

## Appendix 1. List of Histologic Subtype Codes

Endometrioid: 8140-3, 8262-3, 8380-3, 8382-3, 8383-3.
Serous: 8260-3, 8441-3, 8450-3, 8460-3, 8461-3.
Clear cell: 8005-3, 8310-3,
Others: 8000-3, 8001-3, 8002-3, 8003-3, 8010-3, 8011-3, 8012-3, 8013-3, 8014-3, 8015-3, 8022-3, 8030-3, 8031-3, 8032-3, 8033-3, 8040-3, 8041-3, 8045-3, 8046-3, 8050-3, 88050, 8090-3, 8098-3, 8120-3, 8123-3, 8130-3, 8143-3, 8144-3, 8145-3, 8200-3, 8201-3, 8210-3, 8211-3, 8220-3, 8221-3, 8230-3, 8244-3, 8246-3, 8249-3, 8261-3, 8263-3, 8290-3, 8313-3, 8320-3, 8340-3, 8370-3, 8381-3, 8384-3, 8410-3, 8440-3, 8510-3, 8550-3, 8562-3, 8571-3, 8572-3, 8573-3, 8574-3, 8575-3, 8576-3, 8830-3, 8960-3, 8990-3, 9014-3, 9015-3, 9130-3, 9133-3, 9150-3, 9508-3.
Carcinosarcoma: 8950-3, 8951-3, 8980-3, 8981-3,
Sarcoma: 8004-3, 8800-3, 8801-3, 8802-3, 8803-3, 8804-3, 8805-3, 8810-3, 8811-3, 8814-3, 8840-3, 8850-3, 8853-3, 8854-3, 8855-3, 8858-3, 8860-3, 8890-3, 8891-3, 8895-3, 8896-3, 8897-3, 8900-3, 8901-3, 8902-3, 8910-3, 8912-3, 8920-3, 8930-3, 8931-3, 8933-3, 8934-3, 8935-3, 8963-3, 8991-3, 9120-3, 9180-3, 9220-3, 9240-3, 9260-3, 9581-3
Metastatic tumor: 8141-3, 8490-3, 8580-3, 8590-3, 8600-3, 8620-3, 8650-3, 8680-3, 8720-3, 8936-3, 9064-3, 9071-3, 9080-3, 9085-3, 9100-3, 9101-3, 9104-3, 9105-3, 9110-3, 9364-3, 9380-3, 9473-3, 9560-3, 9561-3
Undifferentiated: 8020-3, 8021-3
Squamous: 8051-3, 8052-3, 8070-3, 8071-3, 8072-3, 8073-3, 8074-3, 8075-3, 8076-3, 8083-3, 8084-3
Mixed: 8255-3, 8323-3, 8940-3
Mucinous: 8470-3, 8471-3, 8480-3, 8481-3, 8482-3
Adenosquamous: 8560-3
Adenocarcinoma with squamous metaplasia: 8570-3

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## Appendix 2. Patient Demographics (N=86,005)

Age (y)	61.5 (±11.8)
≥ 50	73,145 (85.0%)
40 - 49	9,850 (11.5%)
30 - 39	2,708 (3.1%)
< 30	302 (0.4%)
Ethnicity	
White	68,873 (80.1%)
Black	3,967 (4.6%)
Hispanic	6,590 (7.7%)
Asian	4,892 (5.7%)
Pacific Islander	1,292 (1.5%)
Others	121 (0.1%)
Unknown	270 (0.3%)
Marital status	
Single	12,527 (14.6%)
Married	48,241 (56.1%)
Others	22,090 (25.6%)
Unknown	3,147 (3.7%)
Registry Area	
West	45,183 (52.5%)
Central	19,398 (22.6%)
East	21,424 (24.9%)
Year at diagnosis	
1983 - 1989	8,019 (9.3%)
1990 - 1999	18,975 (22.1%)
2000 - 2009	43,671 (50.8%)
2010 - 2012	15,340 (17.8%)
Stage	
IA	68,468 (79.6%)
IB	10,578 (12.3%)
I NOS	6,959 (8.1%)
Histology	
Grade 1 endometrioid	53,402 (62.1%)
Grade 2 endometrioid	32,603 (37.9%)
Tumor size	
≤ 2.0 cm	16,412 (19.1%)
2.1 - 4.0 cm	15,885 (18.5%)
4.1 - 6.0 cm	6,516 (7.6%)
6.1 - 8.0 cm	1,688 (2.0%)
8.1 - 10.0 cm	515 (0.6%)
> 10.0 cm	304 (0.4%)
Unknown	44,685 (52.0%)
Surgery type	
Total/pan/simple hyst	75,997 (88.4%)
Extended hyst/mRH/RH	7,240 (8.4%)
Hyst, NOS	1,987 (2.3%)
Supracervical/subtotal hyst	725 (0.8%)
Others	56 (0.1%)

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Adjuvant radiation	
None	73,715 (85.7%)
WPRT ± ICBT	6,960 (8.1%)
ICBT alone	4,249 (4.9%)
Other radiation type	306 (0.4%)
Unknown	775 (0.9%)

Number (%) or mean ( $\pm$ SD) is shown. \*included undifferentiated endometrioid type, †adenocarcinoma with squamous metaplasia. Abbreviations: hyst, hysterectomy; mRH, modified hysterectomy; RH, radical hysterectomy; WPRT, whole pelvic radiation therapy; ICBT, intra-cavitary brachytherapy; and Surg, surgery.

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**Appendix 3. Causes of Death for Women Aged <50 With Stage, I Grade 1 Endometrioid Endometrial Cancer (n=9,110)**

	Event No.	Cumulative risk			P
		10-yr (%)	15-yr (%)	20-yr (%)	
Endometrial cancer					.31
Oophorectomy	96	1.4%	2.1%	2.3%	
Ovarian conservation	8	1.1%	1.1%	1.1%	
Cardiovascular disease					<b>.042</b>
Oophorectomy	115	1.1%	1.9%	3.7%	
Ovarian conservation	6	0.2%	0.2%	2.3%	
Other chronic diseases					.20
Oophorectomy	76	0.6%	1.3%	2.9%	
Ovarian conservation	5	0.2%	0.5%	1.5%	
Other causes					.83
Oophorectomy	157	1.6%	3.2%	5.4%	
Ovarian conservation	17	1.6%	2.2%	4.2%	
Other malignancies					.21
Oophorectomy	156	1.7%	2.9%	5.2%	
Ovarian conservation	13	1.1%	2.0%	2.7%	

Number (%) is shown. Log-rank test for *P*-values. Significant *P*-values are emboldened. \*including musculoskeletal tissue. Abbreviations: OC, ovarian conservation and ;10-yr, 15-yr, and 20-yr, 10-, 15-, 20-year cumulative risk of death.

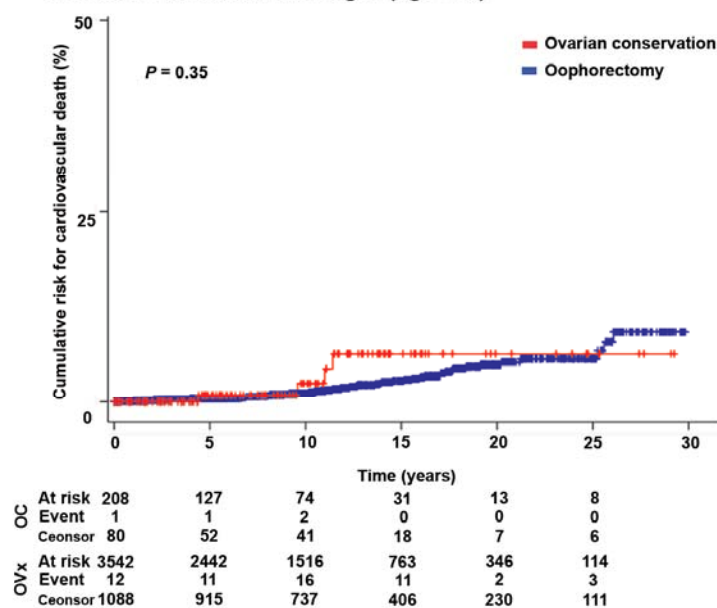
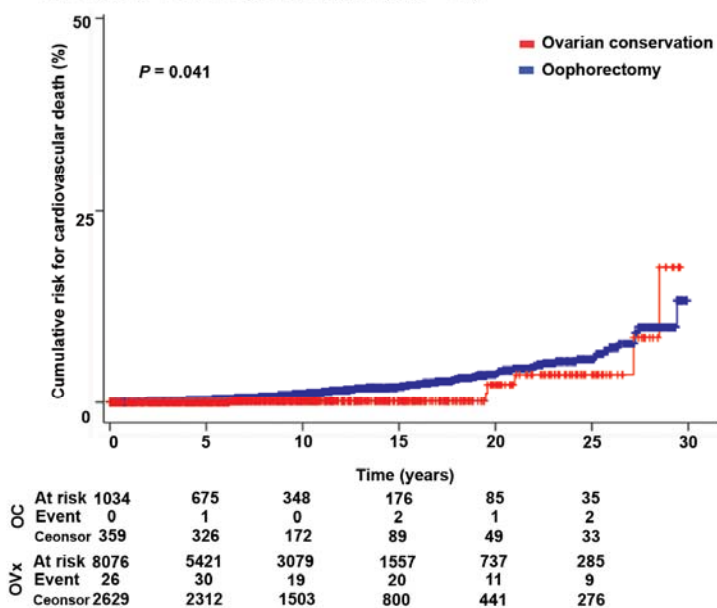
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**Appendix 4. Cumulative incidence of death due to cardiovascular disease in women aged <50 with stage I grade 1 and 2 endometrioid endometrial cancer.**

**A. Grade 1 endometrioid stage I (age <50)**

**B. Grade 2 endometrioid stage I (age <50)**



Log-rank test for *P*-value. Y-axis was truncated to 0-50%. Survival curves were constructed for: grade 1 endometrioid (panel A) and grade 2 endometrioid (panel B) endometrial cancer.

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**Appendix 5. Ovarian Conservation in Women Aged <50 With Stage I, Grade 2 Endometrioid Endometrial Cancer (n=3,750)**

	<b>OC</b>	<b>Oophorectomy</b>	<b>P</b>
No.	208 (5.5%)	3,542 (94.5%)	
Age (y)	39.9 (±6.4)	43.2 (±5.3)	<b>&lt;.001</b>
40-49	118 (4.0%)	2,809 (96.0%)	
30-39	76 (10.4%)	652 (89.6%)	
< 30	14 (14.7%)	81 (85.3%)	
Ethnicity			<b>.015</b>
White	121 (4.9%)	2,340 (95.1%)	
Black	23 (9.2%)	227 (90.8%)	
Hispanic	38 (7.8%)	451 (92.2%)	
Asian	18 (4.5%)	380 (95.5%)	
Others	7 (4.9%)	135 (95.1%)	
Unknown	1 (10.0%)	9 (90.0%)	
Marital status			.22
Single	68 (6.2%)	1,032 (93.8%)	
Others	129 (5.1%)	2,380 (94.9)	
Unknown	11 (7.8%)	130 (92.2%)	
Registry Area			.99
West	113 (5.5%)	1,941 (94.5%)	
Central	48 (5.6%)	808 (94.4%)	
East	47 (5.6%)	793 (94.4%)	
Year at diagnosis			.15
1983-1989	12 (4.4%)	258 (95.6%)	
1990-1999	40 (4.6%)	833 (95.4%)	
2000-2009	114 (5.6%)	1,911 (94.4%)	
2010-2012	42 (7.4%)	540 (92.8%)	
Stage			.66
IA	171 (5.4%)	2,996 (94.6%)	
IB	18 (6.4%)	263 (93.6%)	
I NOS	19 (6.3%)	283 (93.7%)	
Tumor size			<b>.011</b>
≤ 2.0 cm	46 (7.6%)	560 (92.4%)	
2.1 - 4.0 cm	24 (3.9%)	586 (96.1%)	
4.1 - 6.0 cm	15 (4.1%)	352 (95.9%)	
> 6.0 cm	6 (2.8%)	207 (97.2%)	
Unknown	117 (6.0%)	1,837 (94.0%)	
Surgery type			<b>&lt; .001</b>
Total/pan/simple hyst	193 (6.0%)	3,004 (94.0%)	
Subtotal/supracervical hyst	9 (25.0%)	27 (75.0%)	
Others	6 (1.1%)	511 (1.2%)	
Adjuvant radiation			.71
No	181 (5.7%)	3,008 (94.3%)	
Yes	25 (4.8%)	495 (95.2%)	
Unknown	2 (4.9%)	39 (95.1%)	

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Number (%), mean ( $\pm$ SD) is shown. Percentages are shown per row. Student *t* test or chi-square test for *P* values. Significant *P*-values are emboldened. Abbreviations: NOS, not otherwise specified; hyst, hysterectomy.

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**Appendix 6. Comparison of Patient Demographics Between Grade 1 and 2 Endometrioid Types Among Women Aged <50 With Stage I Endometrial Cancer (n=12,860)**

	<b>Grade 1 endometrioid</b>	<b>Grade 2 endometrioid</b>	<b>P</b>
No.	9,110	3,750	
Age (y)	42.8 (±5.4)	43.1 (±5.4)	<b>.023</b>
40-49	6923 (76.0%)	2927 (78.1%)	
< 40	2187 (24.0%)	823 (21.9%)	
Ethnicity			<b>&lt;.001</b>
White	5824 (63.9%)	2461 (65.6%)	
Black	478 (5.2%)	250 (6.7%)	
Hispanic	1427 (15.7%)	489 (13.0%)	
Asian	950 (10.4%)	398 (10.6%)	
Pacific Islander	373 (4.1%)	134 (3.6%)	
Others	14 (0.2%)	8 (0.2%)	
Unknown	44 (0.5%)	10 (0.3%)	
Marital status			.10
Single	2474 (27.2%)	1100 (29.3%)	
Married	5297 (58.1%)	2073 (55.3%)	
Divorced	752 (8.3%)	334 (8.9%)	
Separated	107 (1.2%)	46 (1.2%)	
Unmarried or domestic partner	3 (0.0%)	1 (0.0%)	
Widowed	118 (1.3%)	55 (1.5%)	
Unknown	359 (3.9%)	141 (3.8%)	
Registry Area			.48
West	4987 (54.7%)	2053 (54.7%)	
Central	2010 (22.1%)	857 (22.9%)	
East	2113 (23.2%)	840 (22.4%)	
Year at diagnosis			<b>&lt;.001</b>
1983-1989	641 (7.0%)	270 (7.2%)	
1990-1999	1814 (19.9%)	873 (23.3%)	
2000-2009	5070 (55.7%)	2025 (54.0%)	
2010-2012	1585 (17.4%)	582 (15.5%)	
Stage			<b>&lt;.001</b>
IA	7894 (86.7%)	3168 (84.5%)	
IB	258 (2.8%)	281 (7.5%)	
I NOS	958 (10.5%)	301 (8.0%)	
Tumor size			<b>&lt;.001</b>
≤ 2.0 cm	2040 (22.4%)	606 (16.2%)	
2.1 - 4.0 cm	1153 (12.7%)	610 (16.2%)	
4.1 - 6.0 cm	576 (6.3%)	367 (9.8%)	
6.1 - 8.0 cm	213 (2.3%)	124 (3.3%)	
8.1 - 10.0 cm	85 (0.9%)	56 (1.5%)	
> 10.0 cm	52 (0.6%)	33 (0.9%)	
Unknown	4991 (54.8%)	1954 (52.1%)	
Surgery type			<b>&lt;.001</b>
Total/pan/simple hyst	8147 (89.4%)	3197 (85.3%)	
Extended hyst, mRH, RH	590 (6.5%)	427 (11.4%)	
Hyst, NOS	217 (2.4%)	89 (2.4%)	

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Subtotal/supracervical hyst	152 (1.7%)	36 (1.0%)	
Others	4 (0.0%)	1 (0.0%)	
Ovarian conservation			<b>&lt;.001</b>
No	8076 (88.6%)	3542 (94.5%)	
Yes	1034 (11.4%)	208 (5.5%)	
Adjuvant radiation			<b>&lt;.001</b>
None	8646 (94.9%)	3189 (85.0%)	
WPRT ± ICBT	219 (2.4%)	303 (8.1%)	
ICBT alone	155 (1.7%)	207 (5.5%)	
Others	25 (0.3%)	10 (0.3%)	
Unknown	65 (0.7%)	41 (1.1%)	

Number (%) or mean ( $\pm$ SD) is shown. Percentages are shown per column. Student *t* test or chi-square test for *P*-values. Significant *P*-values are emboldened. Abbreviations: hyst, hysterectomy; mRH, modified hysterectomy; RH, radical hysterectomy; WPRT, whole pelvic radiation therapy; and ICBT, intra-cavitary brachytherapy.

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