



# Delaying ACL Reconstruction Increases the Risk of Medial Meniscal Tear

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# Introduction

> Am J Sports Med. 2016 Jun;44(6):1502-7. doi: 10.1177/0363546516629944. Epub 2016 Feb 26.

## Incidence of Anterior Cruciate Ligament Tears and Reconstruction: A 21-Year Population-Based Study

Thomas L Sanders<sup>1</sup>, Hilal Maradit Kremers<sup>2</sup>, Andrew J Bryan<sup>3</sup>, Dirk R Larson<sup>4</sup>, Diane L Dahm<sup>3</sup>, Bruce A Levy<sup>3</sup>, Michael J Stuart<sup>3</sup>, Aaron J Krych<sup>3</sup>



➔ Incidence : 68/100.000 (241 if 19-24yo men)<sup>1</sup>

➔ **WHEN** proceed reconstruction ?<sup>2</sup>

➔ Effect of delaying surgery?  
(cartilage, meniscus)

**3 months ?**

**6 months ?**

**12 months ?**

# Aims

⇒ 1. Evaluate relationship between the rate and repairability of meniscal injury and timing before ACL reconstruction

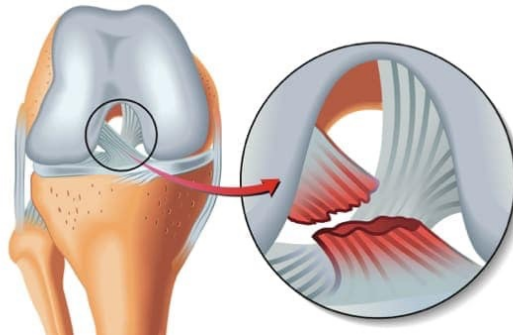
⇒ 2. Evaluate the relationship between chondral injury and

⇒ Pre-injury Tegner level of activity score (TAS)<sup>3</sup>,

⇒ Age,

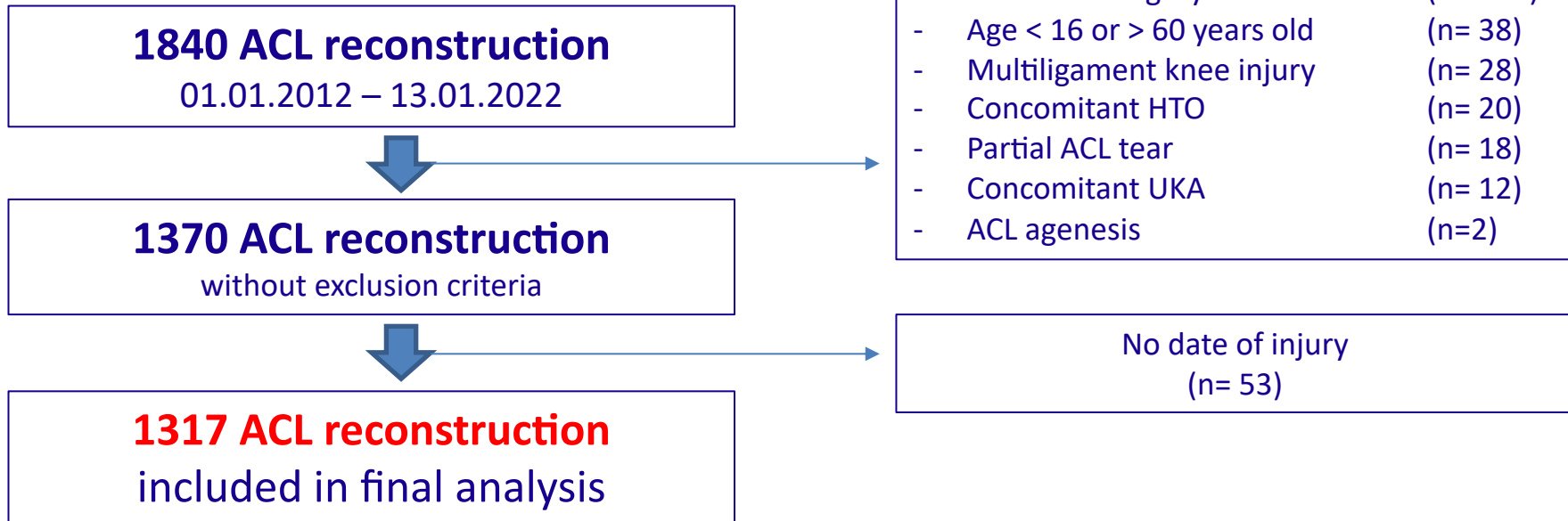
⇒ BMI,

⇒ Gender.



# Methods

## Monocentric, retrospective cohort



# Methods

**1317 ACL reconstruction**

**Delay before surgery**

**< 3 months**

n=427



**Ref.**

**3 - 6 months**

n=388

**6 - 12 months**

n=248

**> 12 months**

n=254



# Classification

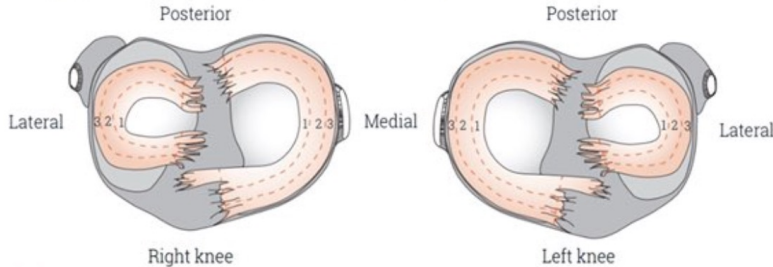
## Meniscal injury: ISAKOS classification<sup>4</sup>

### 1. Tear depth

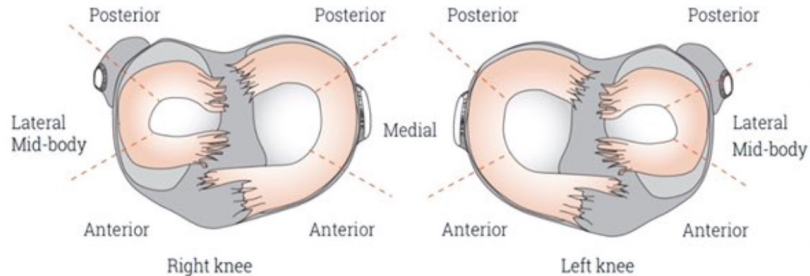
- Partial     Complete

### 2. Location - Rim width (circumferential location)

- Zone 1     Zone 2     Zone 3



### 3. Radial location

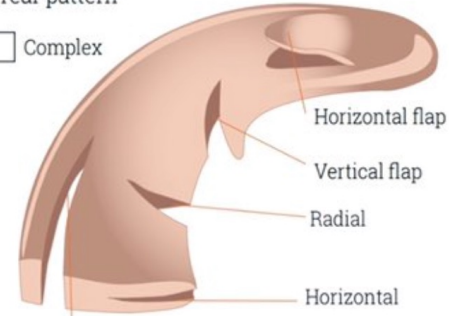


### 4. Central to the popliteal hiatus

- Yes     No

### 5. Tear pattern

- Complex



Longitudinal-vertical: extension is a bucket handle tear

### 6. Quality of tissue

- Non-degenerative  
 Degenerative  
 Undetermined

### 7. Length of tear (mm)

# Results

## 1. Demographic data

⇒ Mean delay before surgery : **11.3months**

⇒ Median delay before surgery : **4.5months**

⇒ **Tegner median: 6 [6-7]**

⇒ Recreational sports

**Median age: 29 // Median BMI: 23.7**

	<b>ACLR 1317</b>
<b>Age (years), median (IQR)</b>	29 (23-38)
<b>Age category, n (%)</b>	
< 25	445 (34%)
25 - 40	580 (44%)
40 - 50	211 (16%)
> 50	81 (6.2%)
<b>Sex Male, n (%)</b>	840 (64%)
<b>BMI (kg/m2), median (IQR)</b>	23.7 (21.7-25.9)
< 18	10 (0.8%)
18-25	827 (63%)
25-30	344 (26%)
> 30	98 (7.4%)
Missing	38 (2.9%)
<b>TAS, median (IQR)</b>	6 (6-7)
<b>Tegner category, n, (%)</b>	
1	3 (0.2%)
2	16 (1.2%)
3	50 (3.8%)
4	98 (7.4%)
5	138 (10%)
6	427 (32%)
7	483 (37%)
8	32 (2.4%)
9	59 (4.5%)
10	11 (0.8%)
Missing	33 (2.5%)
<b>Medial chondral injury, n (%)</b>	224 (17%)
<b>Lateral chondral injury, n (%)</b>	115 (9%)
<b>Medial meniscal tear, n (%)</b>	506 (38%)
<b>Lateral meniscal tear, n (%)</b>	348 (26%)



# Results

## 2. Meniscal injury

### Lateral meniscal injury

n=349 (26%)



### Medial meniscal injury

n=506 (38%)

Lateral meniscal injury (n=348)		Tear pattern	Medial meniscal injury (n=506)	
< 12 months (n=376)	> 12 months (n=130)		< 12 months (n=376)	> 12 months (n=130)
222 (59%)	63 (49%)	<b>Longitudinal-vertical</b>	222 (59%)	63 (49%)
59 (16%)	24 (18%)	<b>Bucket handle tear</b>	59 (16%)	24 (18%)
34 (9%)	8 (6%)	<b>Horizontal</b>	34 (9%)	8 (6%)
12 (3%)	8 (6%)	<b>Radial</b>	12 (3%)	8 (6%)
57 (15%)	27 (21%)	<b>Vertical flap</b>	57 (15%)	27 (21%)
4 (1%)	3 (2%)	<b>Horizontal flap</b>	4 (1%)	3 (2%)
47 (13%)	21 (16%)	<b>Complex</b>	47 (13%)	21 (16%)

# Results

## 3. Primary outcome

Delaying ACLR

### Medial compartment

- ↗ **Rate** of meniscal injury if delaying **>12months** (OR=1.14; **p= 0.000**)
- ⊘ **Repairability** of meniscal injury if delaying **>12months** (OR=0.97; **p=0.63**)
- ⊘ Rate / Severity if delaying reconstruction 3-6 or 6-12months (n.s.)

### Lateral compartment

- ⊘ Rate / Repairability if delaying reconstruction (n.s.)

# Results

## 3. Secondary outcomes

↗ Tegner score

- ↘ **Rate** of medial meniscal injury (OR=0.90; **p= 0.020**)
- ⊘ Repairability of medial meniscal injury (n.s.)

↗ Age

- ↗ **Rate** of medial meniscal injury (OR 1.07; **p=0.025**)
- ↘ **Repairability** of medial meniscal injury (OR 0.85; p=0.000)

↗ IMC

- ⊘ Rate / Repairability in both compartment (n.s.)

Male Sex

- ↗ **Rate** of medial meniscal injury (OR=1.13; **p<0.001**)
- ↗ **Rate** of lateral meniscal injury (OR=1.10; **p<0.001**)
- ⊘ Repairability in both compartment (n.s.)

# Conclusion

## *Injury – Reconstruction delay*

- > 12 months ↗ rate of medial meniscal injury
- **High pre-injury TAS** decreases the rate of medial meniscal injury
- **Age** is the only one factor decreasing repairability

**Timing of ACLR should be optimally reduced  
and should be < 12 months to avoid meniscal injury**

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