# IMPACT OF FACILITY VOLUME ON OUTCOMES FOLLOWING OPERATIVE MANAGEMENT OF NON-METASTATIC RECTAL ADENOCARCINOMA: AN ANALYSIS OF THE NATIONAL CANCER DATABASE

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## Clinical Question

Does facility surgical volume affect short and long-term outcomes in patients with non-metastatic rectal cancer?

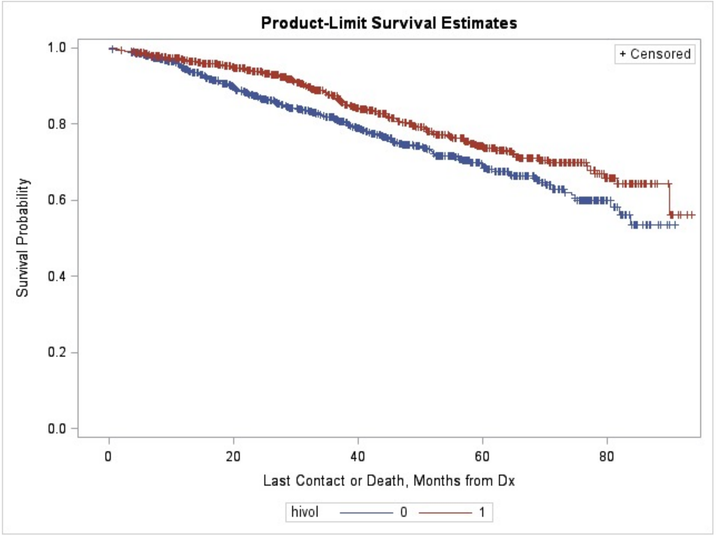
## Methods

- National Cancer Database Retrospective Cohort Study
- Patients diagnosed with non-metastatic adenocarcinoma of the rectum or rectosigmoid junction who underwent surgical resection between 2010-2016
- Cohorts separated into low facility volume (<5 cases/year) and high facility volume (>10 cases/year).
- Propensity-score matching (PSM) was then utilized to balance potential confounding covariates between cohorts
- Kaplan-Meier estimation and Cox-Proportional Hazards regression were used to analyze survival. Other outcomes analyzed by way of logistic regression or Mann-Whitney U test.

## Results

- Low and high volume inclusion criteria identified 3805 and 3986 patients, respectively, before matching.
- Patients treated at high volume centers tended to be younger, have a lower Charlson morbidity index score, have more private insurance, higher incomes, and received treatment at academic medical centers (respective p<0.05).
- Patients at high volume centers presented at higher clinical stage, received more chemotherapy and radiation, and were more likely to undergo a minimally-invasive surgical approach than patients at low volume centers (respective p<0.05).
- PSM resulted in 983 patients in each cohort with adequate confounding covariate balance (all respective p>0.15).
- No difference was detected in regional nodes positive ≥4, negative circumferential margins, unplanned readmission, 30- or 90-day mortality, or days from surgery to adjuvant chemotherapy.
- High volume centers were significantly associated with increased odds of ≥12 regional nodes examined (odds ratio=1.92; p<0.001) and decreased odds of positive margins (odds ratio=0.61; p=0.013)
- Despite no difference in 30- or 90-day mortality, high volume was significantly associated with decreased mortality hazard for overall survival (hazard ratio=0.72; p=0.002).

| Outcome | High Volume Facility (n=983) | Low Volume Facility (n=983) | p-value |
|---|---|---|---|
| Conversion to Open | 48 (4.9%) | 58 (5.9%) | **<0.001** |
| 12+ Regional Nodes Examined | 736 (74.9%) | 690 (70.2%) | **<0.001** |
| Positive Margins | 48 (4.9%) | 57 (5.8%) | **0.0186** |
| Unplanned Readmission | 65 (6.7%) | 61 (6.2%) | 0.192 |
| 30-day mortality | 12 (1.2%) | 10 (1.0%) | 0.354 |
| 90-day mortality | 21 (2.2%) | 19 (1.9%) | 0.104 |
| Days to start Adjuvant Chemo Median (range) | 48.0 (0,651) | 49.0 (0,405) | 0.006 |
| %5-Year Overall Survival | 73.5% (70.4% - 74.4%) | 1.3% (68.8% - 71.9%) | **<0.001** |




## Conclusions

1. Significant differences in demographics and clinicopathologic variables exist between specialized centers with high surgical volume and those with lower surgical volume.
2. When matched for demographics and stage, patients who underwent surgery at high volume centers had improved chances of adequate lymphadenectomy, margin-negative resection, and long-term survival.
3. These findings have implications for patient referral and centralization of the care of patients with rectal cancer.