Supplementary Table S1. Pathological characteristics of resection specimens from 125 patients in the National Cancer Center Hospital cohort.

| Category                        | NCCH cohort [n=125] | Positive Lymph node metastasis [n=51] (43.7%) | Negative Lymph node metastasis [n=74] (56.3%) | P value |
|---------------------------------|---------------------|-----------------------------------------------|-----------------------------------------------|---------|
| **Histological types**          |                     |                                               |                                               | 0.59**  |
| Endometrioid                    |                     |                                               |                                               |         |
| Grade 1                         | 47 (37.6%)          | 14 (27.5%)                                    | 33 (44.5%)                                    |         |
| Grade 2                         | 17 (13.6%)          | 8 (15.7%)                                     | 9 (12.2%)                                     |         |
| Grade 3                         | 18 (14.4%)          | 8 (15.7%)                                     | 10 (13.5%)                                    |         |
| Carcinosarcoma                  | 19 (15.2%)          | 9 (17.6%)                                     | 10 (13.5%)                                    |         |
| Serous                          | 13 (10.4%)          | 7 (13.7%)                                     | 6 (8.1%)                                      |         |
| Mix                             | 5 (4.0%)            | 2 (3.9%)                                      | 3 (4.1%)                                      |         |
| Others                          | 6 (4.8%)            | 3 (5.9%)                                      | 3 (4.1%)                                      |         |
| **FIGO stage**                  |                     |                                               |                                               | <0.01** |
| IA                              | 35 (28.0%)          | 0 (0.0%)                                      | 35 (47.3%)                                    |         |
| IB                              | 17 (13.6%)          | 0 (0.0%)                                      | 17 (23.0%)                                    |         |
| II                              | 14 (11.2%)          | 0 (0.0%)                                      | 14 (18.9%)                                    |         |
| IIA                             | 5 (4.0%)            | 0 (0.0%)                                      | 5 (6.8%)                                      |         |
| IIIB                            | 2 (1.6%)            | 0 (0.0%)                                      | 2 (2.7%)                                      |         |
| IIC1                            | 25 (20.0%)          | 25 (49.0%)                                    | 0 (0.0%)                                      |         |
| IIC2                            | 16 (12.8%)          | 16 (31.4%)                                    | 0 (0.0%)                                      |         |
| IVB                             | 11 (8.8%)           | 10 (19.6%)                                    | 1 (1.4%)                                      |         |
| **Number of resected lymph nodes (median, range)** | 30 (10-131)         | 46 (10-131)                                   | 21 (10-56)                                    | <0.01*  |
| **Extent of lymphadenectomy**   |                     |                                               |                                               | <0.01** |
| Pelvic only                     | 63 (50.4%)          | 6 (11.8%)                                     | 57 (77.0%)                                    |         |
| Pelvic + Para-aortic            | 62 (49.6%)          | 45 (88.2%)                                    | 17 (23.0%)                                    |         |
| **Primary tumor diameter [mm] (median, range)** | 50 (1.5-184)       | 55 (1.5-135)                                   | 50 (6-184)                                    | <0.01*  |
| **Myometrial invasion**         |                     |                                               |                                               | <0.01** |
| <50%                            | 52 (41.6%)          | 10 (19.6%)                                    | 42 (56.8%)                                    |         |
| ≥50%                            | 73 (58.4%)          | 41 (80.4%)                                    | 32 (43.2%)                                    |         |
| **Lymph vascular space invasion** |                   |                                               |                                               | <0.01** |
| Negative                        | 51 (40.8%)          | 5 (9.8%)                                      | 46 (62.2%)                                    |         |
| Positive                        | 73 (58.4%)          | 46 (90.2%)                                    | 27 (36.5%)                                    |         |
| Unknown                         | 1 (0.8%)            | 0 (0.0%)                                      | 1 (1.3%)                                      |         |
| **Ascites cytology**            |                     |                                               |                                               | <0.01** |
| Negative                        | 79 (63.2%)          | 22 (43.1%)                                    | 57 (77.0%)                                    |         |
| Positive                        | 46 (36.8%)          | 29 (56.9%)                                    | 17 (23.0%)                                    |         |
| **Serum CA125 [U/mL] (median, range)** | 20 (4-1403)        | 50 (7-1403)                                   | 16 (4-448)                                    | <0.01*  |
| **Adjuvant therapy**            |                     |                                               |                                               | <0.01** |
| None                            | 66 (52.8%)          | 3 (5.9%)                                      | 63 (85.1%)                                    |         |
| Chemotherapy                    | 58 (46.4%)          | 47 (92.2%)                                    | 11 (14.9%)                                    |         |
| Radiation therapy               | 1 (0.8%)            | 1 (2.0%)                                      | 0 (0.0%)                                      |         |
| **Follow-up period [month] (median, range)** | 49 (4-137)         | 29 (5-137)                                    | 51 (4-82)                                     | <0.01*  |

* Mann-Whitney’s U test. ** Chi-squared test.
FIGO: The International Federation of Gynecology and Obstetrics, NCCH: National Cancer Center Hospital.
Supplementary Table S2. Pathological characteristics of resection specimens from 129 patients in the Showa University Hospital cohort.

| Category                        | SUH cohort | Positive [n=29] | Negative [n=100] | P value |
|---------------------------------|------------|-----------------|------------------|---------|
|                                 | [n=129]    | (22.5%)         | (77.5%)          |         |
| Histological types              |            |                 |                  | 0.14**  |
| Endometrioid                    |            |                 |                  |         |
| Grade 1                         | 51 (39.5%) | 7 (24.1%)       | 44 (44.0%)       |         |
| Grade 2                         | 37 (28.7%) | 9 (31.0%)       | 28 (28.0%)       |         |
| Grade 3                         | 18 (14.0%) | 6 (20.7%)       | 12 (12.0%)       |         |
| Carcinosarcoma                  | 6 (4.6%)   | 2 (6.9%)        | 4 (4.0%)         |         |
| Serous                          | 7 (5.4%)   | 2 (6.9%)        | 5 (5.0%)         |         |
| Mix                             | 5 (3.9%)   | 3 (10.4%)       | 2 (2.0%)         |         |
| Others                          | 5 (3.9%)   | 0 (0.0%)        | 5 (5.0%)         |         |
| FIGO stage                      |            |                 |                  | <0.01** |
| IA                              | 56 (43.4%) | 0 (0.0%)        | 56 (56.0%)       |         |
| IB                              | 27 (20.9%) | 0 (0.0%)        | 27 (27.0%)       |         |
| II                              | 6 (4.6%)   | 0 (0.0%)        | 6 (6.0%)         |         |
| IIIA                            | 8 (6.2%)   | 0 (0.0%)        | 8 (8.0%)         |         |
| IIIB                            | 1 (0.8%)   | 0 (0.0%)        | 1 (1.0%)         |         |
| IIIC1                           | 8 (6.2%)   | 8 (27.6%)       | 0 (0.0%)         |         |
| IIIC2                           | 14 (10.9%) | 14 (48.3%)      | 0 (0.0%)         |         |
| IVB                             | 9 (7.0%)   | 7 (24.1%)       | 2 (2.0%)         |         |
| Number of resected lymph nodes (median, range) | 49 (13-141) | 44.5 (13-121) | 60 (14-141) | <0.01*  |
| Extent of lymphadenectomy        |            |                 |                  | <0.01** |
| Pelvic only                     | 68 (52.7%) | 6 (20.7%)       | 62 (62.0%)       |         |
| Pelvic + Para-aortic            | 61 (47.3%) | 23 (79.3%)      | 38 (38.0%)       |         |
| Primary tumor diameter [mm] (median, range) | 10.3 (0-88.4) | 13.6 (0.45-88.4) | 8.8 (0-65.3) | <0.01*  |
| Myometrial invasion             |            |                 |                  | <0.01** |
| <50%                            | 73 (56.6%) | 8 (27.6%)       | 65 (65.0%)       |         |
| ≥50%                            | 55 (42.6%) | 21 (72.4%)      | 34 (34.0%)       |         |
| Unknown                         | 1 (0.8%)   | 0 (0.0%)        | 1 (1.0%)         |         |
| Lymph vascular space invasion   |            |                 |                  | <0.01** |
| Negative                        | 68 (52.7%) | 2 (6.9%)        | 66 (66.0%)       |         |
| Positive                        | 50 (38.8%) | 22 (75.9%)      | 28 (28.0%)       |         |
| Unknown                         | 11 (8.5%)  | 5 (17.2%)       | 6 (6.0%)         |         |
| Ascites cytology                |            |                 |                  | 0.046** |
| Negative                        | 91 (70.5%) | 17 (58.6%)      | 74 (74.0%)       |         |
| Positive                        | 27 (20.9%) | 10 (34.5%)      | 17 (17.0%)       |         |
| Unknown                         | 11 (8.5%)  | 2 (6.9%)        | 9 (9.0%)         |         |
| Serum CA125 [U/mL] (median, range) | 30.5 (5.4-849) | 70.3 (13.3-849) | 23.2 (5.4-521.3) | <0.01*  |
| Adjuvant therapy                |            |                 |                  | <0.01** |
| None                            | 60 (46.5%) | 5 (17.2%)       | 55 (55.0%)       |         |
| Chemotherapy                    | 67 (51.9%) | 24 (82.8%)      | 43 (43.0%)       |         |
| Radiation therapy               | 2 (1.6%)   | 0 (0.0%)        | 2 (2.0%)         |         |
| Follow-up period [month] (median, range) | 55 (1-124) | 50 (1-121) | 55 (3-124) | 0.91*   |

* Mann-Whitney’s U test.  ** Chi-squared test.
FIGO: The International Federation of Gynecology and Obstetrics. SUH: Showa University Hospital.
Supplementary Table S3. Patient characteristics of the National Cancer Center Hospital cohort: 125 endometrial cancer patients by training or test set.

| Category                                      | All [n=125] | Training [n=75] | Test [n=50] | P value |
|-----------------------------------------------|-------------|-----------------|-------------|---------|
| Patients with lymph node metastasis           | 51 (40.8%)  | 33 (44.0%)      | 18 (36.0%)  | 0.46**  |
| Age, median (range) [years]                   | 60 (29-89)  | 60 (29-89)      | 57 (34-82)  | 0.84*   |
| Histological types by biopsy                  |             |                 |             | 0.36**  |
| Low-grade endometrial cancer                  | 71 (56.8%)  | 40 (53.3%)      | 31 (62.0%)  |         |
| High-grade endometrial cancer                 | 54 (43.2%)  | 35 (46.7%)      | 19 (38.0%)  |         |
| MRI findings                                  |             |                 |             |         |
| Myometrial invasion                           |             |                 |             | 0.37**  |
| <50%                                          | 61 (48.8%)  | 34 (45.3%)      | 27 (54.0%)  |         |
| ≥50%                                          | 64 (51.2%)  | 41 (54.7%)      | 23 (46.0%)  |         |
| Enlarged lymph nodes                          |             |                 |             | 1.00**  |
| Negative                                      | 100 (80.0%) | 60 (80.0%)      | 40 (80.0%)  |         |
| Positive                                      | 25 (20.0%)  | 15 (20.0%)      | 10 (20.0%)  |         |
| Tumor diameter, median (range) [mm]           | 50 (6-184)  | 50 (15-120)     | 50 (6-184)  | 0.83*   |
| Serum CA125, median (range) [U/mL]            | 20 (4-1403) | 20 (4-1403)     | 23 (5-270)  | 0.77*   |

* Mann-Whitney's U test.  ** Chi-squared test.

MRI: Magnetic resonance imaging, CA125: Cancer antigen 125
Supplementary Table S4. Hazard ratios for progression-free survival and overall survival according to prognostic factors in 265 patients with endometrial cancer.

| Survival   | Cohorts | Variable                                      | (A) NCCH cohort (n=125) | (B) SUH cohort (n=129) | (A) NCCH cohort (n=125) | (B) SUH cohort (n=129) |
|------------|---------|-----------------------------------------------|-------------------------|------------------------|-------------------------|------------------------|
|            |         |                                               | Univariate              | Multivariate*          | Univariate              | Multivariate*          |
|            |         |                                               | HR (95% CI) P value     | HR (95% CI) P value    | HR (95% CI) P value     | HR (95% CI) P value    |
| Progression free | (A) NCCH cohort (n=125) | Presence of adjuvant therapy (presence / absence) | 4.05 (1.96-8.37) < 0.01 | 2.56* (1.11-5.88) 0.03 | Presence of adjuvant therapy (presence / absence) | 3.36 (0.94-12.0) 0.06 | 1.86* (0.48-7.35) 0.66 |
|            |         | Predicted LNM state (positive / negative)      | 3.91 (1.96-7.79) < 0.01 | 2.43* (1.10-5.36) 0.03 | Predicted LNM state (positive / negative)      | 7.74 (2.67-22.4) < 0.01 | 6.26* (2.01-19.5) < 0.01 |
| Overall    | (A) NCCH cohort (n=125) | Presence of adjuvant therapy (presence / absence) | 5.51 (2.06-14.7) < 0.01 | 3.92* (1.30-11.9) 0.02 | Presence of adjuvant therapy (presence / absence) | 1.45E+09 (-) 0.99 | 1.09E+9* (-) 0.99 |
|            |         | Predicted LNM state (positive / negative)      | 3.70 (1.59-8.60) < 0.01 | 1.90* (0.74-4.91) 0.18 | Predicted LNM state (positive / negative)      | 10.7 (1.95-58.8) < 0.01 | 5.84* (1.06-32.0) 0.04 |

*Adjusted by presence of adjuvant therapy and predicted LNM state.

HR: Hazard ratio. CI: Confidence interval, NCCH: National Cancer Center Hospital, LNM: Lymph node metastasis, SUH: Showa University Hospital.