**S5 Table. Multivariable Cox proportional hazards regression analysis demonstrates association of the deep learning system (DLS) with disease-specific survival in FFPE-only\* cases.**

|  |  |  |
| --- | --- | --- |
| **Study** | **Number of cases (excludes frozen slides)** | **Risk Factor** |
| **DLS** | **Age** | **Male** | **Stage** |
| HR | p | HR | p | HR | p | HR | p |
| **BLCA** | 91 | 0.70[0.37, 1.31] | 0.262 | 1.23[0.78, 1.95] | 0.3657 | 1.45[0.54, 3.91] | 0.461 | **2.27****[1.33, 3.87]** | **0.003** |
| BRCA | 244 | 2.02[0.95, 4.30] | 0.068 | 0.99[0.70, 1.41] | 0.9754 | NaN | NaN | **2.70****[1.51, 4.84]** | **0.0009** |
| **COAD** | 100 | **5.35****[1.78, 16.08]** | **0.002** | 1.02[0.61, 1.72] | 0.9288 | 0.93[0.26, 3.29] | 0.911 | **10.79****[3.32, 35.08]** | **0.0001** |
| HNSC | 95 | 0.98[0.52, 1.84] | 0.948 | 0.92[0.60, 1.40] | 0.7013 | 0.92[0.36, 2.32] | 0.856 | **2.22****[1.11, 4.44]** | **0.0247** |
| **KIRC** | 128 | **1.50****[1.04, 2.16]** | **0.031** | 1.00[0.67, 1.47] | 0.9835 | 0.47[0.21, 1.06] | 0.068 | **3.34****[2.11, 5.30]** | **0.0000** |
| **LIHC** | 82 | **3.52****[1.79, 6.91]** | **0.0003** | 1.31[0.87, 1.97] | 0.1998 | 0.91[0.28, 2.94] | 0.880 | **2.22****[1.23, 4.02]** | **0.0084** |
| **LUAD** | 104 | 1.48[0.94, 2.34] | 0.090 | 0.88[0.61, 1.26] | 0.4741 | 1.29[0.55, 3.06] | 0.558 | **2.05****[1.47, 2.86]** | **0.0000** |
| **LUSC** | 101 | 1.30[0.65, 2.60] | 0.465 | 0.98[0.58, 1.67] | 0.9504 | 1.34[0.48, 3.79] | 0.575 | 1.59[0.96, 2.66] | 0.074 |
| **STAD** | 84 | 0.78[0.41, 1.47] | 0.443 | 0.95[0.68, 1.33] | 0.7663 | 1.87[0.77, 4.55] | 0.170 | **2.40****[1.25, 4.59]** | **0.0082** |
| **Combined** | 1053 | **1.42****[1.21, 1.66]** | **0.0000** | 1.09[0.98, 1.22] | 0.1289 | 1.22[0.93, 1.61] | 0.158 | **2.20****[1.90, 2.53]** | **0.0000** |

\*FFPE indicates formalin-fixed paraffin-embedded, “FFPE-only” indicates that images specified by TCGA as “frozen” specimens/slides have been excluded.