

Approach to the Athlete with an ACL Tear

Primary Care Conference
7/21-7/25/25
Kauai, HI

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Kaiser Permanente

Disclosures

None to report

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Who is at Risk?

- **Active in pivoting and jumping sports**
 - Soccer, basketball, football
- **Females 5X higher risk**
- **Involved in competition**
- **Younger age**



ACL Tear

Cutting and Twisting Sports



Valgus and internal rotation



Making the Diagnosis

History

- Giving way episode
 - Rapid deceleration
 - Jumping
 - Cutting
- Often non-contact
- +/- pop
- Swelling usually within the first few hours



Exam

Lachman



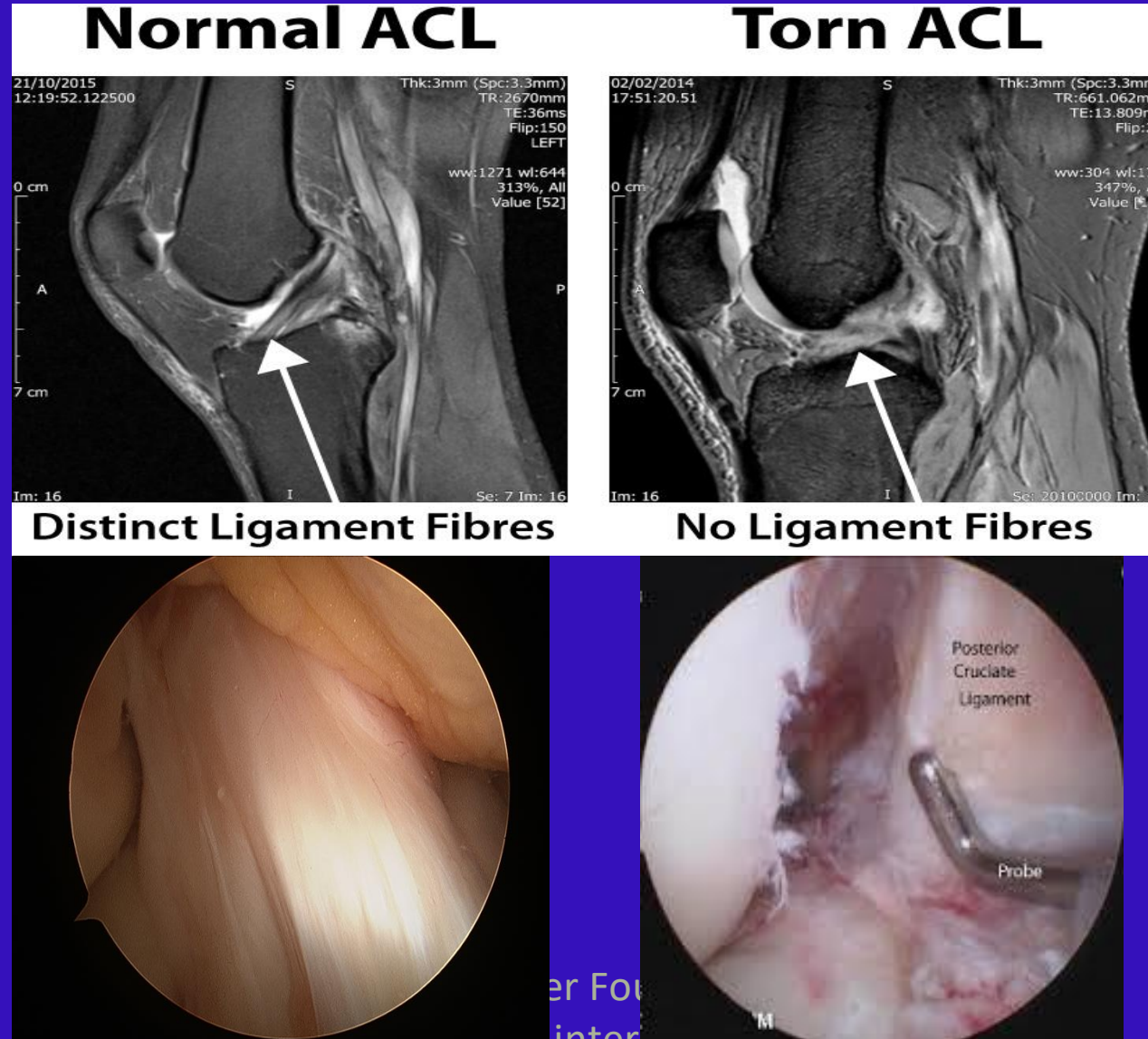
Pivot shift



KT 1000



ACL Tear



What is the problem with an ACL Tear ?

- ACL tear leads to instability
- Giving way episodes lead to meniscal and cartilage injuries



Does Everyone Need a Reconstruction?

Noyes Rule of Thirds

- **1/3 will compensate well with Non-op Rx (Copers)**
- **1/3 will modify activities to avoid instability (Adapters)**
- **1/3 will require Surgery (Non-copers)**

How can we determine which 1/3 ?

The easy ones

- Sedentary



- Elite Pivoting and Twisting Sport athlete



Predicting the Risk of Instability



Laxity	Level 1 and 2 Sports Hours/Yr		
KT 1000 Man Max	<50	50-199	>200
<5	Low	Low	Moderate
5-7	Low	Moderate	High
>7	Moderate	High	High

Fithian Am J Sports Med

Decision-Making for Non-op Rx

- Timed Hop test > 80% compared to normal leg
 - 0-1 giving way episodes
 - KOOS ADL's > 80
 - Global Rating of Knee Function > 60%
- 93 patients enrolled
 - 39/93 Qualified for Non-op Rx
 - 12/93 Succeeded
 - 15% of all comers may be copers



A subject performing the Hop Test

Kelly-Fitzgerald KSSTA 2008

Does Everyone Need a Reconstruction?

- **RCT 121 patients (Sweden)**
- 62 patients Rehab + ACLR
- 59 patients Rehab + optional surgery
- **No difference in Knee Osteoarthritis Outcome Score (KOOS)**
 - Both groups improved
- **Surgery in 37% at 2 years and 51% by 5 years**
- **Better knee stability in ACLR group**
- **Fewer subsequent meniscal operations in the ACLR group**

Frobell NEJM 2010
BMJ 2013

ACL's Can Heal

- KANON Study

Rehab

54 pts

24 delayed ACLR

ACLR

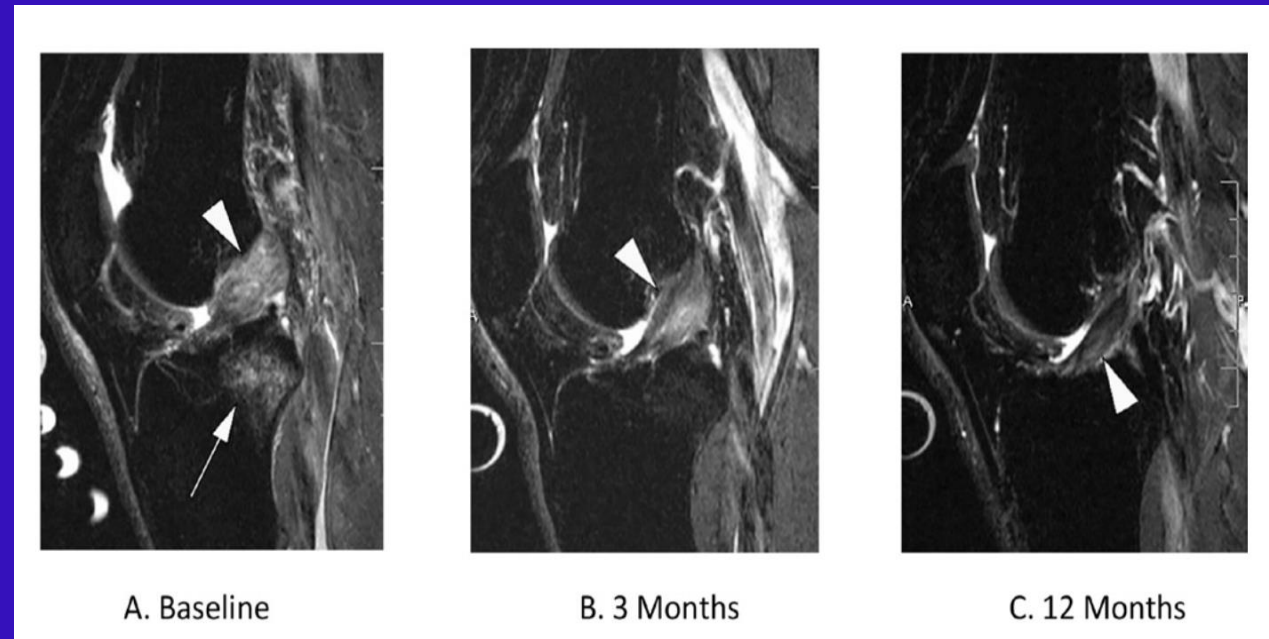
62 pts

Healed

16 (30%)

Nonhealed

14



Filbay SR, et al. *Br J Sports Med* 2023,

ACLR vs Non-op treatment

- 41 patients in each group
3 yr f/u

	ACLR	NON-OP
Tegner	8.0 ± 1.0	5.5 ± 0.9
IKDC	90.9 ± 3.8	65.0 ± 8.1
KOOS Sport/Rec	92.4 ± 7.6	66.6 ± 6.1
Med Men Tear	5%	63%
Instability	5%	88%

Posttraumatic OA after ACL Injury Machine learning comparison Surgery vs Non-op Management

	ACLR	NON-OP
N	975	220
PTOA	215 (22%)	140 (64)
TKA	25 (3%)	50 (23%)

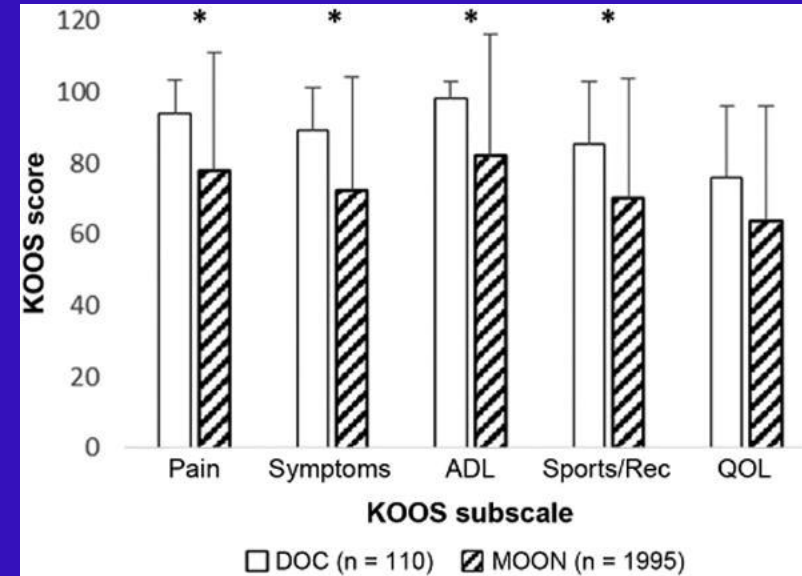
ACLR decreased rate of PTOA by 11%

When is the patient ready for surgery

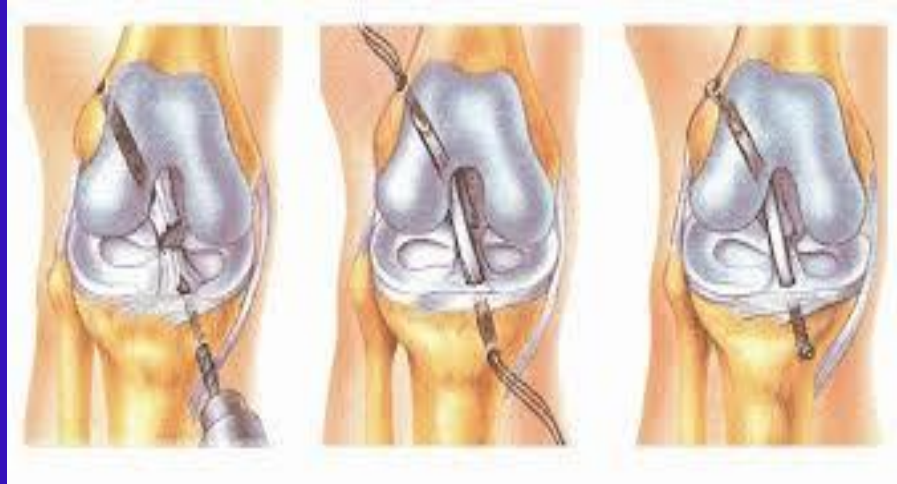
- Shelbourne
 - Full range of motion
 - No effusion



- (Delaware –Oslo cohort)
 - 10 neuromuscular training sessions
 - Better 2 yr KOOS



Anterior Cruciate Ligament Reconstruction (ACLR)



ACLR Graft Choices

Graft type

- **Autograft**
 - Patellar tendon
 - Hamstring tendon
 - Quad tendon
- **Allograft**
 - Patellar tendon
 - Achilles tendon
 - Soft tissue
 - Tibialis
 - Peroneal



Bone-Patellar Tendon-Bone (BPTB)



Hamstring Tendon Autograft



Quadriceps tendon Autograft



Allograft (Cadaver tissue)



Accelerated Rehab

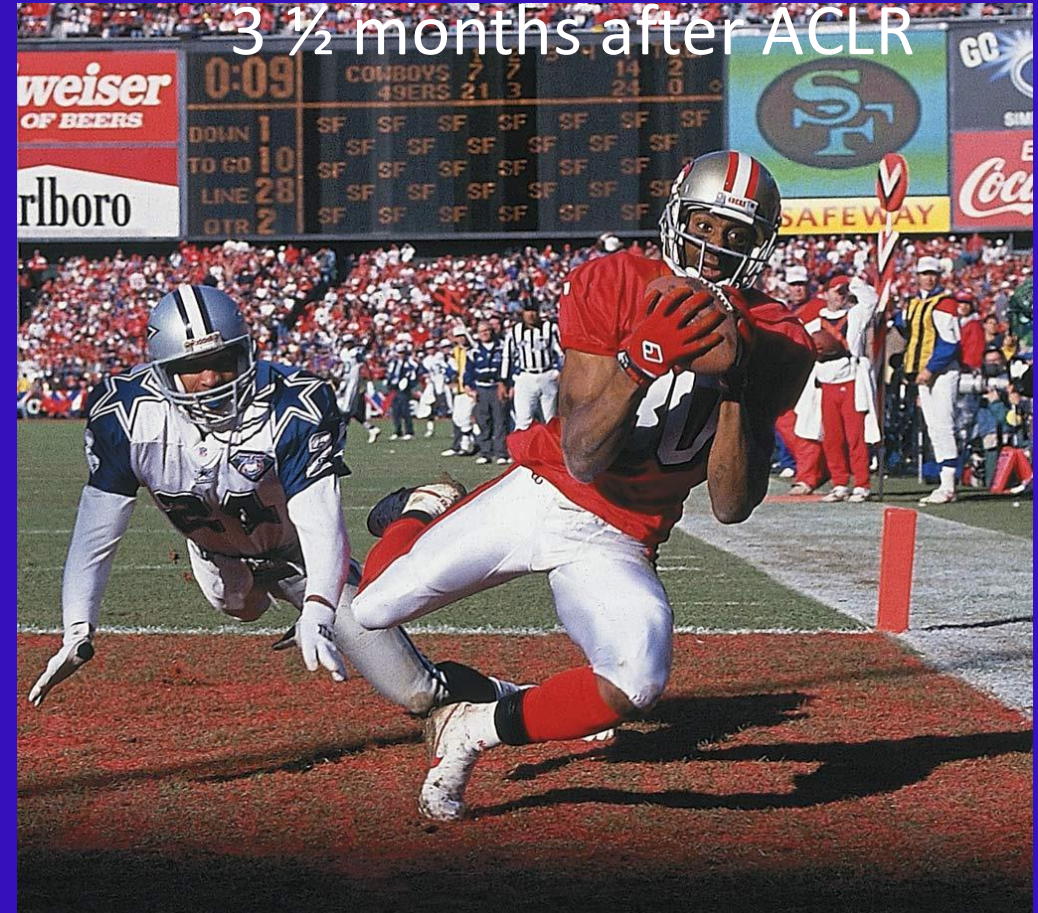
- Regaining motion is critical
 - Extension/hyperextension equal to the opposite leg



- Week 1 Milestones
 - Full extension
 - Flexion to 110 degrees
 - Active quad contraction
 - Straight leg raise
 - Decreasing effusion

How fast is too fast

- Surgeons have big egos
- The faster my athletes get back the better surgeon I am



Return to Sports Criteria

Delaware-Oslo ACL Cohort

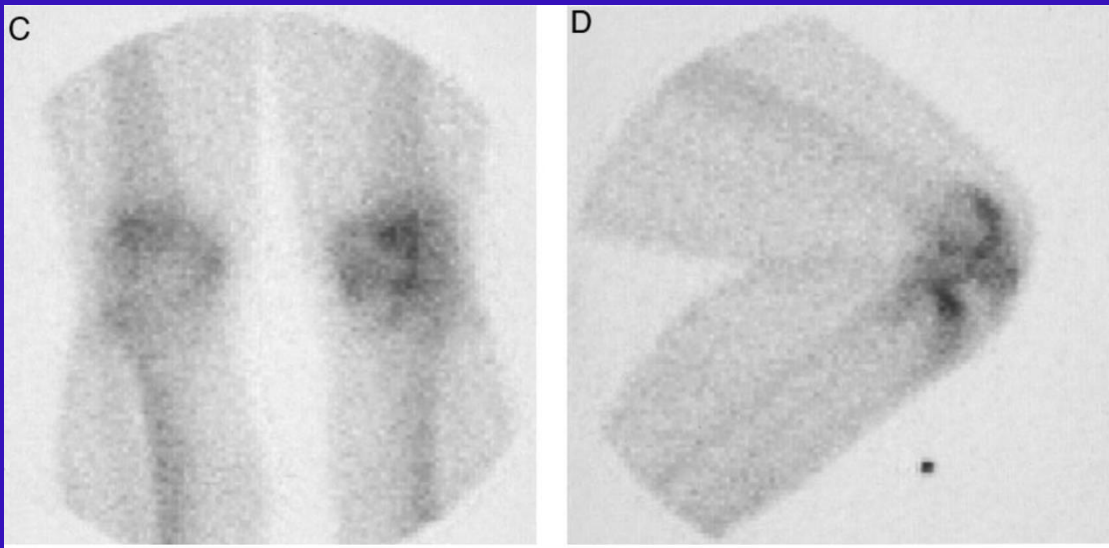
- 4 X higher risk of re-injury if returning to Level 1 sport
- 51% decrease risk of re-injury for every month RTS delayed until 9 months
- 3% decrease in re-injury risk for every 1% increase in quadriceps strength symmetry
- **Estimated 84% decreased risk of re-injury if 90% quadriceps strength symmetry and after 9 months**



Grindem British J Sports Med 2016

Hurry up and wait

- Pet scans and Bone scans may not return to normal for 18-24 months



- MRI changes over time



ACL Return to Sports

- Large meta-analysis
7556 patients
- 81% returned to some
sports
- 65% returned to
preinjury level of sport
- 55% returned to
competitive sports

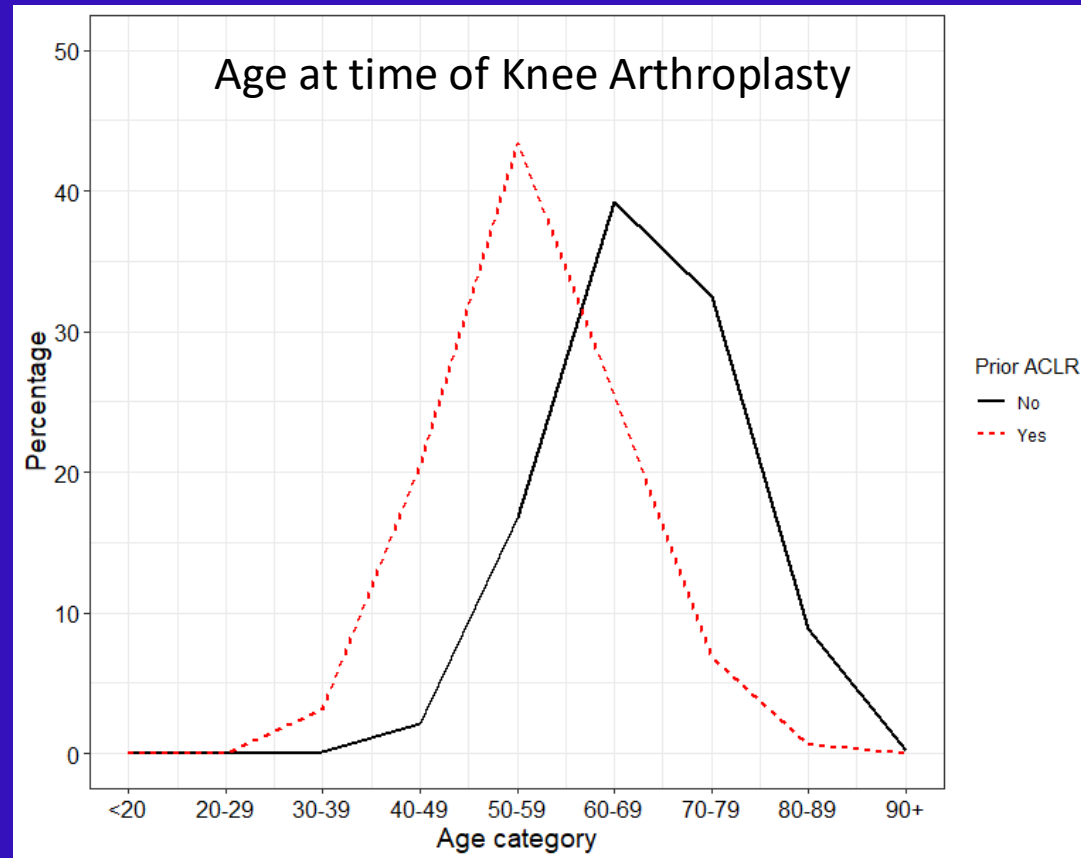


Challenges

- Surgery doesn't make the knee normal
- Osteoarthritis is increased after ACL Injury
- Surgery does not prevent the long term consequences of osteoarthritis



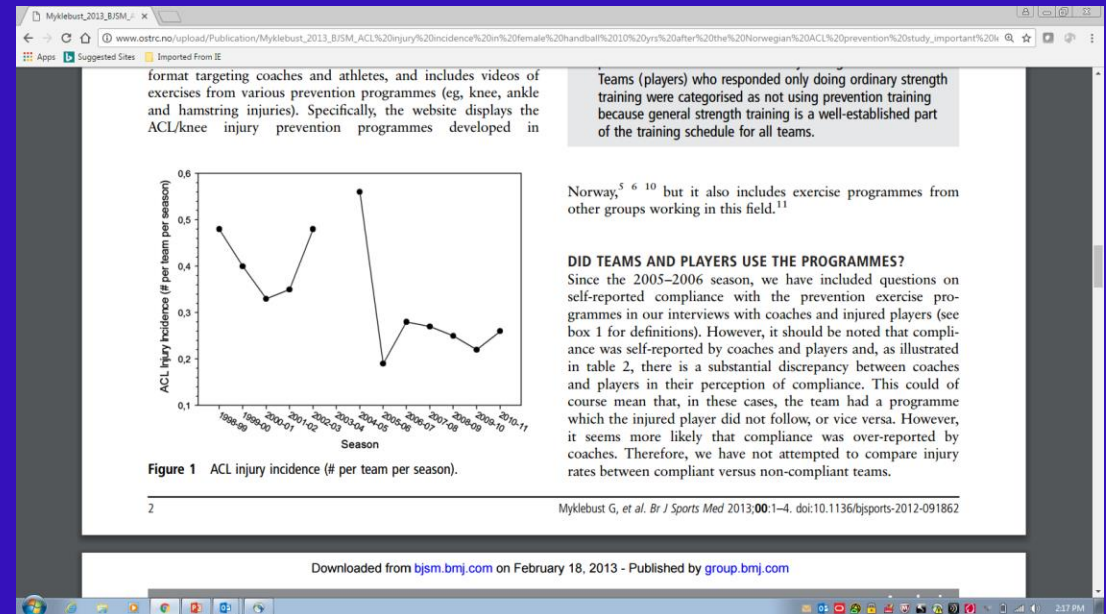
Risk of Total Knee Replacement after ACLR



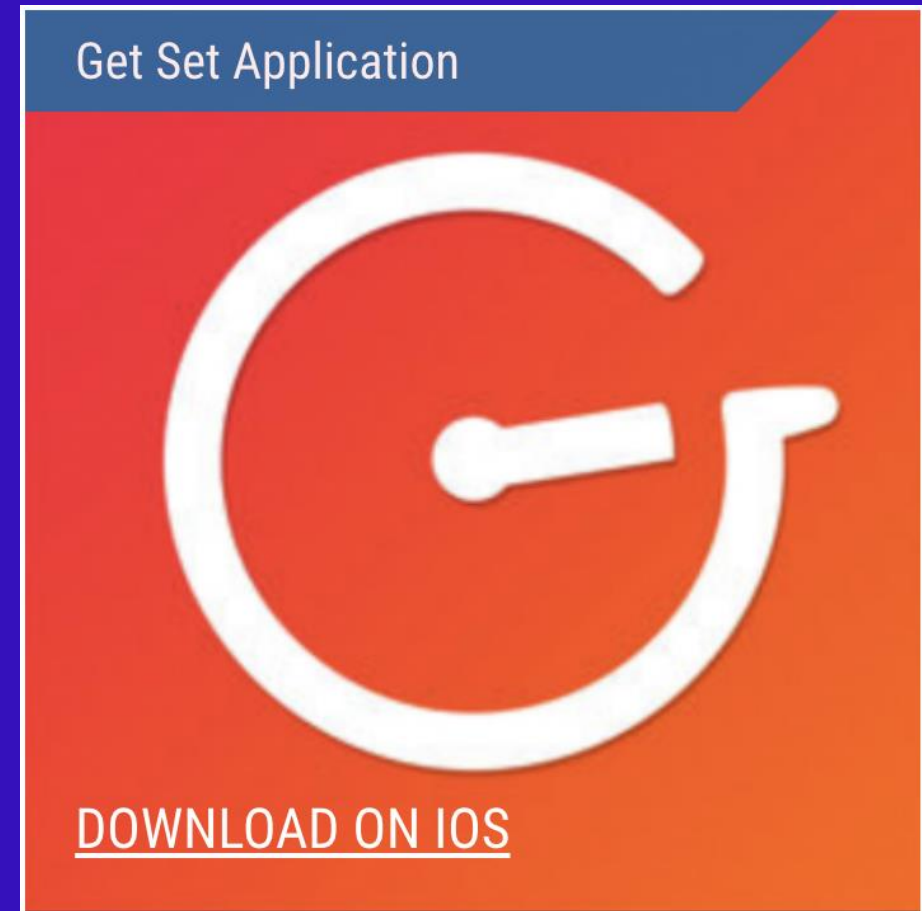
ACL Prevention Programs Are Important

- > 50,000 ACL tears per year in female high school and collegiate athletes.
- 1/100 high school female athletes
- Published studies demonstrate a 50% efficacy rate in decreasing ACL injury risk (24%-84%)

Norwegian team handball



We need to convince parents and coaches



Thank You