MASSAGE & MYOTHERAPY AUSTRALIA

Assessment and Treatment of Anterior Hip and Groin Pain

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MEdNeuroSc, Adv. Dip. HSc (STT)

ACE ADVANCED CLINICAL EDUCATION

1

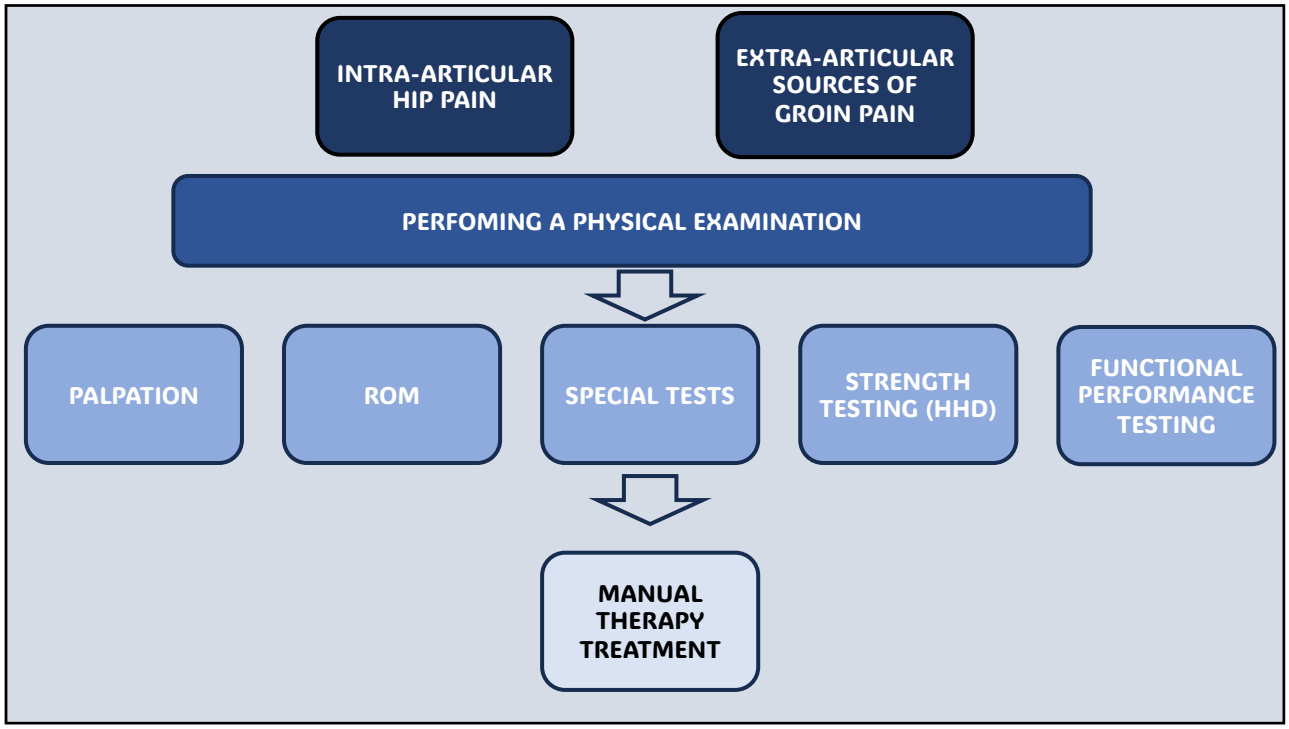
GOALS

- Understand pathoetiology & recognise signs and symptoms
- Structure your hip and groin assessment
- Use physical assessment results to apply appropriate MT techniques
- Use assessment to inform exercise and education

2

A BRIEF OVERVIEW

3



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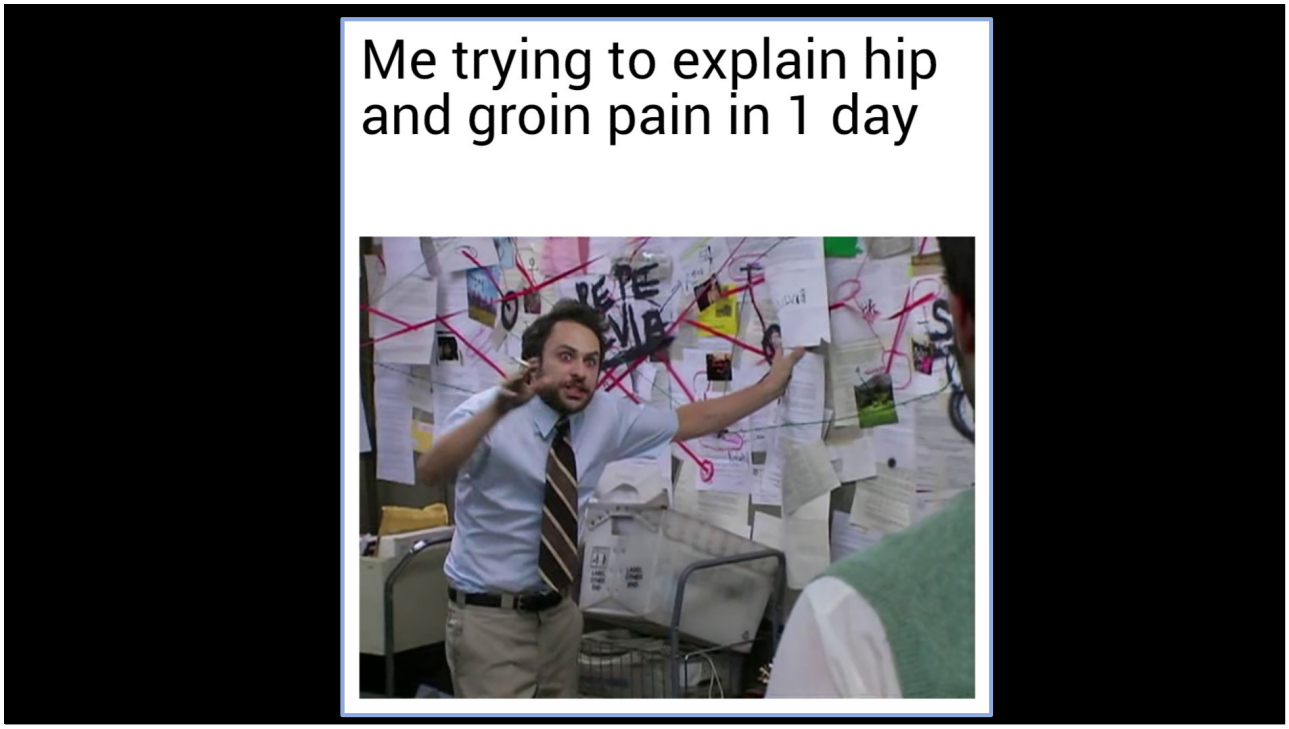
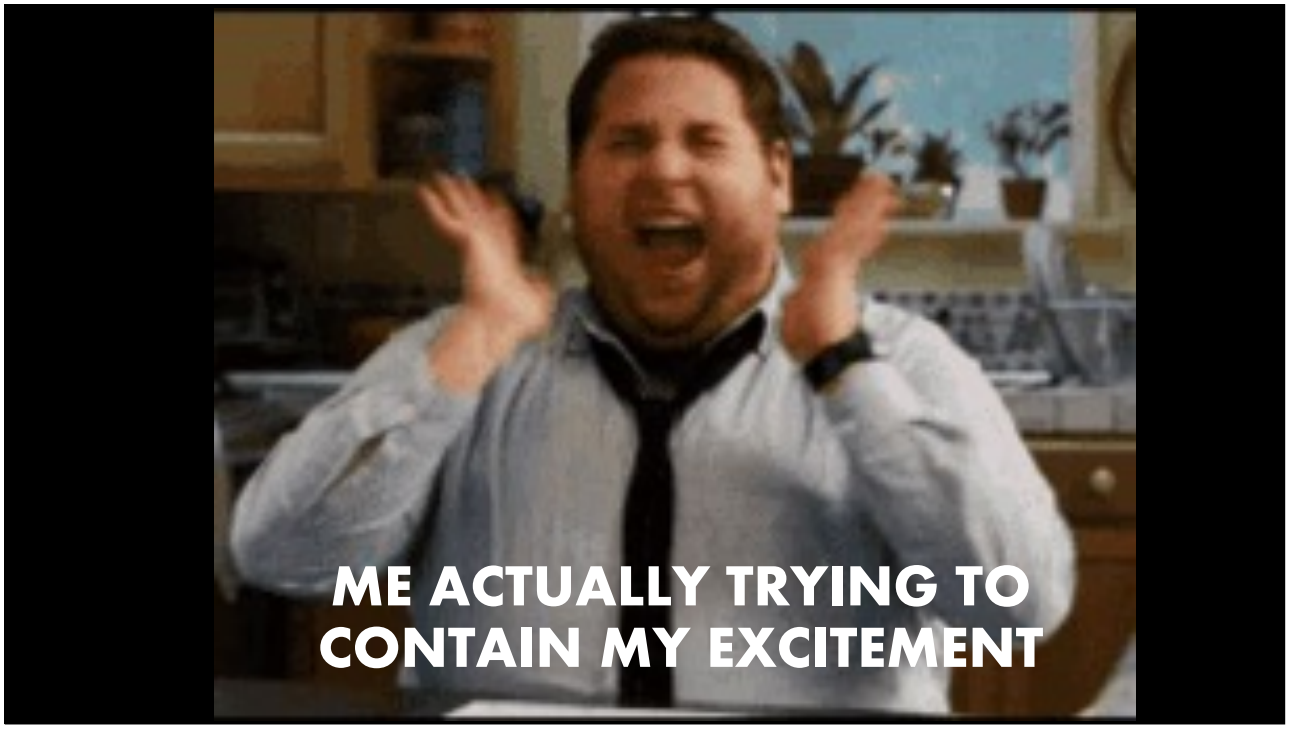
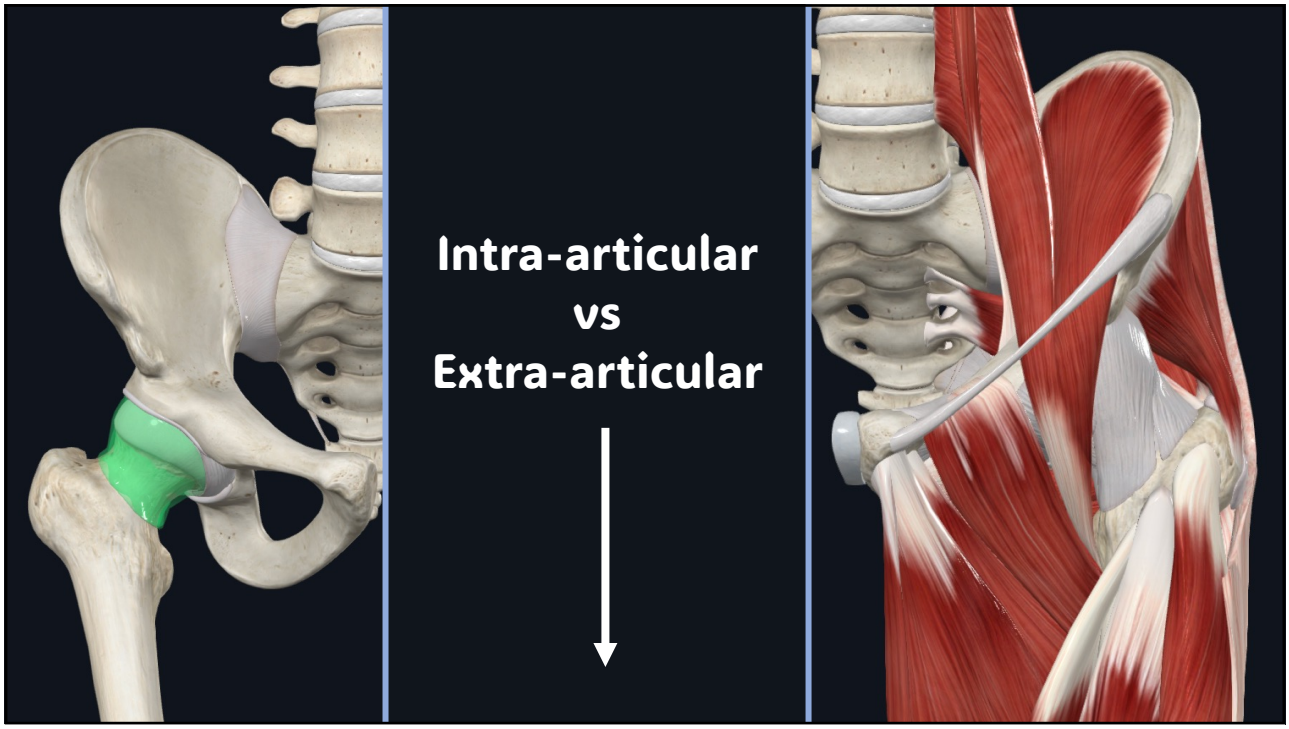

Me trying to explain hip and groin pain in 1 day

5


ME ACTUALLY TRYING TO CONTAIN MY EXCITEMENT

6



7

HIP RELATED PAIN

Consensus recommendations on the classification, definition and diagnostic criteria of hip-related pain in young and middle-aged active adults from the International Hip-related Pain Research Network, Zurich 2018

Michael P Reiman [1], Rintje Agricola,[2] Joanne L Kemp [3], Joshua J Heerey [3], Adam Weir,[4,5] Pim van Klij [2], Ara Kassarjian,[6,7] Andrea Britt Mosler [3], Eva Ageberg [8], Per Hölmich,[9] Kristian Marstrand Warholm [10], Damian Griffin,[11,12] Sue Mayes,[3] Karim M Khan [13], Kay M Crossley [3], Mario Bizzini,[14] Nancy Bloom,[15] Nicola C Casartelli [16,17], Laura E Diamond [18], Stephanie Di Stasi [19], Michael Drew,[20,21] Daniel J Friedman,[22] Matthew Freke,[23] Boris Gojanovic [24,25], Sion Glyn-Jones,[26] Marcie Harris-Hayes [15], Michael A Hunt,[27] Franco M Impellizzeri [28], Lasse Ishøi [9], Denise M Jones,[3] Matthew G King [3], Peter R Lawrenson [29], Michael Leunig,[30] Cara L Lewis [31], Nicolas Mathieu,[32] Håvard Moksnes,[33] May-Arna Risberg,[34,35] Mark James Scholes [3], Adam I Semciw,[3] Andreas Serner [36], Kristian Thorborg [9], Tobias Wörner [37], Hendrik Paulus Dijkstra[36,38]

Made recommendations on how to classify, define and diagnose hip disease in young and middle-aged active adults

Reiman et al. (2018)

8

HIP RELATED PAIN

1. Non-MSK and serious hip pathology must be first ruled out
   - Tumours, SCFE, infection etc
2. Competing MSK conditions ruled out

Hip pain in young and middle age active adults can be categorised into:

FAI Syndrome

Acetabular dysplasia and / or hip instability

Other conditions without bony morphology causing hip pain:
-Chondral, labral and ligamentum teres conditions

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Michael P Reiman [1], Rintje Agricola,[2] Joanne L Kemp [3], Joshua J Heerey [3], Adam Weir,[4,5] Pim van Klij [2], Ara Kassarjian,[6,7] Andrea Britt Mosler [3], Eva Ageberg [8], Per Hölmich,[9] Kristian Marstrand Warholm [10], Damian Griffin,[11,12] Sue Mayes,[3] Karim M Khan [13], Kay M Crossley [3], Mario Bizzini,[14] Nancy Bloom,[15] Nicola C Casartelli [16,17], Laura E Diamond [18], Stephanie Di Stasi [19], Michael Drew,[20,21] Daniel J Friedman,[22] Matthew Freke,[23] Boris Gojanovic [24,25], Sion Glyn-Jones,[26] Marcie Harris-Hayes [15], Michael A Hunt,[27] Franco M Impellizzeri [28], Lasse Ishøi [9], Denise M Jones,[3] Matthew G King [3], Peter R Lawrenson [29], Michael Leunig,[30] Cara L Lewis [31], Nicolas Mathieu,[32] Håvard Moksnes,[33] May-Arna Risberg,[34,35] Mark James Scholes [3], Adam I Semciw,[3] Andreas Serner [36], Kristian Thorborg [9], Tobias Wörner [37], Hendrik Paulus Dijkstra[36,38]

Reiman et al. (2018)

9

Hip vs Groin

10

11

Consensus statement

OPEN ACCESS

Doha agreement meeting on terminology and definitions in groin pain in athletes

Adam Weir,[1] Peter Brukner,[2] Eamonn Delahunt,[3,4] Jan Ekstrand,[5] Damian Griffin,[6] Karim M Khan,[1,7] Greg Lovell,[8] William C Meyers,[9] Ulrike Muschaweck,[10] John Orchard,[11] Hannu Paajanen,[12] Marc Philippon,[13,14,15] Gilles Reboul,[1,16] Philip Robinson,[17] Anthony G Schache,[18] Ernest Schilders,[19] Andreas Serner,[21] Holly Silvers,[20] Kristian Thorborg,[21] Timothy Tyler,[22] Geoffrey Verrall,[23] Robert-Jan de Vos,[24] Zarko Vuckovic,[1] Per Hölmich[1,21]

Twenty-four international experts from 14 different countries were provided with two cases.
Each expert was asked to provide up to three diagnostic terms for each case

↓

Case 1: 18 different terms
Case 2: 22 different terms

Weir et al. (2015)

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Consensus statement

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Adam Weir,[1] Peter Brukner,[2] Eamonn Delahunt,[3,4] Jan Ekstrand,[5] Damian Griffin,[6] Karim M Khan,[1,7] Greg Lovell,[8] William C Meyers,[9] Ulrike Muschaweck,[10] John Orchard,[11] Hannu Paajanen,[12] Marc Philippon,[13,14,15] Gilles Reboul,[1,16] Philip Robinson,[17] Anthony G Schache,[18] Ernest Schilders,[19] Andreas Serner,[21] Holly Silvers,[20] Kristian Thorborg,[21] Timothy Tyler,[22] Geoffrey Verrall,[23] Robert-Jan de Vos,[24] Zarko Vuckovic,[1] Per Hölmich[1,21]

Various injury definitions, classification and terminology has been used to report different forms of groin injuries

Weir et al. (2015)

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✗ Terms NOT Recommended by the Doha Agreement

- Adductor tendinitis
- Iliopsoas tendinitis
- Adductor tendinopathy
- Iliopsoas tendinopathy
- Athletic groin pain
- Athletic pubalgia
- Biomechanical groin overload
- Gilmore's groin
- Groin disruption
- Hockey-goalie syndrome
- Hockey groin
- Osteitis pubis
- Sports groin
- Sportsman's groin
- Sports hernia
- Sportsman's hernia

Receiving different diagnostic labels for the same condition

Patient:

Weir et al. (2015)

14

✕ **Terms NOT Recommended by the Doha Agreement**

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- Sports hernia
- Sportsman's hernia

"Groin pain" in athletes was the group's preferred umbrella term in longstanding groin pain in athletes.

It cannot be misunderstood to be a diagnostic term.

Weir et al. (2015)

15

GROIN PAIN CLASSIFICATION

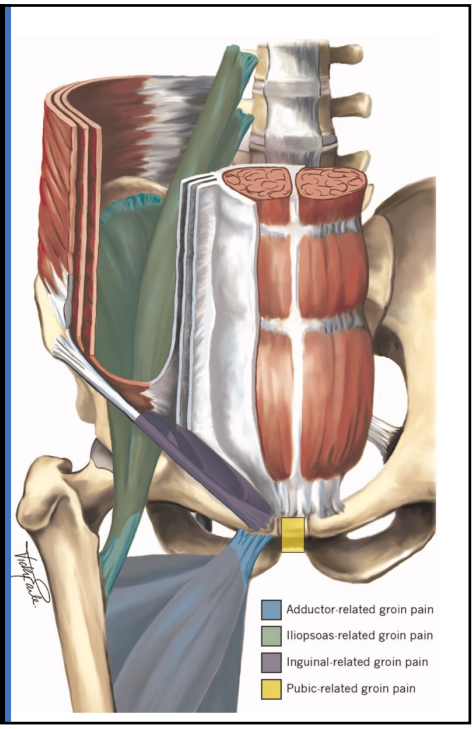
5 categories

16

GROIN PAIN CLASSIFICATION

- ADDUCTOR RELATED GROIN PAIN
- ILIOPSOAS RELATED GROIN PAIN
- PUBIC RELATED GROIN PAIN
- INGUINAL RELATED GROIN PAIN
- HIP RELATED GROIN PAIN
- OTHER CAUSES OF GROIN PAIN IN ATHLETES

Weir et al ., (2015)



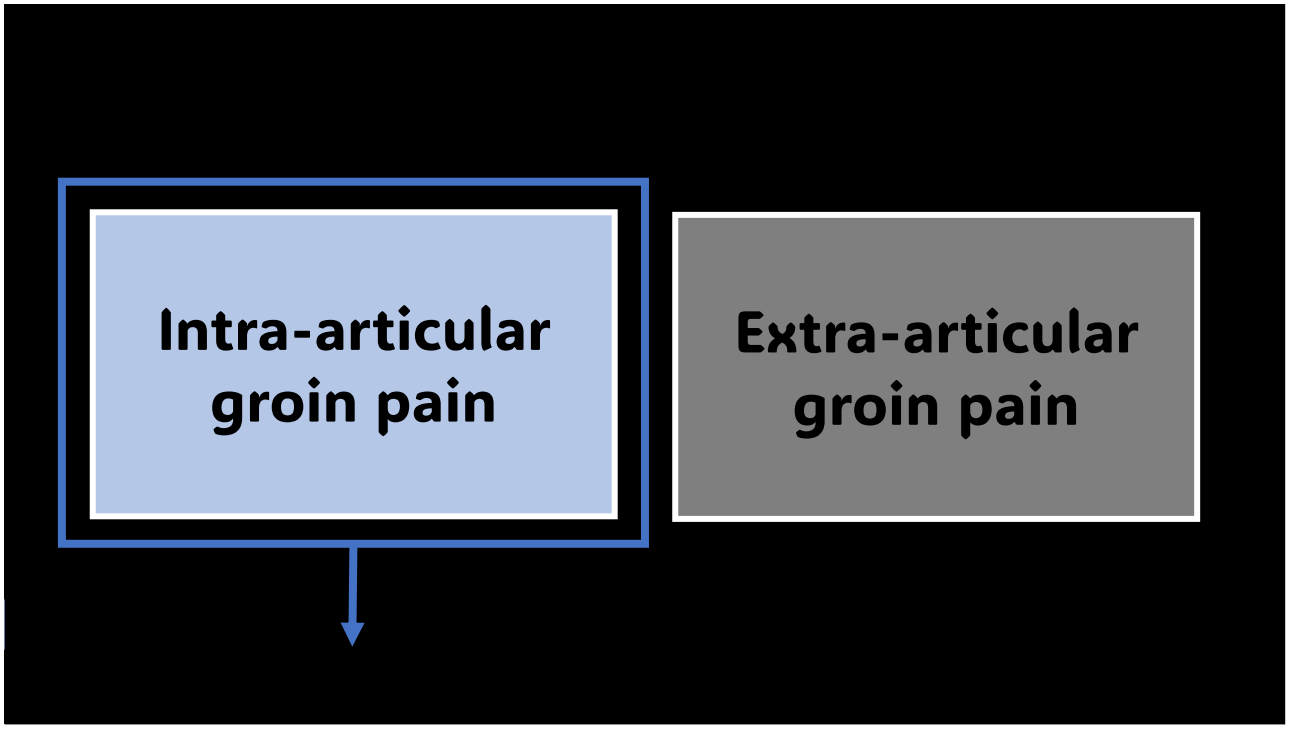
17

Intra-articular groin pain

Extra-articular groin pain

History | Mechanisms of injury | Signs and symptoms

18



19

What is Femoroacetabular impingement syndrome (FAIS)?

20

Consensus statement

The Warwick Agreement on femoroacetabular impingement syndrome (FAI syndrome): an international consensus statement

D R Griffin,[1,2] E J Dickenson,[1,2] J O'Donnell,[3,4] R Agricola,[5] T Awan,[6] M Beck,[7] J C Clohisy,[8] H P Dijkstra,[9] E Falvey,[10,11] M Gimpel,[12] R S Hinman,[13] P Hölmich,[9,14] A Kassarjian,[15,16] H D Martin,[17] R Martin,[18,19] R C Mather,[20] M J Philippon,[21] M P Reiman,[20] A Takla,[3,22,23,24] K Thorborg,[14] S Walker,[25] A Weir,[9,26] K L Bennell[23]

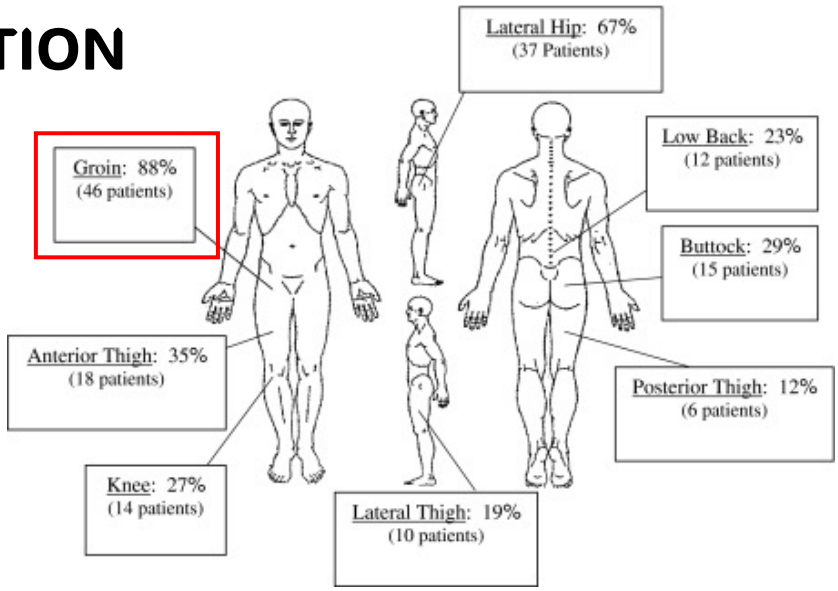
"Motion-related clinical disorder of the hip with a triad of symptoms, clinical signs and imaging findings.

It represents symptomatic premature contact between the proximal femur and the acetabulum."

Griffin et al. (2016)

21

FAI PAIN PRESENTATION

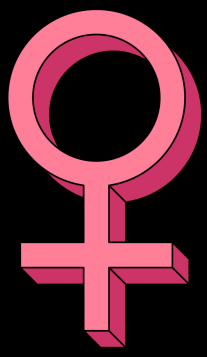


Clohisy et al., (2009)

22

Who does it affect?

More **common in males** →
affects approx. 15-25% males
(Argricola R, 2013)



23

Who does it affect?

5-15% females (Argricola R, 2013)

24

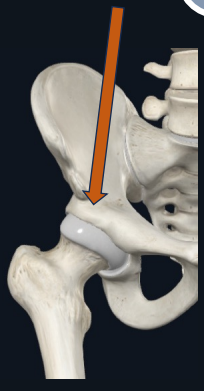
Develops from high impact sports during skeletal maturation

High-level male athletes are 1.9 to 8.0 times more likely to develop a cam deformity than male controls
(Nepple et al. 2015)

25

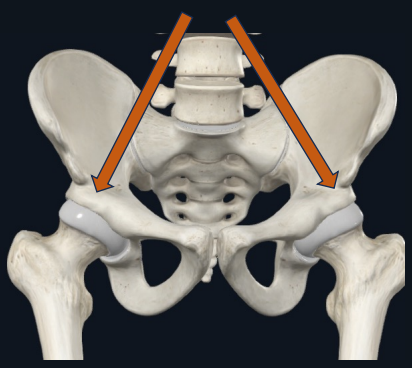
- Activity dependent
- Symptoms present in athletic people aged between 18-50
- Later in life

1



or

2



Dijkistra et al., (2021)

26

Why is this important?

27

Time and Cost of Diagnosis for Symptomatic Femoroacetabular Impingement

Cynthia A. Kahlenberg,* BA, Brian Han,* BA, Ronak M. Patel,† MD, Prashant P. Deshmane,* MD, and Michael A. Terry,*,‡ MD

Investigation performed at Northwestern University Feinberg School of Medicine, Chicago, Illinois, USA

Patients see on average of 4 health care providers

Have an average of 3.4 diagnostic imaging tests

Can take up to 32 months for an accurate diagnosis

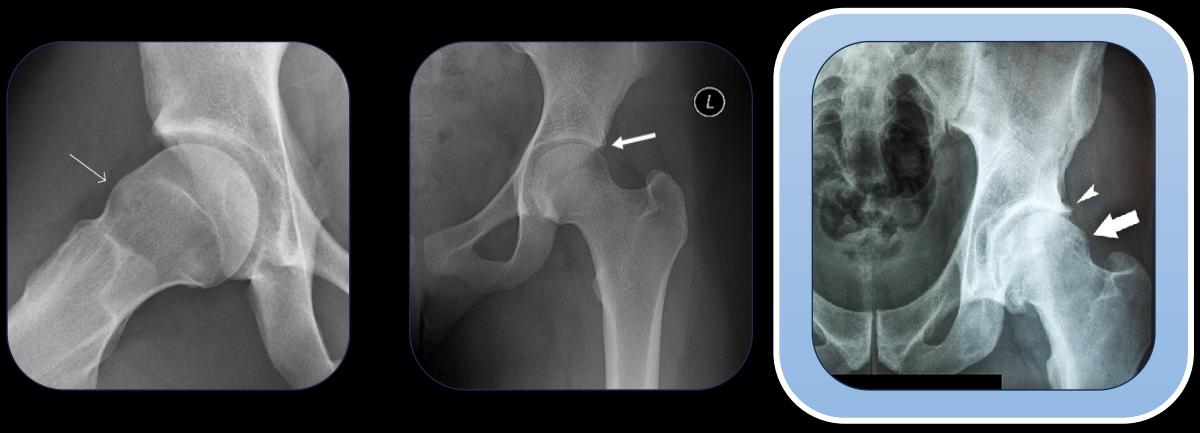
Kahlenberg, C. A. et al (2014)

28

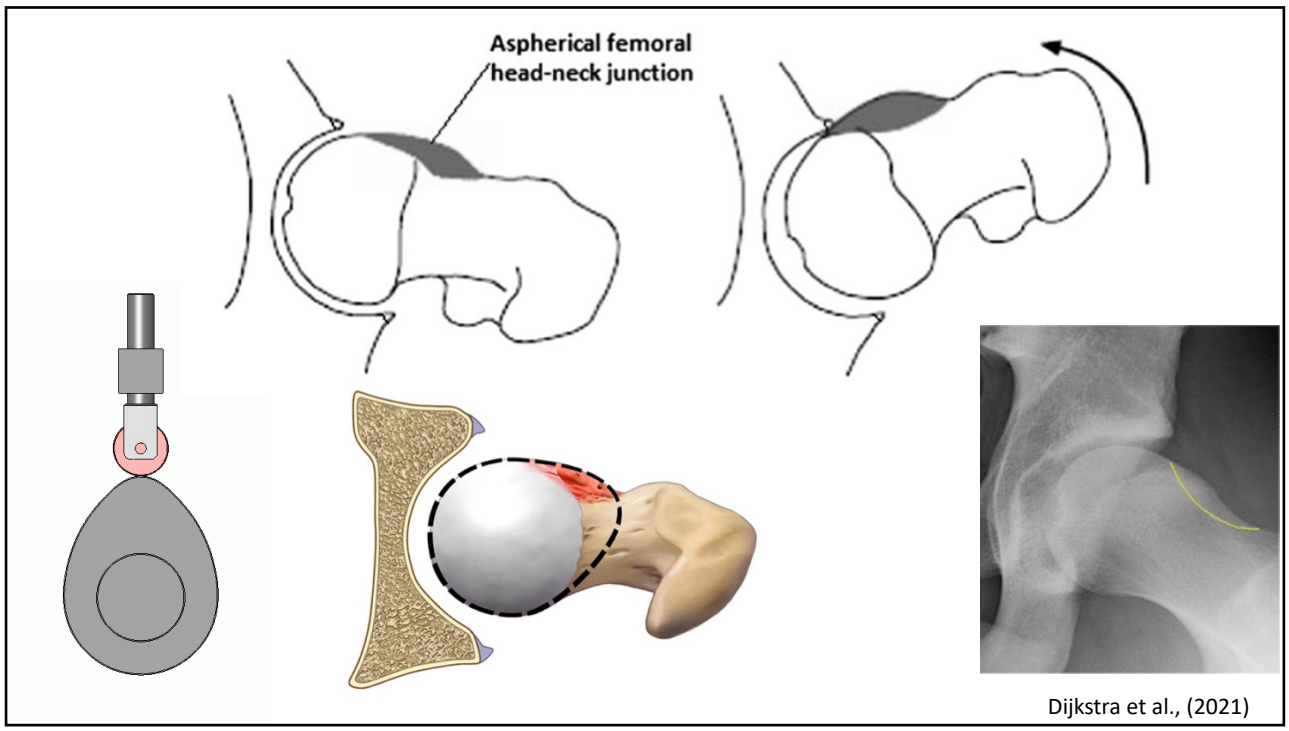
What does FAIS look like?

29

Primary FAI Morphology

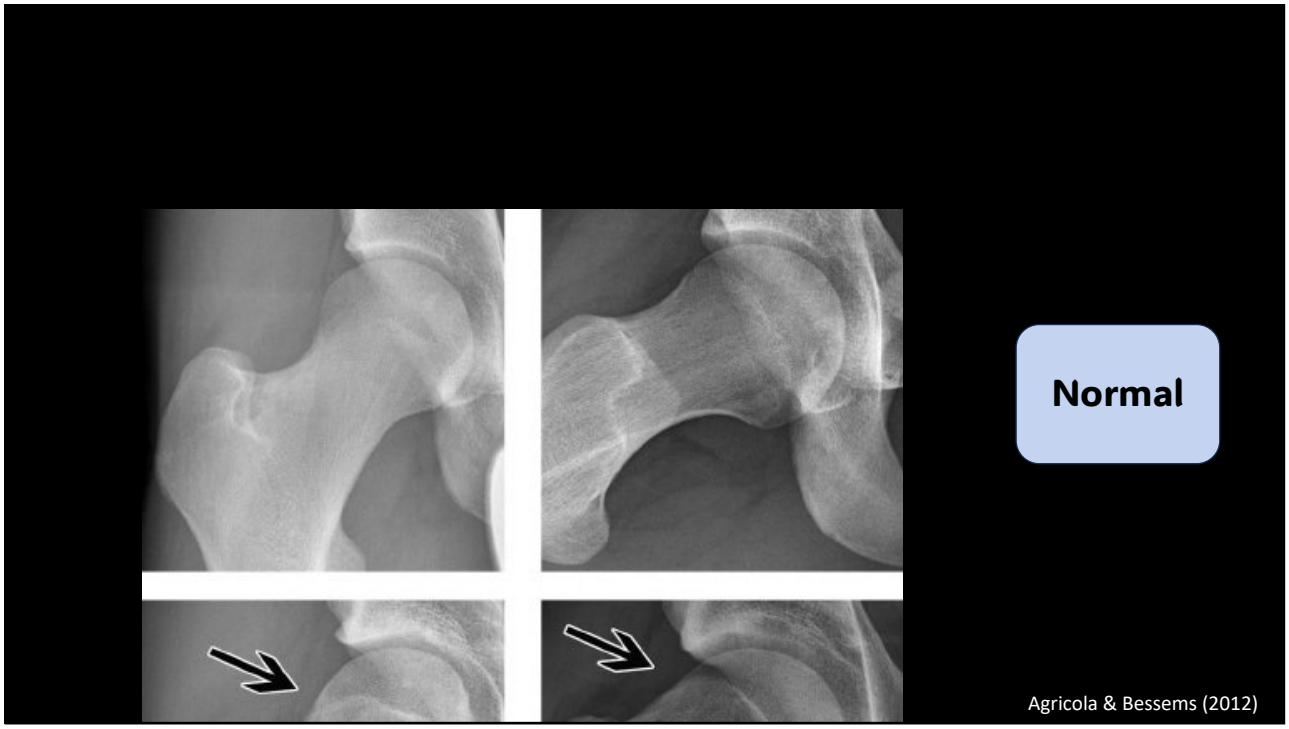


30



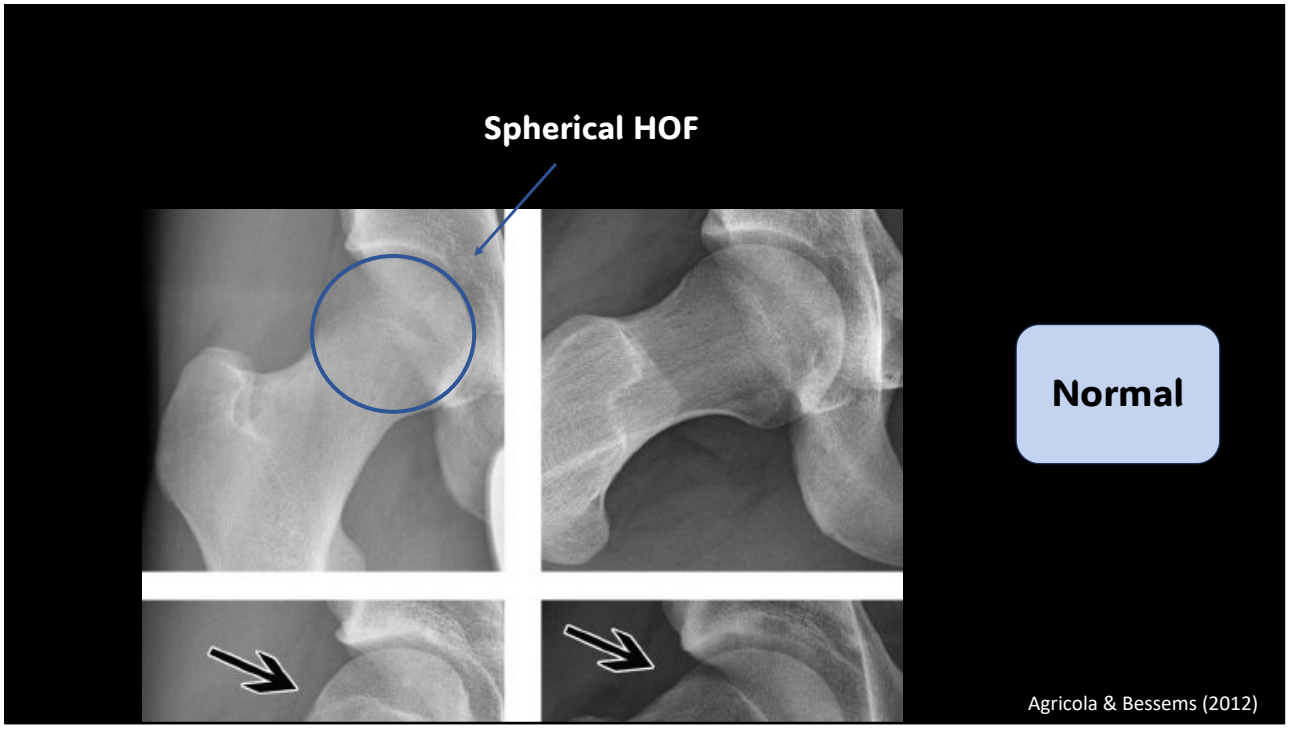
Dijkstra et al., (2021)

31

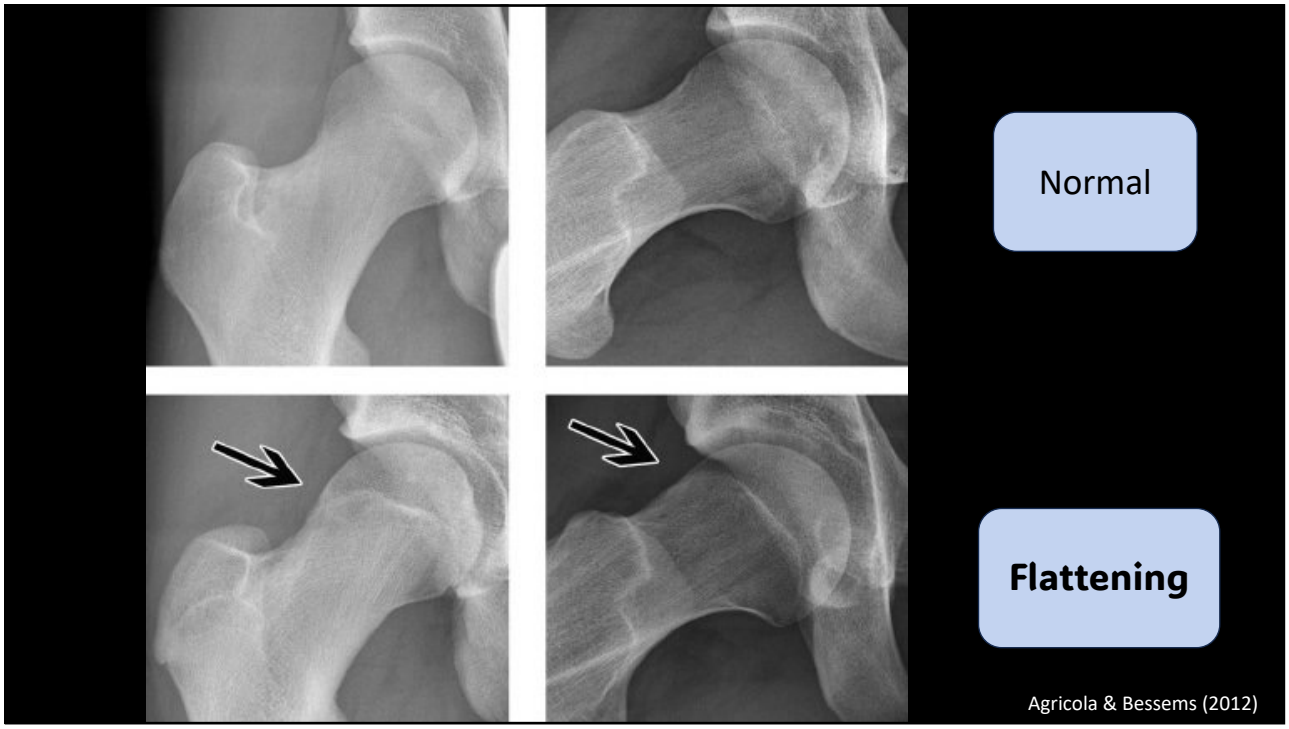


Agricola & Bessems (2012)

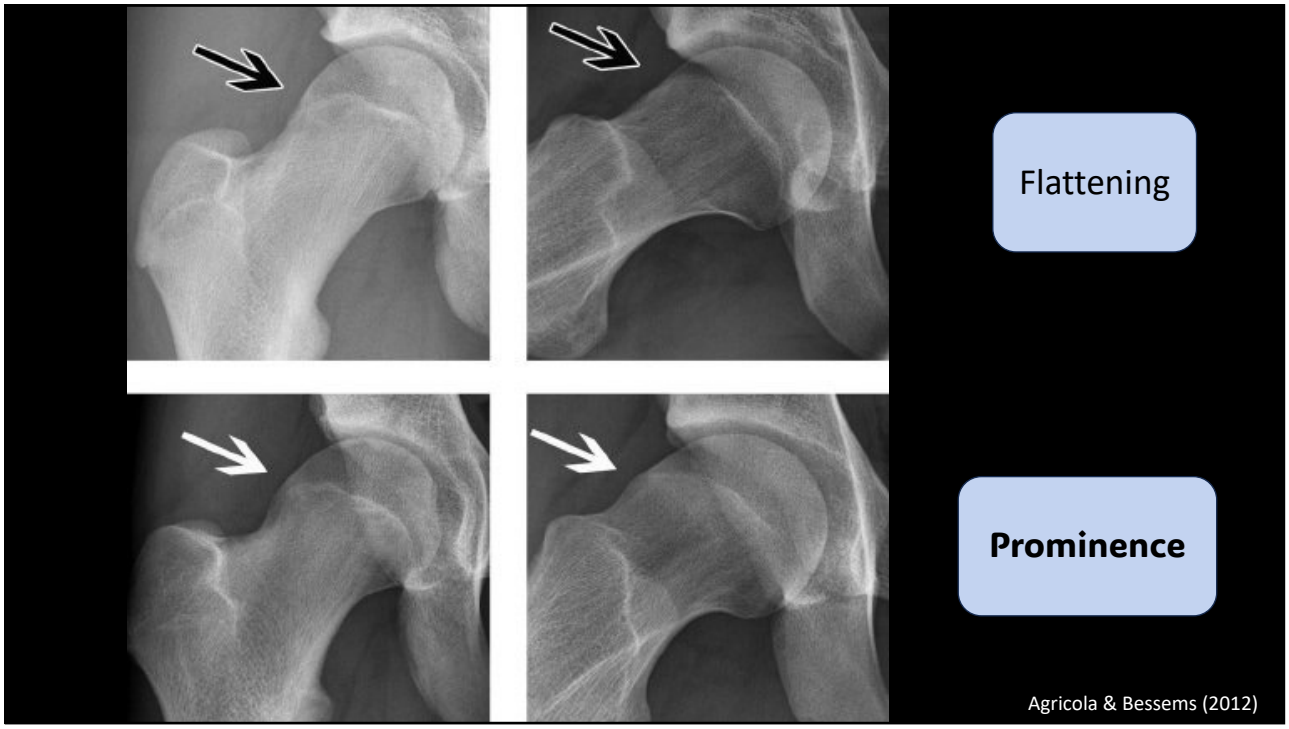
32


Spherical HOF
Normal
Agricola & Bessems (2012)

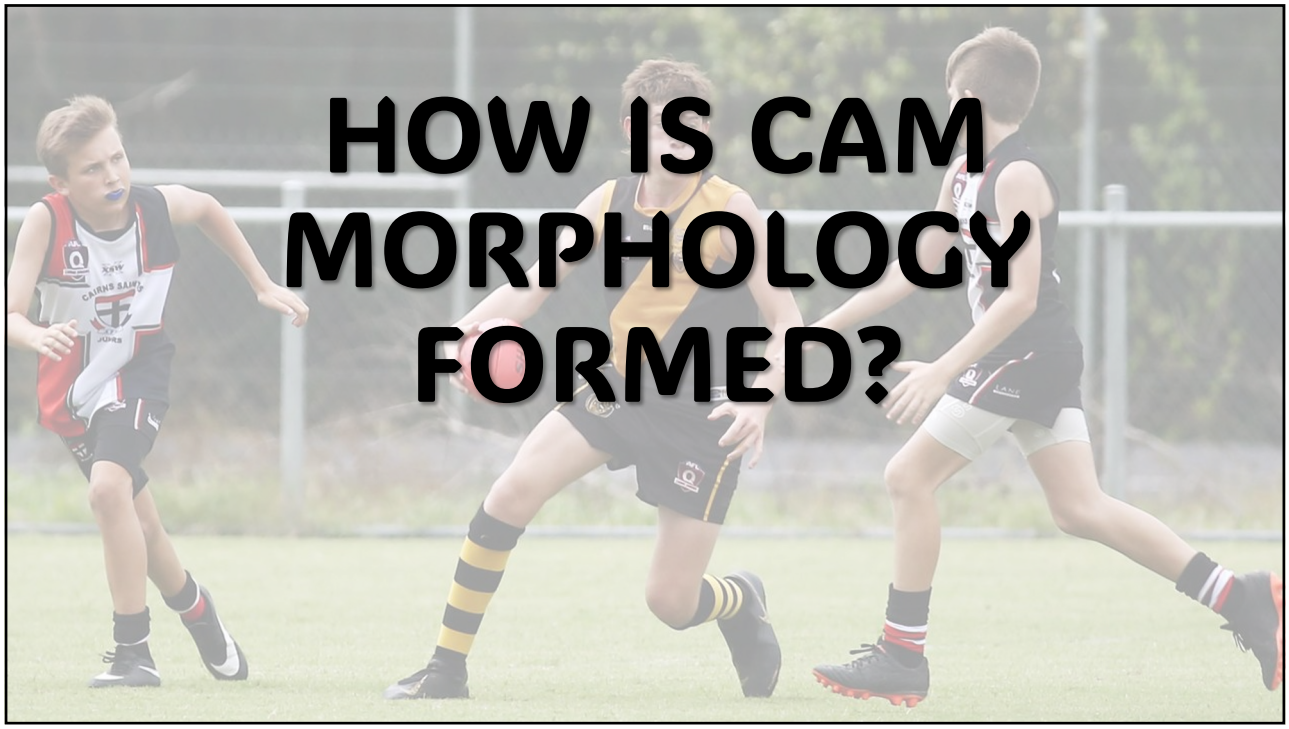
33


Normal
Flattening
Agricola & Bessems (2012)

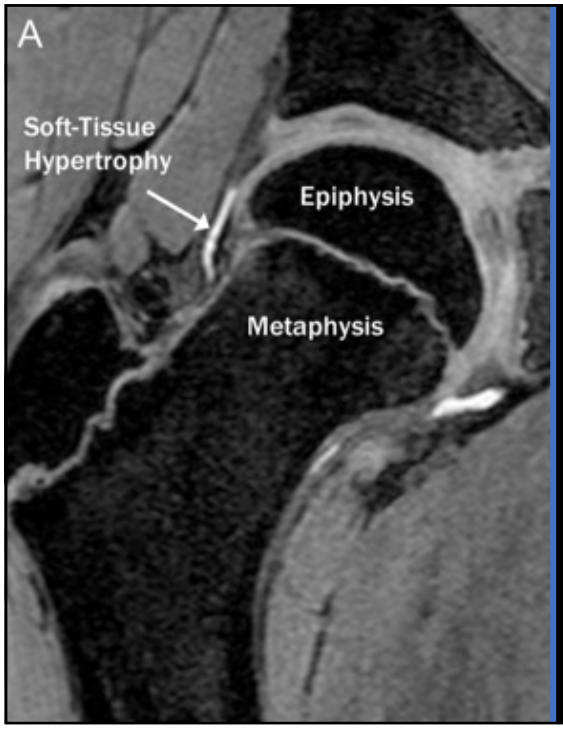
34


Flattening
Prominence
Agricola & Bessems (2012)

35


HOW IS CAM MORPHOLOGY FORMED?

36



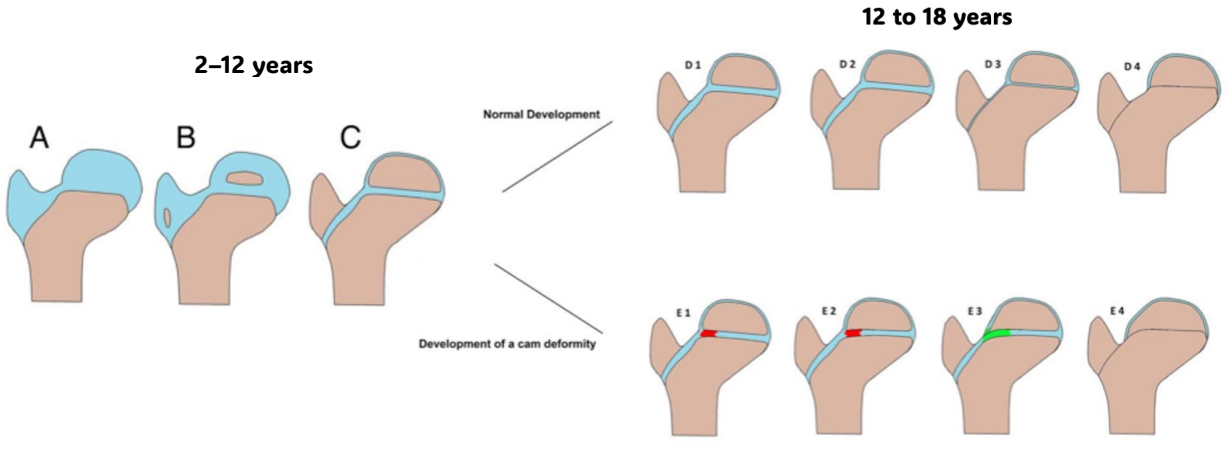
Soft tissue hypertrophy occurs between 10-14 years

Result of structural adaptation to high-impact sporting activities

Continuing until growth plate closes

37

Hip growth and development



(Agricola. R, Weinans, H. 2015)

38

CAM Morphology in the absence of symptoms is NOT FAIS

39

CAM Morphology in the absence of symptoms is NOT FAIS

CAM morphology often occurs in asymptomatic male athletes in both hips

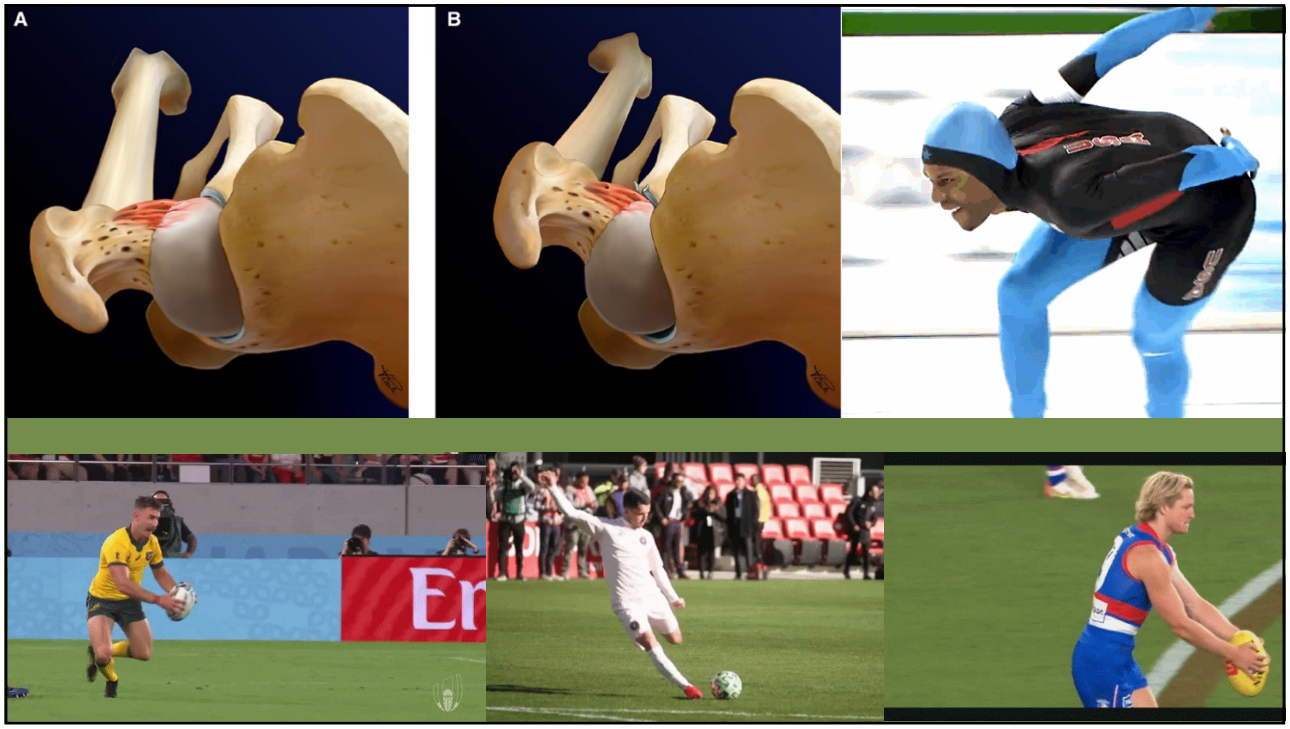
A normal physiological response to load, in most athletes.

Asymptomatic **Symptomatic**

40

Morphology combined with…

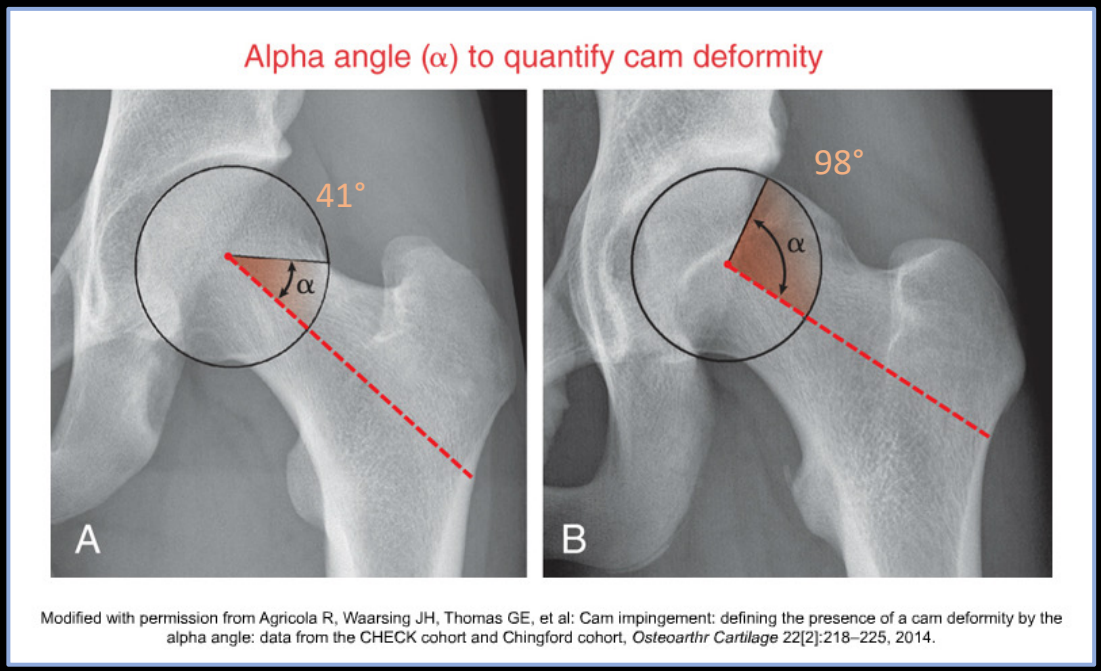
41



42

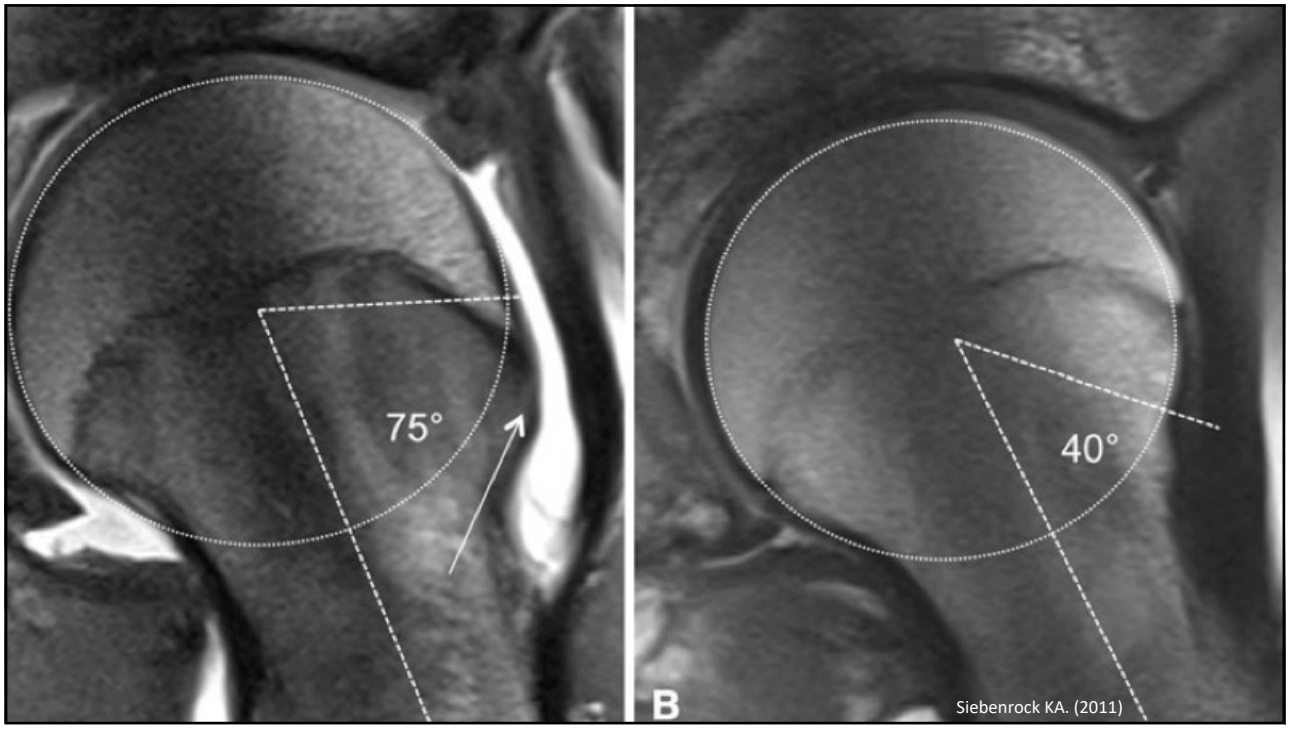
How is CAM type morphology measured?

43

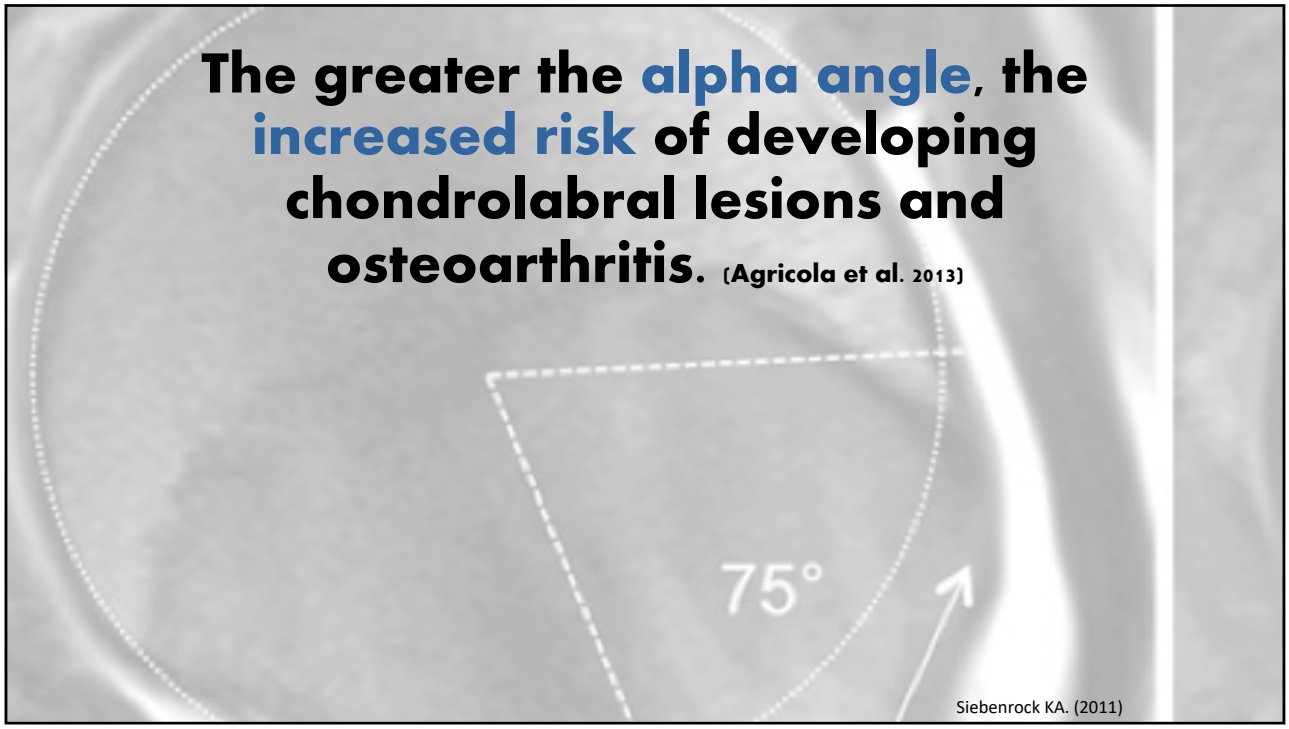


Agricola R (2013)

44


75°
40°
B
Siebenrock KA. (2011)

45


The greater the alpha angle, the increased risk of developing chondrolabral lesions and osteoarthritis. (Agricola et al. 2013)
75°
Siebenrock KA. (2011)

46

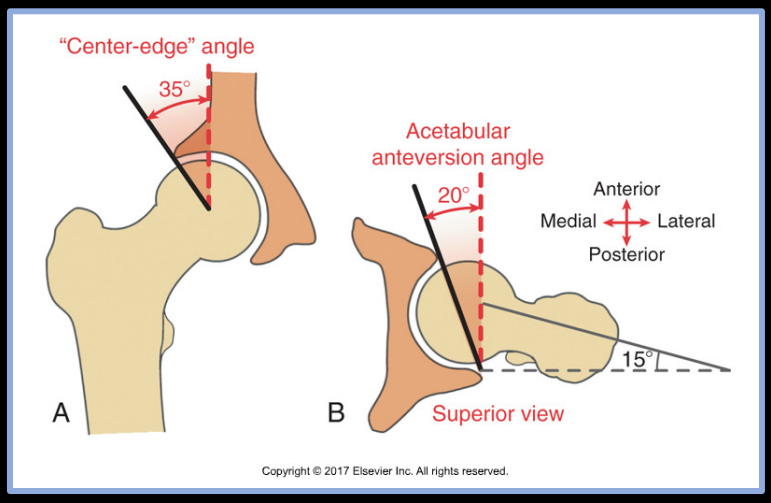
Alpha angle >60°

When you go to the FAI anonymous meeting...

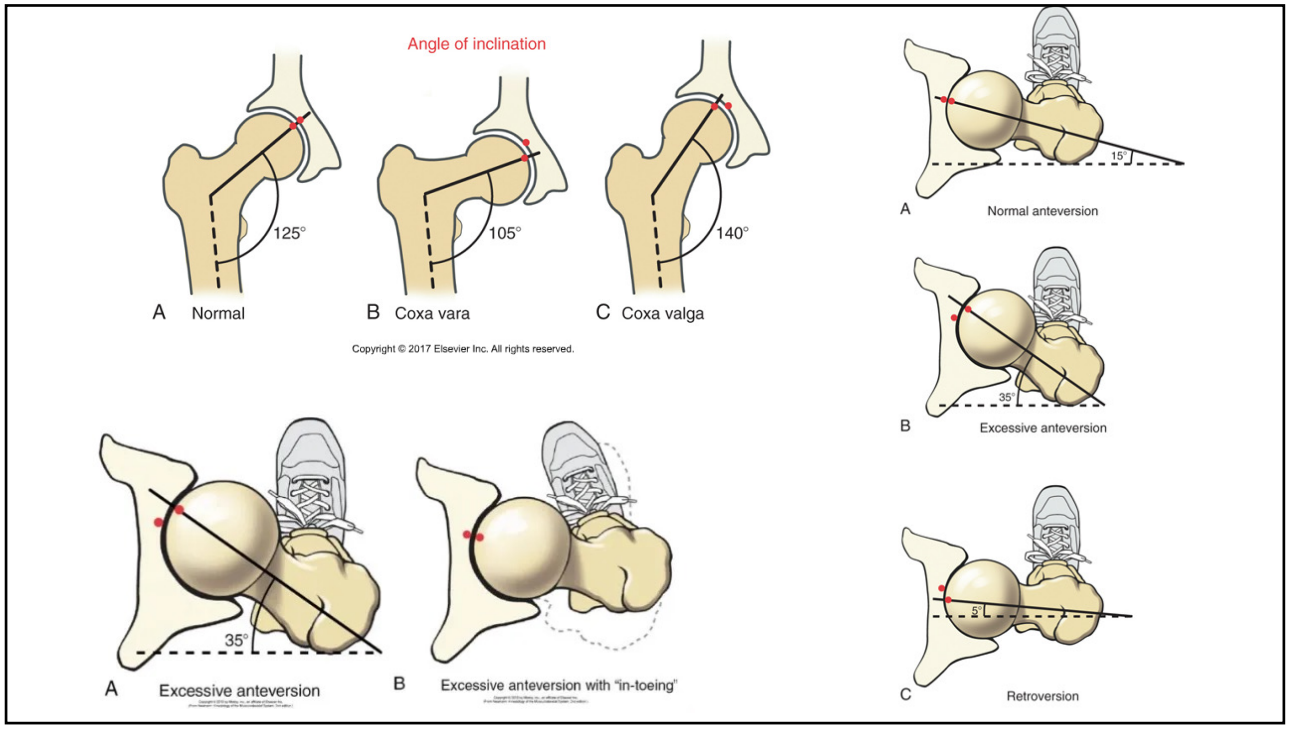
Hi I'm cam and I'm over 60°

47

Hip Morphology



48



49

PINCER TYPE MORPHOLOGY

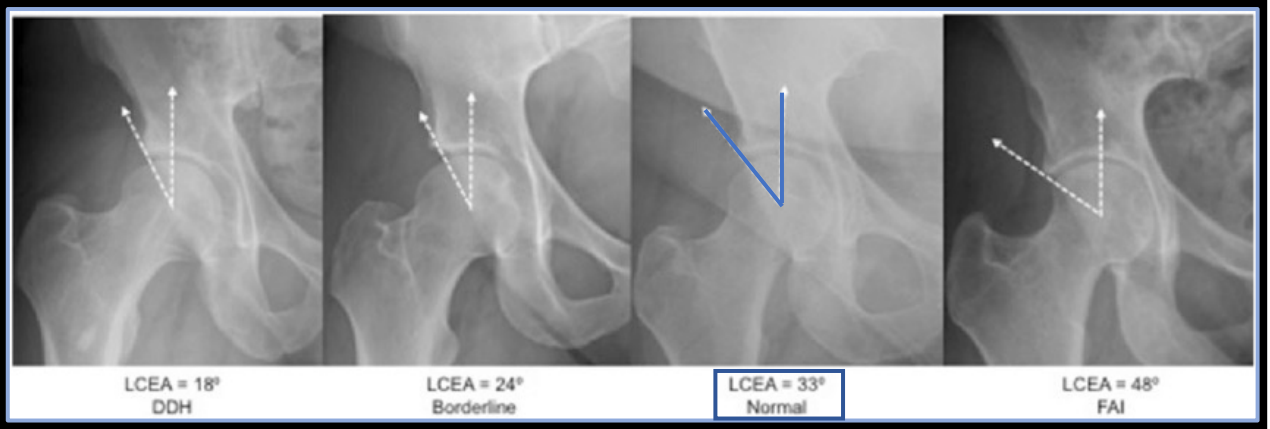
Acetabular retroversion

Over coverage

Deep acetabulum
(Coxa profunda)

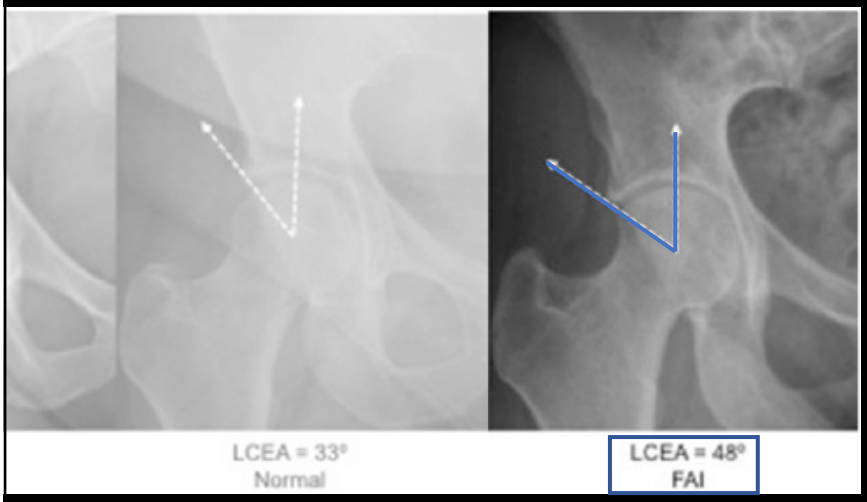
50

Lateral center edge angle



51

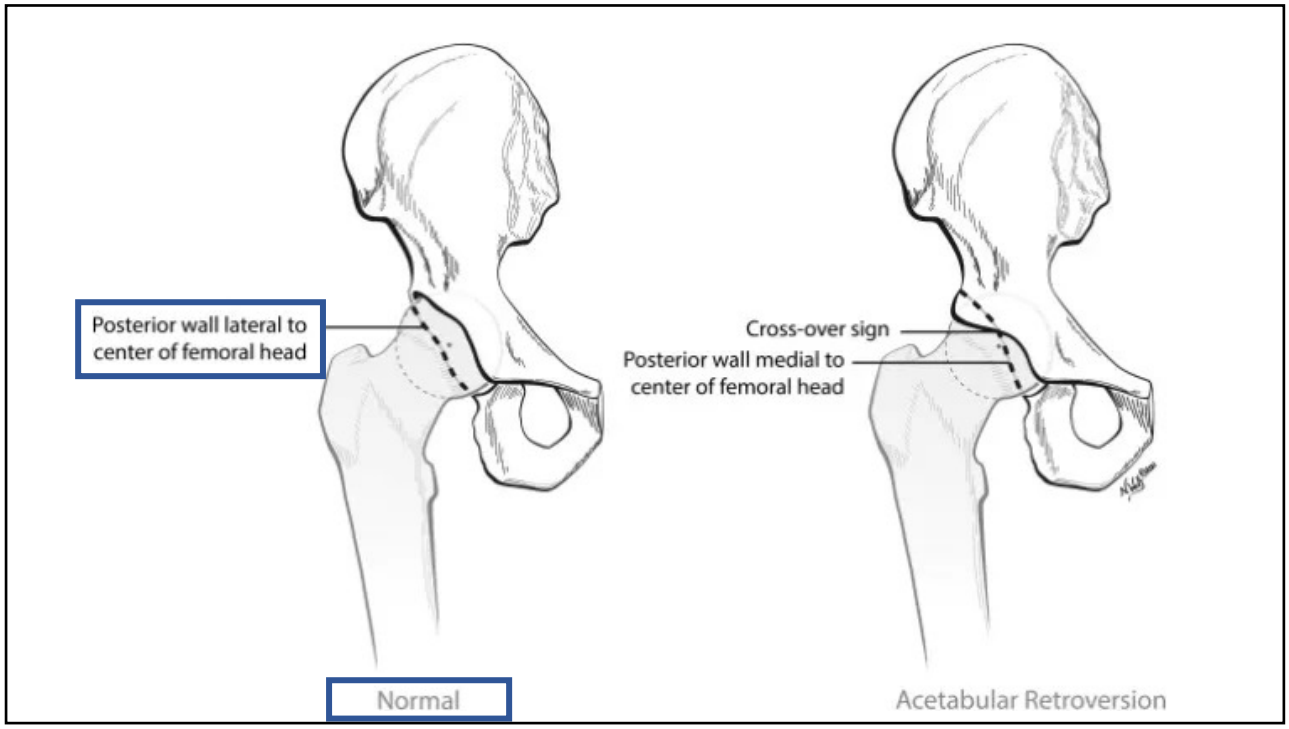
Lateral center edge angle



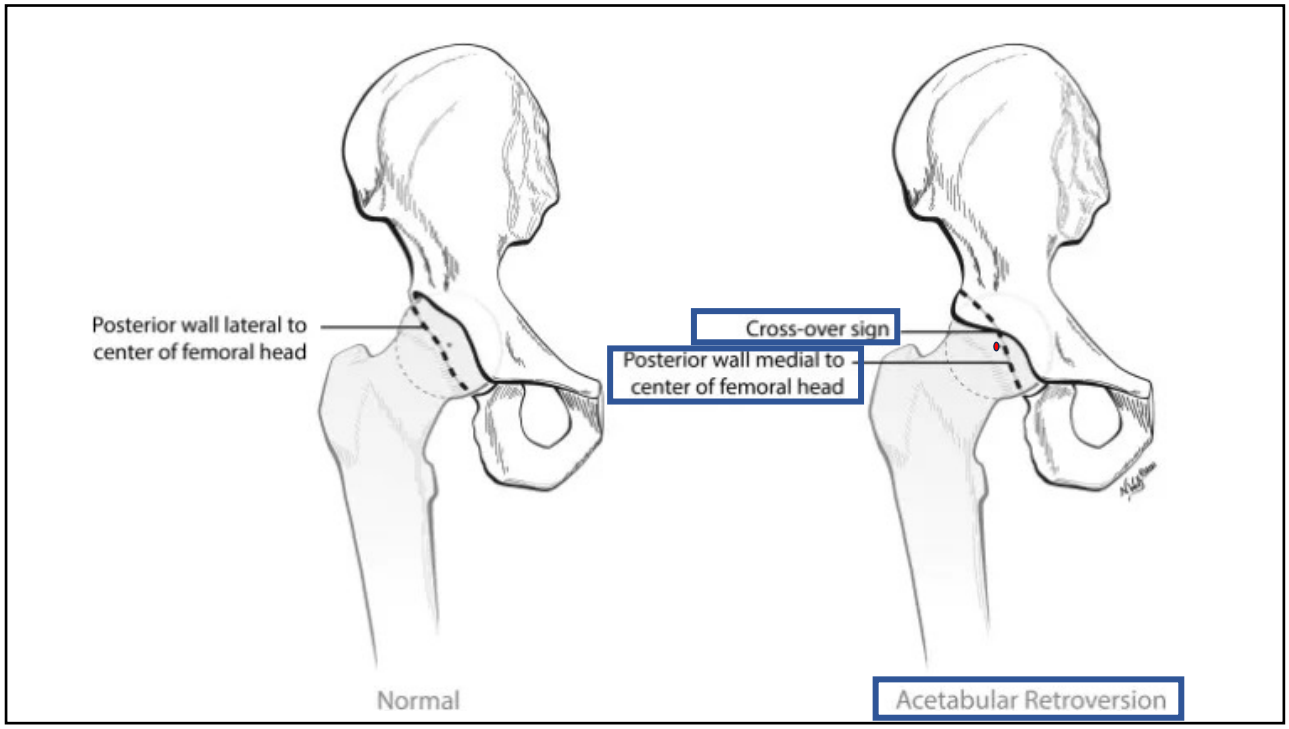
LCEA ≥40° is categorised as PINCER morphology

(Wong, T. Y et al. 2018)

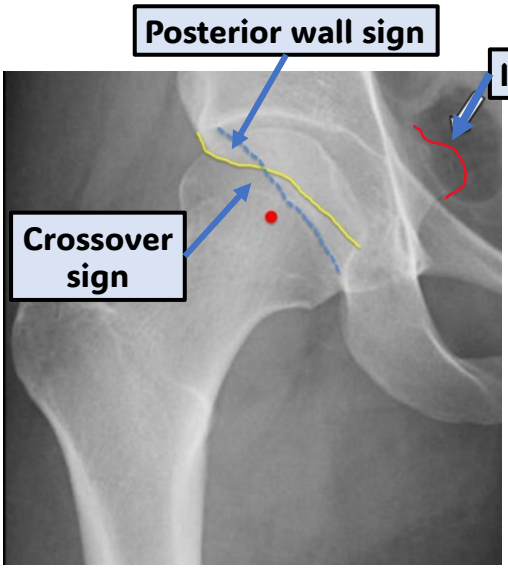
52

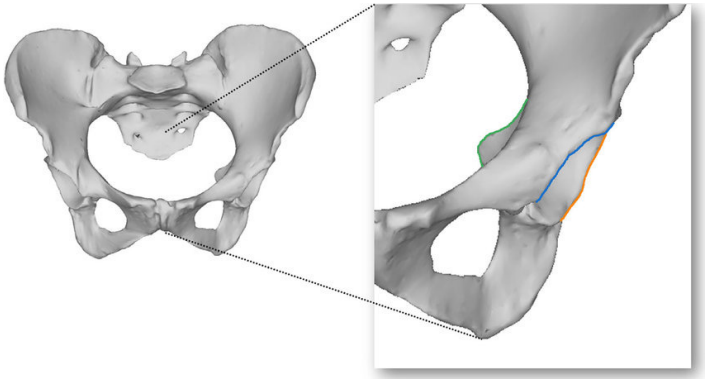

Posterior wall lateral to center of femoral head
Cross-over sign
Posterior wall medial to center of femoral head
Normal
Acetabular Retroversion

53


Posterior wall lateral to center of femoral head
Cross-over sign
Posterior wall medial to center of femoral head
Normal
Acetabular Retroversion

54



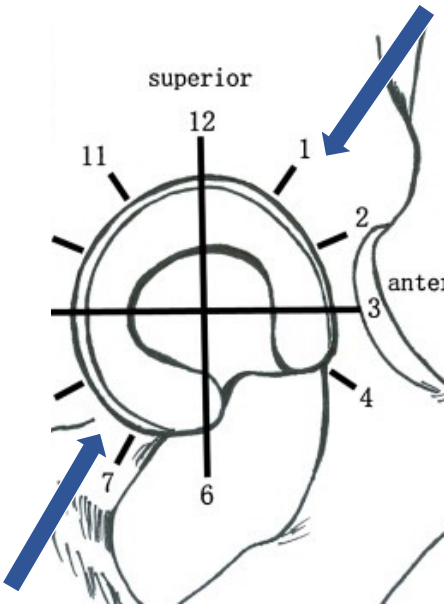


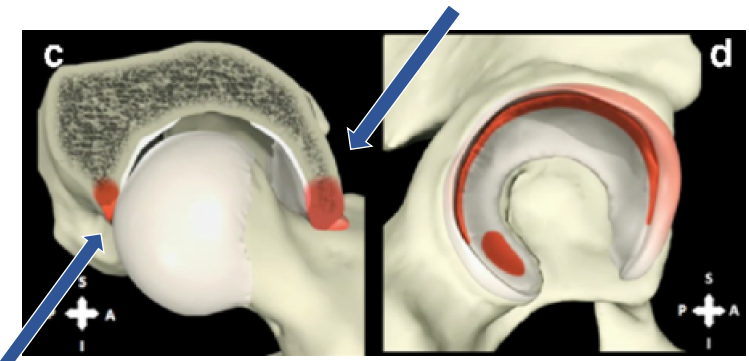
Flores et al. (2018)

Waltenberger et al. (2020)

55

Pincer type morphology





Mascarenhas et al., (2020); Murphy et al., (2016)

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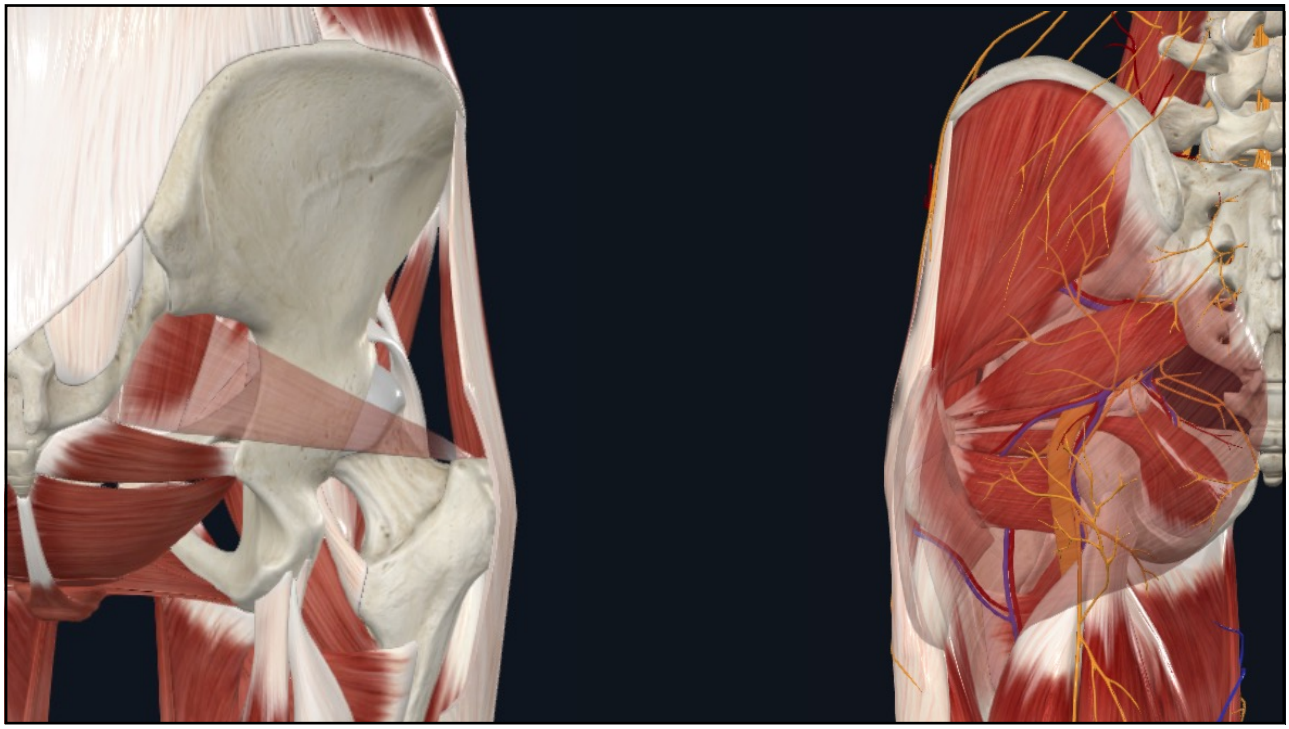
57



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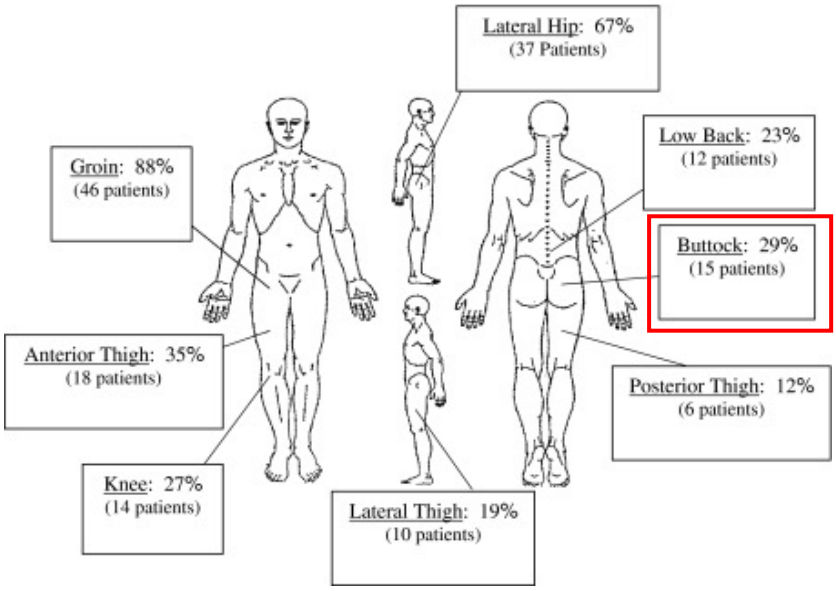
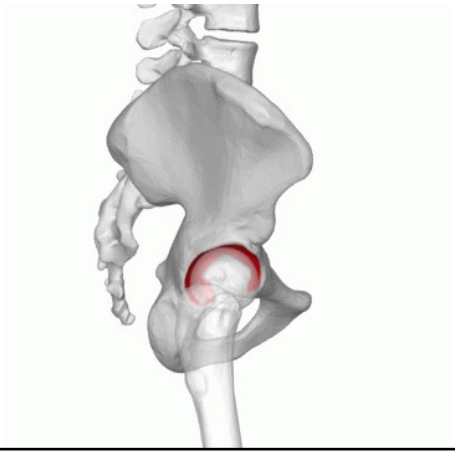
FAI PAIN PRESENTATION

Remember me?



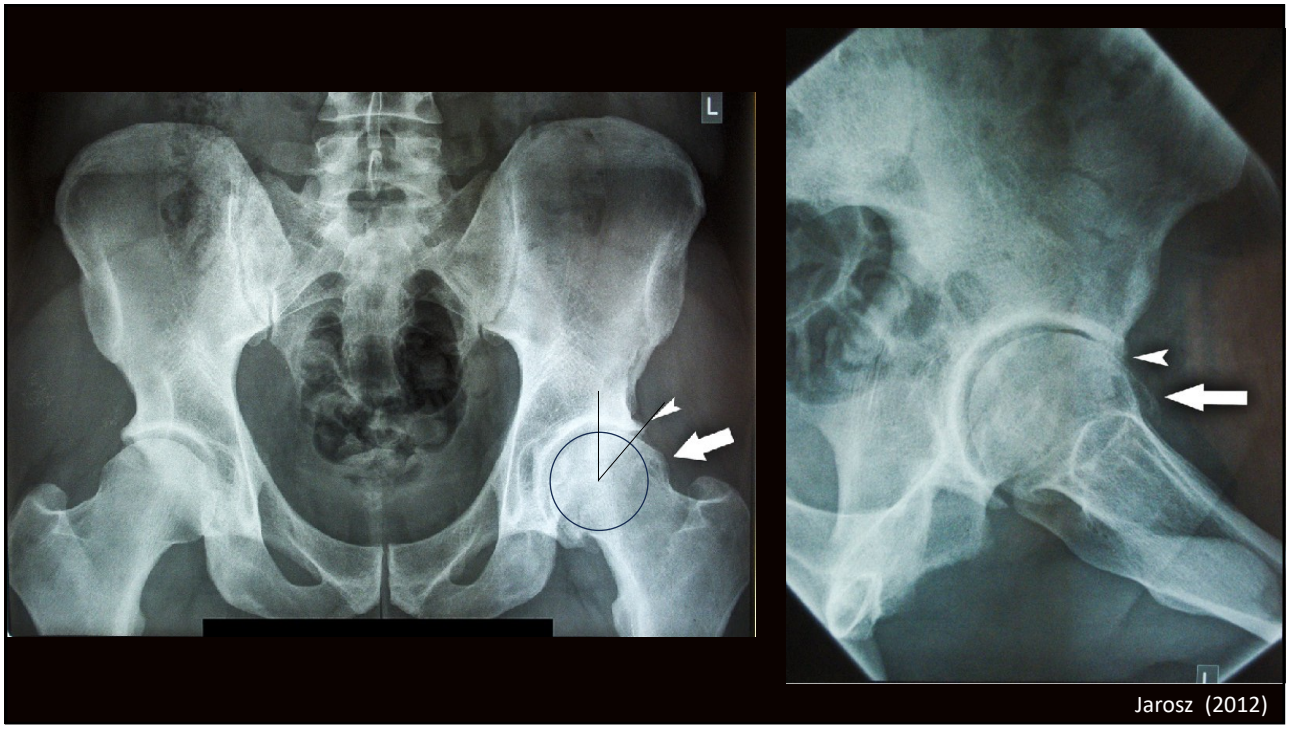
59

REMEMBER…THE HIP IS A 3-DIMENSIONAL STRUCTURE



60

61



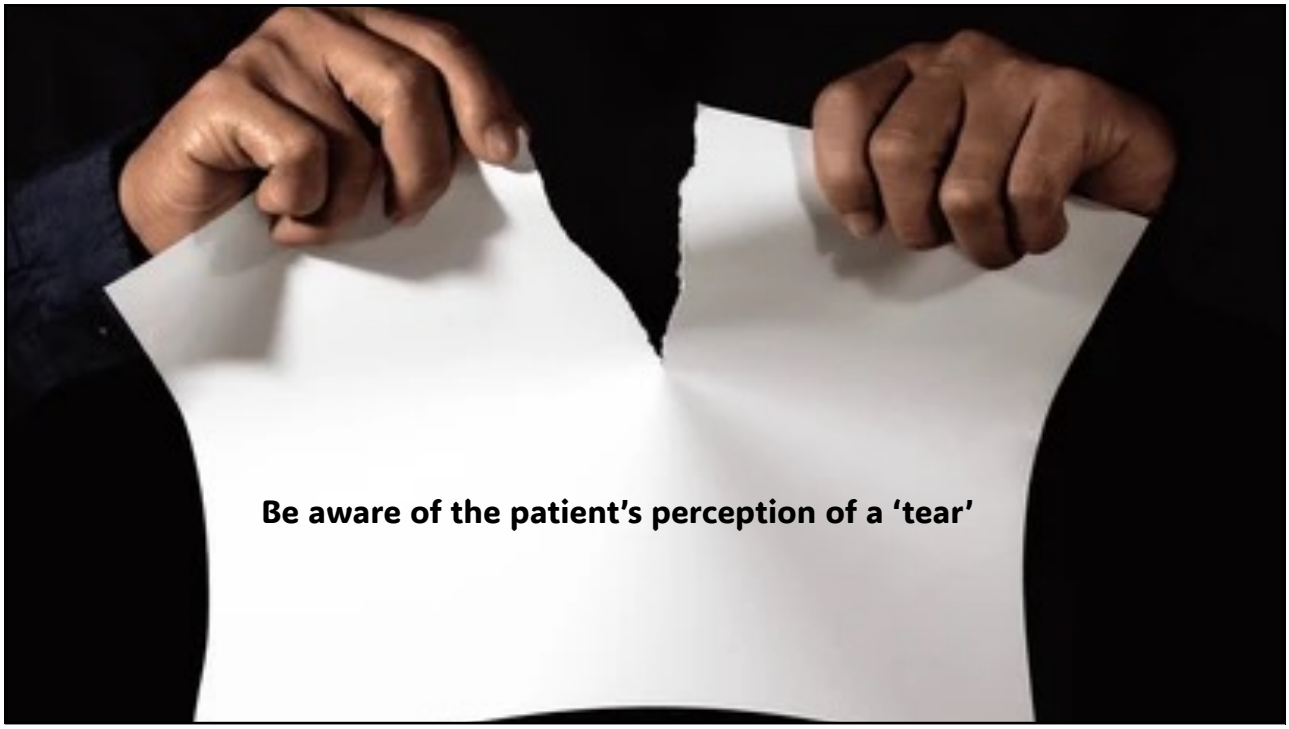
62

Mixed-type morphology is the most common. Reported to be as high as 74% of FAI cases

(Hale et al., 2021; Zhou et al., 2021

63

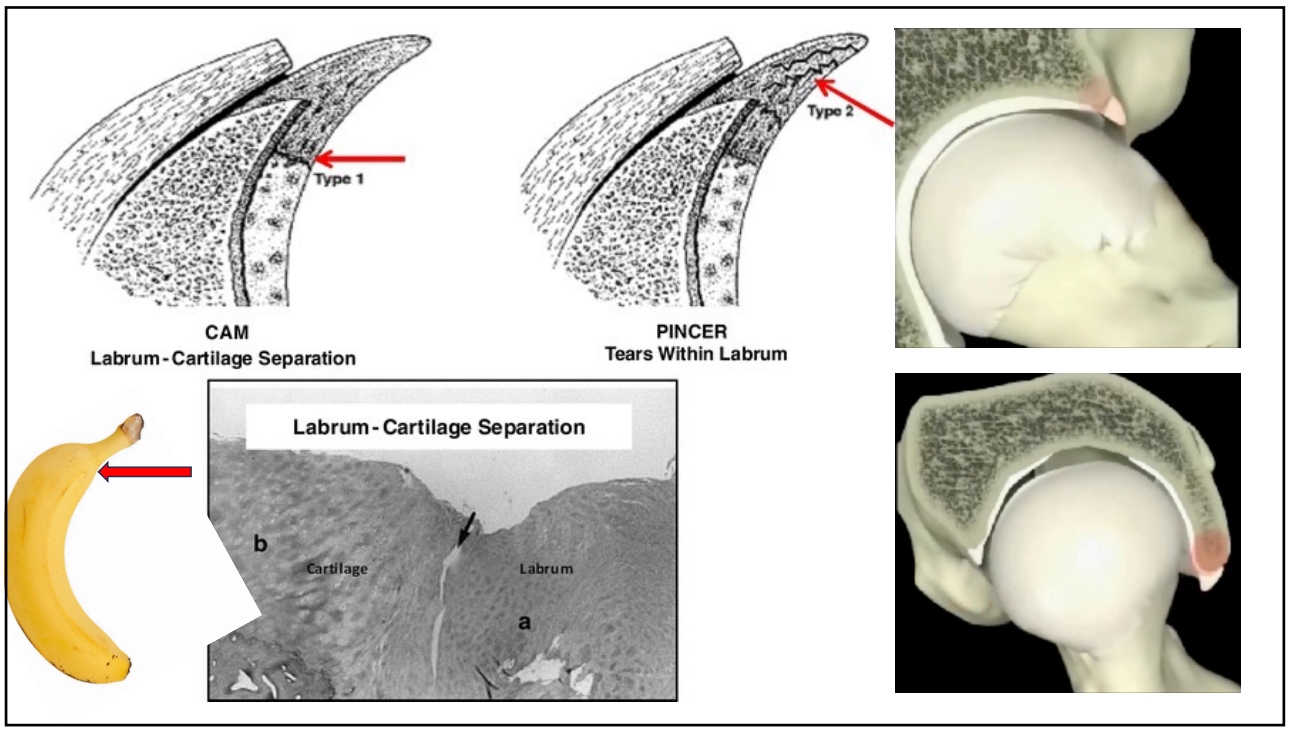
64



65

How does CAM and pincer morphology contribute to FAIS?

66



67

Cam morphology is a significant risk factor for the development of Hip OA

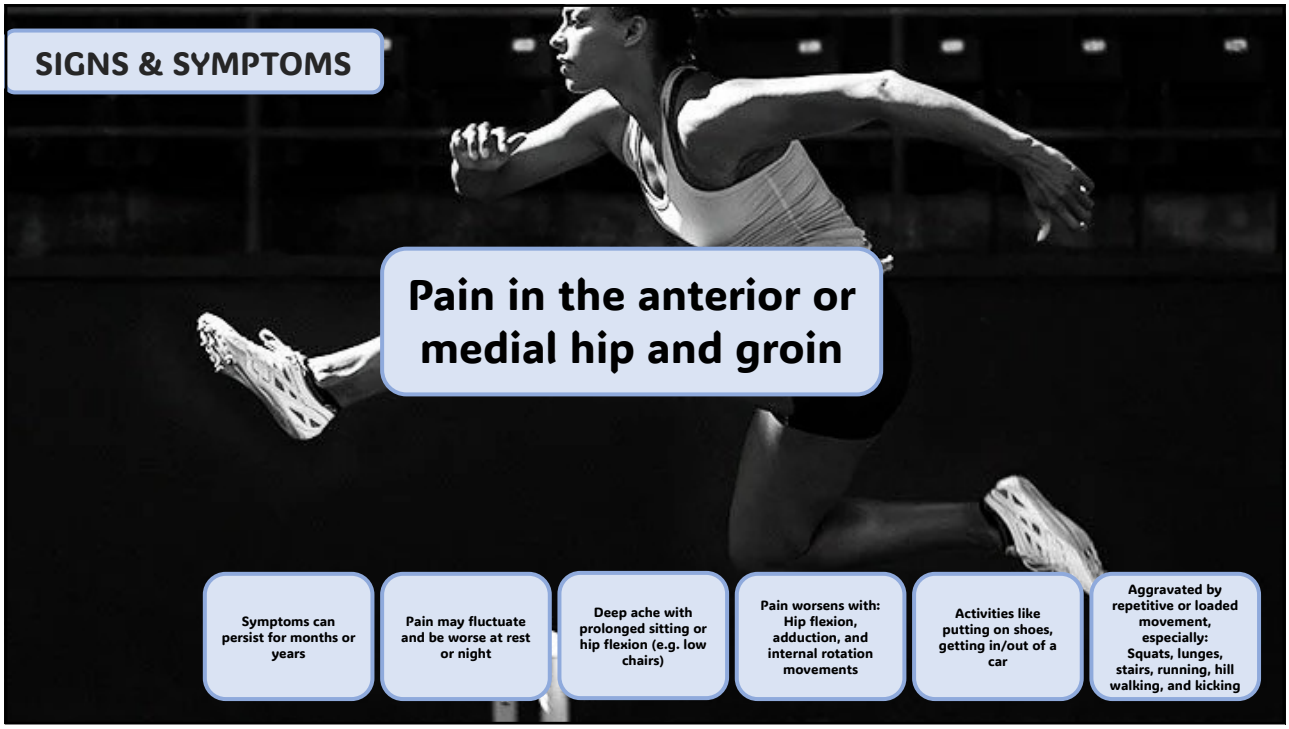
HOWEVER...

Only 6 - 25% of people with FAI develop OA within 5-19 years
(Agricola et al. 2013; Nicholls et al. 2011)

68


SIGNS & SYMPTOMS
Pain in the anterior or medial hip and groin
Symptoms can persist for months or years
Pain may fluctuate and be worse at rest or night
Deep ache with prolonged sitting or hip flexion (e.g. low chairs)
Pain worsens with: Hip flexion, adduction, and internal rotation movements
Activities like putting on shoes, getting in/out of a car
Aggravated by repetitive or loaded movement, especially: Squats, lunges, stairs, running, hill walking, and kicking

69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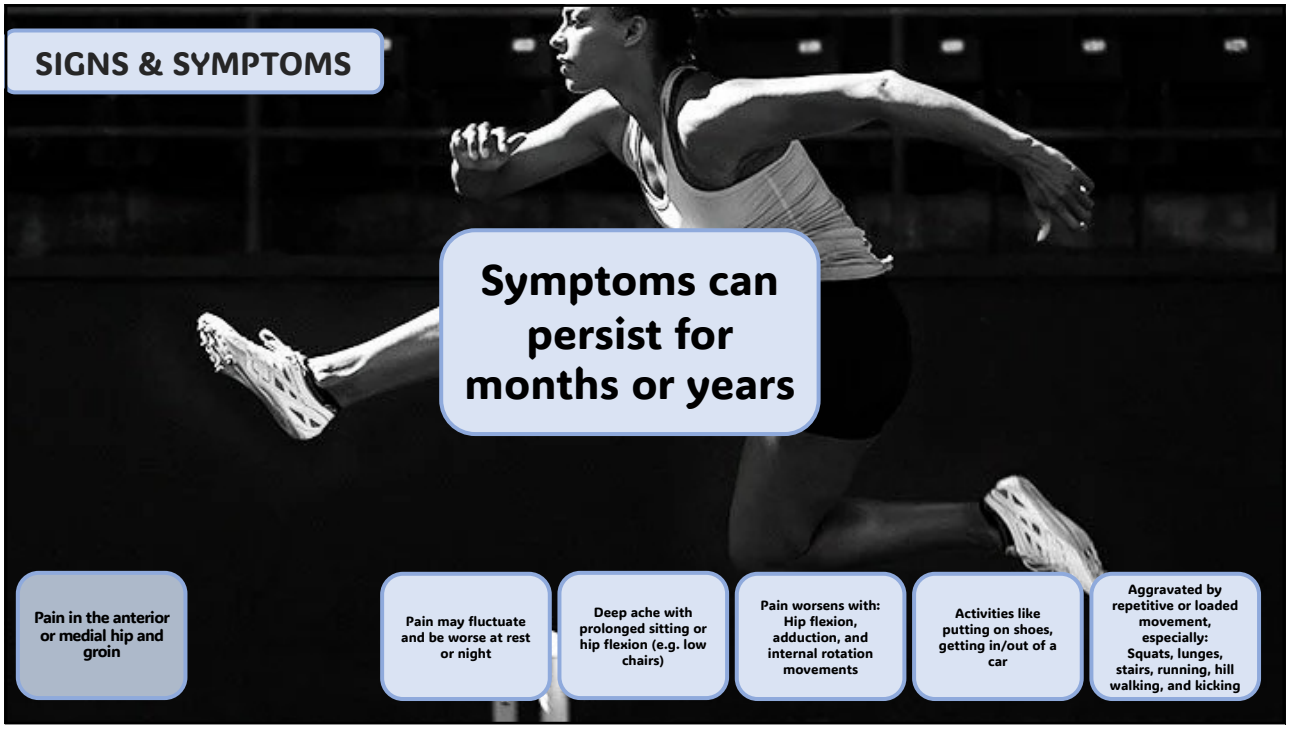
70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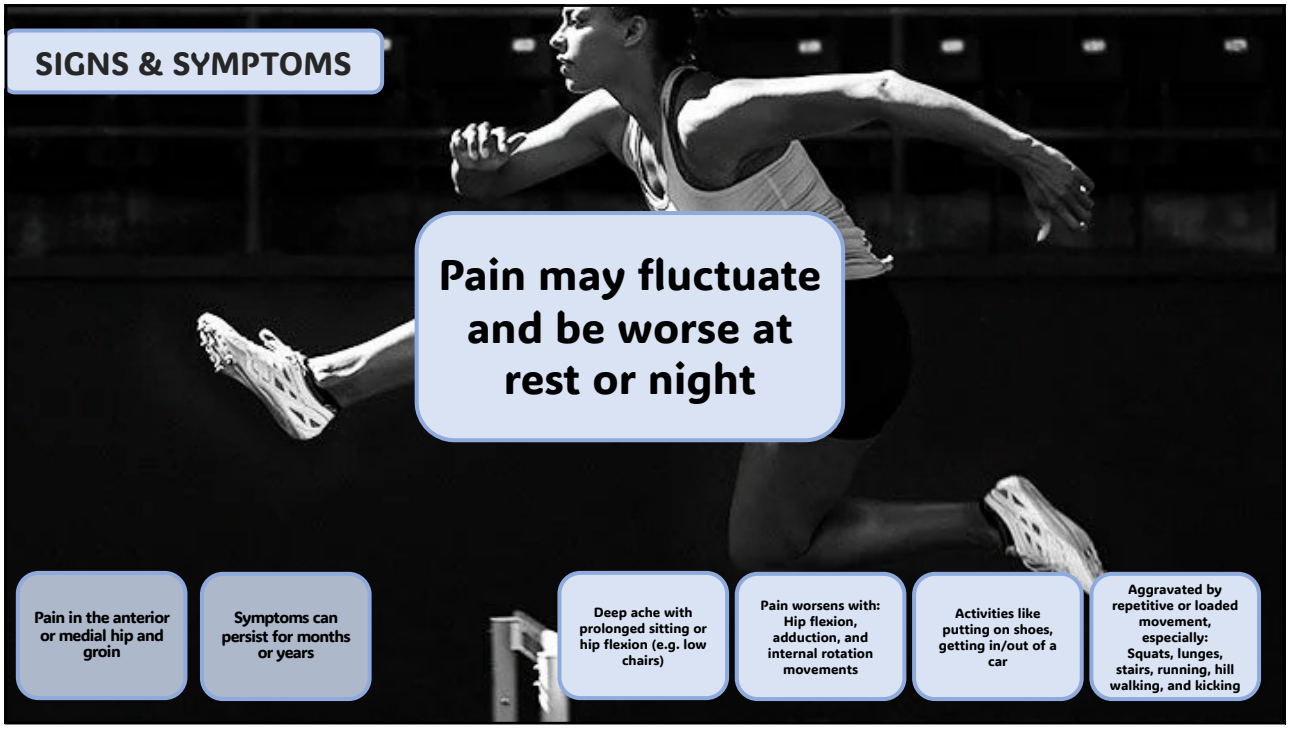
71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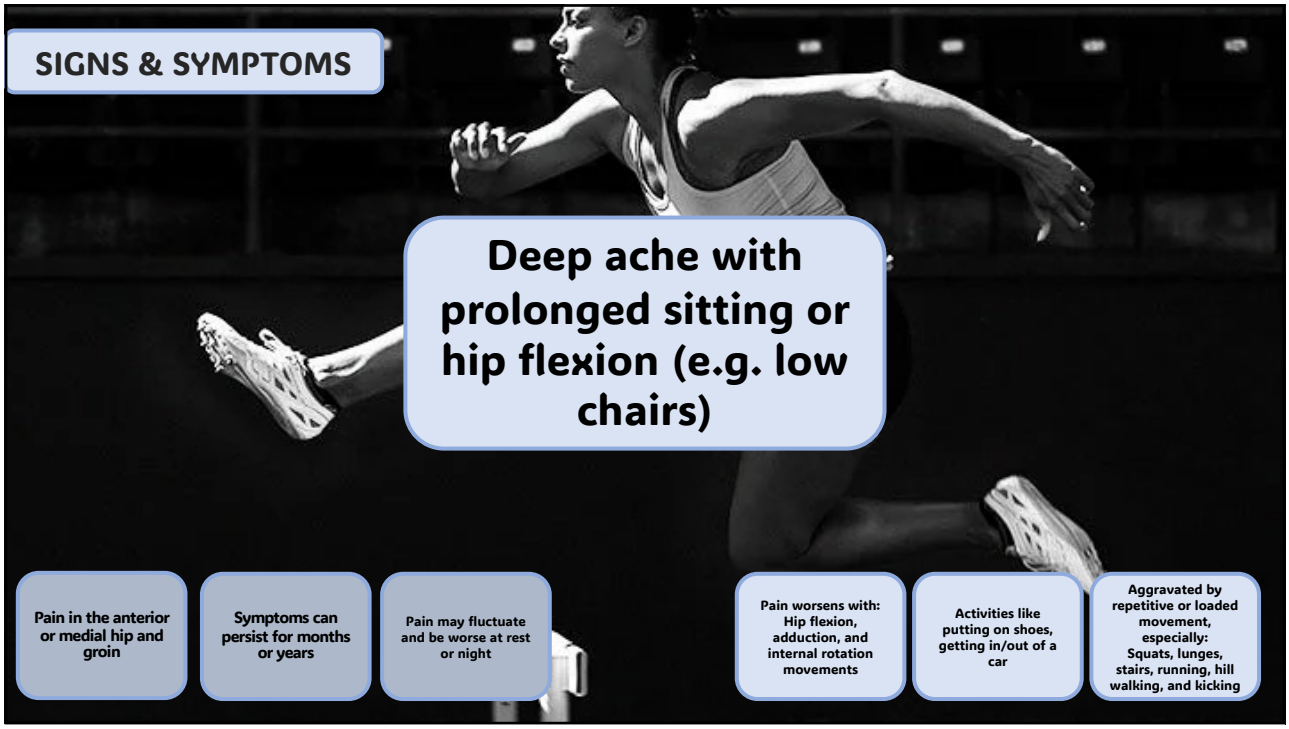
72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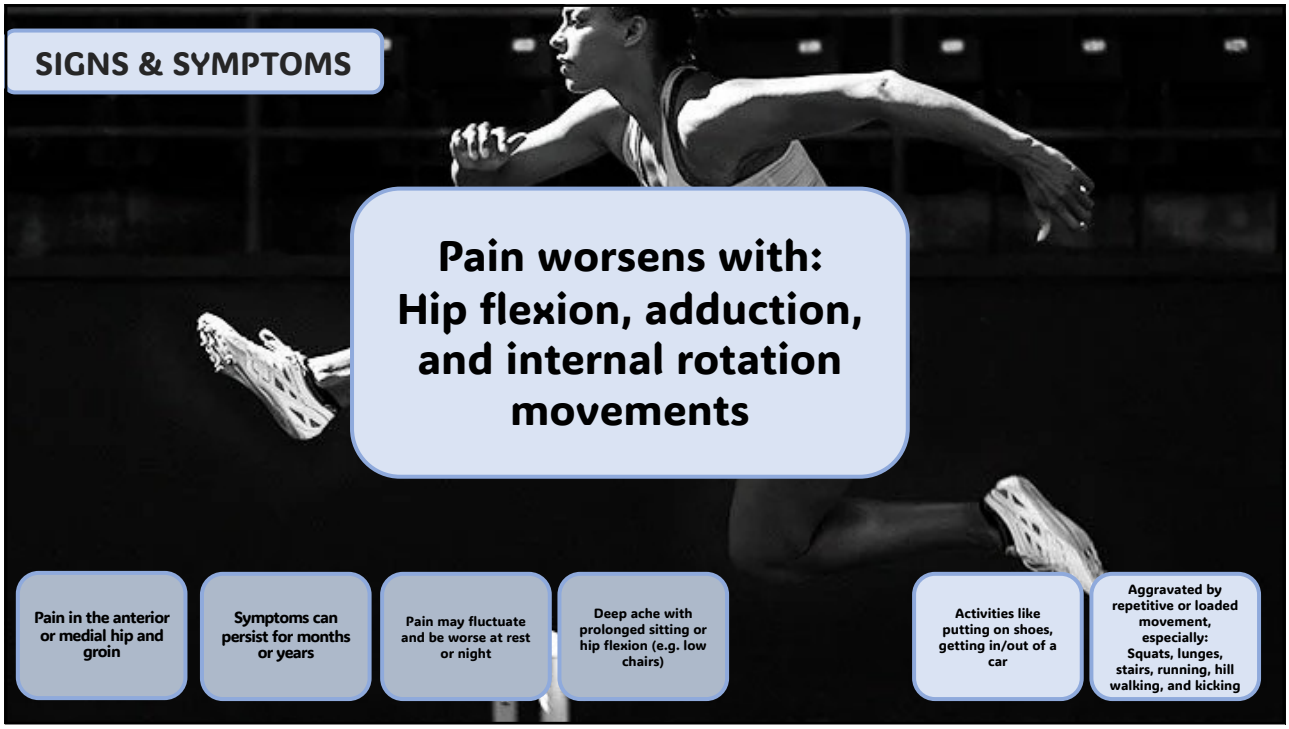
73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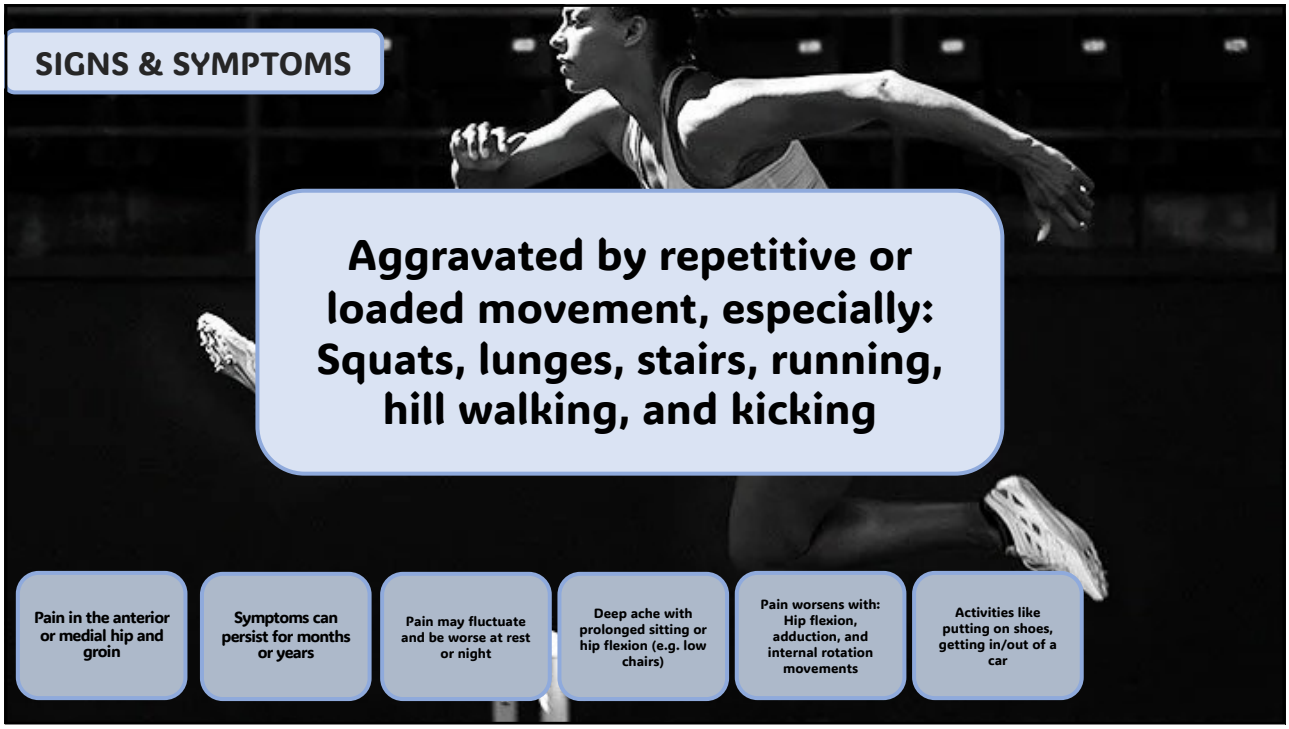
74


SIGNS & SYMPTOMS
Activities like putting on shoes, getting in/out of a car
Pain in the anterior or medial hip and groin
Symptoms can persist for months or years
Pain may fluctuate and be worse at rest or night
Deep ache with prolonged sitting or hip flexion (e.g. low chairs)
Pain worsens with: Hip flexion, adduction, and internal rotation movements
Aggravated by repetitive or loaded movement, especially: Squats, lunges, stairs, running, hill walking, and kicking

75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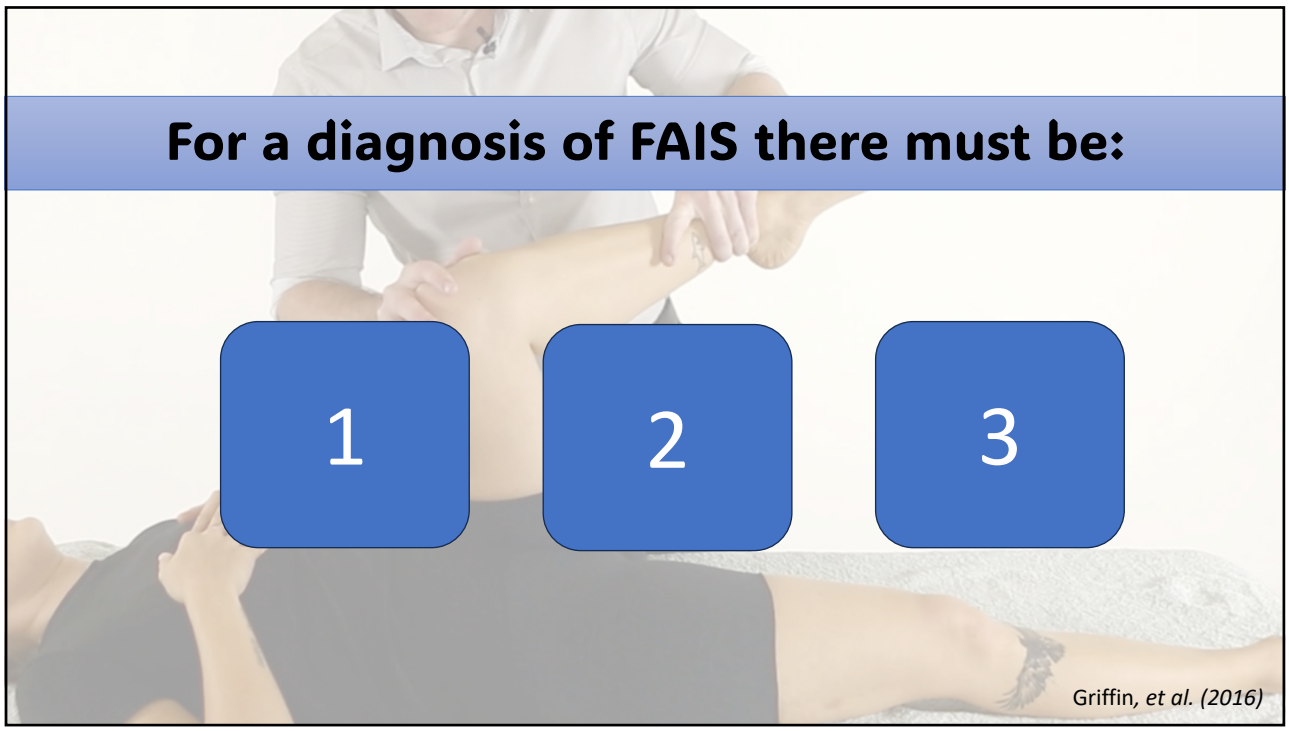
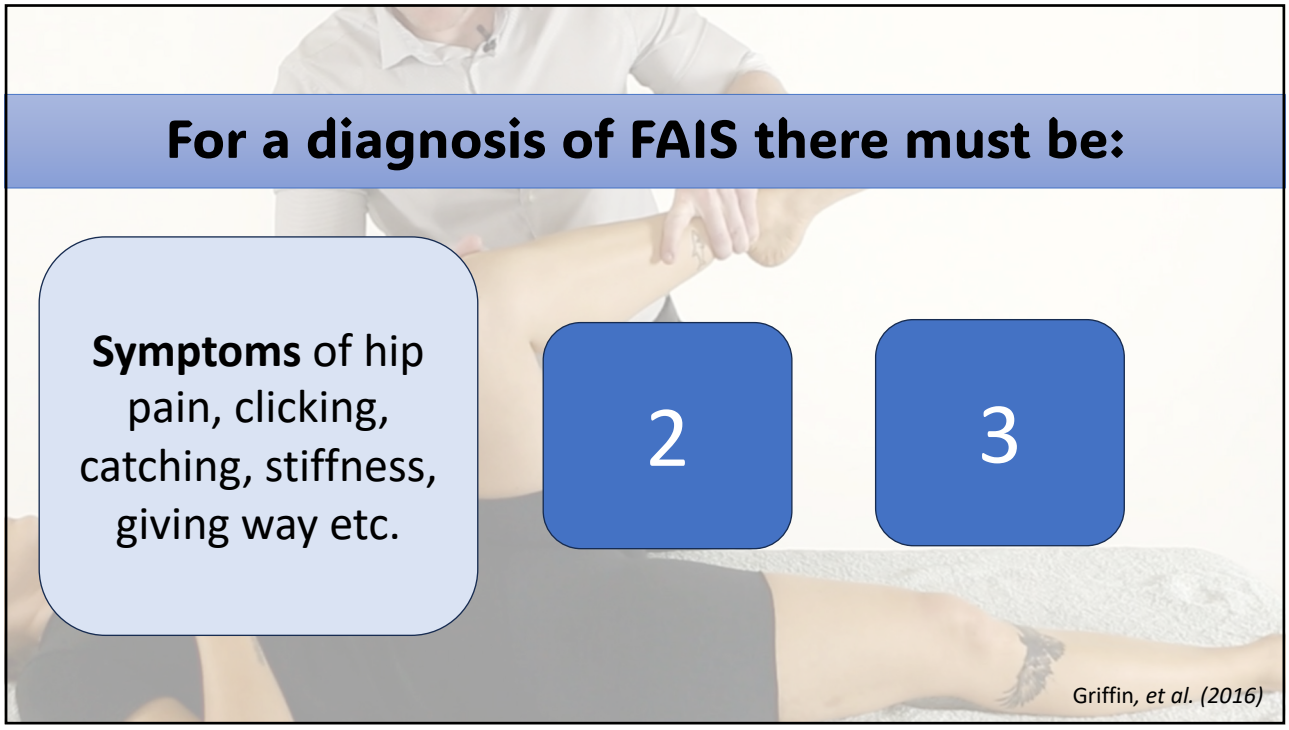
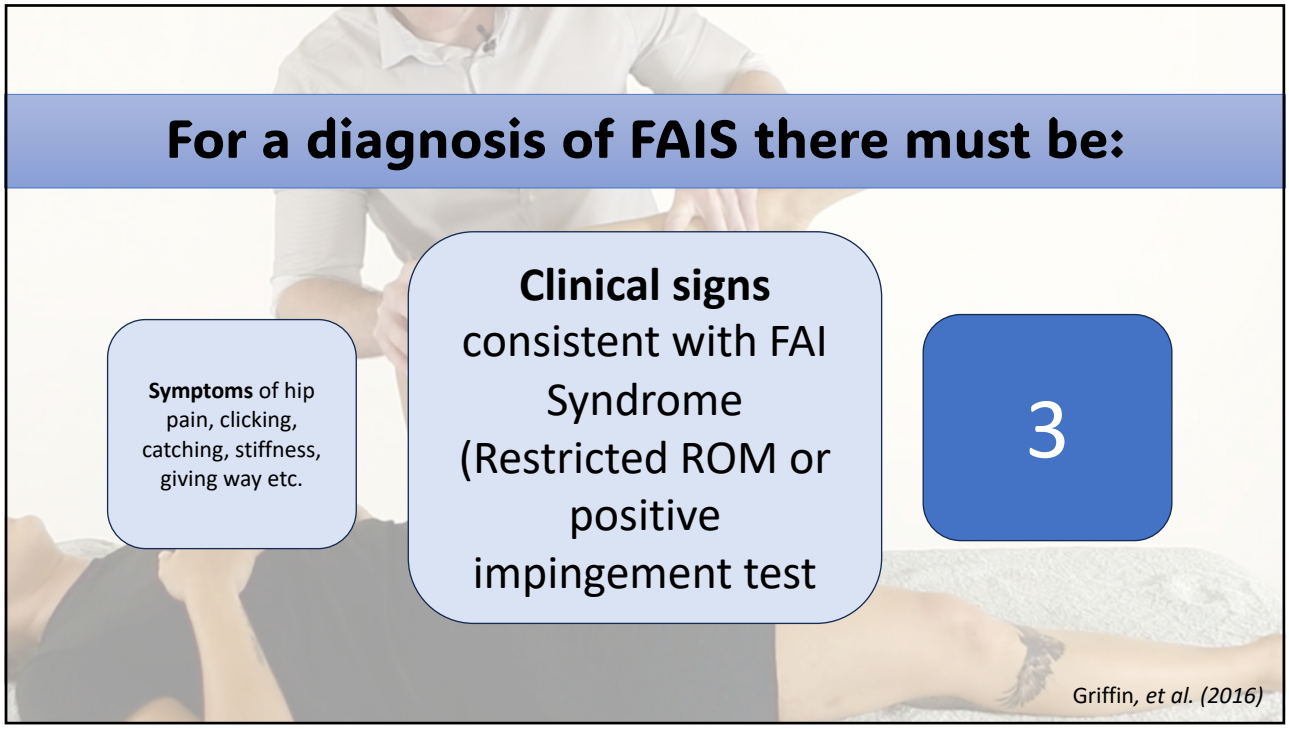
76


For a diagnosis of FAIS there must be:
1
2
3
Griffin, et al. (2016)

77


For a diagnosis of FAIS there must be:
Symptoms of hip pain, clicking, catching, stiffness, giving way etc.
2
3
Griffin, et al. (2016)

78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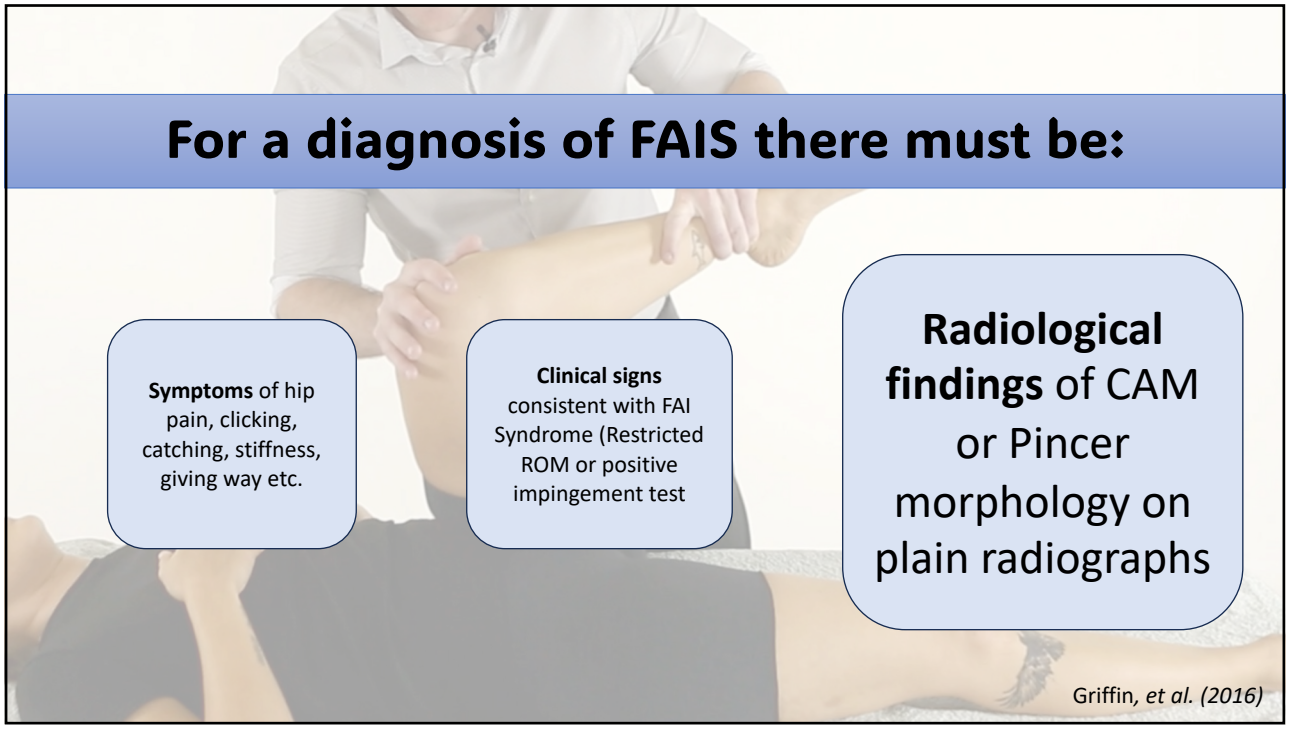
Symptoms of hip pain, clicking, catching, stiffness, giving way etc.
Clinical signs consistent with FAI Syndrome (Restricted ROM or positive impingement test
3
Griffin, *et al. (2016)*

79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Symptoms of hip pain, clicking, catching, stiffness, giving way etc.
Clinical signs consistent with FAI Syndrome (Restricted ROM or positive impingement test
Radiological findings of CAM or Pincer morphology on plain radiographs
Griffin, *et al. (2016)*

80

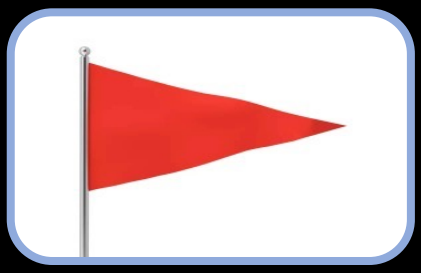
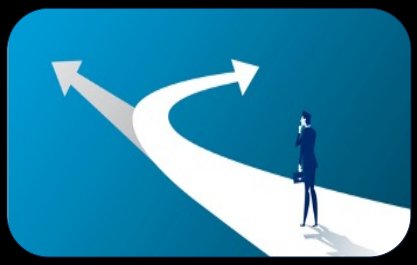
BUT...

81

Do we need imaging?

82

Do we need imaging?


83

PHYSICAL EXAMINATION

84

85

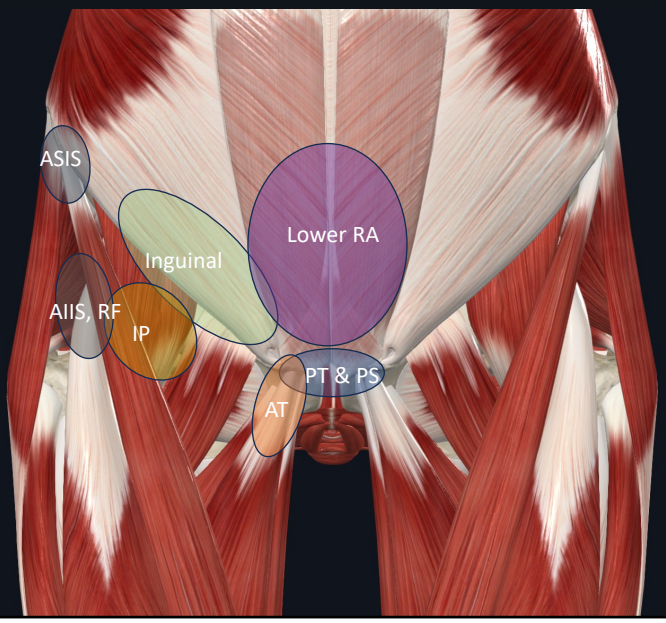
General Functional Movements Tests

- Repeated lumbar movements
- Single leg balance
- Squat
- Split squat
- Single leg squat

→ Quality of movement
→ Reproduction of symptoms
→ Significant asymmetries

86

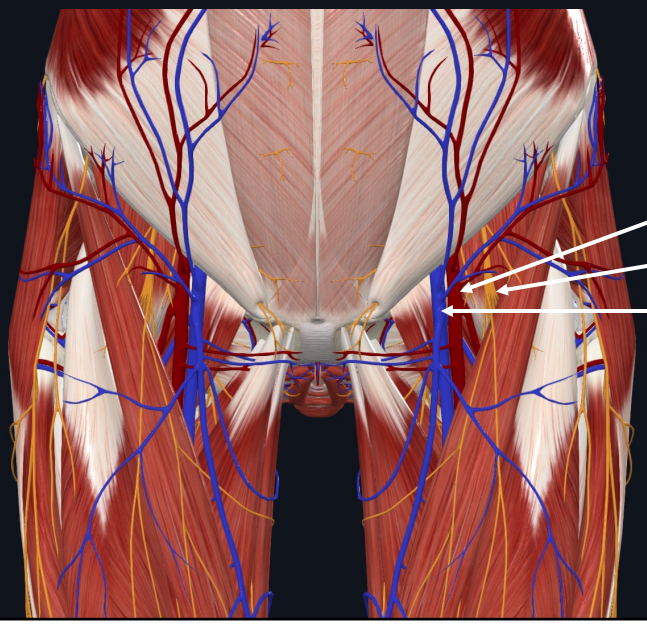
PALPATION



- Pubic tubercle & Pubic symphysis
- Lower abdominals
- Inguinal ligament
- Lower quadrant
- ASIS
- Proximal Sartorius
- AIIS
- Proximal rectus femoris
- Iliopsoas
- Superior pubic ramus
- Adductor tendon
- Pectineus

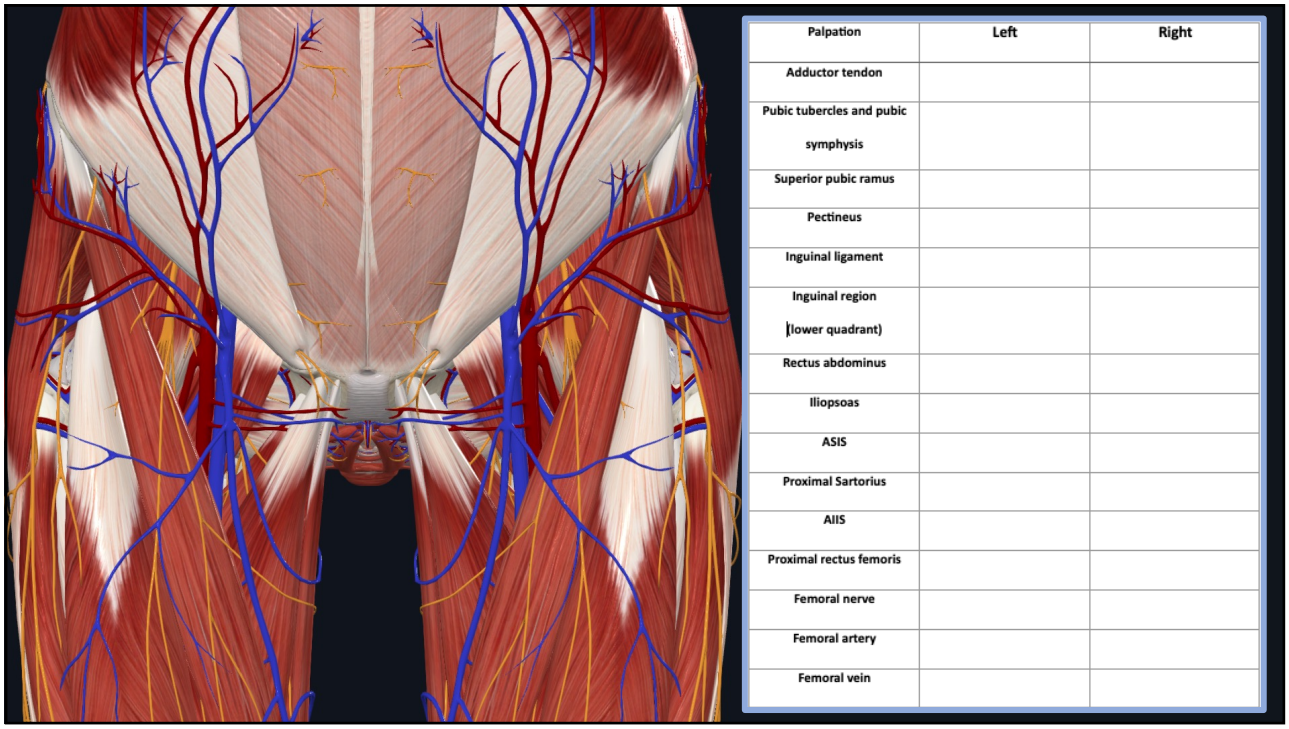
87

PALPATION



- Femoral artery
- Femoral nerve
- Femoral vein

88



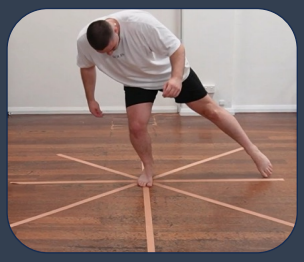
Palpation	Left	Right
Adductor tendon		
Pubic tubercles and pubic symphysis		
Superior pubic ramus		
Pectineus		
Inguinal ligament		
Inguinal region (lower quadrant)		
Rectus abdominus		
Iliopsoas		
ASIS		
Proximal Sartorius		
AIIS		
Proximal rectus femoris		
Femoral nerve		
Femoral artery		
Femoral vein		

89

90

PHYSICAL ASSESSMENT

Clinical assessment (Special tests and ROM)



91

PHYSICAL ASSESSMENT

Clinical assessment (Special tests and ROM)

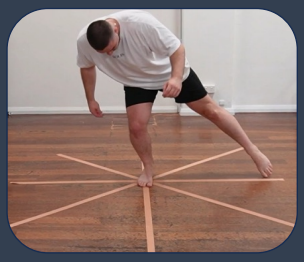
Functional performance

92

PHYSICAL ASSESSMENT

Clinical assessment (Special tests and ROM)

Functional performance



Muscle strength (HHD)

93

HIP RANGE OF MOVEMENT (ROM)

94


RANGE OF MOVEMENT
Reduced Hip IR <20° and hip flexion <120°
Consistent with FAIS
Metron
Metron

95


HIP ROM

96

Practical activity

Hip movement	Left	Right
Hip flexion (knee extended)		
Hip flexion (knee flexed)		
Hip extension		
Hip internal rotation (90° hip flexion)		
Hip internal rotation (0° hip flexion)		
Hip external rotation (90° hip flexion)		
Hip external rotation (0° hip flexion)		
Hip adduction (0° hip flexion)		
Hip abduction (0° hip flexion)		
Hip horizontal adduction (90° hip flexion)		
Hip horizontal abduction (90° hip flexion)		

97

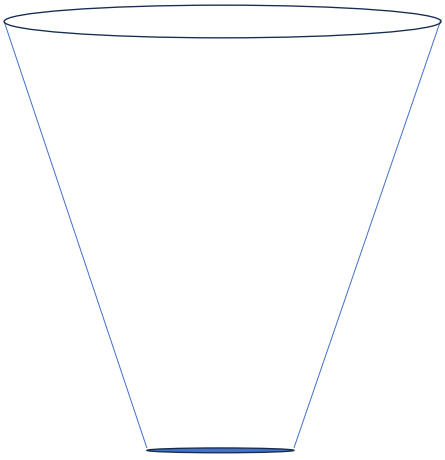
Building evidence

Hip ROM

Functional movement

Special tests

Functional performance tests



Palpation

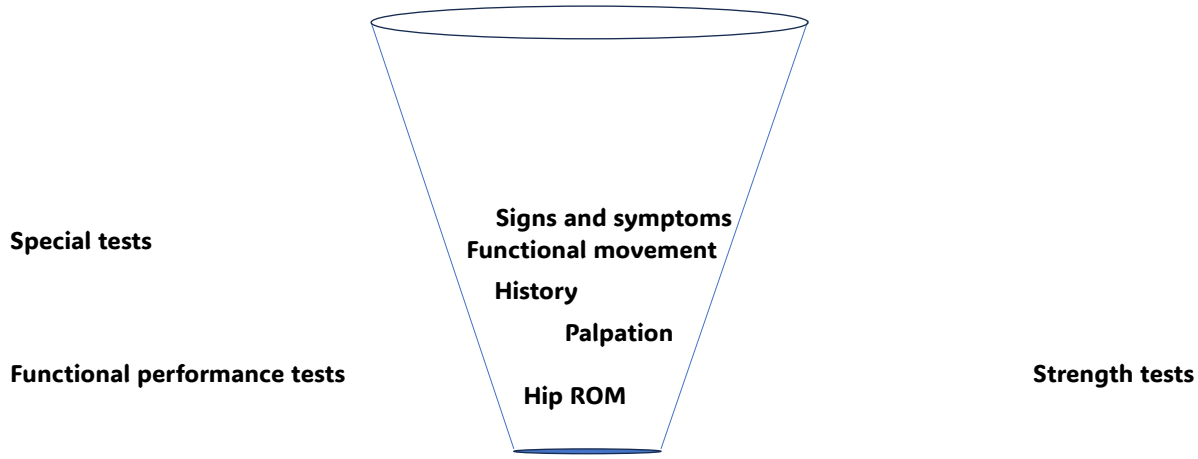
History

Signs and symptoms

Strength tests

98

Building evidence



99

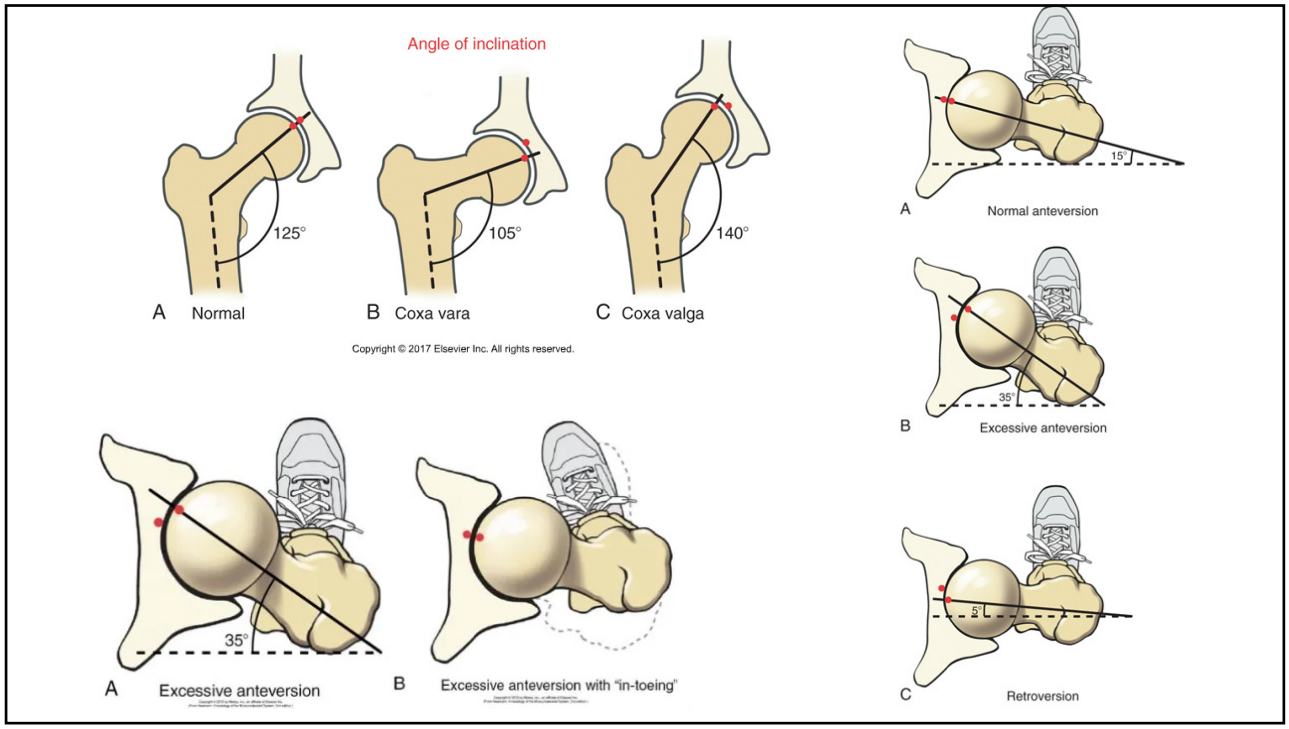
ROM can tell you a lot!

100

Lateral center edge angle (LCEA)

Hypermobility hypomobility or bony morphological variation

101



102

INTRA-ARTICULAR ASSESSMENT

103

Cluster 1

104

105

Consensus statement

Consensus recommendations on the classification, definition and diagnostic criteria of hip-related pain in young and middle-aged active adults from the International Hip-related Pain Research Network, Zurich 2018

Michael P Reiman ,[1] Rintje Agricola,[2] Joanne L Kemp ,[3] Joshua J Heerey ,[3] Adam Weir,[4,5] Pim van Klij ,[2] Ara Kassarjian,[6,7] Andrea Britt Mosler ,[3] Eva Ageberg ,[8] Per Hölmich,[9] Kristian Marstrand Warholm ,[10] Damian Griffin,[11,12] Sue Mayes,[3] Karim M Khan ,[13] Kay M Crossley ,[3] Mario Bizzini,[14] Nancy Bloom,[15] Nicola C Casartelli ,[16,17] Laura E Diamond ,[18] Stephanie Di Stasi ,[19] Michael Drew,[20,21] Daniel J Friedman,[22] Matthew Freke,[23] Boris Gojanovic ,[24,25] Sion Glyn-Jones,[26] Marcie Harris-Hayes ,[15] Michael A Hunt,[27] Franco M Impellizzeri ,[28] Lasse Ishøi ,[9] Denise M Jones,[3] Matthew G King ,[3] Peter R Lawrenson ,[29] Michael Leunig,[30] Cara L Lewis ,[31] Nicolas Mathieu,[32] Håvard Moksnes,[33] May-Arna Risberg,[34,35] Mark James Scholes ,[3] Adam I Semciw,[3] Andreas Serner ,[36] Kristian Thorborg ,[9] Tobias Wörner ,[37] Hendrik Paulus Dijkstra[36,38]

The Zurich consensus recommendation on hip related pain suggested a negative FADIR test helps to rule out hip disease in young and middle-aged active adults presenting with hip-related pain.

106

107

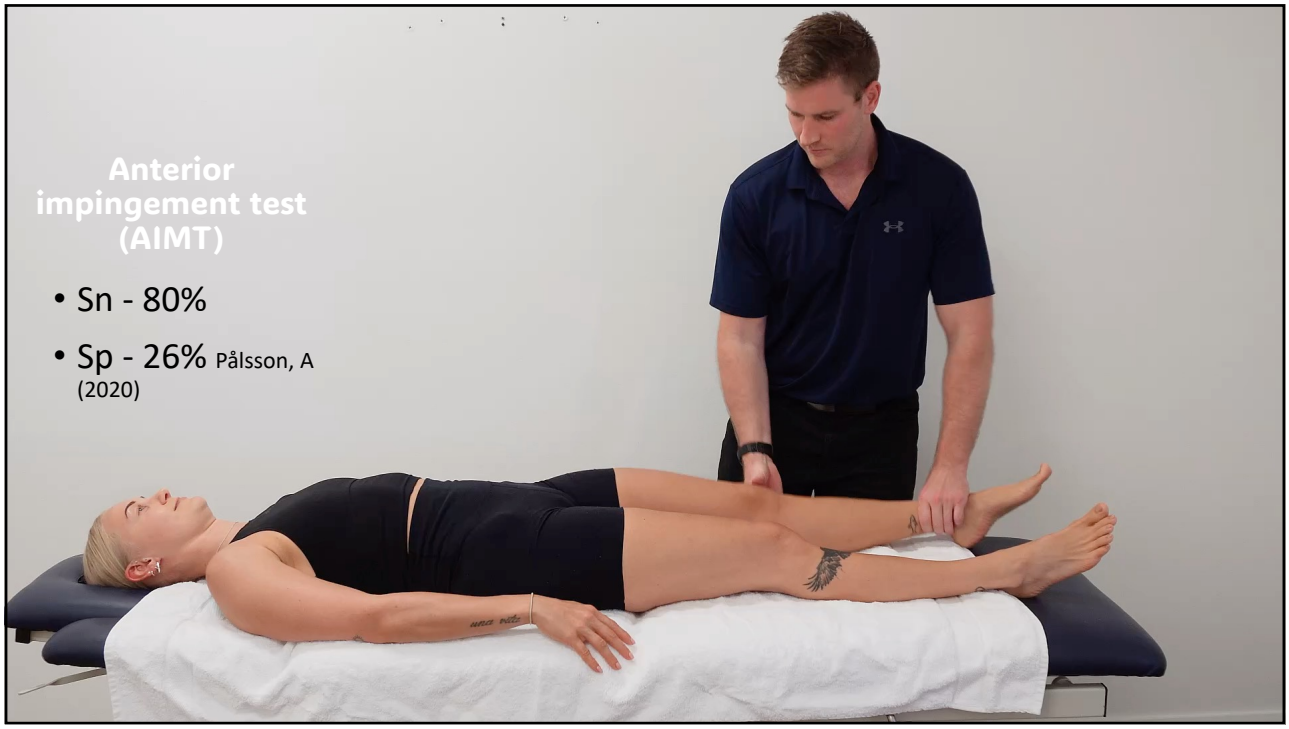
KEELAN R. ENSEKI, PT, MS • NANCY J. BLOOM, PT, DPT, MSOT • MARCIE HARRIS-HAYES, DPT, MSc • MICHAEL T. CIBULKA, PT, DPT
ASHLEY DISANTIS, PT, DPT • STEPHANIE DI STASI, PT, PhD • PHILIP MALLOY, PT, PhD • JOHN C. CLOHISY, MD • ROBROY L. MARTIN, PT, PhD

Hip Pain and Movement Dysfunction Associated With Nonarthritic Hip Joint Pain: A Revision

FADIR and FABER tests are useful to identify those without FAI when the tests are negative

Enseki et al., (2023)

108



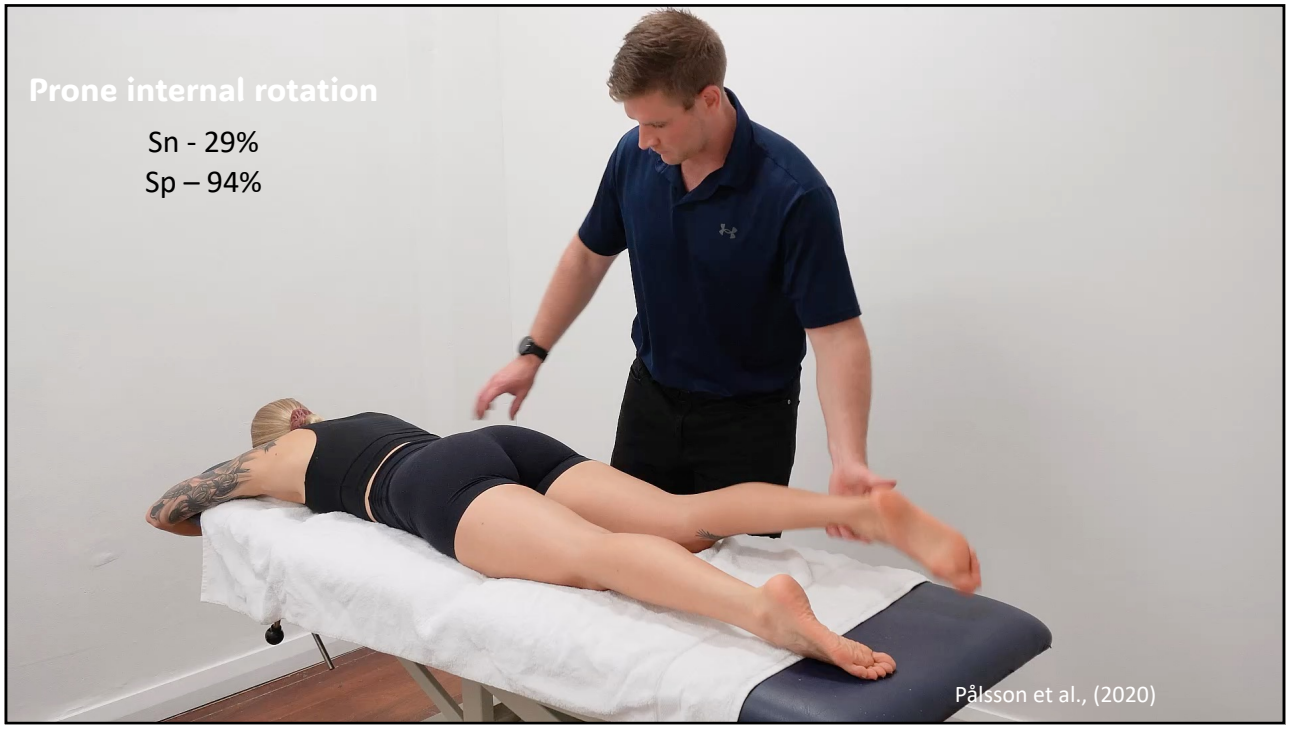
109

Diagnostic accuracy of clinical tests for the diagnosis of hip femoroacetabular impingement/labral tear: a systematic review with meta-analysis

M P Reiman,[1,2] A P Goode,[1] C E Cook,[1] P Hölmich,[3,4] K Thorborg[3,5]

Currently, only the FADIR and Flex-IR tests are supported by the data as valuable screening tests for FAI and labral tear pathology

110



111

HIP

Combining results from hip impingement and range of motion tests can increase diagnostic accuracy in patients with FAI syndrome

Anders Pålsson[1] · Ioannis Kostogiannis[2] · Eva Ageberg[1]

The AIMT and FADIR test can only be used to rule out patients with FAI syndrome, while evaluation of ROM in internal rotation with neutral position may be more suitable to rule in patients with FAI syndrome

112

BENT KNEE FALL OUT TEST

113

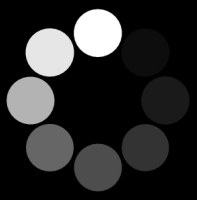
Bent knee fall-out test (BKFO)

BKFO ROM was positively associated with cam morphology, where a 1cm reduction in range resulted in 23% greater odds of having cam morphology

McMillan, R et al. (2023)

114

Still building evidence...



115

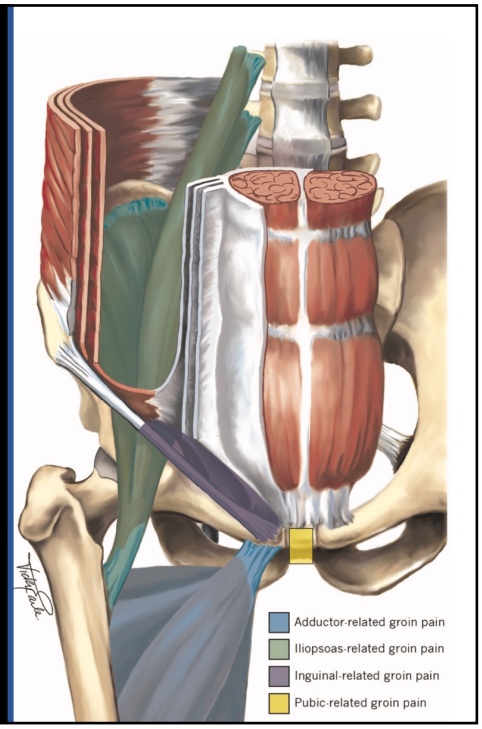
Intra-articular groin pain

Extra-articular groin pain

117

Extra-articular groin pain

- Adductor-related
- Inguinal-related
- Pubic-related
- Iliopsoas-related



118

ADDUCTOR RELATED GROIN PAIN (ARGP)

119

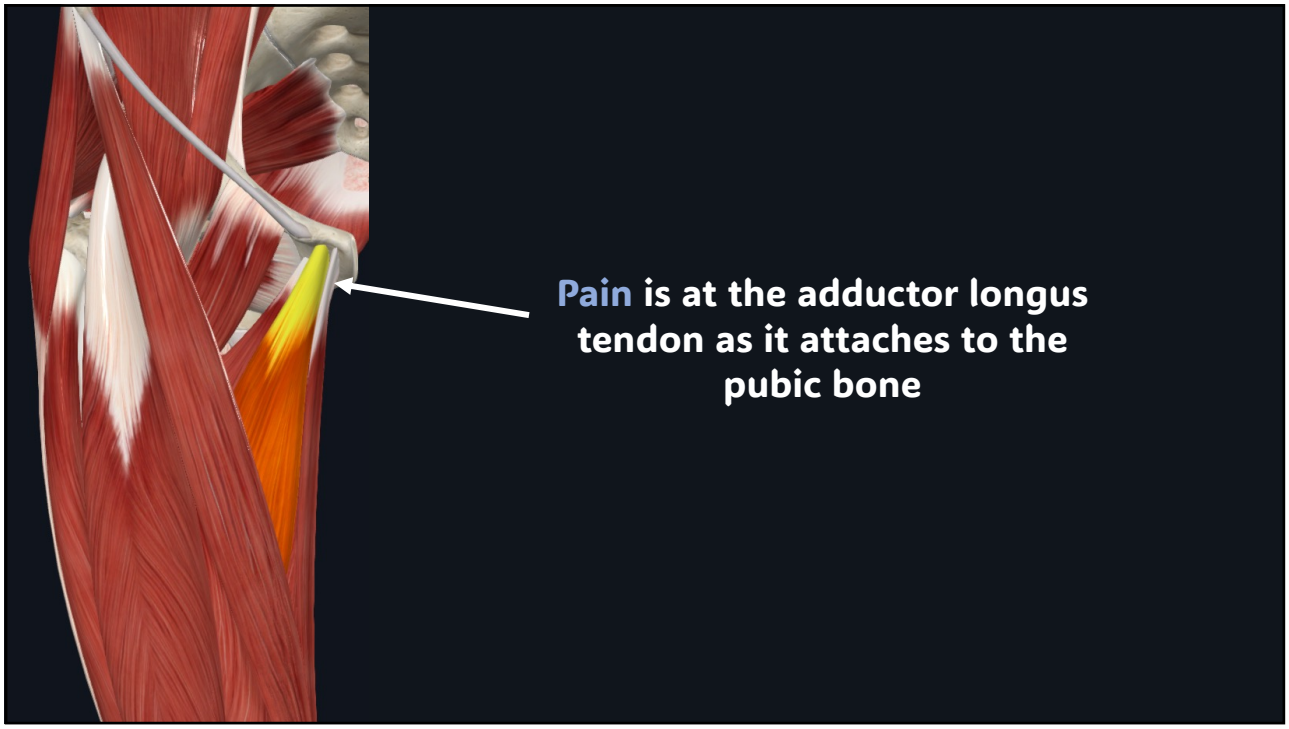
Factors that are associated with an increased risk of groin injuries in athletes

- Previous groin injury
- Higher level of play
- Reduced hip ADduction: ABduction strength
- Lower levels of sport-specific training

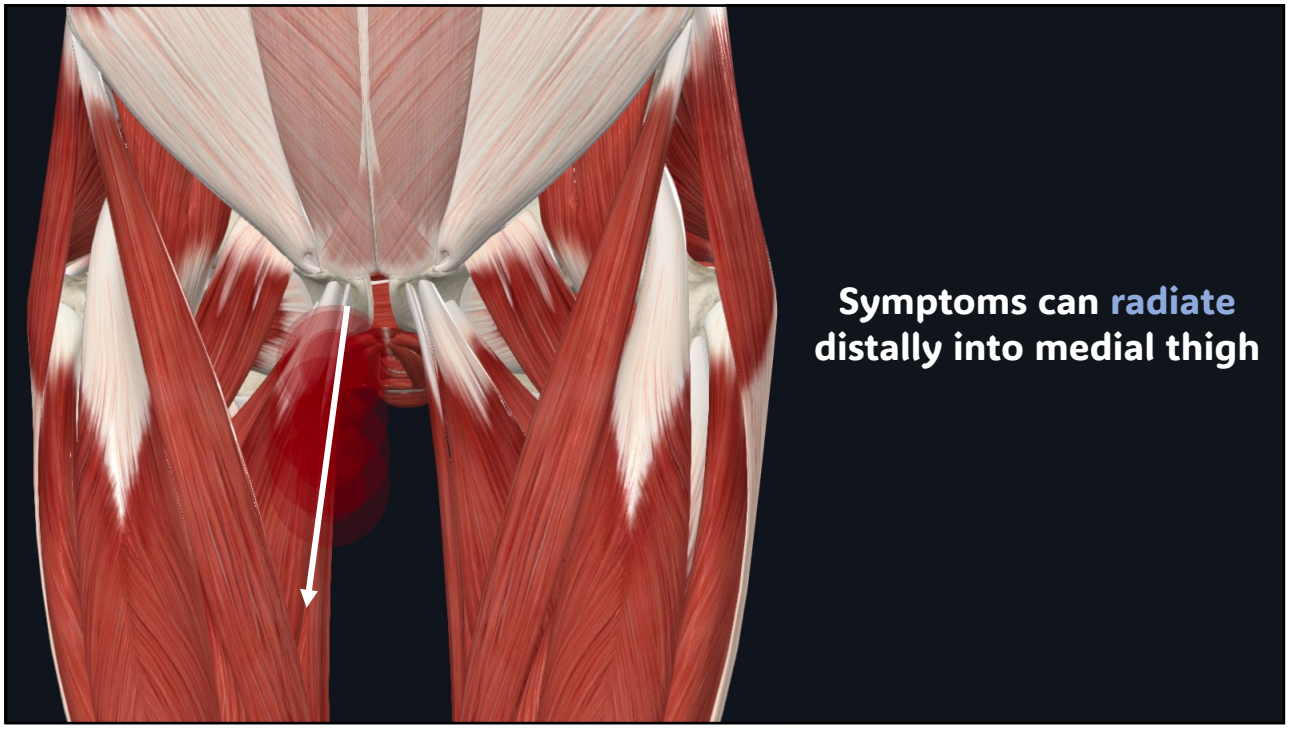
120

ARGP
Signs & Symptoms

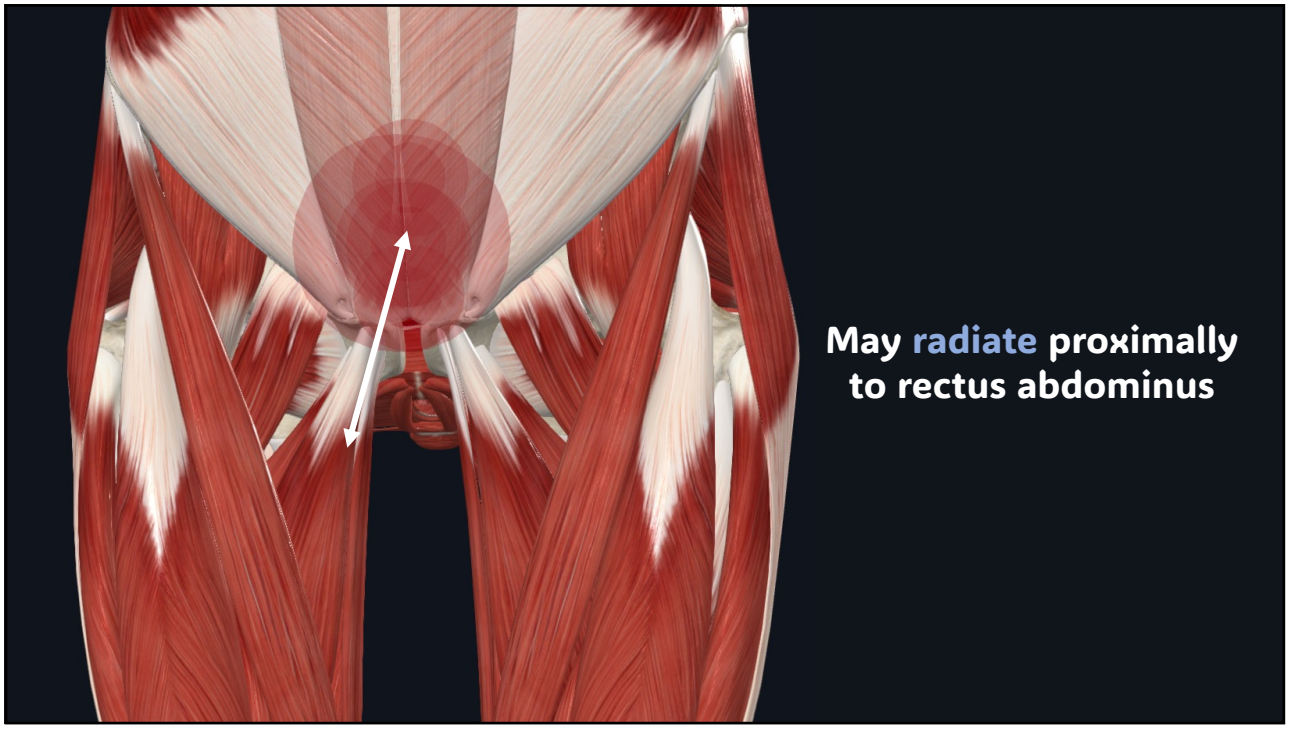
121


Pain is at the adductor longus tendon as it attaches to the pubic bone

122


Symptoms can radiate distally into medial thigh

123


May radiate proximally to rectus abdominus

124


MESSI
10
Aggravated with side-to-side movements, kicking and twisting

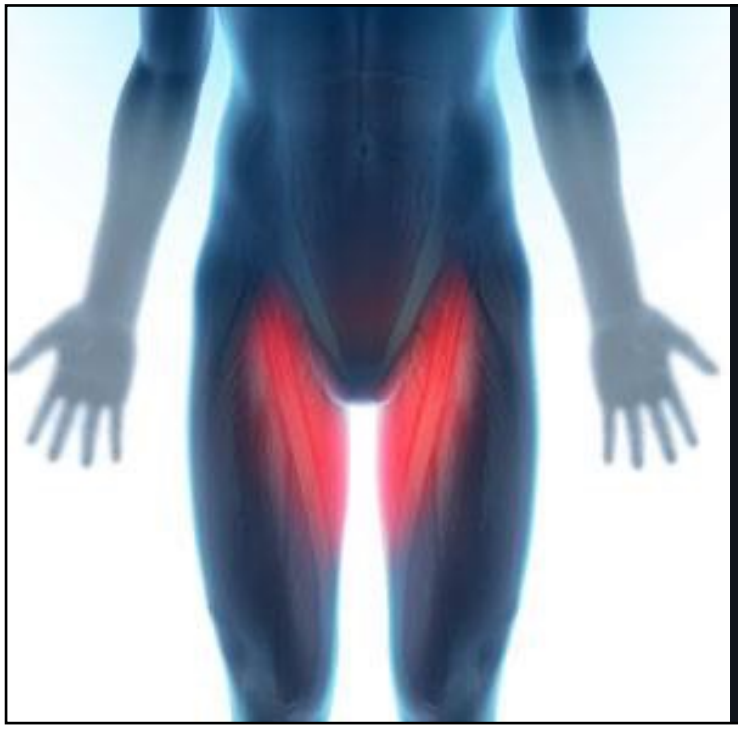
125

Acute injuries linked with specific MOI

126

May demonstrate "warm up" in early stages but as injury progresses pain severity may increase with exercise

127

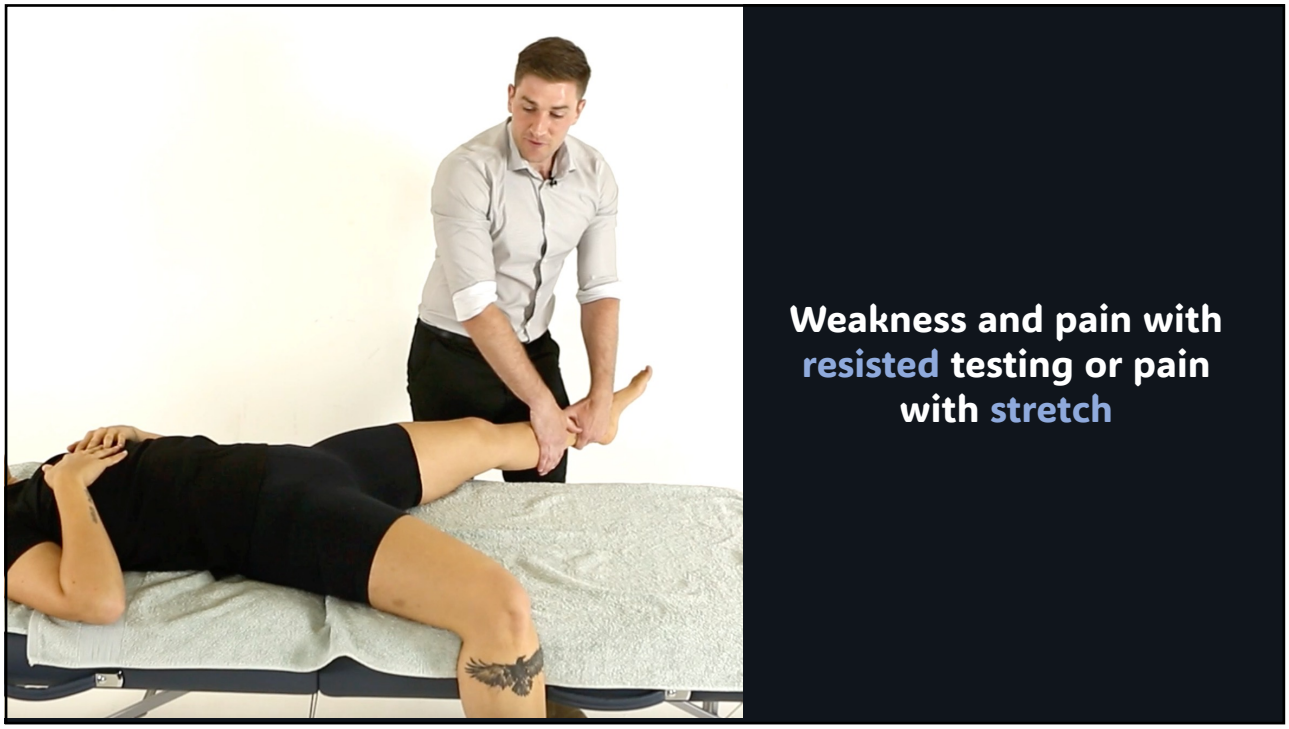


Athletes may complain of pain and stiffness in the morning following exercise

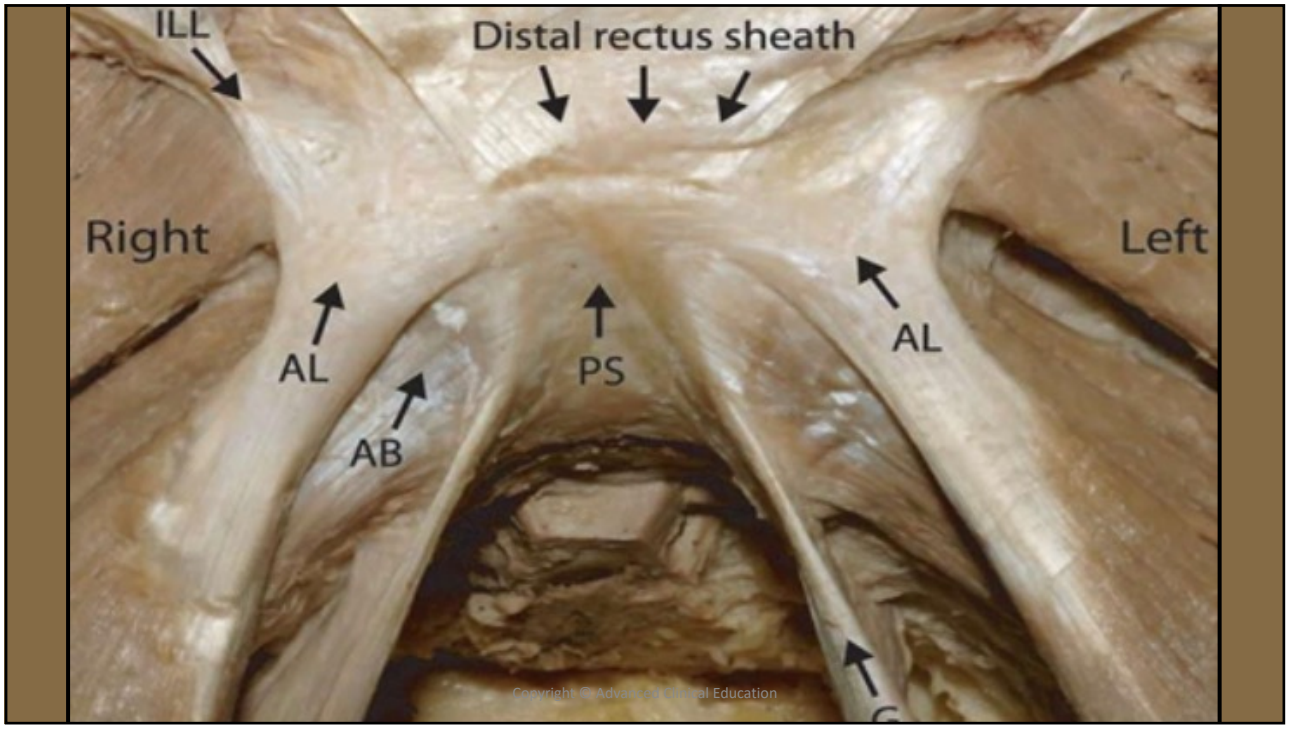
128

In chronic cases, pain will be present immediately with exercise

129


Weakness and pain with resisted testing or pain with stretch

130


ILL
Distal rectus sheath
Right
Left
AL
AB
PS
AL
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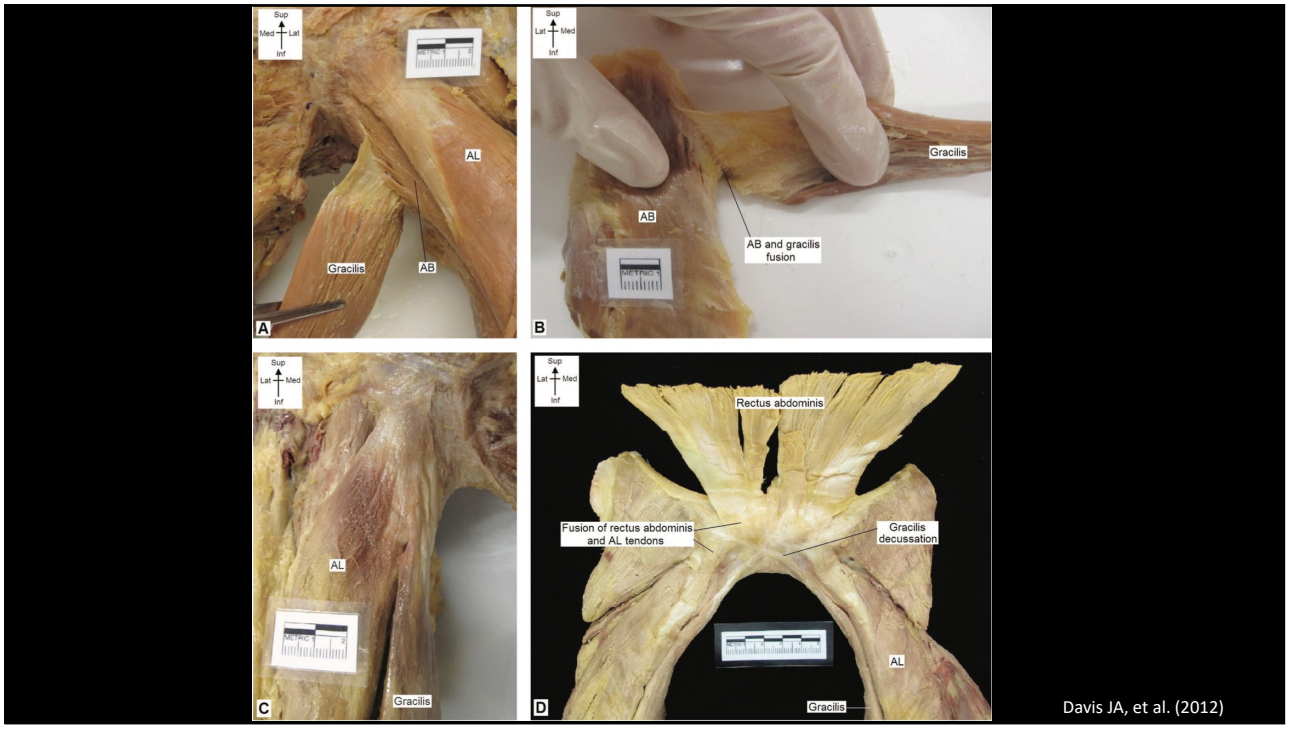
131



132

Cluster 2

133

ADDUCTOR SQUEEZE TEST

SN 43%, SP 91%

Reproduction of familiar pain is considered a positive test

134

ADDUCTOR SQUEEZE TEST

SN 43%, SP 91%

Reproduction of familiar pain is considered a positive test

135

Which factors differentiate athletes with hip/groin pain from those without? A systematic review with meta-analysis

Andrea B Mosler,[1,2] Rintje Agricola,[3] Adam Weir,[4] Per Hölmich,[4,5] Kay M Crossley[2,6]

Reduced strength on the adductor squeeze test, reduced range of motion in internal rotation and bent knee fall out are the outcome measures that best differentiate athletes with hip/groin pain from those without this pain.

Mosler et al., (2015)

136

PUBIC RELATED GROIN PAIN (PRGP)

137

Original article

OPEN ACCESS

Athletic groin pain (part 1): a prospective anatomical diagnosis of 382 patients—clinical findings, MRI findings and patient-reported outcome measures at baseline

É C Falvey,[1,2] E King,[1,3] S Kinsella,[2] A Franklyn-Miller[1,4]

382 consecutive athletic groin pain patients

Injury to the pubic aponeurosis (PA) 240 (62.8%) was the most common diagnosis.

Nearly two-thirds of patients (63.6%) demonstrated pain and abnormality in multiple anatomical structures.

138

Table 1 Patient demographics and clinical findings

Category	Value	
Age (years) (mean, SD)	27.6 (7.6)	
Height (cm) (mean, SD)	180 (6.0)	
Weight (kg) (mean, SD)	81.9 (9.4)	
Duration of symptoms in weeks- (median, IQR, range)	36 (16–75), (8–520)	
Sport	(%)	Individual diagnosis
Gaelic Football	57.9	PA (59%), Add (15%), Hip (22%), HF (3%), Ing (1%)
Hurling	10.5	PA (53%), Add (15%), Hip (27%), HF (3%), Ing (2%)
Soccer	13.6	PA (77%), Add (12%), Hip (11%), HF (0%), Ing (0%)
Rugby	8.6	PA (67%), Add (12%), Hip (21%), HF (0), Ing (0)
Athletics	6.3	PA (54%), Add (13%), Hip (25%), HF (4%), Ing (4%)
Other	3.1	PA (58%), Add (25%), Hip (17%), HF (0), Ing (0)
Level of participation	(%)	
Elite	25.7	PA (61%), Add (15%), Hip (21%), HF (2%), Ing (1%)
Club	65.2	PA (58%), Add (16%), Hip (21%), HF (4%), Ing (1%)
Recreational	9.2	PA (62%), Add (9%), Hip (26%), HF (0), Ing (3%)

Add, adductor injury; HF, hip flexor injury; Hip, hip injury; Ing, inguinal injury; Other, golf, ju-jitsu, rowing, hockey.

OPEN ACCESS

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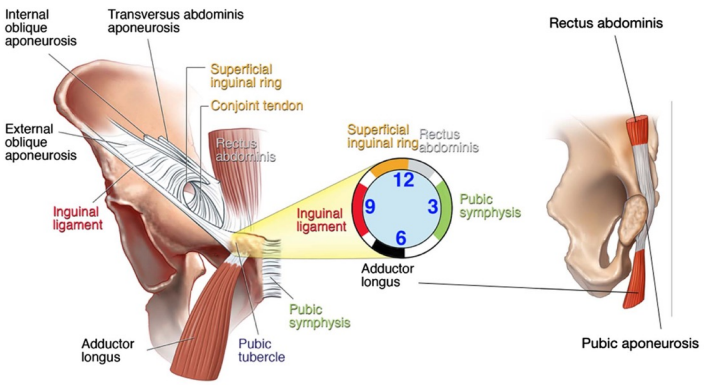

Falvey et al., *(2016)*

139

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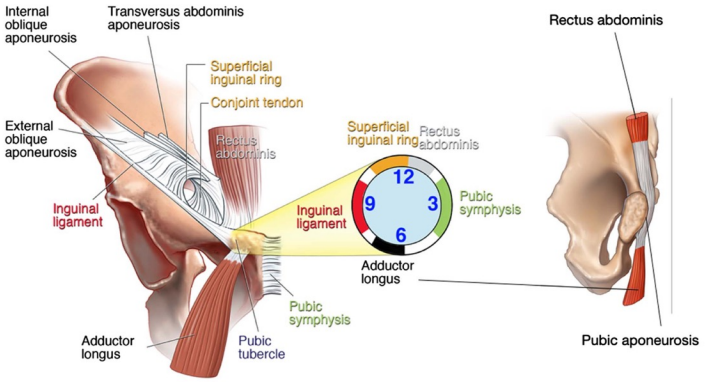

Falvey et al., *(2016)*

140

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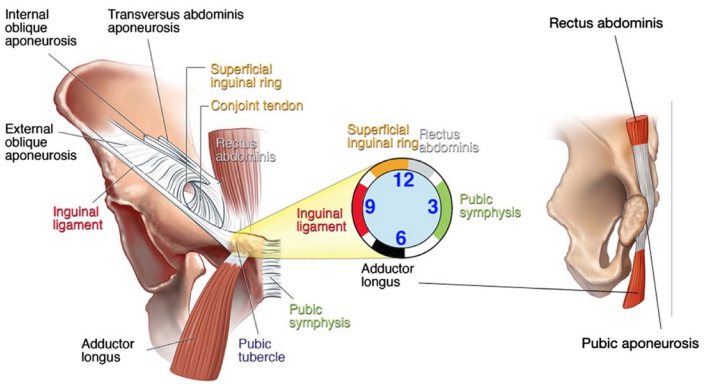

Falvey et al., *(2016)*

141

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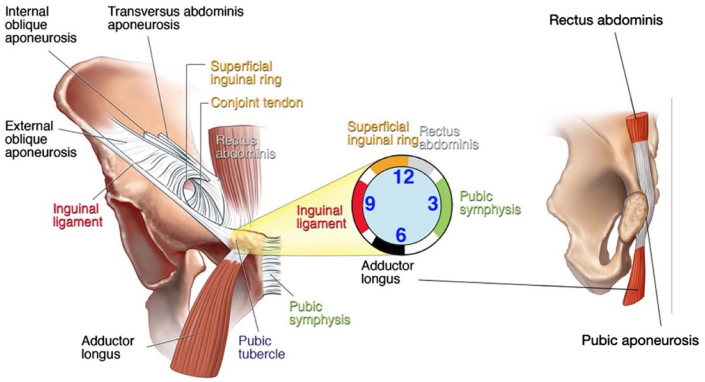

Falvey et al., *(2016)*

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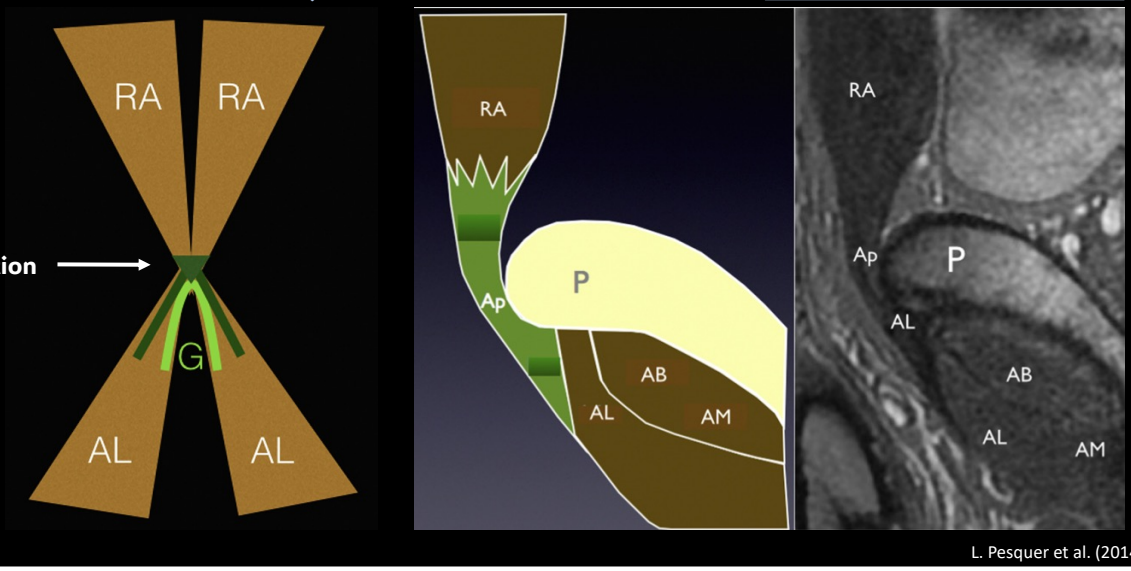
Adductor longus-rectus abdominus aponeurosis (RA-AL Aponeurosis)


REVIEW / *Musculoskeletal imaging*

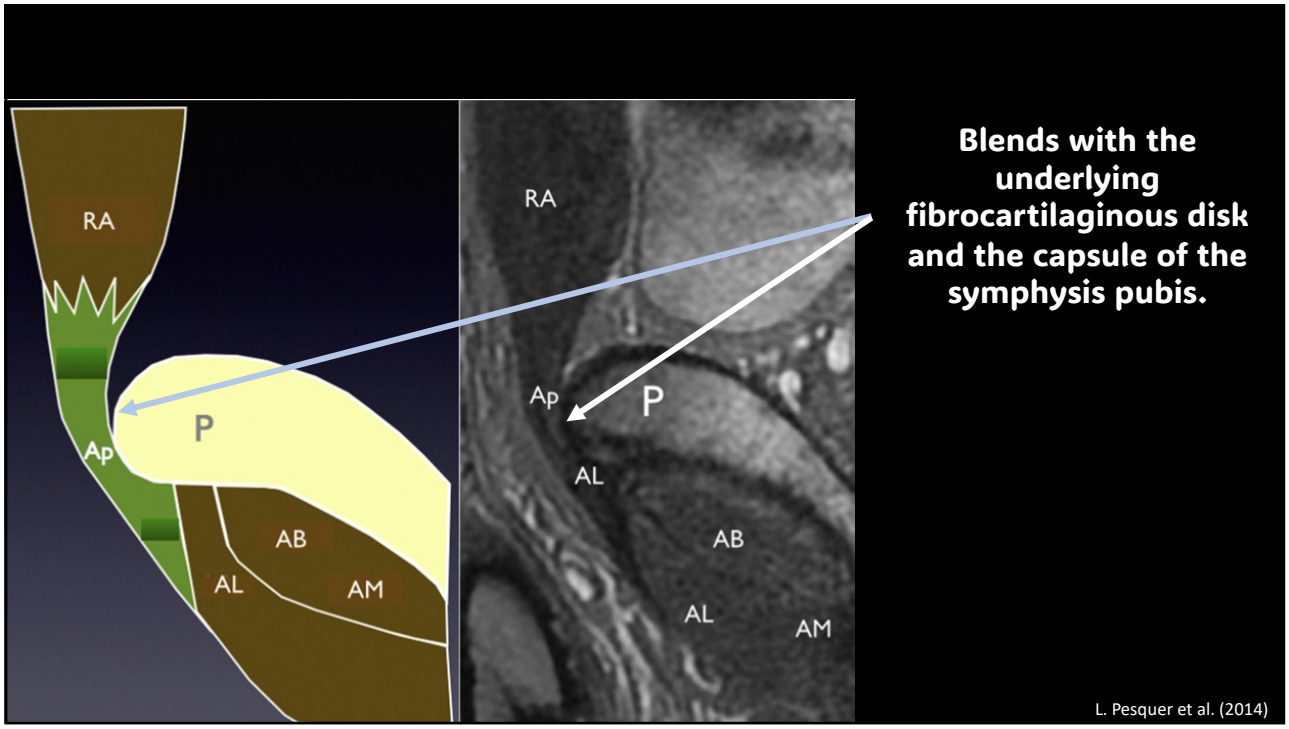
Imaging of adductor-related groin pain

L. Pesquer[a,*], G. Reboul[b], A. Silvestre[a], N. Poussange[a], P. Meyer[a], B. Dallaudière[a,c]



L. Pesquer et al. (2014)

143



144

PRGP

Cluster 2 with cluster 3

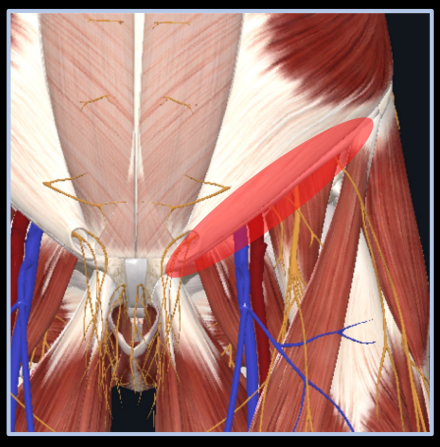
Differentiate PRGP from ARGP and IGRGP with symptom reproduction location and palpation

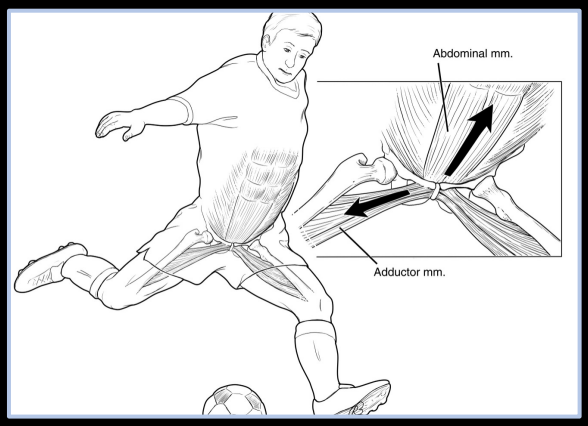
145

Inguinal Related Groin Pain (IGRGP)

146

Inguinal Related Groin Pain



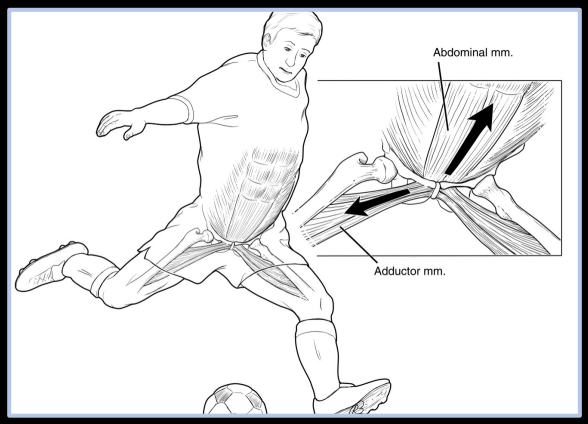


Pain in the inguinal region that worsens with activity

Elattar, O et al. (2016)

147

Inguinal Related Groin Pain

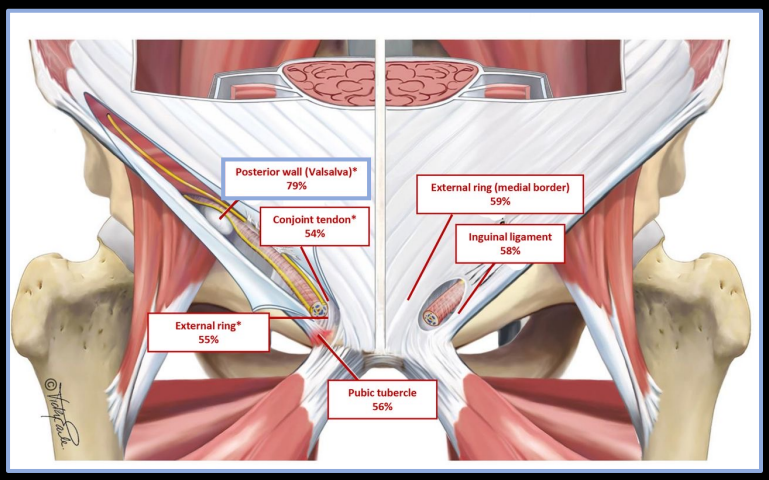


Associated with sports involving high-speed cutting and pivoting that demand trunk hyperextension and thigh hyper-abduction.

Elattar, O et al. (2016)

148

Inguinal Related Groin Pain

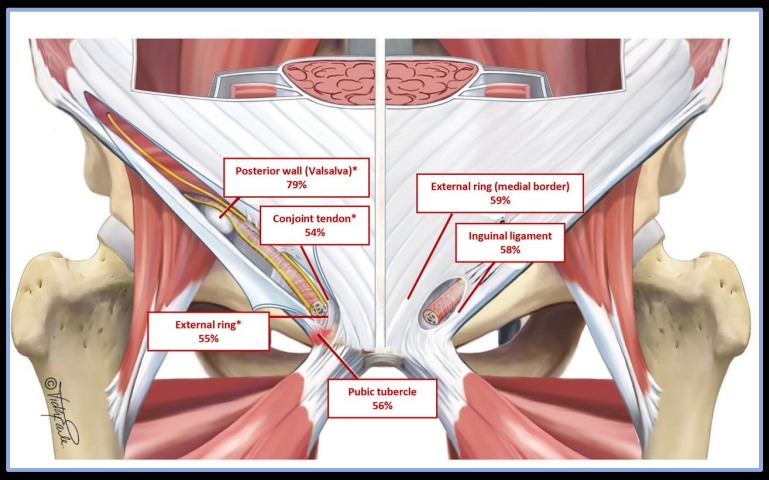


Disruption of the rectus abdominus tendon insertion to the pubis and weakness of the posterior inguinal wall

Elattar, O et al. (2016)

149

Inguinal Related Groin Pain

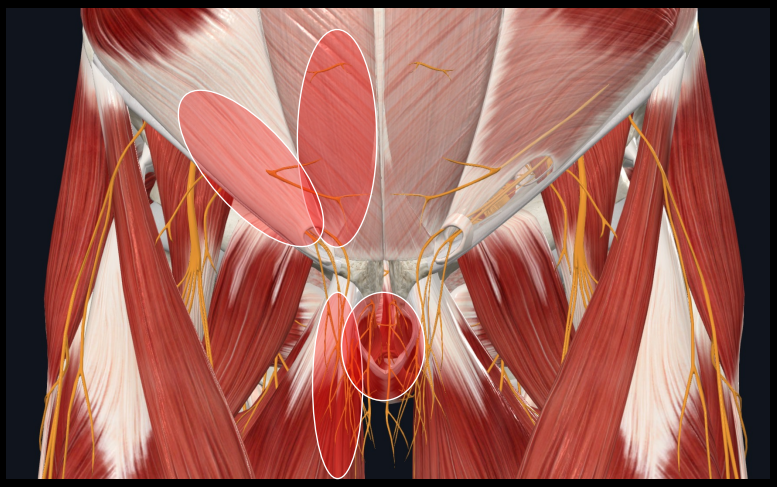


No palpable inguinal hernia found

Elattar, O et al. (2016)

150

Inguinal Related Groin Pain

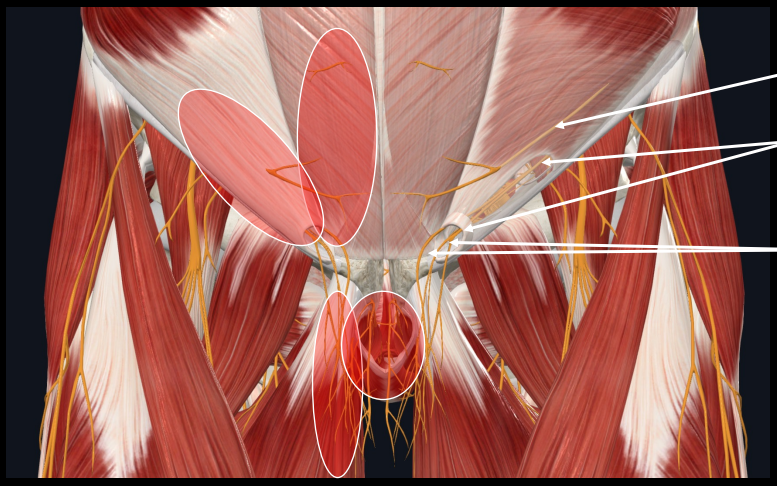


Pain may radiate to the abdominal wall, medial thigh, pubic symphysis or genitals.

Elattar, O et al. (2016)

151

Inguinal Related Groin Pain



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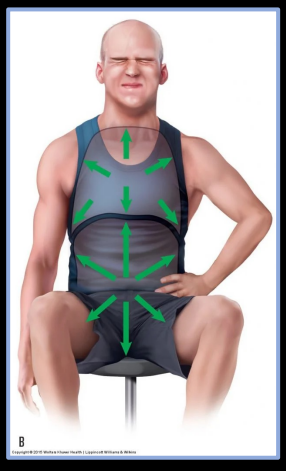
Elattar, O et al. (2016)

152

Inguinal Related Groin Pain



Pain reproduced with resisted abdominal muscle testing OR on Valsalva/cough/sneeze

Weir et al., (2015)

153

Cluster 3

154

155

Variations

- Resisted sit-up with hips flexed (0 and 45 degrees of trunk flexion)
- Resisted oblique sit-up
- Supine cross test (isometric)

156

Palpation is important!!

157

Original article

Can standardised clinical examination of athletes with acute groin injuries predict the presence and location of MRI findings?

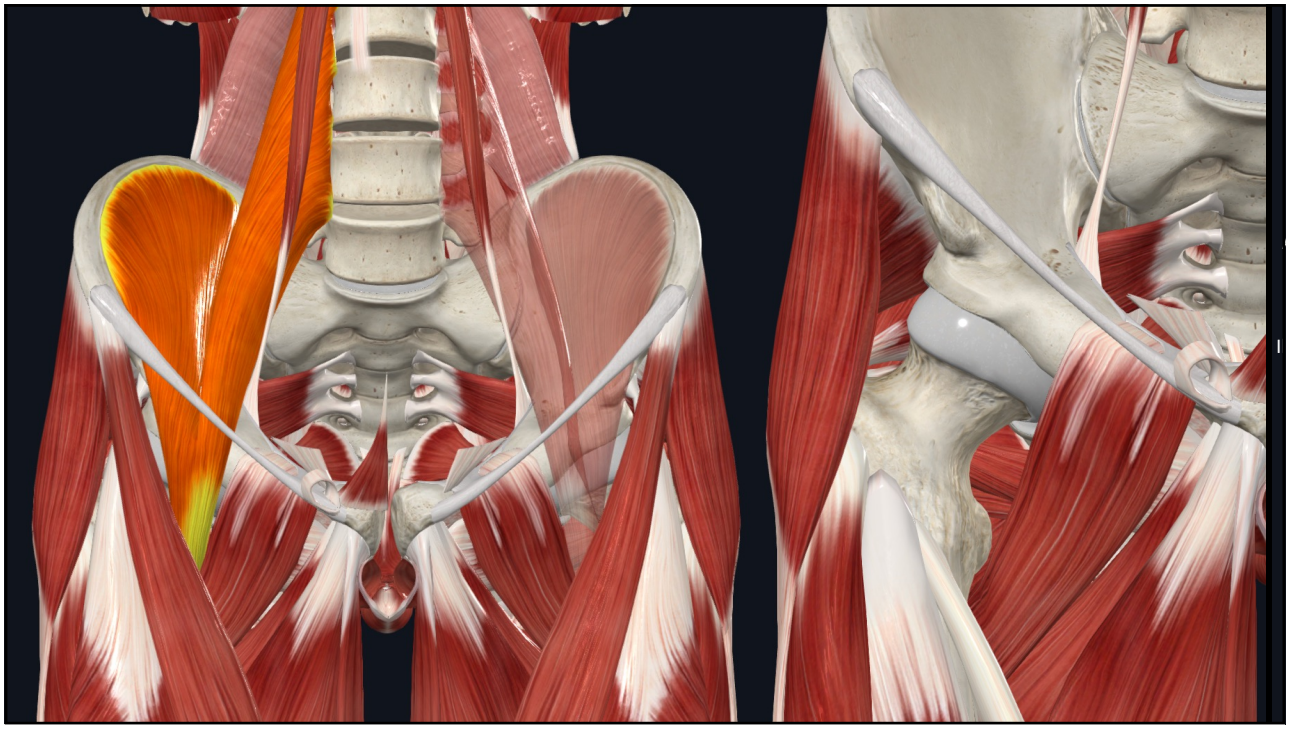
Andreas Serner,[1,2] Adam Weir,[1] Johannes L Tol,[1,3] Kristian Thorborg,[2] Frank Roemer,[4,5] Ali Guermazi,[4] Per Hölmich[1,2]

The absence of palpation pain in the adductors and hip flexors has the highest predictive value for ruling out acute injury in these structures, with an accuracy greater than 90%.

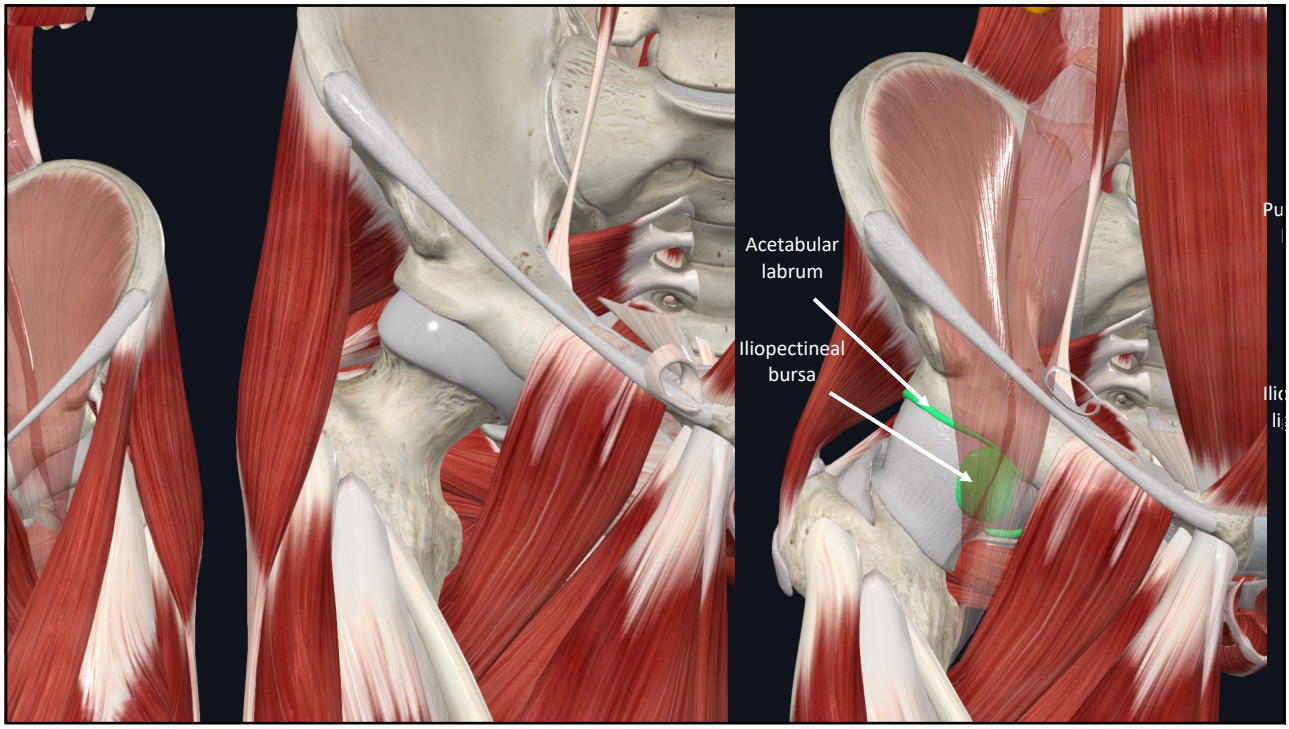
158

ILIOPSOAS RELATED GROIN PAIN (IPRGP)

159



160



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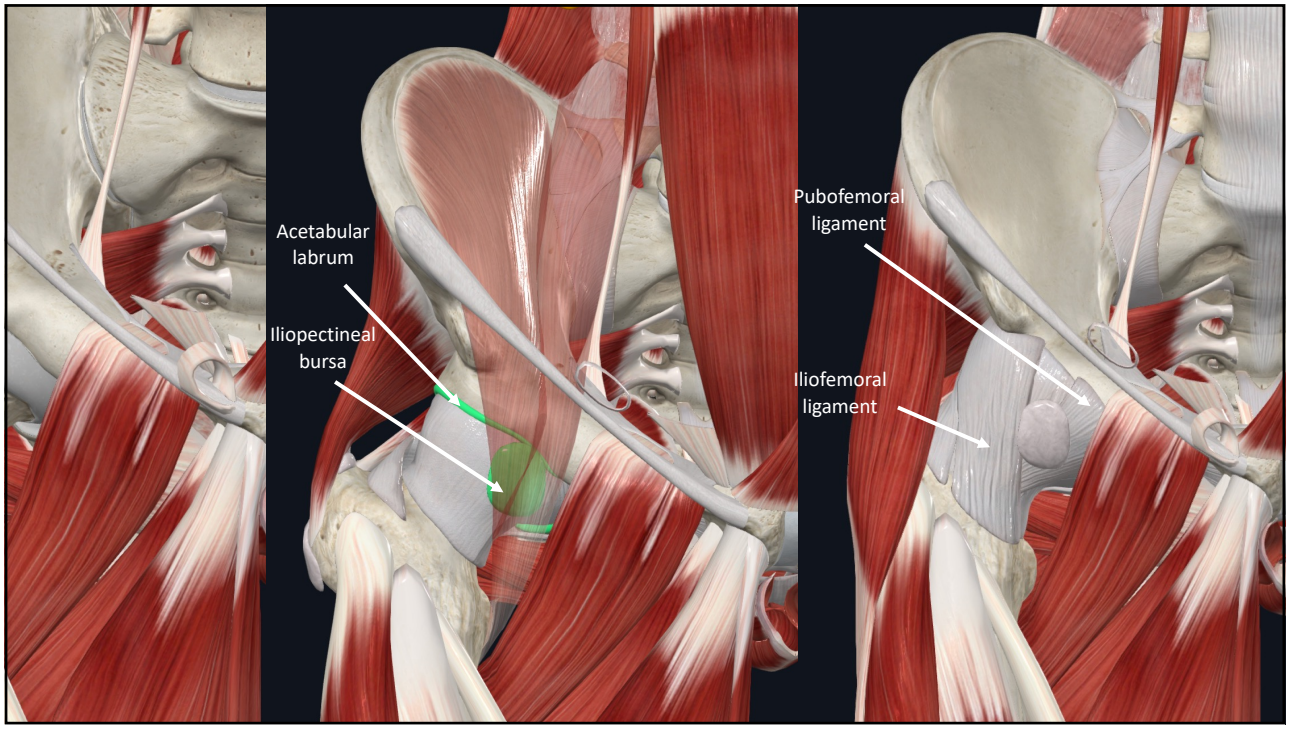
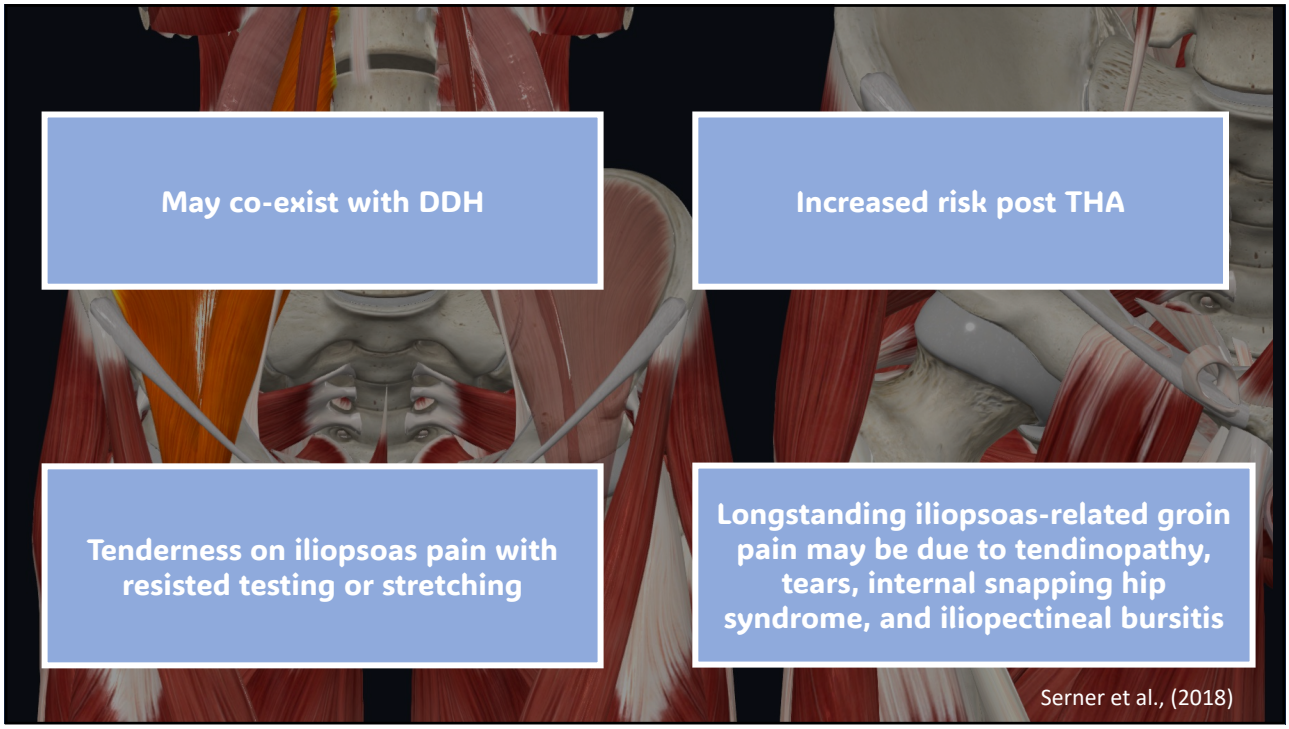

Acetabular labrum
Iliopectineal bursa
Pubofemoral ligament
Iliofemoral ligament

162


May co-exist with DDH
Increased risk post THA
Tenderness on iliopsoas pain with resisted testing or stretching
Longstanding iliopsoas-related groin pain may be due to tendinopathy, tears, internal snapping hip syndrome, and iliopectineal bursitis
Serner et al., (2018)

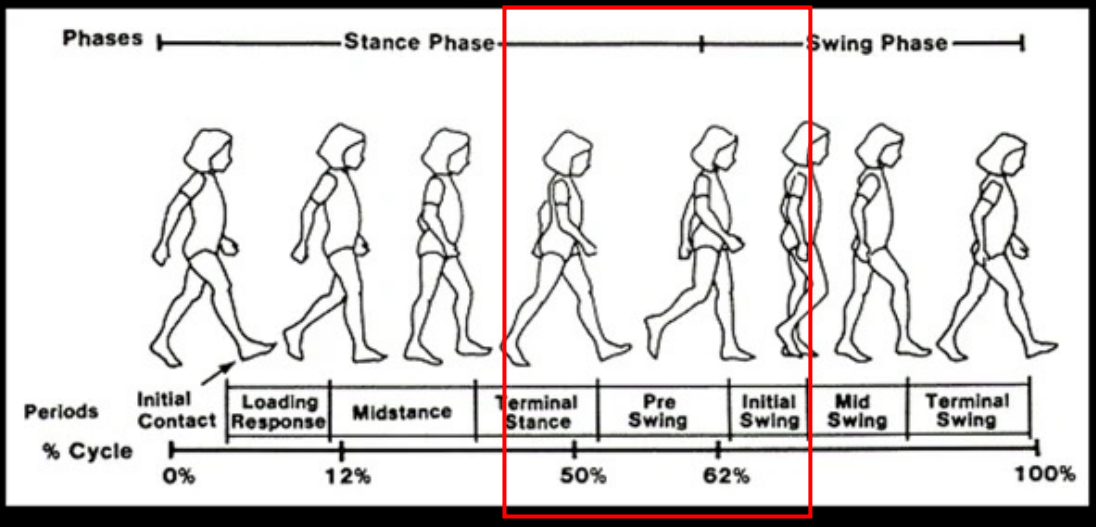
163

IPRGP Signs & Symptoms

164

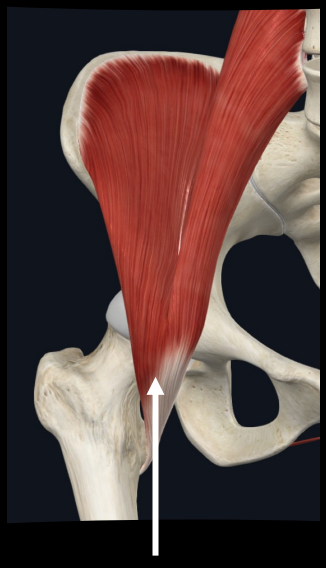
Most common in runners

165



Late stance / early swing phase

166



Myotendinous junction

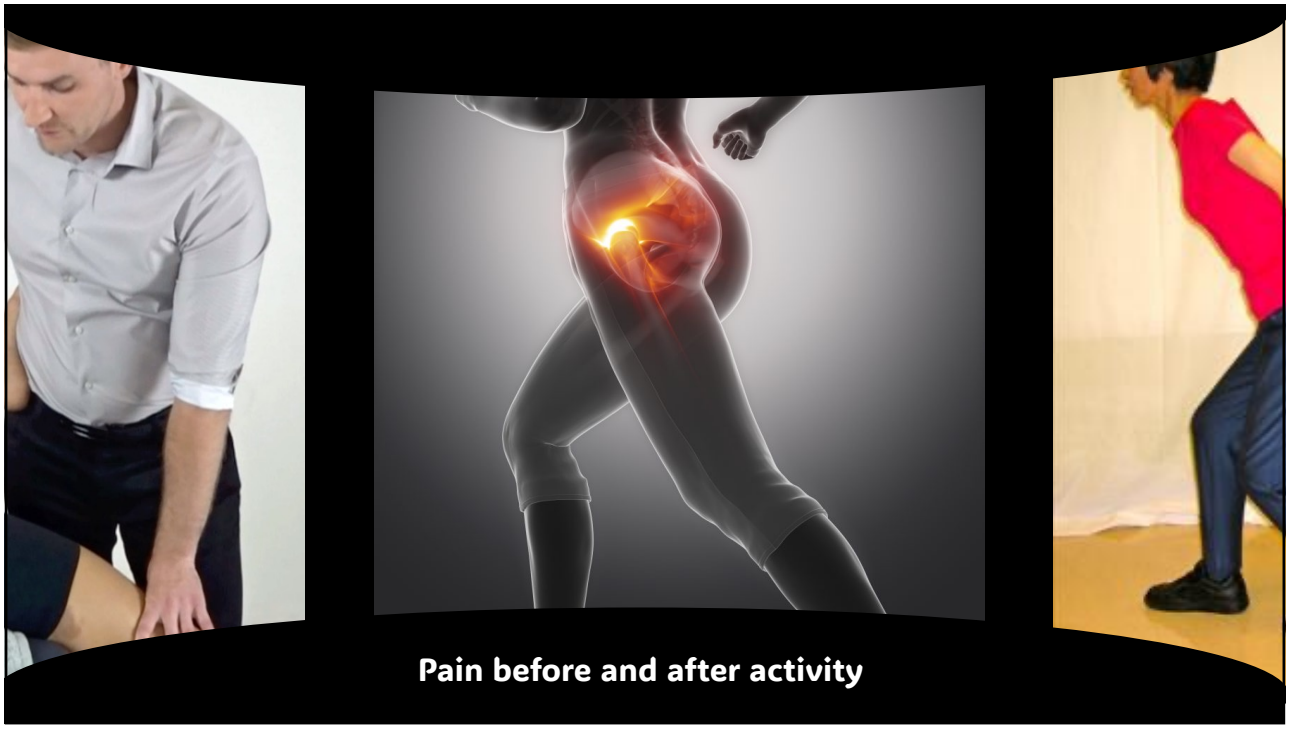
167

168

169

170

171



172

173


Worse with long stride length

174


Difference in stride length (guarding symptomatic side)

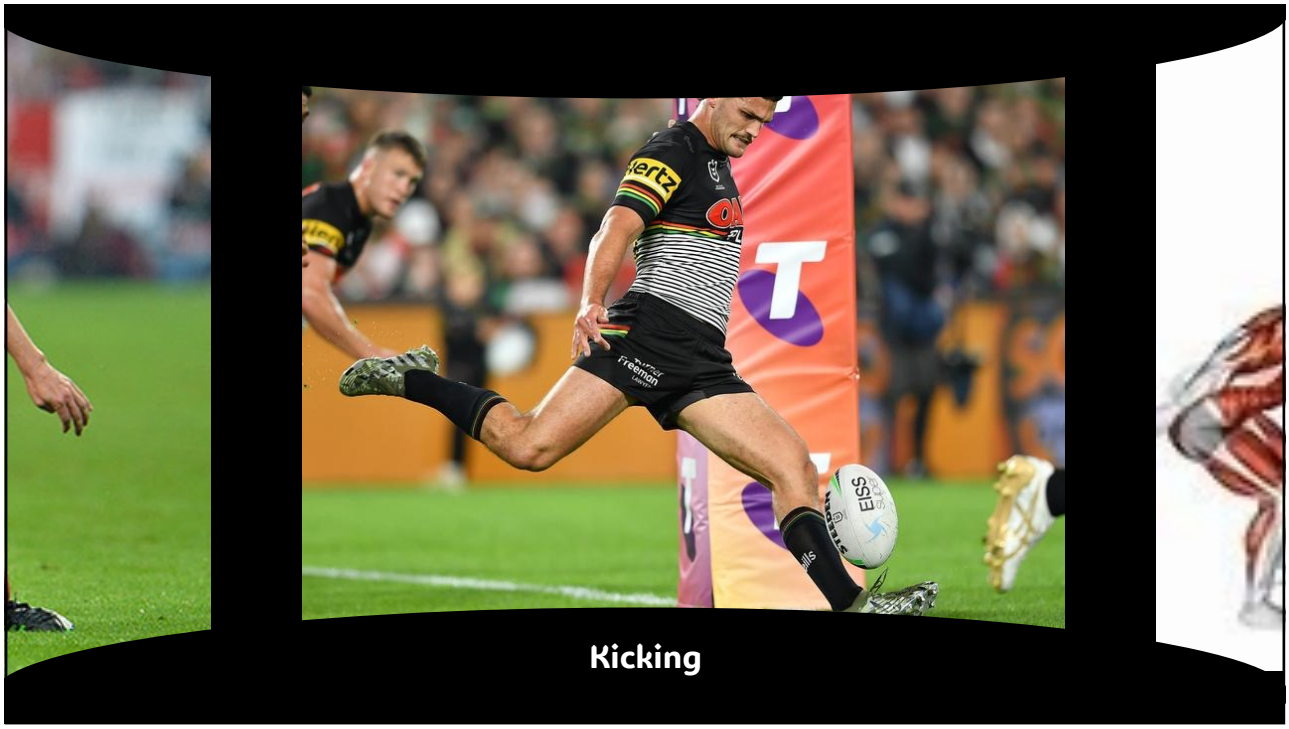
175


Pain may radiate into the proximal anterior thigh

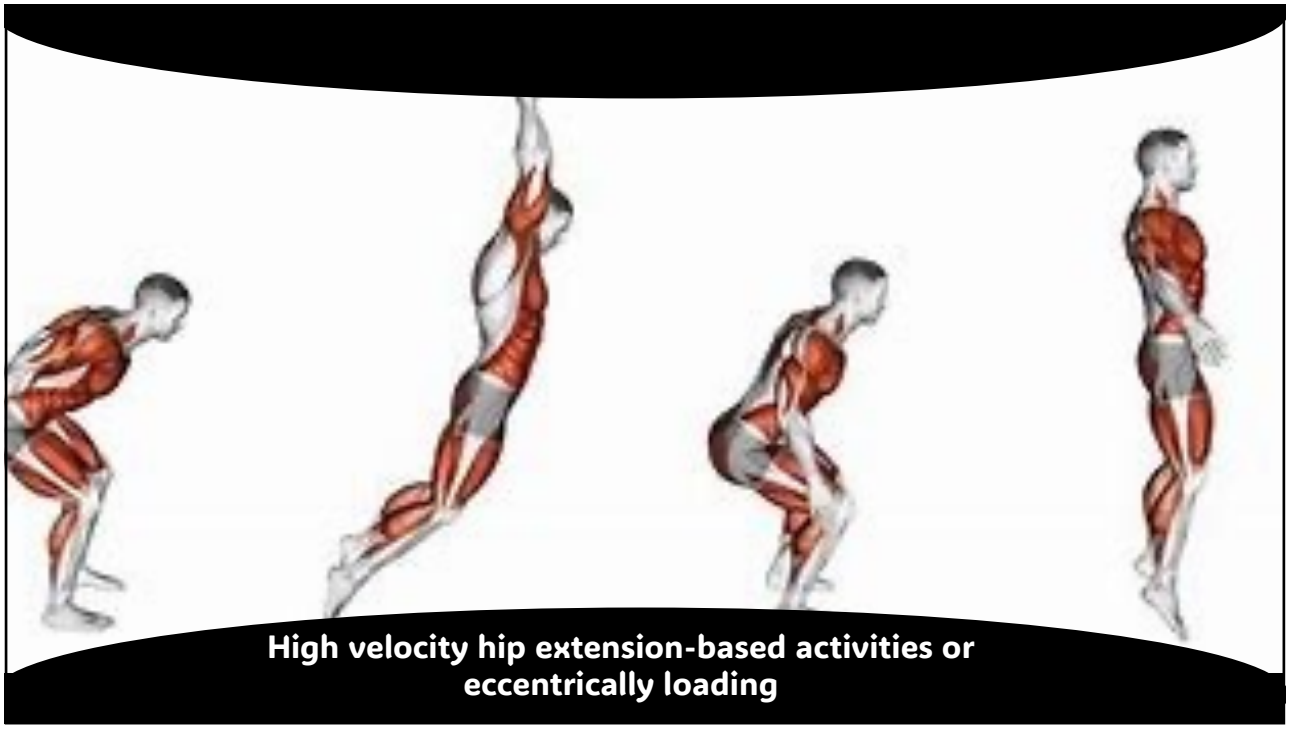
176


MOI: Change of direction

177


Kicking

178


High velocity hip extension-based activities or eccentrically loading

179


Rapid increase in unaccustomed load

180


Iliopsoas related groin pain
ARGP
Will be felt more laterally than ARGP

181

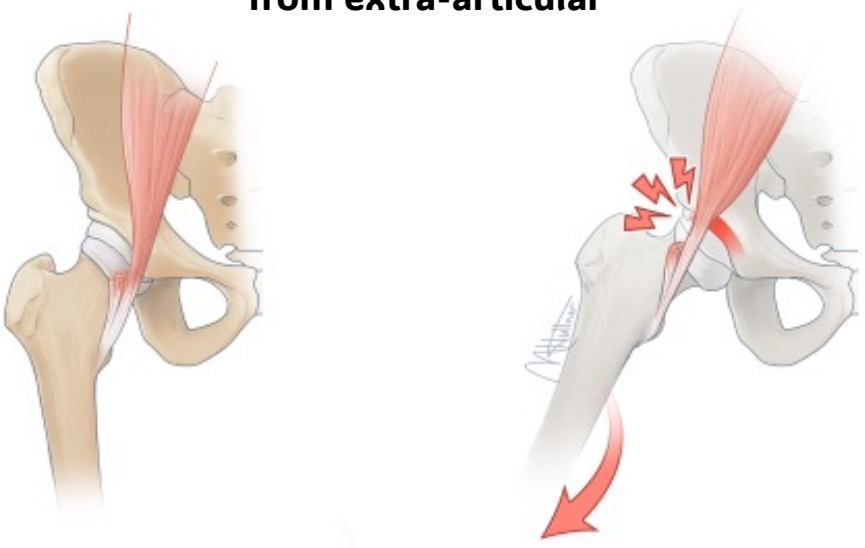
Cluster 4

182

183

184

Differentiate intra-articular clicking/clunking or catching pain from extra-articular



185

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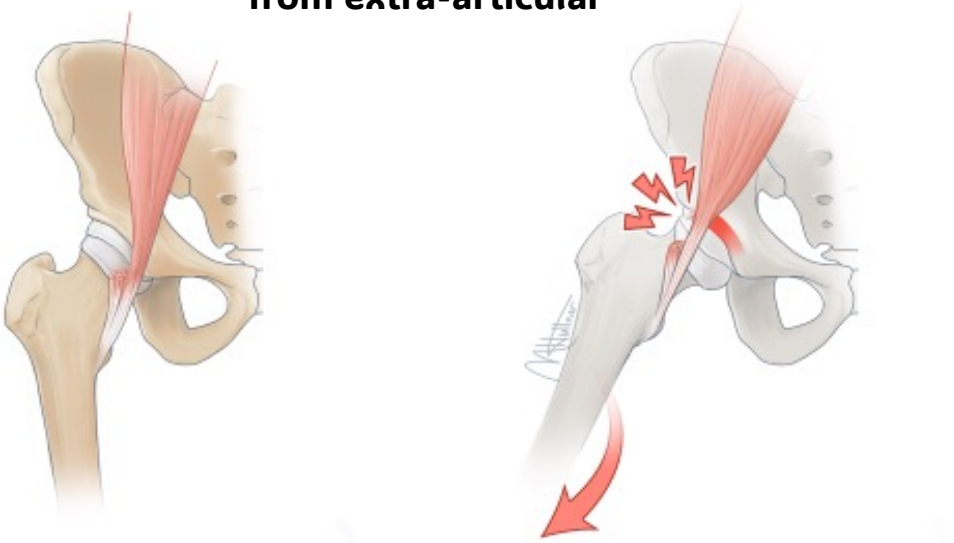


ISHS has been reported to be frequently associated with FAIS (Giai Via. 2017)

186

187

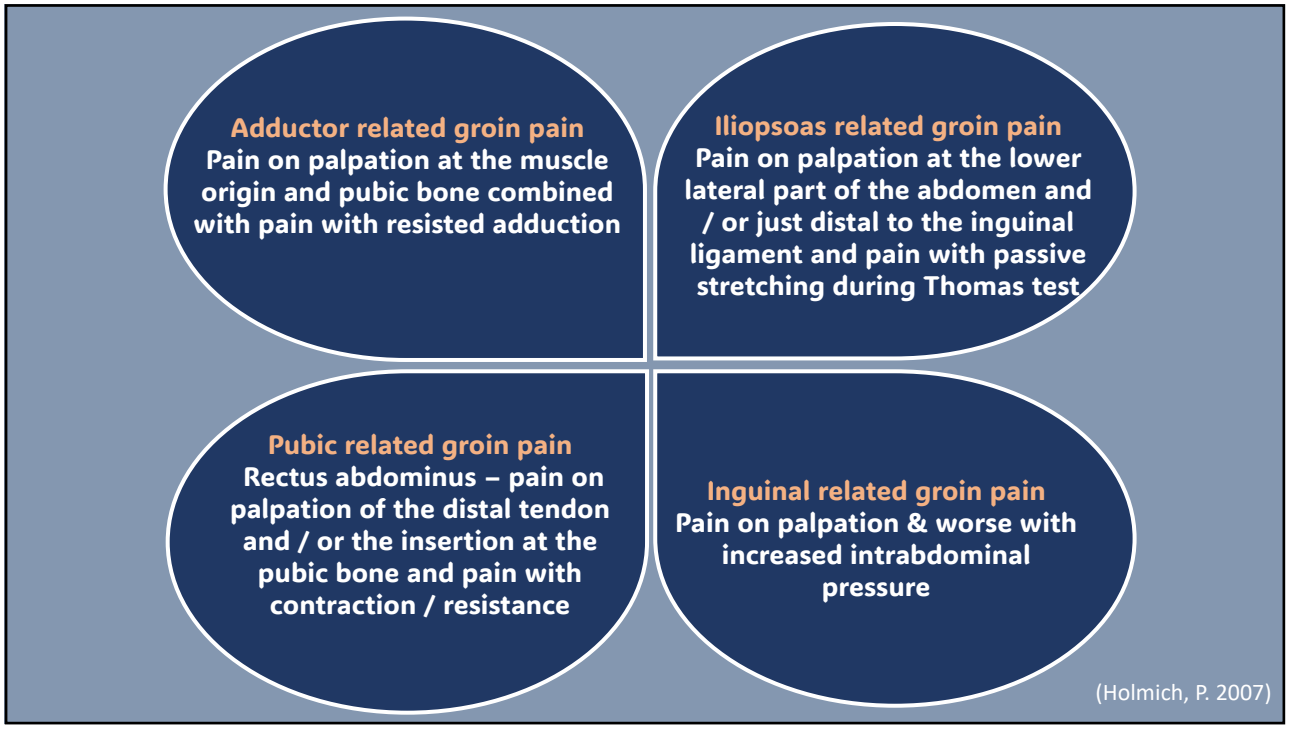
188

Putting it all together for Groin pain

Differentiating between iliopsoas, inguinal, pubic and adductor related groin pain

(Holmich, P. 2007)

189



190

But that's not the full picture...

191

Obtaining objective strength measures and side to side comparisons

192

Scand J Med Sci Sports 2010: 20: 493–501
DOI: 10.1111/j.1600-0838.2009.00958.x

SCANDINAVIAN JOURNAL OF MEDICINE & SCIENCE IN SPORTS

Clinical assessment of hip strength using a hand-held dynamometer is reliable

K. Thorborg[1], J. Petersen[1], S. P. Magnusson[2], P. Hölmich[1]

IJSPT

ORIGINAL RESEARCH

MEASURES OF HIP MUSCLE STRENGTH AND RATE OF FORCE DEVELOPMENT USING A FIXATED HANDHELD DYNAMOMETER: INTRA-TESTER INTRA-DAY RELIABILITY OF A CLINICAL SET-UP

Lasse Ishøi, PT, MSc[1]
Per Hölmich, MD, DMSc[1]
Kristian Thorborg, PT, MSportsPT, PhD[1,2]

HHD is a reliable testing method for hip muscle strength

193

In groups of 4 or 5

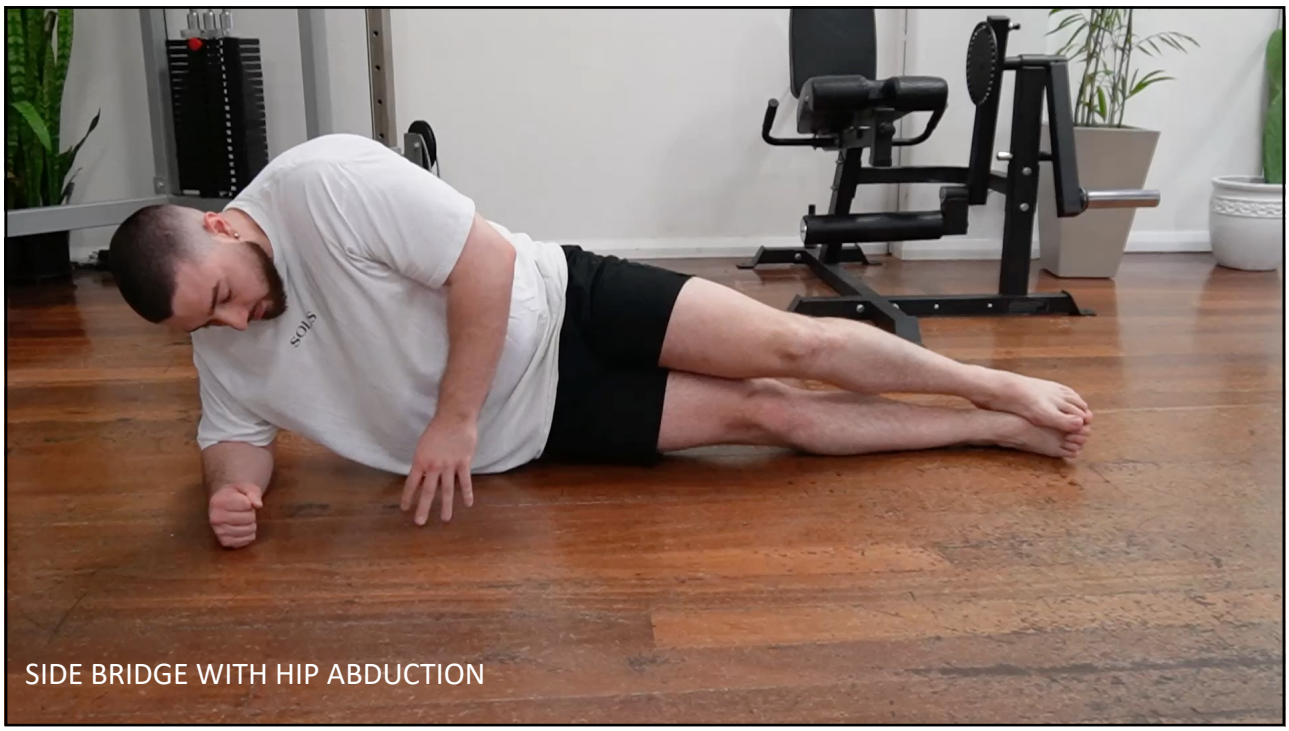
HHD should be placed approx. 5cm proximal to the ankle or knee when testing

	Left	VAS (0-100)	Right	VAS (0-100)
Hip flexion (10°) (*Supine - knee* extended)				
Hip flexion (90°) (*Supine - knee* flexed)				
Hip adduction – (*Supine - knee* extended – hip abducted to 30°)				
Hip adduction – (*Supine* - 45° hip flexion)				
Hip adduction – (*Supine* - 90° hip flexion)				
Hip extension – (*Prone - knee* flexed 90°)				
Hip abduction – (*Supine - knee* extended *and abducted to* 30°)				

194

FUNCTIONAL PERFORMANCE TESTS

195



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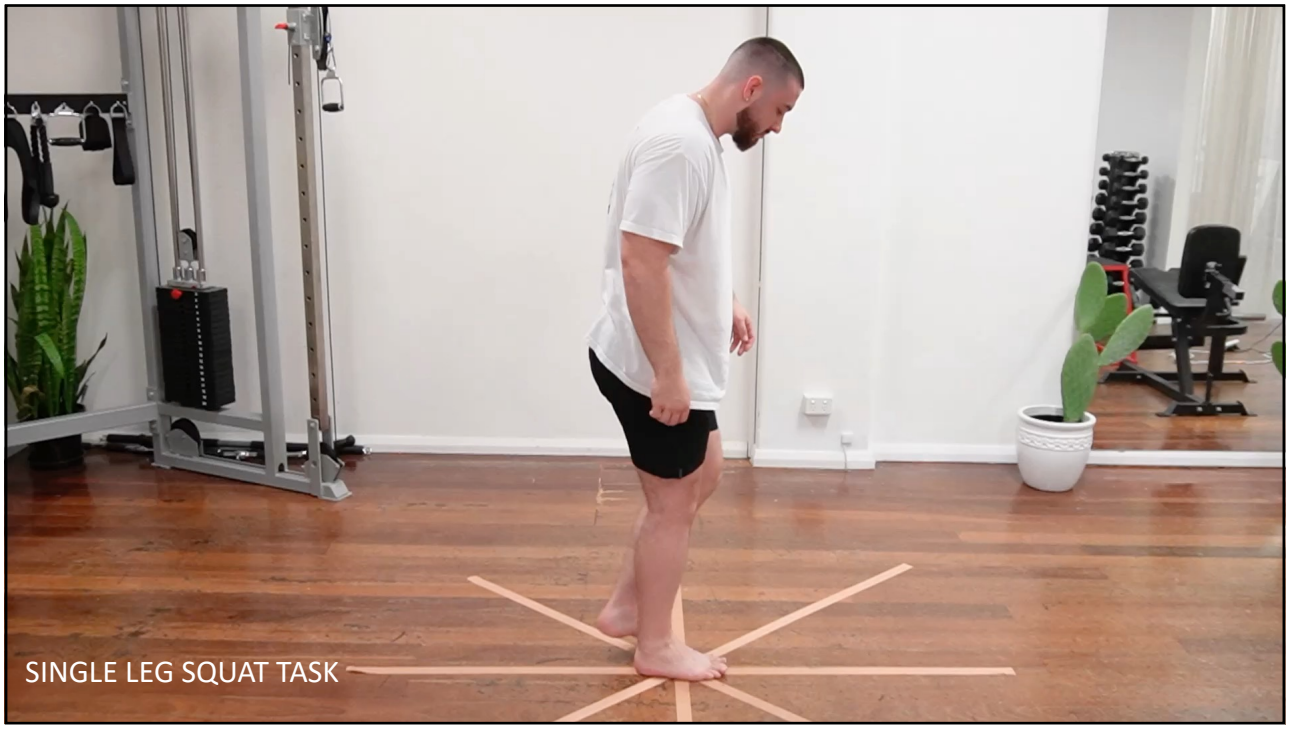

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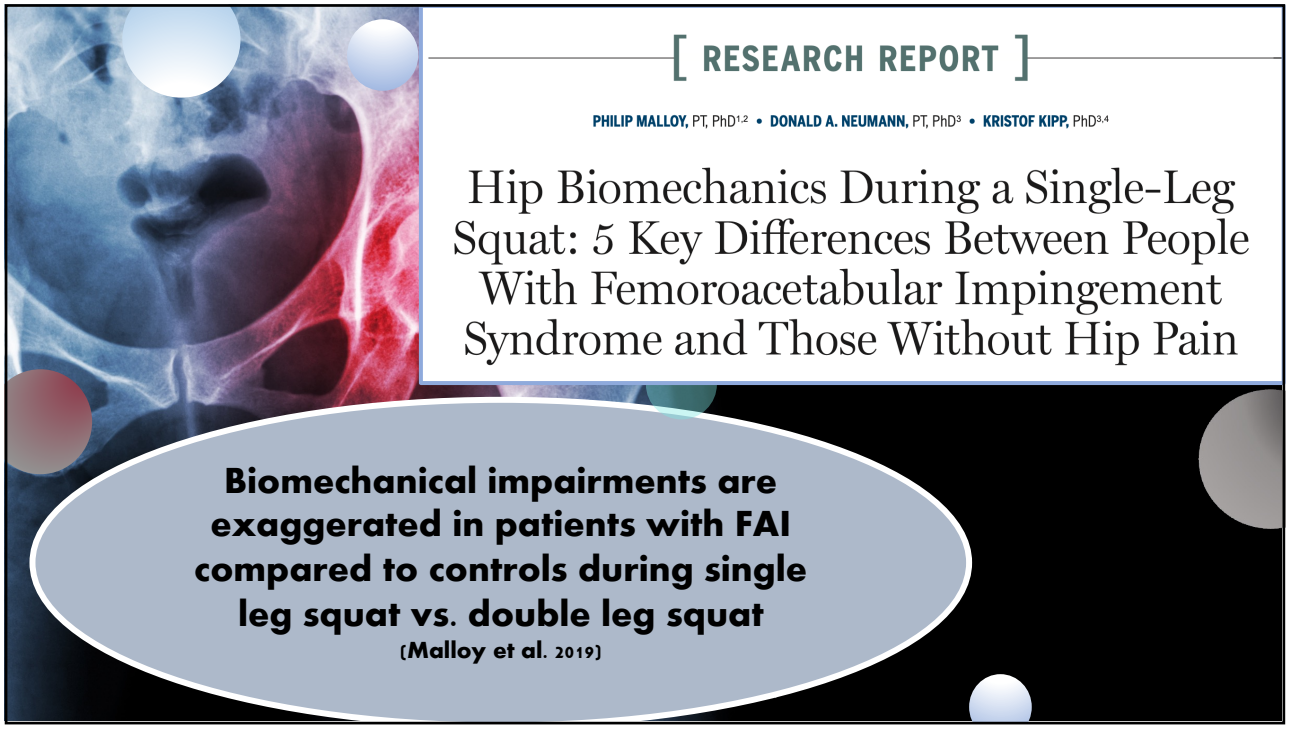
[RESEARCH REPORT]
PHILIP MALLOY, PT, PhD[1,2] • DONALD A. NEUMANN, PT, PhD[3] • KRISTOF KIPP, PhD[3,4]
Hip Biomechanics During a Single-Leg Squat: 5 Key Differences Between People With Femoroacetabular Impingement Syndrome and Those Without Hip Pain
Biomechanical impairments are exaggerated in patients with FAI compared to controls during single leg squat vs. double leg squat
(Malloy et al. 2019)

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SINGLE LEG STANCE

199

200

Contents lists available at ScienceDirect

Manual Therapy

journal homepage: www.elsevier.com/math

Original article

The Star Excursion Balance Test: Criterion and divergent validity on patients with femoral acetabular impingement

Ann-Christin Johansson [a, *], Hillevi Karlsson [b]

[a] Department of Physiotherapy, School of Health, Care and Social Welfare, Mälardalen University, Box 883, SE-721 23 Västerås, Sweden
[b] Department of Orthopedics, Hospital of Västmanland County, SE-721 89 Västerås, Sweden

SEBT is a valid assessment in relation to pain and other symptoms in the evaluation of FAI patients.

It is recommended as a complement to other measurements.

201

202

Review

Physical impairments in symptomatic femoroacetabular impingement: a systematic review of the evidence

Matthew D Freke,[1] Joanne Kemp,[2] Ida Svege,[3] May Arna Risberg,[4] Adam Semciw,[5] Kay M Crossley[6]

Arthritis Care & Research
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DOI 10.1002/acr.22193

ORIGINAL ARTICLE

Impairment of Dynamic Single-Leg Balance Performance in Individuals With Hip Chondropathy

ANNA L. HATTON,[1] JOANNE L. KEMP,[1] SANDRA G. BRAUER,[1] ROSS A. CLARK,[2] AND KAY M. CROSSLEY[1]

Muscle strength and single leg balance squat performance are impaired in people with FAI and hip OA

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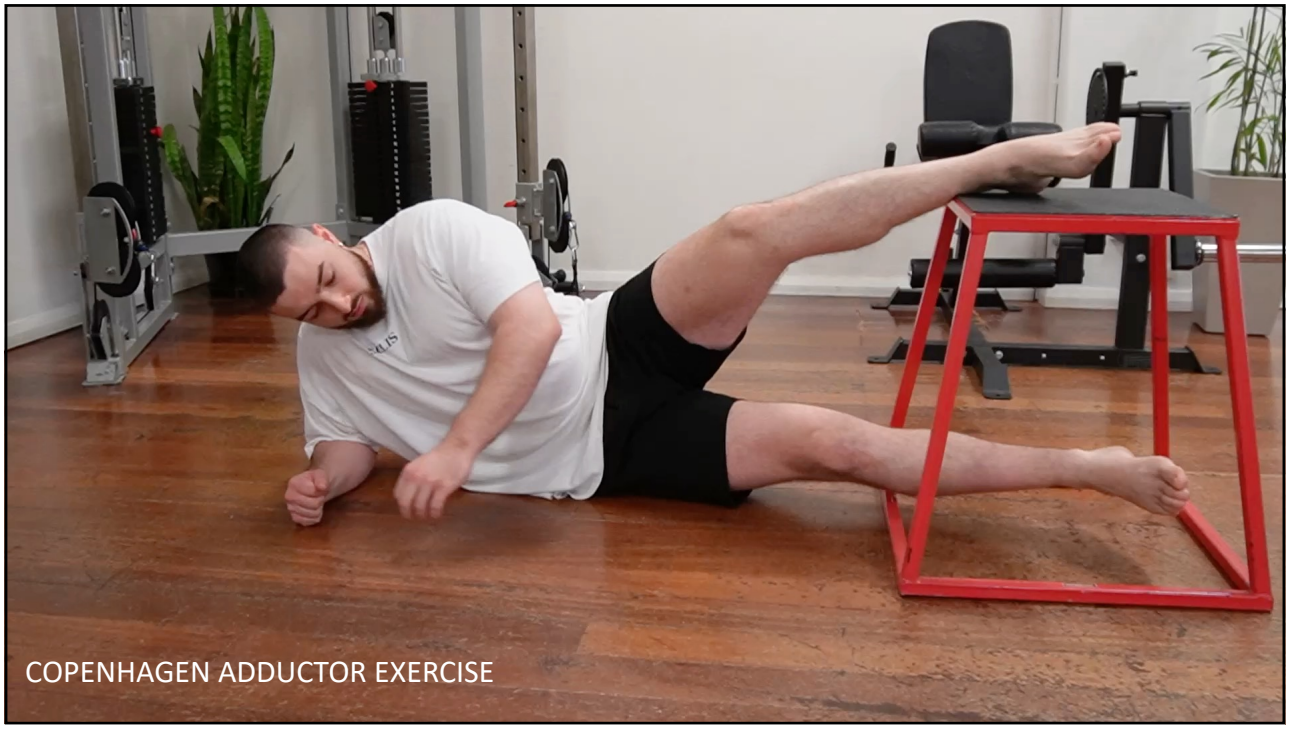

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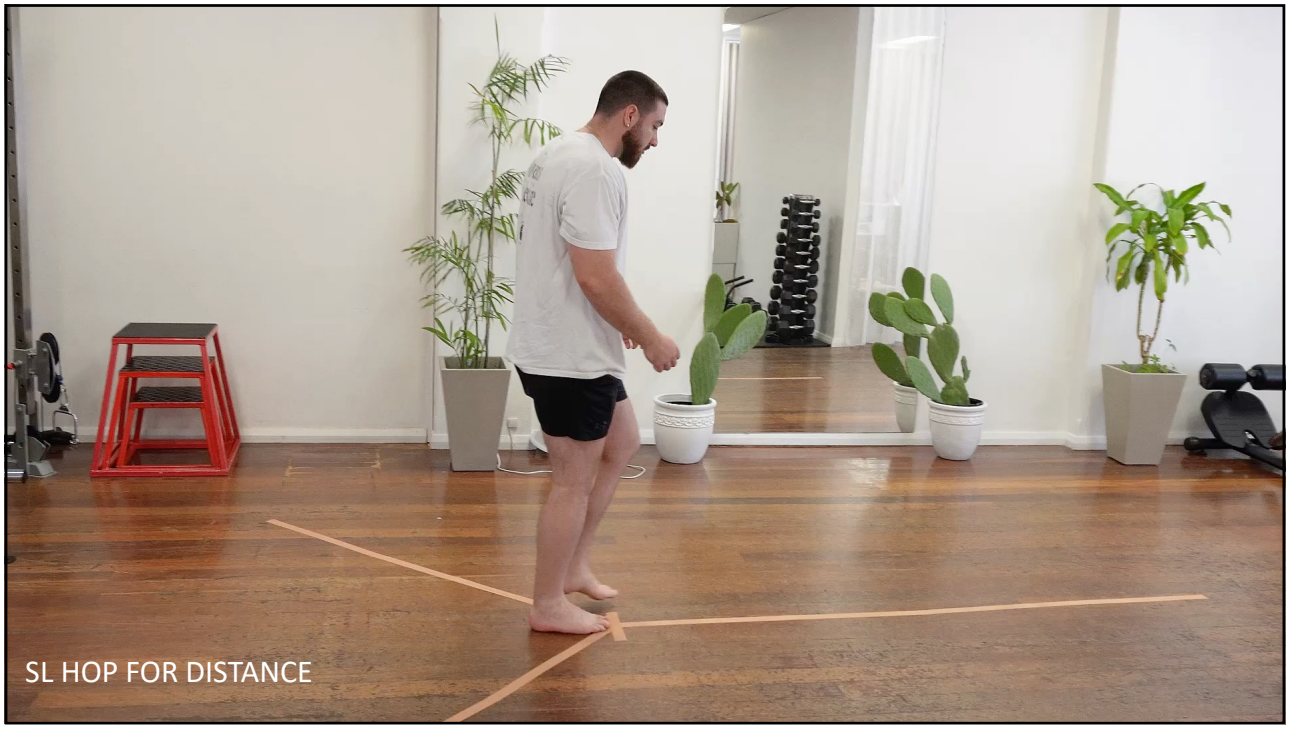

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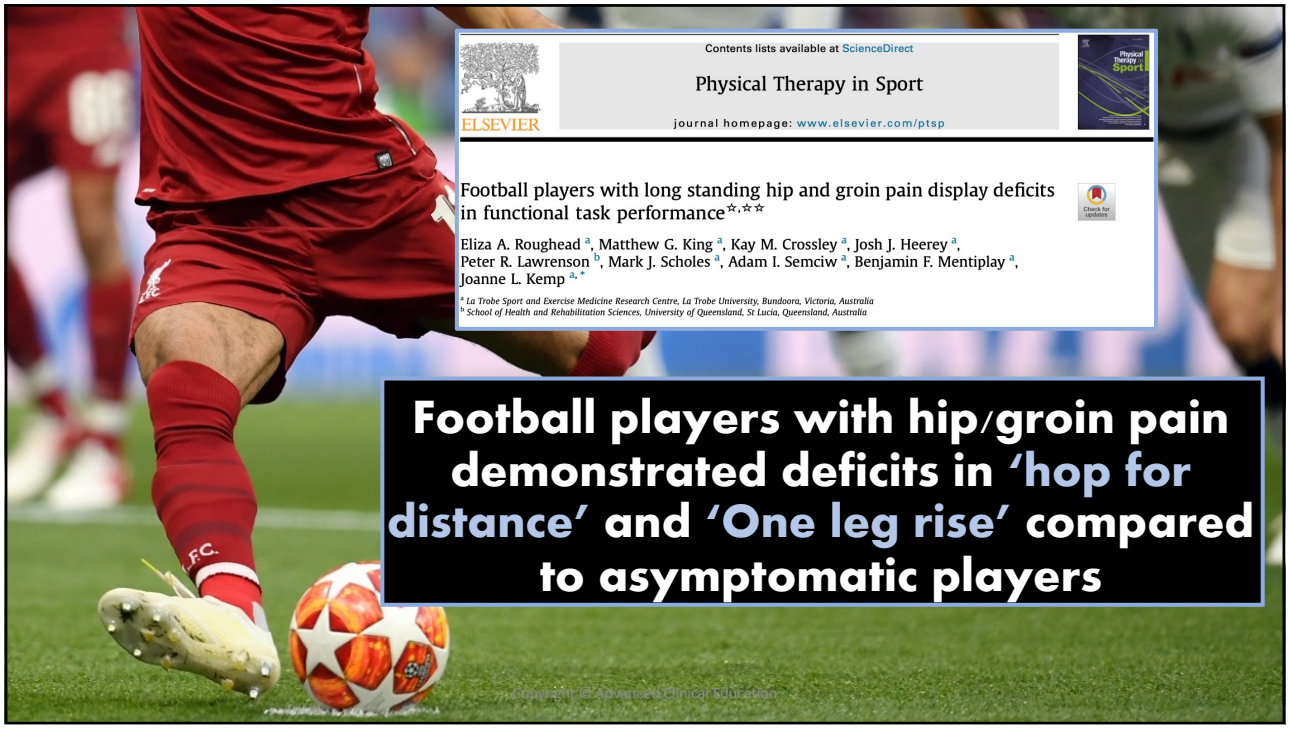
Contents lists available at ScienceDirect
Physical Therapy in Sport
journal homepage: www.elsevier.com/ptsp
Football players with long standing hip and groin pain display deficits in functional task performance☆,☆☆
Eliza A. Roughead [a], Matthew G. King [a], Kay M. Crossley [a], Josh J. Heerey [a], Peter R. Lawrenson [b], Mark J. Scholes [a], Adam I. Semciw [a], Benjamin F. Mentiplay [a], Joanne L. Kemp [a,*]
[a] La Trobe Sport and Exercise Medicine Research Centre, La Trobe University, Bundoora, Victoria, Australia
[b] School of Health and Rehabilitation Sciences, University of Queensland, St Lucia, Queensland, Australia
Football players with hip/groin pain demonstrated deficits in 'hop for distance' and 'One leg rise' compared to asymptomatic players
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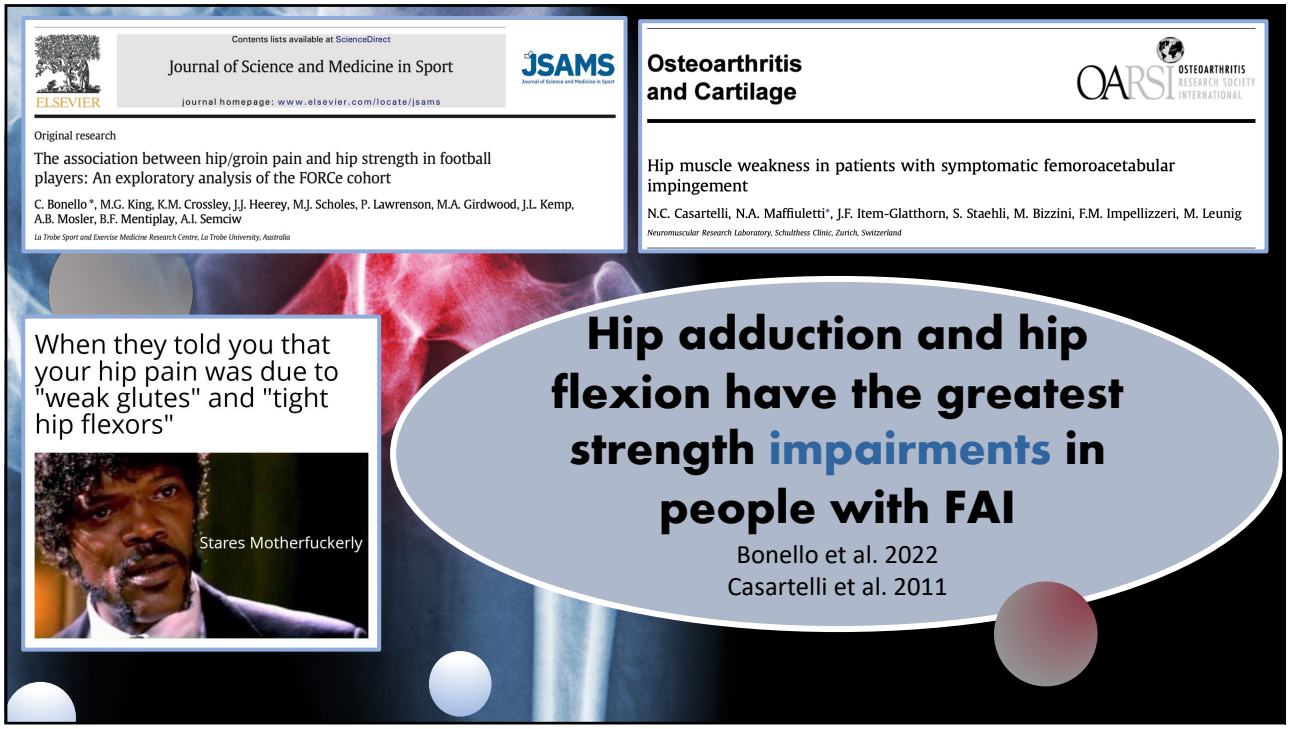
Contents lists available at ScienceDirect
Journal of Science and Medicine in Sport
journal homepage: www.elsevier.com/locate/jsams
Original research
The association between hip/groin pain and hip strength in football players: An exploratory analysis of the FORCe cohort
C. Bonello *, M.G. King, K.M. Crossley, J.J. Heerey, M.J. Scholes, P. Lawrenson, M.A. Girdwood, J.L. Kemp, A.B. Mosler, B.F. Mentiplay, A.I. Semciw
La Trobe Sport and Exercise Medicine Research Centre, La Trobe University, Australia
Osteoarthritis and Cartilage
Hip muscle weakness in patients with symptomatic femoroacetabular impingement
N.C. Casartelli, N.A. Maffiuletti*, J.F. Item-Glatthorn, S. Staehli, M. Bizzini, F.M. Impellizzeri, M. Leunig
Neuromuscular Research Laboratory, Schulthess Clinic, Zurich, Switzerland
When they told you that your hip pain was due to "weak glutes" and "tight hip flexors"
Stares Motherfuckerly
Hip adduction and hip flexion have the greatest strength impairments in people with FAI
Bonello et al. 2022
Casartelli et al. 2011

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Try it out in pairs

Pain reproduction, effort, asymmetries

FPT	Left	RPE (0-10)	VAS (0-100)	Right	RPE (0-10)	VAS (0-100)
SL Squat task (5 reps)						
SL Squat to rise (Total reps in 30 seconds)						
Y-Balance test (Distance)						
CAE (Copenhagen adductor exercise (time / reps)						
Side bridge test (time)						
Single leg jump – (distance - cm)						

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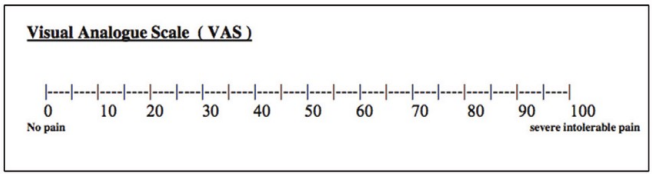
Also measure RPE

Perform test at baseline 4 weeks, 8 weeks and 12 weeks

Rating of Perceived Exertion (RPE Scale)	
10	Maximal
9	Really, Really, Hard
8	Really Hard
7	
6	Hard
5	Challenging
4	Moderate
3	Easy
2	Really Easy
1	Rest

Note VAS scores



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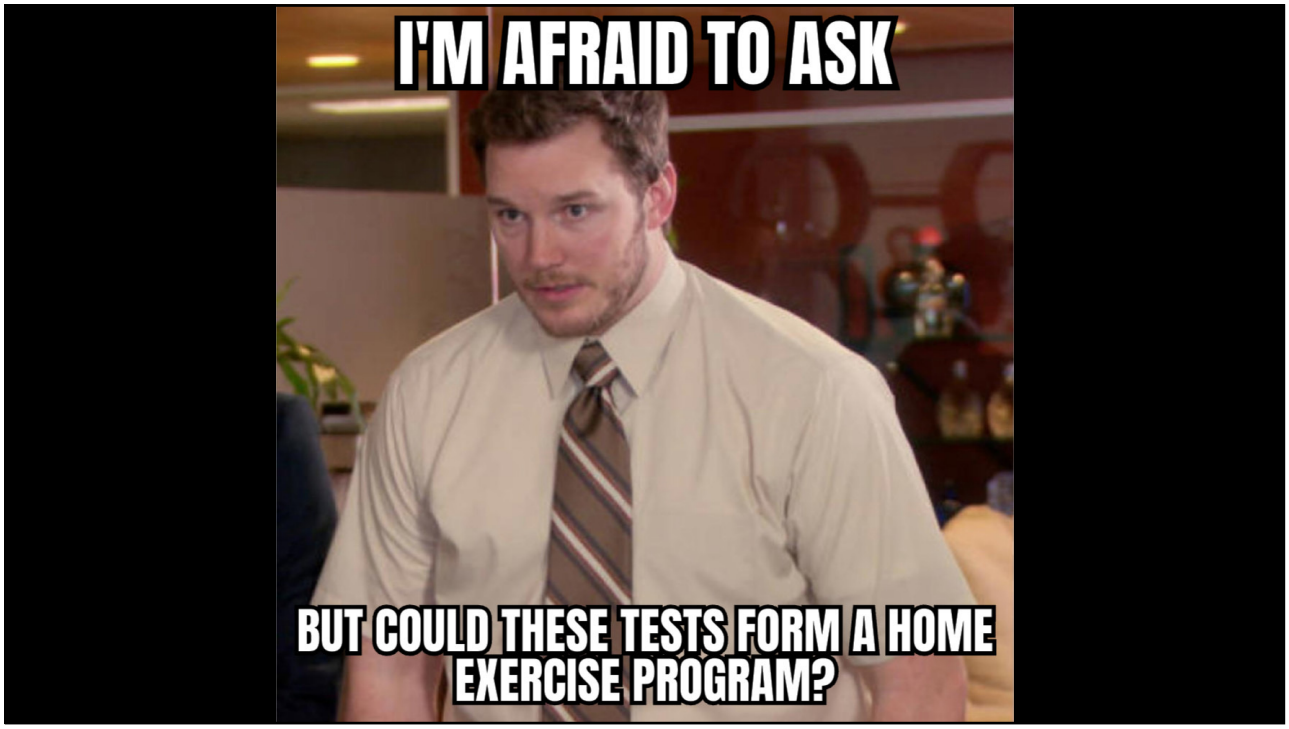
I'M AFRAID TO ASK
BUT COULD THESE TESTS FORM A HOME EXERCISE PROGRAM?

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2
1
PUTTING IT TOGETHER FOR FAIS AND INTRA-ARTICULAR GROIN PAIN

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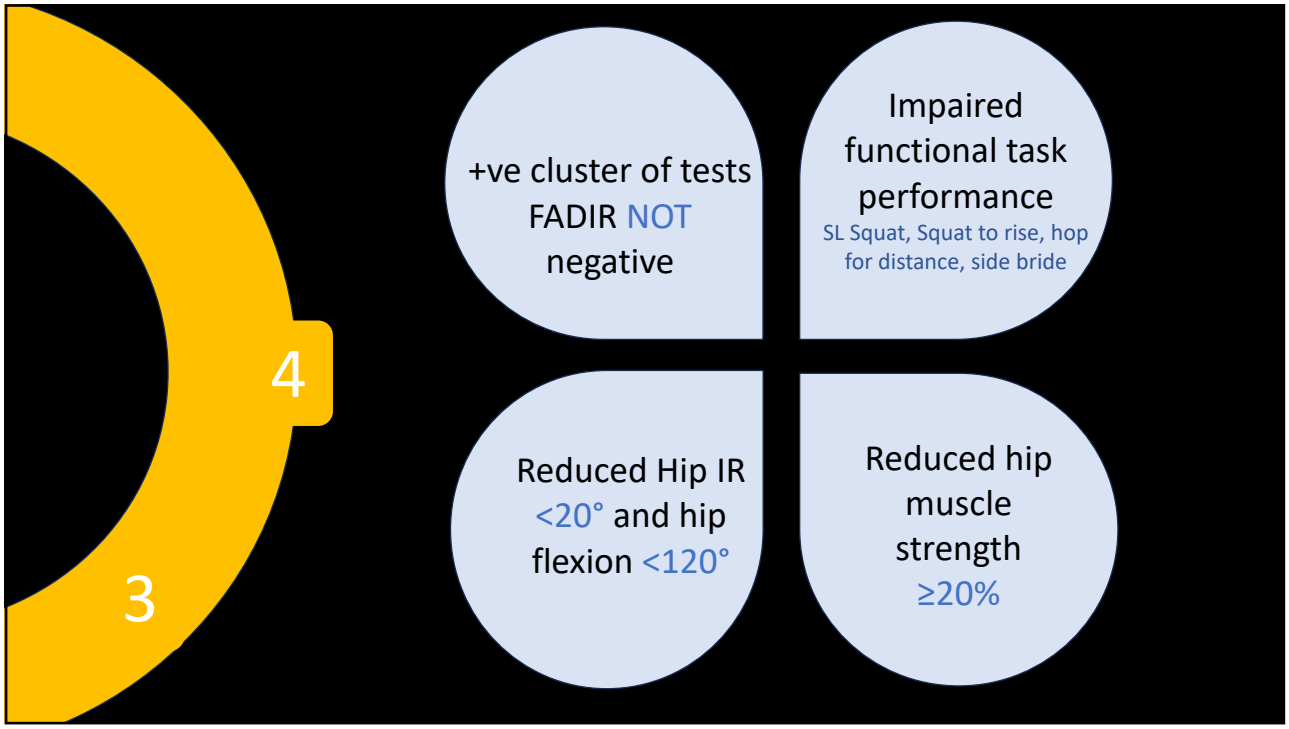
4
3
+ve cluster of tests FADIR NOT negative
Impaired functional task performance
SL Squat, Squat to rise, hop for distance, side bride
Reduced Hip IR <20° and hip flexion <120°
Reduced hip muscle strength ≥20%

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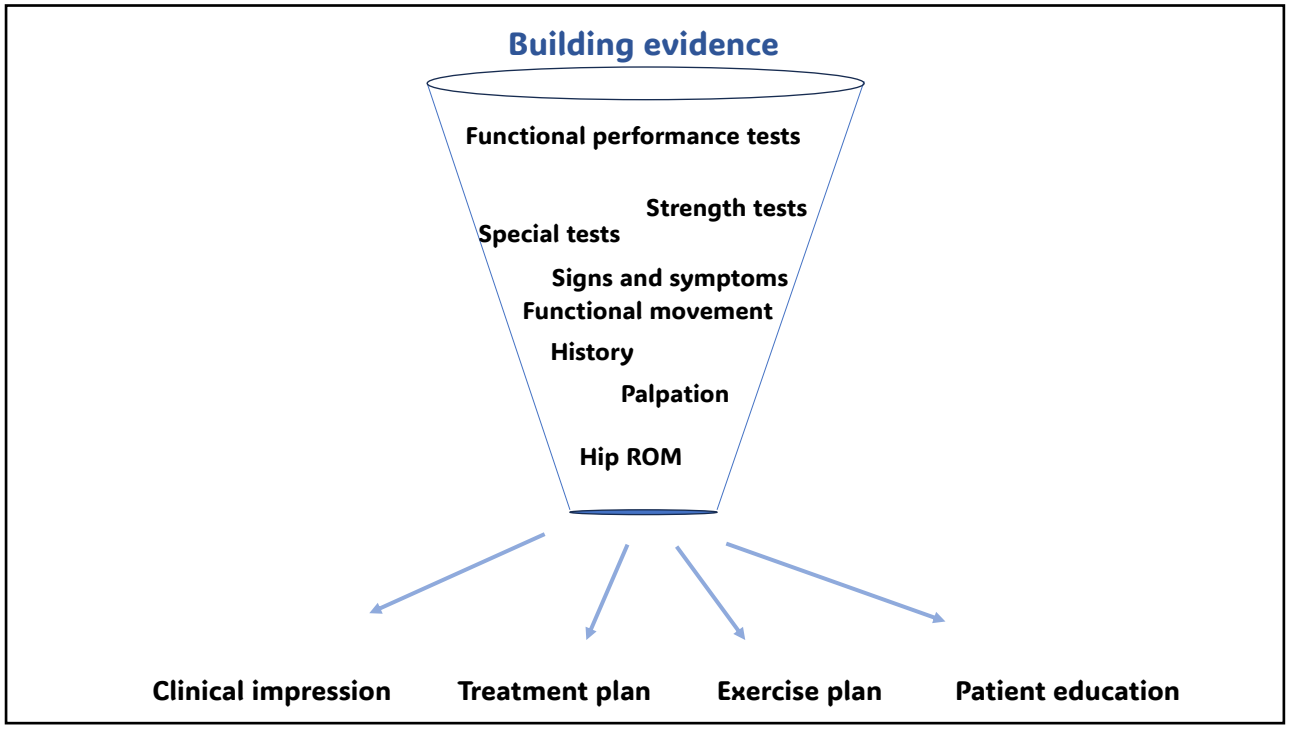
Building evidence
Functional performance tests
Strength tests
Special tests
Signs and symptoms
Functional movement
History
Palpation
Hip ROM
Clinical impression
Treatment plan
Exercise plan
Patient education

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WHY Manual therapy?

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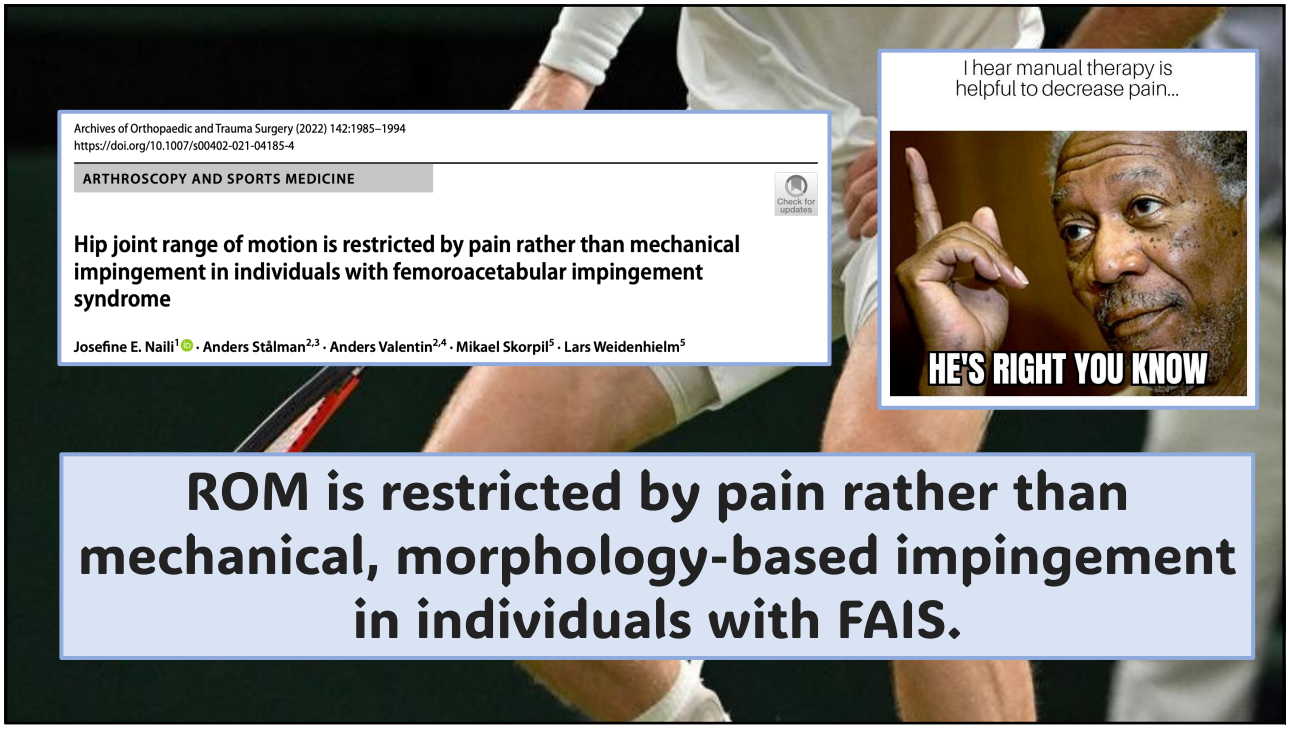
Archives of Orthopaedic and Trauma Surgery (2022) 142:1985–1994
https://doi.org/10.1007/s00402-021-04185-4
ARTHROSCOPY AND SPORTS MEDICINE
Hip joint range of motion is restricted by pain rather than mechanical impingement in individuals with femoroacetabular impingement syndrome
Josefine E. Naili[1] · Anders Stålman[2,3] · Anders Valentin[2,4] · Mikael Skorpil[5] · Lars Weidenhielm[5]
I hear manual therapy is helpful to decrease pain...
HE'S RIGHT YOU KNOW
ROM is restricted by pain rather than mechanical, morphology-based impingement in individuals with FAIS.

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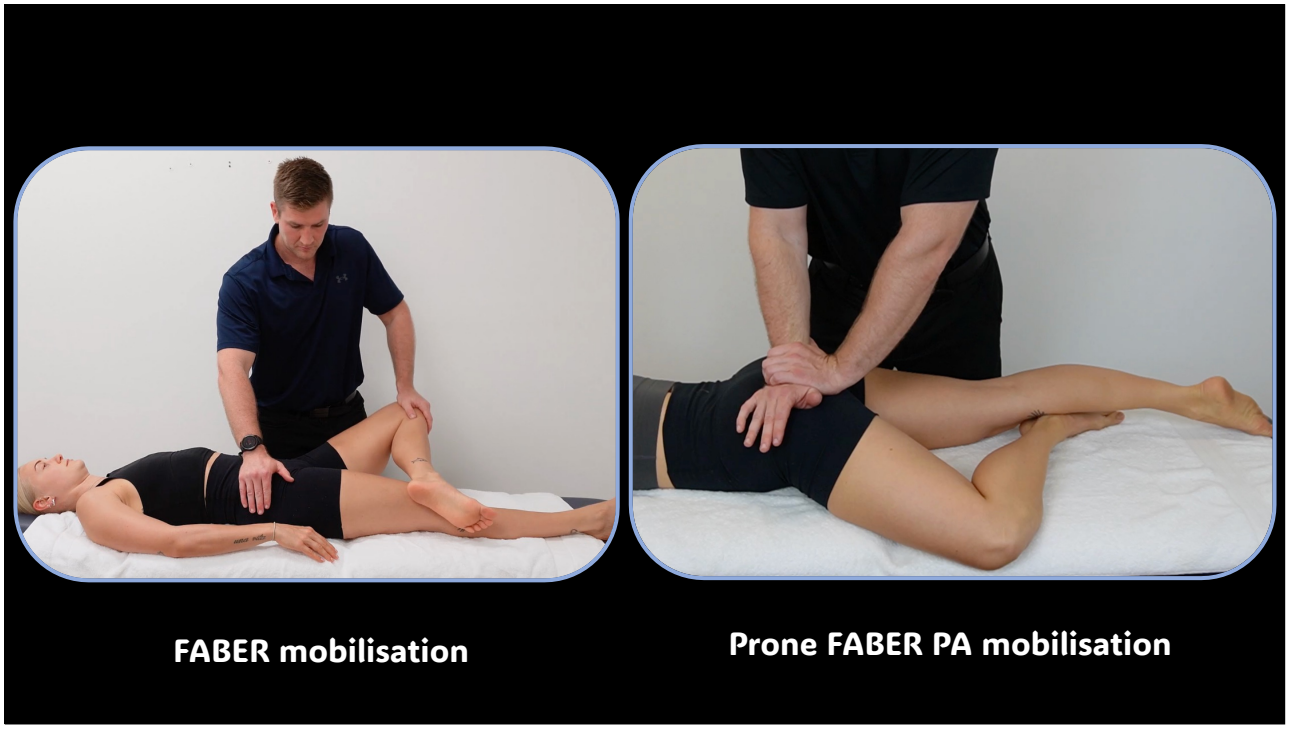
FABER mobilisation
Prone FABER PA mobilisation

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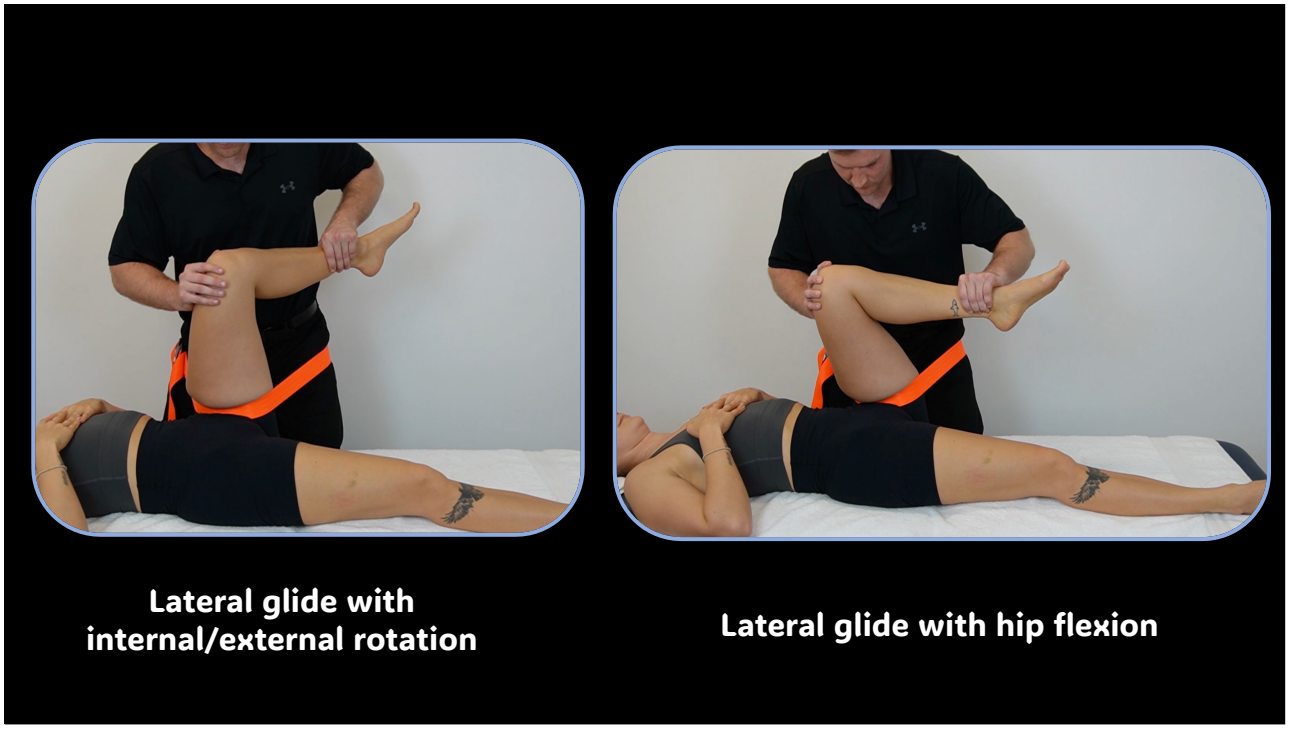
Lateral glide with internal/external rotation
Lateral glide with hip flexion

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Inferior glide / PA glide with hip flexion
LAD mobilisation

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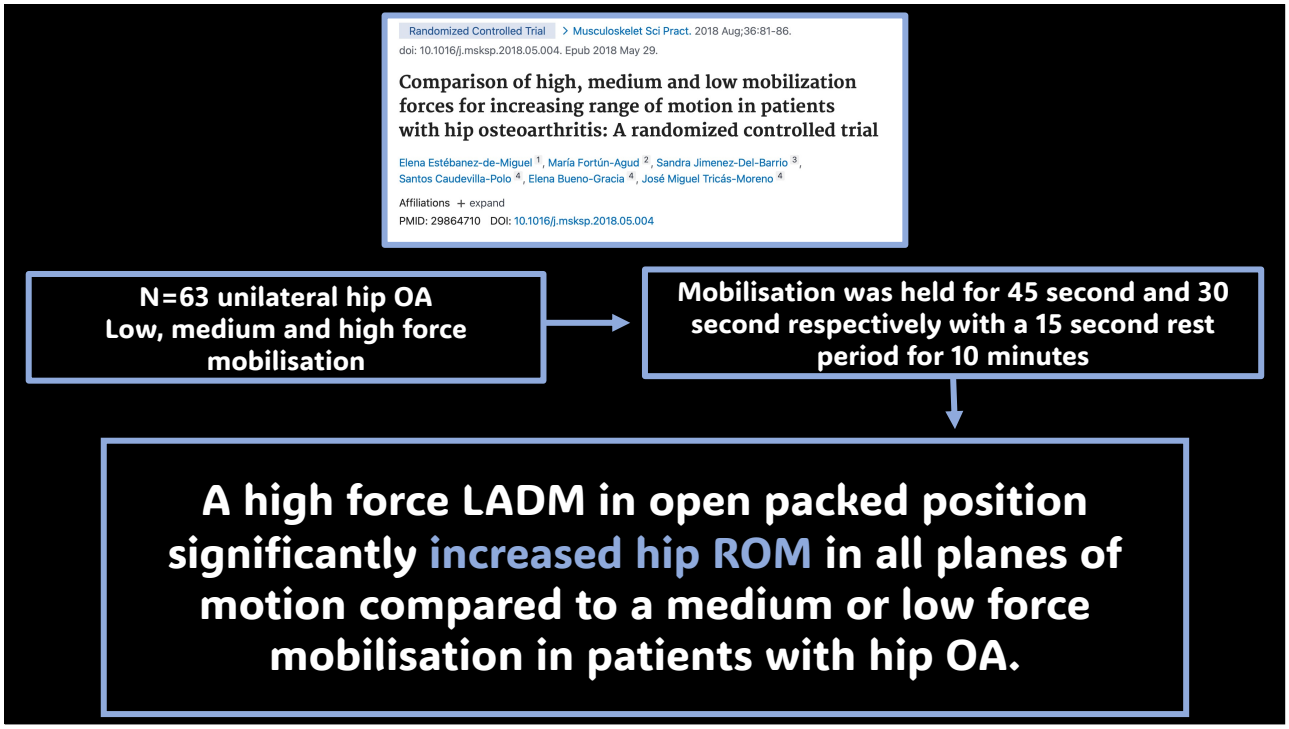
Randomized Controlled Trial > Musculoskelet Sci Pract. 2018 Aug;36:81-86.
doi: 10.1016/j.msksp.2018.05.004. Epub 2018 May 29.
Comparison of high, medium and low mobilization forces for increasing range of motion in patients with hip osteoarthritis: A randomized controlled trial
Elena Estébanez-de-Miguel [1], María Fortún-Agud [2], Sandra Jimenez-Del-Barrio [3], Santos Caudevilla-Polo [4], Elena Bueno-Gracia [4], José Miguel Tricás-Moreno [4]
Affiliations + expand
PMID: 29864710 DOI: 10.1016/j.msksp.2018.05.004
N=63 unilateral hip OA
Low, medium and high force mobilisation
Mobilisation was held for 45 second and 30 second respectively with a 15 second rest period for 10 minutes
A high force LADM in open packed position significantly increased hip ROM in all planes of motion compared to a medium or low force mobilisation in patients with hip OA.

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MASSAGE & MYOTHERAPY AUSTRALIA
Thank you
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bodine@advancedclinicaled.com
ACE ADVANCED CLINICAL EDUCATION

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