Current trends in de-escalation of post-operative radiation therapy in HPV-associated oropharyngeal cancer

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Background

- Oropharyngeal squamous carcinoma (OPSCC) incidence is rising, driven by HPV.[1]
- Standard adjuvant management historically ~70Gy radiation;[2] long-term toxicities motivate interest in dose de-escalation while maintaining oncologic control[3]
- Multiple trials (e.g., ECOG-ACRIN E3311, DART, MINT, PATHOS) have explored reduced-dose strategies; however, real-world adoption patterns and disparities remain understudied.

Objective: Assess national variability in post-operative radiation de-escalation among HPV+ OPSCC by risk group, geography, and facility type

Methods

Retrospective cohort using the National Cancer Database (NCDB). Eligible patients included adult patients with HPV+ OPSCC (2009–2020); exclusions included palliative intent, clinical trial. HPV cohort determined using NCDB-reported values (2009-2017) and a validated surrogate proxy model. Patients were stratified into **low** (LRC; pT1–T2N0–N1 with negative margins), **intermediate** (IRC; close margins, 2-4 metastatic lymph nodes, perineural invasion/lymphovascular invasion), and **high** (HRC; positive margins, extranodal extension, or ≥5 metastatic nodes) risk groups (adapted from ECOG-ACRIN E3311)[4]. Radiation therapy dose was categorized into four groups: (<60, 60–64, 65–69, ≥70 Gy); de-escalation defined as <65 Gy. Covariates included age, sex, race, income, education, insurance, Charlson-Deyo, travel distance, urbanicity, U.S. region, and facility type. To assess predictors of radiation de-escalation, ordinal logistic regression (ordered dose categories) and binary logistic regression (<65 Gy vs ≥65 Gy) were performed.

References

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Results

Table 1. Patient Demographics	
Variable (count, (%))	Patients (n = 29,995)
Risk stratification	
High	15 (0.2%)
Intermediate	141 (2.0%)
Low	7,058 (98%)
Urbanicity	
Metropolitan	23,668 (84%)
Urban	3,441 (12%)
Rural	1,219 (4.3%)
Facility type	
Academic	14,685 (50%)
Community	10,210 (35%)
Integrated	4,318 (15%)
Facility region	
Northeast	5,904 (20%)
Midwest	10,380 (36%)
South	7,585 (26%)
West	5,344 (18%)
Sex	
Female	4,345 (14%)
Male	25,650 (86%)
Median income ($)	
< 46,277	3,661 (14%)
46,277 - 57,856	5,781 (22%)
57,857 - 74,062	6,967 (27%)
74,063 +	9,768 (37%)
Education Level	
Lower	9,784 (37%)
Higher	16,408 (63%)
Travel distance	
>30 miles	7,251 (28%)
≤30 miles	18,959 (72%)

Table 2. Adjusted ordinal regression model

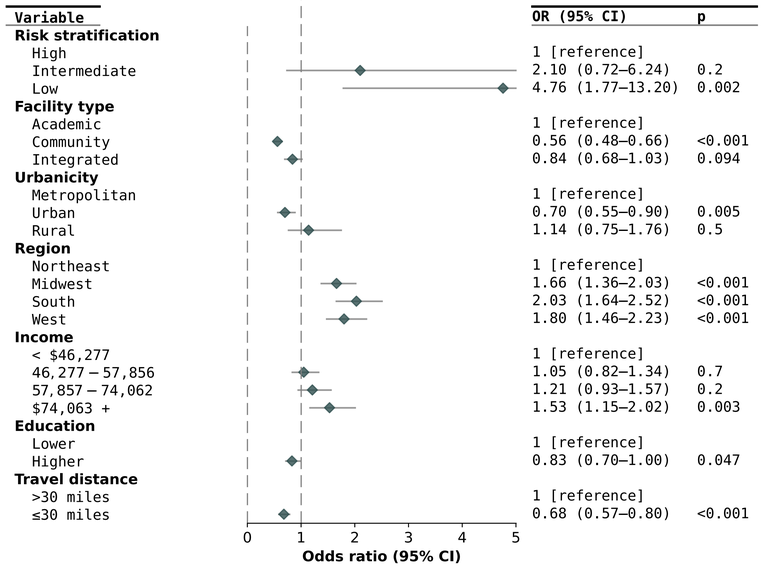
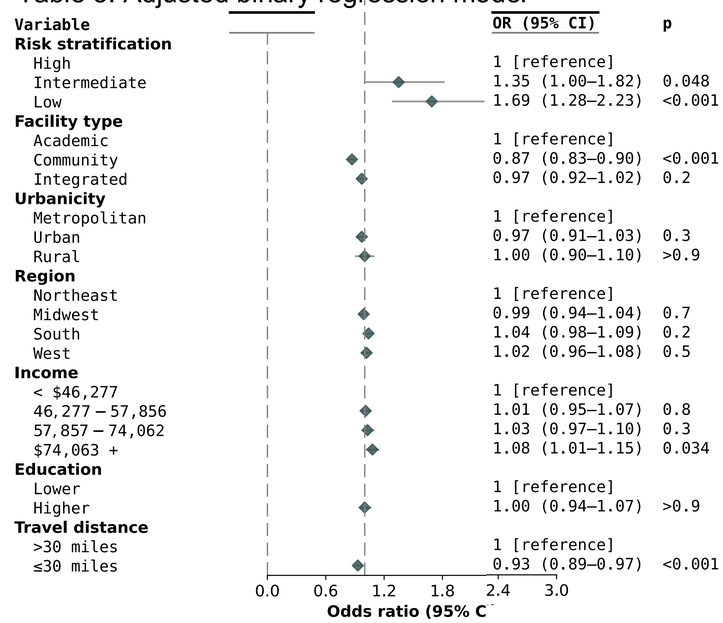


Table 3. Adjusted binary regression model



Discussion/Conclusion

- Academic centers are more likely to implement de-escalation, suggesting early adoption and aligns with research activity/multidisciplinary practice typical of academic institution.
- Risk-aligned de-escalation: LRC patients consistently show higher odds of reduced dose, concordant with risk-stratified strategies.
- Geographic and socioeconomic patterns indicate uneven uptake (higher odds outside the Northeast; increased odds with higher income) with potential implications for access and equity.
- Education finding: Higher educational attainment was associated with less de-escalation
- Travel distance: Longer travel correlates with greater likelihood of de-escalation, possibly reflecting referral patterns to academic centers.
- Limitations: Retrospective design, limited clinical granularity, HPV imputation for some years.
- This study highlights the importance of risk stratification when assessing postoperative therapeutic treatments across different practice settings.
- Further investigation is needed to understand the factors contributing to the observed disparities in the management of HPV-positive OPSCC patients.

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