**Additional material for paper “MRI-based anatomical characterisation of lower-limb muscles in older women”**

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Subject code | Height [cm] | Weight [kg] | BMI | Age [year] |
| Subject 1 | **MC17** | 164.0 | 61.4 | 22.8 | 70.5 |
| Subject 2 | **MC18** | 156.0 | 75.8 | 31.1 | 64.1 |
| Subject 3 | **MC19** | 160.5 | 78.6 | 30.5 | 73.0 |
| Subject 4 | **MC20** | 158.5 | 69.4 | 27.6 | 67.4 |
| Subject 5 | **MC22** | 160.0 | 66.3 | 25.9 | 72.2 |
| Subject 6 | **MC24** | 160.5 | 58.8 | 22.8 | 65.3 |
| Subject 7 | **MC25** | 163.5 | 56.8 | 21.2 | 74.6 |
| Subject 8 | **MC26** | 158.5 | 64.2 | 25.6 | 68.5 |
| Subject 9 | **MC27** | 155.0 | 67.0 | 27.9 | 61.8 |
| Subject 10 | **MC28** | 154.0 | 60.0 | 25.3 | 83.0 |
| Subject 11 | **MC29** | 160.4 | 78.0 | 30.3 | 59.1 |
| Mean |  | 159.2 | 66.9 | 26.5 | 69.0 |
| SD |  | 3.2 | 7.7 | 3.4 | 6.7 |

Table – Anthropometric data

**Inter-operator repeatability of muscle volumes [cm3]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Muscles | Subject 1 | Subject 2 | Subject 3 | Max CoV |
| **OP1** | **OP2** | **OP3** | **OP1** | **OP2** | **OP3** | **OP1** | **OP2** | **OP3** |
| Adductor brevis | 65.5 | 48.3 | 55.4 | 48.2 | 59.6 | 56 | 61.4 | 79.1 | 50.3 | 22.8 |
| Adductor longus | 75.9 | 95.6 | 108.7 | 66.8 | 78.7 | 71.7 | 81.1 | 91.6 | 77.6 | 17.7 |
| Adductor magnus | 291.2 | 316.1 | 294.7 | 313.3 | 329.4 | 352.3 | 322.2 | 352.2 | 346.8 | 5.9 |
| Biceps femoris short head | 51.5 | 42.2 | 46.9 | 87.2 | 82.7 | 84.9 | 61.9 | 60.5 | 61.2 | 9.9 |
| Biceps femoris long head | 131.7 | 143.7 | 143.2 | 119.6 | 135 | 124.8 | 110.7 | 120.8 | 104 | 7.6 |
| Gastrocnemius lateralis | 96.5 | 99.5 | 95.8 | 59.9 | 60.3 | 65 | 97.8 | 102.8 | 99.4 | 4.6 |
| Gastrocnemius medialis | 179 | 187.7 | 184.5 | 139.2 | 146.5 | 149.2 | 147.5 | 158 | 160.6 | 4.5 |
| Gluteus maximus | 561.4 | 617.1 | 592.2 | 409.1 | 447.4 | 469.9 | 574.1 | 559.7 | 577.3 | 7 |
| Gluteus medius | 236.8 | 257.8 | 271.7 | 208.7 | 220.1 | 255.1 | 256.7 | 293.9 | 262.7 | 10.6 |
| Gluteus minimus | 62.1 | 75.3 | 67.1 | 56.9 | 64.5 | 75.9 | 33.6 | 42.9 | 37.3 | 14.5 |
| Gracilis | 48.1 | 52.7 | 57.3 | 40.6 | 40.4 | 39.3 | 43.3 | 52.5 | 38.2 | 16.2 |
| Iliacus | 109 | 119.5 | 123.7 | 123.4 | 119.2 | 138.4 | 117.1 | 112.1 | 125.6 | 7.9 |
| Peroneus brevis | 18.6 | 20.8 | 43.3 | 32.7 | 29.9 | 31.8 | 33.6 | 42.8 | 55.4 | 49.6 |
| Peroneus longus | 37.6 | 42.9 | 14.3 | 25.4 | 24 | 21.5 | 39.4 | 36.4 | 23.2 | 48.1 |
| Psoas | 97.1 | 108.6 | 99.4 | 70.1 | 78.7 | 76.1 | 51.6 | 57.6 | 49.7 | 7.8 |
| Rectus femoris | 103.7 | 101.1 | 110.1 | 123.6 | 135.7 | 138.8 | 132.3 | 152.2 | 144.4 | 7 |
| Sartorius | 77.7 | 90.2 | 95.1 | 69 | 77.2 | 71.7 | 96.9 | 98.5 | 88.9 | 10.2 |
| Semimembranosus | 165.2 | 163.8 | 167 | 157 | 167.4 | 163.1 | 88.2 | 108.5 | 94.5 | 10.7 |
| Semitendinosus | 81.8 | 92.5 | 87.9 | 118.5 | 130.6 | 120 | 109.4 | 119.5 | 104.5 | 6.9 |
| Soleus | 346.3 | 373 | 369 | 297.3 | 345.1 | 347.9 | 338.1 | 341 | 347.1 | 8.6 |
| Tensor fasciae latae | 33.9 | 43.2 | 41.4 | 28.9 | 32.5 | 33.3 | 41.3 | 48.5 | 45.1 | 12.5 |
| Tibialis anterior | 110.6 | 100.6 | 116.6 | 82.2 | 120.9 | 138.5 | 83.1 | 119.1 | 88.6 | 25.3 |
| Tibialis posterior | 76.2 | 70.9 | 81.4 | 60.9 | 72.4 | 77.4 | 65.8 | 81.1 | 68.4 | 12 |
| Vastus intermedius | 251.6 | 266.3 | 272.4 | 233.9 | 250.2 | 233.9 | 199.6 | 223.5 | 225.1 | 6.6 |
| Vastus lateralis | 321.1 | 326 | 326.4 | 286.4 | 348.2 | 328.3 | 303 | 335.4 | 339.2 | 9.8 |
| Vastus medialis | 182 | 195.9 | 196.2 | 208.1 | 206.8 | 206.5 | 205.6 | 207 | 201.2 | 4.2 |

Table 2 – Right-limb muscle volumes segmented by three operators for three randomly selected subjects. Maximum coefficient of variation (CoV) across the three datasets is reported.

**Intra-operator repeatability of muscle volumes [cm3]**

|  |  |  |
| --- | --- | --- |
| Muscles | Subject 1 | CoV |
| **REP1** | **REP2** | **REP3** |
| Adductor brevis | 54.7 | 47.7 | 54.2 | 7.5 |
| Adductor longus | 73.1 | 81.7 | 74.6 | 6.0 |
| Adductor magnus | 362.3 | 342.0 | 339.8 | 3.6 |
| Biceps femoris caput breve | 54.8 | 57.4 | 60.2 | 4.7 |
| Gastrocnemius lateralis | 71.4 | 79.8 | 80.0 | 6.4 |
| Gastrocnemius medialis | 114.1 | 126.1 | 129.6 | 6.6 |
| Gluteus maximus | 626.2 | 616.8 | 641.9 | 2.0 |
| Gluteus medius | 238.5 | 260.5 | 262.9 | 5.3 |
| Gluteus minimus | 37.7 | 58.6 | 52.0 | 21.6 |
| Gracilis | 45.0 | 45.6 | 43.3 | 2.7 |
| Iliacus | 103.5 | 109.0 | 105.8 | 2.6 |
| Peroneus brevis | 28.8 | 33.3 | 32.4 | 7.6 |
| Peroneus longus | 34.7 | 32.5 | 40.1 | 10.9 |
| Rectus femoris | 106.4 | 114.8 | 118.9 | 5.6 |
| Sartorius | 91.8 | 89.1 | 92.5 | 2.0 |
| Semimembranosus | 80.9 | 92.3 | 90.2 | 6.9 |
| Semitendinosus | 115.8 | 108.1 | 104.6 | 5.2 |
| Soleus | 279.0 | 277.4 | 250.6 | 5.9 |
| Tensor fasciae latae | 49.4 | 49.9 | 50.5 | 1.1 |
| Tibialis anterior | 78.7 | 77.7 | 84.0 | 4.2 |
| Tibialis posterior | 66.8 | 72.9 | 79.8 | 8.9 |
| Vastus intermedius | 165.9 | 162.4 | 163.3 | 1.1 |
| Vastus lateralis | 312.2 | 310.3 | 317.8 | 1.2 |

Table - Right-limb muscle volumes segmented three times by one operator. Coefficient of variation (CoV) across the three repetitions is reported.

**Muscle volumes [cm3]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Muscle | Subject 1 | Subject 2 | Subject 3 | Subject 4 | Subject 5 | Subject 6 | Subject 7 | Subject 8 | Subject 9 | Subject 10 | Subject 11 |  |  |  |
| **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Mean** | **SD** | **CoV** |
| Adductor brevis | 61 | 59 | 62 | 50 | 78 | 75 | 47 | 48 | 59 | 53 | 69 | 72 | 58 | 48 | 39 | 42 | 57 | 66 | 54 | 61 | 71 | 67 | 59 | 11 | 18 |
| Adductor longus | 70 | 62 | 83 | 84 | 60 | 80 | 72 | 70 | 69 | 76 | 117 | 101 | 66 | 67 | 70 | 73 | 79 | 76 | 92 | 81 | 90 | 88 | 78 | 13 | 17 |
| Adductor magnus | 448 | 449 | 396 | 336 | 379 | 349 | 317 | 318 | 324 | 321 | 370 | 297 | 324 | 313 | 294 | 229 | 336 | 291 | 282 | 322 | 498 | 402 | 345 | 63 | 18 |
| Biceps femoris short head | 52 | 43 | 41 | 37 | 73 | 70 | 31 | 40 | 51 | 68 | 60 | 52 | 81 | 87 | 35 | 40 | 57 | 52 | 69 | 62 | 77 | 58 | 56 | 16 | 28 |
| Biceps femoris long head | 128 | 116 | 123 | 133 | 122 | 134 | 93 | 85 | 78 | 55 | 96 | 104 | 119 | 120 | 90 | 86 | 135 | 132 | 95 | 111 | 140 | 136 | 111 | 23 | 21 |
| Gluteus maximus | 606 | 583 | 786 | 736 | 654 | 607 | 474 | 434 | 646 | 587 | 469 | 454 | 406 | 409 | 515 | 441 | 618 | 561 | 593 | 574 | 777 | 750 | 576 | 118 | 20 |
| Gluteus medius | 251 | 198 | 257 | 257 | 284 | 297 | 196 | 201 | 237 | 215 | 233 | 268 | 197 | 209 | 183 | 166 | 251 | 237 | 285 | 257 | 419 | 346 | 247 | 57 | 23 |
| Gracilis | 36 | 37 | 76 | 58 | 43 | 55 | 17 | 32 | 45 | 28 | 54 | 53 | 48 | 41 | 34 | 27 | 48 | 48 | 38 | 43 | 68 | 68 | 45 | 14 | 32 |
| Iliacus | 82 | 95 | 127 | 130 | 107 | 109 | 101 | 106 | 110 | 105 | 111 | 102 | 127 | 123 | 105 | 95 | 118 | 109 | 124 | 117 | 165 | 136 | 114 | 17 | 15 |
| Rectus femoris | 115 | 116 | 69 | 128 | 112 | 115 | 94 | 103 | 113 | 101 | 151 | 158 | 127 | 124 | 141 | 118 | 113 | 104 | 125 | 132 | 157 | 131 | 120 | 21 | 17 |
| Sartorius | 60 | 52 | 93 | 76 | 105 | 72 | 64 | 54 | 85 | 79 | 91 | 82 | 63 | 69 | 51 | 51 | 86 | 78 | 102 | 97 | 166 | 152 | 83 | 30 | 36 |
| Semimembranosus | 122 | 124 | 151 | 149 | 126 | 149 | 104 | 116 | 98 | 86 | 108 | 115 | 154 | 157 | 107 | 104 | 154 | 165 | 99 | 88 | 125 | 123 | 124 | 24 | 19 |
| Semitendinosus | 72 | 87 | 142 | 155 | 93 | 82 | 95 | 103 | 102 | 84 | 140 | 126 | 101 | 118 | 63 | 57 | 89 | 82 | 89 | 109 | 137 | 129 | 103 | 27 | 26 |
| Tensor fasciae latae | 46 | 34 | 53 | 52 | 50 | 52 | 17 | 22 | 34 | 32 | 33 | 32 | 36 | 29 | 58 | 69 | 36 | 34 | 58 | 41 | 46 | 52 | 42 | 13 | 31 |
| Vastus intermedius | 222 | 237 | 353 | 342 | 295 | 305 | 256 | 258 | 258 | 264 | 283 | 243 | 277 | 234 | 256 | 251 | 272 | 252 | 230 | 200 | 329 | 255 | 267 | 38 | 14 |
| Vastus lateralis | 304 | 294 | 393 | 365 | 352 | 309 | 293 | 286 | 245 | 257 | 307 | 296 | 327 | 286 | 260 | 228 | 350 | 321 | 328 | 303 | 499 | 394 | 318 | 59 | 19 |
| Vastus medialis | 167 | 172 | 208 | 183 | 268 | 243 | 224 | 260 | 203 | 232 | 241 | 223 | 226 | 208 | 220 | 187 | 209 | 182 | 178 | 206 | 267 | 198 | 214 | 30 | 14 |
| Gastrocnemius lateralis | 87 | 81 | 85 | 66 | 80 | 56 | 67 | 62 | 48 | 61 | 64 | 68 | 64 | 60 | 86 | 83 | 69 | 96 | 81 | 98 | 97 | 100 | 75 | 15 | 20 |
| Gastrocnemius medialis | 141 | 146 | 185 | 178 | 176 | 189 | 132 | 160 | 131 | 146 | 134 | 144 | 157 | 139 | 143 | 140 | 188 | 179 | 123 | 148 | 226 | 228 | 161 | 29 | 18 |
| Peroneus brevis | 40 | 30 | 41 | 36 | 42 | 36 | 34 | 57 | 29 | 28 | 33 | 42 | 39 | 33 | 34 | 24 | 25 | 19 | 41 | 34 | 39 | 34 | 35 | 8 | 23 |
| Soleus | 306 | 286 | 401 | 369 | 406 | 376 | 323 | 368 | 258 | 277 | 286 | 291 | 305 | 297 | 267 | 264 | 360 | 346 | 328 | 338 | 503 | 516 | 340 | 70 | 21 |
| Tibialis anterior | 83 | 100 | 104 | 96 | 94 | 102 | 79 | 88 | 89 | 85 | 78 | 76 | 74 | 82 | 111 | 100 | 110 | 111 | 89 | 83 | 136 | 114 | 95 | 15 | 16 |
| Tibialis posterior | 66 | 72 | 87 | 81 | 91 | 84 | 89 | 84 | 58 | 57 | 73 | 76 | 56 | 61 | 87 | 78 | 68 | 76 | 73 | 66 | 109 | 111 | 77 | 15 | 19 |

Table 4 – Right and left volume of the muscles segmented in the lower limbs of the eleven subjects enrolled in the study Mean, standard deviation (SD) and coefficient of variation (CoV) are reported .

**Muscle length [mm]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Muscle | Subject 1 | Subject 2 | Subject 3 | Subject 4 | Subject 5 | Subject 6 | Subject 7 | Subject 8 | Subject 9 | Subject 10 | Subject 11 |  |  |  |
| **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Right** | **Left** | **Mean** | **SD** | **CoV** |
| Adductor brevis | 202 | 218 | 183 | 171 | 228 | 177 | 235 | 245 | 182 | 183 | 196 | 203 | 200 | 204 | 215 | 226 | 192 | 178 | 220 | 258 | 221 | 243 | 208 | 25 | 12 |
| Adductor longus | 234 | 237 | 246 | 234 | 263 | 267 | 295 | 291 | 272 | 297 | 280 | 266 | 237 | 260 | 283 | 268 | 236 | 212 | 286 | 263 | 232 | 269 | 260 | 24 | 9 |
| Adductor magnus | 363 | 356 | 372 | 377 | 373 | 390 | 365 | 374 | 342 | 357 | 361 | 313 | 364 | 359 | 322 | 307 | 297 | 279 | 304 | 296 | 389 | 396 | 348 | 35 | 10 |
| Biceps femoris short head | 208 | 202 | 227 | 224 | 253 | 258 | 240 | 258 | 230 | 242 | 281 | 281 | 242 | 254 | 207 | 217 | 227 | 223 | 234 | 221 | 210 | 220 | 234 | 22 | 10 |
| Biceps femoris long head | 291 | 298 | 280 | 275 | 302 | 324 | 257 | 261 | 250 | 254 | 273 | 259 | 293 | 283 | 282 | 261 | 292 | 283 | 227 | 262 | 298 | 296 | 277 | 22 | 8 |
| Gluteus maximus | 255 | 259 | 206 | 211 | 286 | 247 | 202 | 202 | 191 | 211 | 214 | 208 | 194 | 185 | 239 | 266 | 253 | 266 | 225 | 261 | 265 | 263 | 232 | 31 | 13 |
| Gluteus medius | 279 | 273 | 268 | 266 | 321 | 325 | 255 | 262 | 263 | 280 | 264 | 265 | 269 | 256 | 289 | 269 | 307 | 292 | 250 | 298 | 330 | 327 | 282 | 25 | 9 |
| Gracilis | 280 | 255 | 278 | 267 | 271 | 275 | 281 | 264 | 278 | 254 | 279 | 275 | 286 | 283 | 280 | 256 | 285 | 274 | 294 | 269 | 290 | 272 | 275 | 11 | 4 |
| Iliacus | 341 | 343 | 340 | 356 | 360 | 358 | 388 | 399 | 365 | 372 | 379 | 380 | 343 | 312 | 377 | 370 | 332 | 337 | 322 | 357 | 342 | 333 | 355 | 22 | 6 |
| Rectus femoris | 230 | 242 | 231 | 228 | 246 | 256 | 296 | 346 | 260 | 236 | 294 | 300 | 275 | 258 | 253 | 233 | 226 | 221 | 264 | 225 | 223 | 238 | 254 | 32 | 12 |
| Sartorius | 351 | 323 | 314 | 318 | 319 | 304 | 335 | 340 | 354 | 331 | 318 | 318 | 320 | 326 | 349 | 331 | 308 | 307 | 314 | 306 | 325 | 318 | 324 | 14 | 4 |
| Semimembranosus | 595 | 586 | 576 | 581 | 591 | 592 | 617 | 626 | 609 | 595 | 590 | 593 | 610 | 593 | 562 | 566 | 589 | 594 | 585 | 590 | 572 | 585 | 591 | 15 | 3 |
| Semitendinosus | 302 | 317 | 269 | 273 | 318 | 309 | 287 | 278 | 217 | 232 | 328 | 323 | 297 | 285 | 251 | 283 | 294 | 301 | 257 | 276 | 282 | 289 | 285 | 28 | 10 |
| Tensor fasciae latae | 321 | 330 | 305 | 332 | 322 | 330 | 342 | 322 | 310 | 325 | 367 | 371 | 362 | 351 | 342 | 365 | 292 | 285 | 292 | 289 | 316 | 283 | 325 | 27 | 8 |
| Vastus intermedius | 374 | 373 | 395 | 374 | 392 | 389 | 353 | 368 | 316 | 318 | 382 | 380 | 375 | 354 | 362 | 336 | 366 | 357 | 352 | 379 | 365 | 349 | 364 | 21 | 6 |
| Vastus lateralis | 183 | 170 | 182 | 196 | 217 | 217 | 173 | 166 | 203 | 202 | 206 | 183 | 163 | 170 | 208 | 212 | 177 | 183 | 182 | 194 | 197 | 188 | 190 | 16 | 9 |
| Vastus medialis | 311 | 320 | 338 | 273 | 298 | 317 | 322 | 330 | 374 | 350 | 330 | 318 | 301 | 299 | 341 | 352 | 364 | 327 | 284 | 286 | 314 | 351 | 323 | 26 | 8 |
| Gastrocnemius lateralis | 202 | 218 | 183 | 171 | 228 | 177 | 235 | 245 | 182 | 183 | 196 | 203 | 200 | 204 | 215 | 226 | 192 | 178 | 220 | 258 | 221 | 243 | 208 | 25 | 12 |
| Gastrocnemius medialis | 234 | 237 | 246 | 234 | 263 | 267 | 295 | 291 | 272 | 297 | 280 | 266 | 237 | 260 | 283 | 268 | 236 | 212 | 286 | 263 | 232 | 269 | 260 | 24 | 9 |
| Peroneus brevis | 363 | 356 | 372 | 377 | 373 | 390 | 365 | 374 | 342 | 357 | 361 | 313 | 364 | 359 | 322 | 307 | 297 | 279 | 304 | 296 | 389 | 396 | 348 | 35 | 10 |
| Soleus | 291 | 298 | 280 | 275 | 302 | 324 | 257 | 261 | 250 | 254 | 273 | 259 | 293 | 283 | 282 | 261 | 292 | 283 | 227 | 262 | 298 | 296 | 277 | 22 | 8 |
| Tibialis anterior | 255 | 259 | 206 | 211 | 286 | 247 | 202 | 202 | 191 | 211 | 214 | 208 | 194 | 185 | 239 | 266 | 253 | 266 | 225 | 261 | 265 | 263 | 232 | 31 | 13 |
| Tibialis posterior | 279 | 273 | 268 | 266 | 321 | 325 | 255 | 262 | 263 | 280 | 264 | 265 | 269 | 256 | 289 | 269 | 307 | 292 | 250 | 298 | 330 | 327 | 282 | 25 | 9 |

Table 5 – Right and left length of the muscles segmented in the lower limbs of the eleven subjects enrolled in the study Mean, standard deviation (SD) and coefficient of variation (CoV) are reported .

**Muscle PCSA [cm2]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | This study | Charles et al | Ward et al | Handsfield et al |
| **Sbj1** | **Sbj2** | **Sbj3** | **Sbj4** | **Sbj5** | **Sbj6** | **Sbj7** | **Sbj8** | **Sbj9** | **Sbj10** | **Sbj11** |
| **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **R** | **L** | **Smp 1** | **Smp 2** | **Smp 3** | **Mean** | **Mean** | **SD** |
| Adductor brevis | 4.5 | 3.9 | 5.0 | 4.3 | 5.0 | 6.2 | 2.9 | 2.9 | 4.7 | 4.2 | 5.2 | 5.2 | 4.3 | 3.5 | 2.6 | 2.7 | 4.4 | 5.4 | 3.6 | 3.5 | 4.7 | 4.0 | 5.1 | 3.4 | 4.9 | 5.0 | 9.7 | 1.9 |
| Adductor longus | 5.9 | 5.3 | 6.8 | 7.2 | 4.5 | 6.0 | 4.9 | 4.8 | 5.1 | 5.1 | 8.4 | 7.6 | 5.6 | 5.1 | 4.9 | 5.4 | 6.7 | 7.2 | 6.4 | 6.2 | 7.7 | 6.6 | 6.7 | 6.2 | 6.5 | 6.6 | 15.4 | 3.6 |
| Adductor magnus | 31.6 | 32.4 | 27.3 | 22.9 | 26.1 | 22.9 | 22.3 | 21.8 | 24.3 | 23.0 | 26.3 | 24.3 | 22.8 | 22.4 | 23.4 | 19.1 | 29.0 | 26.8 | 23.8 | 27.9 | 32.9 | 26.1 | 26.8 | 50.1 | 31.0 | 21.3 | 45.5 | 8.5 |
| Biceps femoris long head | 15.7 | 13.9 | 15.7 | 17.3 | 14.4 | 14.8 | 12.9 | 11.6 | 11.2 | 11.6 | 12.6 | 14.3 | 14.5 | 15.1 | 11.4 | 11.8 | 16.6 | 16.6 | 15.0 | 15.1 | 16.8 | 16.4 | 13.1 | 12.3 | 16.3 | 11.5 | 25.9 | 4.9 |
| Biceps femoris short head | 5.1 | 4.3 | 3.7 | 3.4 | 5.9 | 5.5 | 2.7 | 3.1 | 4.5 | 5.8 | 4.4 | 3.8 | 6.8 | 7.0 | 3.4 | 3.7 | 5.1 | 4.7 | 6.0 | 5.7 | 7.5 | 5.4 | 4.1 | 10.7 | 11.1 | 5.2 | 7.8 | 1.8 |
| Gastrocnemius lateralis | 12.6 | 11.5 | 15.3 | 11.6 | 10.4 | 8.4 | 12.4 | 11.3 | 9.3 | 10.7 | 11.0 | 12.0 | 12.1 | 12.0 | 13.4 | 11.6 | 10.1 | 13.5 | 13.4 | 13.9 | 13.5 | 14.1 | 13.1 | 11.8 | 12.0 | 36.0 | 46.8 | 8.7 |
| Gastrocnemius medialis | 26.6 | 28.3 | 36.3 | 35.2 | 28.8 | 30.6 | 27.2 | 32.0 | 26.3 | 27.3 | 26.8 | 28.6 | 30.7 | 28.6 | 26.1 | 27.3 | 32.3 | 32.2 | 25.8 | 26.1 | 35.9 | 36.6 | - | - | - | 36.1 | 45.6 | 10.2 |
| Gluteus maximus | 26.2 | 27.3 | 34.8 | 33.6 | 30.8 | 28.5 | 24.7 | 24.8 | 31.8 | 27.3 | 21.4 | 22.1 | 21.6 | 20.9 | 23.3 | 21.3 | 27.4 | 25.6 | 27.8 | 27.3 | 35.5 | 34.7 | - | - | - | 2.2 | 4.7 | 1 |
| Gluteus medius | 24.2 | 21.0 | 25.0 | 26.0 | 28.4 | 29.2 | 18.8 | 20.5 | 23.1 | 20.0 | 22.6 | 26.3 | 18.6 | 19.9 | 17.7 | 17.5 | 23.8 | 23.3 | 26.2 | 25.8 | 39.1 | 34.4 | 17.8 | 17.9 | 20.3 | 10.2 | 12.4 | 2.5 |
| Gracilis | 1.3 | 1.4 | 2.8 | 2.1 | 1.5 | 1.9 | 0.6 | 1.0 | 1.5 | 1.0 | 1.8 | 1.8 | 1.8 | 1.6 | 1.1 | 0.9 | 1.8 | 1.8 | 1.5 | 1.5 | 2.5 | 2.6 | 5.3 | 5.8 | 3.6 | 9.9 | 23 | 6 |
| Iliacus | 4.5 | 5.4 | 6.8 | 6.9 | 5.7 | 5.6 | 5.5 | 5.5 | 5.4 | 5.4 | 6.1 | 5.8 | 6.5 | 6.5 | 5.8 | 5.5 | 6.6 | 6.1 | 6.4 | 6.2 | 8.6 | 7.1 | - | - | - | 21.4 | 50.1 | 10 |
| Peroneus brevis | 9.2 | 6.5 | 9.4 | 8.2 | 8.9 | 7.5 | 6.0 | 8.7 | 5.9 | 6.1 | 5.9 | 7.3 | 7.4 | 6.7 | 7.0 | 5.4 | 5.7 | 4.4 | 8.1 | 7.8 | 9.1 | 7.6 | - | - | - | 5.0 | - | - |
| Rectus femoris | 15.6 | 17.1 | 10.4 | 19.2 | 16.7 | 18.1 | 13.3 | 14.4 | 15.3 | 14.6 | 22.6 | 23.6 | 19.0 | 18.0 | 19.3 | 16.9 | 17.5 | 16.1 | 19.0 | 20.6 | 23.0 | 19.6 | 22.7 | 22.0 | 26.1 | 13.9 | 34.8 | 7.4 |
| Sartorius | 1.1 | 1.0 | 1.8 | 1.5 | 2.0 | 1.4 | 1.2 | 1.0 | 1.5 | 1.5 | 1.7 | 1.5 | 1.1 | 1.3 | 1.0 | 1.0 | 1.6 | 1.5 | 1.9 | 1.8 | 3.2 | 2.9 | 3.2 | 3.0 | 3.2 | 1.9 | 3.4 | 0.8 |
| Semimembranosus | 16.8 | 16.4 | 23.4 | 22.7 | 16.6 | 20.1 | 15.0 | 17.4 | 18.8 | 15.5 | 13.7 | 14.9 | 21.6 | 23.0 | 17.8 | 15.3 | 21.9 | 22.9 | 16.0 | 13.3 | 18.5 | 17.7 | 8.5 | 28.6 | 21.2 | 19.1 | 37.8 | 9.1 |
| Semitendinosus | 3.4 | 4.1 | 7.2 | 7.2 | 4.4 | 3.8 | 4.3 | 4.9 | 5.1 | 4.0 | 5.9 | 5.2 | 4.3 | 5.2 | 2.8 | 2.4 | 4.7 | 4.4 | 4.7 | 5.8 | 6.7 | 7.0 | 12.8 | 15.7 | 15.4 | 4.9 | 9.3 | 2.3 |
| Soleus | 74.4 | 69.7 | 92.3 | 89.6 | 94.1 | 88.0 | 83.2 | 90.8 | 74.1 | 79.2 | 68.0 | 69.6 | 73.9 | 76.3 | 67.0 | 71.5 | 89.4 | 88.3 | 84.7 | 81.2 | 125.1 | 134.5 | 80.3 | 45.8 | 85.2 | 58.8 | 124.1 | 24.9 |
| Tensor fasciae latae | 2.5 | 2.0 | 2.9 | 2.7 | 2.3 | 2.4 | 1.0 | 1.3 | 1.7 | 1.6 | 1.6 | 1.8 | 2.2 | 1.7 | 2.8 | 3.2 | 2.0 | 1.9 | 3.2 | 2.1 | 2.3 | 2.8 | - | - | - | 2.5 | 4 | 1.3 |
| Tibialis anterior | 9.9 | 11.5 | 11.3 | 13.1 | 11.7 | 11.9 | 9.1 | 9.9 | 8.8 | 9.0 | 8.8 | 8.8 | 9.2 | 10.2 | 12.0 | 10.5 | 11.2 | 12.5 | 11.6 | 10.8 | 16.0 | 12.0 | 19.8 | 11.3 | 17.0 | 11.1 | 15.8 | 2.9 |
| Tibialis posterior | 18.5 | 18.5 | 22.2 | 20.6 | 21.7 | 21.8 | 23.1 | 20.9 | 14.7 | 15.8 | 18.7 | 19.1 | 15.2 | 18.3 | 22.9 | 24.1 | 20.7 | 22.3 | 21.0 | 17.8 | 29.0 | 32.9 | - | - | - | 14.8 | 28.4 | 4.7 |
| Vastus intermedius | 22.6 | 26.0 | 36.7 | 38.2 | 27.6 | 34.6 | 30.7 | 27.6 | 25.7 | 25.9 | 28.0 | 24.8 | 27.9 | 23.2 | 26.7 | 26.7 | 28.6 | 27.7 | 23.8 | 21.1 | 38.2 | 29.2 | 14.2 | 31.7 | 38.8 | 16.8 | 39 | 8 |
| Vastus lateralis | 18.8 | 20.0 | 24.8 | 23.7 | 25.1 | 23.7 | 17.6 | 21.2 | 14.0 | 18.1 | 19.5 | 21.1 | 21.9 | 19.4 | 16.4 | 16.3 | 23.4 | 22.5 | 20.3 | 19.8 | 30.4 | 26.5 | 18.6 | 28.2 | 61.9 | 37.0 | 59.3 | 12.1 |
| Vastus medialis | 22.6 | 21.3 | 29.9 | 26.7 | 32.3 | 31.6 | 27.2 | 30.7 | 28.9 | 28.3 | 28.2 | 26.0 | 25.5 | 24.3 | 26.2 | 22.9 | 24.5 | 24.1 | 24.2 | 24.9 | 33.5 | 27.0 | 23.6 | 35.0 | 25.9 | 23.7 | 59.1 | 11.4 |

Table –Physiological cross-sectional areas (PCSAs) measured for the eleven subjects enrolled in our study (for right and left muscles) and three cadavers included in Charles et al., 2019. Mean and mean and SD PCSA are reported for Ward et al. 2009 and Handsfield et al. 2014, respectively.

**References**

1. Charles JP, Moon C-H, Anderst WJ. Determining subject-specific lower-limb muscle architecture data for musculoskeletal models using diffusion tensor imaging. Journal of Biomechanical Engineering. 2019;141(6).
2. Handsfield GG, Meyer CH, Hart JM, Abel MF, Blemker SS. Relationships of 35 lower limb muscles to height and body mass quantified using MRI. Journal of Biomechanical Engineering. 2014;47(3):631-8.
3. Ward SR, Lieber RL. Density and hydration of fresh and fixed human skeletal muscle. Journal of Biomechanics. 2005;38(11):2317-20.