Injuries in Racket sports

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Current president of Thai orthopedic society of sport medicine

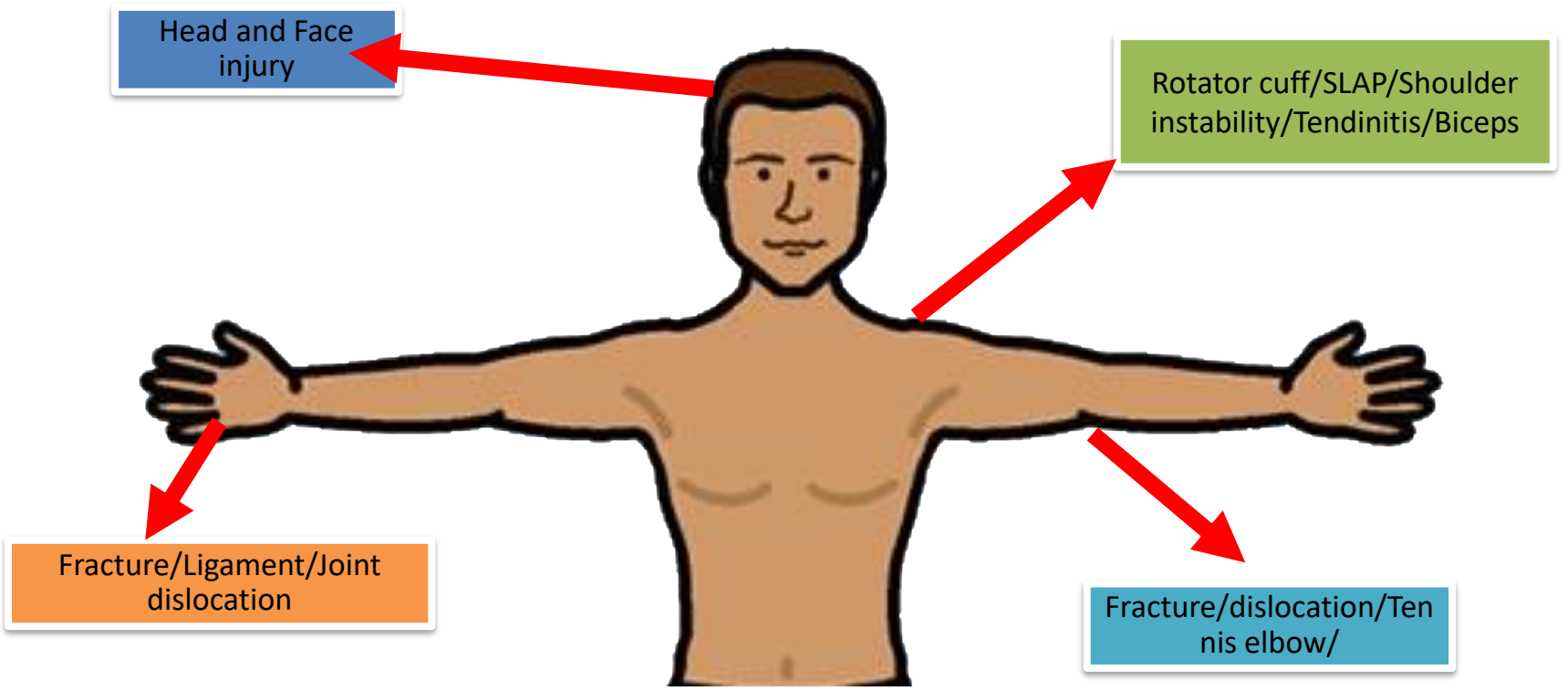
6th World Congress of Racket Sport Science

Introduction

- Sport injuries in Scandinavia :10-19% of all severe injuries in ER
- Common sports injuries: Knee and ankle injuries
- Common racket sports injuries: Shoulder, elbow and lower extremities

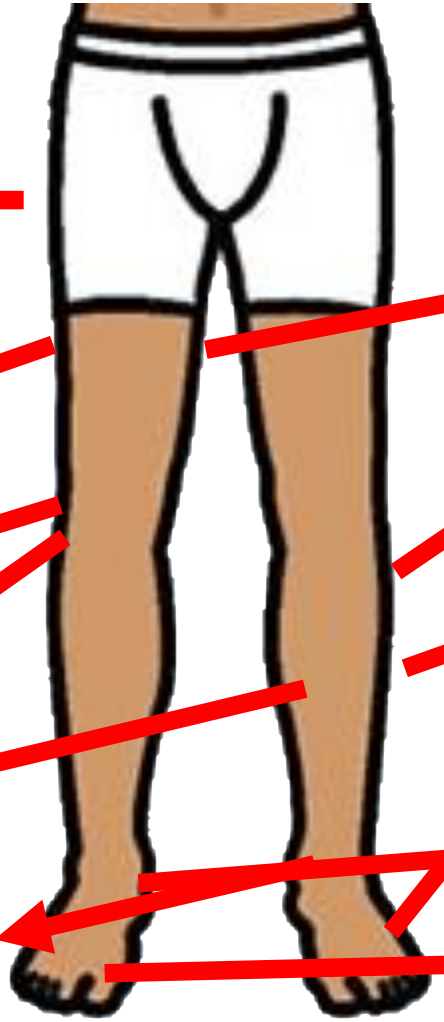
Bahr R et al. (2003) Epidemiology and prevention of sports injuries. Textbook of Sports Medicine: Basic Science and Clinical Aspects of Sports Injury and Physical Activity, pp. 299-314.

INJURIES



Bahr R et al. (2003) Epidemiology and prevention of sports injuries. Textbook of Sports Medicine: Basic Science and Clinical Aspects of Sports Injury and Physical Activity, pp. 299-314.

Injuries



Runner hip

Hamstring injury

Femoral Stress fx

IT band syndrome

ACL, Meniscus injury

Tibial stress fracture

Runner knee

Foot and ankle stress fx

Calf injury

Achilles tendon injury

Ankle sprain

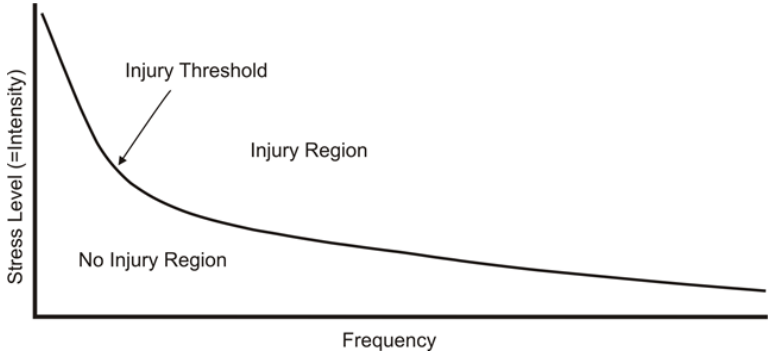
Plantar fasciitis

Failure Mode of injury

www.youtube.com

Over Ultimate Tensile Strength(1/3)

Fatigue Failure Or Overuse(2/3)



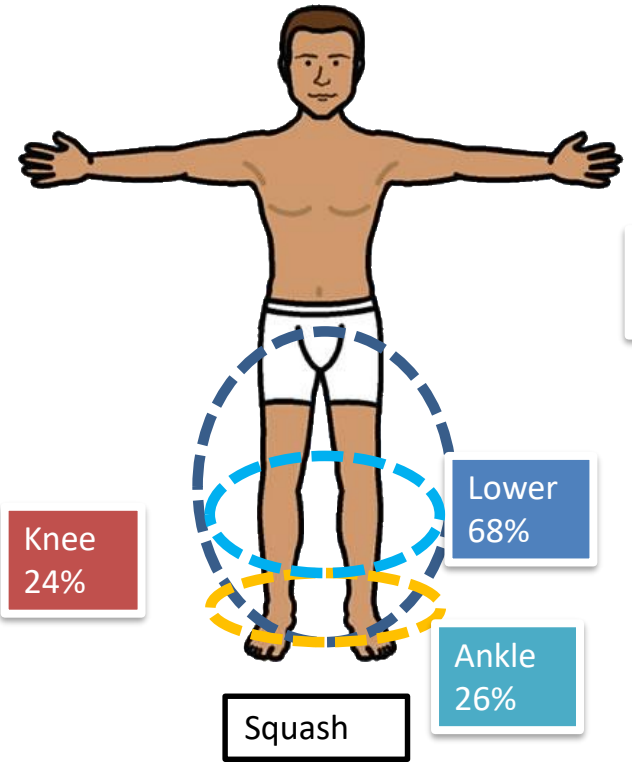
Etiology of acute injury

Turning/changing direction/shifting weight/pivot/twist	34%
Movement/running/moving sideways or backwards	22%
Lunge/pushing off/reaching	11%
Landing/jump and land	7%

Joanna Reeves. A Retrospective Review from 2006 to 2011 of Lower Extremity Injuries in Badminton in New Zealand Sports 2015, 3, 77-86

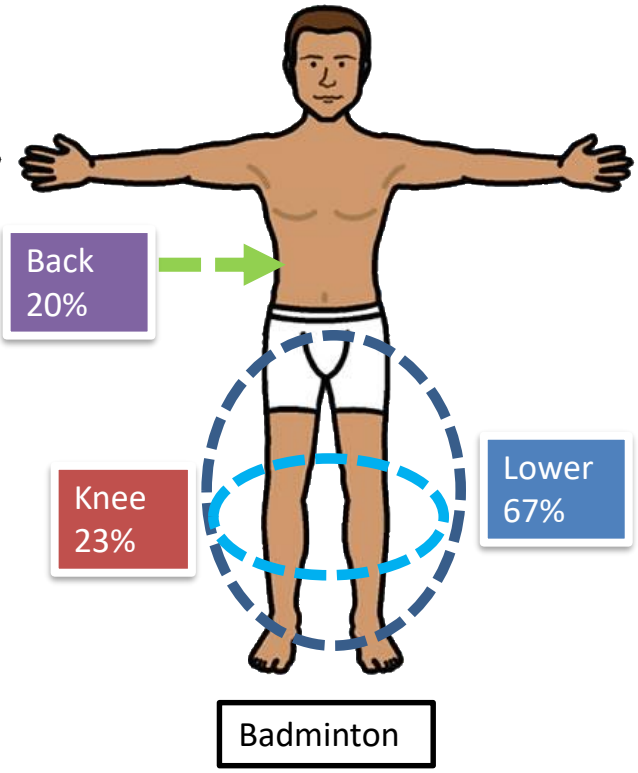
INCIDENCE

18 injuries/1000 hours of participations.



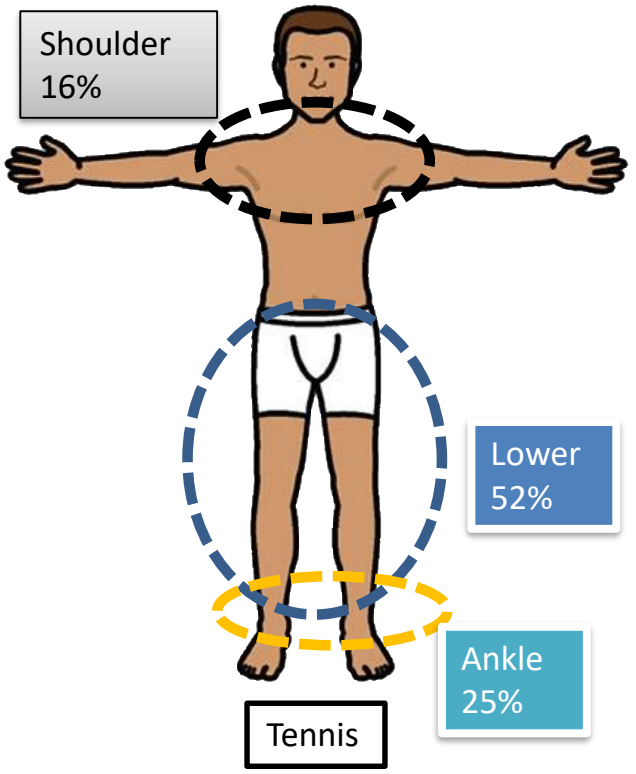
Squash

2.9 injuries/1000 hours of participations.



Badminton

3 injuries/1000 hours of participations.



Tennis

Ibrahim Hamed Ibrahim Hassan (2018) Common Injuries in Racket Sports: A Mini Review. Ortho Surg Ortho Care Int J

RISK FACTORS

Lower Extremities alignment

Intrinsic risk factors

Gender, Age

High BMI

Extrinsic risk factors

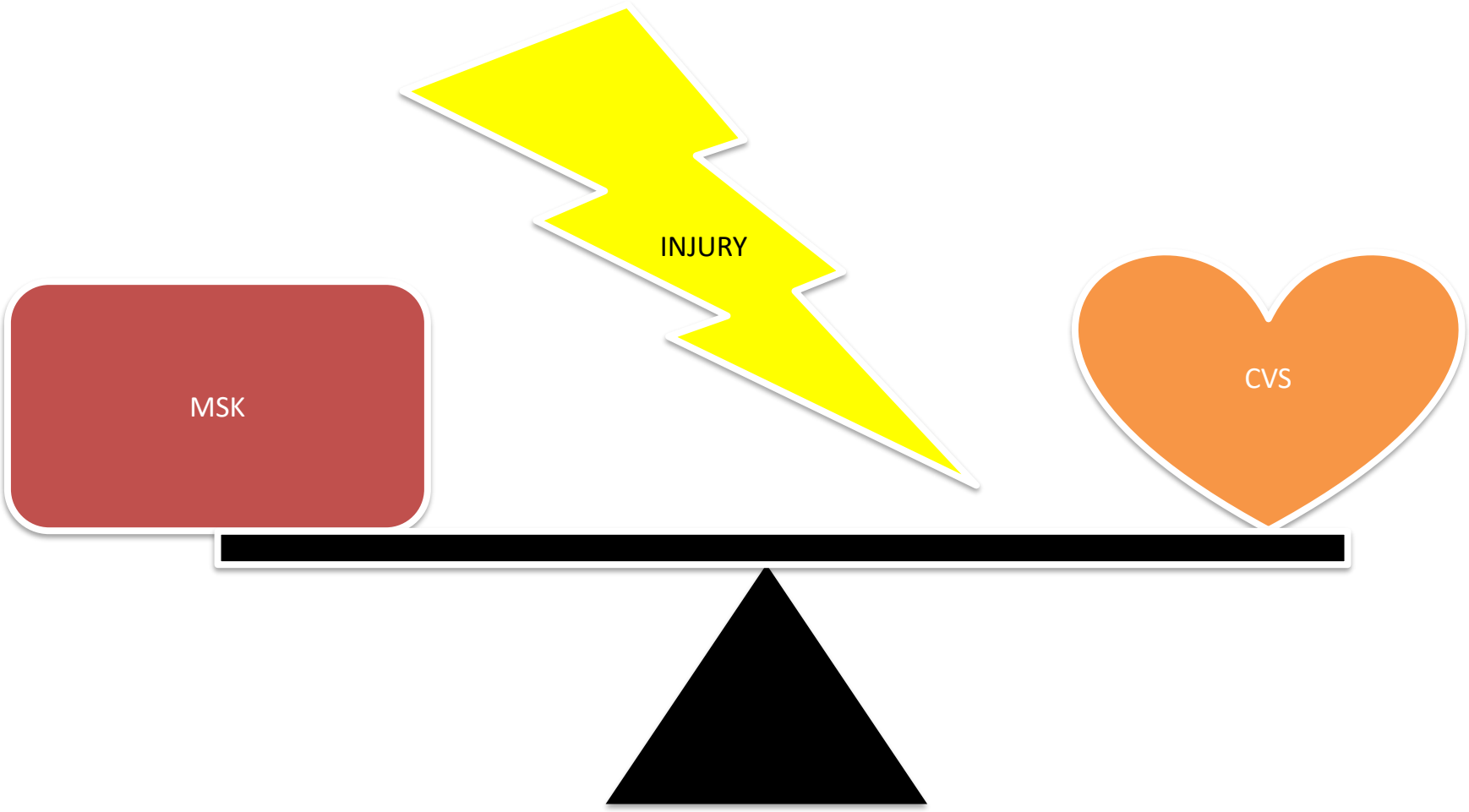
Racquet grip position
Ulnar side injury → western or semi western
Radial side injury → Eastern grip

Tagliafi co AS, Ameri P, Michaud J, et al. Wrist injuries in nonprofessional tennis players: relationships with different grips. Am J Sports Med 2009;37:760–7.

Volume pf play
Higher
if > 3hrs/week

Pluim B, Staal JB. Tennis. In: Caine DJ, Harmer P, Schiff M, eds. Epidemiology of Injury in Olympic Sports. Oxford, UK: Wiley Blackwell 2010:277–93.

TRAINING



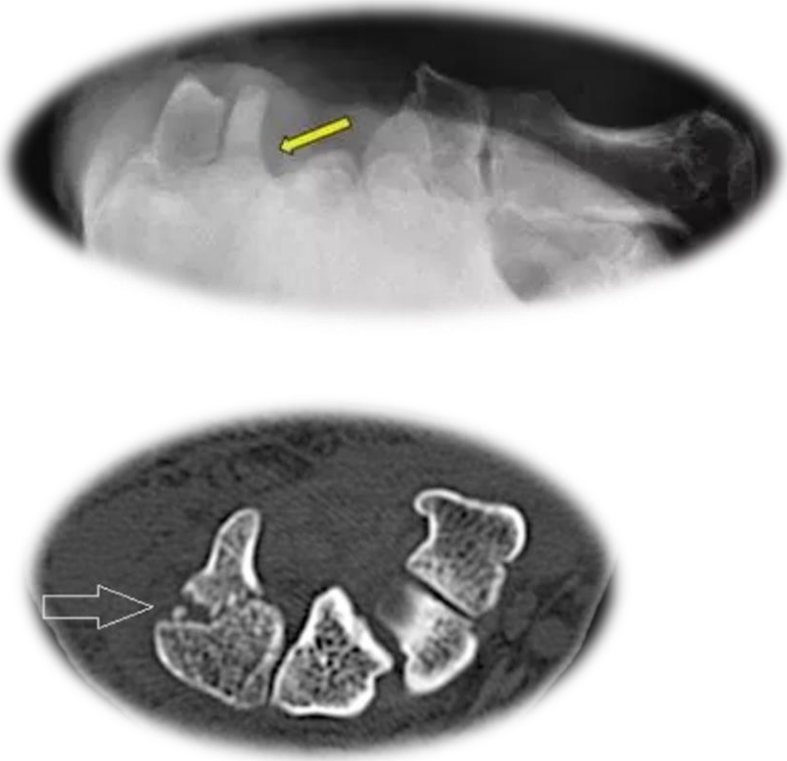
Case Study

World ranking tennis player came to us with a problem of wrist pain after a tennis game.

Physical exam revealed slightly tender over his hand

No obvious deformity

Case Study(example images)



Case Study

- **Problem**
- When should he return to play?
- Is this the end of his career?
- As a caregiver what is the best plan for him?

Decision making

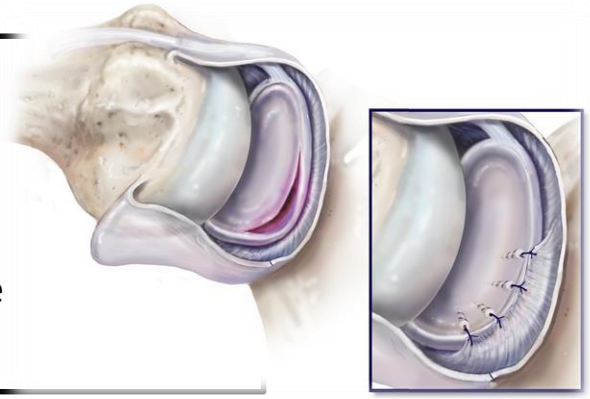
- **Many factors**
- Age
- Degree of performance
- Medical comorbidities
- Cosmetic
- Associated conditions

Case I(shoulder dislocate)

- **<u>Recurrent Shoulder dislocation(20times)</u>**
- The patient had hyperlaxity of his shoulder.
- Higher motion
- More prone to injuries

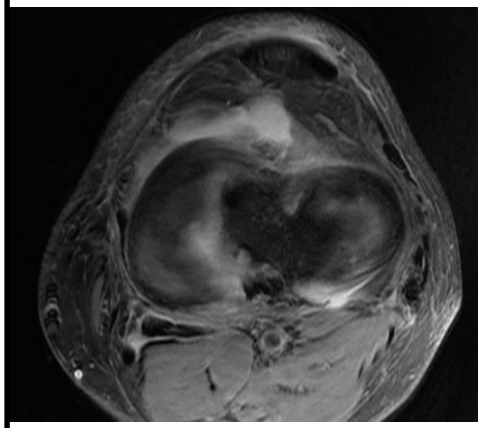
www.youtube.com

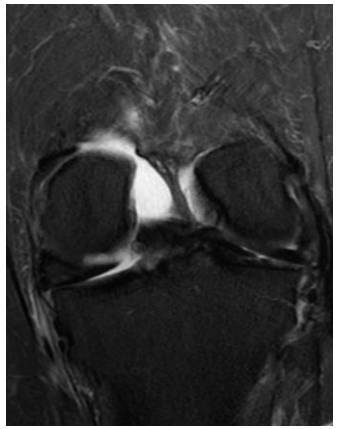
- **<u>In case of surgery</u>**
- Stiffness may occur
- Decrease in performance



Case II(Senior player with meniscus injury)

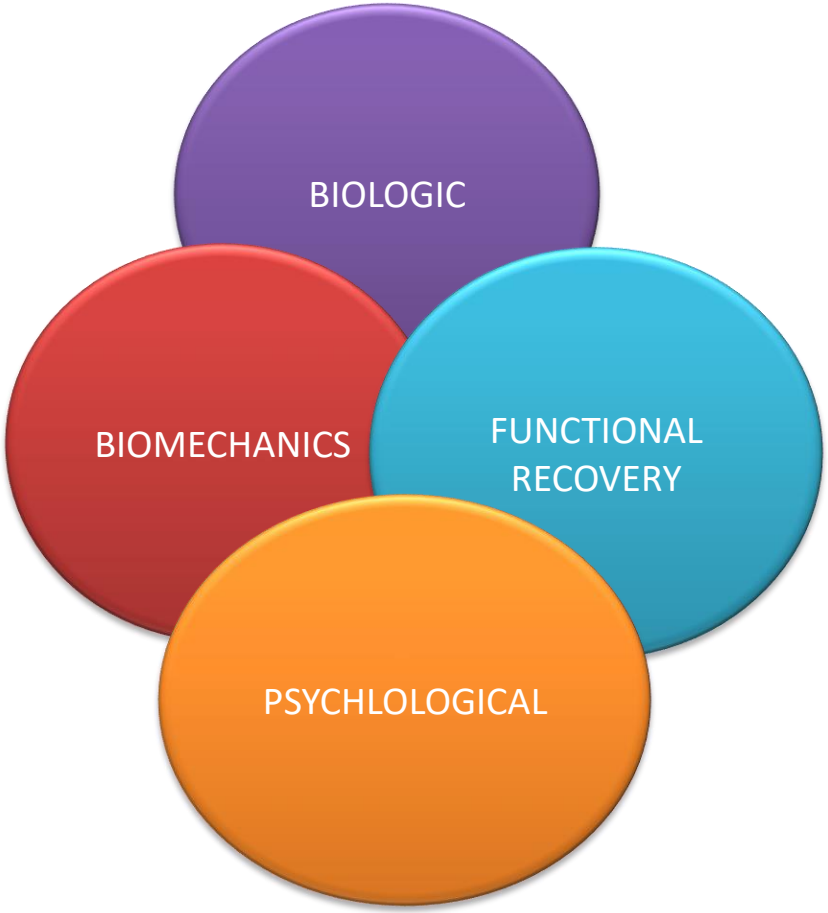
- A 64-year-old badminton player
- Suffer form knee pain after falling
- He want to go back and play badminton at the previous level





Medial Meniscal root injury and early osteoarthritis

RETURN TO PLAY



Biologic healing

Depend on type of injuries

ACL reconstruction – tendon to bone healing or bone to bone healing

fracture – duration of bone healing

Muscle and tendon injury

BIOMECHANICS

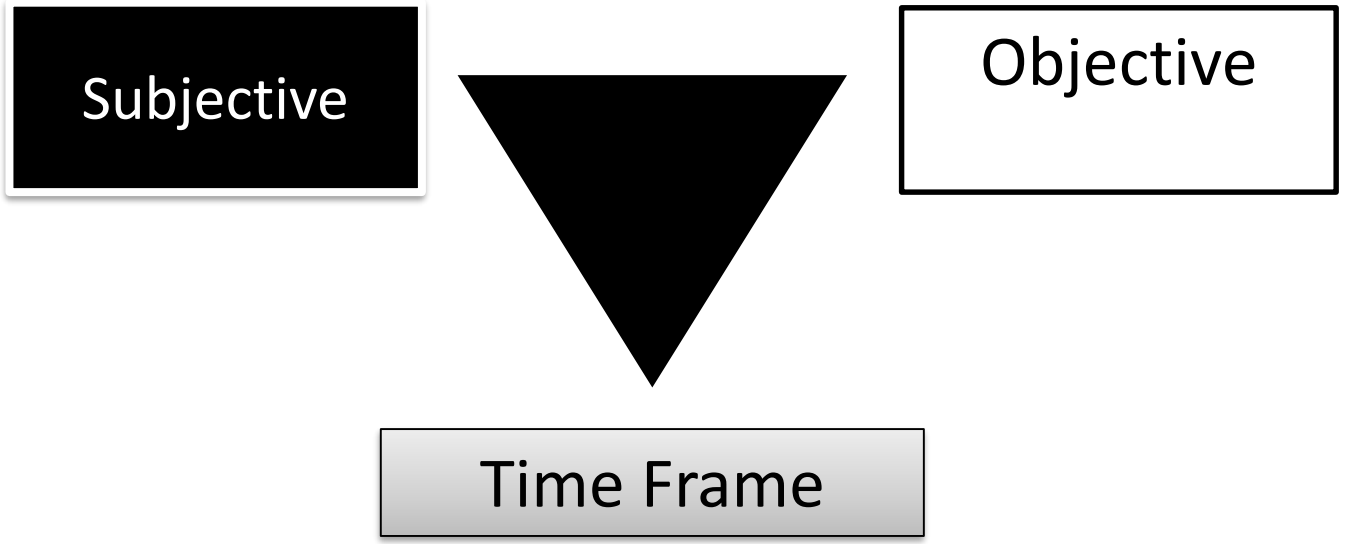
Anatomic abnormalities that lead to injury

http://athleticlab.com

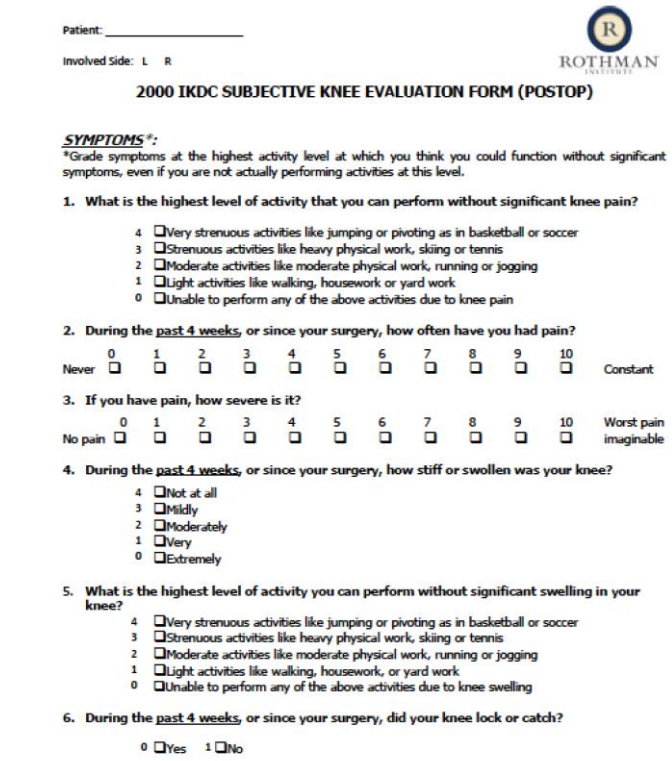
Movement pattern

www.youtube.com

Functional Recovery



Functional Recovery: Subjective



Patient: _____

Involved Side: L R

ROTHMAN INSTITUTE

2000 IKDC SUBJECTIVE KNEE EVALUATION FORM (POSTOP)

***SYMPTOMS**:*

*Grade symptoms at the highest activity level at which you think you could function without significant symptoms, even if you are not actually performing activities at this level.

1. What is the highest level of activity that you can perform without significant knee pain?

4 ☐Very strenuous activities like jumping or pivoting as in basketball or soccer
3 ☐Strenuous activities like heavy physical work, skiing or tennis
2 ☐Moderate activities like moderate physical work, running or jogging
1 ☐Light activities like walking, housework or yard work
0 ☐Unable to perform any of the above activities due to knee pain

2. During the past 4 weeks, or since your surgery, how often have you had pain?

0 1 2 3 4 5 6 7 8 9 10
Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Constant

3. If you have pain, how severe is it?

0 1 2 3 4 5 6 7 8 9 10
No pain ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Worst pain imaginable

4. During the past 4 weeks, or since your surgery, how stiff or swollen was your knee?

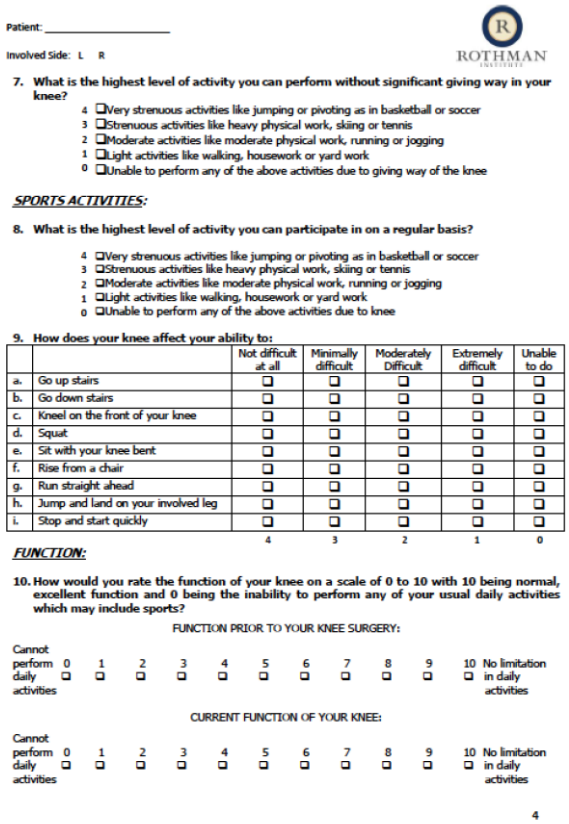
4 ☐Not at all
3 ☐Mildly
2 ☐Moderately
1 ☐Very
0 ☐Extremely

5. What is the highest level of activity you can perform without significant swelling in your knee?

4 ☐Very strenuous activities like jumping or pivoting as in basketball or soccer
3 ☐Strenuous activities like heavy physical work, skiing or tennis
2 ☐Moderate activities like moderate physical work, running or jogging
1 ☐Light activities like walking, housework, or yard work
0 ☐Unable to perform any of the above activities due to knee swelling

6. During the past 4 weeks, or since your surgery, did your knee lock or catch?

0 ☐Yes 1 ☐No



Patient: _____

Involved Side: L R

ROTHMAN INSTITUTE

7. What is the highest level of activity you can perform without significant giving way in your knee?

4 ☐Very strenuous activities like jumping or pivoting as in basketball or soccer
3 ☐Strenuous activities like heavy physical work, skiing or tennis
2 ☐Moderate activities like moderate physical work, running or jogging
1 ☐Light activities like walking, housework or yard work
0 ☐Unable to perform any of the above activities due to giving way of the knee

***SPORTS ACTIVITIES**:*

8. What is the highest level of activity you can participate in on a regular basis?

4 ☐Very strenuous activities like jumping or pivoting as in basketball or soccer
3 ☐Strenuous activities like heavy physical work, skiing or tennis
2 ☐Moderate activities like moderate physical work, running or jogging
1 ☐Light activities like walking, housework or yard work
0 ☐Unable to perform any of the above activities due to knee

9. How does your knee affect your ability to:

		Not difficult at all	Minimally difficult	Moderately Difficult	Extremely difficult	Unable to do
a.	Go up stairs	☐	☐	☐	☐	☐
b.	Go down stairs	☐	☐	☐	☐	☐
c.	Kneel on the front of your knee	☐	☐	☐	☐	☐
d.	Squat	☐	☐	☐	☐	☐
e.	Sit with your knee bent	☐	☐	☐	☐	☐
f.	Rise from a chair	☐	☐	☐	☐	☐
g.	Run straight ahead	☐	☐	☐	☐	☐
h.	Jump and land on your involved leg	☐	☐	☐	☐	☐
i.	Stop and start quickly	☐	☐	☐	☐	☐
		4	3	2	1	0

***FUNCTION**:*

10. How would you rate the function of your knee on a scale of 0 to 10 with 10 being normal, excellent function and 0 being the inability to perform any of your usual daily activities which may include sports?

FUNCTION PRIOR TO YOUR KNEE SURGERY:

Cannot perform daily activities 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ No limitation in daily activities

CURRENT FUNCTION OF YOUR KNEE:

Cannot perform daily activities 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ No limitation in daily activities

4

Functional questionnaire(IKDC)

Functional Recovery: Objective

Testing
Most common (ACL –Rothman)
- Muscle strength (cybex)
- Hop tests (Range 1-4)
- Sports specific/agility

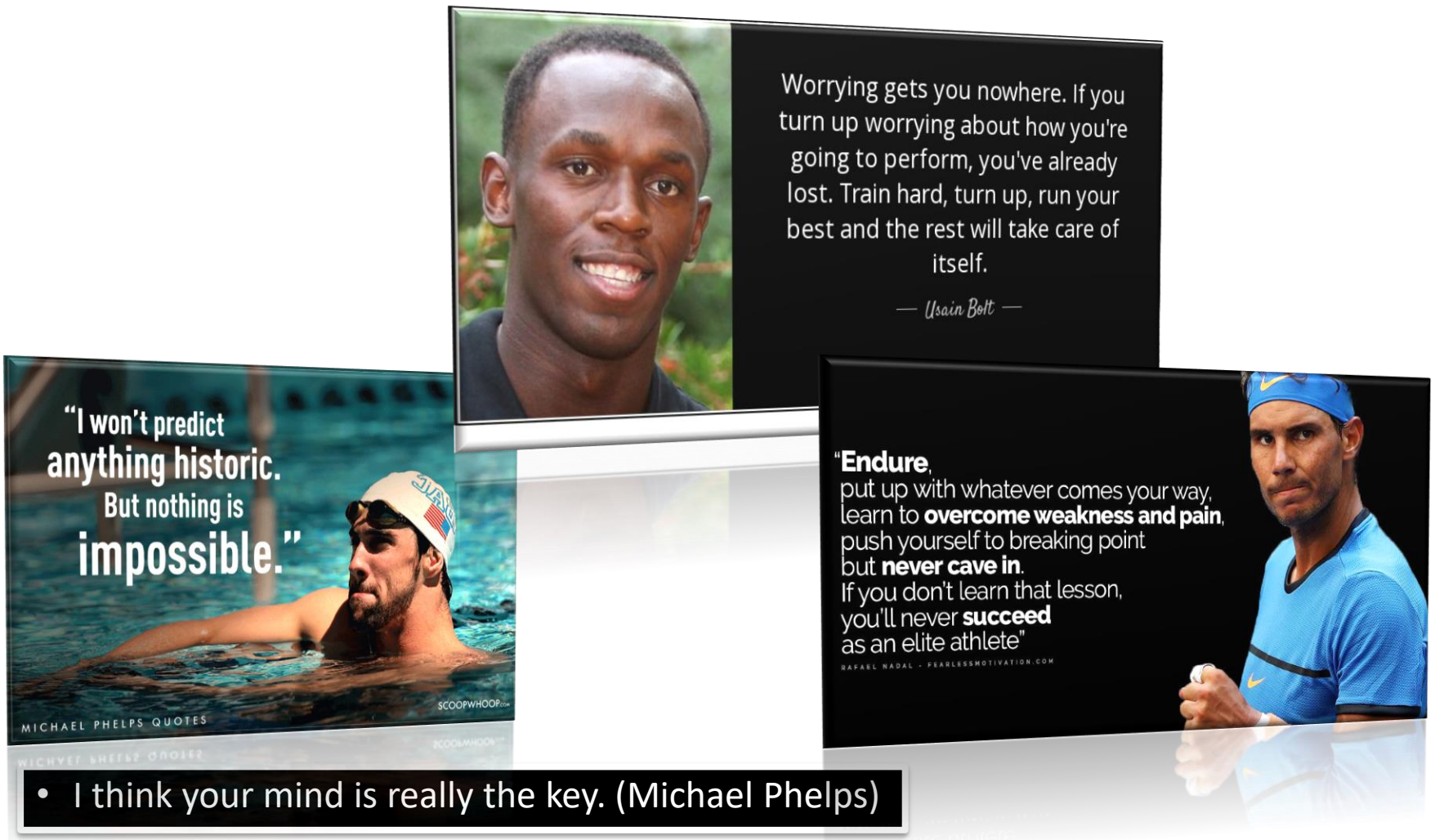
Physical Examination
- No effusion
- Negative Lachman
- ROM

HOP TEST

CYBEX

www.youtube.com

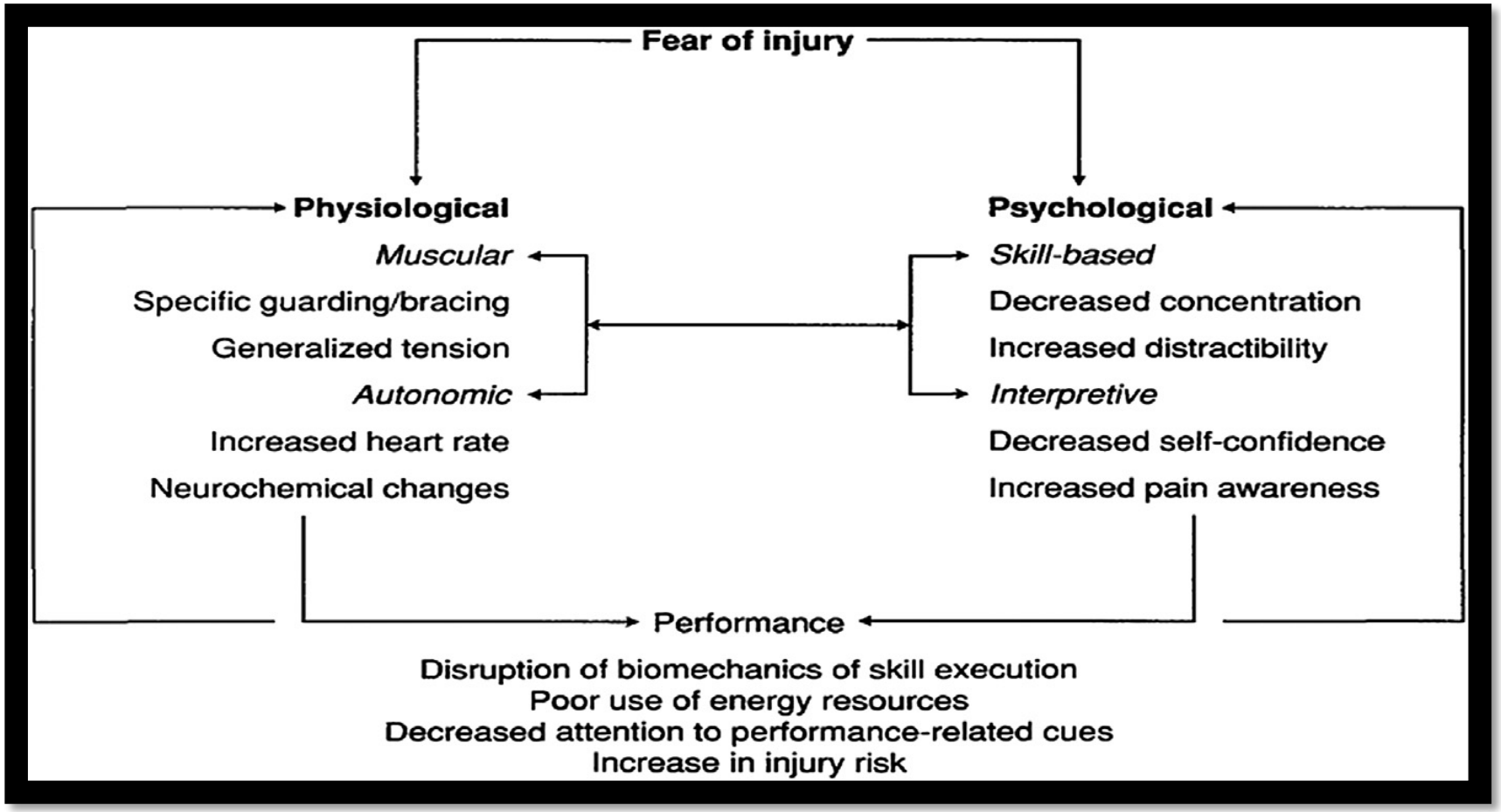
Psychological



- I think your mind is really the key. (Michael Phelps)

Psychological

Leslie Podlog, Psychosocial Factors in Sports Injury Rehabilitation and Return to Play, Phys Med Rehabil Clin N Am 25 (2014) 915–930



Psychological

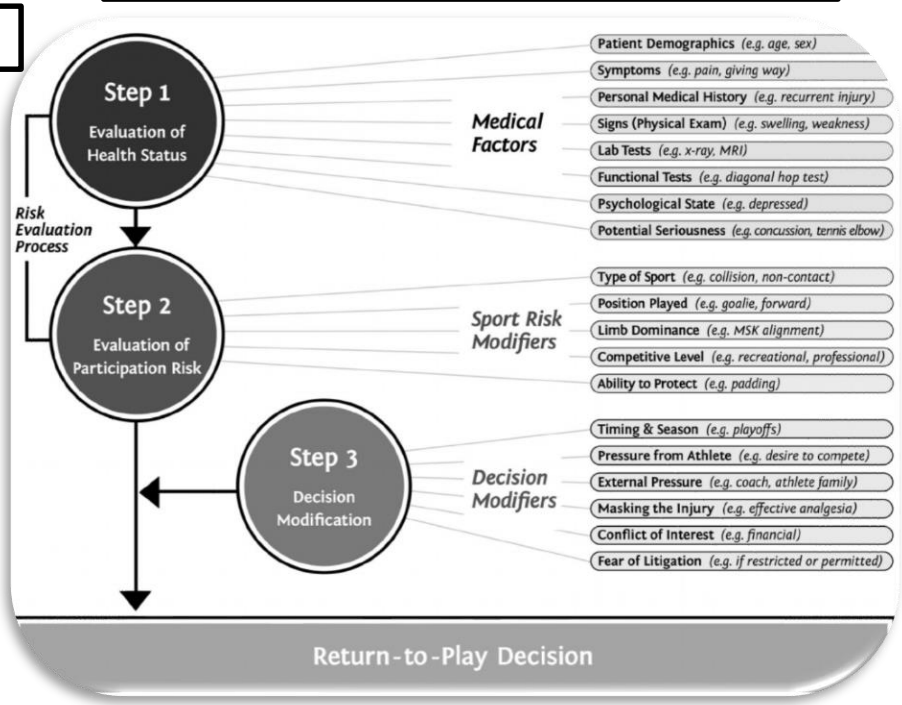
Step 1 : Assess medical factors

Step 2 : Risks in sport played

Step 3 : Decision making

Methods for Assessing Psychological Readiness to Return

- Questionnaire
  - Creighton and colleagues
  - 3-step return-to-competition decision-making model
  - the Injury Psychological Readiness to Return to Sport Scale (I-PRRS) 2009



Leslie Podlog, Psychosocial Factors in Sports Injury Rehabilitation and Return to Play, Phys Med Rehabil Clin N Am 25 (2014) 915–930

EXAMPLE

- Lose in World Championship 2003 and Olympic 2004
- He had disturbing shoulder injury.
- He decided to do shoulder surgery.

Silver in Asian game 2006
Gold in Olympics 2008

Behind The Scene

“NO DEFINITE CUT POINT Criterions”

Rothman Institute of Orthopedics at Thomas Jefferson University (ACL)

- Surveyed 10 ACL experts
  - 8 orthopaedic surgeons
  - 2 therapists specializing in ACL rehab
  - Rank all criteria for importance (1-5)
- Highest scores kept
- Lowest scores deleted from checklist

Criteria	Average Score (Range)
Months post-op clearance	8 (6-9)
Hop tests	4 (2-5)
Full ROM*	4.1 (3-5)
Isokinetic strength	2 (1-4)
No effusion	3.7 (2-5)
Arthrometer	1.5 (1-4)
No pain	3.8 (3-5)
FMS†	3.7 (3-5)
No instability	4.5 (4-5)
Thigh circumference	3.6 (2-5)
IKDC‡	3 (1-5)
Movement assessment	4.1(3-5)
Pro Agility	3.4 (1-5)

Rothman Institute of Orthopedics at Thomas Jefferson University (ACL)

CRITERIA FOR RETURN-TO-PLAY

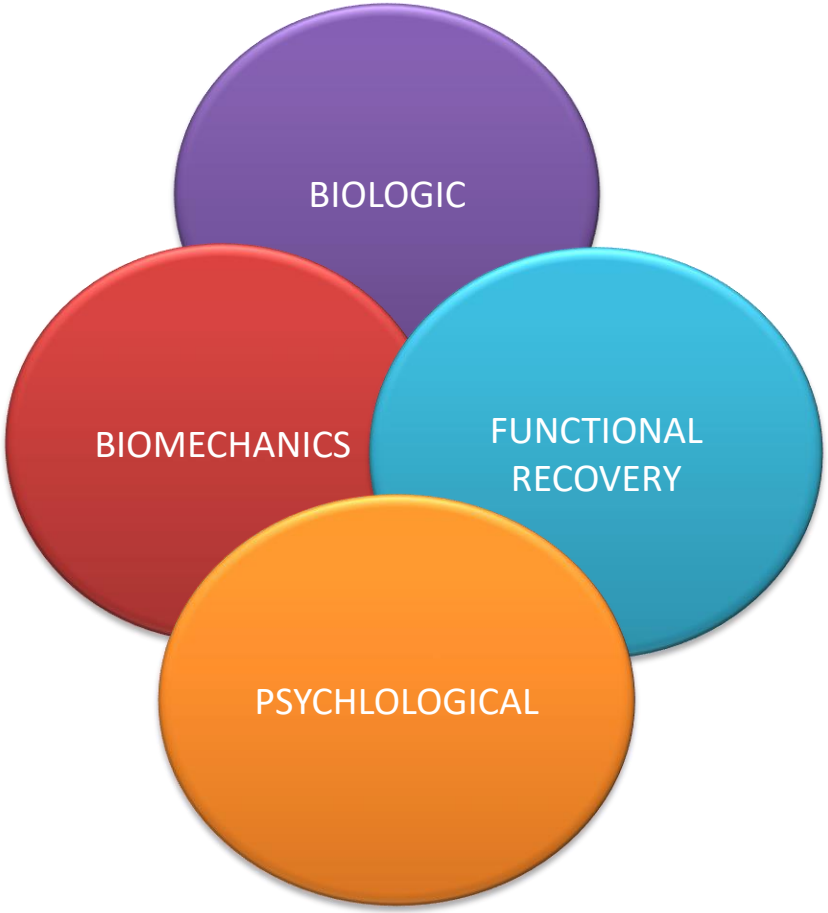
1.	No or minimal effusion, full ROM, no instability	☐ PASS	☐ FAIL
2.	Thigh circumference < 1.5 cm difference	☐ PASS	☐ FAIL
3.	IKDC ≥ 90%	☐ PASS	☐ FAIL
4.	FMS ≥ 14	☐ PASS	☐ FAIL
5.	LSI ≥ 90% for all 4 hop tests	☐ PASS	☐ FAIL
6.	Pro agility ≥ 90%	☐ PASS	☐ FAIL
7.	Movement assessment ≥ 80%	☐ PASS	☐ FAIL

NOTES:_____

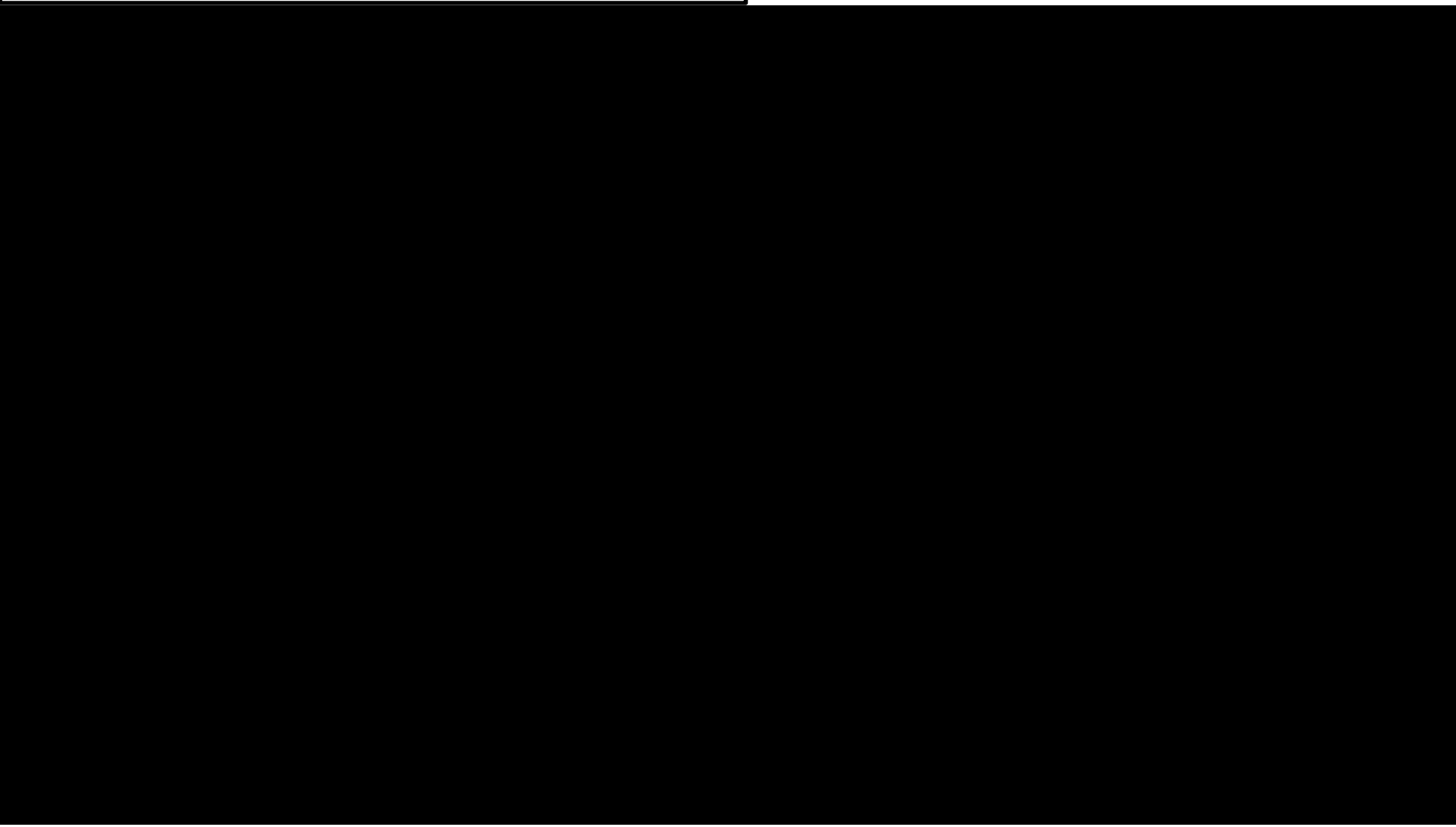
_____

- One hour to complete
  - All ACLs 6-9 months post-op
  - Must pass all movement assessments to pass
  - If fail, additional PT for 6 weeks and re-test

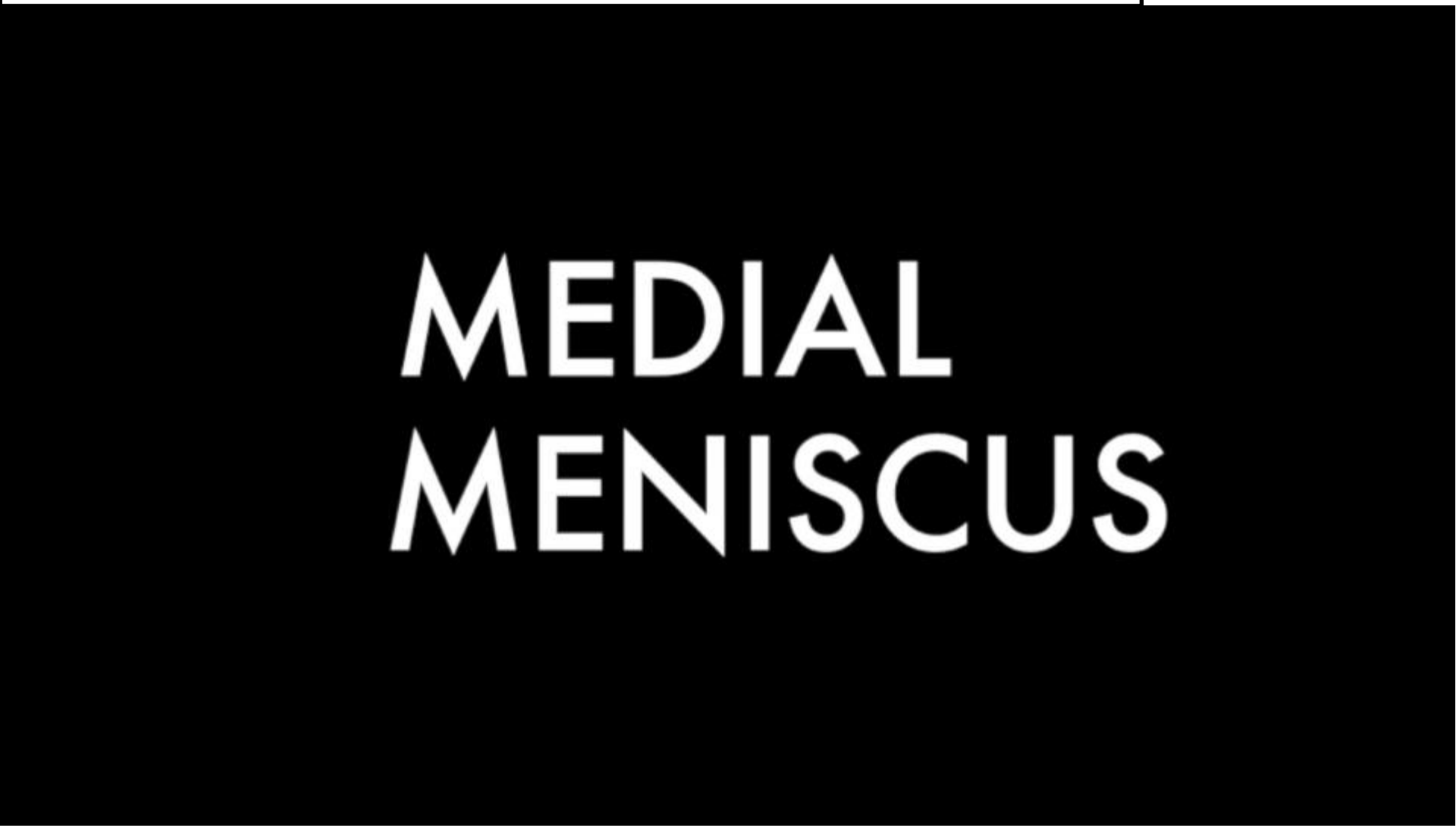
RETURN TO PLAY



CASE I(SHOULDER DISLOCATE)



CASE II(SENIOR PLAYER WITH MENISCUS INJURY)



Case II(Senior player with meniscus injury)

Technical Note

Arthroscopic Medial Meniscus Root Repair With Soft Suture Anchor Without Posterior Portal Technique

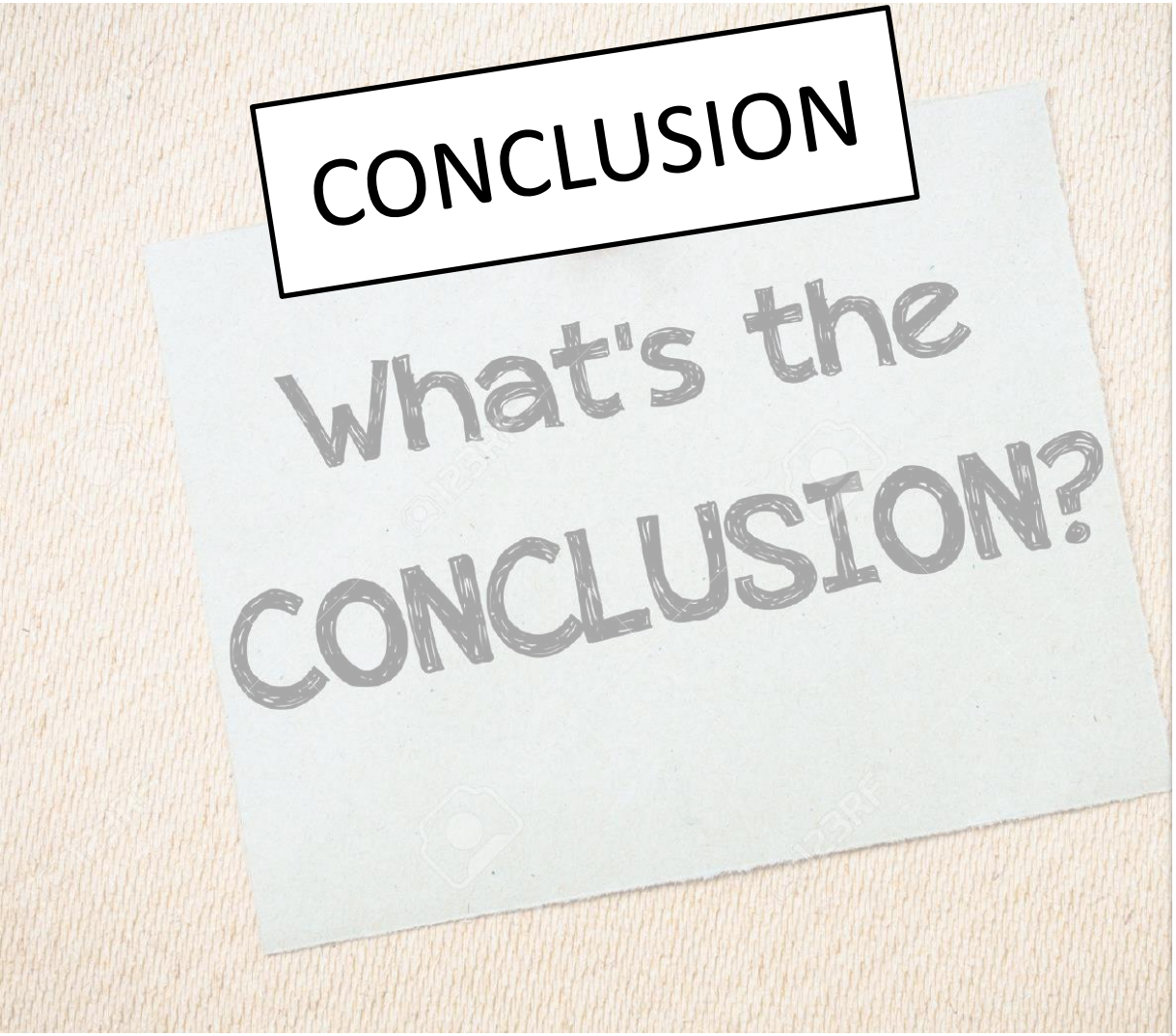
Somsak Kuptniratsaikul, M.D., Thun Itthipanichpong, M.D., and Vanasiri Kuptniratsaikul, M.D.

Abstract: Medial meniscal root injury is known to cause an increase in tibiofemoral contact pressure and results in early osteoarthritis. There have been many reports on meniscal root repairing techniques, which can be categorized into 2 groups. One is transosseous suture, and the other is anchor suture repair. Both techniques show improvement in not only clinical performance, but also radiographic finding. However, the meniscal root repair procedure must be performed by experienced physicians. Most techniques require a posteromedial portal, which takes time and may even complicate the procedure. The technique proposed in this study provides a simple procedure in which no posteromedial portal is required and a soft anchor suture, a commonly used suture in glenolabral repair, is used. The use of this suture, instead of the conventional anchor suture, is believed to lessen possible injury to the cartilage and results in easier revision surgery.

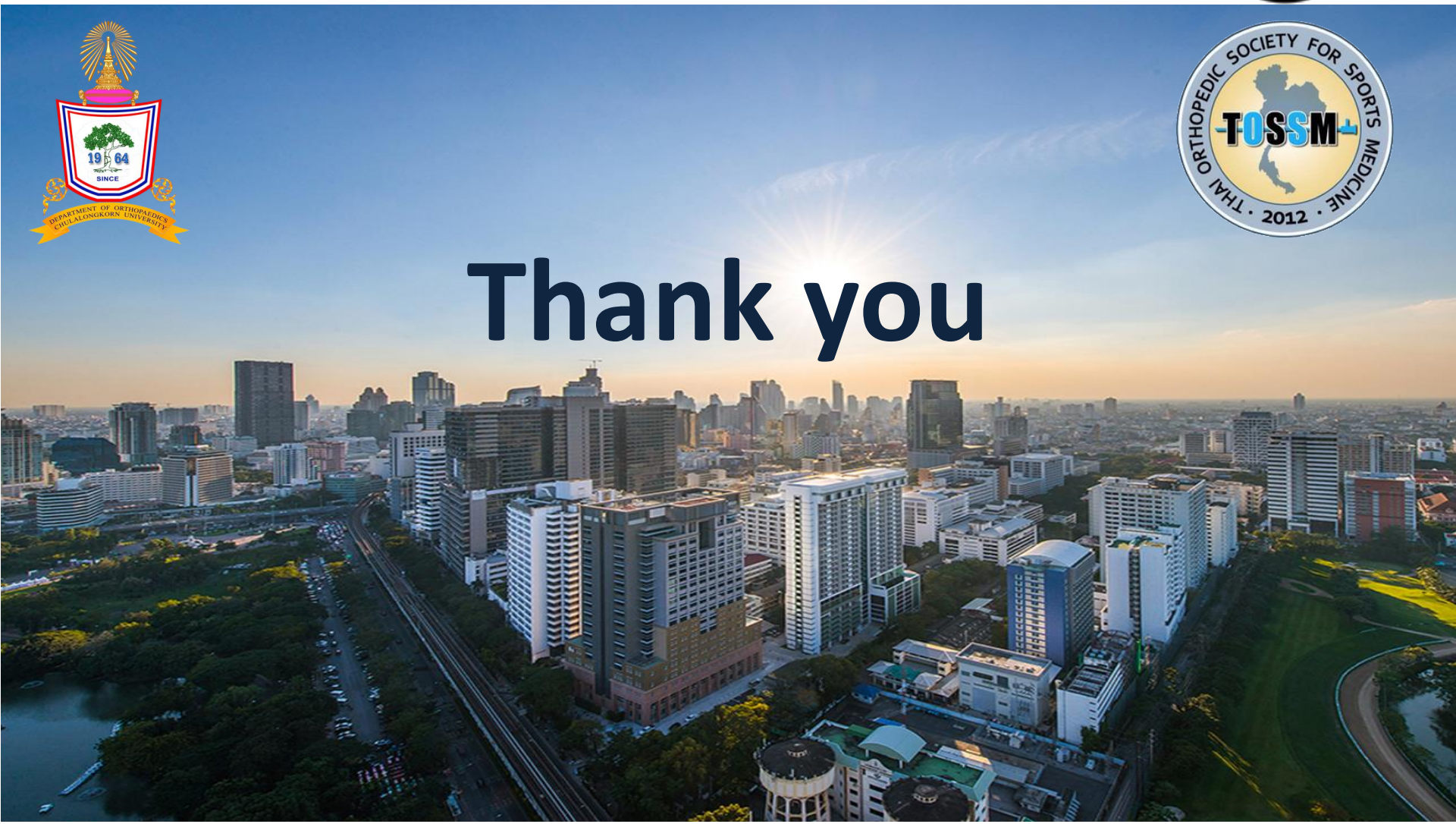
Kuptniratsaikul S., Itthipanichpong T, Kuptniratsaikul V. Arthrosc Tech. 2018

The patient is pain free now.

He has returned to light play sport since last visit.



- Racket sport injuries
- Individualization
- Need biologic, biomechanics, functional evaluation, and psychological evaluation
- Gradual return is important


Thank you