

Table S1 : Specialized keywords used for each database search.

	Psychometric properties		Data Acquisition Systems		Movements
General keywords	psychometric property OR reliability OR validity	AND	inertial measurement unit OR wearable sensor OR inertial sensor OR accelerometry	AND	joint angle OR range of motion OR movement OR kinematic
MeSH (Pubmed)	psychometrics OR reproducibility of results		physiology/instrumentation OR accelerometry		biomechanical phenomena OR range of motion, articular OR movement
CinAHL descriptors	reliability and validity		wearable sensors OR wearable technology		kinematic OR range of motion
Thesaurus (Ergonomic abstract)	test validity OR reliability		wearable technology		range of motion).
Ei mainheading (Compendex)	reliability OR reliability analysis		biomedical equipment OR wireless sensor networks OR wearable sensors)		joint anatomy
Emtree (Embase)	validity OR reliability		electronic sensor		range of motion

Table S2 : Synthesis of criterion validity results.

Authors	n	IMU used	Motion capture system used	Task	Validity
Knee					
Al-Amri & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking Jump Squat	- Sagittal plane: CMC > 0.9 et $r^2 > 0.8$ - Frontal and transverse plan: $r^2 = 0.4-0.8$
Bergmann, J. H. & al.	14	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Climbing steps	Pearson Coefficient (r)/ RMSE (°) (mean±SD): 0.98 ±0.05 / 4 ± 3
Blair, S & al.	30	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Kicking tasks	Mean difference ± 90% CL Australian football: 0.1 ± 1.1 Soccer: 0.3 ± 1.1 Rugby: 0.2 ± 1.1
Cloete, T. & al.	8	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking	Flexion/extension RMSE (°) (SD) / R (mean + SD) Right: 7.61 (4.47)/ 0.92 (0.08) Left: 9.33 (5.45)/ 0.85 (0.22) Valgus/varus RMSE (°) (SD) / R (mean + SD) Right: 10.22 (4.71)/ 0.26 (0.48) Left: 11.46 (6.90)/ 0.12 (0.41) Rotation: RMSE (°) (SD) / R (mean + SD) Right: 6.44 (2.83)/ 0.25 (0.44) Left: 8.18 (4.28)/ 0.24 (0.40)
Dejnabadi, H. & al.	8	Accelerometer chips ADXL202/210 and yaw rate gyro chips ADXRS150/300	Ultrasound-based motion measurement (Zebris,D)	Walking	Average RMSE error: 1 ° Mean: 0.5° SD: 0.8° CMC: 0.999
Dowling, A. V. & al.	38	Inertial measurement units (PhysilogVR , BioAGM, CH)	Qualisys (Medical, Gothenburg, SE)	2-drop jumps with a unilateral support landing	(R / accuracy °/precision °): Land prep: 0.97 /-3.7/2.4 Contact: 0.92 /-4.7/3.4 Max stance: 0.93 /-2.4/3.9 Difference: 0.94 /2.3/3.9
Favre, J. & al.	10	IMUs (ADXRS and ADXL) (PhysilogVR , BioAGM, CH)	Libertys (Polhemus, USA)	Maximal active ROM Walking (30m)	μ /RMS /CC (mean ±SD) Flexion extension: -1.0± 1.0/ 1.5±0.4/1.00±0.00 Abduction/adduction: 0.0 ±0.6/1.7±0.5/0.86±0.08 Internal-external rotation: 3.4±2.7/ 1.6±0.5/

					0.95±0.03
Jaysrichai T. & al.	10	IMU sensors (SparkFun Electronics, Niwot, CO, USA)	Qualisys (Medical, Gothenburg, SE)	Knee flexion Hip and knee flexion test Forward step test Leg abduction test Walking (normal speed)	RMS(Min-Max) (°)/ ICC (Min-Max): Knee flexion right: 1.5-3.6/0.99-1.00 left: 2.5-4.7/0.97-1.00 Hip and knee flexion test Right: 1.6-3.9/ 0.99-0.99 left: 2.6- 5.4/ 0.97-0.99 Forward step test right: 2.4-4.2/0.88-0.96 left: 1.9-5.2/0.85-0.99 Leg abduction test right :1.1-4.0/-0.26-0.86 left: 1.4-2.1/-0.27-0.87 Walk right: 2.7-5.3/0.84-0.98 left: 2.3-5.1/0.84-0.98
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximal active ROM	r^2 0.82 (flexion only) Lower extremity ± 10°
Leardini A. & al.	17	Riablo™ (CoRehab, Trento, Italy) <i>An adaptive system, comprised of several IMU</i>	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	1. Knee flexion against gravity in single leg up-right posture 2. Knee extension against gravity from the chair 3. Lunge 4. Squat	RMSE - Mean ± SD (°) 1. 3.9 ± 0.7 2. 3.8 ± 0.8 3. 4.5 ± 1.3 4. 5.0 ± 1.2
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSD (°)/Err peak(°)/CMC Sit-to-stand: 1.3 / 3.2 / 0.983 Walk: 2.4 / 5.6 / 0.990 Turn: 2.4 / 4.9 / 1.000
Robert-Lachaine X. & al.	12	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC/ /LoA Z= 2.3/0.99/ -0.1±4.4 X= 1.9/0.91/0.6±2.8 Y= 3.3/0.97/0.4 ±5.5
Saito, H. & al.	3	Wireless sensors (WAA-006, Wireless Technologies)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking (3 different speeds)	<u>Without Kalman Filter</u> RMSE (SD) 5.73 (2.15) R (SD) 0.976 (0.011)

					<u>With Kalman Filter</u> RMSE (SD) 3.33 (0.80) R (SD) 0.985 (0.008)
Takeda, R. & al.	3	Tri-axial acceleration sensor (H34C, Hitachi Metals, Ltd.) and three gyro sensors (ENC-03M, muRata Manufacturing Co., Ltd.)	DIPP-Motion Pro (Ditect Co., Ltd.)	Walking (5m)	RMSE = 6.79 Absolute deviation (AD) = 4.65 Correlation coefficient (CC) = 0.92
Zhang, JT & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking Stair descent Stair ascent	ROM/error (°)/CMC (only in walking) Walking: Flexion-extension= $0.8 \pm 2.61 / 1.87 \pm 1.27 / 0.99$ Abduction-adduction = $1.45 \pm 10.81 / 5.09 \pm 4.18 / 0.71$ Internal-external rotation = $0.03 \pm 4.69 / 2.7 \pm 2.2 / 0.88$ Stair descent: Flexion-extension= $0.41 \pm 1.59 / 1.99 \pm 1.07$ Abduction-adduction= $0.65 \pm 9.88 / 5.53 \pm 3.78$ Internal-external rotation = $0.1 \pm 8.53 / 3.66 \pm 3.62$ Stair ascent: Flexion-extension= $0.11 \pm 0.68 / 1.71 \pm 1.45$ Abduction-adduction = $0.79 \pm 8.16 / 4.68 \pm 3.76$ Internal-external rotation = $1.65 \pm 7.08 / 5.15 \pm 3.08$
Hip					
Al-Amri & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking Jump Squat	- Sagittal plan: CMC > 0.9 et r² > 0.8 - Transverse hip: poor
Bauer, C. M. & al.	22	IMUs (Valedo_ User Manual, Hocoma AG)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Maximal active ROM	r² / RMSE Flexion= $0.99 \pm 0.01 / 6.1 \pm 2.7$ Extension = $0.94 \pm 0.09 / 5.6 \pm 4.1$ Lateral flexion right = $0.87 \pm 0.21 / 1.1 \pm 0.7$ Lateral flexion left = $0.85 \pm 0.2 / 1.1 \pm 0.7$
Bergmann, J. H. & al.	14	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Climbing steps	Pearson Coefficient/ RMSE (°) (mean±SD) : $0.96 \pm 0.06 / 5 \pm 3$
Blair, S & al.	30	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Kicking tasks	Mean difference ± 90% CL Australian football: -1.4 ± 0.3 Soccer: -1.7 ± 0.3

					Rugby: -1.5 ± 0.3
Cloete, T. & al.	8	MOVEN inertial motion-capture system (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking	Flexion/extension RMSE (°) (SD) / R (mean + SD) Right: 5.71 (3.18) / 0.94 (0.08) Left: 5.91 (4.36) / 0.94 (0.07) Abduction/adduction RMSE (°) (SD) / R (mean + SD) Right: 7.93 (4.53) / 0.53(0.45) Left: 6.75 (5.77) / 0.57 (0.34) Rotation RMSE (°) (SD) / R (mean + SD) Right: 6.49 (3.16) / 0.72 (0.1) Left: 9.26 (6.63) / 0.35 (0.29)
Dejnabadi, H. & al.	8	Accelerometer chips ADXL202/210 and yaw rate gyro chips ADXRS150/300	Ultrasound-based motion measurement (Zebris,D)	Walking	Average RMS error: 0.6° Mean: 0.1° SD: 1.1° CMC: 0.998
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximal active ROM	r^2 0.69 to 0.93 (abduction= 0.93, adduction=0.82, extension=0.82, flexion=0.90, internal rotation=0.79, external rotation= 0.69) Lower extremity $\pm 10^{\circ}$ (except for adduction, extension and flexion at the hip = $\pm 20^{\circ}$)
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSD (°)/Err peak(°)/CMC Sit-to-stand: 0.9/ 2.4/ 0.999 Walk: 1.6/ 4.4/ 0.981 Turn: 1.3/ 3.3/ 1.000
Robert-Lachaine X. & al.	12	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands))	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC /LoA Z= 2.2/1.00/ -0.3 ± 4.1 X= 2.3/0.97/ 0.2 ± 3.7 Y= 3.5/0.95/ -0.6 ± 5.6
Saber-Sheikh, K. & al.	20	Xsens MTx sensors (Xsens technologies B.V., Enschede, the Netherlands)	Fastrak system (Polhemus, 2007)	Walking	RMSE Mean difference: -0.05 (SD 0.77) X: -0.69 (SD 0.90); Y: -0.4 (SD 1.05); Z: -0.28 (SD 1.63)
Saito, H. & al.	3	Wireless sensors (WAA-006, Wireless Technologies)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking (3 different speeds)	<u>Without Kalman Filter</u> RMSE (SD) 7.03 (3.95) R (SD) 0.965 (0.019) <u>With Kalman Filter</u> RMSE (SD)

					3.55 (1.37) R (SD) 0.989 (0.005)
Takeda, R. & al.	3	Tri-axial acceleration sensor (H34C, Hitachi Metals, Ltd.) and three gyro sensors (ENC-03M, muRata Manufacturing Co., Ltd.)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking (5m)	Flex-Ext RMSE = 8.72 Absolute deviation (AD) = 6.57 Correlation coefficient (CC) = 0.88 ABD-ADD RMSE = 4.96 Absolute deviation (AD) = 3.30 Correlation coefficient (CC) = 0.72
Zhang, JT & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking Stair descent Stair ascent	ROM/error (°)/CMC (only in walking) Walking: Flexion-extension= 2.42 ± 3.83 / 2.47 ±1.6 /0.99 Abduction-adduction = 5.37± 5.56/4.83±3.16 /0.39 Internal-external rotation = 0.04 ± 4.38 / 3.02 ± 1.64 /0.96 Stair descent: Flexion-extension= 1.32 ± 2.87 / 1.9 ±1.24 Abduction-adduction = 11.78± 6.09/2.08 ±2.17 Internal-external rotation = 0.37 ± 3.29 / 1.38 ± 1.08 Stair ascent: Flexion-extension= 1.95 ± 3.73 / 2.41 ±1.73 Abduction-adduction = 3.17± 3.02/3.57 ±2.54 Internal-external rotation = 0.00 ± 2.23 / 2.32 ± 1.35
Ankle					
Akins, J. S. & al.	12	MARG sensors (X-IMU, x-io Technologies Limited, UK).	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Soccer field maneuvers	Correlation coefficient/ RMSE* Plantar-dorsiflexion = 0.935-0.975/1.64-3.595 Eversion-inversion = -0.74 – 0.327 / 2.857-5.175 Internal-external rotation =0.545-0.654/8.358-10.375 *only initial contact data are reported, for more details refer to article
Al-Amri & al.	26	MTw2 trackers (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking Jump	- Sagittal plan: CMC > 0.9 et r² > 0.8 - Frontal plan ankle (walking): poor

				Squat	
Bergmann, J. H. & al.	14	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Climbing steps	Pearson Coefficient/ RMSE (°) (mean±SD): 0.93 0.05/ 4±2
Cloete, T. & al.	8	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking	Plantar / dorsi flexion RMSE (°) (SD) / R (mean + SD) Right: 11.6 (4.27)/ 0.08 (0.16) Left: 11.12 (5.01) /0.07 (0.38) Eversion/inversion RMSE (°) (SD) / R (mean + SD) Right: 9.13 (3.64)/ 0.17 (0.48) Left: 11.3 (3.59) /-0.01 (0.27) Rotation RMSE (°) (SD) / R (mean + SD) Right: 18.8 (6.67)/0.16 (0.32) Left: 17.89 (7.50)/ 0.38 (0.53)
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximal active ROM	r^2 0.92(dorsiflexion) 0.93(plantar flexion) Lower extremity ± 10°
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSE (°)/Err peak(°)/CMC Sit-to-stand : 1.1 / 2.9 / 0.935 Walk: 2.1/ 5.7 / 0.996 Turn: 1.7/ 4.5 / 1.000
Mifsud NL. & al.	14	IMU (Debus und Diebold Messsysteme, GmbH)	Qualisys (Medical, Gothenburg, SE)	Running (10 meter at 12 ± 1.2 km/h)	Inversion/eversion (B, frontal plan) : Bias 6,1 LOA (95%): -6.7, 18.9 ICC: -0.35 RMSE: 6.3 Internal/external rotation (p, transverse plan) : Bias: 0.3 LOA (95%): -15.8, 16.3 ICC: 0.37 RMS : 7,7 Horizontal sol angle (y, sagittal plan): Bias: -7.1 LOA (95%): -18.3, 4.1 ICC: 0.92 RMSE: 7.0

Robert-Lachaine X. & al.	12	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC /LoA Z= 3.8/0.95/0.0 ±7.2 X= 4.3/0.89/-0.6±8.0 Y= 7.3/0.77/0.8 ±13.6
Rouhani, H. & al.	3	IMUs (PhysilogVR , BioAGM, CH)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking (2, 3.5, and 5 km/h)	RMS differences (°) Slow walking: 1.2 Medium walking: 1.4 Fast walking :2.0 Mean coefficient correlation: 0.93 Mean difference: below 4 degrees
Saito, H. & al.	3	Wireless sensors (WAA-006, Wireless Technologies)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking (3 different speeds)	<u>Without Kalman Filter</u> RMSE (SD) 5.60 (2.42) R (SD) 0.768 (0.126) <u>With Kalman Filter</u> RMSE (SD) 3.94 (0.89) R (SD) 0.824 (0.064)
Zhang, JT & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Walking Stair descent Stair ascent	ROM/error (°)/CMC (only in walking) Walking: Flexion-extension= 0.4 ± 2.58 / 2.15 ±1.24 / 0.99 Abduction-adduction = 1.38± 3.19/1.81±1.26 / 0.95 Inversion-eversion = 1.25 ± 2.37 / 1.84 ± 1.06 /0.77 Stair descent: Flexion-extension= 0.04 ± 2.56 / 3.99 ±2.05 Abduction-adduction = 8.06± 7.35/6.69± 3.23 Inversion-eversion = 0.29 ± 4.4 / 2.58 ± 1.61 Stair ascent: Flexion-extension= 0.26 ± 3.00 / 2.86 ±1.62 Abduction-adduction = 3.43± 4.82/ 2.56± 1.76 Inversion-eversion = 0.31 ± 2.93 / 1.61 ± 1.12
Pelvis					
Blair, S & al.	30	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Kicking tasks	Mean difference ± 90% CL Australian football: 0.9 ± 0.7 Soccer: 0.1 ± 0.7 Rugby: 0.3 ± 0.7
Bolink,	17	IMUs	MOCAP, six VICON	Gait	ICC/RMSE (°)/ Pearson correlation

S. A. & al.		(MicroStrain® Inertia-Link)	MX-3+ and two VICON MX-T20 cameras	Sit-to-stand Block step-up	Gait Sagittal plane: 0.96/2.7/0.94 Frontal plane: 1.00/2.68/0.91 Sit-to-stand Sagittal plane: 0.99/8.89/0.92 Frontal plane: 1.00/4.44/0.89 Block step-up Sagittal plane: 0.98/6.61/0.86 Frontal plane: 0.96/3.05/0.85
Bugane, F. & al.	16	Free4Act (F4A – LetSense Srl, Bologna, Italy)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Walking	Tilt RMSE (SD): 0.73 (0.38) R (SD): 0.88 (0.04) difference (SD): 0.12 (0.13) Obliquity RMSE (SD): 1.22 (0.41) R (SD): 0.95 (0.02) Difference ° (SD): 0.85 (0.46) Rotation RMSE (SD): 2.66 (1.57) R (SD): 0.91 (0.11) Difference ° (SD): 1.76 (1.03)
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSE (°)/Err peak(°)/CMC Sit-to-stand: 1.0/2.9/0.997 Walk: 2.2/5.1/0.842 Turn: 1.7/4.0/1.000
Plamondon & al.	6	IMUs (Micro Strain 3DM-G, Burlington)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Lifting tasks (Static validation and dynamic validation)	RMSE (SD) ° Static validation Flexion a: Static: 0.7 (0.2) Slow: 0.4 (0.1) Moderate: 0.4 (0.1) Fast: 0.4 (0.1) All speeds: 0.5 (0.2) Lateral b Static: 0.8 (0.1) Slow: 0.6 (0.1) Moderate: 0.5 (0.1) Fast: 0.6 (0.1) All speeds: 0.7 (0.2) Torsion g Static: 2.4 (0.4) Slow: 1.7 (0.2)

					Moderate: 1.5 (0.1) Fast: 2.2 (0.3) All speeds: 2.0 (0.5) Dynamic validation <u>Flexion a:</u> RMS = 2.0 95 th = 5.3 CMC = 0.974 <u>Lateral b:</u> RMS =1.8 95 th = 4.9 CMC = 0.975 <u>Torsion g:</u> RMS = 4.7 95 th = 15.1 CMC = 0.998
Schall, M. C. & al.	6	IMU system (I2 M Motion Tracking, Series SXT)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Simulated milking cluster attachment task	(RMSE° (SD)) Flexion-extension: 6.2 (3.0) Lateral Bending: 5.0 (2.1)
Trunk					
Bauer, C. M. & al.	22	IMUs (Valedo_ User Manual, Hocoma AG)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Maximal range of motion - Isolated trunk movement	r² / RMSE Thoracic: Flexion= 0.95 ± 0.04 / 5.8 ±2.0 Extension = 0.94 ±0.09 / 5.9 ± 3.3 Lateral flexion right = 0.99 ± 0.01 / 2.8 ± 1.4 Lateral flexion left = 0.99 ± 0.03/ 2.6 ± 2.0 Lumbar: Flexion= 0.99 ± 0.01 / 4.1 ±1.8 Extension = 0.97 ±0.05 / 4.4 ± 2.2 Lateral flexion right = 0.99 ± 0.01 / 1.8 ± 0.0 Lateral flexion left = 0.99 ± 0.01/ 1.9 ± 1.3
Bergami ni, E.	5	FreeSense, Sensorize	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Running	r=0.994 ± 0.013 RMSE: 3°±2°
Dowlin g, A. V. & al.	38	Inertial measurement units (PhysilogVR , BioAGM, CH)	Qualisys (Medical, Gothenburg, SE)	2-drop jumps with a unilateral support landing	(R / accuracy °/ precision °) Contact: 0.75/-4.6/6.8 Max stance: 0.88/-5.5/5.6 Difference :0.72/0.0/5.4
Godwin A. & al.	1	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sweep Table wash Asymmetric lifting	(mean) RMSE - Max. RMSE (°) Lumbar: Sweep: X: 1.4 – 5.7; Y: 1.3-6.3; Z: 1,0 – 5.1

					Table wash: X: 4.1 – 12.5; Y:3.5- 10.5; Z: 2.0 – 8,1 Asymetric lifting: X: 5.5 – 12.9; Y: 9,8 – 26.3; Z: 11.2 – 26.2 Upper trunk: Sweep: X: 2.3 – 5.8; Y: 1.5 – 4.6; Z: 3.8 – 10.3 Table wash: X: 4.0 – 12.1; Y: 3.4 – 7.7; Z: 6.0 – 17.4 Asymetric lifting: X: 4.9 – 15.4; Y: 6.9 – 17.1; Z: 12.4 – 32.1
Ha TH. & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Fastrak system (Polhemus, 2007)	Simple trunk movement	Correlation coefficient Flexion: X= 0.0667 ; Y=0.8876 ; Z=0.3065 Extension: X=0.1930; Y=0.6573; Z=0.2389 Right lateral flexion: X=0.2251; Y=0.4941; Z=0.8535 Left lateral flexion: X=0.597; Y=0.7832; Z=0.900 Right rotation: X=0.6657; Y=0.5963; Z=0.2771 Left rotation: X=0.5411; Y=0.2674; Z=0.4622
Leardin i A. & al.	17	Riablo™ (CoRehab, Trento, Italy) <i>An adaptive system, comprised of several IMU</i>	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	1. Lunge 2. Squat	RMSE : Mean ± SD (°) 1. 1.6 ± 0.6 2. 2.7 ± 2.1
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSD (°)/Err peak (°)/CMC Sit-to-stand: 1.5 /3.7/0.996 Walk: 2.9 /6.8 /0.853 Turn: 3.1 /5.6 /0.999
Mjosund HL. & al	14	ViMove	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Simple trunk movements	RMSE ± SD/ Mean difference/LoA Flexion: 1.82 ±1.00/0.42/-3.86 Extension: 0.71 ± 0.34 / -0.12/ -2.15 Lateral Right: 0.77 ± 0.24/ -0.16/-2.37 Lateral left: 0.98 ± 0.69/ -0.08/-3.11
Plamondon & al.	6	IMUs (Micro Strain 3DM-G, Burlington)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Lifting task (Static validation and dynamic validation)	<u>Mean RMSE (SD) °</u> Static validation <u>Flexion a:</u> Static: 0.9 (0.1) Slow: 0.7 (0.2) Moderate: 0.7 (0.1) Fast: 0.6 (0.1) All speeds: 0.8 (0.2) <u>Lateral b</u> Static: 0.8 (0.2) Slow: 0.8 (0.2)

					Moderate: 0.7 (0.1) Fast: 0.6 (0.1) All speeds: 0.7 (0.1) <u>Torsion g</u> Static: 24 (0.5) Slow: 1.4 (0.3) Moderate: 2.1 (0.3) Fast: 1.4 (0.3) All speeds: 1.9 (0.6) Dynamic validation <u>Flexion a:</u> RMS =2.7 95 th = 8.0 CMC = 0.993 <u>Lateral b:</u> RMS = 1.9 95 th = 6.3 CMC = 0.971 <u>Torsion g:</u> RMS = 5.2 95 th = 20.5 CMC = 0.988
Robert-Lachaine X. & al.	12	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC /LoA Z= 1.3/1.00/ 0.1 ±2.3 X- 1.5/0.98/-0.4±2.2 Y= 3.6/0.97/-2.6 ±4.5
Schall, M. C. & al.	6	IMU system (I2 M Motion Tracking, Series SXT)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Simulated milking cluster attachment task	(RMSE° (SD)) Flexion-extension: 5.4 (2.6) Lateral Bending: 5.8 (2.9)
Shoulder					
Barraza Madrigal, J. A. & al.	10	Invensense-MPU6050	Ariel Performance Analysis System (APAS)	Maximal active ROM (Flexion Extension)	RMSE (°) <u>Max values :</u> X axis: 1.57 Y axis: 0.63 Z axis: 1.25 <u>Min. Values :</u> X axis: 1.13 Y axis: 1.31 Z axis: 1.98
Bouvier, B. & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Eagle 4 (Motion Analysis Corporation, CA, USA)	Maximal active ROM Wheel test	CMC / RMSE (°) <u>Shoulder flexion</u> flexion=0.98/13.4

					internal/external rotation= 0.60/14 <u>Shoulder abduction</u> flexion = 0.97/19.3 external/internal rotation = 0.83/21.8 <u>Wheel</u> flexion= 0.91/14.7 abduction= 0.73/11.4 internal/external rotation = 0.74/18.1
Cutti, A. G. & al.	1	IMMS MT9B (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Maximal active ROM	RMS error (°) /π / m (angular coefficient of regression) 97% of data pairs: ranged 0.2 to 3.2/ 90.4% of data pair: above 0.86/ 88% of data pairs: 0.79 to 1.15
Ertzgarrd, P. & al.	10	IMUs (Analog devices, Adis 16350)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Lifting and dropping Throwing Task 1: Top of the head, to the shoulder, clapping back of hands together, moved hands to the knee and then to the toe Task 2: Ears, to the eyes and then to the mouth	ICC Cone: flexion-extension=0.952/Abduction-Adduction= 0.879/External-internal rotation= 0.943 Throwing: flexion-extension=0.975/Abduction-Adduction= 0.817/External-internal rotation= 0.905 Task 1: flexion-extension=0.902/Abduction-Adduction= 0.949/External-internal rotation= 0.799 Task 2: flexion-extension=0.943/Abduction-Adduction= 0.946/External-internal rotation= 0.768
Fantozzi, S. & al.	8	IMMU system (Opal, APDM, 7 units, 128 Hz, Motion Studio software beta version 1.0.0.201310221707)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Swimming (Simulated front-crawl and breaststroke)	CMC/RMSE (°)/r Front-crawl Flex-ext: 0.99/ 5/ 0.99 ABD-ADD: 0.97/10/0.95 Int-ext rot: 0.99/7/0.98

					Breast-stroke: ABD-ADD: 0.99/ 5/1 Int-ext rot: 0.99/3/0.99
Gil-Agudo, A. & al.	1	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Drinking	Flexion- extension: 0.76 ±4.04/0.998 Abduction- Adduction: 0.69 ±10.47 / 0.991 Internal- external rotation: -0.65± 5.67/ 0.992
Godwin A. & al.	1	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sweep Table wash Asymmetric lifting	(mean) RMSE - Max. RMSE (°) Sweep: Right :X: 12.7 – 34.1; Y:8.9 – 30.8; Z:25.5 – 53.9 Left : X: 2.8 – 11.5; Y: 3.3- 13.3 ; Z: 2.8 – 10.9 Table wash: Right : X: 14.8 – 45.8; Y: 12.4 – 39.5; Z: 25.6 – 64.1 Left : X: 7.1 – 31.8; Y: 9.3 – 32.3; Z: 12.1 – 64.5 Asymmetric lifting: Right : X: 9.6 – 33.1; Y:13.1 – 33.2; Z: 17.1 – 55.5 Left : X: 12.9 – 49.8; Y: 16.2 – 42.2; Z: 23.6 – 74.2
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximum range of motion	r^2 0.79 to 0.89 (flexion= 0.84, extension= 0.84, abduction= 0.86, internal rotation = 0.79, external rotation = 0.89) Upper extremity ± 20°
Pérez R. & al.	1	MTi Xsens inertial (Xsens technologies B.V., Enschede, the Netherlands)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Flexion-ext ABD-ADD Internal rotation Serving water from a jar	Correlation coefficient: Flexion-Ext: 0.994 ABD-ADD: 0.718 Inter. Rot: 0.995 Serving water from a jar: Flexion-Ext: 0.995 ABD-ADD: 0.908 Inter. Rot: 0.853 Mean peak diff. °: Flexion-Ext: 13.4 ABD-ADD: 17.25 Inter. Rot: 60.45 Serving water from a jar: Flexion-Ext: 13.82 ABD-ADD: 7.44 Inter. Rot: 28.88
Robert-Lachaine X. & al.	12	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC/LoA X= 2.9/1.00/-0.1± 5.2 Z= 3.0/0.99/ -0.9±4.2 Y=2.5/0.99/-0.7± 3.8

Schall, M. C. & al.	6	IMU system (I2 M Motion Tracking, Series SXT)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Simulated milking cluster attachment task	(RMSE° (SD)) 7.2-12.1 (2.4-3.2)
Zhou, H. & al.	8	MTx inertial sensors (Xsens technologies B.V., Enschede, the Netherlands)	Qualisys (Medical, Gothenburg, SE)	Activity of daily living and rotation of upper extremity at different speeds (following circle and rectangle)	Mean ±SD (°)/RMS (°) /Correlation 0.05 m/s: 1.79±1.45/2.04/0.96- 0.1 m/s: -2.29±2.44/2.38/0.97 0.15 m/s: 2.69±2.35/2.06/0.94 0.25 m/s: -2.13±2.03/2.05/0.98
Elbow					
Bouvier, B. & al.	10	MTx (Xsens Technologies B. V.)	Eagle 4 (Motion Analysis Corporation, CA, USA)	Flexion Extension Pronation Supination Wheel test	CMC / RMSE (°) flexion-extensions = 0.93/24 pronation-supination= 0.95/14,2 wheel= 0.80/24,9
Cutti, A. G. & al.	1	IMMS MT9B (Xsens technologies B.V., Enschede, the Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Simple movement	RMS error (°) /r/ m (angular coefficient of regression) 97% of data pairs : ranged 0.2 to 3.2/ 90.4% of data pair: above 0.86/ 88% of data pairs: 0.79 to 1.15
Ertzgaa rd, P. & al.	10	IMUs (Analog de- vices, Adis 16350)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Lifting and dropping Throwing Task 1: Top of the head, to the shoulder, clapping back of hands together, moved hands to the knee and then to the toe Task 2: Ears, to the eyes and then to the mouth	ICC Cone: flexion- extension=0.984, pronation- supination= 0.682 Throwing: flexion- extension=0.845, pronation- supination= 0.783 Task 1: flexion- extension=0.914, pronation- supination= 0.792 Task 2: flexion- extension=0.888, pronation- supination= 0.808
Fantozzi, S. & al.	8	IMMU system (Opal, APDM, 7 units, 128 Hz, Motion Studio software beta version 1.0.0.201310221707)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Swimming (simulated front-crawl and breaststroke)	CMC/RMSE (°)/r Front-crawl Flex-ext: 0.95/15/0.96 Pro-sup : 0.93/10/0.92 Breast-stroke: Flex-ext: 0.98/8/0.99

					Pro-sup: 0.97/6/0.99
Gil-Agudo, A. & al.	1	Xsens MTx (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Drinking	Flexion-extension: -0.54 ±2.63/0.999 Pronation- Supination: -5.16 ±4.5/ 0.991
Godwin A. & al.	1	Xsens MTx (Xsens Technologies, Enschede, The Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sweep Table wash Asymmetric lifting	(mean) RMSE - Max. RMSE (°) Sweep: Right : X: 8.6 – 19.4; Y: 2.2 – 6.5; Z: 5.6 – 19.3 Left: X: 1.0 – 5.8; Y: 0.6 – 2.5; Z: 1.8 – 7.0 Table wash: Right: X: 9.7 – 30.6; Y:6.3 – 19.2; Z: 13.4 – 31.8 Left: X: 4.5 – 17.6; Y: 3.5 – 14.6; Z: 2.9 – 14.1
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximum range of motion	r ² 0.77 (flexion only) Upper extremity ± 20°
Pérez R. & al.	1	MTi Xsens inertial (Xsens technologies B.V., Enschede, the Netherlands)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Flexion Extension Pronation Supination Serving water from a jar	Correlation coefficient: Flex-ext: 0.984 Pro-Sup: 0.968 Serving water from a jar: Flex-ext: 0.979 Pro-sup: 0.925 Mean peak diff. °: Flex-ext: 5.8 Pro-Sup: 24.1 Serving water from a jar: Flex-ext: 18.6 pro-sup: 11.7
Robert-Lachaine X. & al.	12	Xsens system (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC/LoA Z= 2.9/0.99/0.3±5.2 X=2.0/0.98/0.3±3.7 Y= 2.6/0.99/0.6 ±4.8
Zhou, H. & al.	8	MTx inertial sensors (Xsens technologies B.V., Enschede, the Netherlands)	Qualisys (Medical, Gothenburg, SE)	Activity of daily living and rotation of upper extremity (following circle and rectangle)	Mean ±SD (°)/RMS (°) /Correlation 0.05 m/s: -2.43±1.97/2.33/0.97 0.1 m/s: -2.53±2.35/2.41/0.96 0.15 m/s: -2.11±2.67/2.25/0.97 0.25 m/s: -2.23±2.14/2.16/0.97
Wrist					
Bouvier, B. & al.	10	Xsens MTx (Xsens technologies B.V., Enschede, the Netherlands)	Eagle 4 (Motion Analysis Corporation, CA, USA)	Flexion Extension Abduction	CMC / RMSE (°) flexion-extensions :0.95 / 11.6 abduction-adductions :0.81/12.3

				Adduction	
Fantozzi, S. & al.	8	IMMU system (Opal, APDM, 7 units, 128 Hz, Motion Studio software beta version 1.0.0.201310221707)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Swimming (simulated front-crawl and breaststroke)	CMC/RMSE (°)/r Front-crawl Flex-ext: 0.95/5/0.96 RA-UL: 0.90/3/0.91 Flex-ext: 0.99/6/1 Breast-stroke: Flex-ext: 0.98/5/0.98 RA-UL: 0.93/4/0.93
Gil-Agudo, A. & al.	1	Xsens MTx (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Drinking	Flexion- extension :3.47 ± 9.43/0.974 Radial-ulnar deviation : -2.19 ± 4.64/ 0.954
Kumar Y. & al.	19	Home-made sensors systems	Goniometer	Maximum range of motion	r ² 0.75 (pronation) 0.73(supination) 0.62 to 0.88(flexion=0.86, extension=0.68, radial deviation=0.88, ulnar deviation=0.62) Upper extremity ± 20°(except for extension and ulnar deviation = ±30°)
Pérez R. & al.	1	MTi Xsens inertial (Xsens technologies B.V., Enschede, the Netherlands)	SMART-DX 7000 (BTS Bioengineering, 7 cameras, 250 Hz, software version 1.10.451.0)	Flexion Extension Serving water from a jar	Correlation coefficient: Flex- ext: 0.987 Serving water from a jar: 0.924 Mean peak diff. °: Flex- ext: 11.65 Serving water from a jar: 26.88
Robert-Lachaine X. & al.	12	Xsens system (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC/LoA Z = 3.8/0.96/-1.0±6.9 X= 2.8/0.95/-0.4 ±5.1 Y=3.6/0.92/-1.3±5.9
Neck					
Gil-Agudo, A. & al.	1	Xsens MTx (Xsens technologies B.V., Enschede, the Netherlands)	Codamotion (Charnwood Dynamics, Leicestershire, UK)	Drinking	Flexion-extension: 1.58±1.34/ 0.999 Inclination: -8.24 ± 2.10 / 0.993
Godwin A. & al.	1	Xsens MTx (Xsens Technologies, Enschede, The Netherlands)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sweep Table wash Asymmetric lifting	(mean) RMSE - Max. RMSE (°) Sweep: X: 1.7 – 5.2; Y: 1.3 – 5.6; Z:0.7-3.5 Table wash: X: 2.2 -12.8; Y: 3.0 – 11.0; Z: 9.8 –

					40.6 Asymmetric lifting: X: 11.7 – 30.9; Y: 6.3 – 18.4; Z: 14.4 – 47.1
Jasiewicz, J.M et al.	10	IC3 (Intersense, Bedford, MA, USA)	Fastrak system (Polhemus, 2007)	Maximum range of motion (Left side) Rotation Flexion Lateral flexion (left)	Mean error – SD (°)/ RMSE – SD/ cross-correlation Head mounted sensors Flexion: -0.2 – 0.8/ 2.1 – 1.1/ 0.98 Lateral flexion: 2.2 – 0.8/ 2.5 – 0.9/ -0.97 Rotation: 0.8 – 1.3/2.3 – 0.9/0.97 C7/Trunk mounted sensors Flexion: -0.0 – 0.6/1.2 – 0.5/0.98 Lateral flexion: 0.4 – 0.3/0.7 – 0.7/0.99 Rotation: -1.9 – 0.7/0.9-0.5/0.98
Lebel K. & al.	20	IGS-180 (synertial) (model OSv3 also called OS3D, Inertial Labs)	Vicon Motion Systems (Oxford Metrics Ltd, Oxford, UK)	Sit-to-stand Walking Turning	RMSED (°)/Err peak (°)/CMC Sit-to-stand: 4.0 /8.0/0.9 Walk: 3.7 /8.9/0.819 Turn: 4.4 /6.8/0.998
Robert-Lachaine X. & al.	12	Xsens system (Xsens technologies B.V., Enschede, the Netherlands)	Optotrak system (Northern Digital Inc., Ontario, Canada)	Handling tasks and simple movements	RMSE/CMC/LoA Z= 1.4/1.00/0.1±2.8 X= 1.5/1.00/-0.0±2.6 Y= 3.0/0.99/-1.4±5.0

RMSE: root mean square error, CMC: coefficient of multiple correlation, LoA: Limits of Agreement, Err: Error, SD: Standard deviation, Diff: Difference, Flex: flexion, Ext: extension, Abd: abduction, Add: Adduction, RA-UL: Radio-ulnar, Pro-sup: Pro-supination; ICC: intraclass correlation coefficient, ROM: Range of motion.

Table S3 : Synthesis of reliability results.

Knee				
Authors	n	IMU used	Task	Reliability
Al-Amri & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Walking Jump Squat	Intra-rater reliability - Sagittal plan : ICC : 0.60 à 0.95 - Absolute : SEM < 5° Inter-rater reliability - Walking and squatting: ICC > 0.6 et SEM < 5° - Jumping: poor to excellent
Favre, J. & al.	10	IMUs (ADXRS and ADXL) (PhysilogVR , BioAGM, CH)	Maximal active ROM Walking (30m)	Intra-rater reliability Repeatability of the θ angle (R) was 2.8°
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin,Germany)	Passive maximal ROM	Intra-rater reliability (ICC) Knee ext: 0.61 Knee flex: 0.82(left), 0.84 (right)
Hip				
Al-Amri & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Walking Jump Squat	Intra-rater reliability - Sagittal plan : ICC : 0.60 à 0.95 - Absolute : SEM < 5° Inter-rater reliability - Walking and squatting: ICC > 0,6 et SEM < 5° - Jumping: poor to excellent
Bauer, C. M. & al.	24	IMUs (Valedo_ User Manual, Hocoma AG)	Maximal active ROM	Intra-rater reliability Index of dependability: 0.19 to 0.9 (High to very reliable)
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin,Germany)	Maximal passive ROM	Intra-rater reliability (ICC) Hip flex: 0.87(left), 0.92 (right) Hip lat. Rot: 0.87 (left), 0.96 (right) Hip med Rot: 0.91 (left), 0.93 (right)
Ankle				
Akins, J. S. & al.	12	MARG sensors (X-IMU, x-io Technologies Limited, UK).	Soccer field maneuvers	Intra-rater reliability (ICC/ /SEM) *: Plantar-dorsiflexion = 0.284-0.755/2.6-7.1 Eversion-inversion = 0.482-0.741/1.5-3.4 Internal-external rotation =0.558-0.788/3.3-5.9 *only initial contact data are reported, for more details refer to article

Al-Amri & al.	26	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Walking Jump Squat	Intra-rater reliability - Sagittal plan: ICC : 0.60 à 0.95 - Absolute: SEM < 5° Inter-rater reliability - Walking and squatting: ICC > 0.6 et SEM < 5° - Jumping: poor to excellent
Mifsud NL. & al.	14	IMU (Debus und Diebold Messsysteme, GmbH)	Running (10 meter at 12 ± 1.2 km/h)	Reliability (test re-test/intra-rater reliability) Inversion/eversion (B, frontal plan): Bias: -0.3 LOA (95%): -7.2, 6.6 ICC: 0.84 RMSE: 3.3 Internal/external rotation (p, transverse plan): Bias: -0.4 LOA (95%): -10.6, 9.9 ICC: 0.88 RMSE: 5.0 Horizontal sol angle (y, sagittal plan): Bias: -0.9 LOA (95%): -8.0, 6.2 ICC: 0.95 RMSE: 3.5
Pelvis				
Bugane, F. & al.	1	Free4Act (F4A – LetSense Srl, Bologna, Italy)	Walking	<u>Intra-subject/intra-raters reliability</u> Tilt Good reliability with SD: 0.3° Obliquity Good reliability with SD: 0.6° Rotation Good reliability with SD: 1.1°
Trunk				
Bauer, C. M. & al.	24	IMUs (Valedo_ User Manual, Hocoma AG)	Maximal active ROM	Intra-rater reliability Index of dependability: 0.19 to 0.9 (High to very reliable [except for the extension of lumbar spine])
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin, Germany)	Maximal active ROM	Intra-rater reliability (ICC) Thoracic and lumbar rotation: 0.8(left), 0.9 (right) Thoracic dans lumbar lat flex: 0.9 (left), 0.92 (right)

Yun, W.S. & al.	19	MEMS-IMU transmitters (EBIMU24G, E2BOX, Seoul, South Korea)	Maximal active ROM	Intra-rater reliability (ICC) Intra-test reliability (first/second session) <u>Sagittal</u> Lateral bending R: 0.983/0.958 Lateral bending L: 0.947/0.945 Rotation R: 0.975/0.949 Rotation L: 0.896/0.944 <u>Coronal</u> Flexion: 0.996/0.997 Extension: 0.983/0.958 Rotation R: 0.918/0.965 Rotation L: 0.966/0.916 <u>Axial</u> Flexion: 0.992/0.989 Extension: 0.974/0.988 Lateral bending R: 0.975/0.965 Lateral bending L: 0.982/0.989 Test-retest reliability <u>Sagittal</u> Lateral bending R: 0.930 Lateral bending L: 0.834 Rotation R: 0.793 Rotation L: 0.815 <u>Coronal</u> Flexion: 0.772 Extension: 0.930 Rotation R: 0.690 Rotation L: 0.669 <u>Axial</u> Flexion: 0.865 Extension: 0.862 Lateral bending R: 0.862 Lateral bending L: 0.890
Shoulder				
Bouvier, B. & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Maximal active ROM Wheel test	Intra-rater reliability CMC / m (°) / r <u>Flexion</u> Flexion=0.99/5.9/1.2 Abduction= 0.72/4.2/1.6

				External/internal rotation = 0.76/6.6/2.1 <u>Abduction</u> Flexion = 0.99/6.2/1.3 Abduction= 0.85/5.7/1.6 External/internal rotation = 0.91/7.5/1.8 <u>Wheel</u> Flexion= 0.96/7.2/1.9 Abduction= 0.91/5.3/1.4 Internal/external rotation= 0.87/7.8/1.6
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin, Germany)	Maximal Passive ROM	Intra-rater reliability (ICC) Shoulder ER: 0.71 (left), 0.86 (right) Shoulder IR: 0.88 (left), 0.87 (right)
Scapula				
van den Noort, J. C & al.	20	MTw, (Xsens technologies B.V., Enschede, the Netherlands)	Arm elevation	(ICC/SEM) (scapular retraction-protraction; Scapular mediolateral rotation; Scapular anterior-posterior tilt) Interrater reliability Anteflexion <u>Upward</u> 0°: 0.68/6; 0.79/3; 0.32/2 30°: 0.68/6; 0.79/3; 0.39/3 60°: 0.68/7; 0.8/3; 0.59/3 90°: 0.72/6; 0.81/4; 0.73/4 120°: 0.76/6; 0.85/4; 0.71/4 <u>Downward:</u> 120°: 0.77/6; 0.85/4; 0.69/4 90°: 0.77/6; 0.76/4; 0.73/3 60°: 0.73/6; 0.71/4; 0.66/2 30°: 0.71/7; 0.72/3; 0.47/2 0°: 0.69/7; 0.75/3; 0.41/2 Abduction <u>Upward</u> 0°: 0.81/5; 0.79/3; 0.56/2 30°: 0.68/6; 0.81/3; 0.37/2 60°: 0.65/6; 0.87/3; 0.5/3 90°: 0.68/6; 0.89/3; 0.82/3 120°: 0.72/6; 0.89/3; 0.82/3 150°: 0.69/7; 0.9/3; 0.87/3 <u>Downward:</u>

				150°:0.67/8; 0.91/3; 0.87/3 120°: 0.69/6; 0.88/3; 0.84/3 90°:0.68/6; 0.86/3; 0.79/2 60°: 0.66/6; 0.82/3; 0.59/3 30°: 0.66/6; 0.74/3; 0.5/3 0°: 0.74/6; 0.76/3; 0.54/2 Intra-raters reliability Anteflexion <u>Upward</u> 0°: 0.83/4; 0.6/4; 0.34/2 30°: 0.85/4; 0.68/4; 0.39/3 60°: 0.83/4; 0.78/4; 0.59/3 90°:0.82/5; 0.86/3; 0.64/4 120°:0.80/5; 0.88/3; 0.67/5 <u>Downward:</u> 120°:0.83/5; 0.87/3; 0.68/4 90°:0.82/5; 0.81; 0.62/4 60°:0.8/5; 0.69/4; 0.57/3 30°:0.79/5; 0.6/4; 0.51/2 0°: 0.8/5; 0.59/4; 0.48/ Abduction <u>Upward:</u> 0°: 0.83/4; 0.74/3; 0.78/1 30°: 0.82/4; 0.71/4; 0.76/1 60°:0.8/4; 0.79/3; 0.81/2 90°:0.8/4;0.84/3; 0.78/3 120°:0.81/4; 0.85/3; 0.75/4 150°: 0.78/5; 0.84/4; 0.71/5 <u>Downward:</u> 150°:0.78/5;0.82/4; 0.69/5 120°: 0.79/5; 0.83/4; 0.73/4 90°:0.77/4; 0.79/3; 0.71/3 60°:0.77/4; 0.69/4; 0.68/2 30°:0.78/4;0.56/4; 0.79/2 0°:0.78/4; 0.69/3; 0.75/2
Elbow				
Bouvier, B. & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Maximal active ROM Wheel test	Intra-rater reliability CMC / m (°) / r flexion-extensions = 0.99/6.2/1.2 pronation-supination = 0.96/7.6/2.2

				wheel = 0,94/10,0/1,2
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin, Germany)	Maximal passive ROM	Intra-rater reliability (Mean SD/ICC) Elbow ext: 3.01/ 0.2 (left), 0.59 (right) Elbow Flex: 4.06/ 0.69 (left), 0.77 (right) Elbow pron: 4.76/ 0.48 (left), 0.43 (right) Elbow sup: 3.94/ 0.39 (left), 0.7 (right)
Wrist				
Bouvier, B. & al.	10	Xsens MVN BIOMECH (Xsens technologies B.V., Enschede, the Netherlands)	Maximal active ROM	Intra-rater reliability CMC / m (°) / r flexion-extensions= 0.96/9.0/1.6 abduction-adductions = 0.96/5.2/1.4
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin, Germany)	Maximal passive ROM	Intra-rater reliability (Mean SD/ICC) Wrist ext: 3.58/ 0.88 (left), 0.9 (right) Wrist flex: 4.23 0.9 (left), 0.86 (right) Wrist ABD: 2.97/ 0.79 (left), 0.89 (right) Wrist ADD: 2.93/ 0.82 (left), 0.87 (right)
Neck				
Duc, C. & al.	10	IMUs (Physilog®, BioAGM, CH)	Maximal active ROM	Intra-rater reliability ICC / SEM ° Primary movement: Ax Flexion-extension (FE): 1.00/1.2 Ay axial rotation (AR): 0.98/3.1 Az lateral bending (LB): 0.87/9.4 Associate movement: Ay (LB): 0.88/3.5 Az (LB): 0.87/2.1 Ax (AR): 0.75/3.7 Az (AR): 0.64/2.5 Ax (FE): 0.91/1.9 Ay (FE): 0.82/1.1
Kim, H. & al.	18	IMUs (model EBIMU24G, E2BOX, Seoul, Republic Korea)	Maximal active ROM	Mean° (SD) /ICC (95% IC) Intra-rater reliability Flexion and extension: <u>Natural test</u> Total: 116.70 ± 17.26/0.98 (0.96–0.99) Extension: 57.23 ± 8.80/0.97 (0.93–0.99) Flexion: 58.48 ± 11.83/0.98 (0.96–0.99) <u>Neutral test</u> Total (sagittal): 106.76 ± 20.33/0.99 (0.97–1.00) Extension: 52.75 ± 9.25/0.95 (0.90–0.98) Flexion: 54.02 ± 13.46/0.98 (0.97–0.99)

				Rotation: <u>Natural test</u> Total (transverse): 89.42 ± 10.1/ 0.97 (0.95–0.99) Left: 44.15 ± 6.72/ 0.97 (0.93–0.99) Right: 45.28 ± 4.97/ 0.98 (0.95–0.99) <u>Neutral test</u> Total (transverse): 83.69 ± 13.79/ 0.99 (0.98–1.00) Left: 42.17 ± 7.33/ 0.98 (0.96–0.99) Right: 41.52 ± 7.11/ 0.98 (0.97–0.99) Lateral flexion: <u>Natural test</u> Total (transverse): 143.29 ± 17.02/ 0.99 (0.97–0.99) Left: 69.67 ± 10.87/0.99 (0.97–0.99) Right: 73.62 ± 10.81/0.99 (0.97–0.99) <u>Neutral test</u> Total (transverse): 134.87 ± 22.43/ 0.98 (0.97–0.99) Left: 64.89 ± 11.74/ 0.98 (0.96–0.99) Right: 69.98 ± 13.99/ 0.99 (0.98–1.00)
Schiefer, C. & al	20	CUELA system (CUELA, IFA, Sankt Augustin, Germany)	Maximal active ROM	Intra-rater reliability (Mean SD/ICC) Cervical rotation: 2.6/0.79 Cervical extension: 2.54/ 0.83 Cervical flexion: 2.86/ 0.83 Cervical lat. flex: 1.98/ 0.93 (left), 0.95 (right)

RMSE: root mean square error, CMC: coefficient of multiple correlation, LoA: Limits of Agreement, SD: Standard deviation, Flex: flexion, Ext: extension, Pro-sup: Pro-supination; ICC: intraclass correlation coefficient, ROM: Range of motion, Standard error of the mean, lat.: lateral; l: left, R: right.

Table S4: Assessment of methodological quality by an appraisal quality tool (MacDermid et al., 2008).

Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total score		
													Total	%	Agreement
Akins, J. S. & al	2	2	2	1	2	2	1	2	2	2	2	2	22	92	83
Al-Amri & al.	2	2	0	2	2	2	2	2	2	2	2	2	22	92	92
Barraza Madrigal, J. A. & al	1	2	0	1	0	N/A	2	2	2	1	1	2	14	64	73
Bauer, C. M. & al.	2	2	0	1	1	2	2	2	2	1	1	2	18	75	92
Bergamini, E.	1	1	0	1	0	N/A	2	1	2	2	1	2	13	59	67
Bergmann, J. H. & al.	1	1	0	0	0	N/A	1	2	2	2	1	2	12	55	83
Blair, S & al.	2	2	0	0	1	N/A	1	2	2	1	2	2	15	68	75
Bouvier, B. & al.	2	1	0	2	0	2	2	2	2	2	2	2	19	79	83
Bolink, S. A. & al.	2	2	0	0	0	N/A	2	2	2	2	1	1	14	64	92
Bugane, F. & al.	2	2	1	1	0	N/A	2	2	2	2	1	2	17	77	100
Cloete, T. & al.	2	1	0	0	0	N/A	2	2	1	2	1	2	13	59	58
Cutti, A. G. & al.	2	1	0	0	1	N/A	2	2	2	2	1	2	15	68	75
Dejnabadi, H. & al.	1	1	0	0	0	N/A	2	2	2	2	1	2	13	59	92
Dowling, A. V. & al.	1	2	0	1	2	N/A	2	2	2	2	1	2	17	77	92
Duc, C. & al.	1	2	1	2	0	N/A	2	1	2	2	2	2	17	77	67
Ertzgaard, P. & al.	2	2	0	1	0	N/A	1	2	2	2	1	1	14	64	83
Fantozzi, S. & al.	1	1	0	0	0	N/A	2	1	2	2	1	1	11	50	92
Favre, J. & al.	1	1	1	1	0	N/A	2	2	1	1	2	2	14	64	67
Godwin A. & al	2	0	0	0	0	N/A	1	1	2	2	1	2	11	50	58
Gil-Agudo, A. & al.	2	0	0	0	0	N/A	2	1	2	1	0	1	9	41	100
Ha TH. & al.	2	2	0	0	0	N/A	1	2	2	2	1	1	13	59	75
Jasiewicz, J.M et al.	1	1	0	0	0	N/A	2	1	2	1	2	2	12	55	92
Jaysrichai T. & al.	1	1	0	0	0	N/A	2	1	2	2	1	1	11	50	100

Kim & al.	2	2	0	0	0	N/A	2	2	2	2	1	2	15	68	92
Kumar Y. & al.	1	1	0	0	1	N/A	1	2	2	2	2	1	13	59	83
Leardini A. & al.	1	1	0	1	0	N/A	2	2	2	1	1	2	13	59	83
Lebel K. & al.	2	1	0	1	2	N/A	2	2	2	2	2	2	18	82	83
Mjosund HL. & al	2	2	1	0	2	N/A	2	2	2	2	2	2	19	86	92
Mifsud NL. & al.	1	0	1	1	0	0	2	2	2	2	1	2	14	58	67
Pérez R. & al.	1	0	0	0	0	N/A	2	2	2	2	1	2	12	55	75
Plamondon & al.	2	1	2	0	0	N/A	2	2	2	2	2	2	17	77	67
Robert-Lachaine X. & al.	1	2	2	0	0	N/A	2	2	2	2	1	2	16	73	83
Rouhani, H. & al.	1	1	1	0	0	N/A	1	1	2	2	0	2	11	50	75
Saber-Sheikh, K. & al.	2	1	0	1	0	N/A	1	1	2	1	0	1	10	45	75
Saito, H. & al.	1	0	0	0	0	N/A	1	1	2	2	1	2	10	45	92
Schall, M. C. & al.	1	1	0	1	0	N/A	2	1	2	1	2	2	13	59	83
Schiefer, C. & al	2	2	1	2	0	2	1	1	1	1	1	2	16	67	83
Takeda, R. & al.	1	1	0	0	0	N/A	1	1	2	2	1	2	11	50	83
van den Noort, J. C & al.	2	1	1	2	0	2	2	2	2	2	1	2	19	79	83
Yun, W.S. & al.	2	2	1	1	0	2	2	2	2	2	1	2	19	79	92
Zhang, JT & al.	2	1	0	0	0	N/A	2	1	2	2	2	2	14	64	83
Zhou, H. & al.	1	0	0	0	0	N/A	2	2	2	2	1	1	11	50	100

Design requirements: Q1. Was the relevant background research cited to define what is currently known about the psychometric properties of the measures under study, and the need or potential contributions of the current research question? Q2. Were appropriate inclusion/exclusion criteria defined? Q3. Were specific psychometric hypotheses identified? Q4. Was an appropriate scope of psychometric properties considered? Q5. Was an appropriate sample size used? Q6. Was appropriate retention/follow-up obtained? (Studies involving retesting or follow-up only) Q7. Documentation: Were specific descriptions provided or referenced that explain the measures and its correct application/interpretation (to a standard that would allow replication)? Q8. Standardized Methods: Were administration and application of measurement techniques within the study standardized and did they are considered potential sources of error/misinterpretation? Q9. Were analyses conducted for each specific hypothesis or purpose? Q10. Were appropriate statistical tests conducted to obtain point estimates of the psychometric property? Q11. Were appropriate ancillary analyses were done to describe properties beyond the point estimates (Confidence intervals, benchmark comparisons, SEM/MID)? Q12. Were the conclusions/clinical recommendations supported by the study objectives, analysis and results?[14]. N/A: not applicable; 2= fully meet criteria; 1 = partially meet criteria; 0= not meeting criteria at all.

Table S5: Assessment of studies examining measurement errors (absolute measures) using COSMIN checklist (box B).

Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Total score		
															Total	%	Agreement
Akins, J. S. & al	1	1	1	1	1	1	N/A	1	1	1	1	N/A	N/A	N/A	10	100	100
Al-Amri & al.	1	1	1	1	1	1	N/A	1	1	1	1	N/A	N/A	N/A	10	100	90
Barraza Madrigal, J. A. & al	0	0	0	1	1	1	N/A	1	1	1	0	N/A	N/A	N/A	6	60	90
Bauer, C. M. & al.	0	0	1	1	1	1	N/A	1	1	1	0	N/A	N/A	N/A	7	70	100
Bouvier, B. & al.	0	0	0	1	0	1	N/A	1	1	1	1	N/A	N/A	N/A	6	60	90
Bugane, F. & al.	0	0	1	1	1	1	N/A	1	1	1	1	N/A	N/A	N/A	8	80	80
Duc, C. & al.	1	1	0	1	0	1	N/A	1	1	1	1	N/A	N/A	N/A	8	80	90
Ertzgaard, P. & al.	1	0	0	1	0	1	N/A	1	1	1	1	N/A	N/A	N/A	7	70	100
Favre, J. & al.	0	0	0	1	0	1	N/A	1	1	0	0	N/A	N/A	N/A	4	40	90
Kim & al.	0	0	0	1	1	1	N/A	1	1	0	1	N/A	N/A	N/A	6	60	80
Mifsud NL. & al.	1	1	0	1	1	1	N/A	1	1	1	1	N/A	N/A	N/A	9	90	100
Schall, M. C. & al.	0	0	0	1	1	0	N/A	N/A	0	0	0	N/A	N/A	N/A	2	22	56
Schiefer, C. & al	0	0	0	1	0	1	N/A	1	1	0	0	N/A	N/A	N/A	4	40	60
van den Noort, J. C & al.	1	1	0	1	1	1	N/A	1	1	1	1	N/A	N/A	N/A	9	90	100
Yun, W.S. & al.	0	0	0	1	0	1	N/A	1	1	0	1	N/A	N/A	N/A	5	50	80

Design requirements: Q1. Was the percentage of missing items given? Q2. Was there a description of how missing items were handled? Q3. Was the sample size included in the analysis adequate? Q4. Were at least two measurements available? Q5. Were the administration's independent? Q6. Was the time interval stated? Q7. Were patients stable in the interim period on the construct to be measured? Q8. Was the time interval appropriate? Q9. Were the test conditions similar for both measurements? e.g. type of administration, environment, instructions. Q10. Were there any important flaws in the design or methods of the study? Statistical methods: Q11. For continuous scores: Was an intraclass correlation coefficient (ICC) calculated? Q12. for dichotomous/nominal/ordinal scores: Was kappa calculated? Q13. For ordinal scores: Was a weighted kappa calculated? Q14. For ordinal scores: Was the weighting scheme described? e.g. linear, quadratic.[13] ; N/A: not applicable; 1 = yes; 0= no.

Table S6: Assessment of studies examining measurement errors (absolute measures) using COSMIN checklist (box C).

Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total score		
												Total	%	Agreement
Akins, J. S. & al	1	1	1	1	1	1	N/A	1	1	1	1	10	100	80
Al-Amri & al.	1	1	1	1	1	1	N/A	1	1	1	1	10	100	90
Barraza Madrigal, J. A. & al	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Bergamini, E.	0	0	0	1	1	0	N/A	N/A	1	1	1	5	56	100
Blair, S & al.	0	0	1	1	1	1	N/A	1	1	1	1	8	80	90
Bouvier, B. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Bolink, S. A. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Bugane, F. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Cutti, A. G. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Dowling, A. V. & al.	0	0	1	1	1	1	N/A	1	1	1	1	8	80	100
Duc, C. & al.	1	1	0	1	0	1	N/A	1	1	1	1	8	80	100
Favre, J. & al.	0	0	0	1	N/A	0	N/A	1	1	1	1	5	56	78
Jaysrichai T. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Kim & al.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kumar Y. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Leardini A. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Lebel K. & al.	0	0	1	1	0	1	N/A	1	1	1	1	7	70	90
Pérez R. & al.	0	0	0	1	0	1	N/A	1	1	1	1	6	60	100
Robert-Lachaine X. & al.	0	0	0	1	1	1	N/A	1	1	1	1	7	70	100
Schall, M. C. & al.	0	0	0	1	1	0	N/A	1	1	1	1	6	60	90
Schiefer, C. & al	0	0	0	1	1	1	N/A	1	1	1	1	7	70	80
van den Noort, J. C & al.	1	1	0	1	1	1	N/A	1	1	1	1	9	90	100
Zhou, H. & al.	0	0	0	1	0	1	N/A	1	1	1	1	6	60	100

Design requirements: Q1. Was the percentage of missing items given? Q2. Was there a description of how missing items were handled? Q3. Was the sample size included in the analysis adequate? Q4. Were at least two measurements available? Q5. Were the administration's independent? Q6. Was the time interval stated? Q7. Were patients stable in the interim period on the construct to be measured? Q8. Was the time interval appropriate? Q9. Were the test conditions similar for both measurements? e.g. type of administration, environment, instructions. Q10. Were there any important flaws in the design or methods of the study? Statistical methods: Q11. for CTT: Was the Standard Error of Measurement (SEM), Smallest Detectable Change (SDC) or Limits of Agreement (LoA) calculated? [13] ; N/A: not applicable; 1 = yes; 0= n.

Table S7: Assessment of studies examining criterion validity using COSMIN checklist (box H).

Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total score		
								Total	%	Agreement
Akins, J. S. & al	1	1	1	1	1	1	N/A	6	100	71
Al-Amri & al.	1	1	1	1	1	1	N/A	6	100	100
Barraza Madrigal, J. A. & al	0	0	0	1	1	0	N/A	2	33	86
Bauer, C. M. & al.	0	0	1	1	1	1	N/A	4	67	86
Bergamini, E.	0	0	0	1	1	1	N/A	3	50	100
Bergmann, J. H. & al.	0	0	0	1	1	1	N/A	3	50	100
Blair, S & al.	0	0	1	1	1	0	N/A	3	50	86
Bouvier, B. & al.	0	0	1	1	1	1	N/A	4	67	86
Bolink, S. A. & al.	0	0	0	1	1	1	N/A	3	50	100
Bugane, F. & al.	0	0	0	1	1	1	N/A	3	50	100
Cloete, T. & al.	0	0	0	1	1	1	N/A	3	50	100
Cutti, A. G. & al.	1	0	1	1	1	1	N/A	5	83	71
Dejnabadi, H. & al.	1	1	0	1	1	1	N/A	5	83	71
Dowling, A. V. & al.	0	0	1	1	1	1	N/A	4	67	100
Duc, C. & al.	1	1	1	1	1	1	N/A	6	100	86
Ertzgaard, P. & al.	1	0	0	1	1	1	N/A	4	67	100
Fantozzi, S. & al.	0	0	0	1	1	1	N/A	3	50	86
Favre, J. & al.	0	0	0	1	1	1	N/A	3	50	100
Godwin A. & al	0	0	0	1	0	0	N/A	1	17	86
Gil-Agudo, A. & al.	0	0	0	1	0	1	N/A	2	33	100
Ha TH. & al.	0	0	0	1	0	1	N/A	2	33	86
Jasiewicz, J.M et al.	0	0	0	1	1	1	N/A	3	50	86
Jaysrichai T. & al.	0	0	0	1	1	1	N/A	3	50	100
Kim & al.	0	0	0	1	1	1	N/A	3	50	100
Kumar Y. & al.	0	0	1	1	1	1	N/A	4	67	86
Leardini A. & al.	0	0	0	1	1	0	N/A	2	33	86

Lebel K. & al.	0	0	1	1	1	1	N/A	4	67	100
Mjosund HL. & al	1	0	1	1	1	1	N/A	5	83	86
Mifsud NL. & al.	1	1	0	1	1	1	N/A	5	83	100
Pérez R. & al.	0	0	0	1	1	1	N/A	3	50	100
Plamondon & al..	1	0	0	1	1	1	N/A	4	67	86
Robert-Lachaine X. & al.	0	0	0	1	1	1	N/A	3	50	86
Rouhani, H. & al.	0	0	0	1	1	1	N/A	3	50	100
Saber-Sheikh, K. & al.	0	0	0	1	1	0	N/A	2	33	100
Saito, H. & al.	0	0	0	1	0	1	N/A	2	33	86
Schall, M. C. & al.	0	0	0	1	1	0	N/A	2	33	100
Takeda, R. & al.	0	0	0	1	1	1	N/A	3	50	100
Zhang, JT & al.	0	0	0	1	1	1	N/A	3	50	100
Zhou, H. & al.	0	0	0	1	1	1	N/A	3	50	100

Design requirements: 1. Was the percentage of missing items given? 2. Was there a description of how missing items were handled? 3. Was the sample size included in the analysis adequate? 4. Can the criterion used or employed be considered as a reasonable 'gold standard'? 5. Were there any important flaws in the design or methods of study? Statistical methods: 6. for continuous scores: Were correlations, or the area under the receiver operating curve calculated? 7. for dichotomous scores: Were sensitivity and specificity determined?[13] ; N/A: not applicable; 1 = yes; 0= no.