

The Impact of Treatment Parameters on Racial Survival Differences in Oropharyngeal Cancer: A National Cancer Database Study

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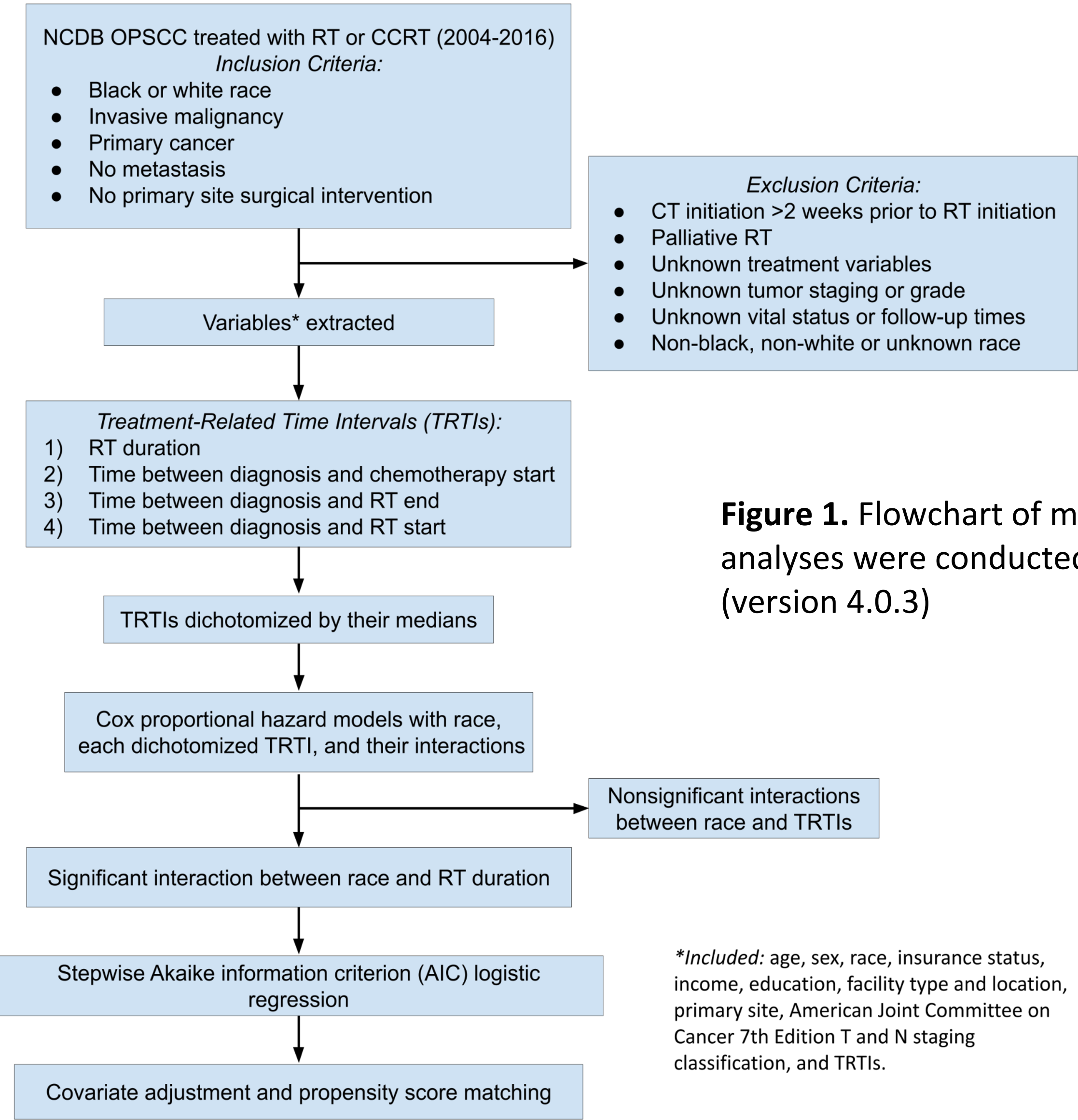
Introduction:

- Delays in diagnosis and treatment of head and neck cancers (HNCs) negatively affect prognosis; these delays are classified under treatment-related time intervals (TRTIs).¹
- Black HNC patients have worse survival compared to whites, are more likely to present with metastatic disease, and are less likely to receive definitive treatment.²
- The lower prevalence of Human Papillomavirus (HPV) in blacks is commonly cited as an explanation for the survival disparities in oropharyngeal squamous cell carcinoma patients (OPSCC).³
- HPV+ OPSCCs tend to have improved disease-free survival (DFS) and lower risk of relapse compared to HPV- OPSCCs.⁴
- Radiation therapy (RT) duration is significantly associated with poorer overall survival (OS) in HPV- but not HPV+ OPSCC patients.⁵
- No study has investigated if differences in treatment parameters account for survival differences between races when accounting for HPV status.

Hypothesis:

- TRTIs will differentially impact survival in blacks and whites with oropharyngeal squamous cell carcinoma when stratifying by HPV status.

Methods:



Cohort Characteristics:

- 3,152 patients (2,877 whites; 275 blacks)
- No difference in primary tumor sites between races.
- A higher proportion of blacks fell into the lowest median income quartile, did not have high school degrees, and were uninsured (p<0.001)
- Blacks had longer times between diagnosis and treatment (p<0.001).
- Patients treated at community cancer programs were more likely to have prolonged RT duration than those treated at academic/research programs (p<0.05).

Results:

- RT duration had a significant interaction with race in HPV- patients.
- For HPV- OPSCC, blacks had worse survival when RT duration was greater than 50 days (HR = 1.77, 95% CI: 1.03-3.05; p=0.039) (Table 1; Figure 1).
- After adjusting for facility type, multivariable Cox model with RT duration, race, and HPV- status, the interaction between race and RT duration was no longer significant (HR = 1.55, 95% CI: 0.90-2.69; p=0.116) (Table 2).

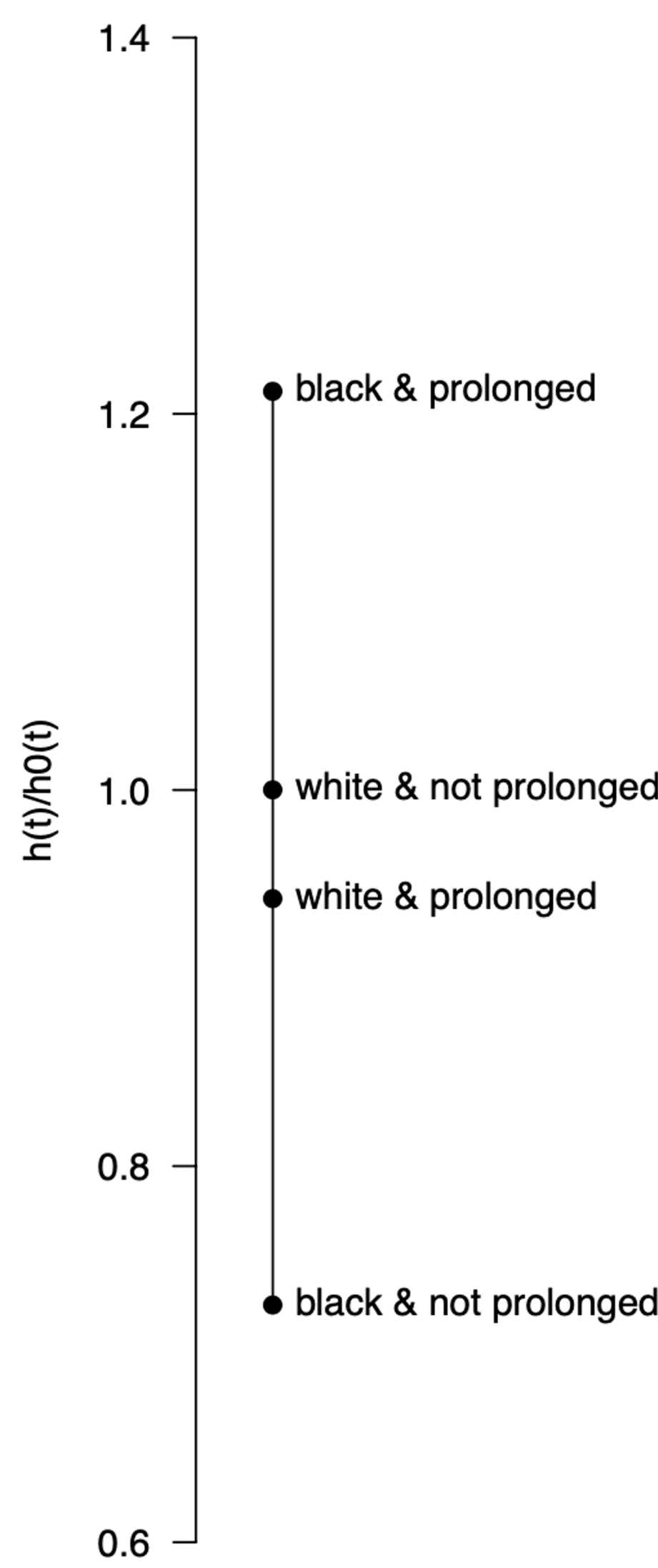


Figure 2. The HR of the interaction term can be calculated from the quantities depicted in the figure using $HR = (1.212/0.726) / (0.942/1) = 1.77$.

Table 2. Multivariable Cox model with RT duration, race, and interaction for HPV- OPSCC patients while adjusting for facility type.

Variable	Hazard Ratio (95% CI)	P-value
Race (black versus white)	0.836 (0.537-1.301)	0.428
RT duration (prolonged versus not prolonged)	0.924 (0.773-1.105)	0.388
Facility type		
Academic/Research versus Community	0.903 (0.758-1.075)	0.251
INCP versus Community	1.139 (0.879-1.476)	0.325
Race*RT duration	1.553 (0.897-2.689)	0.116

Abbreviations: RT, radiation therapy; HPV, human papillomavirus; OPSCC, oropharyngeal squamous cell carcinoma; INCP, Integrated Network Cancer Program

* p-values <0.05 were considered statistically significant

Conclusions:

- This study demonstrated a significant disparity in survival between blacks and whites with HPV- OPSCC when there is a prolongation of RT duration.
- When adjusting for facility type, this difference in survival is no longer significant, highlighting the importance of facility type in impacting outcomes of OPSCC patients.
- Efforts should be made to improve patient access to well-equipped, high volume facilities.
- TRTIs are not currently included in the guidelines for OPSCC treatment, but given our findings, it is crucial to consider their prognostic utility.

Future Work:

- The only endpoint for our study was OS, and future studies should investigate other indicators such as DFS, quality of life, and recurrence rates.
- Because of a smaller black cohort size, the characteristics described in this study may not represent the general black OPSCC population and future studies can be conducted with a larger population of black patients to see if the findings in this study still hold true.

References:

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Table 1. Multivariable Cox model with interactions between RT duration and race for HPV- OPSCC patients.

Variable	Hazard Ratio (95% CI)	P-value
Race (black versus white)	0.726 (0.471-1.120)	0.148
RT duration (prolonged versus not prolonged)	0.942 (0.790-1.124)	0.508
Race*RT duration	1.771 (1.029-3.048)	0.039*

Abbreviations: RT, radiation therapy; HPV, human papillomavirus; OPSCC, oropharyngeal squamous cell carcinoma

* p-values <0.05 were considered statistically significant