lip	0	0.00	0	0.00	0	0.00	1	3.88	1	1.06	0.94	-0.01
Tongue	0	0.00	2	1.53	1	1.07	0	0.00	3	3.41	0.88	-0.06
Salivary gland	1	4.79	1	1.54	2	4.28	0	0.00	4	1.71	2.33	0.33
Mouth	0	0.00	0	0.00	2	1.37	0	0.00	2	5.34	0.37	-0.48
Nasopharynx	1	12.71	2	8.44	0	0.00	0	0.00	3	0.60	5.00*	0.35
Tonsil	0	0.00	0	0.00	0	0.00	1	3.95	1	1.31	0.76	-0.04
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.38	0.00	-0.06
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	1.04	0.00	-0.15
<b>Digestive system</b>	28	1.14	62	0.82	63	1.12	44	0.92	197	204.26	0.96	-1.04
Esophagus	1	1.43	0	0.00	0	0.00	1	0.74	2	5.82	0.34	-0.55
Stomach	4	2.09	2	0.34	5	1.19	5	1.42	16	15.45	1.04	0.08
Small intestine	1	2.82	1	0.89	2	2.36	1	1.35	5	3.06	1.63	0.28
Colon	11	0.90	34	0.90	31	1.10	21	0.87	97	102.43	0.95	-0.78
Rectum, rectosigmoid junction	2	0.52	9	0.76	9	1.06	9	1.31	29	31.12	0.93	-0.31
Rectum	0	0.00	5	0.64	5	0.89	4	0.87	14	20.49	0.68	-0.93
Anus, anal canal	1	3.03	1	0.97	1	1.33	1	1.60	4	2.74	1.46	0.18
Liver	0	0.00	1	0.60	0	0.00	0	0.00	1	4.58	0.22	-0.52
Gallbladder	1	1.81	1	0.60	2	1.66	0	0.00	4	4.39	0.91	-0.06
Bile ducts, other biliary	1	1.91	1	0.60	2	1.57	1	0.86	5	4.62	1.08	0.06
Pancreas	5	1.55	11	1.10	10	1.33	5	0.77	31	27.25	1.14	0.54
<b>Respiratory system</b>	17	1.19	58	1.27	35	1.02	29	1.00	139	123.22	1.13	2.27
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	1.20	0.00	-0.17
Larynx	0	0.00	0	0.00	1	0.97	0	0.00	1	3.74	0.27	-0.39
Lung, bronchus	17	1.24	58	1.33*	34	1.04	29	1.04	138	117.98	1.17	2.88
<b>Female breast</b>	27	0.88	77	0.80	75	1.09	48	0.86	227	251.28	0.90	-3.50
<b>Female genital system</b>	18	1.29	42	0.99	28	0.96	17	0.75	105	107.91	0.97	-0.42
Cervix uteri	1	0.61	8	1.69	4	1.35	3	1.49	16	11.33	1.41	0.67
Corpus uteri	11	1.55	26	1.20	16	1.08	10	0.88	63	54.97	1.15	1.16
Ovary	4	0.99	6	0.48	6	0.68	4	0.57	20	32.28	0.62*	-1.77
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	1.68	0.00	-0.24
Vulva	1	1.65	1	0.53	2	1.40	0	0.00	4	5.19	0.77	-0.17
<b>Urinary system</b>	37	7.26*	56	3.51*	26	2.19*	27	2.64*	146	43.19	3.38*	14.80
Urinary bladder	22	7.39*	27	2.90*	5	0.72	10	1.66	64	25.31	2.53*	5.57
Kidney parenchyma	13	7.65*	27	5.05*	20	5.04*	17	5.04*	77	14.38	5.35*	9.01
Renal pelvis, other urinary	2	4.77	2	1.54	1	1.04	0	0.00	5	3.50	1.43	0.22
Ureter	2	15.67*	1	2.53	0	0.00	0	0.00	3	1.06	2.82	0.28
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	1	5.88	1	0.79	1.27	0.03
<b>Soft tissue including heart</b>	0	0.00	2	1.51	2	2.08	2	2.46	6	3.52	1.70	0.36
<b>Kaposi sarcoma</b>	0	0.00	1	8.32	0	0.00	0	0.00	1	0.34	2.98	0.10
<b>Melanoma of skin</b>	7	3.37*	10	1.52	6	1.25	2	0.51	25	17.39	1.44	1.10
<b>Eye, orbit</b>	0	0.00	0	0.00	1	2.98	0	0.00	1	1.24	0.81	-0.03
<b>Brain, central nervous system</b>	2	1.80	4	1.16	1	0.41	2	1.03	9	8.95	1.01	0.01
<b>Thyroid</b>	10	10.05*	9	2.96*	2	0.98	2	1.33	23	7.59	3.03*	2.22
<b>Lymphatic, hematopoietic</b>	15	1.85*	32	1.26	25	1.32	23	1.41	95	68.69	1.38*	3.79
Hodgkin lymphoma	0	0.00	2	2.58	0	0.00	0	0.00	2	1.96	1.02	0.01
Non-Hodgkin lymphoma	10	2.58*	11	0.89	13	1.41	13	1.62	47	33.45	1.40*	1.95
Myeloma	5	3.45*	5	1.11	3	0.90	3	1.07	16	12.10	1.32	0.56
Leukemia	0	0.00	14	1.79	9	1.55	7	1.40	30	21.18	1.42	1.27
Acute lymphocytic	0	0.00	0	0.00	1	5.91	1	7.12	2	0.62	3.24	0.20
Chronic lymphocytic	0	0.00	4	1.32	2	0.89	4	2.09	10	8.18	1.22	0.26
Acute non-lymphocytic	0	0.00	5	1.79	2	0.96	1	0.55	8	7.57	1.06	0.06
Chronic myeloid	0	0.00	4	3.71	2	2.51	0	0.00	6	2.91	2.06	0.44

\*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.

# Kidney Parenchyma

## Males, ≥18 Years of Age

**Table 11.2.5:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, males, ≥18 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			
	Number starting interval	Person-years in interval	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
	23,211	16,047	17,002	47,880	8,685	30,492	4,080	21,505	23,211	115,924		
<b>All subsequent cancers</b>	403	1.52*	919	1.08*	683	1.09*	550	1.06	2,555	2,261.20	1.13*	25.34
All excluding same site	358	1.38*	863	1.04	641	1.05	509	1.00	2,371	2,211.38	1.07*	13.77
<b>Buccal cavity, pharynx</b>	9	1.05	12	0.46*	14	0.79	8	0.61	43	65.42	0.66*	-1.93
Lip	1	0.68	2	0.45	5	1.65	6	2.68	14	11.19	1.25	0.24
Tongue	3	1.80	1	0.19	1	0.29	0	0.00	5	12.88	0.39*	-0.68
Salivary gland	0	0.00	1	0.49	1	0.67	1	0.79	3	5.45	0.55	-0.21
Mouth	5	2.45	3	0.48	4	0.97	1	0.34	13	15.30	0.85	-0.20
Nasopharynx	0	0.00	1	0.97	0	0.00	0	0.00	1	2.50	0.40	-0.13
Tonsil	0	0.00	1	0.38	2	1.17	0	0.00	3	6.37	0.47	-0.29
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	1.95	0.00	-0.17
Hypopharynx	0	0.00	1	0.34	1	0.50	0	0.00	2	7.36	0.27*	-0.46
<b>Digestive system</b>	49	0.86	165	0.91	157	1.20*	113	1.06	484	473.88	1.02	0.87
Esophagus	4	1.07	10	0.85	6	0.71	3	0.44	23	30.83	0.75	-0.68
Stomach	4	0.60	16	0.78	14	0.96	15	1.29	49	53.40	0.92	-0.38
Small intestine	3	3.74	3	1.16	1	0.53	2	1.24	9	6.90	1.30	0.18
Colon	20	0.84	79	1.03	78	1.39*	47	1.01	224	202.78	1.10	1.83
Rectum, rectosigmoid junction	9	0.86	27	0.82	28	1.21	14	0.77	78	84.68	0.92	-0.58
Anus, anal canal	0	0.00	2	1.56	3	3.31	0	0.00	5	3.32	1.51	0.15
Liver	3	1.25	4	0.52	7	1.26	3	0.64	17	20.31	0.84	-0.29
Gallbladder	0	0.00	2	1.38	1	0.96	2	2.33	5	3.82	1.31	0.10
Bile ducts, other biliary	1	0.85	5	1.31	1	0.34	3	1.16	10	10.48	0.95	-0.04
Pancreas	5	0.77	15	0.73	17	1.16	24	2.00*	61	53.76	1.13	0.62
<b>Respiratory system</b>	36	0.68*	134	0.80*	111	0.94	92	0.98	373	432.75	0.86*	-5.15
Nose, nasal cavity, ear	0	0.00	4	3.08	1	1.11	0	0.00	5	3.34	1.50	0.14
Larynx	1	0.23	9	0.66	8	0.87	5	0.74	23	33.90	0.68	-0.94
Lung, bronchus	35	0.73	121	0.80*	102	0.94	87	1.01	345	394.49	0.87*	-4.27
<b>Male breast</b>	3	5.90*	2	1.23	1	0.85	1	1.02	7	4.28	1.63	0.23
<b>Male genital system</b>	154	1.91*	313	1.17*	213	1.05	189	1.06	869	730.19	1.19*	11.97
Prostate	152	1.91*	312	1.18*	212	1.05	187	1.06	863	723.04	1.19*	12.07
Testis	1	2.29	1	0.81	1	1.49	1	2.70	4	2.71	1.48	0.11
<b>Urinary system</b>	108	4.22*	165	2.01*	92	1.52*	75	1.47*	440	219.42	2.01*	19.03
Urinary bladder	60	3.30*	99	1.69*	47	1.08	32	0.86	238	157.64	1.51*	6.93
Kidney parenchyma	45	7.58*	56	2.95*	42	3.07*	41	3.66*	184	49.81	3.69*	11.58
Renal pelvis, other urinary	3	2.08	10	2.19*	3	0.91	2	0.75	18	11.97	1.50	0.52
Ureter	2	4.10	5	3.24*	3	2.69	0	0.00	10	4.04	2.48*	0.51
<b>Bone, joints</b>	1	4.31	0	0.00	0	0.00	1	2.72	2	1.80	1.11	0.02
<b>Soft tissue including heart</b>	3	2.90	4	1.22	3	1.28	1	0.51	11	8.63	1.27	0.20
<b>Kaposi sarcoma</b>	0	0.00	1	0.59	1	0.97	0	0.00	2	3.98	0.50	-0.17
<b>Melanoma of skin</b>	9	1.41	27	1.29	23	1.48	12	0.90	71	56.13	1.26	1.28
<b>Eye, orbit</b>	0	0.00	1	0.82	0	0.00	1	1.49	2	3.13	0.64	-0.10
<b>Brain, central nervous system</b>	4	1.43	5	0.57	6	0.99	6	1.27	21	22.27	0.94	-0.11
<b>Thyroid</b>	5	5.07*	8	2.64*	6	2.95*	3	1.95	22	7.60	2.89*	1.24
<b>Lymphatic, hematopoietic</b>	19	0.98	70	1.12	39	0.86	38	1.00	166	165.34	1.00	0.06
Hodgkin lymphoma	0	0.00	2	0.96	2	1.49	1	1.05	5	5.08	0.98	-0.01
Non-Hodgkin lymphoma	6	0.71	24	0.88	13	0.65	18	1.06	61	72.68	0.84	-1.01
Myeloma	7	2.13	12	1.13	11	1.42	5	0.76	35	28.20	1.24	0.59
Leukemia	6	0.85	32	1.43	13	0.79	14	1.03	65	59.38	1.09	0.48
Acute lymphocytic	0	0.00	1	1.63	0	0.00	1	3.04	2	1.57	1.27	0.04
Chronic lymphocytic	3	1.04	7	0.76	6	0.90	7	1.29	23	24.13	0.95	-0.10
Acute non-lymphocytic	3	1.31	11	1.49	4	0.74	3	0.65	21	19.67	1.07	0.11
Chronic myeloid	0	0.00	6	1.99	1	0.45	1	0.54	8	8.02	1.00	0.00

\*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.

## Kidney Parenchyma Both Sexes, 18-49 Years of Age

**Table 11.2.6:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, 18-49 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>	38	3.53*	84	1.84*	78	1.51*	133	1.32*	333	208.66	1.60*	30.24
All excluding same site	23	2.20*	59	1.33*	61	1.22	114	1.16	257	202.92	1.27*	13.15
<b>Buccal cavity, pharynx</b>	2	4.16	1	0.49	1	0.46	2	0.62	6	7.91	0.76	-0.46
Lip	0	0.00	0	0.00	0	0.00	0	0.00	0	0.73	0.00	-0.18
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	1.82	0.00	-0.44
Salivary gland	1	24.13	0	0.00	0	0.00	1	4.03	2	0.61	3.30	0.34
Mouth	1	8.60	0	0.00	0	0.00	0	0.00	1	1.97	0.51	-0.24
Nasopharynx	0	0.00	1	7.52	0	0.00	0	0.00	1	0.44	2.29	0.14
Tonsil	0	0.00	0	0.00	1	3.12	1	2.43	2	1.11	1.80	0.22
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24	0.00	-0.06
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.76	0.00	-0.18
<b>Digestive system</b>	1	0.63	11	1.54	16	1.86*	21	1.20	49	34.90	1.40*	3.43
Esophagus	0	0.00	0	0.00	0	0.00	2	1.56	2	2.59	0.77	-0.14
Stomach	0	0.00	3	3.92	3	3.51	2	1.25	8	3.40	2.35*	1.12
Small intestine	0	0.00	1	5.33	0	0.00	0	0.00	1	0.80	1.24	0.05
Colon	0	0.00	1	0.40	6	1.90	8	1.15	15	13.17	1.14	0.44
Rectum, rectosigmoid junction	0	0.00	3	2.10	2	1.14	4	1.17	9	6.91	1.30	0.51
Anus, anal canal	0	0.00	0	0.00	2	12.03*	0	0.00	2	0.63	3.18	0.33
Liver	1	10.04	2	4.66	1	2.16	1	1.16	5	1.86	2.69	0.76
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.31	0.00	-0.07
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	1	2.77	1	0.68	1.47	0.08
Pancreas	0	0.00	0	0.00	2	1.96	3	1.43	5	4.12	1.21	0.21
<b>Respiratory system</b>	0	0.00	7	1.07	10	1.18	22	1.24	39	34.16	1.14	1.18
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.38	0.00	-0.09
Larynx	0	0.00	0	0.00	0	0.00	1	0.68	1	3.21	0.31	-0.54
Lung, bronchus	0	0.00	7	1.22	10	1.34	21	1.31	38	30.45	1.25	1.84
<b>Female breast</b>	0	0.00	4	0.49	8	0.98	12	1.03	24	30.17	0.80	-0.02
<b>Female genital system</b>	0	0.00	4	1.26	1	0.32	3	0.65	8	11.75	0.68	-2.44
Cervix uteri	0	0.00	1	1.15	0	0.00	0	0.00	1	2.40	0.42	-0.91
Corpus uteri	0	0.00	3	2.62	1	0.74	2	0.86	6	5.09	1.18	0.59
Ovary	0	0.00	0	0.00	0	0.00	1	0.72	1	3.56	0.28	-1.67
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.12	0.00	-0.08
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	0.35	0.00	-0.23
<b>Male genital system</b>	5	7.92*	3	0.84	10	1.62	29	1.33	47	32.13	1.46*	5.77
Prostate	4	9.85*	2	0.70	9	1.57	28	1.31	43	30.46	1.41*	4.87
Testis	1	4.82	1	1.62	1	2.85	1	4.82	4	1.38	2.89	1.01
<b>Urinary system</b>	21	30.36*	37	12.06*	19	5.16*	25	3.30*	102	15.02	6.79*	21.15
Urinary bladder	6	16.88*	11	6.82*	2	0.98	6	1.29	25	8.65	2.89*	3.98
Kidney parenchyma	15	48.75*	25	18.78*	17	11.41*	19	7.29*	76	5.73	13.25*	17.09
Renal pelvis, other urinary	0	0.00	1	8.14	0	0.00	0	0.00	1	0.64	1.56	0.09
Ureter	0	0.00	1	39.80	0	0.00	0	0.00	1	0.17	5.88	0.20
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	1	8.93	1	0.33	2.99	0.16
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	3.04	1	2.23	2	1.25	1.60	0.18
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.85	0.00	-0.45
<b>Melanoma of skin</b>	3	3.93	3	1.04	3	1.15	3	0.84	12	9.84	1.22	0.53
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.40	0.00	-0.10
<b>Brain, central nervous system</b>	2	7.73	1	1.02	1	1.09	2	1.56	6	3.44	1.75	0.62
<b>Thyroid</b>	4	12.95*	5	4.56*	2	2.26	2	2.11	13	3.24	4.01*	2.37
<b>Lymphatic, hematopoietic</b>	0	0.00	8	1.82	4	0.92	9	1.24	21	17.11	1.23	0.95
Hodgkin lymphoma	0	0.00	1	2.16	0	0.00	1	3.08	2	1.26	1.58	0.18
Non-Hodgkin lymphoma	0	0.00	2	0.85	1	0.44	5	1.36	8	8.89	0.90	-0.22
Myeloma	0	0.00	2	4.35	2	3.51	0	0.00	4	2.27	1.76	0.42
Leukemia	0	0.00	3	2.66	1	0.85	3	1.42	7	4.70	1.49	0.56
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	11.41	1	0.26	3.78	0.18
Chronic lymphocytic	0	0.00	0	0.00	1	2.41	2	2.37	3	1.64	1.83	0.33
Acute non-lymphocytic	0	0.00	2	5.13	0	0.00	0	0.00	2	1.56	1.28	0.11
Chronic myeloid	0	0.00	1	4.79	0	0.00	0	0.00	1	0.75	1.33	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. EAR for female cancers is based on 15,346 PYR and for male cancers on 25,775 PYR.

## Kidney Parenchyma Both Sexes, 50-69 Years of Age

**Table 11.2.7:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, 50-69 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					
	Number starting interval	Person-years in interval	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR		
<b>All subsequent cancers</b>	18,845	13,191	263	1.60*	696	1.15*	590	1.09*	536	1.02	2,085	1,832.73	1.14*	24.35
All excluding same site			235	1.47*	653	1.11*	549	1.03	497	0.97	1,934	1,793.45	1.08*	13.57
<b>Buccal cavity, pharynx</b>			6	1.04	8	0.42*	13	0.90	7	0.62	34	50.74	0.67*	-1.62
Lip			0	0.00	1	0.41	3	1.48	6	3.35*	10	6.98	1.43	0.29
Tongue			3	2.51	0	0.00*	2	0.67	0	0.00	5	10.45	0.48	-0.53
Salivary gland			0	0.00	0	0.00	3	2.66	0	0.00	3	3.93	0.76	-0.09
Mouth			2	1.33	3	0.61	3	0.82	1	0.35	9	12.93	0.70	-0.38
Nasopharynx			1	3.86	1	1.23	0	0.00	0	0.00	2	2.01	0.99	0.00
Tonsil			0	0.00	1	0.48	1	0.70	0	0.00	2	5.11	0.39	-0.30
Oropharynx			0	0.00	0	0.00	0	0.00	0	0.00	0	1.60	0.00	-0.15
Hypopharynx			0	0.00	1	0.45	1	0.60	0	0.00	2	5.77	0.35	-0.36
<b>Digestive system</b>			33	1.01	107	0.90	113	1.04	111	1.01	364	370.26	0.98	-0.60
Esophagus			1	0.44	6	0.76	5	0.75	2	0.33	14	22.82	0.61	-0.85
Stomach			1	0.30	7	0.58	13	1.22	14	1.30	35	36.71	0.95	-0.16
Small intestine			3	5.79*	2	1.06	1	0.60	2	1.20	8	5.76	1.39	0.22
Colon			14	1.06	52	1.05	47	1.00	50	0.99	163	160.09	1.02	0.28
Rectum, rectosigmoid junction			5	0.78	16	0.70	25	1.27	15	0.83	61	66.83	0.91	-0.56
Anus, anal canal			1	2.79	2	1.59	1	0.97	1	1.10	5	3.56	1.40	0.14
Liver			2	1.47	3	0.61	4	0.93	2	0.47	11	14.79	0.74	-0.37
Gallbladder			1	3.02	1	0.81	2	1.69	1	0.79	5	4.02	1.24	0.09
Bile ducts, other biliary			0	0.00	3	1.30	2	0.90	3	1.15	8	7.74	1.03	0.02
Pancreas			4	1.02	14	0.97	12	0.92	21	1.59	51	44.52	1.15	0.63
<b>Respiratory system</b>			34	1.02	116	0.97	100	0.97	88	0.95	338	348.94	0.97	-1.06
Nose, nasal cavity, ear			0	0.00	3	3.30	1	1.35	0	0.00	4	2.61	1.53	0.13
Larynx			1	0.35	6	0.62	5	0.68	4	0.72	16	25.39	0.63	-0.91
Lung, bronchus			33	1.10	107	0.98	94	0.99	84	0.98	318	320.15	0.99	-0.21
<b>Female breast</b>			13	0.90	51	1.03	42	1.03	29	0.80	135	141.43	0.95	-1.77
<b>Female genital system</b>			13	1.88*	17	0.74	16	0.89	12	0.80	58	62.97	0.92	-1.37
Cervix uteri			0	0.00	1	0.41	1	0.61	2	1.73	4	6.03	0.66	-0.56
Corpus uteri			10	2.63*	13	1.03	11	1.12	7	0.90	41	34.11	1.20	1.89
Ovary			2	1.05	2	0.31	3	0.57	3	0.65	10	18.35	0.55	-2.29
Vagina			0	0.00	0	0.00	0	0.00	0	0.00	0	0.85	0.00	-0.23
Vulva			1	5.24	1	1.41	1	1.48	0	0.00	3	2.38	1.26	0.17
<b>Male genital system</b>			63	1.88*	197	1.44*	145	1.07	134	0.98	539	443.15	1.22*	14.26
Prostate			62	1.88*	197	1.46*	145	1.07	133	0.97	537	439.61	1.22*	14.49
Testis			0	0.00	0	0.00	0	0.00	0	0.00	0	1.08	0.00	-0.16
<b>Urinary system</b>			56	4.30*	98	2.03*	73	1.65*	76	1.70*	303	150.20	2.02*	14.75
Urinary bladder			27	3.19*	51	1.60*	31	1.02	35	1.11	144	102.27	1.41*	4.03
Kidney parenchyma			28	7.32*	43	3.18*	41	3.57*	39	3.74*	151	39.28	3.84*	10.78
Renal pelvis, other urinary			1	1.36	4	1.45	1	0.39	2	0.78	8	8.65	0.93	-0.06
Ureter			1	4.22	2	2.21	1	1.16	0	0.00	4	2.86	1.40	0.11
<b>Bone, joints</b>			0	0.00	0	0.00	0	0.00	0	0.00	0	1.49	0.00	-0.14
<b>Soft tissue including heart</b>			1	1.56	4	1.80	3	1.59	2	1.05	10	6.65	1.50	0.32
<b>Kaposi sarcoma</b>			0	0.00	2	3.57	0	0.00	0	0.00	2	1.45	1.38	0.05
<b>Melanoma of skin</b>			10	2.37*	25	1.70*	18	1.46	10	0.86	63	42.88	1.47*	1.94
<b>Eye, orbit</b>			0	0.00	1	1.09	1	1.34	1	1.51	3	2.59	1.16	0.04
<b>Brain, central nervous system</b>			2	0.99	5	0.73	5	0.91	6	1.27	18	19.12	0.94	-0.11
<b>Thyroid</b>			10	9.51*	10	2.96*	5	2.05	3	1.63	28	8.72	3.21*	1.86
<b>Lymphatic, hematopoietic</b>			17	1.50	44	1.06	39	1.04	45	1.17	145	129.14	1.12	1.53
Hodgkin lymphoma			0	0.00	3	2.04	1	0.91	0	0.00	4	3.92	1.02	0.01
Non-Hodgkin lymphoma			11	2.09*	16	0.84	14	0.81	22	1.24	63	59.57	1.06	0.33
Myeloma			3	1.53	6	0.83	7	1.06	7	1.03	23	22.62	1.02	0.04
Leukemia			3	0.81	19	1.39	17	1.35	16	1.22	55	43.02	1.28	1.16
Acute lymphocytic			0	0.00	1	2.47	1	2.95	1	3.24	3	1.17	2.56	0.18
Chronic lymphocytic			1	0.64	4	0.69	6	1.14	9	1.72	20	17.82	1.12	0.21
Acute non-lymphocytic			2	1.71	5	1.13	5	1.18	4	0.87	16	14.46	1.11	0.15
Chronic myeloid			0	0.00	5	2.81	3	1.84	1	0.57	9	5.67	1.59	0.32

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 36,393 PYR and for male cancers on 67,207 PYR.

**Table 11.2.8:** Risk of subsequent primary cancers after cancer of the kidney parenchyma, both sexes, ≥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>	267	1.35*	508	0.95	292	1.07	85	0.88	1,152	1,104.41	1.04	11.70
All excluding same site	252	1.30*	493	0.93	288	1.07	85	0.89	1,118	1,085.22	1.03	8.06
<b>Buccal cavity, pharynx</b>	3	0.71	8	0.73	5	0.96	1	0.55	17	22.18	0.77	-1.27
Lip	1	1.20	1	0.45	2	1.81	1	2.52	5	4.54	1.10	0.11
Tongue	0	0.00	3	1.49	0	0.00	0	0.00	3	4.02	0.75	-0.25
Salivary gland	0	0.00	2	1.64	0	0.00	0	0.00	2	2.63	0.76	-0.15
Mouth	2	1.85	0	0.00	3	2.21	0	0.00	5	5.73	0.87	-0.18
Nasopharynx	0	0.00	1	3.04	0	0.00	0	0.00	1	0.65	1.53	0.08
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	1.46	0.00	-0.36
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.50	0.00	-0.12
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	1.87	0.00	-0.46
<b>Digestive system</b>	43	0.91	109	0.84	91	1.31*	25	0.94	268	272.98	0.98	-1.22
Esophagus	4	1.94	4	0.72	1	0.37	0	0.00	9	11.23	0.80	-0.55
Stomach	7	1.39	8	0.59	3	0.41	4	1.41	22	28.74	0.77	-1.66
Small intestine	1	1.68	1	0.61	2	2.34	1	3.16	5	3.40	1.47	0.39
Colon	17	0.76	60	0.97	56	1.64*	10	0.75	143	131.95	1.08	2.72
Rectum, rectosigmoid junction	6	0.78	17	0.83	10	0.97	4	1.10	37	42.07	0.88	-1.25
Anus, anal canal	0	0.00	1	1.12	1	2.18	0	0.00	2	1.87	1.07	0.03
Liver	0	0.00	0	0.00*	2	0.98	0	0.00	2	8.25	0.24*	-1.54
Gallbladder	0	0.00	2	1.09	1	1.01	1	2.51	4	3.89	1.03	0.03
Bile ducts, other biliary	2	1.89	3	0.98	1	0.56	0	0.00	6	6.68	0.90	-0.17
Pancreas	6	1.07	12	0.78	13	1.59	5	1.58	36	32.36	1.11	0.89
<b>Respiratory system</b>	19	0.58*	69	0.80	36	0.88	11	0.87	135	172.87	0.78*	-9.31
Nose, nasal cavity, ear	0	0.00	1	1.35	0	0.00	0	0.00	1	1.55	0.65	-0.13
Larynx	0	0.00	3	0.64	4	2.02	0	0.00	7	9.03	0.78	-0.50
Lung, bronchus	19	0.62*	65	0.80	32	0.83	11	0.92	127	161.86	0.78*	-8.57
<b>Female breast</b>	14	0.98	22	0.58*	25	1.27	7	0.93	68	79.68	0.85	-6.59
<b>Female genital system</b>	5	0.81	21	1.31	11	1.38	2	0.67	39	33.19	1.17	3.27
Cervix uteri	1	1.75	6	4.23*	3	4.46	1	4.12	11	2.91	3.79*	4.56
Corpus uteri	1	0.33	10	1.28	4	1.09	1	0.80	16	15.78	1.01	0.12
Ovary	2	1.06	4	0.81	3	1.18	0	0.00	9	10.37	0.87	-0.77
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.71	0.00	-0.40
Vulva	0	0.00	0	0.00	1	1.52	0	0.00	1	2.46	0.41	-0.82
<b>Male genital system</b>	86	1.84*	113	0.88	58	0.95	26	1.35	283	254.90	1.11	12.25
Prostate	86	1.86*	113	0.89	58	0.95	26	1.37	283	252.97	1.12	13.09
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24	0.00	-0.10
<b>Urinary system</b>	68	4.01*	86	1.83*	26	1.06	1	0.11*	181	97.39	1.86*	20.55
Urinary bladder	49	3.97*	64	1.85*	19	1.03	1	0.15*	133	72.03	1.85*	14.99
Kidney parenchyma	15	4.28*	15	1.59	4	0.86	0	0.00	34	19.19	1.77*	3.64
Renal pelvis, other urinary	4	3.63	7	2.34	3	1.96	0	0.00	14	6.18	2.27*	1.92
Ureter	3	8.05*	3	2.98	2	3.92	0	0.00	8	2.07	3.87*	1.46
<b>Bone, joints</b>	1	7.08	0	0.00	0	0.00	1	14.87	2	0.76	2.63	0.30
<b>Soft tissue including heart</b>	2	2.77	2	1.00	1	0.91	0	0.00	5	4.26	1.17	0.18
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	1	3.72	0	0.00	1	1.01	0.99	0.00
<b>Melanoma of skin</b>	3	0.86	9	0.91	8	1.50	1	0.48	21	20.79	1.01	0.05
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	1.38	0.00	-0.34
<b>Brain, central nervous system</b>	2	1.24	3	0.70	1	0.48	0	0.00	6	8.67	0.69	-0.66
<b>Thyroid</b>	1	1.61	2	1.25	1	1.33	0	0.00	4	3.23	1.24	0.19
<b>Lymphatic, hematopoietic</b>	17	1.13	50	1.20	21	0.94	7	0.83	95	87.78	1.08	1.77
Hodgkin lymphoma	0	0.00	0	0.00	1	2.29	0	0.00	1	1.85	0.54	-0.21
Non-Hodgkin lymphoma	5	0.78	17	0.95	11	1.14	4	1.11	37	37.68	0.98	-0.17
Myeloma	9	3.35*	9	1.21	5	1.28	1	0.71	24	15.41	1.56	2.11
Leukemia	3	0.54	24	1.55	4	0.48	2	0.60	33	32.85	1.00	0.04
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.75	0.00	-0.19
Chronic lymphocytic	2	0.90	7	1.15	1	0.31	0	0.00	10	12.85	0.78	-0.70
Acute non-lymphocytic	1	0.52	9	1.69	1	0.35	0	0.00	11	11.22	0.98	-0.06
Chronic myeloid	0	0.00	4	1.90	0	0.00	0	0.00	4	4.51	0.89	-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. EAR for female cancers is based on 17,741 PYR and for male cancers on 22,942 PYR.

## Kidney Parenchyma Renal Cell Carcinoma, Both Sexes, ≥18 Years of Age

**Table 11.2.9:** Risk of subsequent primary cancers after renal cell carcinoma of the kidney parenchyma, both sexes, ≥18 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			
	Number starting interval	Person-years in interval	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
	32,992	23,064										
			24,626	70,144	12,859	45,712	6,158	32,626	32,992	171,546		
<b>All subsequent cancers</b>	481	1.44*	1,144	1.05	879	1.09*	708	1.06	3,212	2,890.10	1.11*	18.76
All excluding same site	427	1.31*	1,065	1.00	819	1.04	656	1.01	2,967	2,830.88	1.05*	7.93
<b>Buccal cavity, pharynx</b>	10	1.06	15	0.51*	19	0.94	9	0.59	53	74.44	0.71*	-1.25
Lip	1	0.70	2	0.45	5	1.64	6	2.61	14	11.19	1.25	0.16
Tongue	2	1.06	2	0.34	2	0.49	0	0.00	6	15.04	0.40*	-0.53
Salivary gland	1	1.32	2	0.81	3	1.65	1	0.65	7	6.57	1.06	0.02
Mouth	5	2.05	2	0.26*	6	1.16	1	0.26	14	19.02	0.74	-0.29
Nasopharynx	1	2.58	3	2.55	0	0.00	0	0.00	4	2.87	1.40	0.07
Tonsil	0	0.00	1	0.35	2	1.04	1	0.73	4	7.11	0.56	-0.18
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	2.16	0.00	-0.13
Hypopharynx	0	0.00	1	0.32	1	0.47	0	0.00	2	7.75	0.26*	-0.34
<b>Digestive system</b>	72	0.99	206	0.88	195	1.13	150	1.06	623	620.40	1.00	0.15
Esophagus	5	1.26	9	0.70	6	0.65	4	0.53	24	33.68	0.71	-0.56
Stomach	7	0.93	18	0.75	17	0.98	18	1.29	60	62.76	0.96	-0.16
Small intestine	4	3.84*	3	0.88	2	0.78	2	0.92	11	9.18	1.20	0.11
Colon	30	0.94	99	0.95	97	1.25*	65	1.00	291	278.83	1.04	0.71
Rectum, rectosigmoid junction	10	0.78	34	0.83	33	1.12	22	0.95	99	106.17	0.93	-0.42
Anus, anal canal	1	1.51	1	0.47	4	2.59	1	0.80	7	5.59	1.25	0.08
Liver	3	1.14	5	0.58	6	0.95	3	0.56	17	22.88	0.74	-0.34
Gallbladder	1	1.12	3	1.06	2	0.97	2	1.19	8	7.49	1.07	0.03
Bile ducts, other biliary	2	1.33	6	1.20	2	0.52	4	1.16	14	13.82	1.01	0.01
Pancreas	9	1.04	25	0.90	24	1.17	29	1.70*	87	74.14	1.17	0.75
<b>Respiratory system</b>	41	0.68*	175	0.89	132	0.93	117	1.03	465	511.74	0.91*	-2.72
Nose, nasal cavity, ear	0	0.00	4	2.50	1	0.87	0	0.00	5	4.17	1.20	0.05
Larynx	1	0.23	8	0.58	8	0.84	5	0.72	22	34.70	0.63*	-0.74
Lung, bronchus	40	0.72*	163	0.91	123	0.94	112	1.06	438	471.65	0.93	-1.96
<b>Female breast</b>	25	0.90	71	0.80	70	1.08	43	0.83	209	233.15	0.90	-3.75
<b>Female genital system</b>	18	1.43	37	0.95	23	0.84	16	0.76	94	100.11	0.94	-0.95
Cervix uteri	1	0.68	7	1.61	3	1.09	3	1.60	14	10.46	1.34	0.55
Corpus uteri	11	1.70	24	1.20	16	1.15	10	0.94	61	51.14	1.19	1.53
Ovary	4	1.10	5	0.43	3	0.36	3	0.46	15	29.94	0.50*	-2.32
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	1.54	0.00	-0.24
Vulva	1	1.87	0	0.00	1	0.75	0	0.00	2	4.76	0.42	-0.43
<b>Male genital system</b>	139	1.92*	293	1.20*	201	1.07	177	1.08	810	669.29	1.21*	13.13
Prostate	137	1.92*	292	1.21*	200	1.07	175	1.08	804	662.73	1.21*	13.18
Testis	1	2.48	1	0.88	1	1.60	1	2.91	4	2.51	1.59	0.14
<b>Urinary system</b>	100	3.64*	160	1.78*	107	1.59*	90	1.60*	457	240.89	1.90*	12.60
Urinary bladder	44	2.33*	74	1.19	43	0.92	37	0.93	198	167.52	1.18*	1.78
Kidney parenchyma	54	7.82*	79	3.53*	60	3.65*	52	3.85*	245	59.22	4.14*	10.83
Renal pelvis, other urinary	2	1.20	7	1.31	4	1.02	1	0.31	14	14.15	0.99	-0.01
Ureter	1	1.82	5	2.83	3	2.31	0	0.00	9	4.67	1.93	0.25
<b>Bone, joints</b>	1	3.35	0	0.00	0	0.00	2	4.01	3	2.38	1.26	0.04
<b>Soft tissue including heart</b>	3	2.29	6	1.42	3	0.98	3	1.16	15	11.17	1.34	0.22
<b>Kaposi sarcoma</b>	0	0.00	2	1.19	1	0.95	0	0.00	3	3.98	0.75	-0.06
<b>Melanoma of skin</b>	14	1.82	34	1.34	29	1.53*	14	0.87	91	68.08	1.34*	1.34
<b>Eye, orbit</b>	0	0.00	1	0.64	0	0.00	1	1.15	2	4.03	0.50	-0.12
<b>Brain, central nervous system</b>	5	1.41	8	0.71	7	0.88	8	1.30	28	28.87	0.97	-0.05
<b>Thyroid</b>	15	8.31*	16	2.84*	8	2.10	4	1.41	43	14.09	3.05*	1.69
<b>Lymphatic, hematopoietic</b>	32	1.30	98	1.22	61	1.02	58	1.16	249	214.84	1.16*	1.99
Hodgkin lymphoma	0	0.00	4	1.52	2	1.15	1	0.80	7	6.48	1.08	0.03
Non-Hodgkin lymphoma	15	1.36	33	0.91	25	0.92	29	1.25	102	97.76	1.04	0.25
Myeloma	11	2.60*	16	1.16	12	1.17	8	0.93	47	36.93	1.27	0.59
Leukemia	6	0.71	45	1.63*	22	1.07	20	1.17	93	73.66	1.26*	1.13
Acute lymphocytic	0	0.00	1	1.29	1	1.79	2	4.62	4	2.01	1.99	0.12
Chronic lymphocytic	3	0.87	10	0.90	8	0.97	10	1.48	31	29.55	1.05	0.08
Acute non-lymphocytic	3	1.06	16	1.73	6	0.86	4	0.68	29	24.93	1.16	0.24
Chronic myeloid	0	0.00	10	2.69*	3	1.08	1	0.43	14	9.99	1.40	0.23

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 64,390 PYR and for male cancers on 107,156 PYR.

**Table 11.3.1:** Characteristics of patients with an initial cancer of the renal pelvis or ureter, both sexes, SEER 1973-2000.

Characteristics	Males		Females		Total	
	No.	%	No.	%	No.	%
<b>Number of patients with 1st primary cancer</b>						
<b>Total</b>	3,824	100.0	2,529	100.0	6,353	100.0
<b>Initial treatment</b>						
Any radiation	375	9.8	257	10.2	632	9.9
With surgery	304	7.9	202	8.0	506	8.0
Without surgery	71	1.9	55	2.2	126	2.0
No radiation	3,449	90.2	2,272	89.8	5,721	90.1
With surgery	3,130	81.9	2,041	80.7	5,171	81.4
Without surgery	319	8.3	231	9.1	550	8.7
<b>Race</b>						
White	3,448	90.2	2,264	89.5	5,712	89.9
Black	130	3.4	124	4.9	254	4.0
Other	238	6.2	136	5.4	374	5.9
Unknown	8	0.2	5	0.2	13	0.2
<b>Age at 1st primary cancer diagnosis, years</b>						
< 30	16	0.4	8	0.3	24	0.4
30–49	286	7.5	103	4.1	389	6.1
50–69	1,771	46.3	918	36.3	2,689	42.3
70–79	1,214	31.7	892	35.3	2,106	33.1
≥ 80	537	14.0	608	24.0	1,145	18.0
<b>Number of patients with one or more primary cancers</b>						
One primary cancer only	2,707	70.8	1,981	78.3	4,688	73.8
1st and 2nd cancers	923	24.1	465	18.4	1,388	21.8
1st, 2nd, and 3rd cancers	174	4.6	70	2.8	244	3.8
1st, 2nd, 3rd, and additional cancers	20	0.5	13	0.5	33	0.5
<b>Other statistics</b>						
Median age at 1st cancer diagnosis	68.8	—	72.6	—	70.4	—
Median year of 1st cancer diagnosis	1985.6	—	1987.0	—	1986.2	—
Median person-years at risk	3.9	—	3.2	—	3.6	—
Percent histologically confirmed*						
Both 1st and 2nd cancers	—	97.5	—	97.3	—	97.4
1st, 2nd, and additional cancers	—	96.6	—	96.2	—	96.5
1st cancer only	—	1.9	—	2.4	—	2.0

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

## Renal Pelvis and Ureter Both Sexes

**Table 11.3.2:** Risk of subsequent primary cancers after cancer of the renal pelvis or ureter, both sexes, 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>	527	6.29*	826	3.00*	350	1.64*	277	1.35*	1,980	777.94	2.55*	315.73
All excluding same site	93	1.19	347	1.35*	258	1.30*	237	1.24*	935	725.01	1.29*	55.15
<b>Buccal cavity, pharynx</b>	4	1.78	8	1.11	1	0.19	6	1.34	19	19.12	0.99	-0.03
Lip	0	0.00	1	0.74	0	0.00	1	1.27	2	3.50	0.57	-0.39
Tongue	1	2.39	1	0.74	0	0.00	0	0.00	2	3.62	0.55	-0.42
Salivary gland	1	5.29	1	1.60	0	0.00	1	2.03	3	1.81	1.66	0.31
Mouth	1	1.71	4	2.14	0	0.00	2	1.77	7	4.91	1.43	0.55
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.69	0.00	-0.18
Tonsil	0	0.00	0	0.00	0	0.00	1	2.90	1	1.56	0.64	-0.15
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.50	0.00	-0.13
Hypopharynx	1	4.46	1	1.38	1	1.96	1	2.40	4	1.88	2.13	0.56
<b>Digestive system</b>	17	0.84	88	1.34*	64	1.28	56	1.20	225	182.85	1.23*	11.07
Esophagus	1	1.10	3	1.01	4	1.76	3	1.36	11	8.34	1.32	0.70
Stomach	3	1.36	6	0.85	4	0.76	5	1.05	18	19.34	0.93	-0.35
Small intestine	0	0.00	2	2.53	0	0.00	0	0.00	2	2.29	0.87	-0.08
Colon	8	0.87	46	1.52*	44	1.88*	34	1.55*	132	84.88	1.56*	12.38
Rectum, rectosigmoid junction	0	0.00	13	1.14	4	0.47	6	0.81	23	30.87	0.74	-2.07
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	1.41	0.00	-0.37
Liver	2	3.17	0	0.00	1	0.62	1	0.60	4	5.96	0.67	-0.52
Gallbladder	0	0.00	2	2.15	2	2.95	1	1.69	5	2.49	2.01	0.66
Bile ducts, other biliary	0	0.00	2	1.42	0	0.00	2	1.68	4	4.15	0.96	-0.04
Pancreas	2	0.84	10	1.30	5	0.85	3	0.55	20	21.46	0.93	-0.38
<b>Respiratory system</b>	26	1.78*	95	1.98*	78	2.15*	71	2.12*	270	132.47	2.04*	36.12
Nose, nasal cavity, ear	0	0.00	0	0.00	1	3.21	1	3.48	2	1.14	1.76	0.23
Larynx	0	0.00	5	1.55	3	1.30	3	1.54	11	8.48	1.30	0.66
Lung, bronchus	26	1.93*	90	2.03*	74	2.21*	66	2.11*	256	122.52	2.09*	35.06
<b>Female breast</b>	6	0.89	27	1.29	20	1.31	20	1.41	73	57.10	1.28*	11.09
<b>Female genital system</b>	3	0.96	10	1.05	8	1.22	6	1.04	27	24.98	1.08	1.41
Cervix uteri	0	0.00	1	1.03	0	0.00	0	0.00	1	2.41	0.42	-0.98
Corpus uteri	2	1.25	4	0.83	4	1.22	5	1.77	15	12.51	1.20	1.74
Ovary	1	1.10	4	1.44	3	1.50	1	0.55	9	7.51	1.20	1.04
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-0.31
Vulva	0	0.00	1	1.93	0	0.00	0	0.00	1	1.47	0.68	-0.33
<b>Male genital system</b>	26	1.52	74	1.26	47	0.96	50	0.99	197	175.09	1.13	9.23
Prostate	25	1.48	73	1.25	45	0.93	50	1.00	193	173.49	1.11	8.22
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.43	0.00	-0.18
<b>Urinary system</b>	434	60.99*	485	20.48*	95	5.11*	41	2.27*	1,055	67.47	15.64*	259.38
Urinary bladder	411	80.76*	439	25.80*	85	6.33*	30	2.29*	965	48.65	19.83*	240.68
Kidney parenchyma	0	0.00	6	1.18	3	0.75	1	0.26	10	14.54	0.69	-1.19
Renal pelvis, other urinary	23	47.79*	40	25.71*	7	6.01*	10	9.37*	80	4.27	18.73*	19.89
Ureter	12	73.32*	18	33.91*	5	12.51*	4	11.15*	39	1.45	26.85*	9.86
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.61	0.00	-0.16
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	1.26	1	1.25	2	2.93	0.68	-0.25
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.84	0.00	-0.22
<b>Melanoma of skin</b>	1	0.64	6	1.14	4	0.92	5	1.06	16	15.90	1.01	0.03
<b>Eye, orbit</b>	0	0.00	1	2.51	0	0.00	1	3.73	2	1.08	1.85	0.24
<b>Brain, central nervous system</b>	5	6.24*	5	1.92	2	1.03	0	0.00	12	7.16	1.68	1.27
<b>Thyroid</b>	0	0.00	2	1.77	0	0.00	1	1.35	3	3.04	0.99	-0.01
<b>Lymphatic, hematopoietic</b>	3	0.48	18	0.86	22	1.35	10	0.63	53	59.30	0.89	-1.65
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	1.60	0.00	-0.42
Non-Hodgkin lymphoma	1	0.37	9	1.01	8	1.13	3	0.41	21	25.91	0.81	-1.29
Myeloma	0	0.00	3	0.85	4	1.47	2	0.76	9	9.95	0.90	-0.25
Leukemia	2	0.85	6	0.77	10	1.67	5	0.88	23	21.84	1.05	0.31
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	7.17	1	0.56	1.79	0.12
Chronic lymphocytic	1	1.05	2	0.64	5	2.06	2	0.89	10	8.75	1.14	0.33
Acute non-lymphocytic	0	0.00	2	0.77	2	1.00	2	1.03	6	7.32	0.82	-0.35
Chronic myeloid	1	3.17	1	0.97	2	2.50	0	0.00	4	2.93	1.36	0.28

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 14,345 PYR and for male cancers on 23,728 PYR.



**Table 11.3.3:** Risk of subsequent primary cancers after cancer of the renal pelvis or ureter, females, 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>	187	7.29*	276	3.46*	95	1.62*	87	1.59*	645	218.71	2.95*	297.16
All excluding same site	27	1.09	118	1.53*	78	1.38*	80	1.52*	303	210.73	1.44*	64.32
<b>Buccal cavity, pharynx</b>	2	4.41	4	2.86	0	0.00	0	0.00	6	3.76	1.60	1.56
Lip	0	0.00	1	9.12	0	0.00	0	0.00	1	0.31	3.25	0.48
Tongue	0	0.00	1	3.28	0	0.00	0	0.00	1	0.82	1.22	0.12
Salivary gland	1	19.93	0	0.00	0	0.00	0	0.00	1	0.43	2.33	0.40
Mouth	1	6.20	2	4.00	0	0.00	0	0.00	3	1.35	2.23	1.15
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.10
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.19
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.09	0.00	-0.06
Hypopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.22	0.00	-0.16
<b>Digestive system</b>	8	1.17	26	1.22	19	1.21	23	1.58*	76	58.24	1.31*	12.38
Esophagus	1	5.91	0	0.00	0	0.00	1	2.71	2	1.45	1.38	0.38
Stomach	0	0.00	4	2.26	2	1.57	2	1.78	8	4.75	1.69	2.27
Small intestine	0	0.00	1	3.92	0	0.00	0	0.00	1	0.73	1.37	0.19
Colon	3	0.87	10	0.93	15	1.87*	15	1.99*	43	29.80	1.44*	9.20
Rectum, rectosigmoid junction	0	0.00	6	1.84	1	0.43	2	0.99	9	8.63	1.04	0.26
Rectum	0	0.00	3	1.41	1	0.66	1	0.74	5	5.69	0.88	-0.48
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.67	0.00	-0.46
Liver	1	7.25	0	0.00	0	0.00	0	0.00	1	1.21	0.83	-0.14
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	1.35	0.00	-0.94
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	1	2.70	1	1.35	0.74	-0.25
Pancreas	2	2.28	4	1.46	1	0.49	1	0.51	8	7.60	1.05	0.28
<b>Respiratory system</b>	6	1.94	34	3.48*	21	2.86*	20	2.77*	81	27.42	2.95*	37.35
Nose, nasal cavity, ear	0	0.00	0	0.00	1	12.05	1	12.71	2	0.31	6.47	1.18
Larynx	0	0.00	0	0.00	1	4.99	1	5.64	2	0.76	2.63	0.86
Lung, bronchus	6	2.03	34	3.64*	19	2.70*	18	2.59*	77	26.28	2.93*	35.36
<b>Female breast</b>	6	0.89	27	1.29	20	1.31	20	1.41	73	57.10	1.28*	11.09
<b>Female genital system</b>	3	0.96	10	1.05	8	1.22	6	1.04	27	24.98	1.08	1.41
Cervix uteri	0	0.00	1	1.03	0	0.00	0	0.00	1	2.41	0.42	-0.98
Corpus uteri	2	1.25	4	0.83	4	1.22	5	1.77	15	12.51	1.20	1.74
Ovary	1	1.10	4	1.44	3	1.50	1	0.55	9	7.51	1.20	1.04
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-0.31
Vulva	0	0.00	1	1.93	0	0.00	0	0.00	1	1.47	0.68	-0.33
<b>Urinary system</b>	160	122.79*	159	39.08*	17	5.64*	7	2.41	343	11.29	30.37*	231.23
Urinary bladder	155	192.75*	151	59.95*	17	9.11*	4	2.23	327	6.99	46.81*	223.08
Kidney parenchyma	0	0.00	1	0.84	0	0.00	0	0.00	1	3.32	0.30	-1.62
Renal pelvis, other urinary	5	42.17*	7	19.27*	0	0.00	3	12.36*	15	0.99	15.21*	9.77
Ureter	5	131.04*	4	34.18*	0	0.00	3	39.55*	12	0.31	38.15*	8.15
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.19	0.00	-0.13
<b>Soft tissue including heart</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.86	0.00	-0.60
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.12	0.00	-0.08
<b>Melanoma of skin</b>	0	0.00	1	0.76	3	2.99	3	2.97	7	3.75	1.87	2.26
<b>Eye, orbit</b>	0	0.00	1	8.49	0	0.00	1	13.56	2	0.31	6.42	1.18
<b>Brain, central nervous system</b>	1	4.05	1	1.31	1	1.80	0	0.00	3	2.07	1.45	0.65
<b>Thyroid</b>	0	0.00	2	3.66	0	0.00	0	0.00	2	1.44	1.39	0.39
<b>Lymphatic, hematopoietic</b>	0	0.00	9	1.39	4	0.83	2	0.43	15	18.07	0.83	-2.14
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-0.31
Non-Hodgkin lymphoma	0	0.00	6	1.99	3	1.31	0	0.00	9	8.52	1.06	0.33
Myeloma	0	0.00	2	1.78	0	0.00	0	0.00	2	3.09	0.65	-0.76
Leukemia	0	0.00	1	0.46	1	0.62	2	1.30	4	6.01	0.67	-1.40
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.16	0.00	-0.11
Chronic lymphocytic	0	0.00	1	1.17	0	0.00	1	1.69	2	2.35	0.85	-0.24
Acute non-lymphocytic	0	0.00	0	0.00	0	0.00	1	1.86	1	2.08	0.48	-0.75
Chronic myeloid	0	0.00	0	0.00	1	4.58	0	0.00	1	0.82	1.22	0.13

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

## Renal Pelvis and Ureter Males

**Table 11.3.4:** Risk of subsequent primary cancers after cancer of the renal pelvis or ureter, males, SEER 1973-2000.

Subsequent primary cancer	Years after first primary cancer diagnosis											
	<1 year		1-4 years		5-9 years		≥10 years		Total			
	Number starting interval	Person-years in interval	O	O/E	O	O/E	O	O/E	O	E	O/E	EAR
	3,824	2,790	3,042	9,000	1,722	6,406	923	5,531	3,824	23,728		
<b>All subsequent cancers</b>	340	5.85*	550	2.81*	255	1.64*	190	1.26*	1,335	559.23	2.39*	326.95
All excluding same site	66	1.24	229	1.27*	180	1.26*	157	1.14	632	514.28	1.23*	49.61
<b>Buccal cavity, pharynx</b>	2	1.12	4	0.69	1	0.24	6	1.68	13	15.37	0.85	-1.00
Lip	0	0.00	0	0.00	0	0.00	1	1.42	1	3.19	0.31	-0.92
Tongue	1	3.12	0	0.00	0	0.00	0	0.00	1	2.80	0.36	-0.76
Salivary gland	0	0.00	1	2.12	0	0.00	1	2.61	2	1.38	1.45	0.26
Mouth	0	0.00	2	1.46	0	0.00	2	2.50	4	3.56	1.12	0.19
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.56	0.00	-0.23
Tonsil	0	0.00	0	0.00	0	0.00	1	3.48	1	1.28	0.78	-0.12
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.41	0.00	-0.17
Hypopharynx	1	5.12	1	1.57	1	2.21	1	2.72	4	1.65	2.42	0.99
<b>Digestive system</b>	9	0.68	62	1.39*	45	1.30	33	1.02	149	124.61	1.20*	10.28
Esophagus	0	0.00	3	1.23	4	2.13	2	1.09	9	6.90	1.31	0.89
Stomach	3	1.85	2	0.38	2	0.50	3	0.82	10	14.59	0.69	-1.93
Small intestine	0	0.00	1	1.86	0	0.00	0	0.00	1	1.56	0.64	-0.24
Colon	5	0.87	36	1.85*	29	1.88*	19	1.32	89	55.08	1.62*	14.30
Rectum, rectosigmoid junction	0	0.00	7	0.85	3	0.49	4	0.74	14	22.24	0.63	-3.47
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.74	0.00	-0.31
Liver	1	2.03	0	0.00	1	0.78	1	0.74	3	4.76	0.63	-0.74
Gallbladder	0	0.00	2	4.82	2	6.37	1	3.50	5	1.14	4.39*	1.63
Bile ducts, other biliary	0	0.00	2	2.14	0	0.00	1	1.21	3	2.80	1.07	0.08
Pancreas	0	0.00	6	1.20	4	1.05	2	0.56	12	13.86	0.87	-0.78
<b>Respiratory system</b>	20	1.74*	61	1.59*	57	1.97*	51	1.94*	189	105.05	1.80*	35.38
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.83	0.00	-0.35
Larynx	0	0.00	5	1.70	2	0.95	2	1.13	9	7.72	1.17	0.54
Lung, bronchus	20	1.90*	56	1.60*	55	2.07*	48	1.98*	179	96.24	1.86*	34.88
<b>Male breast</b>	0	0.00	1	2.80	0	0.00	0	0.00	1	1.02	0.98	-0.01
<b>Male genital system</b>	26	1.52	74	1.26	47	0.96	50	0.99	197	175.09	1.13	9.23
Prostate	25	1.48	73	1.25	45	0.93	50	1.00	193	173.49	1.11	8.22
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.43	0.00	-0.18
<b>Urinary system</b>	274	47.14*	326	16.63*	78	5.01*	34	2.24*	712	56.17	12.67*	276.40
Urinary bladder	256	59.74*	288	19.86*	68	5.88*	26	2.30*	638	41.67	15.31*	251.32
Kidney parenchyma	0	0.00	5	1.28	3	0.97	1	0.33	9	11.22	0.80	-0.94
Renal pelvis, other urinary	18	49.63*	33	27.67*	7	7.75*	7	8.49*	65	3.28	19.79*	26.01
Ureter	7	55.77*	14	33.83*	5	15.82*	1	3.54	27	1.14	23.72*	10.90
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.42	0.00	-0.18
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	1.77	1	1.74	2	2.07	0.96	-0.03
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.72	0.00	-0.30
<b>Melanoma of skin</b>	1	0.87	5	1.26	1	0.30	2	0.54	9	12.14	0.74	-1.33
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.77	0.00	-0.32
<b>Brain, central nervous system</b>	4	7.22*	4	2.17	1	0.72	0	0.00	9	5.09	1.77	1.65
<b>Thyroid</b>	0	0.00	0	0.00	0	0.00	1	2.47	1	1.60	0.62	-0.25
<b>Lymphatic, hematopoietic</b>	3	0.71	9	0.63	18	1.58	8	0.71	38	41.22	0.92	-1.36
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	1.15	0.00	-0.48
Non-Hodgkin lymphoma	1	0.58	3	0.51	5	1.04	3	0.60	12	17.39	0.69	-2.27
Myeloma	0	0.00	1	0.42	4	2.11	2	1.07	7	6.86	1.02	0.06
Leukemia	2	1.20	5	0.89	9	2.05	3	0.72	19	15.82	1.20	1.34
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	10.15	1	0.40	2.51	0.25
Chronic lymphocytic	1	1.48	1	0.44	5	2.80	1	0.61	8	6.40	1.25	0.68
Acute non-lymphocytic	0	0.00	2	1.09	2	1.38	1	0.71	5	5.23	0.96	-0.10
Chronic myeloid	1	4.52	1	1.35	1	1.72	0	0.00	3	2.11	1.42	0.37

\*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 11.3.5:** Risk of subsequent primary cancers after cancer of the renal pelvis or ureter, both sexes, <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>	83	14.73*	134	5.08*	83	2.39*	115	1.52*	415	142.27	2.92*	224.72
All excluding same site	11	2.06*	37	1.49*	56	1.71*	95	1.34*	199	133.87	1.49*	53.67
<b>Buccal cavity, pharynx</b>	0	0.00	2	1.74	0	0.00	2	1.03	4	4.61	0.87	-0.51
Lip	0	0.00	1	7.14	0	0.00	0	0.00	1	0.59	1.69	0.34
Tongue	0	0.00	0	0.00	0	0.00	0	0.00	0	0.97	0.00	-0.80
Salivary gland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.33	0.00	-0.27
Mouth	0	0.00	1	3.26	0	0.00	1	2.11	2	1.18	1.69	0.68
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.22	0.00	-0.18
Tonsil	0	0.00	0	0.00	0	0.00	0	0.00	0	0.50	0.00	-0.41
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.12
Hypopharynx	0	0.00	0	0.00	0	0.00	1	4.63	1	0.51	1.95	0.40
<b>Digestive system</b>	3	2.76	9	1.74	14	2.06*	22	1.50	48	27.73	1.73*	16.70
Esophagus	0	0.00	0	0.00	0	0.00	2	2.23	2	1.77	1.13	0.19
Stomach	1	8.35	0	0.00	1	1.44	2	1.38	4	2.82	1.42	0.97
Small intestine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.45	0.00	-0.37
Colon	2	4.87	9	4.49*	9	3.27*	15	2.39*	35	11.44	3.06*	19.41
Rectum, rectosigmoid junction	0	0.00	0	0.00	2	1.44	2	0.75	4	5.35	0.75	-1.12
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	0.31	0.00	-0.25
Liver	0	0.00	0	0.00	0	0.00	0	0.00	0	1.21	0.00	-1.00
Gallbladder	0	0.00	0	0.00	0	0.00	0	0.00	0	0.28	0.00	-0.23
Bile ducts, other biliary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.57	0.00	-0.47
Pancreas	0	0.00	0	0.00	2	2.50	0	0.00	2	3.28	0.61	-1.05
<b>Respiratory system</b>	5	4.33*	8	1.46	18	2.53*	32	2.30*	63	27.64	2.28*	29.13
Nose, nasal cavity, ear	0	0.00	0	0.00	0	0.00	0	0.00	0	0.23	0.00	-0.19
Larynx	0	0.00	0	0.00	2	3.19	2	2.08	4	2.25	1.78	1.44
Lung, bronchus	5	4.91*	8	1.64	16	2.50*	29	2.26*	58	25.09	2.31*	27.11
<b>Female breast</b>	0	0.00	2	0.72	4	1.27	9	1.65	15	12.08	1.24	7.59
<b>Female genital system</b>	0	0.00	1	0.72	2	1.38	3	1.32	6	5.46	1.10	1.40
Cervix uteri	0	0.00	1	5.08	0	0.00	0	0.00	1	0.63	1.59	0.96
Corpus uteri	0	0.00	0	0.00	1	1.28	2	1.64	3	2.92	1.03	0.20
Ovary	0	0.00	0	0.00	1	2.40	1	1.46	2	1.57	1.27	1.11
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.06	0.00	-0.16
Vulva	0	0.00	0	0.00	0	0.00	0	0.00	0	0.17	0.00	-0.44
<b>Male genital system</b>	0	0.00	6	1.69	7	1.06	19	0.95	32	30.62	1.05	1.66
Prostate	0	0.00	6	1.75	7	1.08	19	0.96	32	30.17	1.06	2.20
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.25	0.00	-0.30
<b>Urinary system</b>	72	161.35*	98	46.09*	28	9.85*	20	3.17*	218	11.73	18.58*	169.96
Urinary bladder	68	250.06*	88	66.27*	23	12.44*	14	3.24*	193	7.76	24.86*	152.63
Kidney parenchyma	0	0.00	1	1.46	1	1.19	0	0.00	2	3.33	0.60	-1.10
Renal pelvis, other urinary	4	164.84*	9	78.06*	4	25.96*	6	17.39*	23	0.64	36.01*	18.43
Ureter	1	149.37*	4	116.76*	3	60.01*	2	17.17*	10	0.21	48.21*	8.07
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.14	0.00	-0.12
<b>Soft tissue including heart</b>	0	0.00	0	0.00	1	7.05	0	0.00	1	0.58	1.72	0.35
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.29	0.00	-0.24
<b>Melanoma of skin</b>	0	0.00	2	2.15	1	0.95	3	1.51	6	4.18	1.44	1.50
<b>Eye, orbit</b>	0	0.00	1	18.59	0	0.00	0	0.00	1	0.23	4.33	0.63
<b>Brain, central nervous system</b>	3	29.73*	2	4.73	1	2.15	0	0.00	6	1.78	3.38*	3.48
<b>Thyroid</b>	0	0.00	1	3.87	0	0.00	1	2.64	2	0.96	2.08	0.86
<b>Lymphatic, hematopoietic</b>	0	0.00	1	0.50	4	1.61	3	0.56	8	10.30	0.78	-1.89
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.42	0.00	-0.34
Non-Hodgkin lymphoma	0	0.00	1	1.04	2	1.68	0	0.00	3	4.95	0.61	-1.61
Myeloma	0	0.00	0	0.00	1	2.57	1	1.14	2	1.62	1.23	0.31
Leukemia	0	0.00	0	0.00	1	1.25	2	1.15	3	3.31	0.91	-0.25
Acute lymphocytic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.11	0.00	-0.09
Chronic lymphocytic	0	0.00	0	0.00	0	0.00	2	2.83	2	1.36	1.47	0.53
Acute non-lymphocytic	0	0.00	0	0.00	1	3.96	0	0.00	1	1.10	0.91	-0.08
Chronic myeloid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.44	0.00	-0.36

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 3,845 PYR and for male cancers on 8,291 PYR.

## Renal Pelvis and Ureter Both Sexes, ≥60 Years of Age

**Table 11.3.6:** Risk of subsequent primary cancers after cancer of the renal pelvis or ureter, both sexes, ≥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>	444	5.68*	692	2.78*	267	1.49*	162	1.25*	1,565	635.67	2.46*	358.31
All excluding same site	82	1.13	310	1.34*	202	1.22*	142	1.18	736	591.15	1.25*	55.85
<b>Buccal cavity, pharynx</b>	4	2.02	6	0.99	1	0.25	4	1.58	15	14.51	1.03	0.19
Lip	0	0.00	0	0.00	0	0.00	1	1.92	1	2.90	0.34	-0.73
Tongue	1	2.74	1	0.90	0	0.00	0	0.00	2	2.65	0.76	-0.25
Salivary gland	1	5.79	1	1.80	0	0.00	1	3.03	3	1.47	2.04	0.59
Mouth	1	1.94	3	1.92	0	0.00	1	1.53	5	3.73	1.34	0.49
Nasopharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.48	0.00	-0.18
Tonsil	0	0.00	0	0.00	0	0.00	1	6.56	1	1.06	0.94	-0.02
Oropharynx	0	0.00	0	0.00	0	0.00	0	0.00	0	0.36	0.00	-0.14
Hypopharynx	1	5.08	1	1.66	1	2.73	0	0.00	3	1.36	2.20	0.63
<b>Digestive system</b>	14	0.73	79	1.30*	50	1.15	34	1.06	177	155.11	1.14	8.44
Esophagus	1	1.20	3	1.15	4	2.19	1	0.76	9	6.58	1.37	0.93
Stomach	2	0.96	6	0.92	3	0.65	3	0.90	14	16.52	0.85	-0.97
Small intestine	0	0.00	2	2.84	0	0.00	0	0.00	2	1.84	1.08	0.06
Colon	6	0.68	37	1.31	35	1.69*	19	1.21	97	73.44	1.32*	9.08
Rectum, rectosigmoid junction	0	0.00	13	1.26	2	0.28	4	0.83	19	25.52	0.74	-2.51
Anus, anal canal	0	0.00	0	0.00	0	0.00	0	0.00	0	1.10	0.00	-0.42
Liver	2	3.42	0	0.00	1	0.75	1	1.01	4	4.76	0.84	-0.29
Gallbladder	0	0.00	2	2.26	2	3.27	1	2.29	5	2.22	2.26	1.07
Bile ducts, other biliary	0	0.00	2	1.53	0	0.00	2	2.33	4	3.58	1.12	0.16
Pancreas	2	0.89	10	1.41	3	0.59	3	0.80	18	18.18	0.99	-0.07
<b>Respiratory system</b>	21	1.56	87	2.04*	60	2.06*	39	1.98*	207	104.83	1.97*	39.39
Nose, nasal cavity, ear	0	0.00	0	0.00	1	3.98	1	5.47	2	0.91	2.20	0.42
Larynx	0	0.00	5	1.87	1	0.59	1	1.01	7	6.23	1.12	0.30
Lung, bronchus	21	1.69*	82	2.08*	58	2.14*	37	2.01*	198	97.42	2.03*	38.78
<b>Female breast</b>	6	0.99	25	1.38	16	1.32	11	1.26	58	45.01	1.29	12.37
<b>Female genital system</b>	3	1.08	9	1.11	6	1.17	3	0.85	21	19.52	1.08	1.41
Cervix uteri	0	0.00	0	0.00	0	0.00	0	0.00	0	1.78	0.00	-1.69
Corpus uteri	2	1.41	4	0.98	3	1.20	3	1.86	12	9.58	1.25	2.30
Ovary	1	1.23	4	1.66	2	1.26	0	0.00	7	5.93	1.18	1.01
Vagina	0	0.00	0	0.00	0	0.00	0	0.00	0	0.39	0.00	-0.37
Vulva	0	0.00	1	2.06	0	0.00	0	0.00	1	1.30	0.77	-0.29
<b>Male genital system</b>	26	1.57*	68	1.23	40	0.95	31	1.02	165	144.47	1.14	13.30
Prostate	25	1.53	67	1.22	38	0.91	31	1.03	161	143.32	1.12	11.45
Testis	0	0.00	0	0.00	0	0.00	0	0.00	0	0.18	0.00	-0.12
<b>Urinary system</b>	362	54.28*	387	17.96*	67	4.26*	21	1.78*	837	55.74	15.02*	301.22
Urinary bladder	343	71.20*	351	22.37*	62	5.35*	16	1.82*	772	40.89	18.88*	281.88
Kidney parenchyma	0	0.00	5	1.13	2	0.64	1	0.44	8	11.21	0.71	-1.24
Renal pelvis, other urinary	19	41.58*	31	21.52*	3	2.97	4	5.54*	57	3.63	15.70*	20.58
Ureter	11	70.08*	14	28.19*	2	5.72	2	8.26	29	1.25	23.29*	10.70
<b>Bone, joints</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.47	0.00	-0.18
<b>Soft tissue including heart</b>	0	0.00	0	0.00	0	0.00	1	1.91	1	2.35	0.42	-0.52
<b>Kaposi sarcoma</b>	0	0.00	0	0.00	0	0.00	0	0.00	0	0.55	0.00	-0.21
<b>Melanoma of skin</b>	1	0.74	4	0.92	3	0.91	2	0.74	10	11.72	0.85	-0.66
<b>Eye, orbit</b>	0	0.00	0	0.00	0	0.00	1	6.17	1	0.85	1.18	0.06
<b>Brain, central nervous system</b>	2	2.86	3	1.37	1	0.67	0	0.00	6	5.39	1.11	0.24
<b>Thyroid</b>	0	0.00	1	1.15	0	0.00	0	0.00	1	2.08	0.48	-0.42
<b>Lymphatic, hematopoietic</b>	3	0.51	17	0.90	18	1.31	7	0.66	45	49.00	0.92	-1.54
Hodgkin lymphoma	0	0.00	0	0.00	0	0.00	0	0.00	0	1.18	0.00	-0.45
Non-Hodgkin lymphoma	1	0.41	8	1.01	6	1.02	3	0.64	18	20.96	0.86	-1.14
Myeloma	0	0.00	3	0.93	3	1.29	1	0.57	7	8.32	0.84	-0.51
Leukemia	2	0.90	6	0.84	9	1.73	3	0.76	20	18.53	1.08	0.57
Acute lymphocytic	0	0.00	0	0.00	0	0.00	1	11.13	1	0.45	2.23	0.21
Chronic lymphocytic	1	1.11	2	0.69	5	2.40	0	0.00	8	7.39	1.08	0.23
Acute non-lymphocytic	0	0.00	2	0.84	1	0.57	2	1.50	5	6.22	0.80	-0.47
Chronic myeloid	1	3.39	1	1.05	2	2.87	0	0.00	4	2.49	1.61	0.58

\*P < 0.05. Notes: See Appendices for definitions of cancer sites and "all excluding same site." Abbreviations: O = observed number of subsequent (2nd, 3rd, etc.) primary cancers; E = expected number of subsequent primary cancers; O/E = ratio of observed to expected cancers; PYR = person-years at risk; EAR = excess absolute risk per 10,000 person-years = [(O-E)/PYR] × 10,000. EAR for female cancers is based on 10,501 PYR and for male cancers on 15,436 PYR.