

# Reeducación Motora



**Table 6.1 TYPICAL OVERACTIVE AND UNDERACTIVE MUSCLES**

Typically Overactive Muscles	Typically Underactive Muscles
Gastrocnemius	Anterior tibialis
Soleus	Posterior tibialis
Adductors	Vastus medialis oblique (VMO)
Hamstring complex	Gluteus maximus/medius
Psoas	Transverse abdominus
Tensor fascia latae	Internal oblique
Rectus femoris	Multifidus
Piriformis	Serratus anterior
Quadratus lumborum	Middle/lower trapezius
Erector spinae	Rhomboids
Pectoralis major/minor	Teres minor
Latissimus dorsi	Infraspinatus
Teres major	Posterior deltoid
Upper trapezius	Deep cervical flexors
Levator scapulae	
Sternocleidomastoid	
Scalenes	

**Table 7.2 SUMMARY OF NORMAL JOINT END RANGES OF MOTION**

Joint	Action	Degrees of Motion
Shoulder	Flexion	160 degrees
	Extension	50 degrees
	Abduction	180 degrees
	Internal rotation	45 degrees
	External rotation	90 degrees
Elbow	Flexion	160 degrees
	Extension	0 degrees
Forearm	Pronation	90 degrees
	Supination	90 degrees
Wrist	Flexion	90 degrees
	Extension	70 degrees
	Radial deviation	20 degrees
	Ulnar deviation	30 degrees
Hip	Flexion	120 degrees
	Extension	0–10 degrees
	Abduction	40 degrees
	Adduction	15 degrees
	Internal rotation	45 degrees
	External rotation	45 degrees
Knee	Flexion	140 degrees
	Extension (hip neutral)	0 degrees
	Extension (hip flexed)	20 degrees
Ankle	Plantarflexion	45 degrees
	Dorsiflexion	20 degrees
Foot	Inversion	30 degrees
	Eversion	10 degrees



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Original research

## Kinematics during lower extremity functional screening tests in young athletes – Are they reliable and valid?

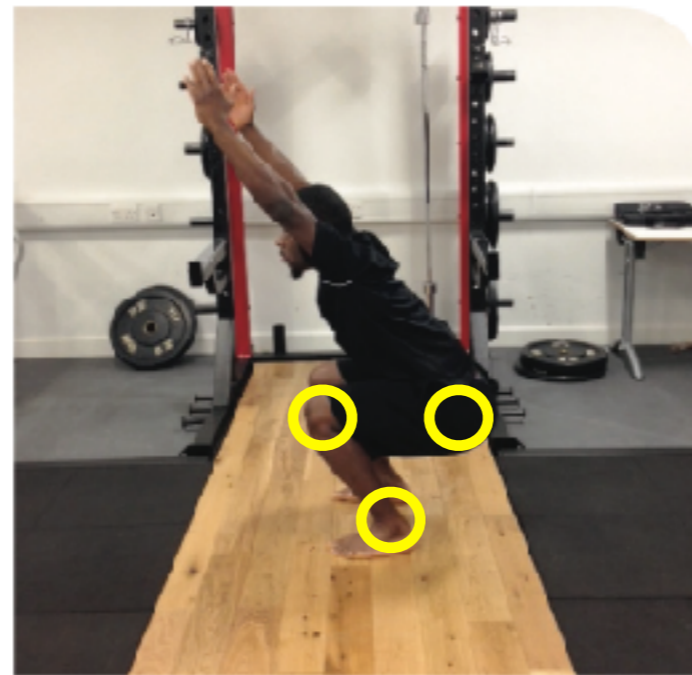
Chris Whatman<sup>a, b</sup>  , Patria Hume<sup>b</sup>, Wayne Hing<sup>a</sup>

**Results:** Within-day reliability was excellent ( $ICC \geq 0.85$ ) and between-day reliability was excellent to good (ICC range 0.60-0.92) for the majority of kinematic variables. Correlations for peak lower extremity kinematics between SKB and Drop Jump were moderate to very large ( $r = 0.39-0.87$ ) as were correlations between Single Leg SKB and Running ( $r = 0.45-0.84$ ).

**Conclusions:** Kinematics during the SKB and single leg SKB have moderate to high reliability and are similar to those during a drop jump or running.

# Screening movement dysfunctions using the overhead squat

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**Figure 1. (on left)**  
Overhead squat (anterior view)

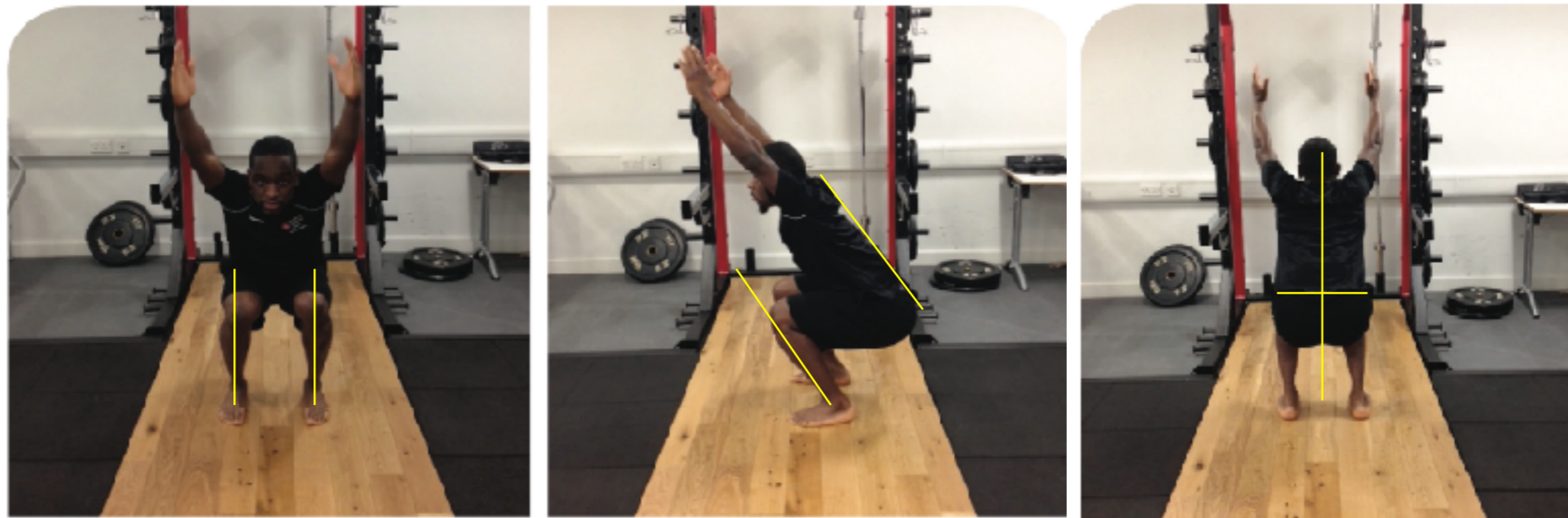
**Figure 2. (on right)**  
Overhead squat (lateral view)

**Table 2. Mean values for peak joint angles and peak joint moments during the overhead squat (adapted from Butler et al, 2010)**

VARIABLE	SCORE OF 1	SCORE OF 2	SCORE OF 3	P
Peak dorsiflexion (°)	24.5 ± 2.3	27.9 ± 2.6	31.4 ± 1.8	0.10
Peak plantarflexion moment (N/kg)	-0.27 ± 0.03	-0.25 ± 0.02	-0.21 ± 0.02	0.15
Peak knee flexion (°)	84.7 ± 4.3	111.0 ± 4.9	130.7 ± 3.8	< 0.01
Peak knee extension moment (N/kg)	0.45 ± 0.04	0.56 ± 0.05	0.63 ± 0.03	< 0.01
Peak hip flexion (°)	88.8 ± 5.1	117.5 ± 4.0	121.1 ± 2.0	< 0.01
Peak hip extension moment (N/kg)	-0.36 ± 0.07	-0.56 ± 0.05	-0.55 ± 0.04	0.34

# Screening movement dysfunctions using the overhead squat

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## Compensations, Muscles Imbalances and Corrective Strategies

View	Checkpoint	Compensation	Probable Overactive Muscles	Probable Underactive Muscles	Sample SMR (Foam Roll) and Static Stretch Techniques	Sample Strengthening Exercises
Anterior	Feet	Turn Out	Soleus Lateral gastrocnemius Biceps femoris (short head)	Medial gastrocnemius Medial hamstring complex Gracilis Sartorius Popliteus	SMR: Gastrocnemius/ soleus SMR: Biceps femoris (short head) Static gastrocnemius stretch Static supine biceps femoris stretch	Single-leg balance reach
	Knees	Move Inward	Adductor complex Biceps femoris (short head) Tensor fascia latae Vastus lateralis	Gluteus medius/maximus Vastus medialis oblique (VMO)	SMR: Adductors SMR: TFL/IT band Static supine biceps femoris stretch Static standing TFL stretch	Tube walking: side to side
Lateral	LPHC	Excessive Forward Lean	Soleus Gastrocnemius Hip flexor complex (THL, rectus femoris, psoas) Abdominal complex (rectus abdominis, external obliques)	Anterior tibialis Gluteus maximus Erector spinae	SMR: Gastrocnemius/ soleus SMR: Quadriceps Static gastrocnemius stretch Static kneeling hip flexor stretch	Quadruped arm/opposite leg raise Ball wall squats
		Low Back Arches	Hip flexor complex (TFL, rectus femoris, psoas) Erector spinae Latissimus dorsi	Gluteus maximus Hamstring complex Intrinsic core stabilisers (transverse abdominus, multifidus, transversospinalis, internal oblique, pelvic-floor muscles)	SMR: Quadriceps SMR: Latissimus dorsi Static kneeling hip flexor stretch Static latissimus dorsi ball stretch	Quadruped arm/opposite leg raise Ball wall squats
	Upper Body	Arms Fall Forward	Latissimus dorsi Teres major Pectoralis major/minor	Mid/lower trapezius Rhomboids Rotator cuff (supraspinatus, infraspinatus, teres minor, subscapularis)	SMR: Thoracic spine SMR: Latissimus dorsi Static latissimus dorsi ball stretch Static pectoral wall stretch	Squat to row
		Shoulder Elevate (pushing/pulling assessment)	Upper trapezius Sternocleidomastoid Levator scapulae	Mid/lower trapezius	SMR: Upper trapezius (Thera Cane) Static stretch upper trapezius/ scalene stretch	Ball cobra
		Head Protrudes Forward (pushing/pulling assessment)	Upper trapezius Sternocleidomastoid Levator scapulae	Deep cervical flexors	SMR: Upper trapezius (Thera Cane) Static stretch upper trapezius/ scalene stretch	Chin tuck (keep head in neutral position during all exercises)

### Single-Leg Squat Assessment, Position



### Single-Leg Squat Assessment, Movement





## Single-Leg Squat Assessment, Compensations



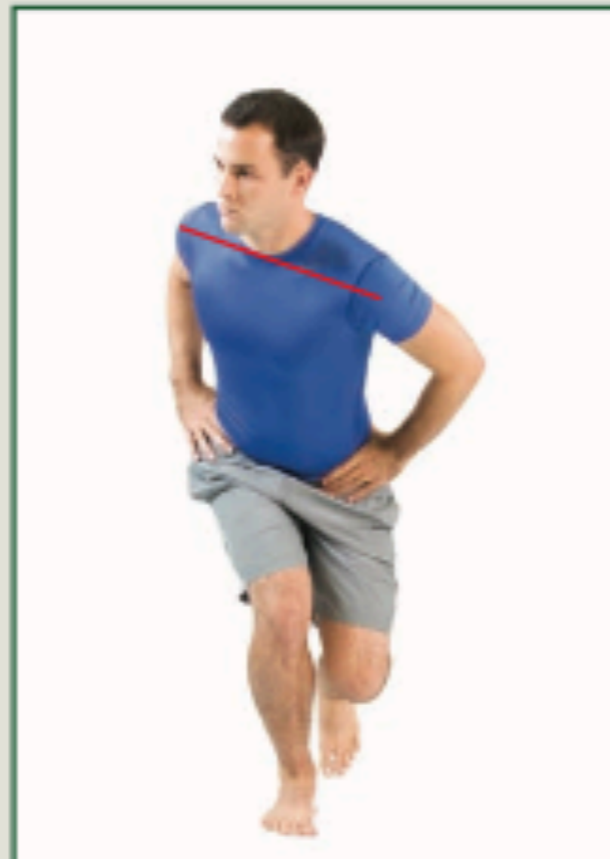
**Knee Moves Inward**



**Hip Hikes**



**Hip Drops**



**Torso Rotates Inward**



**Torso Rotates Outward**

## MOVEMENT COMPENSATIONS FOR THE SINGLE-LEG SQUAT ASSESSMENT

View	Checkpoint	Compensation	Probable Overactive Muscles	Probable Underactive Muscles
Anterior	Knee	Move Inward (Valgus)	Adductor Complex Bicep Femoris (short head) TFL Lat. Gastrocnemius Vastus Lateralis	Med. Hamstring Med. Gastrocnemius Gluteus Medius/ Maximus VMO
		LPHC	Hip Hike	Quadratus Lumborum (opposite side of stance leg) TFL/ Gluteus Minimus (same side as stance leg)
	Hip Drop		Adductor Complex (same side as stance leg)	Gluteus Medius (same side as stance leg) Quadratus Lumborum (same side as stance leg)
	Upper Body	Inward Trunk Rotation	Internal Oblique (same side as stance leg) External Oblique (opposite side of stance leg) TFL (same side) Adductor complex (same side as stance leg)	Internal Oblique (opposite side of stance leg) External Oblique (same side as stance leg) Gluteus Medius/ Maximus
			Outward Trunk Rotation	Internal Oblique (opposite side of stance leg) External Oblique (same side as stance leg) Piriformis (same side as stance leg)