Analyses summary for association of CK2α scores with variables

| Variable | TotalN=119 | oneN=28 | twoN=60 | threeN=31 | P-Value |
| --- | --- | --- | --- | --- | --- |
| **Smoking Status (SMSTATUS)** |  |  |  |  |  |
|  Never Smoked | 7 (5.88) | 0 (0) | 4 (6.67) | 3 (9.68) | 0.0646 a |
|  Current Smoker | 58 (48.74) | 19 (67.86) | 29 (48.33) | 10 (32.26) |  |
|  Former Smoker | 54 (45.38) | 9 (32.14) | 27 (45) | 18 (58.06) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Gender (GENDER2)** |  |  |  |  |  |
|  Male | 119 (100) | 28 (100) | 60 (100) | 31 (100) | 0.0646 a |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **age (AGE)** |  |  |  |  |  |
|  Mean | 63.08 | 63.57 | 63.15 | 62.48 | 0.8408 b |
|  Std Dev | 7.16 | 6.87 | 6.87 | 8.12 |  |
|  Median | 63.00 | 63.50 | 63.50 | 63.00 |  |
|  Minimum | 44.00 | 53.00 | 50.00 | 44.00 |  |
|  Maximum | 88.00 | 88.00 | 82.00 | 80.00 |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Alcohol Use (ALCOHOL2)** |  |  |  |  |  |
|  Non Drinker | 19 (15.97) | 4 (14.29) | 9 (15) | 6 (19.35) | 0.8434 a |
|  Current Drinker | 58 (48.74) | 13 (46.43) | 32 (53.33) | 13 (41.94) |  |
|  Former Drinker | 42 (35.29) | 11 (39.29) | 19 (31.67) | 12 (38.71) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Tumor Site; label (TSUBSITE\_2)** |  |  |  |  |  |
|  Tonsil | 68 (58.62) | 19 (73.08) | 36 (60) | 13 (43.33) | 0.0031 a |
|  Base of Tongue | 41 (35.34) | 3 (11.54) | 21 (35) | 17 (56.67) |  |
|  Soft Palate | 6 (5.17) | 3 (11.54) | 3 (5) | 0 (0) |  |
|  Pharyngeal Wall | 1 (0.86) | 1 (3.85) | 0 (0) | 0 (0) |  |
|  N Missing | 3 | 2 | 0 | 1 |  |
| **T Stage (TSTAGE)** |  |  |  |  |  |
|  T1 | 46 (38.66) | 12 (42.86) | 24 (40) | 10 (32.26) | 0.9405 a |
|  T2 | 39 (32.77) | 8 (28.57) | 21 (35) | 10 (32.26) |  |
|  T3 | 19 (15.97) | 5 (17.86) | 8 (13.33) | 6 (19.35) |  |
|  T4 | 15 (12.61) | 3 (10.71) | 7 (11.67) | 5 (16.13) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **N Stage (NSTAGE2)** |  |  |  |  |  |
|  N0 | 24 (20.17) | 11 (39.29) | 8 (13.33) | 5 (16.13) | 0.1113 a |
|  N1 | 14 (11.76) | 2 (7.14) | 8 (13.33) | 4 (12.9) |  |
|  N2 | 72 (60.5) | 12 (42.86) | 41 (68.33) | 19 (61.29) |  |
|  N3 | 9 (7.56) | 3 (10.71) | 3 (5) | 3 (9.68) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Stage Group (AJCCSTAGE\_2)** |  |  |  |  |  |
|  I | 10 (8.4) | 7 (25) | 3 (5) | 0 (0) | 0.0350 a |
|  II | 9 (7.56) | 2 (7.14) | 5 (8.33) | 2 (6.45) |  |
|  III | 16 (13.45) | 3 (10.71) | 8 (13.33) | 5 (16.13) |  |
|  IVA | 73 (61.34) | 12 (42.86) | 41 (68.33) | 20 (64.52) |  |
|  IVB | 11 (9.24) | 4 (14.29) | 3 (5) | 4 (12.9) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Inital Treatment Only (TX\_MODALITY\_INIT)** |  |  |  |  |  |
|  CCRT concurrent chemo radiation | 69 (57.98) | 13 (46.43) | 40 (66.67) | 16 (51.61) | 0.5361 a |
|  XRT radiation alone | 12 (10.08) | 5 (17.86) | 4 (6.67) | 3 (9.68) |  |
|  SUR/CCRT surgery and chemo\_rad | 9 (7.56) | 2 (7.14) | 4 (6.67) | 3 (9.68) |  |
|  SUR surgery alone | 12 (10.08) | 5 (17.86) | 5 (8.33) | 2 (6.45) |  |
|  SUR/XRT surgery and adjuvant radiation | 6 (5.04) | 1 (3.57) | 3 (5) | 2 (6.45) |  |
|  CCRT/SURG chemo\_rad and sugery | 11 (9.24) | 2 (7.14) | 4 (6.67) | 5 (16.13) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **P16 (P16)** |  |  |  |  |  |
|  negative | 35 (29.66) | 21 (75) | 12 (20) | 2 (6.67) | <0.0001 c |
|  positive | 83 (70.34) | 7 (25) | 48 (80) | 28 (93.33) |  |
|  N Missing | 1 | 0 | 0 | 1 |  |
| **Two Category HPV E6E7 (DICHHPVE6E7)** |  |  |  |  |  |
|  negative | 35 (29.41) | 22 (78.57) | 10 (16.67) | 3 (9.68) | <0.0001 c |
|  positive | 84 (70.59) | 6 (21.43) | 50 (83.33) | 28 (90.32) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **KI 67 Index (KI67)** |  |  |  |  |  |
|  <10 low | 6 (5.04) | 5 (17.86) | 1 (1.67) | 0 (0) | 0.0003 c |
|  10-20 borderline | 27 (22.69) | 11 (39.29) | 11 (18.33) | 5 (16.13) |  |
|  >20 high | 86 (72.27) | 12 (42.86) | 48 (80) | 26 (83.87) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Did disease progress? (DISESEPROG2)** |  |  |  |  |  |
|  no | 78 (65.55) | 15 (53.57) | 41 (68.33) | 22 (70.97) | 0.3030 c |
|  yes | 41 (34.45) | 13 (46.43) | 19 (31.67) | 9 (29.03) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Progression Free Survival Days (PFSURVDAYS)** |  |  |  |  |  |
|  Mean | 1175.78 | 998.86 | 1108.43 | 1465.94 | 0.2062 b |
|  Std Dev | 1088.99 | 1029.89 | 976.71 | 1307.12 |  |
|  Median | 834.00 | 666.50 | 834.50 | 1025.00 |  |
|  Minimum | 0.00 | 57.00 | 0.00 | 83.00 |  |
|  Maximum | 4201.00 | 3795.00 | 4076.00 | 4201.00 |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Death (DEATH)** |  |  |  |  |  |
|  no | 77 (64.71) | 11 (39.29) | 42 (70) | 24 (77.42) | 0.0044 c |
|  yes | 42 (35.29) | 17 (60.71) | 18 (30) | 7 (22.58) |  |
|  N Missing | 0 | 0 | 0 | 0 |  |
| **Overall Survival Days (OVSURVTIMEDAYS)** |  |  |  |  |  |
|  Mean | 1330.49 | 1137.46 | 1253.15 | 1654.52 | 0.1260 b |
|  Std Dev | 1060.50 | 1026.71 | 944.69 | 1250.83 |  |
|  Median | 918.00 | 794.00 | 962.00 | 1072.00 |  |
|  Minimum | 71.00 | 71.00 | 91.00 | 252.00 |  |
|  Maximum | 4201.00 | 3795.00 | 4076.00 | 4201.00 |  |
|  N Missing | 0 | 0 | 0 | 0 |  |

a Fisher's Exact test

b ANOVA Type III F-test

c Pearson's Chi-Square

Relationship between p16 and hpve6e7

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

| **Table of p16 by HPV\_E6E7** |
| --- |
| **p16(p16)** | **HPV\_E6E7(HPV\_E6E7)** |
| **neg** | **pos1+** | **pos2+** | **pos3+** | **Total** |
| **negative** |

|  |
| --- |
| 33 |
| 27.97 |
| 94.29 |
| 94.29 |

 |

|  |
| --- |
| 2 |
| 1.69 |
| 5.71 |
| 10.53 |

 |

|  |
| --- |
| 0 |
| 0.00 |
| 0.00 |
| 0.00 |

 |

|  |
| --- |
| 0 |
| 0.00 |
| 0.00 |
| 0.00 |

 |

|  |
| --- |
| 35 |
| 29.66 |
|   |
|   |

 |
| **positive** |

|  |
| --- |
| 2 |
| 1.69 |
| 2.41 |
| 5.71 |

 |

|  |
| --- |
| 17 |
| 14.41 |
| 20.48 |
| 89.47 |

 |

|  |
| --- |
| 39 |
| 33.05 |
| 46.99 |
| 100.00 |

 |

|  |
| --- |
| 25 |
| 21.19 |
| 30.12 |
| 100.00 |

 |

|  |
| --- |
| 83 |
| 70.34 |
|   |
|   |

 |
| **Total**  |

|  |
| --- |
| 35 |
| 29.66 |

 |

|  |
| --- |
| 19 |
| 16.10 |

 |

|  |
| --- |
| 39 |
| 33.05 |

 |

|  |
| --- |
| 25 |
| 21.19 |

 |

|  |
| --- |
| 118 |
| 100.00 |

 |
| **Frequency Missing = 1** |

 |

|  |
| --- |
| **Statistics for Table of p16 by HPV\_E6E7** |

| **Statistic** | **DF** | **Value** | **Prob** |
| --- | --- | --- | --- |
| **Chi-Square** | 3 | 100.3844 | <.0001 |
| **Likelihood Ratio Chi-Square** | 3 | 115.3606 | <.0001 |
| **Mantel-Haenszel Chi-Square** | 1 | 76.4872 | <.0001 |
| **Phi Coefficient** |   | 0.9223 |   |
| **Contingency Coefficient** |   | 0.6780 |   |
| **Cramer's V** |   | 0.9223 |   |

Univariate and Multivariate Cox Regression

Highlighted in pink – p value

Highlighted in blue –HR and CI

**HPV**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichhpve6e7** | 1 | 13.2258 | 0.0003 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichhpve6e7** | **negative** | 1 | 1.14031 | 0.31355 | 13.2258 | 0.0003 | 3.128 | Two Category HPV E6E7 negative |

| **Hazard Ratios for Two Category HPV E6E7** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichhpve6e7 negative vs positive** | 3.128 | 1.692 | 5.783 |

**HPV controlling for smoking (HPV remains significant)**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichhpve6e7** | 1 | 7.8803 | 0.0050 |
| **newdichsm** | 1 | 2.2623 | 0.1326 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichhpve6e7** | **negative** | 1 | 0.94284 | 0.33587 | 7.8803 | 0.0050 | 2.567 | Two Category HPV E6E7 negative |
| **newdichsm** |  | 1 | 0.53582 | 0.35624 | 2.2623 | 0.1326 | 1.709 |   |

| **Hazard Ratios for Two Category HPV E6E7** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichhpve6e7 negative vs positive** | 2.567 | 1.329 | 4.959 |

**CK2**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichck2ihc** | 1 | 8.5504 | 0.0035 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichck2ihc** | **2 and 3 high** | 1 | -0.92181 | 0.31524 | 8.5504 | 0.0035 | 0.398 | Two category CK2 IHC 2 and 3 high |

| **Hazard Ratios for Two category CK2 IHC** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichck2ihc 2 and 3 high vs low** | 0.398 | 0.214 | 0.738 |

**CK2 controlling for smoking (CK2 remains significant)**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichck2ihc** | 1 | 5.7776 | 0.0162 |
| **newdichsm** | 1 | 4.5151 | 0.0336 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichck2ihc** | **2 and 3 high** | 1 | -0.77354 | 0.32182 | 5.7776 | 0.0162 | 0.461 | Two category CK2 IHC 2 and 3 high |
| **newdichsm** |  | 1 | 0.71932 | 0.33853 | 4.5151 | 0.0336 | 2.053 |   |

| **Hazard Ratios for Two category CK2 IHC** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichck2ihc 2 and 3 high vs low** | 0.461 | 0.246 | 0.867 |

**Ki67**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichki67** | 1 | 1.9778 | 0.1596 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichki67** | **<=20 low or borderline** | 1 | 0.46175 | 0.32834 | 1.9778 | 0.1596 | 1.587 | dichki67 <=20 low or borderline |

| **Hazard Ratios for dichki67** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichki67 <=20 low or borderline vs >20 high** | 1.587 | 0.834 | 3.020 |

**Age (continuous so for 1 yr increase)**

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **age** | 1 | 0.01059 | 0.02073 | 0.2609 | 0.6095 | 1.011 | age |

| **Hazard Ratios for age** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **age Unit=1** | 1.011 | 0.970 | 1.053 |

**Dichotomous alcohol (current or former drinker vs non-drinker)**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichalc** | 1 | 0.9180 | 0.3380 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichalc** | **current or former drinker** | 1 | 0.50400 | 0.52603 | 0.9180 | 0.3380 | 1.655 | dichalc current or former drinker |

| **Hazard Ratios for dichalc** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichalc current or former drinker vs non drinker** | 1.655 | 0.590 | 4.641 |

**tstage**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **dichtstage** | 1 | 0.6525 | 0.4192 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **dichtstage** | **tstage 3 or 4** | 1 | 0.26522 | 0.32833 | 0.6525 | 0.4192 | 1.304 | dichtstage tstage 3 or 4 |

| **Hazard Ratios for dichtstage** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **dichtstage tstage 3 or 4 vs tstage 1 or 2** | 1.304 | 0.685 | 2.481 |

**Nstage**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **nstadich** | 1 | 0.3395 | 0.5601 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **nstadich** | **1 2 or 3** | 1 | 0.23012 | 0.39494 | 0.3395 | 0.5601 | 1.259 | nstadich 1 2 or 3 |

| **Hazard Ratios for nstadich** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **nstadich 1 2 or 3 vs none** | 1.259 | 0.580 | 2.730 |

**AJCC (per 1 unit increase – continuous)**

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **ajccstage\_2** | 1 | 0.14141 | 0.15392 | 0.8441 | 0.3582 | 1.152 | Stage Group |

| **Hazard Ratios for Stage Group** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **ajccstage\_2 Unit=1** | 1.152 | 0.852 | 1.558 |

**Txmod\_init (Treatment)**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **txmod\_init** | 4 | 4.0964 | 0.3931 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **txmod\_init** | **CCRT concurrent chemo radiation** | 1 | 0.26248 | 0.53999 | 0.2363 | 0.6269 | 1.300 | txmod\_init CCRT concurrent chemo radiation |
| **txmod\_init** | **SUR/CCRT surgery and chemo\_rad** | 1 | -0.53793 | 0.65516 | 0.6741 | 0.4116 | 0.584 | txmod\_init SUR/CCRT surgery and chemo\_rad |
| **txmod\_init** | **SUR/XRT surgery and adjuvant radiation** | 1 | -0.82558 | 1.12212 | 0.5413 | 0.4619 | 0.438 | txmod\_init SUR/XRT surgery and adjuvant radiation |
| **txmod\_init** | **XRT radiation alone** | 1 | 0.34156 | 0.67373 | 0.2570 | 0.6122 | 1.407 | txmod\_init XRT radiation alone |

| **Hazard Ratios for txmod\_init** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **txmod\_init CCRT concurrent chemo radiation vs SUR surgery alone** | 1.300 | 0.451 | 3.747 |
| **txmod\_init SUR/CCRT surgery and chemo\_rad vs SUR surgery alone** | 0.584 | 0.162 | 2.109 |
| **txmod\_init SUR/XRT surgery and adjuvant radiation vs SUR surgery alone** | 0.438 | 0.049 | 3.950 |
| **txmod\_init XRT radiation alone vs SUR surgery alone** | 1.407 | 0.376 | 5.270 |

**Smoking - current vs. former or never**

| **Type 3 Tests** |
| --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **newdichsm** | 1 | 6.7075 | 0.0096 |

| **Analysis of Maximum Likelihood Estimates** |
| --- |
| **Parameter** |  | **DF** | **ParameterEstimate** | **StandardError** | **Chi-Square** | **Pr > ChiSq** | **HazardRatio** | **Label** |
| **newdichsm** | **current smoker** | 1 | 0.85836 | 0.33143 | 6.7075 | 0.0096 | 2.359 | newdichsm current smoker |

| **Hazard Ratios for newdichsm** |
| --- |
| **Description** | **Point Estimate** | **95% Wald Confidence Limits** |
| **newdichsm current smoker vs never or former smoker** | 2.359 | 1.232 | 4.517 |