Supplementary Figure 1A-D: Example of Corrected Tumor PET and L3-Level CT Images at Diagnosis for Representative Patients from Low SUV\textsubscript{Max} No WL (A-B) and High SUV\textsubscript{Max} WL (C-D) Groups. Erector Spinae (Green) and Psoas Muscle (Red) Groups Indicated on CT Images for Estimate of Cancer-Associated Sarcopenia.
**Supplementary Table 1:** Multivariate Logistic Regression Evaluating Relationship of Tumor SUV\(_{\text{Max}}\) with WL Incidence at Diagnosis Including Tumor Grade as a Covariate

| Patient or Tumor Factor | Odds Ratio (95% CI) | P-value |
|-------------------------|---------------------|---------|
| Female Sex              | 0.84 (0.493, 1.433) | 0.5227  |
| Age at Diagnosis        | 1.021 (0.993, 1.049)| 0.1407  |
| **Race**                |                     |         |
| Non-Hispanic Caucasian  | Reference           | 0.0267  |
| Black                   | 2.379 (1.319, 4.291)| 0.0040  |
| Hispanic                | 2.331 (0.761, 7.138)| 0.1384  |
| Asian or Pacific Islander| 1.372 (0.215, 8.771)| 0.7384  |
| **Alcohol History**     |                     |         |
| None                    | Reference           | 0.5154  |
| Prior Use               | 1.65 (0.695, 3.916) | 0.2561  |
| Current Use             | 1.058 (0.606, 1.844)| 0.8437  |
| **Tobacco History**     |                     |         |
| None                    | Reference           | 0.6935  |
| Prior Use               | 0.825 (0.316, 2.152)| 0.6938  |
| Current Use             | 1.047 (0.393, 2.792)| 0.9261  |
| **Charlson Comorbidity Index** |                     |         |
| 0                       | Reference           | 0.2385  |
| 1                       | 0.521 (0.254, 1.070)| 0.0756  |
| 2                       | 0.568 (0.262, 1.232)| 0.1520  |
| 3+                      | 0.847 (0.390, 1.839)| 0.6744  |
| **Histology**           |                     |         |
| Squamous                | Reference           | 0.1182  |
| Adenocarcinoma          | 0.555 (0.303, 1.016)| 0.0562  |
| Other or Unknown        | 1.000 (0.442, 2.263)| 0.9996  |
| **Stage**               |                     |         |
| 1                       | Reference           | 0.2553  |
| 2                       | 0.468 (0.176, 1.244)| 0.1282  |
| 3                       | 0.876 (0.434, 1.767)| 0.7120  |
| 4                       | 1.235 (0.577, 2.641)| 0.5866  |
| **Grade**               |                     |         |
| 1                       | Reference           | 0.3166  |
| 2                       | 1.348 (0.279, 6.510)| 0.7101  |
| 3                       | 2.218 (0.444, 11.082)| 0.3319  |
| 4                       | 1.203 (0.102, 14.187)| 0.8833  |
| **Tumor SUV\(_{\text{Max}}\)** | 1.050 (1.011, 1.091) | 0.0110  |
Supplementary Table 2: Broad Survival Comparisons

| Patient Group                        | Median Survival Time in Months (95% CI) | P-value  |
|--------------------------------------|----------------------------------------|----------|
| WL at Diagnosis                      |                                        | <0.0001  |
| No                                   | 28 (22.756, 33.244)                    |          |
| Yes                                  | 16 (12.575, 19.425)                    |          |
| SUV<sub>Max</sub> Cutpoint by Optimal Survival |                                        | <0.0001  |
| Low SUV                              | 56 (42.655, 69.345)                    |          |
| High SUV                             | 19 (16.495, 21.506)                    |          |
| SUV<sub>Max</sub> Cutpoint by Cohort Median |                                        | 0.0020   |
| Low SUV                              | 33 (23.288, 42.712)                    |          |
| High SUV                             | 19 (16.152, 21.848)                    |          |
| SUV<sub>Max</sub> Cutpoint by Stage Median |                                        | 0.0486   |
| Low SUV                              | 28 (19.484, 36.516)                    |          |
| High SUV                             | 21 (17.129, 24.871)                    |          |
**Supplementary Table 3:** Log-Rank Survival Results for Survival-Optimized SUV Cutpoint

| Patient Group         | Median Survival Time in Months (95% CI) | Groups Compared                       | P-value |
|-----------------------|----------------------------------------|---------------------------------------|---------|
| **Stage 1**           |                                         |                                       |         |
| No WL, Low SUV        | 96 (77.38, 114.62)                     | No WL: High SUV vs Low SUV            | 0.0364  |
| No WL, High SUV       | 64 (32.646, 95.354)                    | WL: High vs Low SUV                   | 0.0286  |
| WL, Low SUV           | 65 (. )                                | SUV Constant                          |         |
| WL, High SUV          | 30 (1.561, 58.439)                     | Low SUV: No WL vs WL                  | 0.6777  |
| Total                 | 73 (53.507, 92.493)                    | High SUV: No WL vs WL                 | 0.0559  |
| **Stage 2**           |                                         |                                       |         |
| No WL, Low SUV        | 63 (. )                                | No WL: High SUV vs Low SUV            | 0.1498  |
| No WL, High SUV       | 35 (2.807, 67.193)                     | WL: High vs Low SUV                   | 0.9516  |
| WL, Low SUV           | 17 (. )                                | SUV Constant                          |         |
| WL, High SUV          | 44 (. )                                | Low SUV: No WL vs WL                  | 0.9683  |
| Total                 | 51 (31.811, 70.189)                    | High SUV: No WL vs WL                 | 0.2835  |
| **Stage 3**           |                                         |                                       |         |
| No WL, Low SUV        | 23 (0, 47.58)                          | No WL: High SUV vs Low SUV            | 0.5958  |
| No WL, High SUV       | 25 (19.454, 30.546)                    | WL: High vs Low SUV                   | 0.7155  |
| WL, Low SUV           | 13 (10.078, 15.922)                    | SUV Constant                          |         |
| WL, High SUV          | 16 (10.726, 21.274)                    | Low SUV: No WL vs WL                  | 0.1704  |
| Total                 | 20 (16.982, 23.018)                    | High SUV: No WL vs WL                 | 0.0201  |
| **Stage 4**           |                                         |                                       |         |
| No WL, Low SUV        | 17 (8.843, 25.157)                     | No WL: High SUV vs Low SUV            | 0.2492  |
| No WL, High SUV       | 12 (8.45, 15.5)                        | WL: High vs Low SUV                   | 0.3559  |
| WL, Low SUV           | 26 (0, 69.626)                         | SUV Constant                          |         |
| WL, High SUV          | 11 (9.165, 12.835)                     | Low SUV: No WL vs WL                  | 0.9043  |
| Total                 | 13 (10.872, 15.128)                    | High SUV: No WL vs WL                 | 0.2089  |
Supplementary Figure 2A-D: Stage Stratified Survival for WL and SUV_{Max} groups (Survival-Optimized Cutpoint)
**Supplementary Table 5: Log-Rank Survival Results by Total Cohort Median SUV Cutpoint**

| Patient Group | Median Survival Time in Months (95% CI) | Groups Compared | P-value |
|---------------|----------------------------------------|-----------------|---------|
| **Stage 1**   |                                        |                 |         |
| No WL, Low SUV| 95 (71.396, 118.604)                   | No WL: High SUV vs Low SUV | 0.9915 |
| No WL, High SUV| 86 (41.364, 130.636)                  | WL: High vs Low SUV   | **0.0175** |
| WL, Low SUV   | 63 (41.804, 84.196)                   | SUV Constant       |         |
| WL, High SUV  | 25 (, 53.053)                         | Low SUV: No WL vs WL | 0.6328 |
| Total         | 73 (53.507, 92.493)                   | High SUV: No WL vs WL | **0.0042** |
| **Stage 2**   |                                        |                 |         |
| No WL, Low SUV| 47 (14.301, 79.699)                   | No WL: High SUV vs Low SUV | 0.6401 |
| No WL, High SUV| 51 (15.723, 86.277)                  | WL: High vs Low SUV  | **0.0614** |
| WL, Low SUV   | 16 (13.060, 18.940)                   | SUV Constant       |         |
| WL, High SUV  | (,)                                   | Low SUV: No WL vs WL | 0.5978 |
| Total         | 51 (31.811, 70.189)                   | High SUV: No WL vs WL | 0.2723 |
| **Stage 3**   |                                        |                 |         |
| No WL, Low SUV| 26 (10.031, 41.969)                   | No WL: High SUV vs Low SUV | 0.8146 |
| No WL, High SUV| 23 (15.924, 30.076)                  | WL: High vs Low SUV  | **0.5097** |
| WL, Low SUV   | 13 (8.617, 17.383)                    | SUV Constant       |         |
| WL, High SUV  | 16 (9.392, 22.608)                    | Low SUV: No WL vs WL | **0.0256** |
| Total         | 20 (16.982, 23.018)                   | High SUV: No WL vs WL | **0.0845** |
| **Stage 4**   |                                        |                 |         |
| No WL, Low SUV| 16 (12.464, 19.536)                   | No WL: High SUV vs Low SUV | 0.2296 |
| No WL, High SUV| 12 (9.027, 14.973)                   | WL: High vs Low SUV  | **0.0565** |
| WL, Low SUV   | 15 (10.305, 19.696)                   | SUV Constant       |         |
| WL, High SUV  | 9 (6.656, 11.344)                     | Low SUV: No WL vs WL | 0.9395 |
| Total         | 13 (10.872, 15.128)                   | High SUV: No WL vs WL | **0.1464** |
Supplementary Figure 3A-D: Stage Stratified Survival for WL and SUV_{Max} Groups (Total Cohort Median Cutpoint of 10.60)

WL and SUV Status at Diagnosis
- No WL, Low SUV
- No WL, High SUV
- WL, Low SUV
- WL, High SUV
- censored
**Supplementary Table 4**: Log-Rank Survival Results for by Stage-Specific Median SUV Cutpoints

| Patient Group       | Median Survival Time in Months (95% CI) | Groups Compared                                      | P-value  |
|---------------------|----------------------------------------|------------------------------------------------------|----------|
| **Stage 1**         |                                        |                                                      |          |
| No WL, Low SUV      | 95 (71.396, 118.604)                   | No WL: High SUV vs Low SUV                           | 0.0364   |
| No WL, High SUV     | 86 (41.364, 130.636)                   | WL: High vs Low SUV                                  | 0.0286   |
| WL, Low SUV         | 63 (41.804, 84.196)                    | SUV Constant                                        |          |
| WL, High SUV        | 25 (0, 53.053)                         | Low SUV: No WL vs WL                                 | 0.6777   |
| Total               | 73 (53.507, 92.493)                    | High SUV: No WL vs WL                                | 0.0559   |
| **Stage 2**         |                                        |                                                      |          |
| No WL, Low SUV      | 47 (14.301, 79.699)                    | No WL: High SUV vs Low SUV                           | 0.9179   |
| No WL, High SUV     | 51 (15.723, 86.277)                    | WL: High vs Low SUV                                  | 0.0614   |
| WL, Low SUV         | 16 (13.060, 18.940)                    | SUV Constant                                        |          |
| WL, High SUV        | (, )                                   | Low SUV: No WL vs WL                                 | 0.5350   |
| Total               | 51 (31.811, 70.189)                    | High SUV: No WL vs WL                                | 0.2261   |
| **Stage 3**         |                                        |                                                      |          |
| No WL, Low SUV      | 26 (10.031, 41.969)                    | No WL: High SUV vs Low SUV                           | 0.8184   |
| No WL, High SUV     | 23 (15.924, 30.076)                    | WL: High vs Low SUV                                  | 0.9047   |
| WL, Low SUV         | 13 (8.617, 17.383)                     | SUV Constant                                        |          |
| WL, High SUV        | 16 (9.392, 22.608)                     | Low SUV: No WL vs WL                                 | 0.0476   |
| Total               | 20 (16.982, 23.018)                    | High SUV: No WL vs WL                                | 0.0416   |
| **Stage 4**         |                                        |                                                      |          |
| No WL, Low SUV      | 16 (12.464, 19.536)                    | No WL: High SUV vs Low SUV                           | 0.4439   |
| No WL, High SUV     | 12 (9.027, 14.973)                     | WL: High vs Low SUV                                  | 0.0565   |
| WL, Low SUV         | 15 (10.305, 19.696)                    | SUV Constant                                        |          |
| WL, High SUV        | 9 (6.656, 11.344)                      | Low SUV: No WL vs WL                                 | 0.8285   |
| Total               | 13 (10.872, 15.128)                    | High SUV: No WL vs WL                                | 0.1129   |
Supplementary Figure 4A-D: Stage Stratified Survival for WL and SUV_{Max} Groups (Cutpoint by Stage-Specific Median)