Using a targeted physiotherapy intervention to treat femoroacetabular impingement syndrome (FAIS)

Joanne L Kemp

PhD, APA Sports Physiotherapist

Latrobe Sport and Exercise Medicine Research Centre

LA TROBE UNIVERSITY • AUSTRALIA

@JoanneLKemp e: j.kemp@latrobe.edu.au

Australian Government
National Health and Medical Research Council
NHMRC

Meet Mr X……

27 year old semi-professional footballer (height 1.80m, weight 69.3 kg, BMI 21.4 kg/m^2)

Never played at professional level

Playing history 8 years at NPL Australia (state-based semi-professional league)

Onset of hip and groin pain right side 1 month into 2016 season

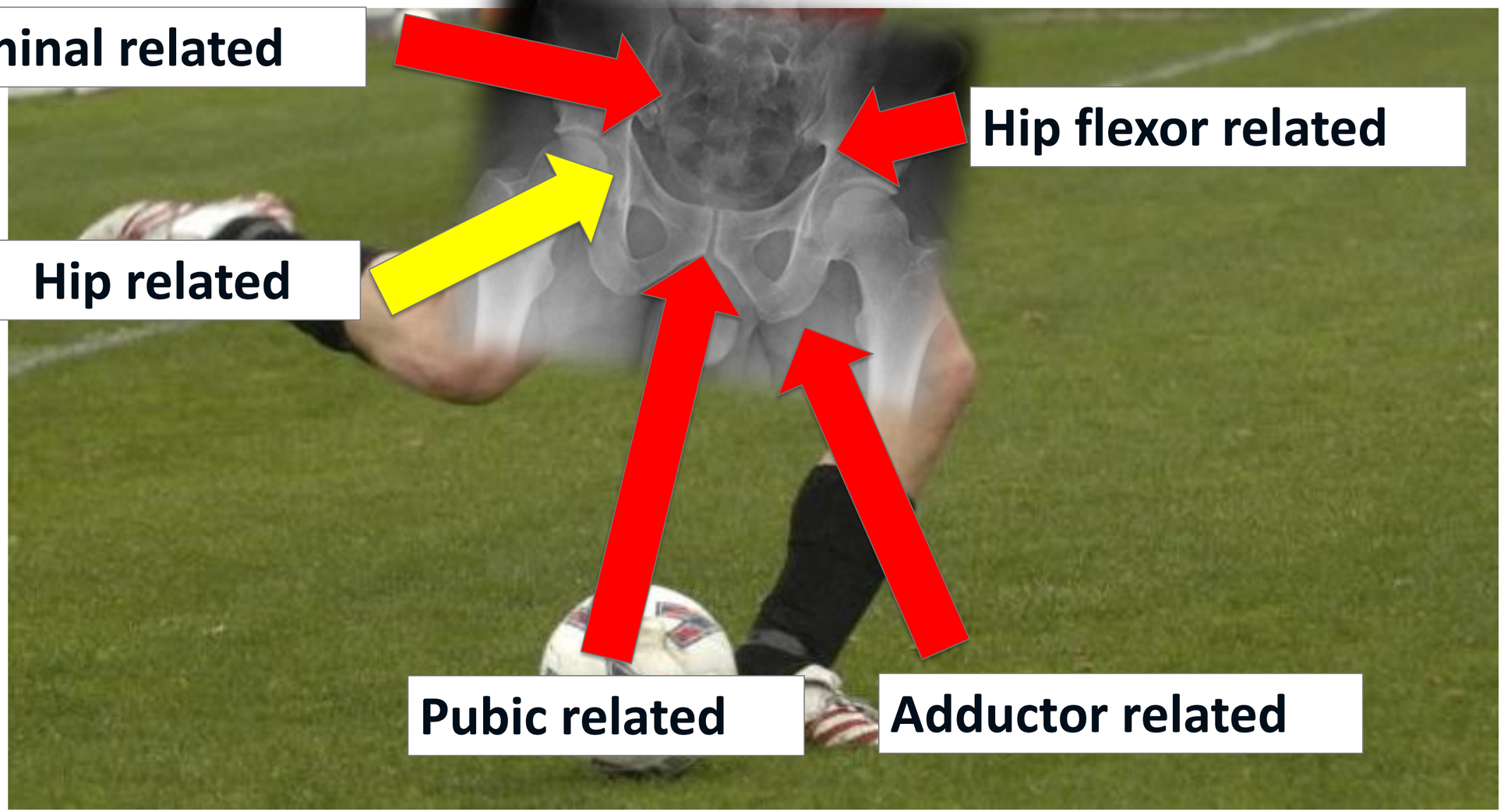
Played on for 3 weeks and then stopped playing

Had not played for 6 months at time of initial assessment (August 2016) due to immediate onset of pain with running

1st episode of hip/groin pain


Haymes

How do we know it is hip-related groin pain?



Consensus statement

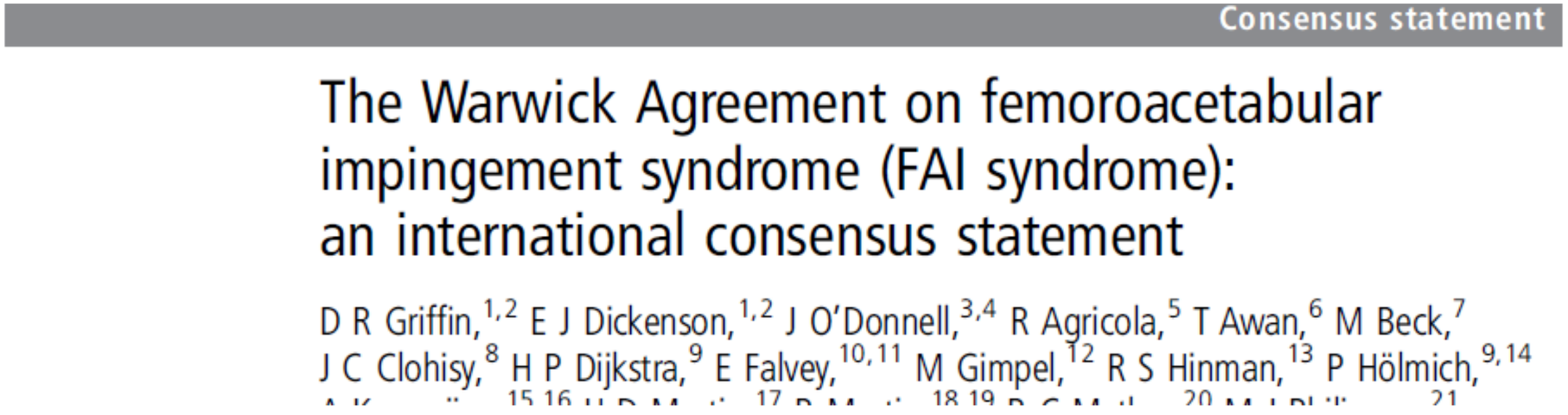
OPEN ACCESS

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

How do we know the hip-related pain is FAI?

For a patient to be diagnosed with <u>FAI Syndrome</u>, must have

1. Positive imaging findings (may include x-ray alpha angle>60) [6]
2. Symptoms
3. Signs of FAI



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]

[6] Agricola et al OAC 2014

Mr X had severe FAI……

Alpha angle >83˚ = **10 x risk of OA**

Right hip muscle weakness = asymmetry >30%
Adductors were especially weak
Reduced functional tasks >30%

IHOT-33 scores and hip range **similar to hip OA**
Significant night pain

Fear of impact of condition on ability to travel
Fear of never playing football again

FAIS has large impact on affected individuals

While most people with cam morphology do not develop FAIS (ie: develop signs and symptoms), for those that do, the impact is enormous Agricola 2013, Kemp 2014, Hinman 2013

Quality of life scores similar to people with end stage hip OA. Clohisy 2013, kemp 2014

Young and middle aged people with large family and work commitments Griffin 2016, Kemp 2014

Unable to exercise = big consequences for general health Kemp 2014, Filbay 2015

Increased risk (10 times greater) of end stage hip OA and THA Agricola 2012, 2013

How can we develop a physiotherapy intervention?

What are treatment options for FAIS?

Griffin 2016

Surgery
Conservative
Physiotherapy

Surgical treatment

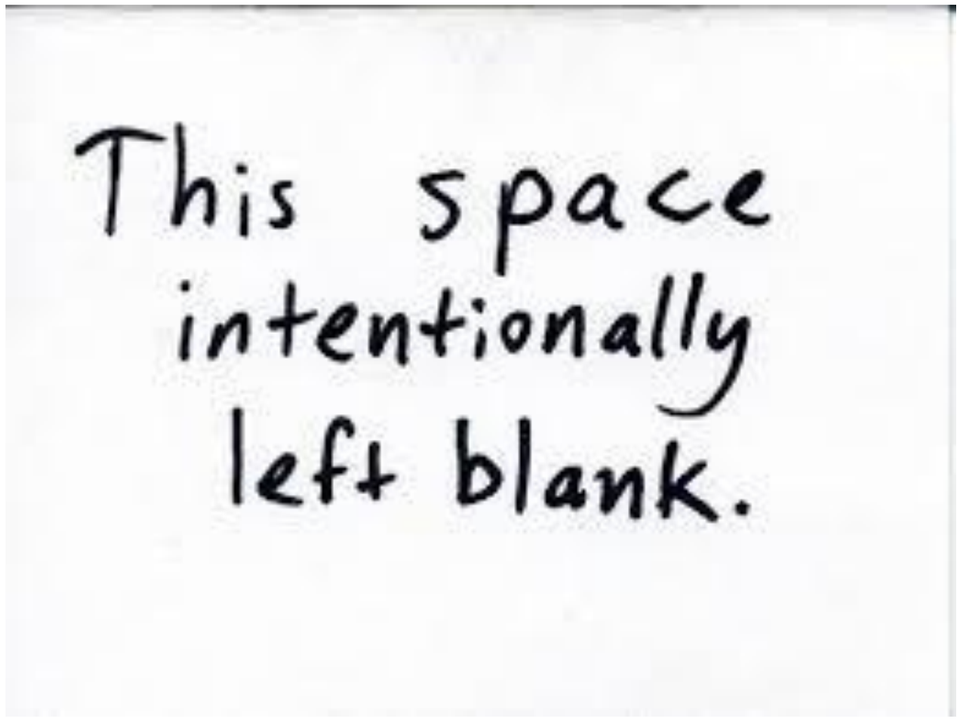
Recent RCT showed adjusted incremental cost of hip arthroscopy compared with physio was £2372; incremental quality-adjusted life years of −0·015 (surgery not cost-effective).Griffin 2018

Increase in co-morbidities post hip scope Rhon 2018

(mental health ↑84%, chronic pain ↑166%, sleep ↑111%, systemic arthropathy ↑132%)

Given this, high-quality non-surgical treatments urgently needed.

“Conservative” treatment



The efficacy of physiotherapy interventions for hip pain: A systematic review of the literature.

Kemp, Mosler, Hart, Bizzini, Scholes, Chang, Crossley, 2018 (unpublished)

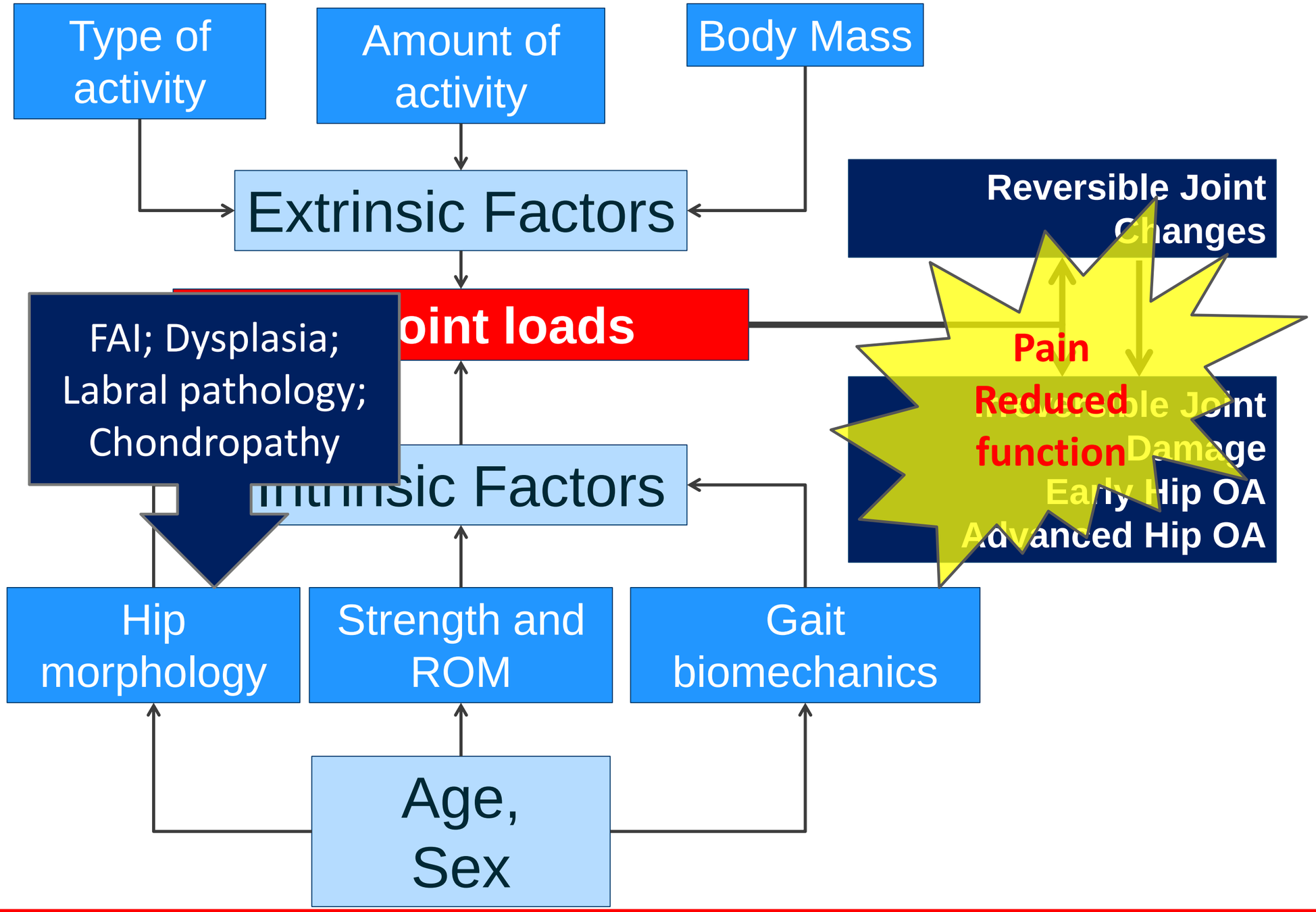
Aim: Identify the effectiveness of physiotherapy interventions in improving pain and function in young and middle aged adults experiencing hip pain (FAI).

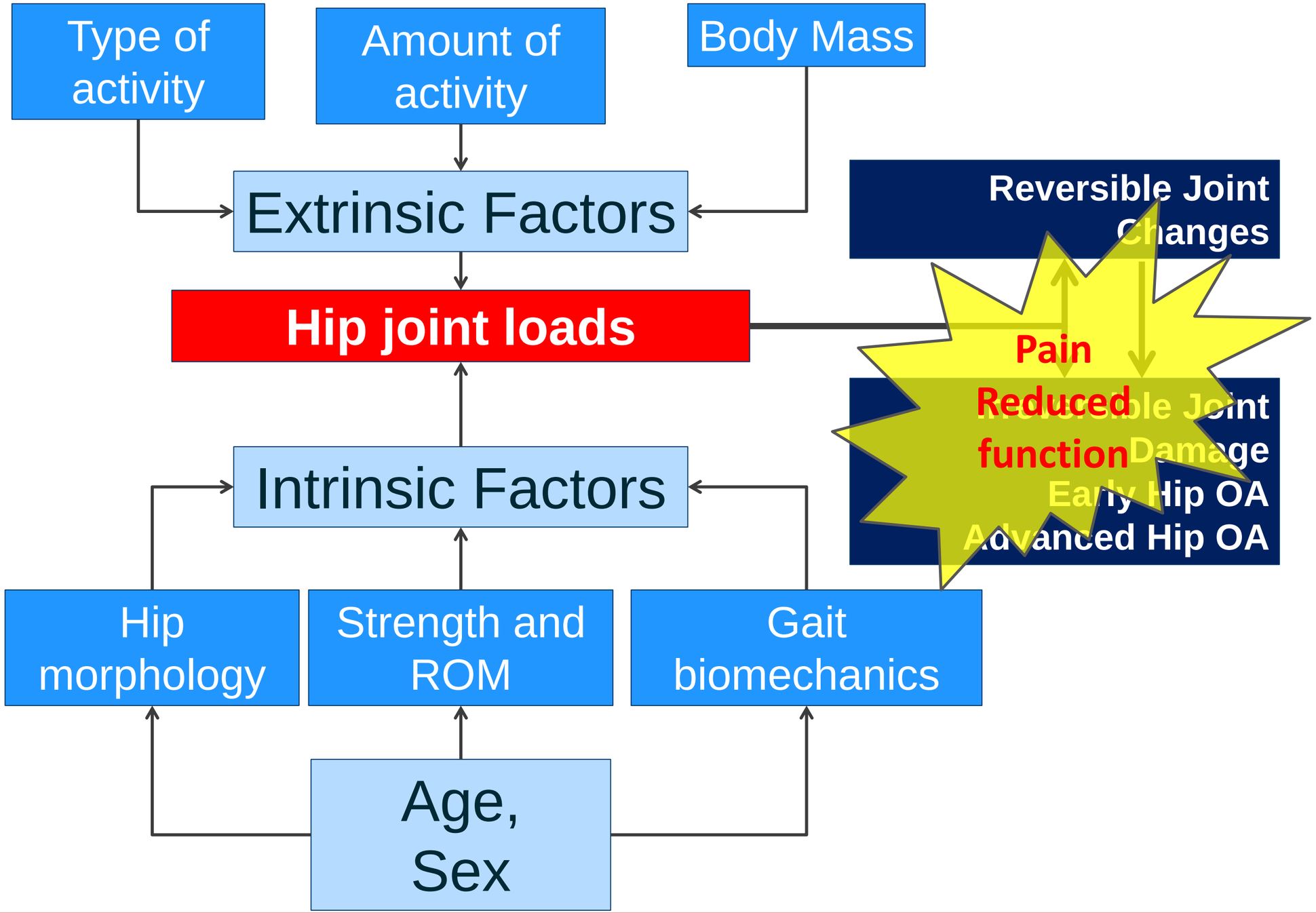
1750 studies retrieved in search

13 studies included, 9 RCTs, 4 case series

No full-scale placebo-controlled RCT evidence supporting non-surgical management for FAIS

Best preliminary results seem to be > 3 month-duration strength-based programs


Type of activity
Amount of activity
Body Mass
Extrinsic Factors
oint loads
FAI; Dysplasia;
Labral pathology;
Chondropathy
Intrinsic Factors
Reversible Joint Changes
Pain
Reduced function
Irreversible Joint Damage
Early Hip OA
Advanced Hip OA
Hip morphology
Strength and ROM
Gait biomechanics
Age, Sex


Type of activity
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Hip morphology
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Gait biomechanics
Age, Sex
Reversible Joint Changes
Pain
Reduced function
Irreversible Joint Damage
Early Hip OA
Advanced Hip OA

Characteristic, modifiable impairments in FAI

Characteristic, modifiable impairments in FAI

Hip muscle strength and single leg dynamic balance reduced FAI v control participants[4]

Better hip flexion range and ADDUCTION strength were associated with better quality of life[5]

FAI = bilateral impairments in functional performance[6,7]

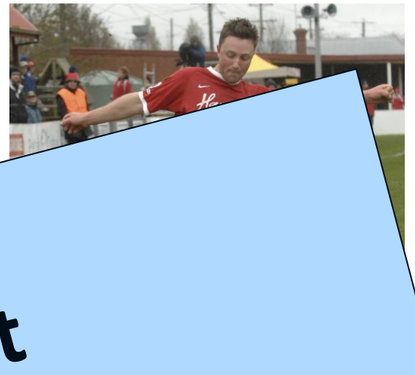
Greater strength in hip abduction and adduction = better functional performance[6]

Better functional performance = less pain and better QOL[6]

[2] Kemp et al in Clinical Sports Medicine 2017 [4] Freke et al BJSM 2016 [5] Kemp et al KSSTA 2017 [6] Kemp et al JOSPT 2016 [7] Charlton et al PMR 2016

How can we then incorporate knowledge of impairments with return to play principles?

[2] Kemp et al in Clinical Sports Medicine 2017



Onset of pa

Return to play

1. Shared decision making
2. RTP planning starts at initial assessment
3. stARRT framework[9,10]

Risk assessment (evidence) vs. Risk tolerance (individual)

[9] Ardern et al BJSM 2016 [10] Shrier in Clinical Sports Medicine 2017

We had a “fantastic” rehab program… but….

*Simon needed to **buy in** to the program*

Needed dedicated commitment of 6 hours/week

Essential part of buy in process was informing Simon of the evidence, and our rationale for the rehab program

Also, providing a clear, structured timeline of the whole rehabilitation program allowed Simon to co-ordinate other aspects of his life (work, family, social) to allow adequate time for the duration of the program

Specific aspects of the evidence-based rehabilitation program

Goal of treatments = optimise hip joint loads to allow RTP, targeting known impairments[2]

Hip strength[4]

Trunk strength[9]

Functional[9] and balance retraining[10]

Cardiovascular loading[2]

Education/Counselling/Shared decision making[2]

[2] Kemp et al in Clinical Sports Medicine 2017 [4] Freke et al BJSM 2016 [5] Kemp et al KSSTA 2017 [9] Kemp et al JOSPT 2017 [10] Hatton et al ACR 2014

Hip strength

[4] Freke et al BJSM 2016

Strength and conditioning principles[11]

Number of reps and sets

Rest between reps and sets

Load applied

Time under tension

Progressive strength program starting with low load, safe positions progressing to high load challenging positions

Allowed to progress when VAS <20mm and Borg perceived exertion ≤5 (moderate)

[11] Toigo and Boutellier 2006

Progressive strength - adduction

1

2

3

4

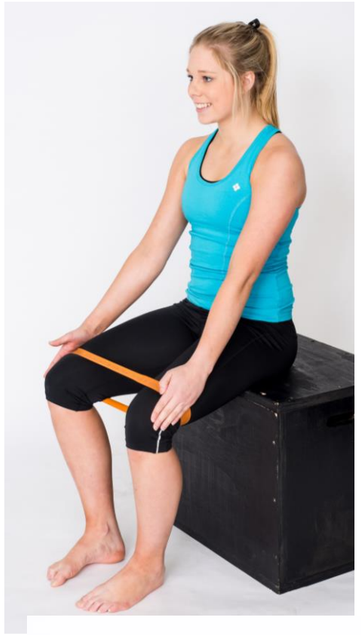
5

6

Progressive strength - abduction

1

2



3

4

5

6

7

Progressive strength - extension

1

2

3

4

5

6

7

8

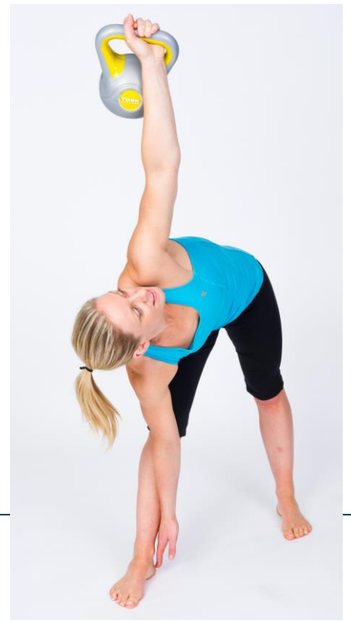
Trunk strength

Progressive strength – trunk

1

2

3



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Retrain both sides

Watch overactivity in hip flexors

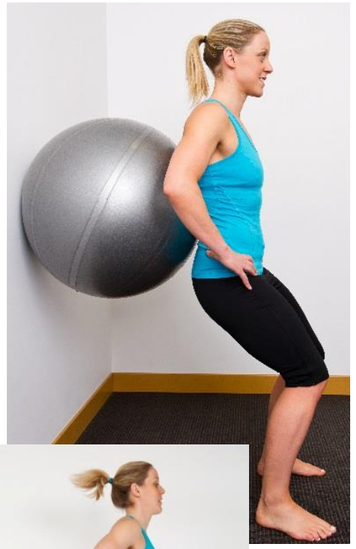
(avoid crunches and sit ups)

Focus on endurance

Function and balance

Progressive functional and balance retraining

1



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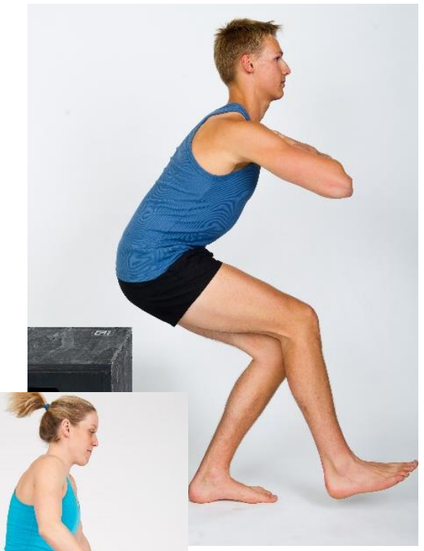

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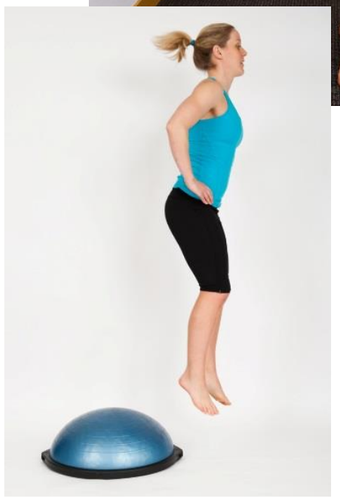

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7

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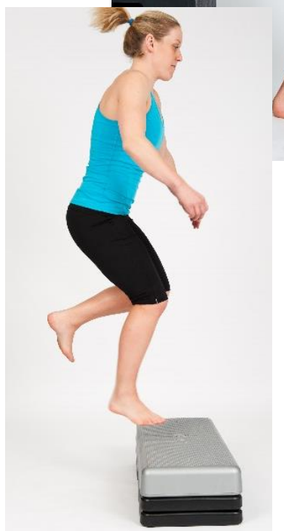

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Retrain both sides
Specific to sports
Focus on strength and endurance
Restore full load requirements

Cardiovascular loading

CV loading program to meet PA guidelines
150 minutes high intensity/week
Start = low impact high intensity (eg: swimming)
Finish = running including speed and direction change

Progression occurred when current phase was completed successfully,
VAS <30mm

Education/Counselling/Shared decision making

Education/Counselling/Shared decision making

Discussed FAI patients have early hip OA and need to manage accordingly

Need to maintain cardiovascular load throughout the rehabilitation process

He will have flare ups of symptoms, and will NOT be painfree with exercise (acceptable level of pain 3/10 ok)

Must be prepared for maintenance program that includes strength, balance, neuromotor control

Impingement position modification for ADL (90% time) = less overall impingement time = allows full sport load (10% time)

What happened to Mr X?

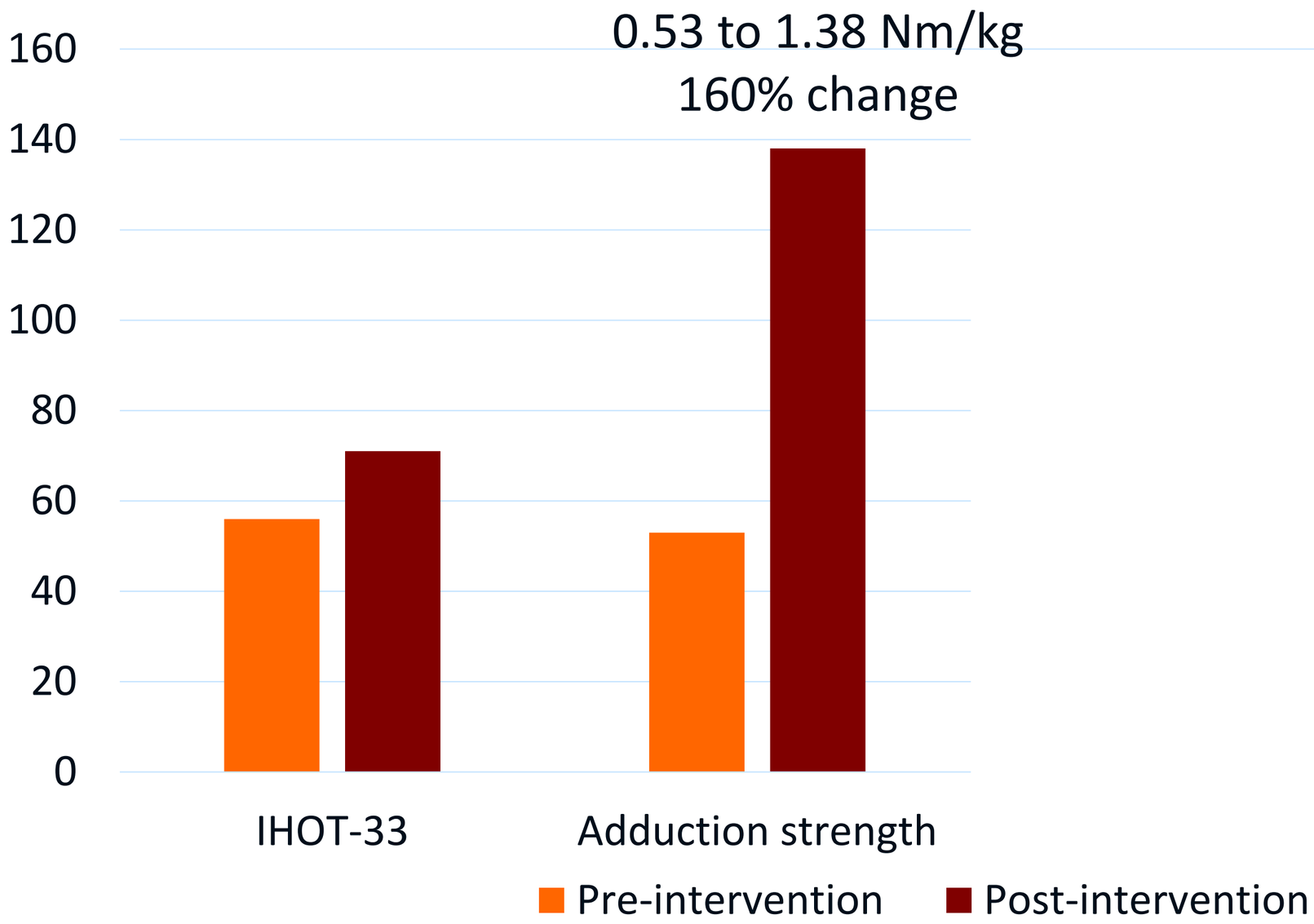
Underwent targeted 12-week “best-evidence” intervention, 8 x physio and 12 x 1:1 supervised gym sessions, and 2x weekly unsupervised gym sessions.

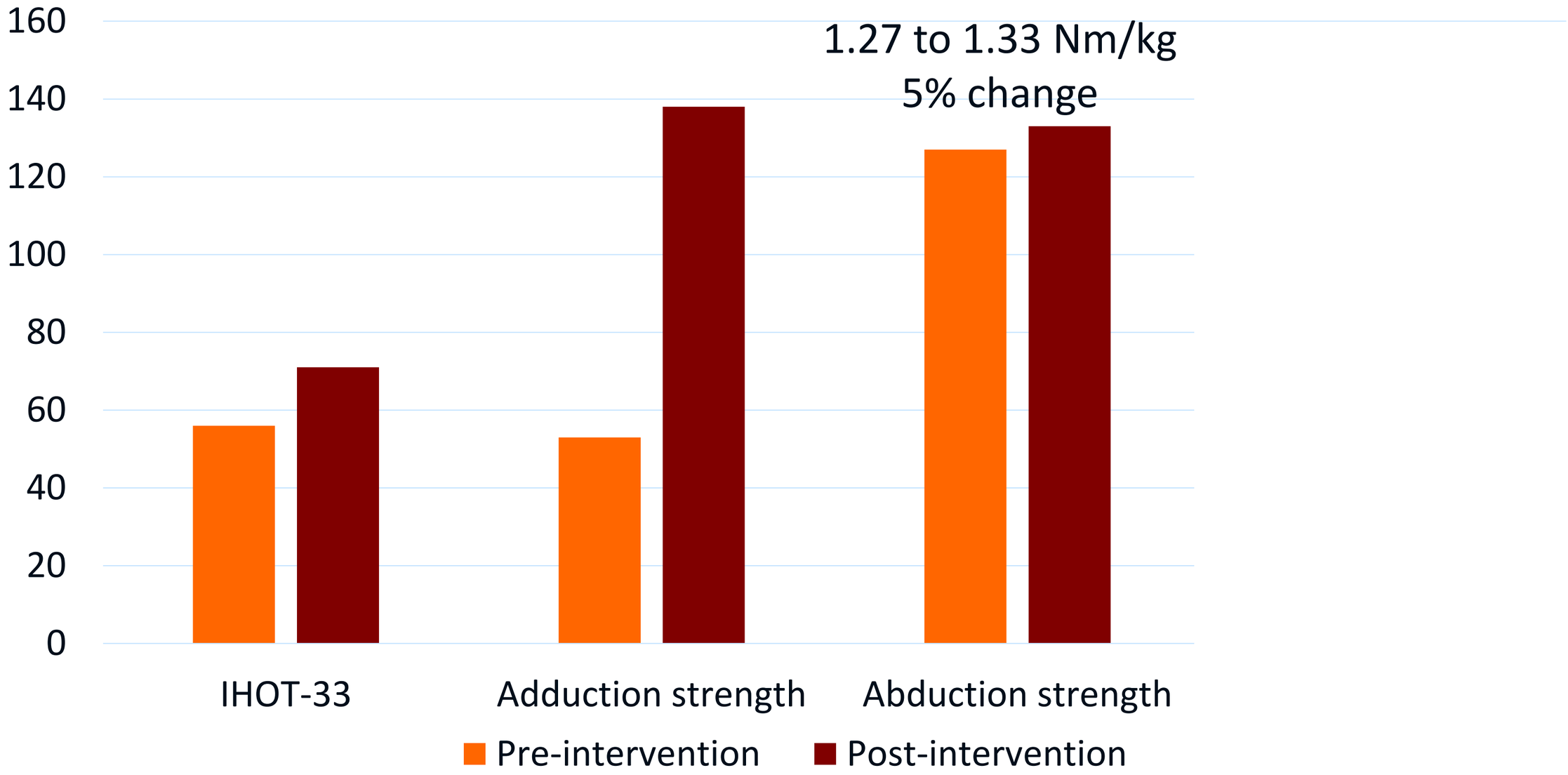
Targeted elements

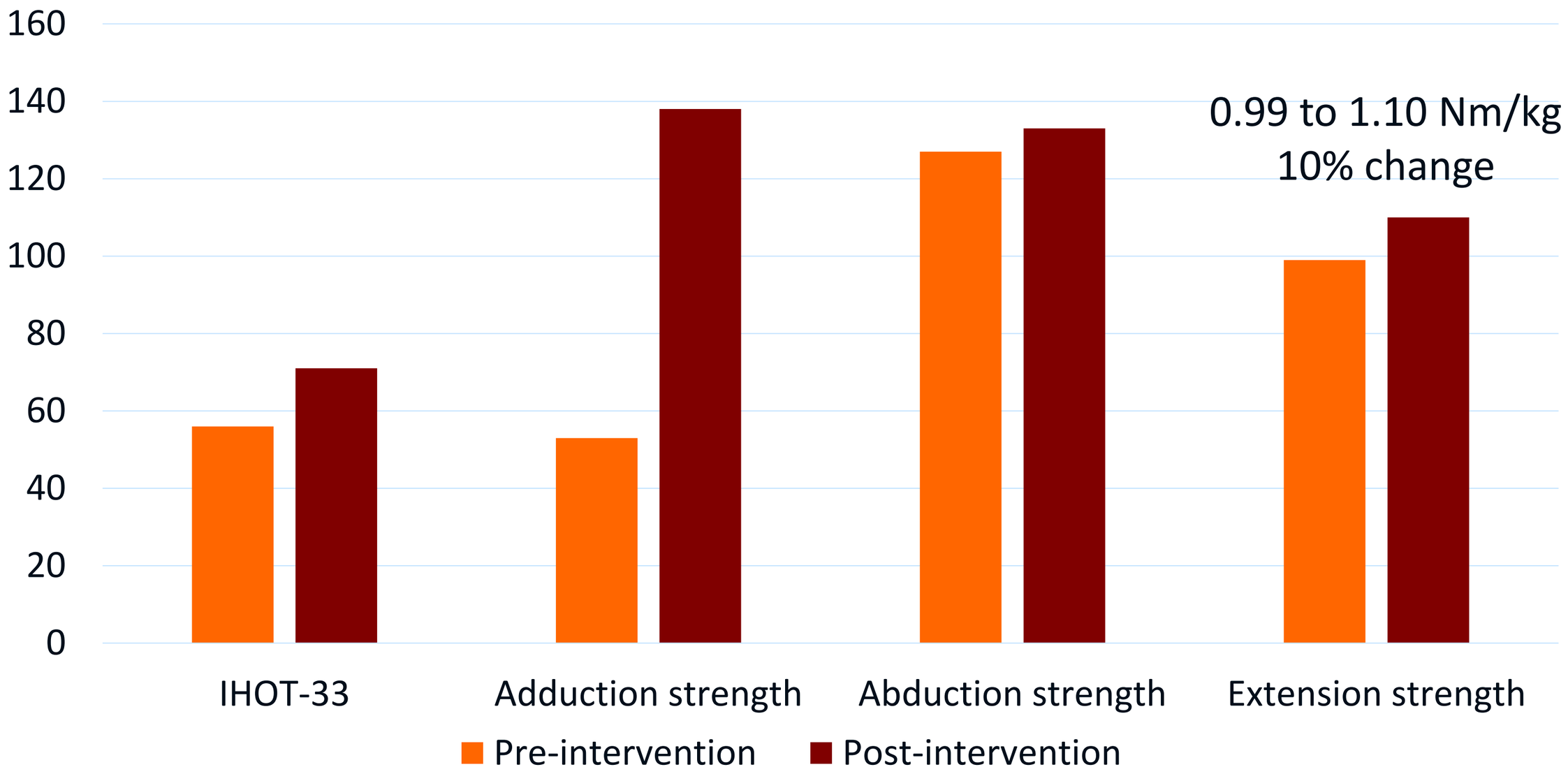
1. Hip muscle strength
2. Trunk muscle strength
3. Functional and balance retraining including RTS
4. CV load management
5. Education

Results

Change in primary and secondary outcomes


0.53 to 1.38 Nm/kg
160% change
160
140
120
100
80
60
40
20
0
IHOT-33
Adduction strength
Pre-intervention
Post-intervention


160
140
120
100
80
60
40
20
0
1.27 to 1.33 Nm/kg
5% change
IHOT-33
Adduction strength
Abduction strength
Pre-intervention
Post-intervention


160
140
120
100
80
60
40
20
0
0.99 to 1.10 Nm/kg
10% change
IHOT-33
Adduction strength
Abduction strength
Extension strength
Pre-intervention
Post-intervention

What about return to play?

No published RTP criteria for FAI……

Hip and trunk strength within 90% of opposite side, or published norms

Functional task performance within 90% of previously published benchmarks in hip cohorts

Full training load for 2 weeks with pain <3/10 during and 24 hours after training

No psych readiness questionnaire = IHOT-33 Physical activity and Social and emotional subscale score >80/100

Simon was confident, wanted to play and felt ready to RTP

What about return to play?

Able to train twice weekly and compete once weekly at full load, in the midfield at desired level at the completion of the rehabilitation program, with minimal hip and groin pain.

Conclusions and take home message

While the are no randomised controlled trials for the effectiveness of physiotherapy in FAI.

It is possible to use an evidence-based intervention, and ***still keep the patient at the centre of the program goals.***

An ***individualised*** program based on current knowledge of characteristic physical impairments, and using RTP principles, can be effective to allow players with FAI to return to play in semi-professional football.

@JoanneLKemp

e: j.kemp@latrobe.edu.au