Hip Evaluation

Eric Magrum DPT OCS FAAOMPT

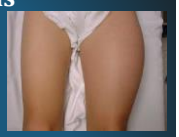
Orthopaedic Manual Physical Therapy Series
Charlottesville 2017-2018

Subjective History

- Initial Hypothesis from Body chart/Intake info
- Symptom onset
- Pain description
- Location – SPECIFIC
- Lumbar Hx
- Referral pattern
- Mechanism (traumatic/insidious)
- What specifically aggravates sxs – ADL/Sport specific
- What specifically reduces sxs
- Previous history – similar
- Mechanical signs/sxs – associated with pain?
- Neurovascular symptoms
- NV risk factors (? AVN) - MEDs
- Developmental/Dysplastic Hip History

Differential Diagnosis – non MSK

- Spinal Metastases – Femur/Pelvis
- Bone Tumors - primary
  - Osteiod osteoma
    - Most common bone cancer (benign)
    - 20% proximal 1/3 femur, 10% pelvis
    - 10-25 yr old males
  - Ewing's sarcoma
    - Malignant, rapidly growing
    - 5-16 yo M>F
  - Chrondroblastomas
  - Chrondrosarcoma



LBP_Cancer Rules

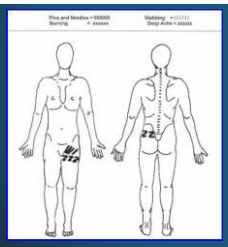
- Pain: Progressive
  - Initially presents mechanical
- Suspicious of Cancer:
  - Cancer Hx (<8 yrs) : + LR 14.7
  - > 50 yo : + LR 2.7
  - Weight Loss: + LR 2.7
  - No improvement 4-6 wks conservative care: + LR 3.0

Chou 2007 Ann Int Med

Decision Making for a Painful Hip: A Case Requiring Referral

J Orthop Sports Phys Ther • Volume 35 • Number 11 • November 2005

Captain David A. Browder, DPT, MS, OCS[1]
Richard E. Erhard, PT, DC[2]



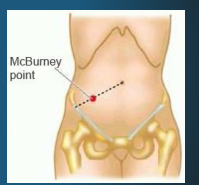
"Sign of the Buttock"

TABLE 2. The "signs of the buttock" and conditions they may indicate.[15]

The 7 signs of the buttock:	Conditions they may indicate:
(1) Limited straight leg raise	• Rheumatic bursitis
(2) Limited hip flexion to the same extent as the straight leg raise	• Osteomyelitis of the upper femur
(3) Limited trunk flexion to the same extent as hip flexion	• Neoplasm of the upper femur
(4) Painful weakness of hip extension	• Neoplasm of the ilium
(5) Noncapsular pattern of restriction at the hip	• Fractured Sacrum
(6) Swollen buttock	• Ischiorectal abscess
(7) Empty end feel on hip flexion	• Septic sacroilitis
	• Septic bursitis

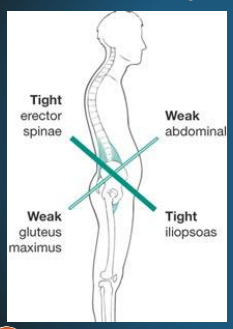
Non-Musculoskeletal Causes

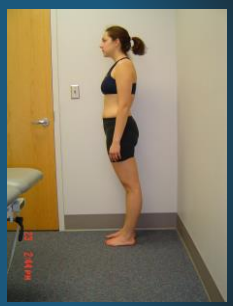
- Inflammatory Disease
  - Abdominal/Intraperitoneal inflammation (Psoas hyper tonicity/spasm/pain)
- Appendicitis (R hip, medial femoral triangle)
- Pelvic Inflammatory Disease
- Crohn's Disease
- Ankylosing Spondylitis
  - 20% present initially peripherally, > 30% Hip



Observation- Posture

Lower Quarter Cross Syndrome





Methods for Assessing Leg Length Discrepancy

Clin Orthop Relat Res (2008) 466:2910–2922

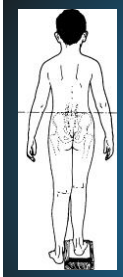


Table 1. Comparison of methods for assessing leg length discrepancy

Methods	Reliability*	Accuracy*	Magnification
Clinical			
Supine tape measure—"Real" (ASIS to malleolus)	+	+	None
Supine tape measure—"Apparent" (umbilicus to malleolus)	+	+	None
Standing blocks	+ +	+	None
Imaging			
Teleoroentgenogram	+ + + +	+ + +	~ 5%
Orthoroentgenogram	+ + +	+ + +	Minimal
Scanogram	+ + + +	+ + +	Minimal

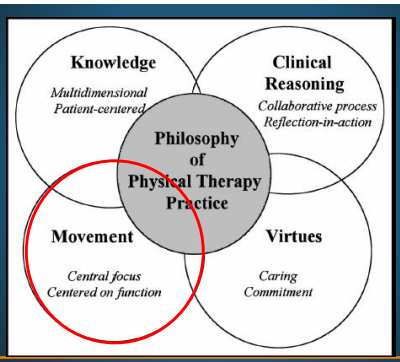
Poor to moderate correlation when comparing the clinical and radiographic techniques

Relationship and significance of gait deviations associated with limb length discrepancy: A systematic review

Gait & Posture 57 (2017) 115–123

Anatomic LLD is common, occurring in both the healthy population and in varied disease processes. Nevertheless, uncertainly still exists as to the clinical significance of LLD, in spite of the fact that more evidence is emerging as to the relationship between several clinical conditions and LLD. In this review, a significant relationship was found between LLD and gait deviations. Compensatory strategies occur throughout the lower limb, in both the shorter and longer limb. As the discrepancy increases, more compensatory strategies occur with higher gait deviations. Sagittal plane deviations seem to be the most effective deviations, although, compensations can occur in the frontal plane. Evidence was found to support that gait deviations might occur starting from a discrepancy of > 1 cm, and increase as LLD increases.

Expert Practice in Physical Therapy



Jensen GM
PT 2000

Observation
This is an Awareness Test

How Many Passes?

Look out for cyclists
dothetest.co.uk

Functional Biomechanical Screen

- **Functional Tests**
  - Simple
  - Time efficient
  - Minimal equipment
  - Reproducible
  - Progressively load the Kinetic Chain
  - Dynamic/Functional
  - Keys for further Exam
  - Compensations
  - "Cause of the problem"
  - Pattern recognition
  - Guide treatment/exercise prescription
- "Regional Interdependence"
- Integration of multiple body regions/systems to execute movement patterns
  - ROM
  - Flexibility
  - Strength
  - Endurance
  - Coordination
  - Motor control

Functional Biomechanical Screen

- **Neuromuscular control may be the modifiable risk factor for injury prevention**
- NM Re education programs
  - Successful at reducing injury/improving function
  - LQ alignment
  - Shock Absorption
  - Balance
  - Stability
  - Muscle recruitment
  - Joint stability

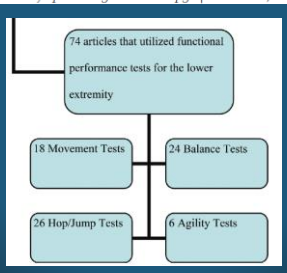
Functional Biomechanical Screen

- Bilateral Squat
- Single Leg Stance
- Single Leg Squat
- Step Down Test
- SEBT/ Y Balance
- Hop Tests
- Swing Test
- Observational Gait Analysis (walk/run)

SYSTEMATIC REVIEW

FUNCTIONAL PERFORMANCE TESTING OF THE HIP IN ATHLETES: A SYSTEMATIC REVIEW FOR RELIABILITY AND VALIDITY

The International Journal of Sports Physical Therapy | Volume 7, Number 4 | August 2012



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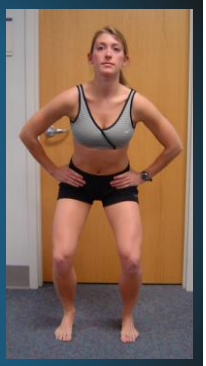
In conclusion, only the deep squat and single-leg stance test demonstrated evidence of validity in a population of patients with hip-related dysfunction. Specifically, diminished squat depth and provocation of pain during the single-leg balance test may be an indication for FAI and gluteal tendinopathy, respectively. The SEBT and single-leg squat test provided evidence of validity through an analysis of kinematics and muscle function in healthy subjects.

Bilateral Squat

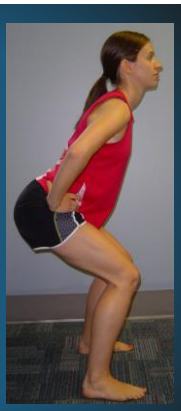
- Patients with femoroacetabular impingement demonstrated less squat depth and altered lumbo-pelvic kinematics[7]



Squat

Dysfunction:
Sagittal plane trunk/pelvis

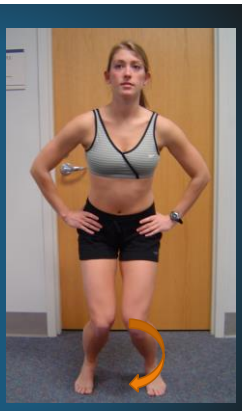
Excessive:
Pelvic Ant Rotation
Lumbar Hyperext



Bilateral Squat

Dysfunction:
Sagittal plane stiffness

Early heel rise
Foot External rotation/STJ pronation
Fem Int Rotation



The Functional Movement Screen

FUNCTIONAL MOVEMENT SYSTEMS FMS FUNCTIONALMOVEMENT.COM

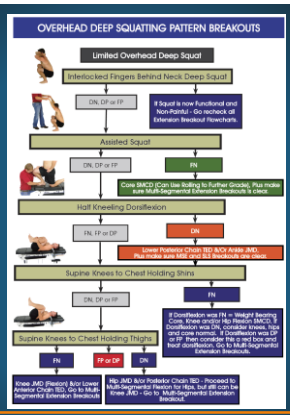
SFMA

Selective Functional Movement Assessment

Overhead Squating □ Primary □ Secondary

- □ Loss of Shoulder Flexion_____
- □ Thoracic Flexes_____
- □ Hips Don't Break Parallel_____
- □ Sagittal Plane Deviation of Lower Extremity Rt._____ Lt, _____

OVERHEAD DEEP SQUATTING PATTERN BREAKOUTS



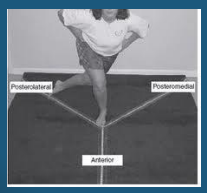
The Functional Movement Screen and Injury Risk: Association and Predictive Value in Active Men

CONCLUSION

Although an FMS score of ≤14 indicated a higher injury risk for all injury types, the low sensitivity, PPV, and AUC suggested that the FMS is not a suitable screening tool for identifying those with a higher risk for injuries in this population using the composite score. Consideration also needs to be given regarding the amount of time and resources that are needed to conduct the screen. Therefore, the use of the FMS to screen for the risk of injuries is not recommended in this population because of low predictive values and the

Am J Sports Med 2016

Clinician-friendly lower extremity physical performance tests in athletes: a systematic review of measurement properties and correlation with injury. Part 2—the tests for the hip, thigh, foot and ankle including the star excursion balance test



Hegedus EJ, *et al. Br J Sports Med* 2015

What are new findings

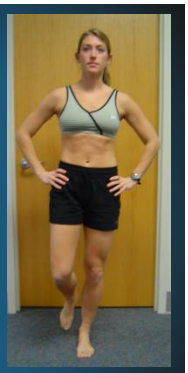
- There are 14 physical performance tests (PPTs) pertinent to the lower extremity and 6 to the knee that have been substantially studied so that we have some idea of their measurement properties in an athletic population.
- The naming and methodology of PPTs in the entire lower extremity are not consistent.
- The one leg hop for distance was the single test of use at the knee and ankle since it is responsive to rehabilitation after anterior cruciate ligament reconstruction and discriminant in cases of ankle instability.
- Only one test, the modified star excursion balance test (SEBT), has shown strong evidence of the ability to predict injury in the lower extremity.
- The hip region is understudied. Only the medial hop has shown utility at the hip where this test can discriminate between a painful and non-painful hip in dancers.

Hegedus EJ, *et al. Br J Sports Med* 2015

Single Leg Stance

- Provocation of pain during 30-second single-leg stance has shown sensitivity (100%) and specificity (97.3%) in detecting tendinopathy of the gluteus medius and minimus.[30]

- Positive Test = increase of pain within 30 seconds of single leg stance[30]
- Normal function of the hip abductors maintains the pelvis nearly perpendicular to the femur in a single leg stance position.[46]
- Normal = 30 seconds of single leg stance without pain[30]



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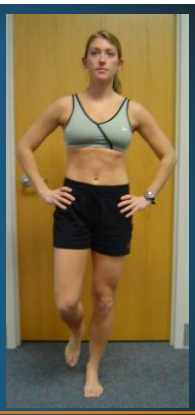
Single Leg Stance

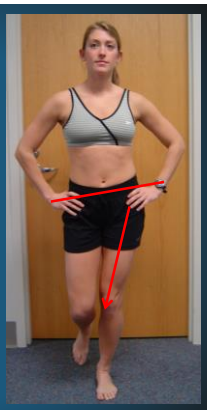


Single Leg Stance

Dysfunction:

Frontal plane weakness

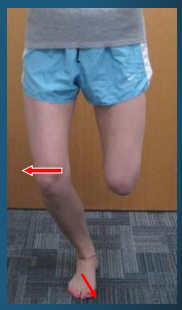
Non-Compensated Trendelenberg
Excessive Femoral ADD



Single Leg Stance

Dysfunction:

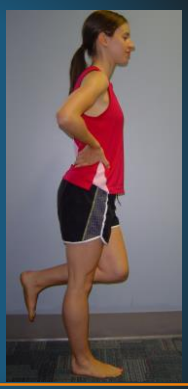
Varus Knee
Lateral Column loading
Poor First Ray stability



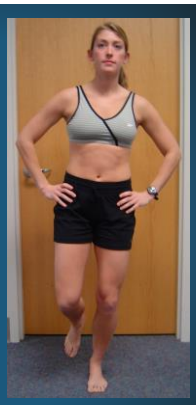
Single Leg Stance

Dysfunction:
Sagittal plane

LP/Hip Hyper EXT
Genu recurvatum



Single Leg Squat



Performance on the Single-Leg Squat Task Indicates Hip Abductor Muscle Function

Am J Sports Med 2011

	Criterion	To Be Rated "Good"
A	Overall impression across the 5 trials:	
	Ability to maintain balance	Participant does not lose balance
	Perturbations of the person	Movement is performed smoothly
	Depth of the squat	The squat is performed to at least 60° of knee flexion
	Speed of the squat	Squat is performed at approximately 1 per 2 seconds
B	Trunk posture	
	Trunk/thoracic lateral deviation or shift	No trunk/thoracic lateral deviation or shift
	Trunk/thoracic rotation	No trunk/thoracic rotation
	Trunk/thoracic lateral flexion	No trunk/thoracic lateral flexion
	Trunk/thoracic forward flexion	No trunk/thoracic forward flexion
C	The pelvis "in space"	
	Pelvic shunt or lateral deviation	No pelvic shunt or lateral deviation
	Pelvic rotation	No pelvic rotation
	Pelvic tilt (take note of depth of squat)	No pelvic tilt
D	Hip joint	
	Hip adduction	No hip adduction
	Hip (femoral) internal rotation	No hip (femoral) internal rotation
E	Knee joint	
	Apparent knee valgus	No apparent knee valgus
	Knee position relative to foot position	Center of the knee remains over the center of the foot

Good: 4/5
Fair: 2-3/5
Poor: 1/5

Classification of Lower Extremity Movement Patterns Based on Visual Assessment: Reliability and Correlation With 2-Dimensional Video Analysis

Conclusions: Visual assessments were made reliably by experienced and novice testers. Additionally, movement-pattern categories based on visual assessments were in excellent agreement with objective methods to measure FPPA change. Therefore, visual assessments can be used in the clinic to assess movement patterns associated with musculoskeletal disorders and in large epidemiologic studies to assess the association between lower extremity movement patterns and musculoskeletal injury.

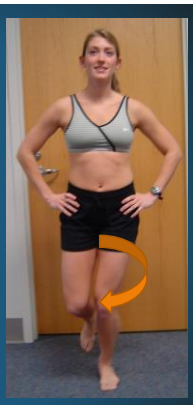
- **Substantial to Excellent Reliability (k : .75 - .90)**
- **90% Agreement with video analysis**

Journal of Athletic Training 2014;49(2)

Single Leg Squat

Dysfunction:
Transverse plane weakness

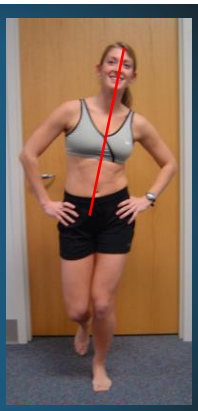
Excessive: Femoral Medial Rotation



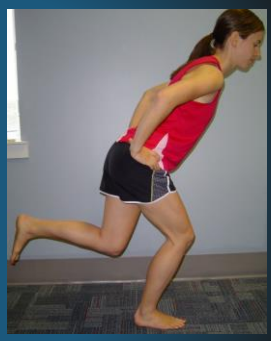
Single Leg Squat

Dysfunction:
Frontal plane Trunk weakness

Compensated Trendelenberg



Single Leg Squat



Dysfunction:
Sagittal plane weakness (Quad avoidance)

Increased forward Trunk Lean

Step Down Test

Quality of Mvt – Step Down Test

- 5 pt scale:
  - Arm strategy to recover balance
  - Trunk mvt – lean either direction
  - Pelvic mvt – rotated/elevated either side
  - Knee position
    - Deviated medial to 2nd toe
    - Deviated past medial border foot (2 pts)
  - Maintain steady unilateral balance

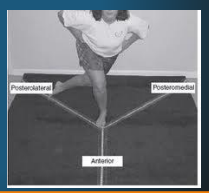
0-1 : Good quality
2-3 : Medium quality
>4 : Poor quality

BMC Musculoskeletal Disorders 2006, 7:33

Star Excursion/ "Y" Balance Tests

- Posterio-medial/Posterio-lateral reach distances
  - Correlated with Hip ABD/EXT strength

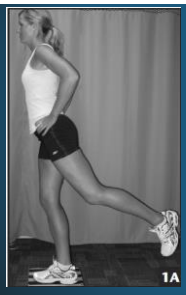
- Medial Reach: 49% MVC Gluteus Medius
- Not studied in a specific population of Hip patients

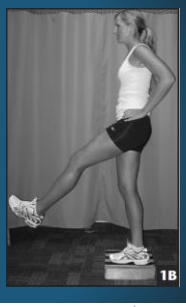


Swing Test

Eric Magrum, DPT, OCS, FAAOMPT

PEARLS OF PRACTICE





Athletic Training & Sports Health Care | Vol. 2 ■ No. 5 ■ 2010

Dysfunction

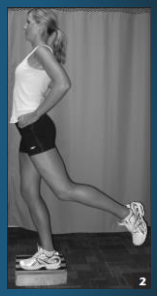
Swing leg

Sagittal plane

Limited Hip Extension

Excessive Lumbar EXT

Pelvic Ant tilt



Dysfunction

Swing leg

Transverse plane

Limited Hip Extension

Excessive Lumbopelvic Rotation

Swing Test

Dysfunction

Stance leg

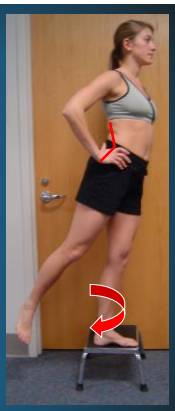
Transverse plane

Excessive Lumbopelvic rotation (swing)

Resultant Stance

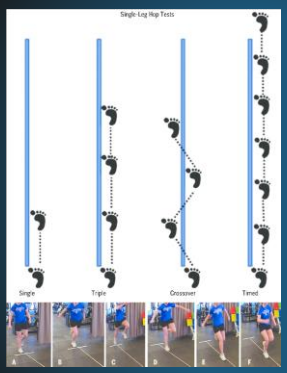
STJ pronation

Fem IR



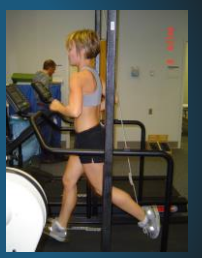
Hop Test

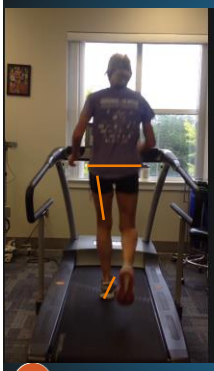
- (+) Stress Fracture screen
- Asses Landing/loading mechanics
  - Trunk Position
    - Decreased Forward Trunk Lean → Decreased Hip strength
  - Hip/Knee flexion
    - Decr Compliance/Shock Absorption
  - Frontal plane Trunk position
    - Resultant Dynamic valgus



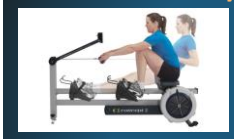
Observational Gait Assessment

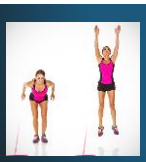
- Treadmill – views Lateral, Posterior
- Video - 30 seconds each view
- Shod/ ? Barefoot
- Assess large deviations
- Systematic
- Segment by segment (Foot/ankle, knee, hip, pelvic, trunk)
- Phase by phase (IC, LR, MSt, TSt, PSw, ISw, MSw, TSw)
- Use Framework until efficient (Rancho/USC)

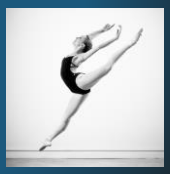




Other Functional Movement Screening Patient/Athlete Specific





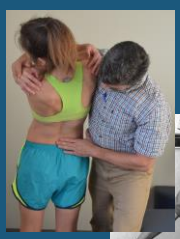


Functional Biomechanical Screen

- Bilateral Squat
- Single Leg Stance
- Single Leg Squat
- Step Down Test
- SEBT/"Y"
- Hop Tests – Medial, Triple, Diagonal, Distance, Timed
- Swing Test
- Observational Gait Analysis

Lumbar Clearing

- Full AROM
- Quadrant
- (-) Neuro Exam
  - SLR/Slump




Radiculopathy/Discogenic signs and symptoms

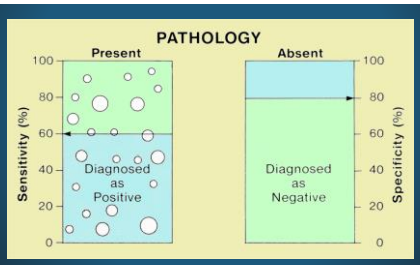
Special Tests

- Straight leg raise test
  - SN 97% SP 57%, QUADAS 10 (Vroomen P, de Krom M, Wilmink J, Kester A, Knottnerus J. Diagnostic value of history and physical examination in patients suspected of lumbosacral nerve root compression. J Neurol Neurosurg Psyciatry. 2002;72:630-634.)
- Slump test
  - SN 83% spec 55%, QUADAS 11 (Stankovic R, Johnell O, Maly P, Willner S. Use of lumbar extension, slump test, physical and neurological examination in the evaluation of patients with suspected herniated nucleus pulposus: a prospective clinical study. *Man Ther.* 1999;4(1):25-32.)
- Well-Leg Raise
  - SN 24% SP 100% QUADAS 7 (Kosteljanetz M, Bang F, Schmidt-Olsen S. The clinical significance of straight leg raising (Lasegue's sign) in the diagnosis of prolapsed lumbar disc. *Spine.* 1988;13:393-395.)


Diagnostic accuracy of clinical tests of the hip: a systematic review with meta-analysis

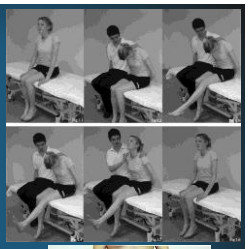
Br J Sports Med (2012)

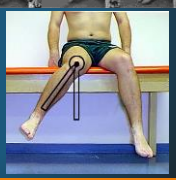
Michael P Reiman,[1] Adam P Goode,[1] Eric J Hegedus,[2] Chad E Cook,[3] Alexis A Wright[2]

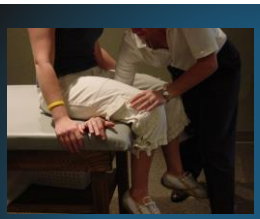


Sitting

- **R/Out Lumbar/Neurogenic cluster**
  - Slump
  - DTRs, Myotomes, Sensation
- **Fulcrum Test**
- **Hip IR/ER Screen**
  - Loss of hip IR first sign of intra articular hip pathology:
    - OA
    - Synovitis
    - Labral pathology
    - FAI







Fulcrum Test

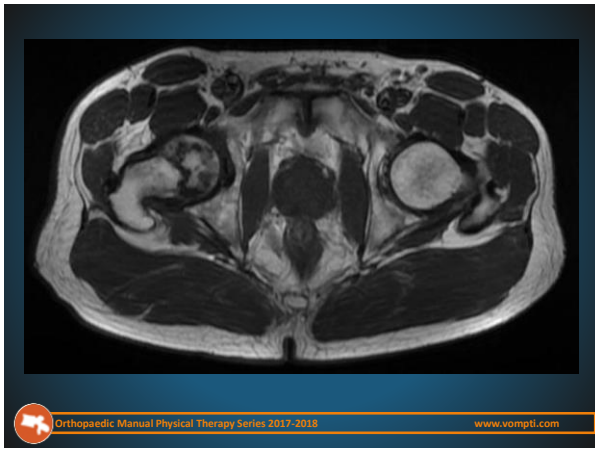
- Testing for femoral shaft stress fractures
- (+) Reproduce pain at Femoral shaft

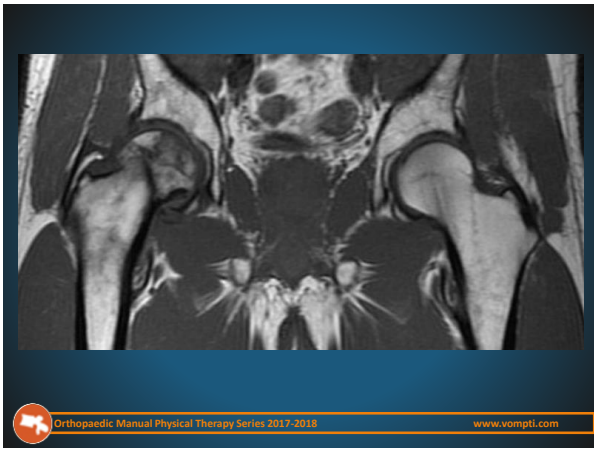
SN/SP (95% CI)	LR+	LR-
93 (NR)/75 (NR)	3.7	0.09
88 (NR)/13 (NR)	1.0	0.92

Use of the Patellar-Pubic Percussion Test in the Diagnosis and Management of a Patient with a Non-Displaced Hip Fracture

Patellar-Pubic Percussion Test										
Adams and Yarnold[60]	41 subjects	NR	NR	Femoral neck, inter-trochanteric, trochanteric and acetabular fracture	NR	94 (NR)/95 (NR)	20.4/0.06	8	Radiograph 90 to 95 (NR)/68 to 100 (NR)[60]	89% inter-rater agreement
Bache and Cross[61]	100 subjects	78.6 years	82 F	Femoral neck fracture	NR	91 (NR)/82 (NR)	5.1/0.11	8	Radiograph 90 to 95 [60] (NR)/68 to 100 (NR)	NR
Tiru et al[62]	290 subjects	72, 6.8 years	236 F	Femoral neck fracture	NR	96 (87 to 99)/86 (49 to 98)	6.7/0.75	10	Radiograph 90 to 95 (NR)/68 to 100 (NR)[60]; Bone scan 91(NR)/100 (NR) [61]; MRI 100 (NR)/100 (NR)[61]; CT: NR	NR

The Journal of Manual & Manipulative Therapy Vol. 15 No. 4 (2007), E78–E84





Supine – Special Tests

- SLR
- Resisted SLR/ASLR
- Hip Flexion +Overpressure
- IR @90 + Overpressure
- ER@90 + Overpressure
- FABER
- SIJ Provocation Cluster
- Scour
- Quadrant
- FADDIR/Impingement
- Log Roll
- McCarthy/Fitzgerald
- Thomas Test
- Joint Assess
  - Distraction Long Axis
  - 90 Hip Flexion Inferior Glide
  - Lateral Glide
  - Post Glide
  - Inferior Medial Glide

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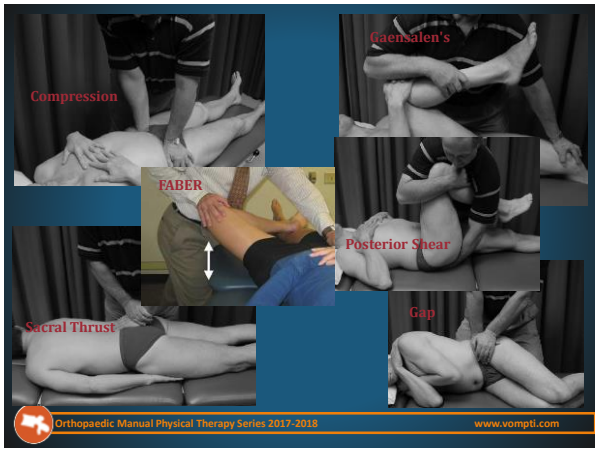
Evidence-Based Diagnosis and Treatment of the Painful Sacroiliac Joint

Mark Laslett, FNZCP, PhD, Dip MT, Dip MDT

TABLE 1. Comparison between Laslett M et al[31] and van der Wurff et al[26] studies of the validity of multiples of positive pain provocation SIJ tests.

Diagnostic accuracy statistic	Number of positive provocation SIJ tests									
	1 or more		2 or more		3 or more		4 or more		5 or more	
	ML	PvW	ML	PvW	ML	PvW	ML	PvW	ML	PvW
Sensitivity %	100	100	93	93	91	85	40	26	27	0
Specificity %	44	42	66	58	78	79	81	82	88	100
Positive LR	1.8	1.7	2.7	2.2	4.3	4.0	3.2	1.4	2.1	0
Negative LR	0.0	0.0	0.10	0.13	0.08	0.18	0.49	0.91	0.84	1.00

Notes:
1. LR = likelihood ratio, ML = Laslett M et al 2005, PvW = van der Wurff et al 2006
2. The shaded cells represent the optimal number of positive SIJ provocation tests producing the highest positive likelihood ratio, i.e., 3 or more.
3. The tests included in this study are distraction, compression, thigh thrust, Gaenslen's test, sacral thrust, and Patrick's FABER test.



Passive/Active/ Resisted SLR

- Palpate post aspect Greater Trochanter
- (+) Poor dynamic stability – Psoas/Illiacus (facilitated TFL) secondary to Incr Ant Fem head translation
- Resisted SLR at 30 degrees (Stinchfield Test)
  - (+) Reproduce groin pain; suspect labral pathology

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Hip Flexion: PROM + Overpressure

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Hip IR/ER: PROM + Overpressure

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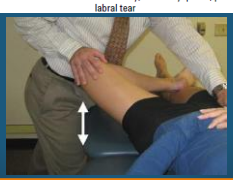
Hip ROM

Test, authors	Subjects	Age (mean, SD)	Gender	Pathology	Symptom Duration	SN/SP (95% CI)	LR+/LR-
Internal Rotation with Overpressure							
Maslowski *et al*[39]	50 subjects	60.2 years	30 F	Variable: labral tear; FAI, arthritic changes, AVN	NR	91 (68 to 99)/18 (5 to 40)	1.1/0.5

Diagnostic accuracy of clinical tests of the hip: a systematic review with meta-analysis *Br J Sports Med* (2012)

Test, authors	Subjects	Age (mean, SD)	Gender	Pathology	SN/SP (95% CI)	LR+/LR-
FABER Test – Intra-Articular Pathology						
Maslowski *et al*[39]	50 subjects	60.2 years	30 F	Variable: labral tear; FAI, arthritic changes, AVN	81 (57 to 96)/25 (9 to 48)	1.1/0.72
Martin *et al*[11]	105 subjects	42, 15 years	24 F	Variable: labral tear, FAI, arthritic changes, dysplasia	60 (41 to 77)/18 (7 to 39)	0.73/2.2
Troelsen *et al*[40]	18 subjects	Range 32 to 56 years	16 F	All had previous peri-acetabular osteotomy; all had dysplasia; post-op: labral tear	42 (NR)/75 (NR)	1.7/0.77



Scour Test

- Circumduction of hip - multidirectional
- Axial force - Compression
- (+) Hip Pain
- Hip OA

SN/SP (95% CI)	LR+/LR-
50 (26 to 74)/29 (12 to 51)	0.70/1.72

Br J Sports Med (2012)

Quadrant Test

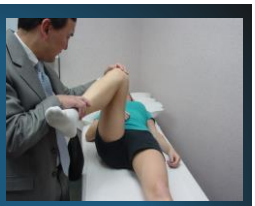
- Flexion, ADDuction, IR
- Axial Compression
- (+) Hip Pain
- Intra articular pathology

SN/SP (95% CI)	LR+/LR-
75 (19 to 99)/43 (18 to 72)	1.3/0.58

Impingement Test/FADDIR

- Flex knee 90 degrees – FLEX, ADD, INT Rot + Overpressure
- (+) Groin Pain
- Pain with IR = Anterior labrum

Impingement Test/FADDIR



Test, authors	Subjects	Age (mean, SD)	Gender	Pathology	SN/SP (95% CI)	LR+/LR-
Impingement (FADDIR) Test – Labral Tear/Intra-Articular Pathology						
Beaule *et al*[40]	30 subjects	40.7 years	13 F	FAI, labral tear	100/all (+) (FAI); 99 (NR)/25 (NR) (labral tear)	NA/NA (FAI); 1.3/0.04 (labral tear)
Keeney *et al*[43]	101 subjects	37.6 years	71 F	Variable: Labral tear; chondral defect; synovitis	99 (NR)/5 (NR)	1.0/0.2
Leunig *et al*[42]	23 subjects	40.2 years	14 F	Variable: Labral tear; dysplasia; arthritic changes	97 (NR)/13 (NR)	1.1/0.23
Martin *et al*[41]	105 subjects	42.15 years	24 F	Variable: labral tear, FAI, arthritic changes, dysplasia	78 (59 to 89)/10 (3 to 29)	0.86/2.2
Sink *et al*[44]	35 subjects	16 years	30 F	Variable: FAI, labral tear; cartilage damage	100/all (+) (FAI); 97 (NR)/4 (NR) (labral tear)	NA/NA (FAI) 1.0/0.75 (labral tear)
Troelsen *et al*[45]	18 subjects	Range 32–56 years	16 F	All had previous peri-acetabular osteotomy; all had dysplasia; post-op: labral tear	59 (NR)/75 (NR)	2.4/0.55

Diagnostic accuracy of clinical tests of the hip: a systematic review with meta-analysis

Michael P Reiman,[1] Adam P Goode,[1] Eric J Hegedus,[2] Chad E Cook,[3] Alexis A Wright[2]

Br J Sports Med (2012)

Table 8 Pooled diagnostic properties and for the diagnosis of labral tear, femoral fracture and gluteal tendinopathy

Diagnostic test	Number studies sample size (n)	SN (95% CI)	SP (95% CI)	-LR (95% CI)	+LR (95% CI)
Labral Tear					
FADDIR (MRA)	4 (n=128) [40 41 43 44]	94 (88 to 97)*	8 (2 to 20)*	0.48 (0.20 to 1.16)	1.02 (0.96 to 1.08)
FADDIR (Arthroscopy)	2 (n=157) [42, 43]	99 (95 to 100)	7 (0 to 34)	0.15 (0.01 to 2.24)	1.06 (0.92 to 1.21)
Flexion IR	3 (n=42) [45–47]	96 (82 to 100)	17 (12 to 54)	0.27 (0.03 to 2.34)	1.12 (0.83 to 1.51)

Log Roll Test

- Used to assess labral pathology/loose body (+ mechanical signs/sxs)
- Maximally IR & ER
- Eliciting a click or popping sensation
- Also screen capsular laxity

Fitzgerald/McCarthy Test

- Assess Anterior Labrum
- Flexion, EXT Rot, ABD →
- IR Rot, ADD, EXT
- (+) reproduce pain, popping or catching
- Sn = 98%

Systematic review

The validity and accuracy of clinical diagnostic tests used to detect labral pathology of the hip: A systematic review Manual Therapy (2011)

Roanna M. Burgess [a,*], Alison Rushton [b], Chris Wright [b], Cathryn Daborn [a]

- Studies - Poor methodology
- "Cluster of Tests"
- Anterior groin Pain
- Mechanical Symptoms
- (+) Quadrant Test
- (+) Impingement Test (Sn = 75%, Sp = 43 - 100%)
- (+) Fitzgerald Test (Sn = 98%)
- (+) Modified Thomas Test (Sp = 92%)

Thomas Test

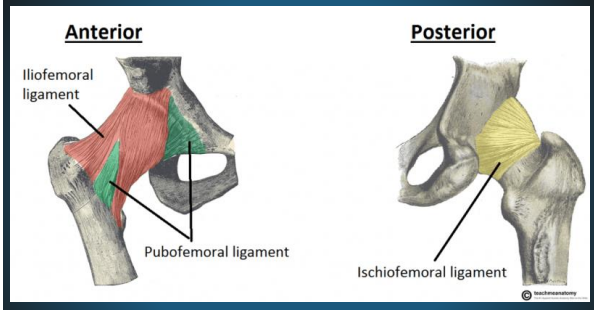
- Bilateral knee flexion
- Lumbar spine flat/no lordosis – not post Innominate rotation (sacrum flat)
- Knee flexed to 90 – Extend Hip
- Assess EXT, ABD/ADD, Rotation
- Hip EXT < 10 EXT = Psoas/capsule tightness/dysfunction (end feel)
- Hip EXT > 10 EXT = Anterior capsule laxity
- Assess Rectus Fem - extend knee increased Hip EXT
- Assess TFL/ITB tightness/dysfunction – ABD increase hip EXT

Supine – Special Tests

- SLR
- ASLR/Resisted SLR
- Hip flexion +overpressure
- IR @90 + overpressure
- ER@90 + overpressure
- FABER
- SIJ Provocation cluster
- Scour
- Quadrant
- FADDIR/Impingement
- Log Roll
- McCarthy/Fitzgerald
- Thomas Test

Hip Joint Accessory Movements Supine

- Assess
  - Amount of Movement
  - End Feel
  - Neutral Zone
  - Contractile Tissue Response
- Distraction Long Axis
- 90 Hip Flexion Inferior Glide
- Lateral Glide
- Post Glide
- Inferior/Medial Glide



Long Axis Distraction

- 10-30 Degrees FF, ABD; Slight ER

Lateral Glide at 90 Flexion

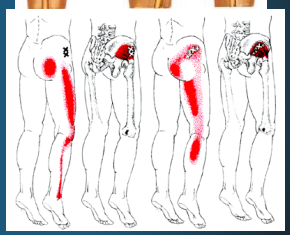
Inferior Glide at 90 Flexion

Posterior Glide at 90 Flexion

Inferior Medial Glide

Side lying – Special Tests

- Ober
- Rectus length
- Psoas
- Resisted Hip ABD



Ober Test

- Asses ITB/TFL mobility
- Patient placed side lying with the hip extended and abducted with the knee flexed
- Stabilize pelvis from lateral flexion, anterior tilt
- Maintain Hip External rotation
- Assess ADD hip
- "Hang ITB on Greater Trochanter"
- (+) < 10 ADD

Hip ABD

- Active/Resisted ABD
- Position Hip EXT, ER
- Asses Hip position
  - Medial Rotation/Flexion
    - Facilitated TFL
- Asses Pelvic Stability
  - Posterior Rotation
    - Facilitated TFL
  - Lateral Flexion
    - Facilitated Quadratus

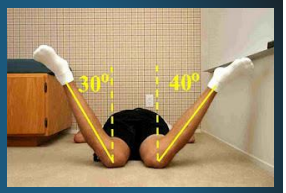
Test, authors	Subjects	Age (mean, SD)	Gender	Pathology	SN/SP (95% CI)	LR+/LR-
Resisted Hip Abduction						
Youdas *et al*[57]	40 subjects	50.4, 7.2 years (controls); and 53.4, 9.0 years; (pathology)	10 F in each group	Radiographic evidence for OA	35 (NR)/90 (NR)	3.5/0.72
					Weakness	
Resisted Hip Abduction						
Bird *et al*[56]	24 subjects	Range 36–75 years	24 F	GMed tear and/or tendinitis, partial tear	73 (NR)/46 (NR)	1.35/0.59
Lequesne *et al*[58]	17 subjects	68.1, 10.8 years	16 F	GMed/GMin tear and/or tendinitis, bursitis	71 (NR)/97 (NR)	23.7/0.30
					Provocation	

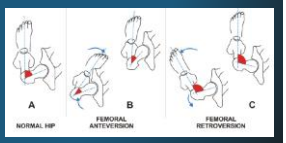
Prone - Special Tests

- Craig's Test - IR/ER
- Femoral Anterior Glide
- Lumbar PA – Central/Unilateral
- Sacral PA/Thrust

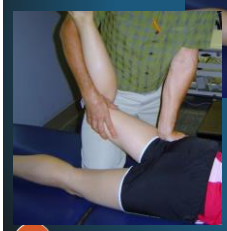
Prone IR/ER – Craig's Test

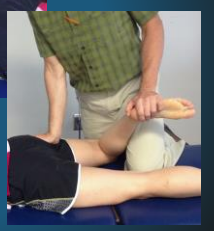
- Palpate Greater Trochanter
- Knee flexed to 90
- Rotate Hip to position the Gr Troch most lateral (parallel to table)
- Normal 35 degrees Medial/Lateral rotation
- Structural Anteversion= Medial Hip Rotation
- Structural Retroversion= Lateral Rotation
- Asymmetry > 10 difference





Anterior Hip Glide





Lower Extremity Functional Scale (LEFS)

Phys Ther. 1999 Apr;79(4):371-83.

The Lower Extremity Functional Scale (LEFS) is a questionnaire containing 20 questions about a person's ability to perform everyday tasks. The LEFS can be used by clinicians as a measure of patients' initial function, ongoing progress and outcome, as well as to set functional goals.

The LEFS can be used to evaluate the functional impairment of a patient with a disorder of one or both lower extremities. It can be used to monitor the patient over time and to evaluate the effectiveness of an intervention.

Interpretation of scores

- The lower the score the greater the disability.
- The minimal detectable change is 9 scale points.
- The minimal clinically important difference is 9 scale points.
- % of maximal function = (LEFS score) / 80 * 100

Instructions

We are interested in knowing whether you are having any difficulty at all with the activities listed below **because of your lower limb problem** for which you are currently seeking attention. Please provide an answer for **each** activity.

Today, *do you* or *would you* have any difficulty at all with:

Activities	Extreme difficulty or unable to perform activity	Quite a bit of difficulty	Moderate difficulty	A little bit of difficulty	No difficulty
1. Any of your usual work, housework or school activities.	0	1	2	3	4
2. Your usual hobbies, recreational or sporting activities.	0	1	2	3	4
3. Getting into or out of the bath.	0	1	2	3	4
4. Walking between rooms.	0	1	2	3	4
5. Putting on your shoes or socks.	0	1	2	3	4
6. Squatting.	0	1	2	3	4
7. Lifting an object, like a bag of groceries from the floor.	0	1	2	3	4
8. Performing light activities around your home.	0	1	2	3	4
9. Performing heavy activities around your home.	0	1	2	3	4
10. Getting into or out of a car.	0	1	2	3	4
11. Walking 2 blocks.	0	1	2	3	4
12. Walking a mile.	0	1	2	3	4
13. Going up or down 10 stairs (about 1 flight of stairs).	0	1	2	3	4
14. Standing for 1 hour.	0	1	2	3	4
15. Sitting for 1 hour.	0	1	2	3	4
16. Running on even ground.	0	1	2	3	4
17. Running on uneven ground.	0	1	2	3	4
18. Making sharp turns while running fast.	0	1	2	3	4
19. Hopping.	0	1	2	3	4
20. Rolling over in bed.	0	1	2	3	4
Column Totals:	0	1	2	3	4