

Supplementary Table 1 Therapy sequence and surgery quality characteristics by clinical stage

| | II (n = 17669) | III (n = 21258) | Total (n = 38927) | P value |
|--|-------------------|--------------------|----------------------|---------------------|
| Chemotherapy Sequence* | | | | <0.001 ¹ |
| No chemotherapy | 2629 (14.9%) | 1258 (5.9%) | 3887 (10.0%) | |
| Chemotherapy after surgery | 1659 (9.4%) | 1836 (8.6%) | 3495 (9.0%) | |
| Chemotherapy before surgery | 9095 (51.4%) | 11068 (52.0%) | 20163 (51.7%) | |
| Chemotherapy before and after surgery | 4286 (24.3%) | 7096 (33.4%) | 11382 (29.2%) | |
| Radiation Sequence* | | | | <0.001 ¹ |
| No radiation | 2960 (16.8%) | 1853 (8.7%) | 4813 (12.4%) | |
| Radiation therapy after surgery | 1309 (7.4%) | 1387 (6.5%) | 2696 (6.9%) | |
| Radiation therapy before surgery | 13400 (75.8%) | 18018 (84.7%) | 31418 (80.7%) | |
| Total Neoadjuvant Therapy (TNT) | 1616 (27.0%) | 2686 (27.2%) | 4302 (27.1%) | 0.697 ¹ |
| Surgery Type | | | | <0.001 ¹ |
| Local excision | 911 (5.2%) | 531 (2.5%) | 1442 (3.7%) | |
| TME with sphincter preservation | 11455 (64.8%) | 14282 (67.2%) | 25737 (66.1%) | |
| TME without sphincter preservation | 5303 (30.0%) | 6445 (30.3%) | 11748 (30.2%) | |
| Surgical Approach | | | | <0.001 ¹ |
| Laparoscopic | 4690 (26.5%) | 5694 (26.8%) | 10384 (26.7%) | |
| Laparoscopic converted to open | 787 (4.5%) | 973 (4.6%) | 1760 (4.5%) | |
| Open | 9286 (52.6%) | 10544 (49.6%) | 19830 (50.9%) | |
| Robotic assisted | 2699 (15.3%) | 3774 (17.8%) | 6473 (16.6%) | |
| Robotic converted to open | 207 (1.2%) | 273 (1.3%) | 480 (1.2%) | |
| Residual Tumor | | | | 0.132 ¹ |
| R0 | 16253 (93.3%) | 19501 (92.8%) | 35754 (93.0%) | |
| R1 | 611 (3.5%) | 801 (3.8%) | 1412 (3.7%) | |
| R2 | 560 (3.2%) | 722 (3.4%) | 1282 (3.3%) | |
| Number of Lymph Nodes Examined (mean ± SD) | 14.0 ± 9.41 | 15.7 ± 9.72 | 14.9 ± 9.62 | <0.001 ² |
| 12 or more lymph nodes examined | 11239 (63.9%) | 15195 (72.3%) | 26434 (68.4%) | <0.001 ¹ |

¹ Chi-Square.² Kruskal Wallis.

*Chemotherapy sequence unknown for 3919 patients; Radiation sequence unknown for 4869 patients; TNT unknown for 23074 patients; Residual tumor unknown for 308 patients; 12 or More LN Examined unknown for 308 patients.