

Supplemental online content for:

## **Risk of Cardiovascular Diseases Among Older Breast Cancer Survivors in the United States: A Matched Cohort Study**

Anthony A. Matthews, PhD; Sharon Peacock Hinton, MPA; Susannah Stanway, MD; Alexander R. Lyon, PhD; Liam Smeeth, PhD; Krishnan Bhaskaran, PhD; and Jennifer L. Lund, PhD

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**eTable 1. ICD-9 and CPT/HCPCS Codes Used to Identify Cardiovascular Disease Outcomes of Interest**

Outcomes	ICD-9 Diagnosis and Procedure Codes	CPT/HCPCS Codes
Angina	411.1, 413.1, 413.9	
Myocardial infarction	410.11, 410.01, 410.31, 410.21, 410.41, 410.81, 410.51, 410.61, 410.91, 410.71	
Revascularization procedures	36.0×, 36.1×, 36.2, 36.3	33140, 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536, 92920, 92924, 92928, 92933, 92937, 92941, 92943, 92980, 92981, 92982, 92984, 92995, 92996, 92997, 92998
Sudden cardiac arrest	427.5	
Stroke (hemorrhagic and ischemic)	430.×, 431.×, 432.1, 432.0, 432.9, 433.91, 433.21, 433.01, 433.11, 433.31, 433.81, 434.01, 434.×, 435.0, 435.1, 435.3, 435.8, 435.9, 436.×	
Arrhythmia	427.31, 427.32, 427.41, 427.42, 427.61, 427.0, 427.69, 427.60, 427.81, 427.89, 427.9	
Deep venous thromboembolism	415.1×	
Pulmonary embolism	415.0, 415.12, 415.13, 415.19	
Heart failure	428.1, 428.0, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9, 414.8, 425.4, 425.11, 425.18, 425.0, 425.3, 425.5, 425.9, 425.2, 425.8	
Pericarditis	420.91, 420.90, 420.99, 423.1, 423.2, 423.0, 423.9, 423.3, 423.8, 420.0	
Valvular heart disease	394.0, 394.1, 394.2, 394.9, 395.0, 395.1, 395.2, 395.9, 397.0, 396.0, 396.1, 396.2, 396.3, 397.9, 396.8, 396.9, 424.0, 424.1, 424.2, 424.3	
Peripheral vascular disease	443.89, 443.9	

**eTable 2. Adjusted HRs for Cardiovascular Risk, Stratified by Time Since Index Date, Including Time Up Until 90 Days After Index**

Outcome	Time Since Index Date	Events, n		Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
		Breast Cancer	Noncancer		
Coronary artery disease	0–30 d	634	1,663	1.95 (1.75–2.18)	<.01
	30–90 d	1,043	3,383	1.51 (1.40–1.63)	
	90 d to 1 y	2,498	13,091	0.93 (0.90–0.97)	
	1–3 y	4,710	23,931	0.97 (0.94–0.99)	
	3–5 y	2,649	13,872	0.96 (0.92–1.00)	
	≥5 y	2,472	12,352	1.02 (0.97–1.06)	
Angina	0–30 d	503	1,251	2.08 (1.84–2.35)	<.01
	30–90 d	808	2,561	1.54 (1.41–1.68)	
	90 d to 1 y	1,754	9,872	0.88 (0.83–0.92)	
	1–3 y	3,307	17,147	0.94 (0.90–0.97)	
	3–5 y	1,761	9,276	0.95 (0.90–1.00)	
	≥5 y	1,486	7,618	0.99 (0.94–1.05)	
Myocardial infarction	0–30 d	155	452	1.81 (1.46–2.25)	<.01
	30–90 d	242	941	1.28 (1.10–1.50)	
	90 d to 1 y	782	3,845	0.96 (0.90–1.04)	
	1–3 y	1,593	8,350	0.94 (0.89–0.99)	
	3–5 y	1,056	5,844	0.91 (0.86–0.97)	
	≥5 y	1,265	6,268	1.09 (1.02–1.16)	
Revascularization	0–30 d	78	328	1.33 (1.01–1.76)	<.01
	30–90 d	196	652	1.58 (1.34–1.88)	
	90 d to 1 y	404	2,678	0.74 (0.67–0.81)	
	1–3 y	1,010	5,411	0.92 (0.86–0.98)	
	3–5 y	587	3,308	0.88 (0.81–0.96)	
	≥5 y	532	2,912	0.98 (0.89–1.07)	
Sudden cardiac arrest	0–30 d	40	209	1.00 (0.68–1.46)	.01
	30–90 d	129	444	1.42 (1.15–1.76)	
	90 d to 1 y	428	1,853	1.19 (1.08–1.32)	
	1–3 y	912	4,322	1.04 (0.97–1.11)	
	3–5 y	632	3,156	1.02 (0.94–1.11)	
	≥5 y	687	3,583	1.02 (0.94–1.11)	
Peripheral vascular disease	0–30 d	540	1,792	1.38 (1.24–1.54)	<.01
	30–90 d	994	3,615	1.39 (1.29–1.50)	
	90 d to 1 y	2,392	14,194	0.82 (0.79–0.86)	
	1–3 y	5,033	26,506	0.91 (0.89–0.94)	
	3–5 y	3,049	15,701	0.96 (0.92–1.00)	
	≥5 y	2,913	14,623	1.03 (0.99–1.08)	
Stroke	0–30 d	639	1,979	1.63 (1.47–1.81)	<.01
	30–90 d	980	4,083	1.16 (1.08–1.25)	
	90 d to 1 y	2,972	15,356	0.94 (0.91–0.98)	
	1–3 y	5,806	29,031	0.96 (0.94–0.99)	
	3–5 y	3,521	16,770	1.02 (0.98–1.06)	
	≥5 y	3,088	15,325	1.05 (1.01–1.09)	
Arrhythmia	0–30 d	2,511	3,040	4.53 (4.21–4.86)	<.01
	30–90 d	3,867	6,082	3.35 (3.19–3.52)	
	90 d to 1 y	4,982	22,892	1.16 (1.12–1.19)	
	1–3 y	8,185	41,287	1.05 (1.03–1.08)	
	3–5 y	4,500	22,800	1.11 (1.07–1.14)	
	≥5 y	3,835	20,153	1.07 (1.03–1.11)	
Heart failure	0–30 d	1,190	2,572	2.28 (2.10–2.49)	<.01
	30–90 d	2,264	5,040	2.28 (2.15–2.41)	
	90 d to 1 y	4,479	19,199	1.17 (1.13–1.21)	
	1–3 y	6,962	33,672	1.03 (1.01–1.06)	
	3–5 y	4,058	19,678	1.05 (1.01–1.09)	
	≥5 y	3,739	18,396	1.07 (1.03–1.11)	

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**eTable 2. Adjusted HRs for Cardiovascular Risk, Stratified by Time Since Index Date, Including Time Up Until 90 Days After Index (cont.)**

Outcome	Time Since Index Date	Events, n		Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
		Breast Cancer	Noncancer		
Pericarditis	0-30 d	101	148	2.93 (2.17-3.97)	<.01
	30-90 d	280	375	3.97 (3.29-4.78)	
	90 d to 1 y	625	1,533	2.11 (1.93-2.31)	
	1-3 y	886	3,395	1.32 (1.23-1.42)	
	3-5 y	614	2,278	1.39 (1.28-1.52)	
	≥5 y	593	2,552	1.23 (1.13-1.35)	
Valvular heart disease	0-30 d	2,122	3,281	3.36 (3.13-3.61)	<.01
	30-90 d	4,457	6,063	4.08 (3.89-4.28)	
	90 d to 1 y	5,447	22,832	1.28 (1.25-1.32)	
	1-3 y	7,745	39,521	1.05 (1.02-1.07)	
	3-5 y	4,008	21,151	1.01 (0.98-1.05)	
	≥5 y	3,375	18,034	1.02 (0.98-1.06)	
Venous thromboembolism	0-30 d	128	275	2.54 (1.97-3.28)	<.01
	30-90 d	311	501	3.11 (2.66-3.63)	
	90 d to 1 y	1,018	2,269	2.25 (2.09-2.41)	
	1-3 y	1,409	4,711	1.52 (1.44-1.61)	
	3-5 y	895	3,088	1.52 (1.41-1.63)	
	≥5 y	819	3,211	1.35 (1.25-1.46)	
Deep vein thrombosis	0-30 d	125	243	2.80 (2.15-3.65)	<.01
	30-90 d	302	455	3.27 (2.79-3.84)	
	90 d to 1 y	981	2,055	2.39 (2.22-2.57)	
	1-3 y	1,334	4,326	1.56 (1.48-1.66)	
	3-5 y	839	2,750	1.60 (1.48-1.72)	
	≥5 y	767	2,930	1.39 (1.28-1.50)	
Pulmonary embolism	0-30 d	4	42	0.63 (0.25-1.61)	.56
	30-90 d	16	62	1.40 (0.79-2.48)	
	90 d to 1 y	63	286	1.09 (0.83-1.43)	
	1-3 y	115	560	1.04 (0.85-1.27)	
	3-5 y	87	453	0.89 (0.71-1.12)	
	≥5 y	91	412	0.95 (0.75-1.20)	

Abbreviation: HR, hazard ratio.

<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).

eTable 3. Adjusted HRs for Cardiovascular Risk, Stratified by Race/Ethnicity			
Outcome	Race/Ethnicity	Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
CAD	White	0.95 (0.94–0.97)	<.01
	Black	1.08 (1.02–1.15)	
	Other	0.94 (0.81–1.10)	
	Asian	1.00 (0.88–1.14)	
	Hispanic	0.90 (0.76–1.06)	
	Native American	1.12 (0.74–1.69)	
Angina	White	0.93 (0.90–0.95)	.62
	Black	0.99 (0.92–1.07)	
	Other	0.93 (0.77–1.12)	
	Asian	0.92 (0.79–1.08)	
	Hispanic	0.96 (0.80–1.15)	
	Native American	1.15 (0.70–1.88)	
MI	White	0.96 (0.93–0.99)	.04
	Black	1.10 (1.00–1.22)	
	Other	1.04 (0.81–1.33)	
	Asian	1.08 (0.87–1.33)	
	Hispanic	0.78 (0.58–1.05)	
	Native American	1.44 (0.66–3.11)	
Revascularization	White	0.88 (0.85–0.92)	.55
	Black	0.94 (0.81–1.09)	
	Other	0.98 (0.67–1.41)	
	Asian	0.89 (0.65–1.23)	
	Hispanic	0.78 (0.54–1.14)	
	Native American	1.60 (0.78–3.27)	
SCA	White	1.03 (0.99–1.08)	.14
	Black	1.20 (1.07–1.33)	
	Other	0.89 (0.64–1.22)	
	Asian	1.12 (0.85–1.47)	
	Hispanic	1.07 (0.76–1.50)	
	Native American	1.70 (0.61–4.73)	
PVD	White	0.93 (0.91–0.94)	.90
	Black	0.93 (0.87–0.99)	
	Other	1.00 (0.86–1.17)	
	Asian	0.89 (0.78–1.02)	
	Hispanic	0.91 (0.77–1.07)	
	Native American	0.84 (0.54–1.31)	
Stroke	White	0.98 (0.96–1.00)	.08
	Black	1.01 (0.95–1.07)	
	Other	0.98 (0.86–1.12)	
	Asian	1.00 (0.89–1.13)	
	Hispanic	1.24 (1.06–1.45)	
	Native American	0.96 (0.66–1.42)	
Arrhythmia	White	1.08 (1.07–1.10)	.14
	Black	1.09 (1.04–1.15)	
	Other	1.09 (0.97–1.22)	
	Asian	1.20 (1.08–1.33)	
	Hispanic	1.15 (1.00–1.32)	
	Native American	0.74 (0.51–1.07)	

(continued)

eTable 3. Adjusted HRs for Cardiovascular Risk, Stratified by Race/Ethnicity (cont.)			
Outcome	Race/Ethnicity	Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
Heart failure	White	1.07 (1.05–1.09)	.35
	Black	1.09 (1.03–1.15)	
	Other	1.05 (0.92–1.20)	
	Asian	1.08 (0.97–1.20)	
	Hispanic	1.27 (1.09–1.47)	
	Native American	1.24 (0.82–1.87)	
Pericarditis	White	1.42 (1.36–1.49)	.46
	Black	1.48 (1.30–1.69)	
	Other	1.43 (0.96–2.15)	
	Asian	1.71 (1.27–2.30)	
	Hispanic	1.50 (1.00–2.26)	
	Native American	0.37 (0.08–1.74)	
VHD	White	1.08 (1.07–1.10)	.39
	Black	1.12 (1.06–1.18)	
	Other	1.23 (1.09–1.38)	
	Asian	1.10 (0.99–1.22)	
	Hispanic	1.09 (0.94–1.27)	
	Native American	1.09 (0.78–1.53)	
VTE	White	1.58 (1.52–1.64)	.02
	Black	1.83 (1.65–2.04)	
	Other	2.41 (1.71–3.39)	
	Asian	1.49 (1.09–2.05)	
	Hispanic	1.53 (1.05–2.24)	
	Native American	2.15 (0.83–5.57)	
DVT	White	1.65 (1.59–1.71)	.03
	Black	1.84 (1.65–2.05)	
	Other	2.84 (1.96–4.10)	
	Asian	1.54 (1.09–2.18)	
	Hispanic	1.62 (1.11–2.36)	
	Native American	2.16 (0.84–5.56)	
PE	White	0.95 (0.84–1.07)	.15
	Black	1.32 (0.91–1.93)	
	Other	0.37 (0.10–1.34)	
	Asian	1.56 (0.79–3.06)	
	Hispanic	1.48 (0.21–10.50)	
	Native American	0.95 (0.84–1.07)	

Abbreviations: CAD, coronary artery disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, pulmonary embolism; PVD, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.

<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).

**eTable 4. Adjusted HRs for Cardiovascular Risk, Stratified by Cardiovascular Disease Before Diagnosis**

Outcome	CVD Before Diagnosis	Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
CAD	No	0.98 (0.96–1.01)	.05
	Yes	0.94 (0.91–0.97)	
Angina	No	0.94 (0.91–0.97)	.45
	Yes	0.92 (0.89–0.96)	
MI	No	1.00 (0.96–1.04)	.05
	Yes	0.94 (0.89–0.98)	
Revascularization	No	0.88 (0.83–0.93)	.66
	Yes	0.90 (0.84–0.96)	
SCA	No	1.12 (1.05–1.18)	.01
	Yes	0.99 (0.93–1.05)	
PVD	No	0.95 (0.92–0.97)	.01
	Yes	0.89 (0.87–0.92)	
Stroke	No	1.00 (0.98–1.02)	.02
	Yes	0.96 (0.93–0.98)	
Arrhythmia	No	1.11 (1.09–1.13)	<.01
	Yes	1.04 (1.01–1.07)	
Heart failure	No	1.11 (1.09–1.14)	<.01
	Yes	0.99 (0.96–1.02)	
Pericarditis	No	1.59 (1.50–1.68)	<.01
	Yes	1.25 (1.18–1.34)	
VHD	No	1.11 (1.09–1.13)	<.01
	Yes	1.04 (1.01–1.07)	
VTE	No	1.79 (1.71–1.87)	<.01
	Yes	1.37 (1.30–1.45)	
DVT	No	1.85 (1.76–1.94)	<.01
	Yes	1.44 (1.36–1.53)	
PE	No	1.10 (0.93–1.30)	.07
	Yes	0.88 (0.74–1.03)	

Abbreviations: CAD, coronary artery disease; CVD, cardiovascular disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, pulmonary embolism; PVD, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.  
<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other CVD (other than the disease of interest).

**eTable 5. Adjusted HRs for Cardiovascular Risk, Stratified by Current Age**

Outcome	Current Age, y	Adjusted HR (95% CI) <sup>a</sup>	P Value for Interaction
CAD	66–75	0.95 (0.92–0.98)	.44
	>75–85	0.97 (0.94–0.99)	
	>85	0.98 (0.94–1.02)	
Angina	66–75	0.88 (0.84–0.91)	<.01
	>75–85	0.94 (0.91–0.97)	
	>85	1.02 (0.97–1.07)	
MI	66–75	1.01 (0.95–1.08)	.28
	>75–85	0.95 (0.91–0.99)	
	>85	0.98 (0.93–1.03)	
Revascularization	66–75	0.81 (0.75–0.87)	.01
	>75–85	0.92 (0.87–0.97)	
	>85	0.96 (0.87–1.07)	
SCA	66–75	1.23 (1.13–1.34)	<.01
	>75–85	1.05 (1.00–1.12)	
	>85	0.95 (0.88–1.02)	
PVD	66–75	0.91 (0.88–0.95)	.53
	>75–85	0.93 (0.90–0.95)	
	>85	0.94 (0.91–0.97)	
Stroke	66–75	1.01 (0.97–1.04)	.06
	>75–85	0.99 (0.97–1.01)	
	>85	0.95 (0.92–0.98)	
Arrhythmia	66–75	1.15 (1.12–1.18)	<.01
	>75–85	1.07 (1.05–1.09)	
	>85	1.04 (1.00–1.07)	
Heart failure	66–75	1.24 (1.21–1.28)	<.01
	>75–85	1.02 (1.00–1.04)	
	>85	1.01 (0.98–1.04)	
Pericarditis	66–75	1.80 (1.67–1.93)	<.01
	>75–85	1.37 (1.29–1.45)	
	>85	1.18 (1.08–1.30)	
VHD	66–75	1.23 (1.20–1.27)	<.01
	>75–85	1.03 (1.01–1.06)	
	>85	1.01 (0.98–1.05)	
VTE	66–75	2.12 (2.00–2.25)	<.01
	>75–85	1.48 (1.41–1.56)	
	>85	1.36 (1.26–1.46)	
DVT	66–75	2.23 (2.10–2.37)	<.01
	>75–85	1.54 (1.47–1.62)	
	>85	1.40 (1.30–1.51)	
PE	66–75	1.10 (0.89–1.37)	.42
	>75–85	0.92 (0.79–1.08)	
	>85	0.98 (0.77–1.24)	

Abbreviations: CAD, coronary artery disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, pulmonary embolism; PVD, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.  
<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).

**eTable 6. HRs for Cardiovascular Risk, Stratified by Cancer Stage**

Outcome	Cancer Stage	Unadjusted HR (95% CI)	Adjusted HR <sup>a</sup> (95% CI)
CAD	I	0.91 (0.89–0.93)	0.90 (0.88–0.92)
	II	1.02 (0.99–1.06)	1.00 (0.97–1.04)
	III	1.22 (1.16–1.29)	1.23 (1.16–1.30)
Angina	I	0.94 (0.91–0.96)	0.93 (0.90–0.96)
	II	0.94 (0.90–0.98)	0.92 (0.89–0.96)
	III	1.01 (0.95–1.09)	1.01 (0.94–1.09)
MI	I	0.87 (0.84–0.91)	0.87 (0.84–0.91)
	II	1.06 (1.00–1.11)	1.03 (0.98–1.09)
	III	1.34 (1.23–1.45)	1.35 (1.24–1.48)
Revascularization	I	0.90 (0.85–0.94)	0.90 (0.85–0.94)
	II	0.89 (0.83–0.95)	0.88 (0.82–0.94)
	III	0.88 (0.78–1.01)	0.88 (0.77–1.00)
SCA	I	0.85 (0.80–0.90)	0.84 (0.80–0.89)
	II	1.20 (1.13–1.28)	1.20 (1.12–1.28)
	III	1.74 (1.57–1.93)	1.85 (1.66–2.05)
PVD	I	0.92 (0.90–0.94)	0.91 (0.89–0.93)
	II	0.95 (0.92–0.98)	0.93 (0.90–0.96)
	III	1.03 (0.98–1.09)	1.04 (0.98–1.10)
Stroke	I	0.94 (0.92–0.97)	0.94 (0.92–0.96)
	II	1.03 (1.00–1.06)	1.02 (0.99–1.05)
	III	1.17 (1.12–1.24)	1.17 (1.11–1.23)
Arrhythmia	I	1.03 (1.01–1.05)	1.03 (1.01–1.05)
	II	1.13 (1.10–1.16)	1.13 (1.10–1.15)
	III	1.34 (1.28–1.40)	1.35 (1.29–1.42)
Heart failure	I	0.97 (0.95–0.99)	0.95 (0.93–0.97)
	II	1.18 (1.15–1.21)	1.18 (1.14–1.21)
	III	1.53 (1.46–1.60)	1.56 (1.49–1.64)
Pericarditis	I	1.21 (1.14–1.28)	1.21 (1.15–1.28)
	II	1.52 (1.42–1.62)	1.54 (1.44–1.65)
	III	2.47 (2.22–2.76)	2.59 (2.31–2.90)
VHD	I	1.03 (1.01–1.05)	1.02 (1.00–1.04)
	II	1.14 (1.11–1.17)	1.14 (1.11–1.17)
	III	1.38 (1.31–1.44)	1.38 (1.32–1.45)
VTE	I	1.36 (1.30–1.43)	1.37 (1.31–1.43)
	II	1.70 (1.61–1.80)	1.73 (1.63–1.83)
	III	2.67 (2.44–2.92)	2.79 (2.54–3.07)
DVT	I	1.40 (1.33–1.46)	1.41 (1.34–1.48)
	II	1.79 (1.70–1.90)	1.82 (1.72–1.93)
	III	2.80 (2.55–3.08)	2.92 (2.65–3.22)
PE	I	1.08 (0.95–1.24)	1.00 (0.87–1.16)
	II	0.86 (0.70–1.05)	0.82 (0.66–1.02)
	III	1.37 (1.00–1.89)	1.37 (0.97–1.92)

Abbreviations: CAD, coronary artery disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, pulmonary embolism; PVD, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.

<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).

**eTable 7. HRs for Cardiovascular Risk, Stratified by Grade**

Outcome	Grade	Unadjusted HR (95% CI)	Adjusted HR <sup>a</sup> (95% CI)
CAD	1	0.91 (0.88–0.94)	0.90 (0.87–0.94)
	2	0.96 (0.93–0.98)	0.95 (0.92–0.97)
	3	1.07 (1.03–1.11)	1.05 (1.01–1.09)
Angina	1	0.91 (0.87–0.95)	0.91 (0.87–0.95)
	2	0.93 (0.90–0.96)	0.92 (0.89–0.95)
	3	1.00 (0.95–1.04)	0.98 (0.94–1.02)
MI	1	0.88 (0.83–0.93)	0.89 (0.83–0.94)
	2	0.96 (0.92–1.01)	0.96 (0.91–1.00)
	3	1.10 (1.04–1.16)	1.09 (1.02–1.15)
Revascularization	1	0.91 (0.84–0.99)	0.92 (0.85–1.00)
	2	0.85 (0.80–0.90)	0.84 (0.79–0.89)
	3	0.98 (0.91–1.06)	0.96 (0.89–1.03)
SCA	1	0.91 (0.83–0.99)	0.92 (0.84–1.00)
	2	1.03 (0.97–1.09)	1.02 (0.96–1.09)
	3	1.26 (1.17–1.35)	1.26 (1.17–1.35)
PVD	1	0.91 (0.88–0.94)	0.91 (0.88–0.94)
	2	0.93 (0.91–0.96)	0.92 (0.90–0.95)
	3	0.97 (0.93–1.00)	0.94 (0.91–0.97)
Stroke	1	0.99 (0.96–1.02)	0.98 (0.95–1.02)
	2	0.97 (0.94–0.99)	0.96 (0.94–0.98)
	3	1.04 (1.01–1.08)	1.03 (0.99–1.06)
Arrhythmia	1	1.06 (1.03–1.09)	1.06 (1.03–1.09)
	2	1.06 (1.04–1.08)	1.06 (1.04–1.08)
	3	1.16 (1.13–1.20)	1.15 (1.12–1.19)
Heart failure	1	0.96 (0.93–0.99)	0.94 (0.91–0.97)
	2	1.05 (1.03–1.07)	1.04 (1.02–1.07)
	3	1.27 (1.23–1.31)	1.25 (1.22–1.29)
Pericarditis	1	1.18 (1.08–1.28)	1.20 (1.10–1.31)
	2	1.32 (1.25–1.41)	1.34 (1.26–1.42)
	3	1.81 (1.68–1.95)	1.84 (1.70–1.98)
VHD	1	1.00 (0.97–1.03)	1.00 (0.97–1.03)
	2	1.08 (1.05–1.10)	1.07 (1.05–1.10)
	3	1.24 (1.21–1.28)	1.23 (1.20–1.27)
VTE	1	1.29 (1.21–1.39)	1.30 (1.21–1.40)
	2	1.54 (1.47–1.62)	1.57 (1.49–1.65)
	3	1.94 (1.82–2.06)	1.95 (1.84–2.08)
DVT	1	1.33 (1.24–1.43)	1.35 (1.25–1.45)
	2	1.59 (1.51–1.67)	1.62 (1.54–1.71)
	3	2.05 (1.92–2.18)	2.07 (1.94–2.20)
PE	1	0.94 (0.75–1.18)	0.88 (0.70–1.11)
	2	1.14 (0.97–1.32)	1.10 (0.94–1.30)
	3	1.00 (0.80–1.24)	0.91 (0.72–1.16)

Abbreviations: CAD, coronary artery disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, pulmonary embolism; PVD, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.

<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).

**eTable 8. HRs for Cardiovascular Risk, Stratified by ER/PR Status**

Outcome	ER/PR Status	Unadjusted HR (95% CI)	Adjusted HR <sup>a</sup> (95% CI)
Coronary artery disease	Positive	0.96 (0.94–0.98)	0.95 (0.93–0.97)
	Negative	1.01 (0.96–1.07)	1.00 (0.95–1.06)
Angina	Positive	0.94 (0.91–0.96)	0.93 (0.90–0.95)
	Negative	0.90 (0.85–0.96)	0.89 (0.84–0.95)
Myocardial infarction	Positive	0.95 (0.92–0.98)	0.94 (0.91–0.98)
	Negative	1.08 (0.99–1.17)	1.07 (0.99–1.17)
Revascularization	Positive	0.88 (0.84–0.92)	0.88 (0.84–0.92)
	Negative	0.91 (0.82–1.01)	0.90 (0.81–1.00)
Sudden cardiac arrest	Positive	1.01 (0.97–1.06)	1.01 (0.97–1.06)
	Negative	1.21 (1.09–1.34)	1.21 (1.08–1.34)
Peripheral vascular disease	Positive	0.92 (0.91–0.94)	0.91 (0.89–0.93)
	Negative	0.98 (0.93–1.03)	0.97 (0.92–1.02)
Stroke	Positive	0.97 (0.96–0.99)	0.97 (0.95–0.98)
	Negative	1.07 (1.03–1.12)	1.06 (1.01–1.11)
Arrhythmia	Positive	1.07 (1.06–1.09)	1.07 (1.05–1.09)
	Negative	1.20 (1.16–1.25)	1.21 (1.16–1.26)
Heart failure	Positive	1.05 (1.03–1.07)	1.04 (1.02–1.06)
	Negative	1.27 (1.22–1.32)	1.26 (1.21–1.31)
Pericarditis	Positive	1.33 (1.27–1.39)	1.34 (1.28–1.40)
	Negative	2.04 (1.85–2.25)	2.08 (1.88–2.31)
Valvular heart disease	Positive	1.06 (1.04–1.08)	1.06 (1.04–1.08)
	Negative	1.31 (1.26–1.37)	1.31 (1.26–1.36)
Venous thromboembolism	Positive	1.51 (1.46–1.57)	1.53 (1.48–1.59)
	Negative	2.04 (1.88–2.22)	2.06 (1.89–2.24)
Deep vein thrombosis	Positive	1.57 (1.51–1.63)	1.59 (1.53–1.66)
	Negative	2.15 (1.97–2.34)	2.17 (1.99–2.37)
Pulmonary embolism	Positive	1.02 (0.91–1.15)	0.96 (0.84–1.09)
	Negative	1.24 (0.95–1.62)	1.28 (0.95–1.72)

Abbreviations: ER, estrogen receptor; HR, hazard ratio; PR, progesterone receptor.

<sup>a</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).



**Table 9. Rates, Rate Difference, and HRs for Cardiovascular Risk, Using Only Inpatient Claims to Identify Cardiovascular Outcomes**

Outcome	Breast Cancer		Noncancer		Rate Difference <sup>b</sup>	Unadjusted HR (95% CI)	Adjusted HR (95% CI) <sup>c</sup>
	Events/Follow-Up <sup>a</sup>	Rate (95% CI) <sup>b</sup>	Events/Follow-Up <sup>a</sup>	Rate (95% CI) <sup>b</sup>			
CAD	5,713/382,316	14.94 (14.56 to 15.33)	30,107/1,904,896	15.81 (15.63 to 15.98)	-2.07 (-3.25 to -0.89)	0.95 (0.93 to 0.98)	0.95 (0.93 to 0.98)
Angina	2,086/389,768	5.35 (5.12 to 5.58)	11,522/1,946,468	5.92 (5.81 to 6.03)	-1.44 (-2.14 to -0.74)	0.90 (0.86 to 0.94)	0.89 (0.85 to 0.93)
MI	3,624/391,230	9.26 (8.96 to 9.56)	19,383/1,953,909	9.92 (9.78 to 10.06)	-1.59 (-2.51 to -0.68)	0.95 (0.91 to 0.98)	0.95 (0.92 to 0.98)
Revascularization	2,029/390,229	5.20 (4.97 to 5.43)	11,381/1,946,544	5.85 (5.74 to 5.95)	-1.66 (-2.35 to -0.97)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)
SCA	845/399,149	2.12 (1.97 to 2.26)	4,040/1,999,496	2.02 (1.96 to 2.08)	0.32 (-0.11 to 0.74)	1.07 (0.99 to 1.14)	1.10 (1.03 to 1.18)
PVD	2,889/39,0519	7.40 (7.13 to 7.67)	16,429/1,952,762	8.41 (8.28 to 8.54)	-2.60 (-3.42 to -1.77)	0.88 (0.85 to 0.91)	0.87 (0.84 to 0.91)
Stroke	5,652/384,342	14.71 (14.32 to 15.09)	28,870/1,918,885	15.05 (14.87 to 15.22)	-0.53 (-1.70 to 0.63)	0.97 (0.95 to 1.00)	0.97 (0.95 to 1.00)
Arrhythmia	7,800/372,939	20.91 (20.45 to 21.38)	37,756/1,876,068	20.13 (19.92 to 20.33)	2.68 (1.28 to 4.09)	1.05 (1.02 to 1.07)	1.05 (1.03 to 1.08)
Heart failure	11872/363,165	32.69 (32.10 to 33.28)	57,861/1,822,120	31.75 (31.50 to 32.01)	3.40 (1.62 to 5.18)	1.04 (1.02 to 1.06)	1.03 (1.01 to 1.05)
Pericarditis	724/397,928	1.82 (1.69 to 1.95)	2,734/1,995,304	1.37 (1.32 to 1.42)	1.27 (0.88 to 1.67)	1.33 (1.24 to 1.44)	1.36 (1.26 to 1.46)
VHD	7,164/374,140	19.15 (18.70 to 19.59)	35,104/1,888,069	18.59 (18.40 to 18.79)	2.02 (0.68 to 3.36)	1.03 (1.00 to 1.05)	1.03 (1.01 to 1.05)
VTE	2,205/393,483	5.60 (5.37 to 5.84)	6503/1,984,083	3.28 (3.20 to 3.36)	6.51 (5.82 to 7.19)	1.75 (1.67 to 1.83)	1.78 (1.70 to 1.86)
DVT	2,134/393,567	5.42 (5.19 to 5.65)	6236/1,984,456	3.14 (3.06 to 3.22)	6.37 (5.70 to 7.04)	1.77 (1.69 to 1.85)	1.79 (1.71 to 1.88)
PE	88/399,619	0.22 (0.17 to 0.27)	334/2,002,235	0.17 (0.15 to 0.18)	0.15 (0.02 to 0.29)	1.29 (1.03 to 1.60)	1.25 (0.99 to 1.57)

Abbreviations: CAD, coronary artery disease; DVT, deep vein thrombosis; HR, hazard ratio; MI, myocardial infarction; PE, peripheral vascular disease; SCA, sudden cardiac arrest; VHD, valvular heart disease; VTE, venous thromboembolism.

<sup>a</sup>Person-years.  
<sup>b</sup>Per 1,000 patient-years.

<sup>c</sup>Adjusted for age, SEER region, time since index, current year, rheumatoid arthritis, chronic kidney disease, hypertension, diabetes, and any other cardiovascular disease (other than the disease of interest).