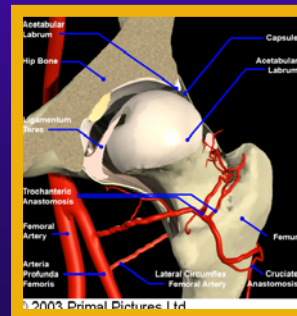
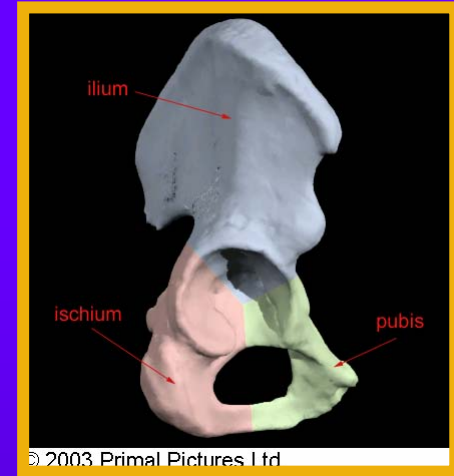




Hip Examination





**Courage gives a leader the
ability to stand straight
and not sway
no matter which way
the wind blows**

- Mike Krzyzewski



Talking Points

◆ Considerations:

- 2ND Largest Joint in the Body
- Antalgic gait noted with hip pathology commonly
- Referral Source to and from SI / Lumbar
- “Y” Ligament of Bigelow Strength
- Transegrity



Pain and Function Questionnaires

- ◆ **Western Ontario & McMaster Universities OA Index (WOMAC)**
 - Pain, Stiffness, and Physical Function
 - 0 (none) ▶▶ 4 (extremely)
- ◆ **Harris Hip Score**
 - Pain, Gait, Mobility, Deformity (ROM loss)
 - Scored by PT

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Patient History

◆ Age / Gender?

- Congenital Hip Dysplasia ✓
- Legg-Calve-Perthes Disease ☞
- Slipped Capital Femoral Epiphysis ⇨
- Osteoporosis / Osteoarthritis ☺

◆ MOI?

- Mechanical Translation ☹
- ? Land on hip, flexed knee, from height on feet
- ? Repetitive loading



Patient History

◆ Location / Boundaries?

Anterior Thigh

Groin

Low Back

Greater Trochanter

Anterior Tibia

Knee

Medial Buttocks

Rank Order: Pain Location OA Hip (Wroblewski 2004)

- 1) Greater Trochanter
- 2) Anterior Thigh
- 3) Knee
- 4) Groin



Differential Diagnosis

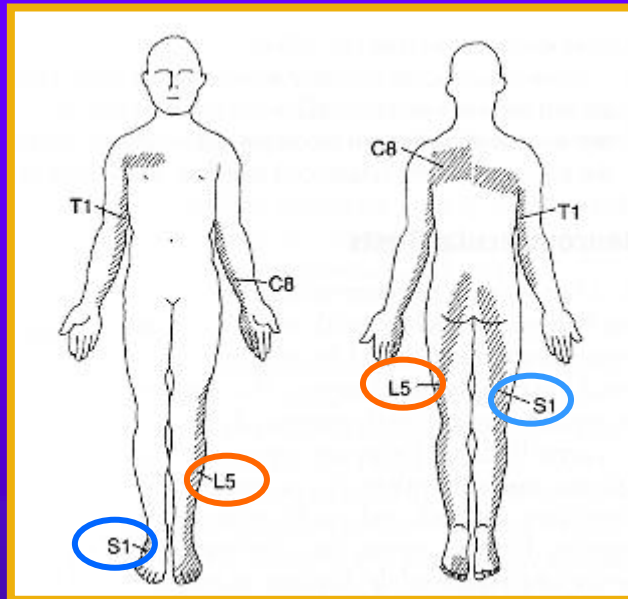
◆ Lumbar Involvement?

– Dermatomes (Table 1-5 Magee, pp 16-17)

- **L1** – LB, inguinal ligament/groin and trochanter
- **L2** – LB, proximal anterior thigh to medial knee (runs oblique)
- **L3** – LB, upper buttock, anteromedial thigh and proximal medial lower leg
- **L4** – medial buttock, lateral thigh, distal medial lower leg to great toe
- **L5** – medial buttock, posterior thigh, lateral lower leg, medial half of plantar foot surface, dorsum of lesser toes
- **S1** – inferior buttock, posterior thigh, posterior lower leg, lateral half of plantar foot surface

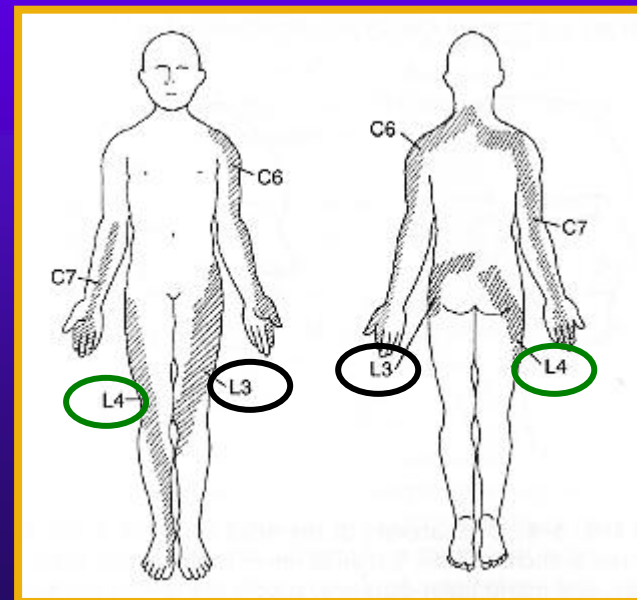
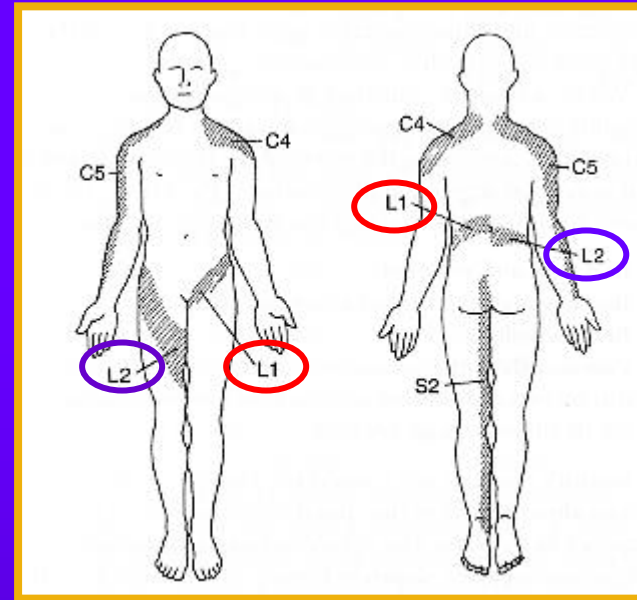


Dermatomes



L1 Red
L2 Purple
L3 Black

L4 Green
L5 Orange
S1 Blue





Patient History

- ◆ **Quality?**
- ◆ **Palliative?**
- ◆ **B, W, S?**
- ◆ **Tests?**
 - **Bone Density Test**
 - Ward's Triangle ▲



Patient History

◆ PMH/PSH?

◆ Meds.?

- Acetaminophen – mild-mod. pain relief
- NSAID's, ex. Ibuprofen for severe pain relief
- COX-2-Specific Inhibitors, ex. ~~Celebrex~~ / ~~Vioxx~~ / Naprosyn for severe pain relief if NSAID's not effective
- Darvocet / Lortab / Loricet / Tylenol #3
- Soma / Flexiril / (m. relaxant)



Patient History

- ◆ Social / Hobbies?
- ◆ Pt. Goals?

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Observation

◆ Gait / Ambulation

– Pattern?

– Gait Component Measures

- ex. Write Step ®



LQS

◆ To R/O.....?



Structural/Postural Examination

- ◆ **Assess Pelvic Obliquity**
- ◆ **Lumbar Spine Orientation**
- ◆ **Symmetrical WB?**
- ◆ **Assess Balance**
 - One legged standing
- ◆ **LE Alignment**
 - Compensated Anteversion = toed _____
 - Compensated Retroversion = toed _____
 - Posterior Dislocation = short/adducted/IR
 - Anterior Dislocation = abducted / ER
 - Intertrochanteric Fracture = short / ER



Postural Examination

- ◆ **Patients Willingness to Move**

- ◆ **Visible Swelling?**
 - Psoas / iliopectineal bursa
 - Ischiogluteal bursa
 - Trochanteric bursa

- ◆ **Skin Color / Texture / Scars**



AROM/PROM

◆ Goniometrics where Appropriate

- Flexion *0-120
- Extension *0-20 (may be <10)
- Abduction *0-45
- Adduction *0-30
- ER *0-45
- IR *0-45
 - [60-90 degrees = anteverted hip with ER < 25]

◆ All end feels _____ except flexion is _____

- *Norkin/White Goniometric text reference



PROM

◆ **When do you perform PROM?**

◆ **Capsular Pattern**

– **Limitation in flexion, abduction and IR**

- Max loss IR, mod. loss flexion, and mod. loss abd. with min. loss of extension – James Cyriax

– **Order may vary – only joint to exhibit this**

– ***Kaltenborn 1989 extension greater limitation than above**

– **Minimal loss of extension = greater functional limitation than the same loss of flexion**



Open and Closed Pack Positions

◆ Open

- 30 flexion
- 30 Abduction
- Slight ER

◆ Closed

- Full Extension
- Slight IR



Resisted Isometrics

- ◆ Perform most painful motions last
- ◆ Short sit or Supine
- ◆ Assess:
 - Flexion / Extension / Abduction / Adduction / IR / ER / Flexion & Extension of Knee???
- ◆ MMT where appropriate:
 - Hislop & Montgomery text
- ◆ Assess for fatigue / pain / weakness / mechanical fault
 - Coxa Saltans = _____



Coxa Saltans Sources

◆ Internal Snapping

- 1) Iliopsoas over lesser trochanter or anterior acetabulum
 - Most common internal source
- 2) Iliofemoral ligament over femoral head

◆ Both commonly cause “snap” with or without pain at 45° while extending from a flexed position

◆ Palpable anteriorly

Coxa Saltans Sources

◆ External Snapping

- 1) ITB over Greater Trochanter
- 2) Gluteus Maximus over Greater Trochanter

◆ Palpated lateral, during hip flexion and extension, increases with IR position

◆ Intra-articular Snapping

- 1) Acetabular labral tear / Loose body
 - Often sharp pain in groin and anterior thigh especially with pivoting motions



Special Tests

◆ Patrick's Test (FABER) / Figure Four Test

– **S and S?**

- Kokmeyer 2002 (59 LBP pt.'s)
 - (+) buttock or groin
 - .61 kappa
- Dryfuss 1996 (85 pt.'s SI block confirmation of SI pain)
 - .62 kappa

◆ **Trendelenburg Sign**

◆ Leg Length Tests (Weber Barstow Maneuver)

– Gross Femur Length

– Gross Tibia Length

◆ Thomas Test / 3 Muscle Kendall Test

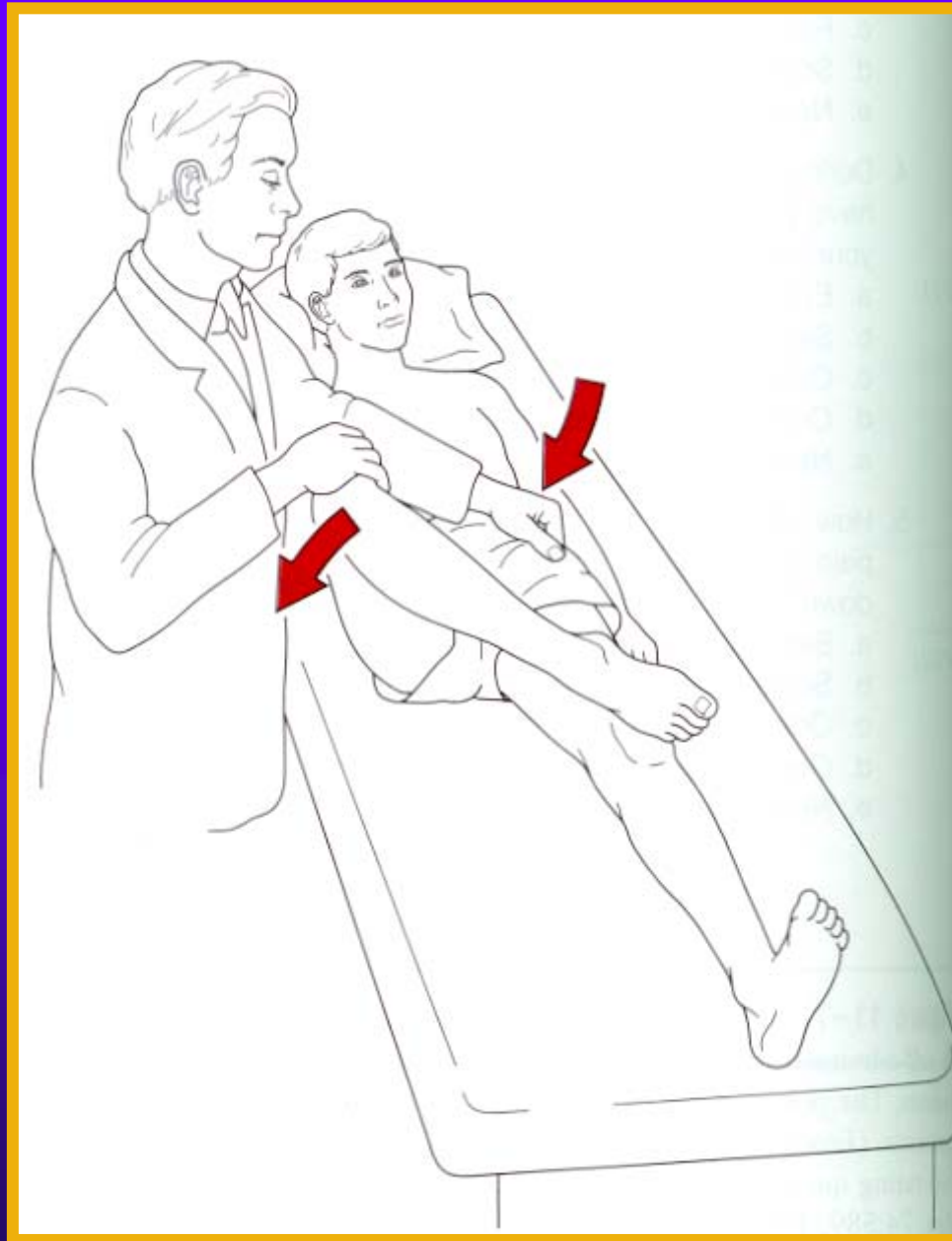
◆ Ely's Test

◆ Craig's Test (Ryder's Method)

– Ruwe et al. 1992

◆ FAIR Test





Patrick's Test /
FABER Test /
Figure-Four

Looks like

_____ Test???

Magee 4th
Edition – pg. 620

Weber-Barstow Maneuver

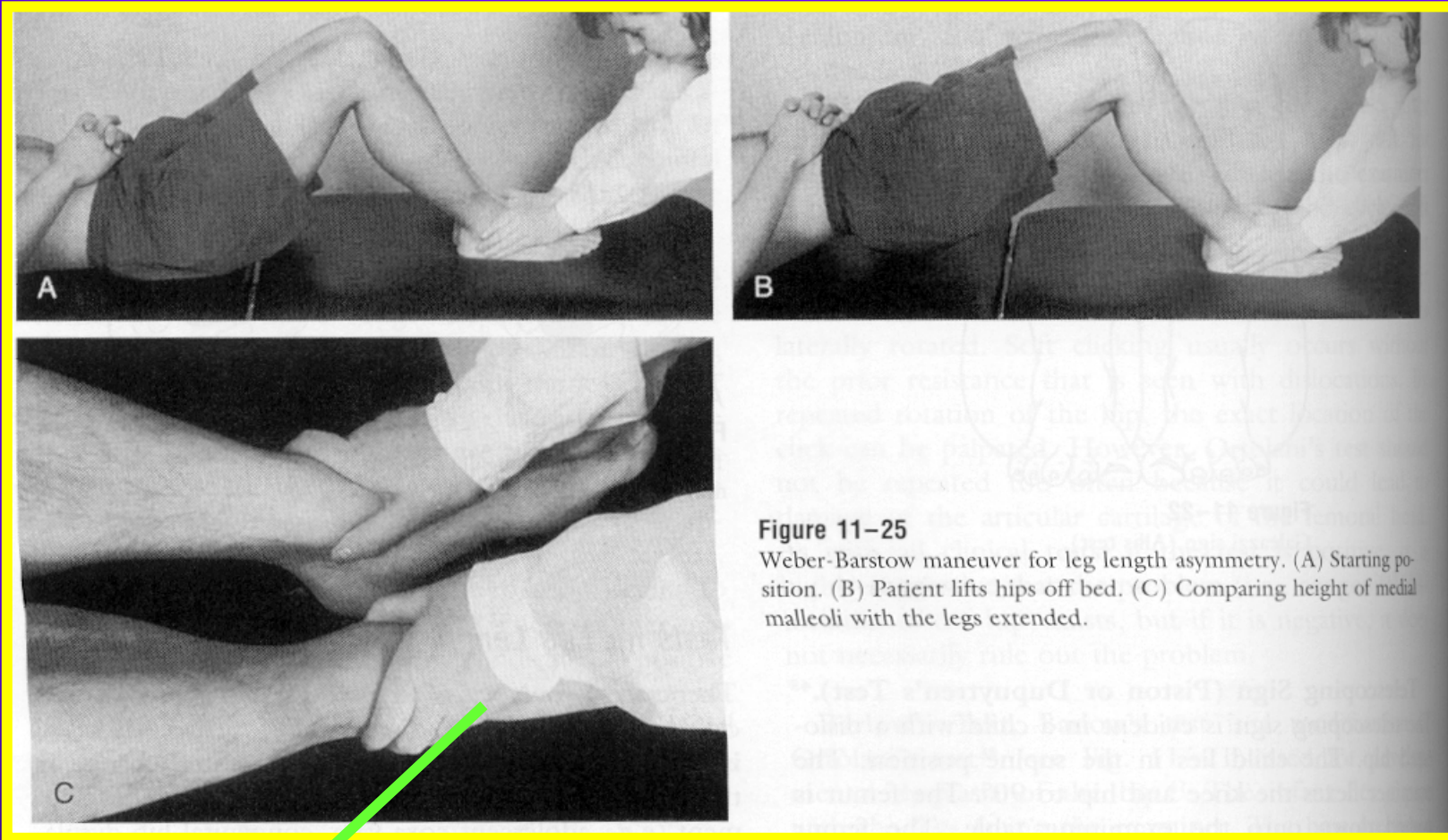


Figure 11-25

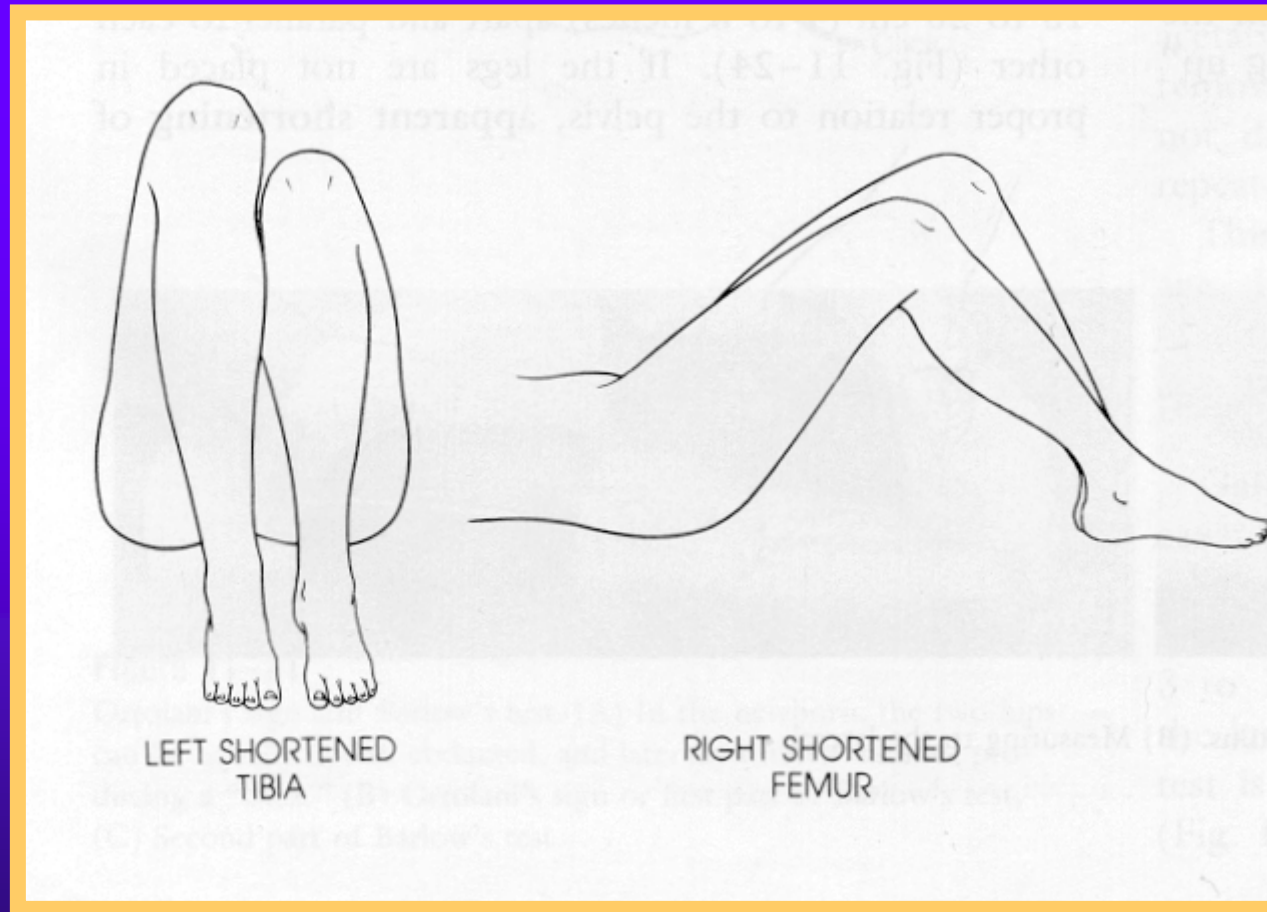
Weber-Barstow maneuver for leg length asymmetry. (A) Starting position. (B) Patient lifts hips off bed. (C) Comparing height of medial malleoli with the legs extended.

***Can measure
true vs. apparent**

Magee 4th
Edition – pg. 628

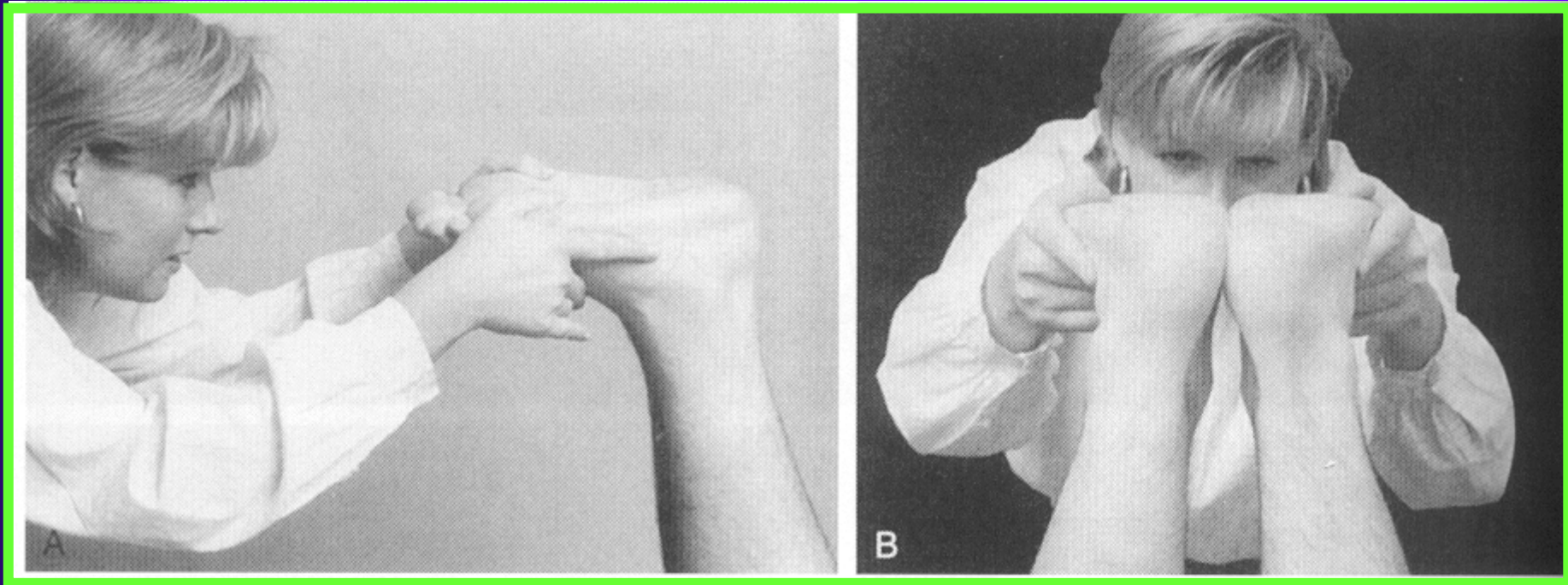


Gross Leg Length Discrepancy



Magee 4th
Edition – pg. 628

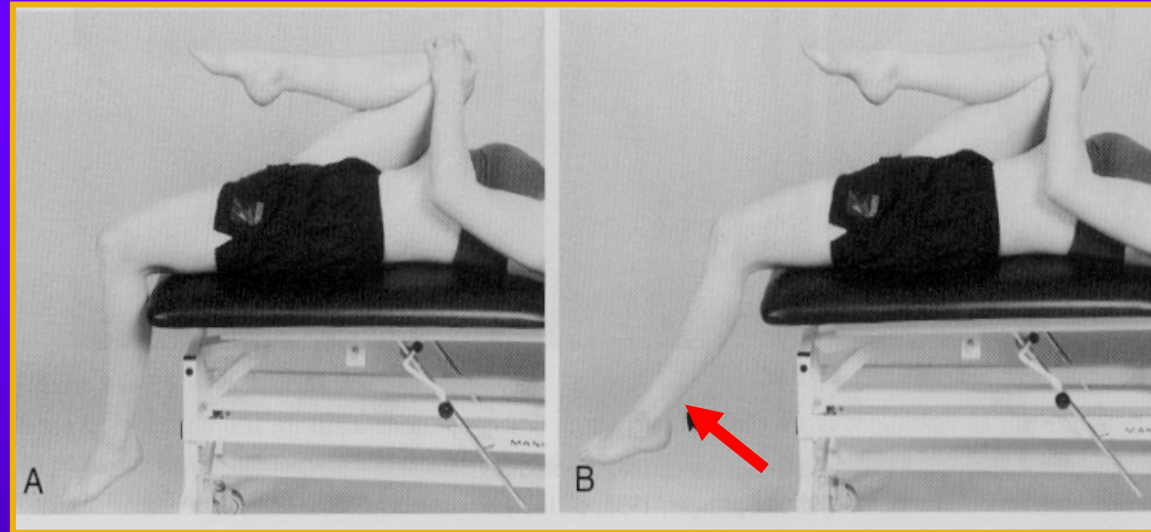
Prone Knee Flexion Test for Tibial Shortening



Magee 4th
Edition - pg. 630



Thomas Test



Magee
- 4th Edition

3 Muscle Kendall test

As above....but also look at....

IP = hip flexor and hip ER

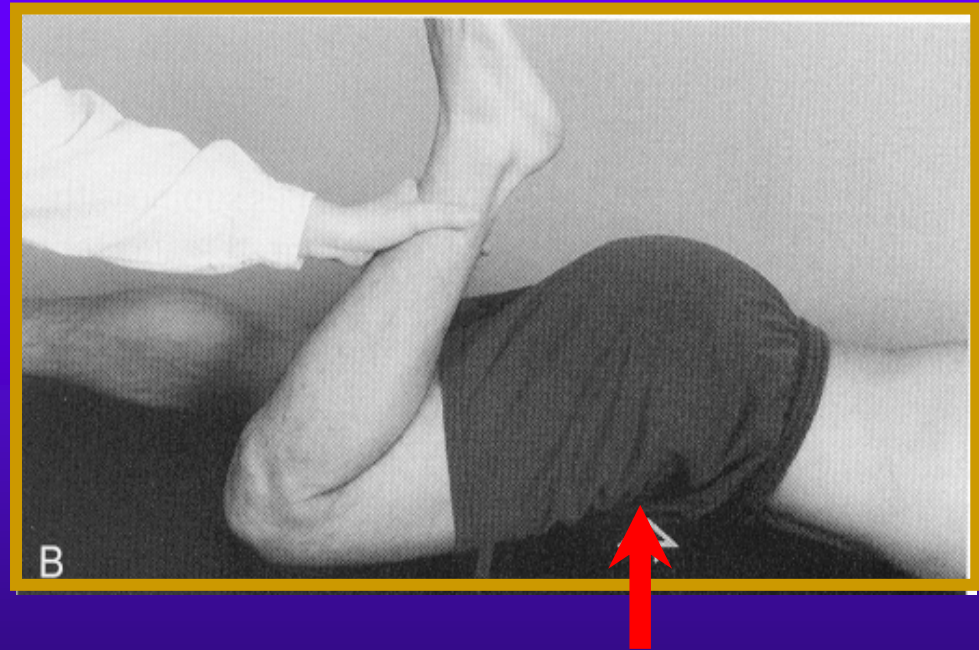
RF = hip flexor and knee extensor

TFL/ITB = hip flexor and hip abductor



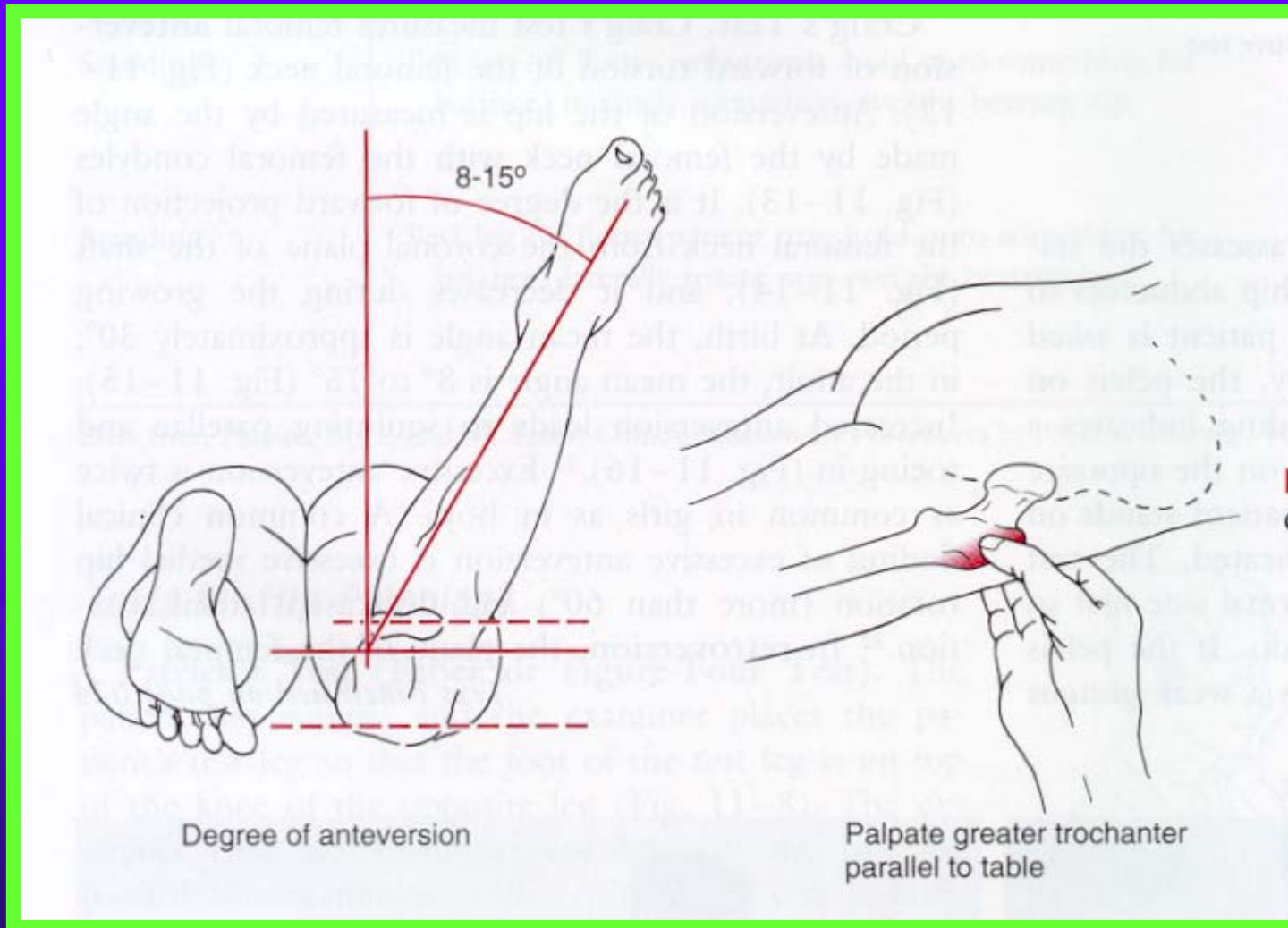
Ely's Test

- ◆ Prone, passive knee flexion
- ◆ Positive for RF tightness if pelvic anterior tilting / hip flexion accompanies knee flexion before end range and if asymmetrical in bilateral comparison



Magee 4th Edition

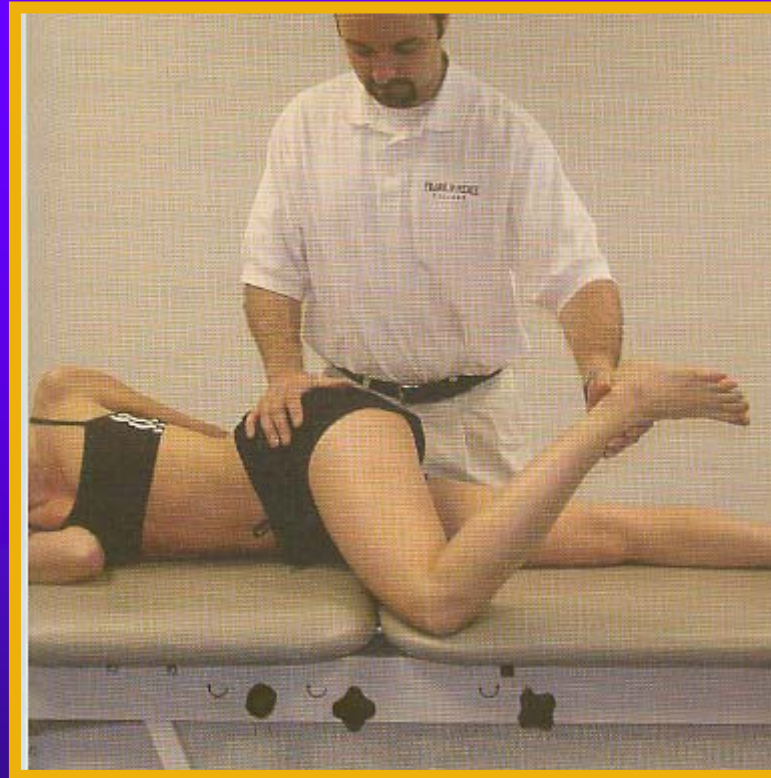
Craig's Test



Magee 4th Edition - pg. 622



FAIR Test



Cleland, J. –
Orthopedic Clinical Examination

Fishman et. al
(2002) Archives
of Physical
Medicine –
10 yr. Piriformis
study

❖ Sen. .88

❖ Spec. .83

+LR= 5.2

-LR=.14

(+) = pain at
intersection of
sciatic nerve
and piriformis

Special Tests Continued



◆ Ober Test

◆ Nobel Compression Test

◆ Quadrant Test / Scour

◆ Ortolani's Test

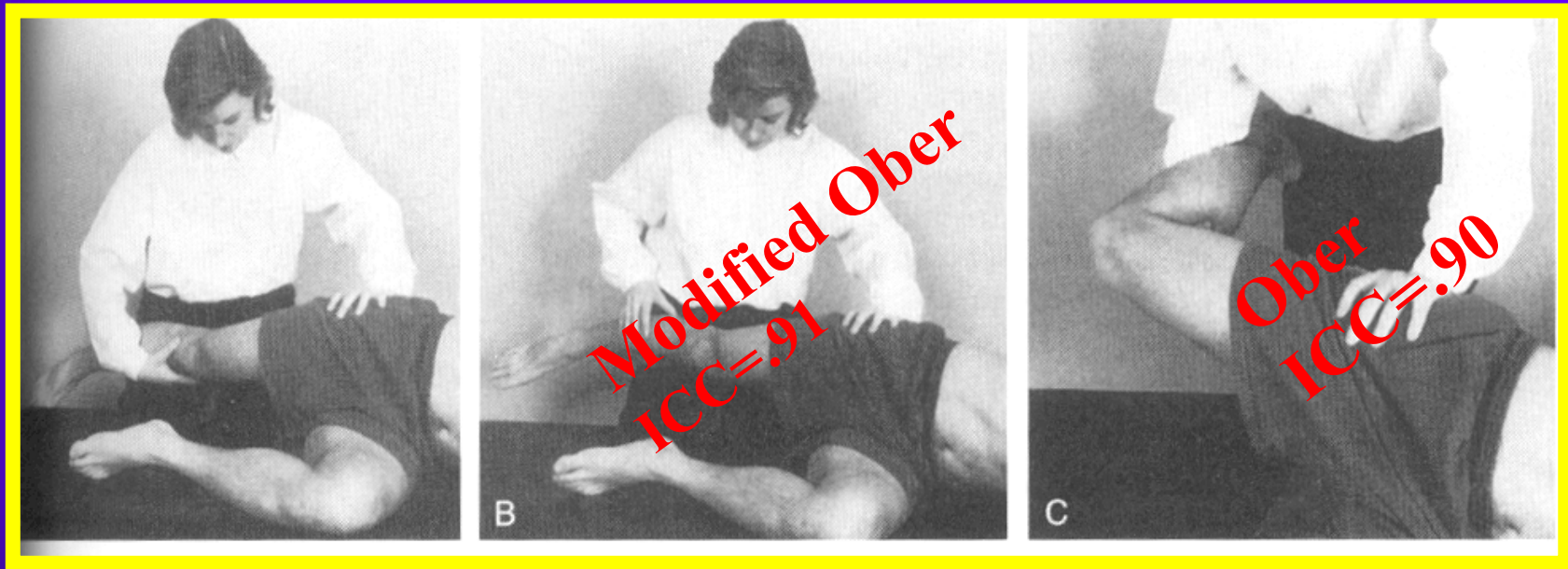
◆ Barlow's Test

- Mod. Of Ortolani's Test
- Supine, hips 90°, knees extended
- Bilateral alternate test
- Middle finger on G.T., thumb medial at L.T.
- Abd. Hip, with distal pressure on G.T.
- (+) if "slip"/Dislocation occurs
- Use thumb, apply post./sup. Force to reduce
- Valid in infants < 6 months

◆ Positive of the Buttock

- Greenwood, Erhard, Jones (1998)
JOSPT

Ober Test



Magee 4th Edition – pg. 633

Reese and Bandy (2003) JOSPT

Ober Test

Modified Ober Test (4-5⁰ > Ober test)



Noble Compression Test



Magee 4th Edition – pg. 633

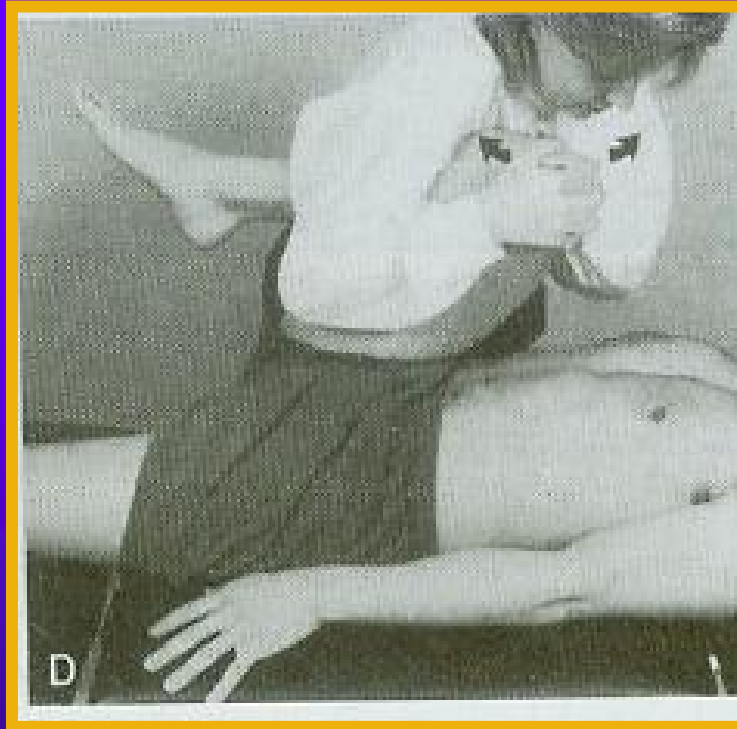
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Scour Test of Hip / Quadrant Test of Hip

- Flex and adduct hip

- Maintain flexion and abduct hip in scouring fashion

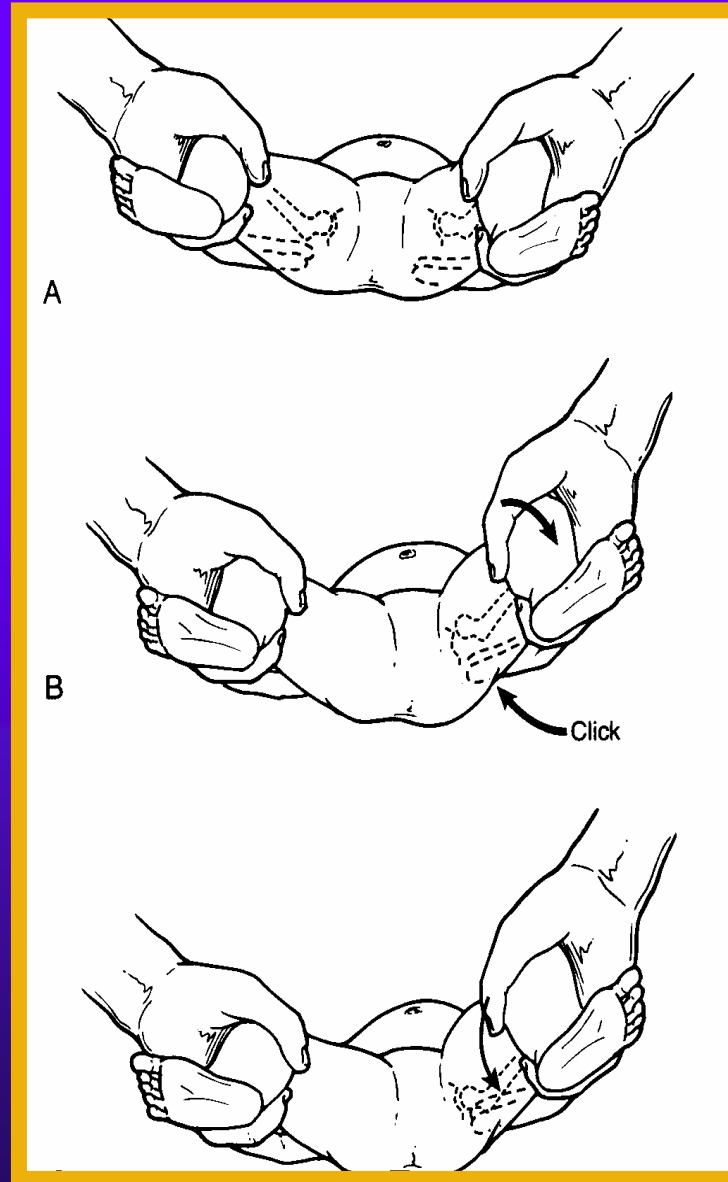
- Use minimal force to elicit response



Magee 4th Edition Pg 643



Ortolani's Test



Magee 4th Edition
– pg. 626

- Infant supine
- Grasp thighs with thumbs medially & fingers lateral at greater trochanter
- Gentle traction, abduction and med. directed pressure on trochanter
- “Click/Clunk” = Reduction
- Valid first 1-3 wks. of birth & only with dislocated/subluxed hips



Joint Play / Accessory Motion Testing

- ◆ Acetabulofemoral distal glide
- ◆ Acetabulofemoral distraction
- ◆ Acetabulofemoral posterior glide femur



Joint Play / Accessory Motion Testing

- ◆ Acetabulofemoral posterior glide greater trochanter
- ◆ Acetabulofemoral anterior glide femur
- ◆ Acetabulofemoral distal glide - hip at 90
- ◆ Acetabulofemoral lateral glide - hip at 90



Palpation

◆ Anterior Aspect

– ASIS

– Iliac Crest

• “Hip Pointer” or contusion

– Greater Trochanter

– Inguinal Ligament

– Iliopectineal Bursa

– MM. – Flexors / Add./Abductors

◆ Posterior Aspect

– Ischial Tuberosities / PSIS

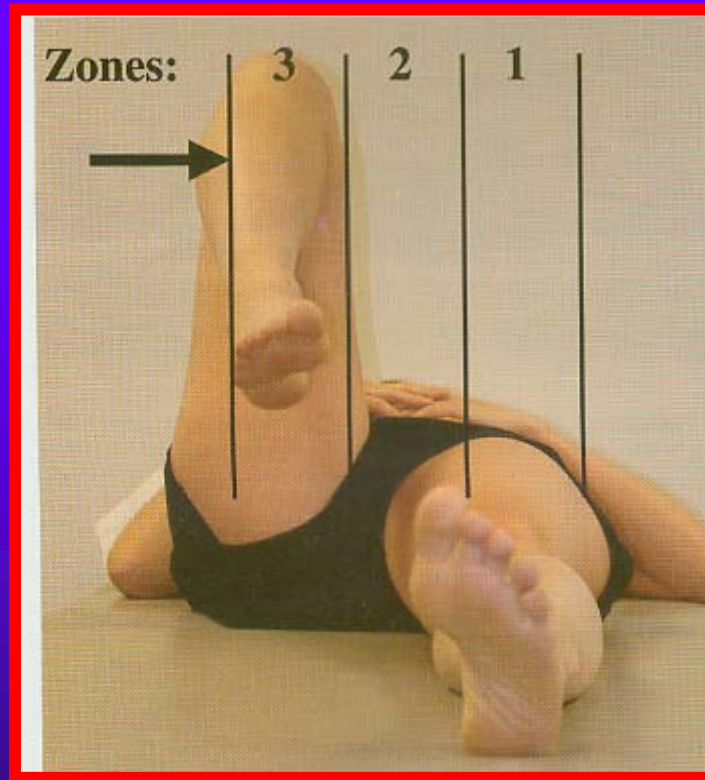


Functional Tests

- ◆ Squatting (Quick Test)
- ◆ Stair Negotiation
- ◆ Crossing Legs in Sitting
- ◆ Walking / Running
- ◆ Hoping / Jumping
- ◆ Crossing Legs in Sitting
 - Perform the Flexion-Adduction test ?

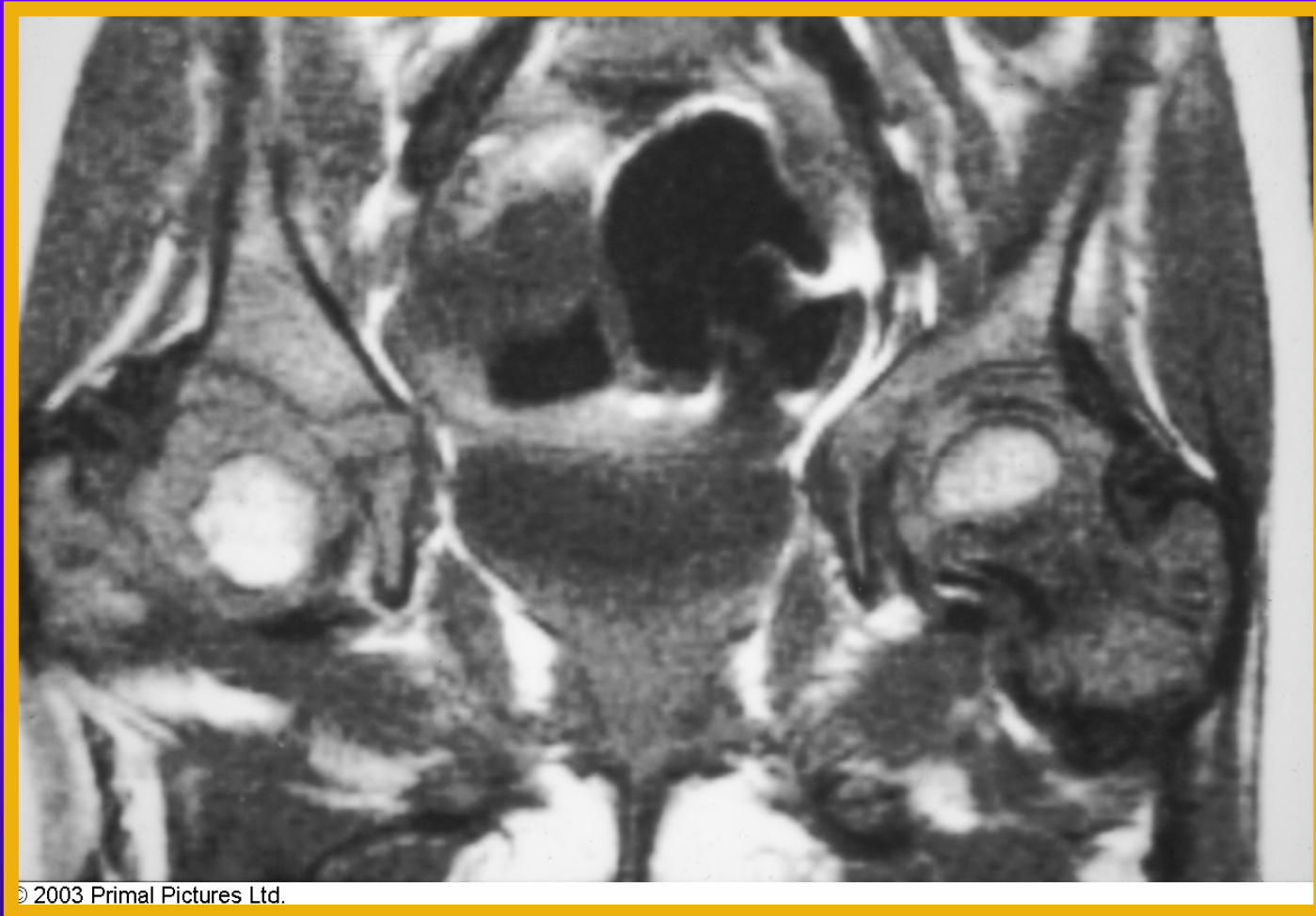


Flexion – Adduction Test



Cleland, J. –
Orthopedic Clinical
Examination

Woods and Macnicol 2001 – in a normal pop. the knee should adduct to Zone 1, with pathologic changes only to Zones 2 or 3 (limitation 2^o to pain, apprehension, or limited end range)
n = 87 pts. with hip pain, (+) for nonspecific hip disease



Slipped Capital Femoral Epiphysis



© 2003 Primal Pictures Ltd.

AVN Femoral Head



© 2003 Primal Pictures Ltd.

Congenital Hip Dysplasia



Osteoarthritis



© 2003 Primal Pictures Ltd.

???

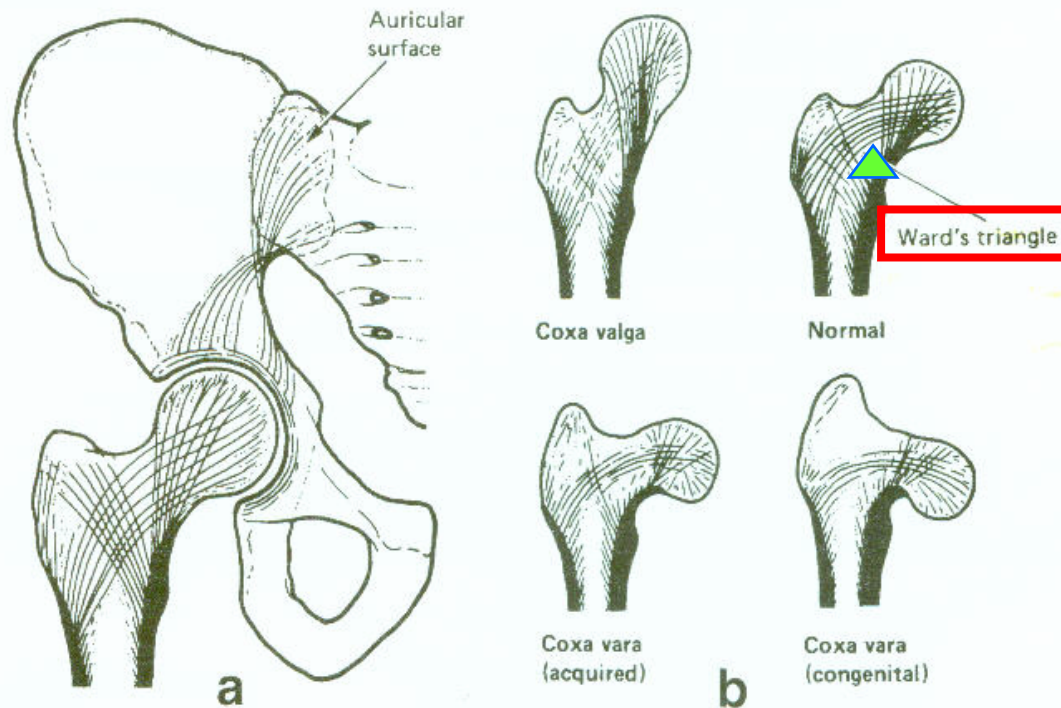
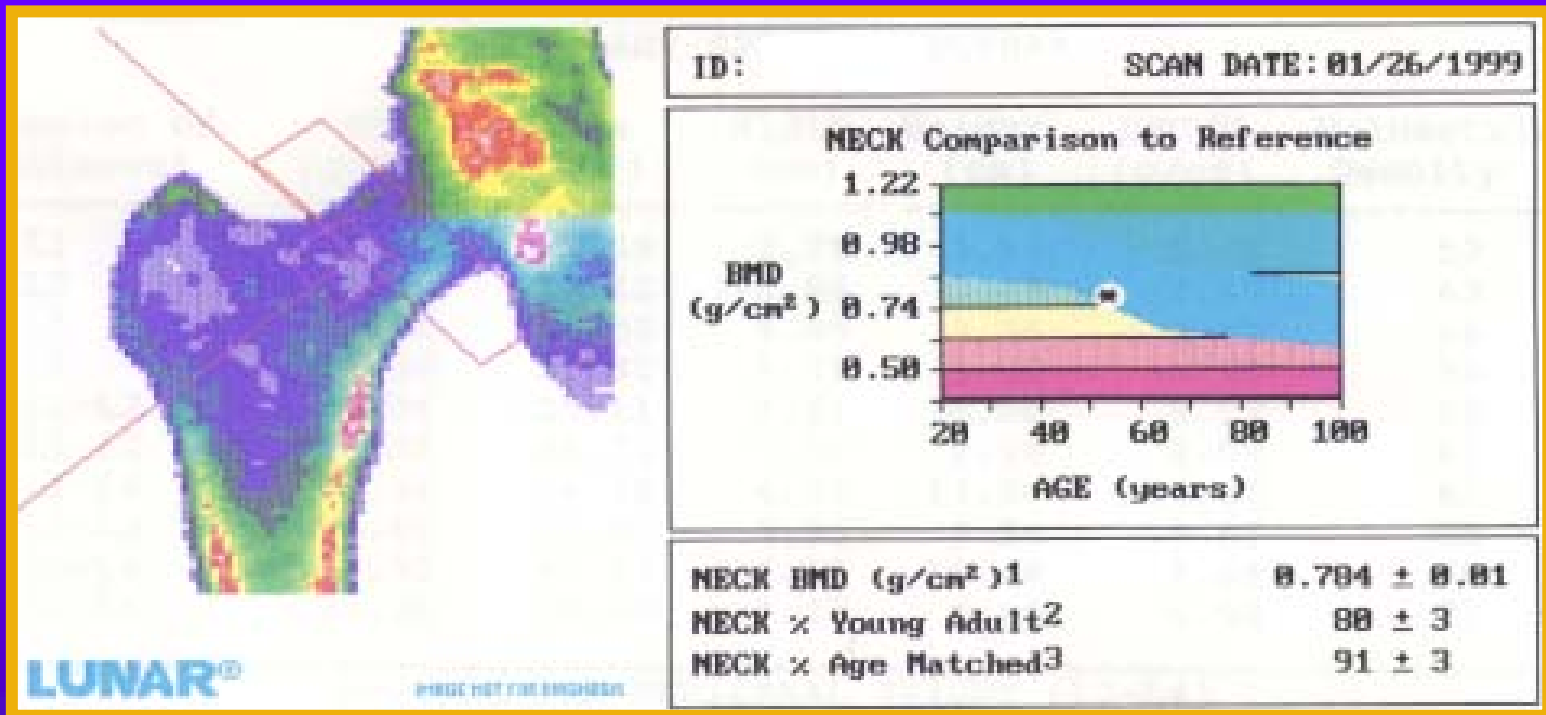


Figure 2. (a) Arrangement of the bony trabecular system in the innominate and upper part of the femur. (b) Changes in the angle of inclination in coxa valga and coxa vara showing the internal remodeling that has occurred as a result. Reprinted with permission from Palastanga N, Field D, Soames R. *Anatomy and Human Movement: Structure and Function*. Oxford, United Kingdom; 1998:427. Copyright 1998, Butterworth-Heinemann.

DEXA
(*dual x-ray
absorptiometry*)





National Osteoporosis Foundation sets
the diagnostic criterion at 2.0 SD
below peak value

Risk Factors include: Women > 65 who weigh less than 140# at
menopause or never used estrogens for > 6 months