

Supplementary Online Content

Rettig EM, Wentz A, Posner MR, et al. Prognostic implication of persistent human papillomavirus type 16 DNA detection in oral rinses for human papillomavirus–related oropharyngeal carcinoma. *JAMA Oncol*. Published online July 30, 2015. doi:10.1001/jamaoncol.2015.2524

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

eTable 1: Characteristics of participants with (“included”) compared to those without (“excluded”) post-treatment oral rinses.

Characteristic	Included N(%)	Excluded N(%)	p-value
Total (N=157)^a	124	33	
Age [years; median (IQR)]			0.17
	56 (50-61)	60 (51-66)	
Gender			0.68
Female	12 (10)	4 (12)	
Male	112 (90)	29 (88)	
Marital status			0.03
Married/living as married	103 (85)	21 (68)	
Not married or living as married	18 (15)	10 (32)	
Race			0.27
White	117 (98)	29 (94)	
Other	3 (3)	2 (6)	
Income			0.009
<\$50,000	16 (15)	11 (41)	
\$50-99,999	36 (33)	7 (26)	
≥\$100,000	58 (53)	9 (33)	
Education			0.84
High school or less	52 (44)	12 (43)	
College	47 (40)	10 (36)	
Advanced degree	20 (17)	6 (21)	
Smoking			0.10
Current	13 (11)	6 (20)	
Former	38 (31)	13 (43)	
Never	70 (58)	11 (37)	
Pack-years [median (IQR)]			0.02
	0 (0-15)	7.5 (0-27)	
Alcohol use			0.40
Current	68 (55)	13 (42)	
Former	35 (28)	11 (35)	
Never	20 (16)	7 (23)	
T stage			0.08
T1-T2	75 (65)	26 (81)	
T3-T4	40 (35)	6 (19)	
N stage			0.10
N0-N2a	37 (30)	15 (45)	
N2b-N3	85 (70)	18 (55)	
Overall stage			0.09
<IV	22 (18)	10 (32)	
IV	99 (82)	21 (68)	

eTable 1: Characteristics of participants with (“included”) compared to those without (“excluded”) post-treatment oral rinses (continued)

Oropharynx subsite			0.19
Tonsil	60 (48)	17 (52)	
Base of tongue	56 (45)	11 (33)	
Other oropharynx	8 (6)	5 (15)	
Treatment			0.07
Radiation-based	78 (64)	13 (45)	
Surgery-based	45 (37)	16 (55)	
HPV16 in oral rinse at diagnosis			0.96
No	57 (46)	15 (45)	
Yes	67 (54)	18 (55)	

Abbreviations: IQR, interquartile range; HPV, human papillomavirus

^aTotal number of participants in original study cohort.

eTable 2: Characteristics of participants with and without newly detected HR-HPV DNA detected in post-treatment oral rinses.

	No newly detected HR-HPV DNA post-treatment N=111 N (%)	Newly detected HR-HPV DNA post-treatment^a N=13 N (%)	p-value
Age, continuous			0.49
Years [median (IQR)]	56 (50-62)	53 (51-57)	
Gender			0.80
Female	11 (10)	1 (8)	
Male	100 (90)	12 (92)	
Marital status			0.09
Married/living as married	94 (87)	9 (70)	
Not married/living as married	14 (13)	4 (30)	
Race			0.20
White	105 (98)	12 (92)	
Other	2 (2)	1 (8)	
Education			0.98
High school or less	46 (43)	6 (46)	
College	42 (40)	5 (38)	
Advanced degree	18 (17)	2 (15)	
Income			0.12
<\$50,000	12 (12)	4 (33)	
\$50-99,999	32 (33)	4 (33)	
≥\$100,000	54 (55)	4 (33)	
Smoking status			0.18
Current smoker	10 (9)	3 (25)	
Former smoker	36 (33)	2 (17)	
Never smoker	63 (58)	7 (58)	
Pack-years, continuous			0.98
Pack-years/10 [median (IQR)]	0 (0-15)	0 (0-12)	
Alcohol use			0.09
Current	64 (58)	4 (31)	
Former	28 (25)	7 (54)	
Never	18 (16)	2 (15)	
N stage			0.97
N0, N1, N2a	33 (30)	4 (31)	
N2b-N3	76 (70)	9 (69)	
T stage			0.45
T1-T2	66 (64)	9 (75)	
T3-T4	37 (36)	3 (25)	

eTable 2: Characteristics of participants with and without newly detected HR-HPV DNA detected in post-treatment oral rinses (continued).

Overall stage			0.21
<IV	18 (17)	4 (31)	
IV	90 (83)	9 (69)	
Oropharynx subsite			0.38
Tonsil	54 (49)	6 (46)	
Base of tongue	51 (46)	5 (38)	
Other oropharynx	6 (5)	2 (15)	
Treatment			0.29
Radiation-based	68 (62)	10 (77)	
Surgery-based	42 (38)	3 (23)	
Any HR-HPV in oral rinse at diagnosis			0.32
No	41 (37)	3 (23)	
Yes	70 (63)	10 (77)	
HPV16 in oral rinse at diagnosis			0.99
No	51 (46)	6 (46)	
Yes	60 (54)	7 (54)	
Lifetime oral sex partners			0.17
0-5 oral sex partners	45 (43)	3 (23)	
>5 oral sex partners	60 (57)	10 (77)	
Recent oral sex			0.90
None	59 (63)	7 (70)	
Any	35 (37)	3 (30)	
Current smoker at any follow-up visit			0.64
No	98 (98)	11 (100)	
Yes	2 (2)	0 (0)	

Abbreviations: IQR, interquartile range; HR-HPV, high-risk human papillomavirus

^aIncludes one participant with newly detected HPV16 DNA and 12 participants with newly detected non-HPV16 HR-HPV DNA in post-treatment oral rinses.

eTable 3: HPV16 viral load in oral rinses at diagnosis compared with clinicopathologic characteristics.

	Median detectable viral load (n=57)^a Median (IQR)	Undetectable N(%)	Low N(%)	High N(%)	p-value
Overall					
	161 (21-846)	64 (53)	28 (23)	29 (24)	
Age (years)					0.36
<50	316 (59-981)	17 (55)	5 (16)	9 (29)	
50-55	251 (33-1250)	16 (59)	4 (15)	7 (26)	
55-60	43 (21-265)	19 (59)	8 (25)	5 (16)	
>60	73 (8-697)	12 (39)	11 (35)	8 (26)	
Gender					0.69
Female	1445 (8-2050)	6 (50)	2 (17)	4 (33)	
Male	150 (21-530)	58 (53)	26 (24)	25 (23)	
Marital status					0.37
Married/living as married	117 (19-500)	52 (52)	25 (25)	23 (23)	
Not married/living as married	1620 (276-2720)	10 (56)	2 (11)	6 (33)	
Education					0.82
High school or less	203 (26-1250)	29 (56)	11 (21)	12 (23)	
College or advanced degree	155 (12-614)	32 (50)	16 (25)	16 (25)	
Income					0.58
<\$100,000	470 (26-2050)	29 (56)	10 (19)	13 (25)	
≥\$100,000	79 (17-316)	29 (53)	15 (27)	11 (20)	
Smoking status					0.04
Never/former smoker	79 (17-530)	55 (52)	28 (27)	22 (21)	
Current smoker	914 (285-1250)	7 (54)	0 (0)	6 (46)	
Alcohol use					0.25
Current	258 (21-697)	35 (54)	11 (17)	19 (29)	
Former	139 (17-1250)	16 (46)	11 (31)	8 (23)	
Never	42 (6-528)	12 (60)	6 (30)	2 (10)	
N stage					0.76
N0, N1, N2a	112 (21-316)	18 (50)	10 (28)	8 (22)	
N2b-N3	178 (20-1310)	44 (53)	18 (22)	21 (26)	
T stage					0.14
T1-T2	161 (21-530)	41 (57)	15 (21)	16 (22)	
T3-T4	150 (17-1830)	15 (38)	13 (33)	12 (30)	
Overall stage					0.36
<IV	150 (25-470)	8 (38)	7 (33)	6 (29)	
IV	169 (21-1116)	5 (55)	21 (22)	23 (24)	

eTable 3: HPV16 viral load in oral rinses at diagnosis compared with clinicopathologic characteristics (continued).

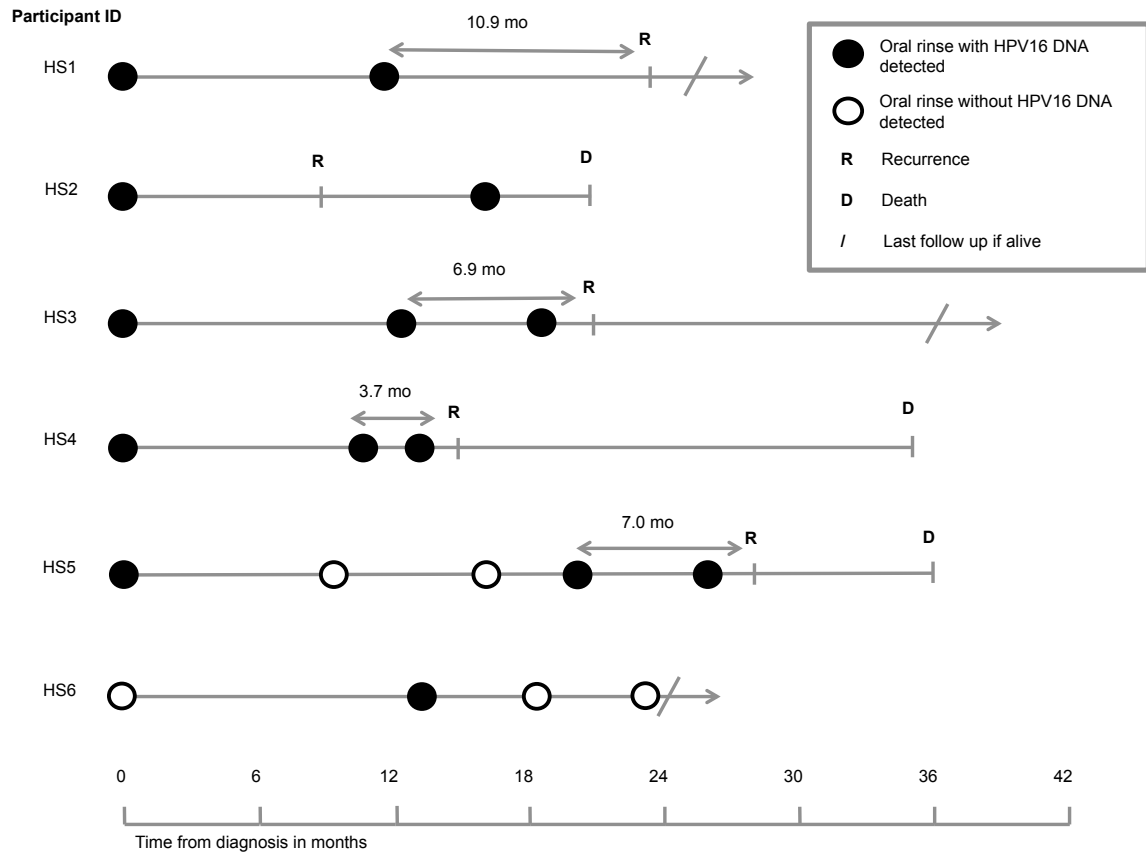
Oropharynx subsite					<0.001
Tonsil	412 (178-1250)	28 (49)	7 (12)	22 (39)	
Base of tongue/other oropharynx	24 (7-150)	36 (56)	21 (33)	7 (11)	
Treatment					0.57
Radiation-based	74 (16-1830)	39 (51)	20 (26)	17 (22)	
Surgery-based	200 (66-471)	24 (55)	8 (19)	12 (27)	
Lifetime oral sex partners					0.15
0-5 oral sex partners	150 (11-846)	29 (63)	9 (20)	8 (17)	
>5 oral sex partners	179 (24-697)	31 (45)	18 (26)	20 (29)	
Lifetime vaginal sex partners					0.88
1-5 vaginal sex partners	24 (5-316)	13 (54)	6 (25)	5 (21)	
>5 vaginal sex partners	179 (23-903)	45 (51)	27 (24)	28 (25)	
Age at oral sex initiation					0.38
<13	285 (161-959)	11 (55)	2 (10)	7 (35)	
13-14	144 (17-846)	37 (49)	20 (27)	18 (24)	
>14 or never	51 (15-258)	13 (62)	5 (24)	3 (14)	
HPV16 DNA detected in oral rinse at diagnosis (lineblot hybridization)					<0.001
No	150 (N/A ^b)	54 (98)	1 (2)	0 (0)	
Yes	169 (21-903)	10 (15)	27 (41)	29 (44)	
Persistent HPV16 in oral rinse					0.32
No	161 (21-697)	63 (54)	26 (22)	27 (23)	
Yes	631 (7-1540)	1 (20)	2 (40)	2 (40)	

Abbreviations: IQR, interquartile range; HPV, human papillomavirus

^aData from the 57 participants with detectable viral load were included in the median values displayed in this column.

^bOnly one participant without HPV16 DNA detected in oral rinse at diagnosis had a detectable HPV16 viral load.

eFigure 1: Timeline of oral rinse results, recurrence and death for participants with persistent oral HPV16 DNA.



Abbreviations: HPV, human papillomavirus; mo, months

eFigure 2: Survival by HPV16 viral load in oral rinse at diagnosis

