

U.S. Department of Veterans Affairs erans Health Administration ffice of Research and Developmer

<u>MP66-10</u> HOSPITAL-LEVEL QUALITY INDICATORS FOR KIDNEY CANCER SURGERY: **Cleveland Clinic A VETERAN'S AFFAIR NATIONAL HEALTH SYSTEM VALIDATION OF CONCEPT**

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INTRODUCTION

- Validation and implementation of quality indicators (QIs) for oncological surgical care is imperative in national health care systems.
- QIs must be adjusted for significant case-mix variations among hospitals and to capture disparate patient outcomes.
- In this study we explore and validate a compound quality score (CQS) as a metric for hospital-level quality of care in kidney cancer patients.

METHODS

- 8233 kidney cancer patients treated at the VA from 2005 to 2015 were identified.
- Two validated process QIs¹ were explored: the proportion of patients with
- T1a tumors undergoing partial a) nephrectomy; and
- b) T1-T2 tumors undergoing minimally invasive radical nephrectomy.
- Demographics, comorbidities, tumor characteristics and treatment year were used for adjustment indirect case-mix using multivariable standardization regression models.
- The predicted versus observed ratio of cases was calculated to generate each QI score.
- The compound quality score (CQS) represents the sum of both QIs scores.
- 96 hospitals were benchmarked by CQS and patient-level outcomes were regressed on CQS levels to assess for length of stay (LOS), 30 days complications/readmission, 90 days overall mortality and total cost of surgical admission.

Table 1. Study cohort for development of quality indicators

| | | Quali | ty Indicator | | |
|---|---------|--------------------------------|-----------------------|---------------|--|
| | | MIS | PN | PN | |
| Total cases | | 3934 | 4299 | 4299 | |
| Age, median (IQR) | | 62 (57-68) | 61 (55-6 | 6) | |
| Male, n (%) | | 3830 (97%) | 4160 (97 | %) | |
| CCI, n (%) | | | | | |
| 0 | | 1088 (28%) | 1170 (27 | 1170 (27%) | |
| | | 800 (20%) | 902 (21) | 902 (21%) | |
| ≥ 2 | | 2046 (52%) | 2227 (52 | %) | |
| T stage, n (%) | | 2050 (700/) | 4200 (10) | 207.) | |
| T2 | | <u>3039 (78%)</u> 875 (22%) | $\frac{100\%}{100\%}$ | | |
| $\frac{12}{N \text{ stage } n(\%)}$ | | 075 (2270) | 0 (0 %) | , | |
| Nx | | 1036 (26%) | 1237 (29 | 1237 (29%) | |
| NO | | 2836 (72%) | | 3018 (70%) | |
| N1 | | 62 (2%) | 44 (1% | 44 (1%) | |
| M0 stage, n (%) | | 3934 (100%) | 4299 (100 | 4299 (100%) | |
| Tumor Histoloav. n (%) | | | | | |
| Clear cell carcinoma | | 3225 (82%) | 3456 (80 | 3456 (80%) | |
| Papillary carcinoma | | 548 (14%) | 715 (179 | 715 (17%) | |
| Chromophobe carcinoma | | 122 (3%) | 108 (3%) | | |
| Other | | 39 (1%) | 20 (0%) | | |
| Tumor Size, median (IQR) | | 5 (3.5-6.9) | 2.8 (2.1-3 | 2.8 (2.1-3.5) | |
| Tumor Grade, n (%) | | | | | |
| I-II | | 2013 (51%) | 2528 (59%) | | |
| | | 982 (25%) | 757 (18%) | | |
| | | 939 (24%) | | | |
| Year of diagnosis, median (IQR) | | 009 (2007-2012 | 2010 (2008-2013) | | |
| Number of cases per beenited median (IOD) | | 104 | | | |
| MIS = T1-T2 tumors undergoing minimally invasive (laparoscopic / robotic) radical nephrectomy. PN = T1a tumors undergoing partial nephrectomy. Abbreviations: CCI: Charlson comorbidity index; IQR: interquartile range; N/A: not applicable. Table 2. Case-mix adjusted associations between hospital-quality measured by CQS and patient-level outcome | | | | | |
| Patient – level Outcomes | Mode | β/OR/HR* | 95% CI | р | |
| Length of Stay | Linear | -0.04 | -0.050.03 | <0.01 | |
| 30 Days Complications | Logisti | c 0.91 | 0.87 - 0.96 | <0.01 | |
| Medical | | 0.93 | 0.88 - 0.98 | <0.01 | |
| Surgical | | 0.88 | 0.83 - 0.95 | <0.01 | |
| Total Cost of Surgical Admission | Linear | -0.014 | -0.007 - 0.02 | < 0.01 | |
| 30 Days Readmission | Logisti | c 1.02 | 0.95 - 1.11 | 0.57 | |
| 90 Days Overall Mortality | Logisti | c 0.85 | 0.67 - 1.08 | 0.187 | |
| *Values reflect change per 1 unit in Compound Quality Score. Abbreviations: β: beta coefficient; CI: confidence interval; HR: hazard ratio; OR: odds ratio. | | | | | |

RESULTS

Highlights

✤ CQS identified 25, 33 and 38 hospitals with higher, lower and average performance, respectively. Total CQS score was independently associated with length of stay [predicted LOS 0.84 days shorter for CQS = 2 vs. CQS = -2], 30 days surgical complications [OR = 0.88, p < 0.01] or 30 days medical complications [OR = 0.93, p < 0.01] and total cost of surgical admission [predicted 12% lower cost for CQS = 2 vs. CQS = -2]

Figure 1. Hospital's benchmarking per CQS





