

Supplementary Online Content

Liao DZ, Schlecht NF, Rosenblatt G, et al. Association of delayed time to treatment initiation with overall survival and recurrence among patients with head and neck squamous cell carcinoma in an underserved urban population. *JAMA Otolaryngol Head Neck Surg*. Published online September 12, 2019. doi:10.1001/jamaoto.2019.2414

eFigure 1. Diagram of Cohort Creation With Exclusion Criteria

eFigure 2. Box and Whisker Plots of TTI for Different Treatment Modalities

eTable 1. Hazard Ratios for TTI>60 (vs TTI≤60) in Subgroup Analysis of Primary Site, Treatment Modality, and Final Stage

eTable 2. Full Multivariate Logistic Regression to Examine Significant Factors That Could Potentially Predict Delayed TTI Based on the Optimal Threshold of 60 Days

eTable 3. Patient Characteristics of Patients With TTI=0 That Were Excluded Due to Miscoding Compared to Remaining Cohort

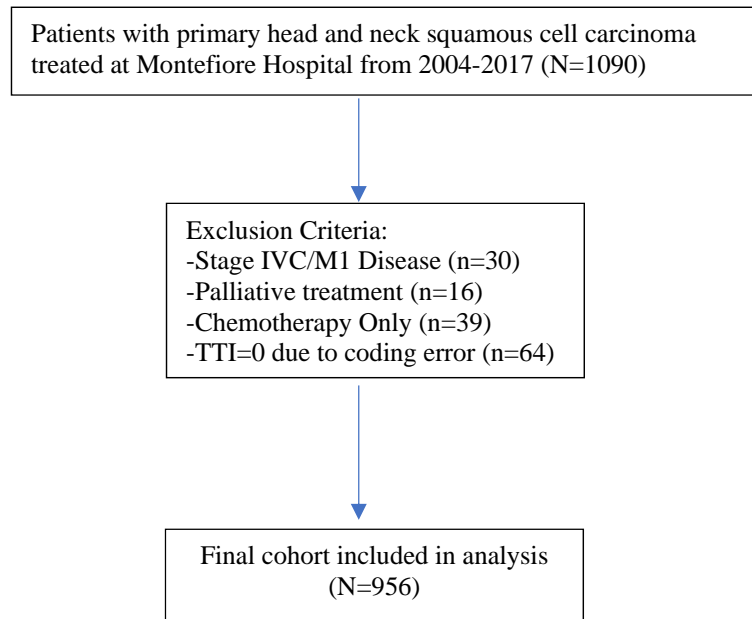
eTable 4. Sensitivity Analysis for Exclusion of TTI=0

eTable 5. Sensitivity Analysis for Exclusion of Patients With Follow-up ≤2 Months

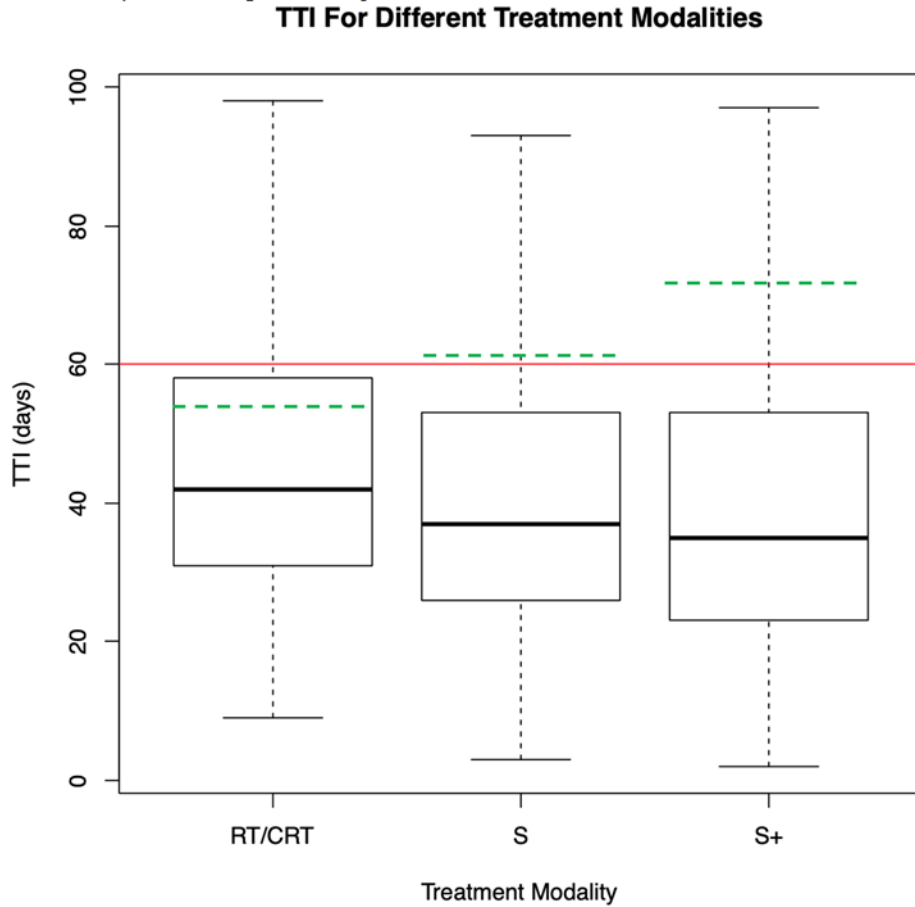
eTable 6. Full Multivariate Logistic Regression to Examine Significant Factors That Could Potentially Predict Delayed TTI Based on the Optimal Threshold of 60 Days

This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Diagram of cohort creation with exclusion criteria



eFigure 2. Box and whisker plots of TTI for different treatment modalities. RT/CRT=radiotherapy/chemoradiotherapy, S=Surgery Only, S+ = Surgery with Adjuvant Therapy. Box and whisker plots show Q1-1.5 * IQR, Q1, Median, Q3, Q3+1.5*IQR, and outliers are not included. Green dashed line are references lines for the specific TTI thresholds for specific groups (RT/CRT Threshold=56 days, S Threshold =62 days, S+ Threshold =71 days) calculated by RPA. Red line is a reference line for the overall threshold of 60 as calculated by recursive partitioning.



eTable 1. Patient characteristics of patients with TTI=0 that were excluded due to miscoding compared to remaining cohort.

	No. (%) with TTI=0 (n=60)		No. (%) with TTI>0 (n=956)		Total (n=1016)
Treatment Category					
CRT	1	(1.7%)	525	(54.9%)	526
S	31	(51.7%)	218	(22.8%)	249
S+	28	(46.7%)	213	(22.3%)	241
Treatment Completion					
No	1	(1.7%)	44	(4.6%)	45
Yes	44	(73.3%)	691	(72.3%)	735
N/A	15	(25.0%)	221	(23.1%)	236
Age					
<50	8	(13.3%)	101	(10.6%)	109
50-59	21	(35.0%)	279	(29.2%)	300
60-69	10	(16.7%)	294	(30.8%)	304
70+	21	(35.0%)	282	(29.5%)	303
Smoking Status					
Current	16	(26.7%)	373	(39.0%)	389
Never	14	(23.3%)	193	(20.2%)	207
Previous	28	(46.7%)	368	(38.5%)	396
Unknown	2	(3.3%)	22	(2.3%)	24
Charlson/Deyo					
0	53	(88.3%)	829	(86.7%)	882
1	2	(3.3%)	16	(1.7%)	18
2+	5	(8.3%)	111	(11.6%)	116
Final Stage					
N/A	5	(8.3%)	21	(2.2%)	26
1	22	(36.7%)	139	(14.5%)	161
2	6	(10.0%)	127	(13.3%)	133
3	11	(18.3%)	186	(19.5%)	197
4	16	(26.7%)	483	(50.5%)	499
Tumor Site					
Larynx	21	(35.0%)	332	(34.7%)	353
Hypopharynx	3	(5.0%)	63	(6.6%)	66
Lip/Oral	14	(23.3%)	202	(21.1%)	216
Nasopharynx	0	(0.0%)	40	(4.2%)	40
Nose/Sinus	5	(8.3%)	30	(3.1%)	35
Oropharynx	17	(28.3%)	289	(30.2%)	306

eTable 2. Sensitivity analysis for exclusion of TTI=0. Multivariate logistic regression models run with TTI=0 treated as TTI>60 and TTI≤60.

	All TTI=0 treated as TTI>60				All TTI=0 treated as TTI≤60		
	Hazard Ratio	95% CI for Hazard Ratio			Hazard Ratio	95% CI for Hazard Ratio	
		Lower	Upper			Lower	Upper
TTI>60 days	1.47	1.163	1.859		1.585	1.239	2.028
Tumor Site							
Larynx (Reference)							
Hypopharynx	1.375	0.932	2.026		1.375	0.932	2.026
Lip/Oral	0.913	0.665	1.255		0.913	0.665	1.255
Nasopharynx	1.076	0.598	1.937		1.076	0.598	1.937
Nose/Sinus	1.294	0.724	2.313		1.294	0.724	2.313
Oropharynx	0.639	0.474	0.861		0.639	0.474	0.861
Age							
<50 years (Reference)							
50-60	1.135	0.717	1.799		1.112	0.702	1.76
60-70	1.64	1.041	2.585		1.594	1.012	2.511
70+	2.237	1.426	3.509		2.215	1.412	3.473
Tobacco Use							
Current (Reference)							
Never	0.579	0.405	0.829		0.579	0.405	0.828
Previous	0.887	0.702	1.121		0.888	0.702	1.122
Unknown	1.464	0.832	2.575		1.449	0.823	2.55
Charlson/Deyo							
0 (Reference)							
1	1.631	0.829	3.21		1.64	0.833	3.23
2+	1.756	1.294	2.384		1.727	1.272	2.344
Treatment Modality							
RT/CRT (Reference)							
S	0.759	0.549	1.05		0.728	0.527	1.006
S+	0.704	0.531	0.934		0.664	0.502	0.879
Treatment Completion							
No (Reference)							
Yes	0.333	0.217	0.509		0.339	0.221	0.519
N/A	0.721	0.462	1.125		0.736	0.472	1.148
Final Stage							
4 (Reference)							

N/A	1.593	0.8	3.171		1.688	0.849	3.359
1	0.353	0.236	0.528		0.361	0.242	0.54
2	0.545	0.369	0.806		0.539	0.364	0.796
3	0.581	0.43	0.786		0.581	0.43	0.786
Race/Ethnicity							
Black/African-American (Reference)							
Asian	2.198	0.913	5.295		2.155	0.893	5.205
Declined	0.836	0.569	1.226		0.834	0.568	1.225
Hispanic	1.329	0.971	1.82		1.337	0.977	1.83
White	1.437	1.064	1.939		1.438	1.066	1.941
Language							
Not English (Reference)							
English	0.747	0.555	1.005		0.739	0.549	0.995
N/A	1.177	0.714	1.94		1.135	0.687	1.876

eTable 3. Patient characteristics of patients with follow-up time ≤ 2 months that were excluded to achieve proportional hazards compared to remaining cohort.

	No. (%) with follow-up ≤ 2 months (n=19)		No. (%) with follow-up > 2 months (n=937)		Total (n=956)
Treatment Category					
CRT	8	(42.1%)	517	(55.2%)	525
S	11	(57.9%)	207	(22.1%)	218
S+	0	(0.0%)	213	(22.7%)	213
Treatment Completion					
No	3	(15.8%)	41	(4.4%)	44
Yes	5	(26.3%)	686	(73.2%)	691
N/A	11	(57.9%)	210	(22.4%)	221
Age					
<50	0	(0.0%)	101	(10.8%)	101
50-59	3	(15.8%)	276	(29.5%)	279
60-69	5	(26.3%)	289	(30.8%)	294
70+	11	(57.9%)	271	(28.9%)	282
Smoking Status					
Current	7	(36.8%)	366	(39.1%)	373
Never	4	(21.1%)	189	(20.2%)	193
Previous	8	(42.1%)	360	(38.4%)	368
Unknown	0	(0.0%)	22	(2.3%)	22
Charlson/Deyo					
0	16	(84.2%)	813	(86.8%)	829
1	0	(0.0%)	16	(1.7%)	16
2+	3	(15.8%)	108	(11.5%)	111
Final Stage					139
N/A	1	(5.3%)	20	(2.1%)	21
1	5	(26.3%)	134	(14.3%)	139
2	0	(0.0%)	127	(13.6%)	127
3	2	(10.5%)	184	(19.6%)	186
4	11	(57.9%)	472	(50.4%)	483
Tumor Site					
Larynx	3	(15.8%)	329	(35.1%)	332
Hypopharynx	2	(10.5%)	61	(6.5%)	63
Lip/Oral	8	(42.1%)	194	(20.7%)	202
Nasopharynx	0	(0.0%)	40	(4.3%)	40
Nose/Sinus	1	(5.3%)	29	(3.1%)	30
Oropharynx	5	(26.3%)	284	(30.3%)	289

eTable 4. Sensitivity analysis for exclusion of patients with follow-up \leq 2 months. Multivariate cox regression model run with cohort including patients with follow-up $>$ 2months.

	Hazard Ratio	95% CI for Hazard Ratio	
		Lower	Upper
TTI>60 days	1.578	1.232	2.022
Tumor Site			
Larynx (Reference)			
Hypopharynx	1.279	0.855	1.914
Lip/Oral	0.927	0.669	1.287
Nasopharynx	1.136	0.629	2.049
Nose/Sinus	1.609	0.879	2.947
Oropharynx	0.658	0.486	0.891
Age			
<50 years (Reference)			
50-60	1.035	0.646	1.656
60-70	1.565	0.986	2.486
70+	2.193	1.384	3.474
Tobacco Use			
Current			
Never	0.568	0.396	0.816
Previous	0.837	0.658	1.064
Unknown	1.341	0.746	2.411
Charlson/Deyo			
0 (Reference)			
1	1.498	0.73	3.076
2+	1.687	1.235	2.304
Treatment Modality			
RT/CRT (Reference)			
S	0.758	0.543	1.059
S+	0.691	0.515	0.927
Treatment Completion			
No (Reference)			
Yes	0.351	0.227	0.543
N/A	0.788	0.5	1.24
Final Stage			
4 (Reference)			
N/A	1.349	0.84	2.166
1	1.474	0.953	2.281
2	2.759	1.836	4.146

3	4.001	1.728	9.264
Race/Ethnicity			
Black/African-American (Reference)			
Asian	1.743	0.671	4.526
Declined	1.359	0.991	1.863
Hispanic	0.68	0.447	1.033
White	1.388	1.025	1.88
Language			
Not English (Reference)			
English	0.694	0.513	0.939
N/A	0.889	0.531	1.488

eTable 5. Hazard ratios for TTI>60 (vs. TTI≤60) in subgroup analysis of primary site, treatment modality, and final stage. These hazard ratios are adjusted for the remainder covariates in the Multivariate Cox Regression in Table 2.

	HR for TTI > 60 days	95% CI for Hazard Ratio	
		Lower	Upper
Tumor Site			
Larynx	2.20	1.39	3.49
Oropharynx	1.97	1.18	3.28
Nose/Sinus ^a	0.08	0	-
Hypopharynx	1.14	0.38	3.40
Nasopharynx ^a	0	0	-
Lip/Oral	0.94	0.48	1.85
Treatment Modality			
Surgery Alone	2.15	1.13	4.07
CRT	1.38	0.99	1.92
SCRT	1.83	0.95	3.54
Final Stage			
Stage I/II	1.94	1.08	3.50
Stage III/IV	1.47	1.12	1.96

a. Upper range of confidence interval was too large to include in table due to inadequate sample size in nose/sinus and nasopharynx cancers

eTable 6. Full multivariate logistic regression to examine significant factors that could potentially predict delayed TTI based on the optimal threshold of 60 days.

	Odds Ratio	95% CI for Odds Ratio	
		Lower	Upper
Marital Status			
Married (Reference)			
Not Married	1.22	0.841	1.771
N/A	0.418	0.115	1.524
Not diagnosed at other facility (vs. diagnosed at other facility)			
	0.529	0.369	0.757
Insurance			
Commercial (Reference)			
Medicaid	2.168	1.283	3.663
Medicare	1.394	0.837	2.323
Other	1.105	0.554	2.207
Uninsured	2.336	0.833	6.548
N/A	2.182	0.873	5.451
Race/Ethnicity			
Black/African-American (Reference)			
Asian	0.943	0.227	3.917
Declined	0.545	0.345	0.862
Hispanic	0.832	0.52	1.332
White	0.525	0.326	0.845
Socioeconomic Status			
Fourth Quartile:>-.57 (Reference)			
Quartile 1: <-5.6	1.232	0.74	2.051
Quartile 2: -5.6 to -2.17	1.027	0.618	1.707
Quartile 3: -2.17 to 0.57	0.999	0.603	1.653
N/A	0.579	0.211	1.587
BMI			
18.5-30 (Reference)			
Underweight <18.5	1.743	1.051	2.889
Obese >30	0.89	0.564	1.402
N/A	1.178	0.655	2.116