**Table S1: Cancer entities**

|  |  |
| --- | --- |
| **Cancer diagnosis** | **n (%)** |
| **Solid cancer** | **219 (66)** |
| Breast cancer | 43 (20) |
| Colorectal cancer | 36 (16)  |
| Non-small cell lung cancer | 26 (12) |
| Choroidal melanoma | 25 11)  |
| Oral cavity and salivary glands cancer | 18 (6)  |
| Pancreatic cancer | 14 (6)  |
| Prostate cancer | 11 (5)  |
| Gynecologic cancer  | 10 (5)  |
| Male genitals cancer  | 10 (5)  |
| Urothelial cancer | 8 (4)  |
| Hepatic / biliary tract cancer | 6 (6) |
| Renal cancer | 4 (2)  |
| Mesothelioma  | 2 (<1) |
| Thyroid cancer  | 2 (<1) |
| Cutaneous melanoma |  (<1) 2 |
| Neuroendocrine cancer | 1 (<1)  |
| Lacrimal gland cancer | 1 (<1) |
| **Hematologic cancer** | **114 (34)** |
| Non-Hodgkin lymphoma | 76 (40) |
| Hodgkin lymphoma | 25 (22) |
| Multiple myeloma | 13 (11) |

**Table S2: Coefficient of variation (CV) for repetitive hand grip strength assessments**

|  |  |  |
| --- | --- | --- |
|  | **CV (%)****Baseline: 1st and 2nd day** | **CV (%)** **Baseline and follow-up** **(3-6 months after baseline)** |
| ***Dominant hand only*** |
| First test vs. first test | 11.4 | 22.6 |
| Strongest test vs. strongest test | **6.6** | **21.7** |
| Average of all tests vs. average of all tests | 8.8 | **21.7** |
| ***Non-dominant hand only*** |
| First test vs. first test | 12.0 | **20.3** |
| Strongest test vs. strongest test | 11.8 | 22.4 |
| Average of all tests vs. average of all tests | **9.3** | 21.3 |
| ***Right hand only*** |
| First test vs. first test | 14.1 | 22.0 |
| Strongest test vs. strongest test | **10.1** | **21.8** |
| Average of all tests vs. average of all tests | 10.2 | **21.8** |
| ***Left hand only*** |
| First test vs. first test | **9.1** | 22.4 |
| Strongest test vs. strongest test | **9.1** | 22.9 |
| Average of all tests vs. average of all tests | 9.7 | **21.7** |
| ***Both hands***  |
| Strongest test vs. strongest test | **5.4** | **11.8** |
| Average of R1+L1 vs. average of R1+L1 | 10.6 | 19.8 |
| Average of R1+L1+R2+L2 vs. average of R1+L1+R2+L2 | 8.5 | 20.1 |
| Average of R1+L1+R2+L2+R3+L3 vs. average of R1+L1+R2+L2+R3+L3 | 7.8 | 22.0 |
| Average of R1+L1+R2+L2+R3+L3+R4+L4 vs. average of R1+L1+R2+L2+R3+L3+R4+L4 | 8.4 | 21.1 |

Abbreviations: R1, right hand first try; L1 – left hand first try

**Table S3: Univariable and multivariable Cox survival analyses in patients with cancer**

|  |  |  |  |
| --- | --- | --- | --- |
| **n** | **Parameter** | **Univariable** | **Multivariable\*** |
|  |  | **HR**  | **95% CI**  | ***X*2**  | ***p*-value** | **HR** | **95% CI** | ***p*-value** |
| All 333 patients with cancer (181 deaths, 55%) | Maximal HGS(per -5kg) | 1.16 | 1.08-1.24 | 20.3 | **<0.0001** | 1.18 | 1.09-1.28 | **<0.0001** |
| 148 patients with cachexia(96 deaths, 65%) | Maximal HGS (per -5kg) | 1.15 | 1.04-1.27 | 7.6 | **0.007** | 1.18 | 1.06-1.31 | **0.002** |
| 185 patients without cachexia (86 deaths, 46%)  | Maximal HGS (per -5kg) | 1.12 | 1.03-1.23 | 6.6 | **0.012** | 1.18 | 1.03-1.34 | **0.017** |

\*Sex as strata and adjusted for: age (years), cancer stage III/IV (yes vs. no), cancer entity (solid vs. hematologic), cachexia (yes vs. no), hypertension (yes vs. no), diabetes (yes vs. no), hyperlipidemia (yes vs. no), chronic kidney disease (yes vs. no) and previous ICI treatment (yes vs. no).

**Table S4: Univariable and multivariable 3-, 6-, 12-, and 24-month Cox survival analyses in patients with cancer**

|  |  |  |  |
| --- | --- | --- | --- |
| **n** | **Parameter** | **Univariable** | **Multivariable\*** |
|  | **HR**  | **95% CI**  | ***X*2**  | ***p*-value** | **HR** | **95% CI** | ***p*-value** |
| **3-month survival** |
| All 333 patients with cancer (182 deaths, 55%) | Maximal HGS(per -5kg) | 1.12 | 1.03-1.22 | 7.8 | **0.005** | 1.16 | 1.05-1.29 | **0.004** |
| 148 patients with cachexia (96 deaths, 65%) | Maximal HGS (per -5kg) | 1.11 | 0.97-1.27 | 2.4 | 0.12 | 1.16 | 1.01-1.35 | **0.042** |
| 185 patients without cachexia (86 deaths, 46%)  | Maximal HGS (per -5kg) | 1.11 | 0.99-1.23 | 3.3 | 0.069 | 1.17 | 1.01-1.37 | **0.040** |
| **6-month survival** |  |  |  |  |  |  |  |  |
| All 333 patients with cancer (182 deaths, 55%) | Maximal HGS (per -5kg) | 1.10 | 1.03-1.19 | 7.2 | **0.008** | 1.12 | 1.03-1.23 | **0.013** |
| 148 patients with cachexia(96 deaths, 65%) | Maximal HGS (per -5kg) | 1.08 | 0.97-1.21 | 1.8 | 0.18 | 1.13 | 0.99-1.28 | 0.051 |
| 185 patients without cachexia (86 deaths, 46%)  | Maximal HGS (per -5kg) | 1.08 | 0.98-1.19 | 2.6 | 0.11 | 1.13 | 0.98-1.29 | 0.099 |
| **12-month survival** |  |  |  |  |  |  |  |  |
| All 333 patients with cancer (182 deaths, 55%) | Maximal HGS (per -5kg) | 1.12 | 1.04-1.20 | 10.5 | **0.001** | 1.13 | 1.04-1.23 | **0.004** |
| 148 patients with cachexia(96 deaths, 65%) | Maximal HGS (per -5kg) | 1.09 | 0.98-1.21 | 2.8 | 0.095 | 1.14 | 1.02-1.28 | **0.025** |
| 185 patients without cachexia (86 deaths, 46%)  | Maximal HGS (per -5kg) | 1.10. | 1.00-1.21 | 4.0 | **0.047** | 0.24 | 0.14-0.41 | **<0.001** |
| **24-month survival** |  |  |  |  |  |  |  |  |
| All 333 patients with cancer (182 deaths, 55%) | Maximal HGS (per -5kg) | 1.14 | 1.06-1.22 | 15.2 | **<0.001** | 1.16 | 1.07-1.26 | **<0.001** |
| 148 patients with cachexia(96 deaths, 65%) | Maximal HGS (per -5kg) | 1.11 | 1.00-1.23 | 4.1 | **0.043** | 1.16 | 1.04-1.29 | **0.008** |
| 185 patients without cachexia (86 deaths, 46%)  | Maximal HGS (per -5kg) | 1.12 | 1.02-1.23 | 6.5 | **0.011** | 0.22 | 0.13-0.37 | **<0.001** |

\*Sex as strata and adjusted for: age (years), cancer stage III/IV (yes vs. no), cancer entity (solid vs. hematologic), and cachexia (yes vs. no)

**Table S5: Survival analyses for different hand grip strength assessments**

|  |  |  |
| --- | --- | --- |
|  | **Univariable** | **Multivariable\*** |
| **HR**  | **95% CI**  | ***X*2**  | ***p*-value** | **HR** | **95% CI** | ***p*-value** |
| ***Dominant hand only*** |
| **First test (per -5kg)** |
| All 333 patients with cancer  | 1.14 | 1.07-1.22 | 16.4 | **<0.001** | 1.15 | 1.06-1.24 | **<0.001** |
|  148 patients with cachexia  | 1.14 | 1.03-1.26 | 6.1 | **0.015** | 1.17 | 1.04-1.30 | **0.007** |
|  185 patients without cachexia  | 1.11 | 1.01-1.21 | 5.1 | **0.027** | 1.14 | 1.01-1.29 | **0.034** |
| **Strongest test (per -5kg)** |
| All 333 patients with cancer  | 1 .14 | 1.07-1.22 | 17.3 | **<0.001** | 1.16 | 1.07-1.25 | **<0.001** |
|  148 patients with cachexia | 1.12 | 1.03-1.26 | 6.6 | **0.012** | 1.18 | 1.06-1.31 | **0.002** |
|  185 patients without cachexia | 1.11 | 1.02-1.21 | 5.7 | **0.017** | 1.14 | 1.02-1.29 | **0.026** |
| **Average all tests (per -5kg)** |
| All 333 patients with cancer  | 1.16 | 1.08-1.24 | 18.9 | **<0.001** | 1.17 | 1.08-1.27 | **<0.001** |
|  148 patients with cachexia | 1.16 | 1.04-1.29 | 8.0 | **0.006** | 1.19 | 1.07-1.33 | **0.002** |
|  185 patients without cachexia | 1.12 | 1.02-1.22 | 5.9 | **0.018** | 1.16 | 1.03-1.31 | **0.013** |
| ***Non-dominant hand only*** |
| **First test (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.25 | 19.7 | **<0.001** | 1.20 | 1.10-1.30 | **<0.001** |
|  148 patients with cachexia | 1.16 | 1.04-1.28 | 8.2 | **0.005** | 1.24 | 1.10-1.38 | **<0.001** |
|  185 patients without cachexia | 1.13 | 1.03-1.25 | 6.3 | **0.015** | 1.14 | 0.99-1.29 | 0.054 |
| **Strongest test (per -5kg)** |
| All 333 patients with cancer  | 1 .18 | 1.10-1.27 | 22.7 | **<0.001** | 1.21 | 1.11-1.31 | **<0.001** |
|  148 patients without cachexia | 1.17 | 1.06-1.30 | 9.4 | **0.002** | 1.25 | 1.12-1.39 |  **<0.001** |
|  185 non-cachectic patients  | 1.14 | 1.04-1.26 | 7.6 | **0.006** | 1.14 | 1.02-1.29 | **0.026** |
| **Average all tests (per -5kg)** |
| All 333 patients with cancer  | 1.18 | 1.09-1.27 | 20.5 | **<0.001** | 1.21 | 1.11-1.32 | **<0.001** |
|  148 patients with cachexia | 1.17 | 1.05-1.30 | 8.7 | **0.004** | 1.25 | 1.11-1.40 | **<0.001** |
|  185 patients without cachexia | 1.14 | 1.03-1.26 | 6.5 | **0.012** | 1.15 | 1.01-1.31 | **0.046** |
| ***Right hand only*** |
| **First test (per -5kg)** |
| All 333 patients with cancer  | 1.15 | 1.08-1-23 | 18.5 | **<0.001** | 1.17 | 1.08-1.27 | **<0.001** |
| 148 patients with cachexia | 1.12 | 1.02-1.24 | 5.5 | **0.022** | 1.17 | 1.05-1.31 | **0.006** |
| 185 patients without cachexia | 1.13 | 1.03-1.23 | 6.9 | **0.010** | 1.19 | 1.05-1.34 | **0.008** |
| **Strongest test (per -5kg)** |
| All 333 patients with cancer  | 1.15 | 1.08-1.23 | 19.5 | **<0.001** | 1.18 | 1.09-1.28 | **<0.001** |
| 148 patients with cachexia | 1.13 | 1.02-1.25 | 6.2 | **0.015** | 1.19 | 1.07-1.32 | **0.001** |
| 185 patients without cachexia | 1.13 | 1.03-1.23 | 7.4 | **0.008** | 1.18 | 1.05-1.33 | **0.007** |
| **Average all tests (per -5kg)** |
| All 333 patients with cancer  | 1.16 | 1.08-1.24 | 19.7 | **<0.001** | 1.19 | 1.10-1.29 | **<0.001** |
| 148 patients with cachexia | 1.14 | 1.03-1.26 | 6.9 | **0.010** | 1.20 | 1.07-1.33 | **0.001** |
| 185 patients without cachexia | 1.13 | 1.03-1.24 | 7.1 | **0.010** | 1.19 | 1.05-1.35 | **0.005** |
| ***Left hand only*** |
| **First test (per -5kg)** |
| All 333 patients with cancer  | 1.16 | 1.08-1.24 | 17.4 | **<0.001** | 1.17 | 1.08-1.27 | **<0.001** |
|  148 patients with cachexia | 1.17 | 1.06-1.30 | 9.2 | **0.003** | 1.23 | 1.10-1.38 | **<0.001** |
|  185 patients without cachexia | 1.11 | 1.01-1.22 | 4.4 | **0.039** | 1.09 | 0.96-1.24 | 0.17 |
| **Strongest test (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.25 | 20.1 | **<0.001** | 1.18 | 1.09-1.28 | **<0.001** |
|  148 patients with cachexia | 1.18 | 1.06-1.31 | 9.9 | **0.002** | 1.23 | 1.11-1.38 | **<0.001** |
|  185 patients without cachexia | 1.12 | 1.02-1.23 | 5.6 | **0.020** | 1.11 | 0.98-1.26 | 0.10 |
| **Average all tests (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.25 | 18.6 | **<0.001** | 1.18 | 1.091.29 | **<0.001** |
|  148 patients with cachexia | 1.18 | 1.06-1.31 | 9.3 | **0.003** | 1.24 | 1.10-1.38 | **<0.001** |
|  185 patients without cachexia | 1.12 | 1.01-1.24 | 5.1 | **0.027** | 1.11 | 0.99-1.27 | 0.11 |
| ***Both hands*** |
| **Strongest test (per -5kg)** |
| All 333 patients with cancer  | 1.16 | 1.08-1.24 | 20.3 | **<0.0001** | 1.19 | 1.10-1.28 | **<0.0001** |
|  148 patients with cachexia | 1.15 | 1.04-1.27 | 7.6 | **0.007** | 1.20 | 1.08-1.33 | **0.001** |
|  185 patients without cachexia | 1.12 | 1.03-1.23 | 6.6 | **0.012** | 1.18 | 1.04-1.34 | **0.010** |
| **Average R1+L1 tests (per -5kg)** |
| All 333 patients with cancer  | 1.16 | 1.08-1.25 | 18.9 | **<0.001** | 1.19 | 1.09-1.30 | **<0.001** |
|  148 cachectic patients  | 1.15 | 1.04-1.28 | 7.5 | **0.007** | 1.21 | 1.08-1.36 | **0.001** |
|  185 patients without cachexia | 1.13 | 1.02-1.24 | 6.0 | **0.017** | 1.16 | 1.02-1.33 | **0.030** |
| **Average R1+L1+R2+L2 tests (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.25 | 19.8 | **<0.001** | 1.20 | 1.09-1.30 | **<0.001** |
|  148 patients with cachexia | 1.16 | 1.05-1.29 | 8.4 | **0.005** | 1.22 | 1.09-1.37 | **<0.001** |
|  185 patients without cachexia | 1.13 | 1.02-1.25 | 6.q | **0.016** | 1.16 | 1.02-1.33 | **0.028** |
| **Average R1+L1+R2+L2+R3+L3 tests (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.25 | 19.7 | **<0.001** | 1.20 | 1.10-1.30 | **<0.001** |
|  148 patients with cachexia | 1.16 | 1.05-1.29 | 8.4 | **0.005** | 1.22 | 1.09-1.37 | **<0.001** |
|  185 patients without cachexia | 1.13 | 1.02-1.25 | 6.1 | **0.015** | 1.17 | 1.02-1.34 | **0.025** |
| **Average R1+L1+R2+L2+R3+L3+R4+L4 tests (per -5kg)** |
| All 333 patients with cancer  | 1.17 | 1.09-1.26 | 20.5 | **<0.001** | 1.20 | 1.10-1.31 | **<0.001** |
|  148 patients with cachexia | 1.17 | 1.05-1.30 | 8.6 | **0.004** | 1.22 | 1.091.36 | **<0.001** |
|  185 patients without cachexia | 1.13 | 1.03-1.25 | 6.5 | **0.013** | 1.18 | 1.03-1.35 | **0.019** |

\*Sex as strata and adjusted for: age (years), cancer stage III/IV (yes vs. no), cancer entity (solid vs. hematologic), and cachexia (yes vs. no)

Abbreviations: R, right, L, left.

**Table S6A: Survival predictive power of hand grip strength in 170 female patients with cancer (death/event in n=91, 53%)**

|  |
| --- |
| Results of receiver operator curve analyses for HGS is presented in relation to follow-up periods between 1 and 24 months. |
| The "best" prognosticators for survival status were considered to be those that gave the highest product of sensitivity and specificity.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time (months)** | **Best cut-off** | **AUC** | **p-value** | **Sensitivity** | **Specificity** | **Product****sensitivity \* specificity** |
| **Overall survival** | **25.1** | **0.591** | **0.041** | **0.544** | **0.626** | **0.341** |
| 1 | 22.6 | 0.579 | 0.22 | 0.605 | 0.565 | 0.342 |
| 2 | 25.1 | 0.490 | 0.86 | 0.462 | 0.579 | 0.268 |
| 3 | 24.2 | 0.507 | 0.88 | 0.529 | 0.510 | 0.270 |
| 4 | 22.6 | 0.490 | 0.84 | 0.589 | 0.431 | 0.254 |
| 6 | 22.6 | 0.508 | 0.86 | 0.598 | 0.441 | 0.264 |
| 12 | 25.1 | 0.531 | 0.49 | 0.495 | 0.595 | 0.294 |
| 18 | 25.1 | 0.552 | 0.24 | 0.518 | 0.612 | 0.317 |
| 24 | 25.1 | 0.551 | 0.25 | 0.512 | 0.605 | 0.310 |

  |

**Table S6B: Survival predictive power of hand grip strength in 163 male patients with cancer (death/event in n=91, 56%)**

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time (months)** | **Best cut-off** | **AUC** | **p-value** | **Sensitivity** | **Specificity** | **Product****sensitivity \* specificity** |
| **Overall survival** | **40.2** | **0.712** | **<0.0001** | **0.694** | **0.681** | **0.473** |
| 1 | 38.3 | 0.592 | 0.17 | 0.567 | 0.727 | 0.413 |
| 2 | 39.8 | 0.601 | 0.044 | 0.573 | 0.717 | 0.411 |
| 3 | 39.8 | 0.621 | 0.012 | 0.589 | 0.696 | 0.410 |
| 4 | 39.8 | 0.604 | 0.025 | 0.580 | 0.651 | 0.378 |
| 6 | 40.2 | 0.595 | 0.037 | 0.582 | 0.639 | 0.372 |
| 12 | 40.2 | 0.636 | 0.003 | 0.630 | 0.659 | 0.415 |
| 18 | 40.2 | 0.669 | <0.0001 | 0.649 | 0.663 | 0.430 |
| 24 | 40.2 | 0.685 | <0.0001 | 0.667 | 0.670 | 0.447 |

 |