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Brief Correspondence

Does Urologist-level Utilization of Active Surveillance for Low-risk Prostate Cancer Correspond with Utilization of Active Surveillance for Small Renal Masses?

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Abstract

Active surveillance (AS) for prostate cancer (CaP) or small renal masses (SRMs) helps in limiting the overtreatment of indolent malignancies. Implementation of AS for these conditions varies substantially across individual urologists. We examined the Michigan Urological Surgery Improvement Collaborative (MUSIC) registry to assess for correlation of AS between patients with low-risk CaP and patients with SRM managed by individual urologists. We identified 27 urologists who treated at least ten patients with National Comprehensive Cancer Network low-risk CaP and ten patients with SRMs between 2017 and 2021. For surgeons in the lowest quartile of AS use for low-risk CaP (<74%), 21% of their patients with SRMs were managed with AS, in comparison to 74% of patients of surgeons in the highest quartile (>90%). There was a modest positive correlation between the surgeon-level risk-adjusted proportions of patients managed with AS for low-risk CaP and for SRMs (Pearson correlation coefficient 0.48). A surgeon's tendency to use AS to manage one low-risk malignancy corresponds to their use of AS for a second low-risk condition. By identifying and correcting structural issues associated with underutilization of AS, interventions aimed at increasing AS use may have effects that influence clinical tendencies across a variety of urologic conditions.

Patient summary: The use of active surveillance (AS) for patients with low-risk prostate cancer or small kidney masses varies greatly among individual urologists. Urologists who use AS for low-risk prostate cancer were more likely to use AS for patients with small kidney masses, but there is room to improve the use of AS for both of these conditions.

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A deserved criticism of prostate cancer (CaP) screening in the USA is the overtreatment of men with indolent CaP. Active surveillance (AS), an observational strategy that aims to avoid or delay treatment of indolent CaP, has emerged as a happy medium in the CaP management armamentarium [1,2]. By dissociating a diagnosis of CaP from reflexive commitment of the patient to treatment, AS has reduced the morbidity from overtreatment of low-risk disease while preserving the ability to cure men and prevent death from CaP in those who will benefit from radical treatment.

The diagnosis of small renal masses (SRMs; ≤ 3 cm) suspicious for renal cell carcinoma (RCC) has increased with the widespread use of abdominal imaging [3,4]. Although more patients have been diagnosed with and treating for RCC, death rates from RCC have remained stable [5,6]. The parallels between overtreatment of clinically insignificant CaP and incidentally detected SRMs cannot be ignored.

The Michigan Urological Surgery Improvement Collaborative (MUSIC) is a physician-led quality improvement consortium of urologists throughout Michigan. An early priority of MUSIC was to encourage the use of AS for appropriate men with CaP [7]. In 2017, MUSIC started the KIDNEY program, aimed at improving the quality of care for patients with renal masses and assessing treatment appropriateness, including the use of AS [8]. MUSIC is a unique registry, as it includes treatment patterns among surgeons who manage

both patients with CaP and patients with SRMs. It remains unknown whether a surgeon's choice to place patients on AS is part of their general clinical practice trend, or if a surgeon's decision to use AS for one condition is independent of their treatment choices made for patients with other conditions.

We retrospectively reviewed the MUSIC prospectively maintained prostate and KIDNEY registries to identify surgeons who managed at least ten patients with SRMs (≤ 3 cm) and ten patients with National Comprehensive Cancer Network low-risk CaP from 2017 to 2021. The objective was to assess for an association between AS for CaP and AS for SRMs among MUSIC surgeons. We compared the risk-adjusted proportions of patients with SRMs managed with AS between surgeons in the lowest and highest quartile for use of AS for men with low-risk CaP. We also conducted the inverse analysis, comparing the risk-adjusted AS rate for CaP patients between quartiles of AS use for SRMs. Correlation between surgeon-level risk-adjusted use of AS for patients with low-risk CaP and use of AS for SRMs was assessed graphically and via Pearson's correlation coefficient. Lastly, we fitted two mixed-effects multivariable logistic regression models to assess the independent association of surgeon use of AS for one malignancy with the rate of AS use for the other condition, adjusting for patient and surgeon factors, with surgeon random effects to account

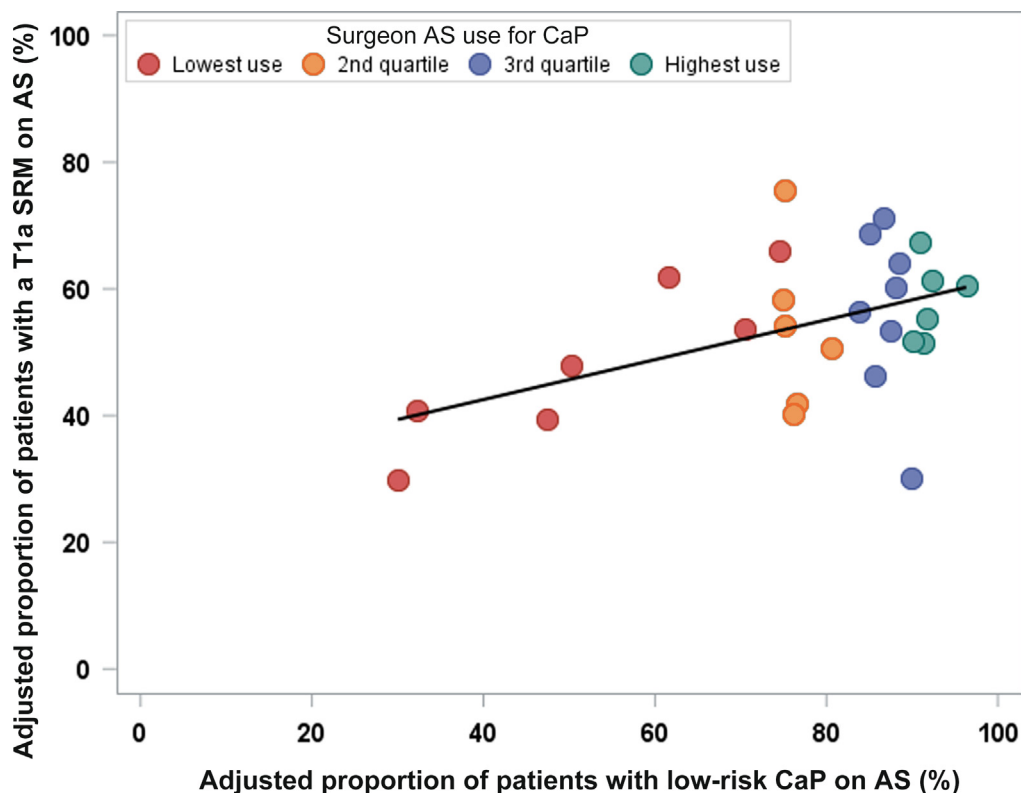


Fig. 1 – Risk-adjusted proportion of a surgeon's patients with low-risk prostate cancer (CaP) and patients with small renal masses (SRMs) managed with active surveillance (AS). A fit line is shown. Multivariable mixed-effects logistic regression models were used to estimate the adjusted proportion of a surgeon's patients managed with AS. The model for CaP included fixed effects for age, Charlson comorbidity index, race, family history of CaP, log of prostate-specific antigen, clinical T stage, number of cores positive for cancer, and maximum percentage of an individual core length positive for cancer. The model for SRM included fixed effects for age, Charlson comorbidity index, sex, baseline glomerular filtration rate, race, tumor type, and clinical tumor size. Both models included a random intercept for surgeons to account for intrasurgeon correlation of treatment decisions.

Table 1 – Mixed-effects multivariable models of patient and surgeon factors associated with selection of AS for patients with NCCN low-risk CaP or with SRMs

Variable	OR (95% CI) ^a	p value
Use of AS for low-risk CaP		
Surgeon's rate of AS use for SRMs (per 5% increment)	1.17 (1.02–1.35)	0.023
Surgeon's annual CaP case volume (per patient increment)	1.10 (1.01–1.20)	0.031
Surgeon age (per 5-yr increment)	0.87 (0.69–1.10)	0.3
Fellowship training (yes vs no)	0.83 (0.33–2.08)	0.7
Practice type		0.7
Academic	Reference	
Community	1.62 (0.36–7.34)	
Hybrid	1.57 (0.49–5.01)	
Patient race		0.6
African American	Reference	
White	1.58 (0.27–9.28)	
Other	1.47 (0.64–3.38)	
Charlson comorbidity index	0.9	
0	Reference	
1	0.92 (0.42–2.04)	
≥2	1.18 (0.56–2.51)	
Family history of CaP (yes vs no)	1.01 (0.59–1.71)	0.9
cT stage (T1 vs T2a)	1.22 (0.44–3.41)	0.7
Patient age (per 5-yr increment)	1.03 (0.86–1.24)	0.7
Prostate-specific antigen (log value)	1.22 (0.67–2.25)	0.5
Number of positive cores (per increment in number)	0.79 (0.69–0.90)	<0.001
Greatest percentage involvement of an individual core (per 5% increment)	0.94 (0.89–1.00)	0.039
Use of AS for SRMs		
Surgeon's rate of AS use for CaP (per 5% increment)	1.09 (1.00–1.20)	0.057
Surgeon's annual SRM case volume (per patient increment)	1.00 (0.98–1.02)	0.9
Surgeon age (per 5-yr increment)	0.91 (0.76–1.09)	0.3
Fellowship training (yes vs no)	0.77 (0.43–1.37)	0.4
Practice type		0.3
Academic	Reference	
Community	1.15 (0.36–3.70)	
Hybrid	0.63 (0.31–1.30)	
Patient race		0.015
African American	Reference	
White	1.10 (0.40–3.04)	
Other	0.54 (0.34–0.85)	
Charlson comorbidity index	0.040	
0	Reference	
1	1.35 (0.91–2.01)	
≥2	1.59 (1.10–2.28)	
Patient sex (female vs male)	1.14 (0.84–1.54)	0.4
Glomerular filtration rate at diagnosis (≤60 vs >60 ml/min)	1.00 (0.69–1.44)	0.9
Tumor type		<0.001
Solid	Reference	
Complex cyst	3.70 (2.05–6.68)	
Indeterminate	2.37 (1.51–3.73)	
Patient age (per 5-yr increment)	1.33 (1.24–1.42)	<0.001
Tumor size (per 1-cm increment)	0.36 (0.28–0.47)	<0.001
AS = active surveillance; CaP = prostate cancer; CI = confidence interval; NCCN = National Comprehensive Cancer Network; OR = odds ratio; SRM = small renal mass.		
^a OR >1 is associated with greater use of AS.		

for intrasurgeon correlation of treatment decisions. The [Supplementary material](#) provides additional details.

A total of 27 urologists managing 825 men with low-risk CaP and 1155 patients with SRMs met the inclusion criteria ([Supplementary Table 1](#)). Some 81% of men with low-risk CaP and 54% of patients with SRMs were managed with AS, which are similar to the AS rates for low-risk CaP (87%) and SRMs (56%) in MUSIC over the same timeframe. Characteristics of the 27 surgeons are shown in [Supplementary Table 2](#).

Among the surgeons in the lowest quartile of AS use for low-risk CaP (<74%), 21% of their patients with SRMs were managed with AS, in comparison to 74% among surgeons in the highest quartile (>90%). Among the surgeons in the lowest quartile of AS use for SRMs (<44%), 45% of their patients with low-risk CaP were managed with AS, in

comparison to 92% among surgeons in the highest quartile (>71%). There was a modest correlation between the risk-adjusted proportion of a surgeon's AS use for their patients with low-risk CaP and for their patients with SRMs ([Fig. 1](#); correlation coefficient 0.48). A surgeon's use of AS for SRM (adjusted odds ratio [aOR] 1.17, 95% confidence interval [CI] 1.02–1.35; $p = 0.023$) was associated with greater odds of AS use for patients with low-risk CaP, while the association of a surgeon's use of AS for low-risk CaP with the use of AS for patients with SRMs was positive but did not meet our predefined level of statistical significance (aOR 1.09, 95% CI 1.00–1.20; $p = 0.057$) after adjusting for patient and surgeon factors ([Table 1](#)).

Urologic oncology has an overtreatment problem. A rightful criticism of the management of both low-risk CaP and SRMs is the overtreatment of indolent disease. Our

results demonstrate that surgeons have clinical tendencies that span urologic conditions. Surgeons who tended to use AS for low-risk CaP also tended to use more AS for SRMs. The inverse is also true; urologists who were more aggressive and treated low-risk CaP were also more likely to definitively treat SRMs. While the motivation for AS for these two conditions may differ, the criticism regarding their overtreatment and underutilization of AS is justifiably deserved.

In 2014, MUSIC conducted a Delphi process to investigate the opinion of individual urologist regarding appropriate use of AS in CaP, and subsequently released a roadmap for the management of men with favorable-risk CaP. Since the dissemination of this roadmap, the use of AS for men with low-risk CaP has steadily increased within MUSIC practices, reaching some of the highest levels reported in the USA [9]. In 2020, the MUSIC-KIDNEY program conducted a similar Delphi process to develop a consensus regarding appropriate use of AS for patients with SRMs, which was summarized in a roadmap for the management of patients with T1 renal masses. The goals of these quality improvement initiatives are to improve shared-decision making and facilitate a balanced discussion regarding the risks and benefits of a variety of management options.

To the best of our knowledge, this is the first report to describe surgical phenotypes and show that a surgeon's clinical tendency for treatment of one low-risk malignancy correspond to their tendency for a second low-risk condition. These data can inform quality improvement efforts aimed at reducing overtreatment of low-risk urologic malignancies. By identifying and correcting structural issues associated with underutilization of AS, interventions may have effects that influence clinical tendencies across a variety of urologic conditions.

Author contributions: Michael Wang had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Wang, Wittenberg, Lane, Ginsburg.

Acquisition of data: Van Til.

Analysis and interpretation of data: Wang, Wittenberg, Van Til, Lane, Ginsburg.

Drafting of the manuscript: Wang, Wittenberg, Ginsburg.

Critical revision of the manuscript for important intellectual content: Cher, Ferrante, Mirza, Johnson, Semerjian, George, Rogers, Wilder, Sarle, Ghani, Lane.

Statistical analysis: Wang, Wittenberg, Van Til, Lane, Ginsburg.

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Administrative, technical, or material support: Van Til.

Supervision: Cher, Lane, Ginsburg.

Other: None.

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References

- [1] Klotz L, Vesprini D, Sethukavalan P, et al. Long-term follow-up of a large active surveillance cohort of patients with prostate cancer. *J Clin Oncol* 2015;33:272–7. <https://doi.org/10.1200/JCO.2014.55.1192>.
- [2] Tosoian JJ, Mamawala M, Epstein JI, et al. Intermediate and longer-term outcomes from a prospective active-surveillance program for favorable-risk prostate cancer. *J Clin Oncol* 2015;33:3379–85. <https://doi.org/10.1200/JCO.2015.62.5764>.
- [3] Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. *CA Cancer J Clin* 2022;72:7–33. <https://doi.org/10.3322/caac.21708>.
- [4] Capitanio U, Bensalah K, Bex A, et al. Epidemiology of renal cell carcinoma. *Eur Urol* 2019;75:74–84. <https://doi.org/10.1016/j.eururo.2018.08.036>.
- [5] Kutikov A, Egleston BL, Wong YN, Uzzo RG. Evaluating overall survival and competing risks of death in patients with localized renal cell carcinoma using a comprehensive nomogram. *J Clin Oncol* 2010;28:311–7. <https://doi.org/10.1200/JCO.2009.22.4816>.
- [6] Chawla SN, Crispen PL, Hanlon AL, Greenberg RE, Chen DYT, Uzzo RG. The natural history of observed enhancing renal masses: meta-analysis and review of the world literature. *J Urol* 2006;175:425–31. [https://doi.org/10.1016/S0022-5347\(05\)00148-5](https://doi.org/10.1016/S0022-5347(05)00148-5).
- [7] Ginsburg K, Cher M, Montie J. Defining quality metrics for active surveillance: the Michigan Urological Surgery Improvement Collaborative experience. *J Urol* 2020;204:1119–21. <https://doi.org/10.1097/JU.0000000000001308>.
- [8] Patel AK, Rogers CG, Johnson A, et al. Initial observation of a large proportion of patients presenting with clinical stage T1 renal masses: results from the MUSIC-KIDNEY statewide collaborative. *Eur Urol Open Sci* 2021;23:13–9. <https://doi.org/10.1016/j.euros.2020.11.002>.
- [9] Vince RA, Sun Y, Mahal B, et al. The impact of a statewide active surveillance initiative: a roadmap for increasing active surveillance utilization nationwide. *Eur Urol* 2023;83:307–10. <https://doi.org/10.1016/j.eururo.2022.05.028>.