

Association between Rectal Spacer Use and Long-Term Health Care Costs: Payer Perspective

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Disclosure

- James B. Yu, MD, is a radiation oncologist at Dartmouth Hitchcock Medical Center; Michael R. Folkert, MD, PhD, is employed by the University of Washington as the Program Chief of the Brachytherapy Program and Physician Lead of the Radioisotope Program, and is a Professor in the Fred Hutchinson Cancer Center Division of Radiation Oncology; and Daniel A. Hamstra, MD, PhD, is a radiation oncologist at Baylor College of Medicine. None of these academic authors were compensated for participating in this study.
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Purpose

- **Rectal spacers (RS) reduce radiation dose to the rectum and have been associated with lower rates of toxicity in men undergoing radiotherapy (RT) for prostate cancer. While RS introduce additional upfront costs, they may lead to long-term cost savings by reducing treatment-related complications and healthcare utilization.**
 - Previous economic evaluations have largely relied on simulated models and focused only on projected toxicity-related costs. Real-world data on the broader impact of RS on healthcare costs remain limited.
- **This study used U.S. claims data to evaluate long-term insurer-paid healthcare costs among prostate cancer patients treated with RT with and without polyethylene glycol (PEG) hydrogel RS.**

Methods

- **Design:** Retrospective cohort study.
- **Datasets:** Medicare 5% and 100% Standard Analytical Files, Merative™ MarketScan® Commercial Database.
- **Patients:** Treated with IMRT, SBRT, proton beam radiotherapy (RT), brachytherapy, or any combination of these, for prostate cancer between 2015-2020.
- **Inclusion/Exclusion Criteria:** Continuous enrollment was required (1 year pre-RT to 4 years post-RT); patients who underwent prostatectomy prior to receiving RT were excluded.
- **Statistical Analyses:** GLM with gamma distribution/log-link and Poisson regression, adjusting for demographics, comorbidities, RT modality, baseline dysfunction, and other covariates; propensity score matching and robustness analyses were conducted.
- **Outcomes:** Cumulative costs of care paid by insurer, 1 year prior to RT, during RT (including spacer), and up to 4 years post RT.

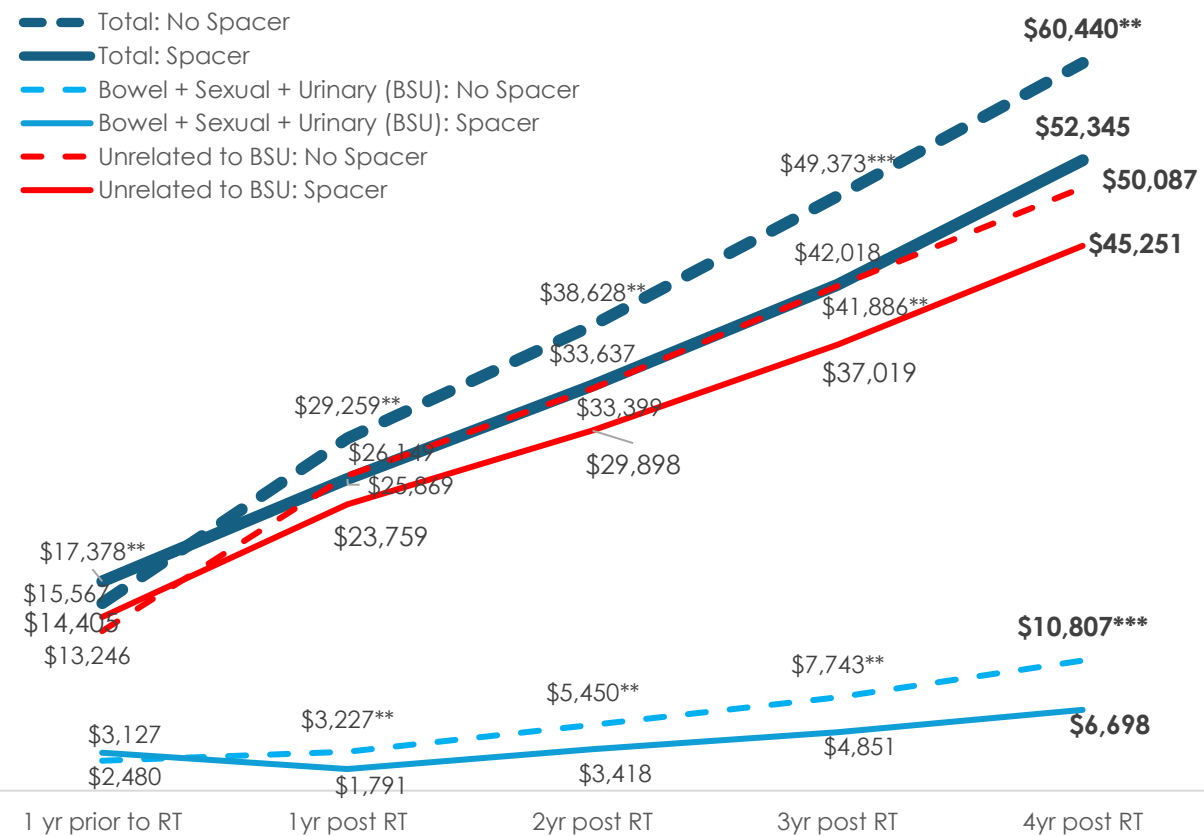
Patient Characteristics

Variables	No Rectal Spacer (n=5,559)		Rectal Spacer (n=270)		p-value
	Mean	SD	Mean	SD	
Age at RT	68.2	8.3	69.3	7.6	0.038
CCI at RT	2.6	1.4	2.4	1.1	0.033
	#	%	#	%	
Data source					
Medicare	4,355	78.3	224	83.0	0.071
MarketScan	1,204	21.7	46	17.0	
RT modality					
IMRT	3,195	57.5	102	37.8	<0.001
SBRT	474	8.5	56	20.7	
Proton	295	5.3	75	27.8	
Brachy	1,093	19.7	16	5.9	
Combo	502	9.0	21	7.8	
Region					
Midwest	1,262	22.9	34	12.8	0.001
Northeast	1,074	19.5	52	19.6	
South	2,302	41.8	131	49.3	
West	871	15.8	49	18.4	
Secondary cancer	527	9.5	21	7.8	0.35
Baseline bowel diagnosis (1 year)	278	5.0	15	5.6	0.68
Baseline sexual diagnosis (1 year)	746	13.4	32	11.9	0.46
Baseline urinary diagnosis (1 year)	2,318	41.7	94	34.8	0.025
Race (only in Medicare 5%)					
White	3,540	81.3	186	83.0	0.082
Black	550	12.6	19	8.5	
Other	265	6.1	19	8.5	

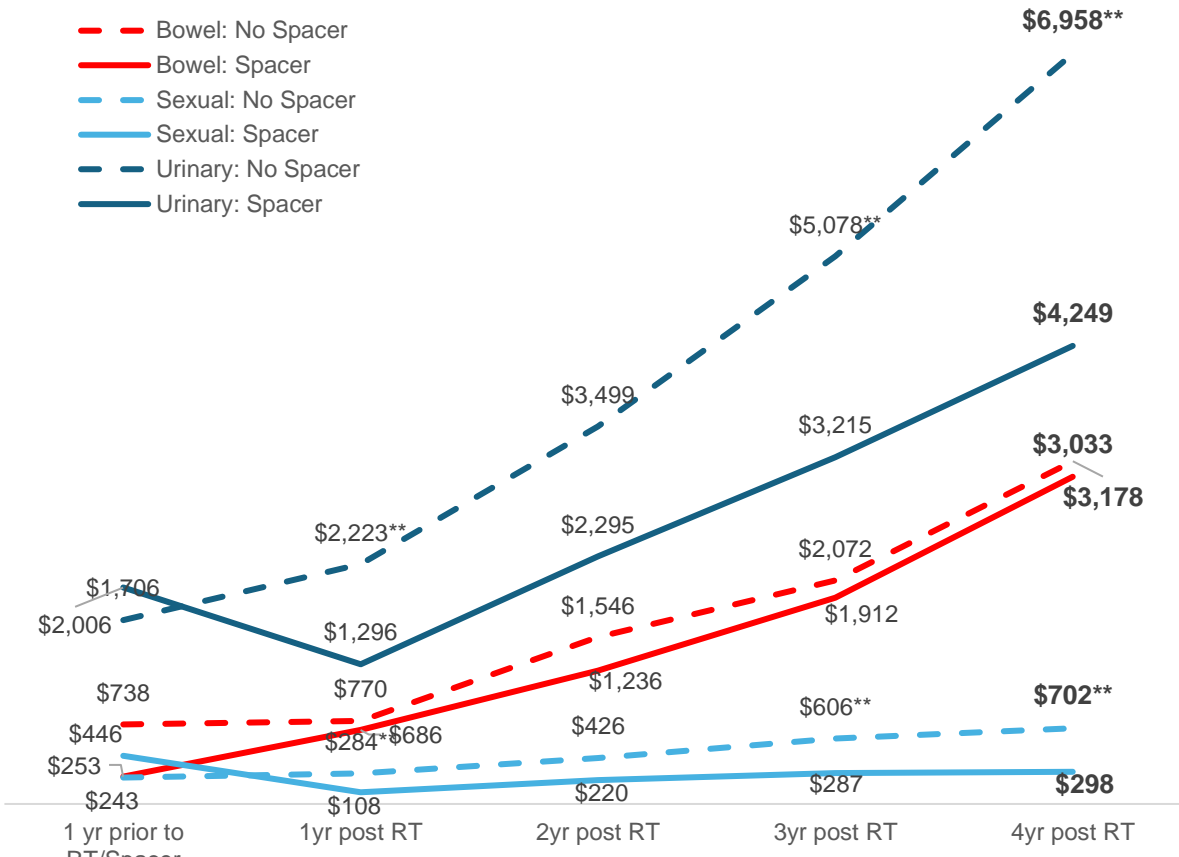
CCI, Charlson Comorbidity Index; IMRT, intensity modulated radiation therapy; RT, radiation therapy; SBRT, stereotactic body radiation therapy; Combo, combination of multiple RT modalities; significant p-values are bolded

Results: Total costs, costs related to bowel/sexual/urinary dysfunction, and other unrelated costs

Total Costs: Related and Unrelated to Bowel/Sexual/Urinary Dysfunction



Costs related to Bowel, Sexual, and Urinary Dysfunction



- Spacer use associated with significantly lower total costs of care by 4 yrs (cost difference \approx **\$8,000**), despite higher baseline costs (1yr prior to RT).
- Costs of RT + spacer also higher among spacer patients by **\$3,949**
- Costs related to RT side effects (bowel, sexual, urinary; BSU) also lower by **\$4,000**

- Sexual and urinary-related costs significantly lower by 4 yr among spacer patients
- Urinary-related costs highest among BSU (bowel, sexual, urinary)

Based on GLM with covariates; ** significant at 0.05, *** significant at 0.01

Conclusion

- RS use in PCa RT patients is associated with **significantly lower long-term overall costs**, despite higher initial healthcare cost.
- **Healthcare cost savings were robust** across payer types, larger in commercial insurance but also seen in Medicare.
- **Drivers of savings over 4-year post-RT period:** reduced urinary and sexual dysfunction, and lower overall healthcare utilization.
- Results from cost analysis in this study underscore the potential for RS to deliver economic value beyond toxicity mitigation.
- Future studies with more granular clinical data or randomized designs would be helpful to further examine the causal impact of RS use on long-term outcomes.

Appendix: Total Cost of Care by Spacer Status

	No Rectal Spacer (n=5,559)	Rectal Spacer(n=270)	Difference	p-value
All Costs of Care				
1 year prior to RT	\$15,567 (\$15097 to \$16037)	\$17,378 (\$15768 to \$18987)	+\$1,811	0.023
RT + RS	\$27,763 (\$27214 to \$28311)	\$31,712 (\$29646 to \$33779)	+\$3,949	<0.001
1 year post RT	\$29,259 (\$28559 to \$29959)	\$25,869 (\$22973 to \$28765)	-\$3,390	0.034
2 years post RT	\$38,628 (\$37649 to \$39607)	\$33,637 (\$29898 to \$37375)	-\$4,991	0.017
3 years post RT	\$49,373 (\$47971 to \$50776)	\$42,018 (\$37405 to \$46630)	-\$7,356	0.004
4 years post RT	\$60,440 (\$58694 to \$62186)	\$52,345 (\$46605 to \$58086)	-\$8,095	0.011
Bowel, Sexual, Urinary-related Costs				
1 year prior to RT	\$2,480 (\$2180 to \$2779)	\$3,127 (\$1893 to \$4362)	+\$647	0.25
1 year post RT	\$3,227 (\$2842 to \$3613)	\$1,791 (\$834 to \$2748)	-\$1,437	0.036
2 years post RT	\$5,450 (\$4825 to \$6075)	\$3,418 (\$1991 to \$4846)	-\$2,031	0.03
3 years post RT	\$7,743 (\$6962 to \$8523)	\$4,851 (\$2965 to \$6736)	-\$2,892	0.02
4 years post RT	\$10,807 (\$9372 to \$12242)	\$6,698 (\$4245 to \$9152)	-\$4,109	0.009
	(\$48551 to \$51624)	(\$40423 to \$50080)		

Values are mean and (95% confidence interval) from Generalized Linear Models (GLMs) controlling for covariates (age, Charlson Comorbidity Index, modality, secondary cancer, baseline bowel/sexual/urinary dysfunction, data source, year of radiation therapy, and state fixed effects). Costs for the 1-year period prior to RT exclude the cost of the spacer. All costs "post" RT include all costs after the initiation of RT, excluding the cost of RT itself, and are cumulative.