**Table 1** Evaluation of specific tension methodology across included studies and their assigned score (based on Figure 1). Abbreviations: ACSA - Anatomical Cross-Sectional Area, CT - Computed Tomography, EMG - Electromyography, ITT - Interpolated Twitch Technique, MA - Moment Arm, MRI - Magnetic Resonance Imaging, MVC - Maximum Voluntary Contraction, PCSA - Physiological Cross-Sectional Area, TQ - Torque, US - Ultrasound.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Summary of methods | Authors | Year | Muscle (s) | ST value  (N/cm2) | Score |
| • Torque not used in calculation • Tendon force measured via stimulation of the motor nerve. • Moment arm not used in calculation • Muscle volume estimated by 3D photogrammetric reconstruction • Fascicle length calculated from measured muscle length, active force-length curve parameter FWHM and literature FWHM-optimal fiber length relationship • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Binder-Markey et al. (17) | 2023 | Gracilis | 17.1 | 27 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and not corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Erskine et al. (7) | 2011 | Quadriceps Femoris | 26.5 | 24 |
| O'Brien et al. (3) | 2010 | Quadriceps Femoris | 55.0 | 24 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corrected using literature values to reflect MVC conditions and max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Erskine et al. (27)  Erskine et al. (9) | 2010 2009 | Quadriceps Femoris Quadriceps Femoris | 29.5  30.3 | 24 |
| • Max. torque measured (percutaneous electrical stimulation) and EMG correction for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Maganaris et al. (16) | 2001 | Soleus  Tibialis Anterior | 15.0  15.5 | 23 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Component tendon force calculated using relative PCSA • Moment arm measured (US) during torque trials at max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Kubo et al. (28) | 2006 | Vastus Lateralis | 23.1 | 22 |
| • MVC torque measured with EMG to correct for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corrected using literature values to correspond to max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during rest • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Maden-Wilkinson et al. (29) | 2020 | Quadriceps Femoris | 33.3 | 21 |
| • MVC torque measured using ITT to correct for muscle activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corrected using literature values to reflect MVC conditions and max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | McPhee et al. (12) | 2018 | Quadriceps Femoris | 29.0 | 21 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Component tendon force calculated using relative PCSA • Moment arm measured (MRI) during rest and not corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Morse et al. (5)  Morse et al .(23) | 2007 2005 | Gastrocnemius Lateralis Gastrocnemius Lateralis | 8.9  13.1 | 21 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Component tendon force calculated using relative PCSA • Moment arm measured (MRI) during rest and corrected using literature values to reflect MVC conditions and max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during rest • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Valamatos et al. (30) | 2018 | Vastus Lateralis | 31.8 | 20 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Component tendon force calculated using relative contribution taken from literature • Moment arm measured (MRI) during rest and corrected using literature values to correspond to max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during rest • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Reeves et al. (4) | 2004 | Vastus Lateralis | 27.0 | 19 |
| • MVC torque measured with EMG to correct for antagonist activation • Component tendon force calculated using relative PCSA • Moment arm measured (MRI) during rest and corrected using literature values to correspond to max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Morse et al. (2) | 2008 | Gastrocnemius Lateralis | 13.1 | 19 |
| • Max. torque measured (surface neuromuscular electrical stimulation) • Tendon force= TQ/MA • Moment arm corresponding to a value taken from literature at the max. torque joint angle. This value was corrected for cadaver shrinkage and changes during MVC.  • Muscle volume estimated by summation of MRI axial images for activated ACSA • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Gorgey et al. (20) | 2006 | Quadriceps Femoris | 25 | 19 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and not corresponding to max. torque joint angle • Muscle volume estimated (MRI) from max. ACSA and literature regression relationship • Fascicle length measured (US) during max. torque trial in a representative muscle (Vastus Lateralis) • Pennation angle measured (US) during max. torque trial in a representative muscle (Vastus Lateralis) • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Erskine et al.( 7) | 2011 | Quadriceps Femoris | 25.9 | 18 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corrected using literature values to reflect MVC conditions and max. torque joint angle  • Muscle volume estimated (MRI) from max. ACSA and literature regression relationship • Fascicle length measured (US) during max. torque trial in a representative muscle (Vastus Lateralis) • Pennation angle measured (US) during max. torque trial in a representative muscle (Vastus Lateralis) • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Erskine et al. (6) Erskine et al. (9) | 2010 2009 | Quadriceps Femoris Quadriceps Femoris | 29.1  25.6 | 18 |
| • MVC torque measured • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Kawakami et al. (14) | 1994 | Elbow Extensors | 65.4 | 18 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Component tendon force calculated using relative contribution taken from literature • Moment arm measured (X-ray) at max. torque joint angle during rest • Muscle volume estimated (US) from max. ACSA and literature regression relationship • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Sims et al. (19) | 2018 | Vastus Lateralis | 23.6 | 17 |
| • MVC torque measured • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and not corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Fukunaga et al. (10) | 1996 | Triceps Surae  Plantar Flexors  Dorsiflexors | 10.8  8.0  24.5 | 17 |
| • MVC torque measured • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle not used in calculation • PCSA= Muscle vol/Fiber length | Kawakami et al. (14) | 1994 | Elbow Flexors | 72.7 | 17 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force approximated from external limb force • Moment arm not used in calculation • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Klein et al. (24) | 2001 | Elbow Extensors | 5.5 | 16 |
| • MVC torque measured • Component tendon force calculated using relative PCSA x MA • Moment arm measured (MRI) during rest and corrected using literature values to correspond to max. torque joint angle  • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Marchetta et al.( 11) | 2012 | Biceps Brachii Brachialis Brachioradialis | 53.4  56.5  53.5 | 15 |
| • MVC torque measured with gravity correction • Tendon force= TQ/MA • Moment arm measured (MRI) during rest and not corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length taken from literature • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Maganaris et al. (16) | 2001 | Soleus  Tibialis Anterior | 10.4  65.8 | 15 |
| • MVC torque measured using ITT to correct for muscle activation and EMG to correct for antagonist activation • Tendon force approximated from external limb force • Moment arm not used in calculation • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle not used in calculation • PCSA= Muscle vol/Fiber length | Klein et al. (24) | 2001 | Elbow Flexors | 16.5 | 15 |
| • Torque not used in calculation • Tendon force approximated from external limb force • Moment arm not used in calculation • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (US) during max. torque trial • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Narici et al. (21) | 1996 | Gastrocnemius Medialis | 13.3 | 15 |
| • MVC torque measured • Component tendon force calculated using relative PCSA x MA • Moment arm measured (MRI) during rest and corresponding to max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle not used in calculation • PCSA= Muscle vol/Fiber length | Kawakami et al. (14) | 1994 | Biceps Brachii Brachialis Brachioradialis | 72.3  72.3  71.9 | 15 |
| • Torque not used in calculation • Tendon force approximated from external limb force • Moment arm corresponding to a value taken from literature at the max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length measured (MRI) during rest • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/muscle thickness)\*sin(pennation angle) | Narici et al. (18) | 1992 | Vastus Lateralis  Vastus Intermedius  Vastus Medialis  Rectus Femoris | 23.7  24.1  27.9  24.3 | 14 |
| • Torque not used in calculation • Tendon force approximated from external limb force • Moment arm not used in calculation • Muscle volume estimated by summation of MRI axial images • Fascicle length calculated from measured muscle length and literature ratio • Pennation angle taken from literature • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Bamman et al. (13) | 2000 | Triceps Surae | 1.97 | 12 |
| • MVC torque measured • Component tendon force calculated using relative contribution taken from literature • Moment arm corresponding to a value taken from literature at the max. torque joint angle • Muscle volume not used in calculation • Fascicle length not used in calculation • Pennation angle not used in calculation • ACSA=Max. ACSA measured (CT) during rest and corrected using literature data to correspond to ACSA during max. Torque | | Klitgaard et al. (26) | 1990 | Elbow Flexors | 65.4 | 12 |
| Nygaard et al. (22) | 1983 | Biceps Brachii | 35.6 | 12 |
| • MVC torque measured with gravity correction • Component tendon force calculated using relative contribution taken from literature • Moment arm corresponding to a value taken from literature at the max. torque joint angle • Muscle volume estimated by summation of MRI axial images • Fascicle length taken from literature • Pennation angle measured during max. torque trial • PCSA= (Muscle vol/Fiber length)\*cos(pennation angle) | Aagaard et al .(31) | 2001 | Quadriceps Femoris | 42.6 | 10 |
| • MVC torque measured • Component tendon force calculated using relative PCSA x MA • Moment arm corresponding to a value taken from literature at the max. torque joint angle • Muscle volume not used in calculation • Fascicle length not used in calculation • Pennation angle not used in calculation • ACSA=Max. ACSA measured (CT) during rest | Dowling et al. (32) | 1994 | Elbow Flexors | 69 | 10 |
| • MVC torque measured • Tendon force approximated from external limb force • Limb length used as moment arm • Muscle volume not used in calculation • Fascicle length not used in calculation • Pennation angle not used in calculation • ACSA=Max. ACSA measured (MRI) | Akagi et al. (25) | 2009 | Elbow Flexors | 14.7 | 9 |