**Supplemental material**

Supplemental Table 1. Spearman Correlations for sarcopenia and fitness measures with the EQ-5D VAS

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| **Characteristic** | **N** | **Spearman Correlation Coefficient** | ***P-value*** |
| D3Cr muscle mass (kg) | 824 | 0.02 | 0.532 |
| D3Cr muscle mass/wgt | 824 | 0.12 | <.001 |
| Total thigh muscle volume (L) | 824 | 0.04 | 0.272 |
| Stair climb time (seconds) | 843 | -0.20 | <.001 |
| Stair climb average functional power (Watts) | 836 | 0.06 | 0.061 |
| Stairs ascended per second (stairs/sec) | 848 | 0.16 | <.001 |
| Chair Stands per 10 sec (chair stands/10 sec) | 874 | 0.19 | <.001 |
| SPPB score (0-12) | 874 | 0.20 | <.001 |
| Walk speed from 400m walk (m/s) | 875 | 0.21 | <.001 |
| Total 400m walk time (sec) | 875 | -0.21 | <.001 |
| VO2peak (mL/kg/min) | 816 | 0.19 | <.001 |
| VO2peak (without weight adjustment) (mL/min) | 816 | 0.06 | 0.090 |
| 4m walk speed (m/s) | 875 | 0.20 | <.001 |
| Narrow walk speed in m/s using best time(calc) | 798 | 0.14 | <.001 |
| Maximum grip strength (kg) | 869 | 0.04 | 0.203 |
| RPE at 1-RM | 840 | 0.01 | 0.768 |
| Leg Strength: 1 Repetition Maximum | 840 | 0.09 | 0.008 |
| Highest peak power across 40-70% of 1RM (*Watts)* | 840 | 0.06 | 0.090 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 840 | 0.13 | <.001 |

Supplemental Table 2. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Mobility in men.

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| **Characteristic** | **No problem in “walking about”**  **N = 300** | **At least some problem in “walking about”**  **N = 56** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.32 ± 0.07 | 0.30 ± 0.06 | 0.006 |
| Total thigh muscle volume (L) | 11.25 ± 1.62 | 11.11 ± 1.55 | 0.576 |
| Stair climb time (seconds) | 24.87 ± 5.58 | 29.34 ± 7.89 | <.001 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.12 ± 1.20 | 3.32 ± 1.67 | <.001 |
| SPPB score (0-12) | 10.48 ± 1.53 | 9.14 ± 2.24 | <.001 |
| Walk speed from 400m walk (m/s) | 1.11 ± 0.16 | 0.95 ± 0.18 | <.001 |
| VO2peak (mL/kg/min) | 22.73 ± 4.92 | 19.80 ± 4.55 | <.001 |
| 4m walk speed (m/s) | 1.08 ± 0.19 | 0.97 ± 0.20 | <.001 |
| Narrow walk speed (m/s) | 1.06 ± 0.23 | 0.95 ± 0.26 | 0.005 |
| Maximum grip strength (kg) | 36.99 ± 8.08 | 37.30 ± 8.12 | 0.790 |
| Leg Strength: 1 Repetition Maximum | 219.68 ± 59.79 | 203.73 ± 53.14 | 0.122 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 5.83 ± 1.78 | 4.99 ± 1.72 | 0.002 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 3. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Mobility in women.

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| **Characteristic** | **No problem in “walking about”**  **N = 445** | **At least some problem in “walking about”**  **N = 74** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.27 ± 0.06 | 0.25 ± 0.06 | 0.001 |
| Total thigh muscle volume (L) | 7.48 ± 1.09 | 7.23 ± 1.11 | 0.094 |
| Stair climb time (seconds) | 26.40 ± 6.86 | 32.74 ± 10.79 | <.001 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.03 ± 1.15 | 3.32 ± 1.25 | <.001 |
| SPPB score (0-12) | 10.30 ± 1.60 | 9.18 ± 2.03 | <.001 |
| Walk speed from 400m walk (m/s) | 1.04 ± 0.17 | 0.91 ± 0.18 | <.001 |
| VO2peak (mL/kg/min) | 18.98 ± 4.10 | 17.06 ± 3.88 | <.001 |
| 4m walk speed (m/s) | 1.03 ± 0.20 | 0.94 ± 0.20 | <.001 |
| Narrow walk speed (m/s) | 0.98 ± 0.23 | 0.85 ± 0.22 | <.001 |
| Maximum grip strength (kg) | 23.41 ± 5.45 | 22.14 ± 6.17 | 0.070 |
| Leg Strength: 1 Repetition Maximum | 142.51 ± 37.81 | 131.02 ± 32.72 | 0.035 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 4.02 ± 1.17 | 3.34 ± 1.16 | <.001 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 4. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Usual activities in men.

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| **Characteristic** | **No problem with performing usual activities (work, housework, family, leisure, etc.)**  **N = 326** | **At least some problem with performing usual activities (work, housework, family, leisure, etc.)**  **N = 30** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.32 ± 0.07 | 0.30 ± 0.07 | 0.051 |
| Total thigh muscle volume (L) | 11.26 ± 1.64 | 10.82 ± 1.15 | 0.159 |
| Stair climb time (seconds) | 25.25 ± 5.91 | 28.78 ± 8.20 | 0.018 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.03 ± 1.32 | 3.64 ± 1.26 | 0.125 |
| SPPB score (0-12) | 10.33 ± 1.69 | 9.60 ± 1.99 | 0.031 |
| Walk speed from 400m walk (m/s) | 1.09 ± 0.16 | 0.98 ± 0.19 | <.001 |
| VO2peak (mL/kg/min) | 22.48 ± 5.04 | 20.14 ± 3.61 | 0.021 |
| 4m walk speed (m/s) | 1.07 ± 0.20 | 0.97 ± 0.20 | 0.013 |
| Narrow walk speed (m/s) | 1.06 ± 0.23 | 0.89 ± 0.28 | 0.001 |
| Maximum grip strength (kg) | 37.07 ± 8.07 | 36.73 ± 8.21 | 0.828 |
| Leg Strength: 1 Repetition Maximum | 217.79 ± 58.50 | 210.33 ± 66.76 | 0.377 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 5.74 ± 1.79 | 5.27 ± 1.78 | 0.263 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 5. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Usual activities in women.

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| **Characteristic** | **No problem with performing usual activities (work, housework, family, leisure, etc.)**  **N = 465** | **At least some problem with performing usual activities (work, housework, family, leisure, etc.)**  **N = 53** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.27 ± 0.06 | 0.25 ± 0.05 | 0.030 |
| Total thigh muscle volume (L) | 7.49 ± 1.09 | 7.06 ± 1.10 | 0.010 |
| Stair climb time (seconds) | 26.61 ± 7.38 | 33.01 ± 9.31 | <.001 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.02 ± 1.14 | 3.26 ± 1.27 | <.001 |
| SPPB score (0-12) | 10.25 ± 1.63 | 9.21 ± 2.04 | <.001 |
| Walk speed from 400m walk (m/s) | 1.04 ± 0.17 | 0.89 ± 0.17 | <.001 |
| VO2peak (mL/kg/min) | 18.99 ± 4.16 | 16.42 ± 2.68 | <.001 |
| 4m walk speed (m/s) | 1.04 ± 0.20 | 0.90 ± 0.17 | <.001 |
| Narrow walk speed (m/s) | 0.97 ± 0.22 | 0.85 ± 0.27 | <.001 |
| Maximum grip strength (kg) | 23.51 ± 5.53 | 20.75 ± 5.47 | <.001 |
| Leg Strength: 1 Repetition Maximum | 143.02 ± 37.01 | 123.65 ± 36.02 | <.001 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 4.00 ± 1.17 | 3.36 ± 1.23 | <.001 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 6. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Pain and discomfort in men.

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| **Characteristic** | **No pain or discomfort**  **N = 183** | **At least some pain or discomfort**  **N = 172** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.32 ± 0.06 | 0.32 ± 0.07 | 0.159 |
| Total thigh muscle volume (L) | 11.32 ± 1.48 | 11.12 ± 1.74 | 0.176 |
| Stair climb time (seconds) | 24.68 ± 5.76 | 26.48 ± 6.51 | 0.002 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.25 ± 1.20 | 3.73 ± 1.39 | <.001 |
| SPPB score (0-12) | 10.63 ± 1.45 | 9.89 ± 1.92 | <.001 |
| Walk speed from 400m walk (m/s) | 1.12 ± 0.16 | 1.04 ± 0.17 | <.001 |
| VO2peak (mL/kg/min) | 22.92 ± 5.02 | 21.58 ± 4.85 | 0.013 |
| 4m walk speed (m/s) | 1.12 ± 0.20 | 1.01 ± 0.18 | <.001 |
| Narrow walk speed (m/s) | 1.08 ± 0.23 | 1.01 ± 0.23 | 0.006 |
| Maximum grip strength (kg) | 38.08 ± 7.88 | 35.91 ± 8.16 | 0.012 |
| Leg Strength: 1 Repetition Maximum | 224.81 ± 58.09 | 208.87 ± 59.29 | 0.021 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 5.96 ± 1.71 | 5.43 ± 1.85 | 0.004 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 7. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Pain and discomfort in women.

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| **Characteristic** | **No pain or discomfort**  **N = 257** | **At least some pain or discomfort**  **N = 262** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.27 ± 0.06 | 0.26 ± 0.06 | 0.087 |
| Total thigh muscle volume (L) | 7.53 ± 1.03 | 7.36 ± 1.16 | 0.037 |
| Stair climb time (seconds) | 25.67 ± 6.00 | 28.87 ± 9.03 | <.001 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.10 ± 1.21 | 3.77 ± 1.15 | 0.001 |
| SPPB score (0-12) | 10.39 ± 1.58 | 9.89 ± 1.80 | 0.001 |
| Walk speed from 400m walk (m/s) | 1.06 ± 0.17 | 0.98 ± 0.17 | <.001 |
| VO2peak (mL/kg/min) | 19.14 ± 4.10 | 18.35 ± 4.10 | 0.011 |
| 4m walk speed (m/s) | 1.07 ± 0.21 | 0.98 ± 0.19 | <.001 |
| Narrow walk speed (m/s) | 1.00 ± 0.23 | 0.92 ± 0.22 | <.001 |
| Maximum grip strength (kg) | 24.33 ± 5.16 | 22.14 ± 5.75 | <.001 |
| Leg Strength: 1 Repetition Maximum | 145.55 ± 37.64 | 136.31 ± 36.55 | 0.005 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 4.19 ± 1.16 | 3.67 ± 1.17 | <.001 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 8. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Anxiety and depression in men.

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| **Characteristic** | **Not anxious or depressed**  **N = 322** | **At least moderately anxious or depressed**  **N = 34** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.32 ± 0.07 | 0.31 ± 0.05 | 0.447 |
| Total thigh muscle volume (L) | 11.23 ± 1.60 | 11.16 ± 1.76 | 0.766 |
| Stair climb time (seconds) | 25.35 ± 6.13 | 27.37 ± 6.47 | 0.058 |
| Chair Stands per 10 sec (chair stands/10 sec) | 4.05 ± 1.28 | 3.46 ± 1.57 | 0.012 |
| SPPB score (0-12) | 10.36 ± 1.65 | 9.47 ± 2.23 | 0.021 |
| Walk speed from 400m walk (m/s) | 1.09 ± 0.17 | 1.04 ± 0.17 | 0.079 |
| VO2peak (mL/kg/min) | 22.50 ± 5.00 | 20.08 ± 4.14 | 0.009 |
| 4m walk speed (m/s) | 1.07 ± 0.20 | 0.99 ± 0.18 | 0.018 |
| Narrow walk speed (m/s) | 1.05 ± 0.24 | 0.98 ± 0.19 | 0.147 |
| Maximum grip strength (kg) | 37.26 ± 7.99 | 34.97 ± 8.64 | 0.116 |
| Leg Strength: 1 Repetition Maximum | 217.77 ± 59.04 | 212.16 ± 59.66 | 0.772 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 5.75 ± 1.79 | 5.29 ± 1.79 | 0.241 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.

Supplemental Table 9. Sex specific association between the observed sarcopenia metrics, VO2 at peak and an EQ-5D subcomponent, Anxiety and depression in women.

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| **Characteristic** | **Not anxious or depressed**  **N = 447** | **At least moderately anxious or depressed**  **N = 71** | ***P-value*** |
| D3Cr muscle mass/wgt | 0.27 ± 0.06 | 0.27 ± 0.05 | 0.872 |
| Total thigh muscle volume (L) | 7.46 ± 1.12 | 7.33 ± 0.96 | 0.351 |
| Stair climb time (seconds) | 26.92 ± 7.61 | 29.59 ± 8.87 | 0.004 |
| Chair Stands per 10 sec (chair stands/10 sec) | 3.98 ± 1.18 | 3.65 ± 1.20 | 0.033 |
| SPPB score (0-12) | 10.19 ± 1.69 | 9.83 ± 1.84 | 0.113 |
| Walk speed from 400m walk (m/s) | 1.03 ± 0.18 | 0.98 ± 0.16 | 0.022 |
| VO2peak (mL/kg/min) | 18.81 ± 4.19 | 18.31 ± 3.46 | 0.514 |
| 4m walk speed (m/s) | 1.02 ± 0.21 | 1.01 ± 0.20 | 0.782 |
| Narrow walk speed (m/s) | 0.97 ± 0.23 | 0.93 ± 0.23 | 0.211 |
| Maximum grip strength (kg) | 23.31 ± 5.43 | 22.77 ± 6.41 | 0.456 |
| Leg Strength: 1 Repetition Maximum | 141.63 ± 37.77 | 137.18 ± 34.87 | 0.463 |
| Highest peak power across 40-70% of 1RM standardized to weight (*Watts/wgt)* | 3.97 ± 1.20 | 3.70 ± 1.10 | 0.070 |

Data shown as mean ± SD  
P-values for continuous variables from a t-test for normally distributed data, a Wilcoxon rank-sum test for skewed data.