

3d advanced course on knee surgery  
Val d'Isère 2010

## Classification of patellofemoral arthritis.

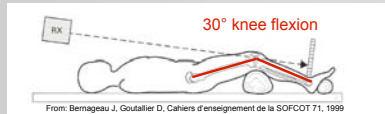


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## X-ray technique

Skyline view



From: Bernageau J, Goutallier D. Cahiers d'enseignement de la SOFCOT 71, 1999

Feet in neutral rotation; quadriceps non contracted !

Knutsson F, Acta Radiol, 1941

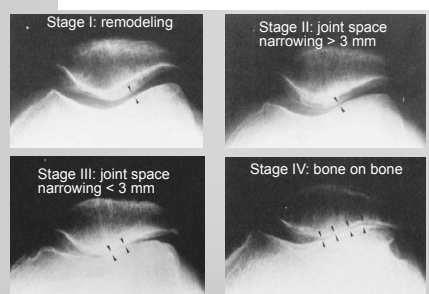
## OA classification

Kellgren-Lawrence

- Gr. O: Normal radiographs
- Gr. I: Dubious osteophytes (dubious OA)
- Gr. II: Osteophytes, no joint line change (minor OA)
- Gr. III: Osteophytes, joint line narrowing (certain OA)
- Gr. IV: Sclerosis, loss of the joint line (evolved OA)

Kellgren JH, Lawrence JS; Ann Rheum Dis 1957

## X-ray classification



Stage I: remodeling

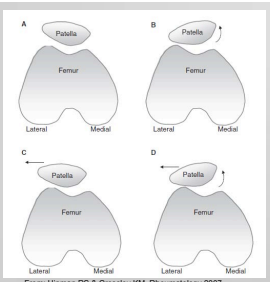
Stage II: joint space narrowing > 3 mm

Stage III: joint space narrowing < 3 mm

Stage IV: bone on bone

Iwano, Clin Orthop 1990

## X-ray classification



**Tilt**  
History of instability

**Shift**  
No history of instability

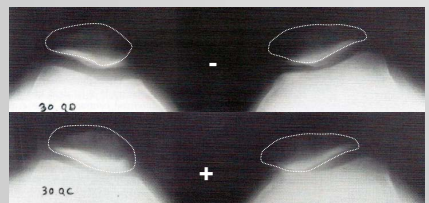
**Tilt & shift**

From: Hinman RS & Crossley KM, Rheumatology 2007

Iwano, Clin Orthop 1990

## X-ray technique

Quadriceps contraction



30° Q.C. -

30° Q.C. +

Diagnosis of unsuspected OA in 5% of patients with PF pain

From: Bernageau J, Goutallier D. Cahiers d'enseignement de la SOFCOT 71, 1999

### X-ray technique

X-ray at 30° and 60° of knee flexion.

From: Müller W.: The knee  
Bernageau J, Goutallier D, 1999

### X-ray classification

Types of lateral OA

- At 30°: lateral OA by patellofemoral malalignment
- At 60°: lateral OA by excessive lateral pressure
- Mixed forms
- Paradoxical forms: lateral OA at 30°; medial at 60°

Bernageau J, Goutallier D, 1999

### X-ray classification

Medial patellofemoral osteoarthritis

Lateral vs. medial OA: 9 / 1  
Iwano , Clin Orthop 1990

### X-ray classification

		Medial facet	Lateral facet
<b>60 %</b>	Patellofemoral alone	8 %	92 %
<b>40 %</b>	Combined with femorotibial	16 %	84 %
	Total	11 %	89 %

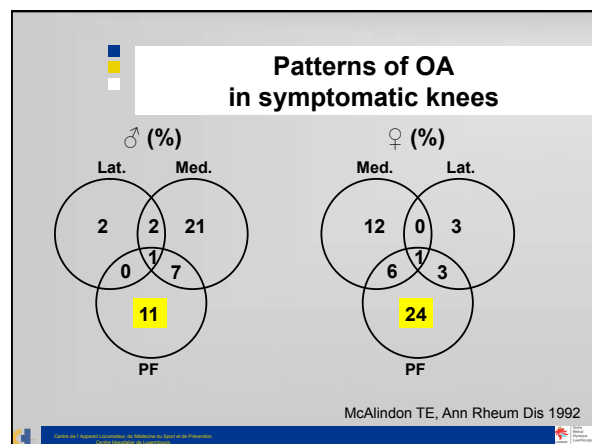
Iwano , Clin Orthop 1990

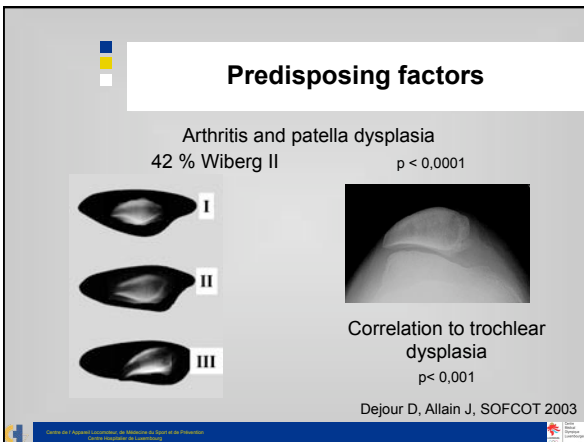
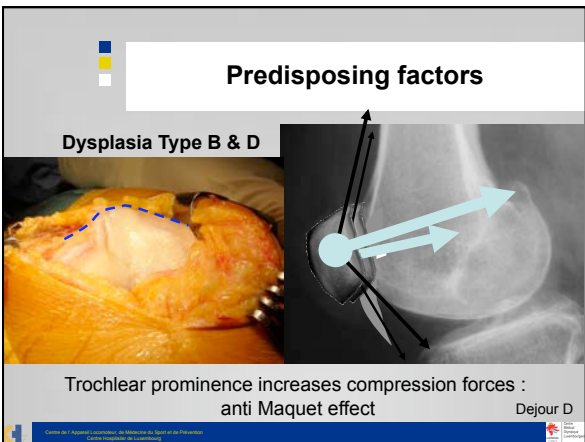
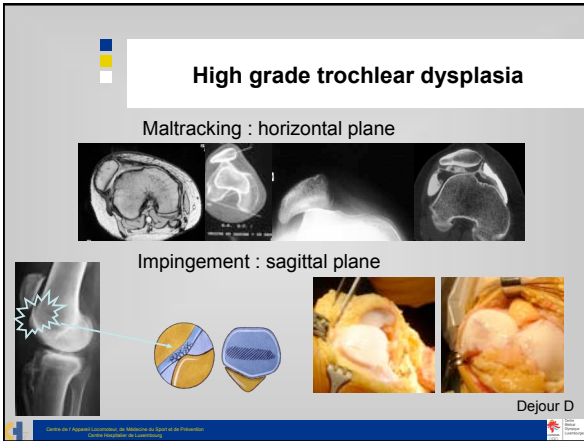
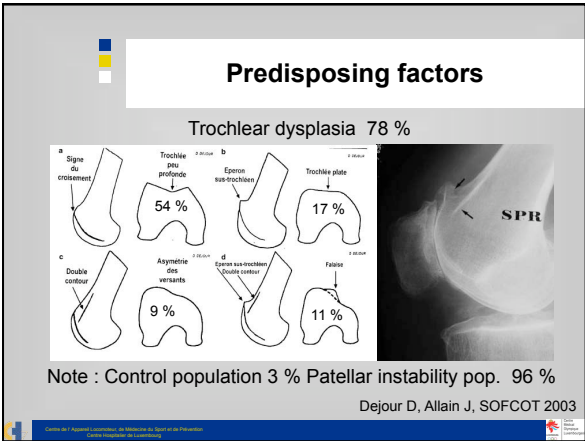
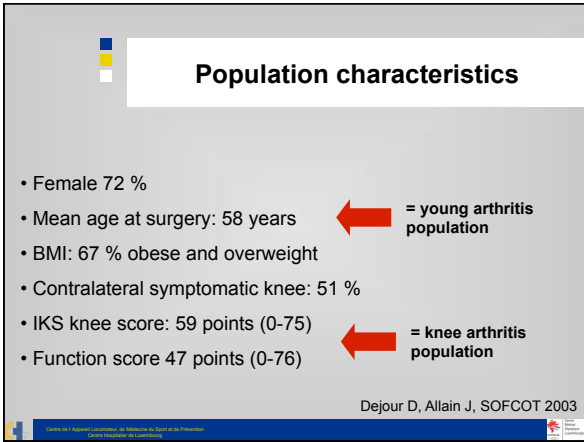
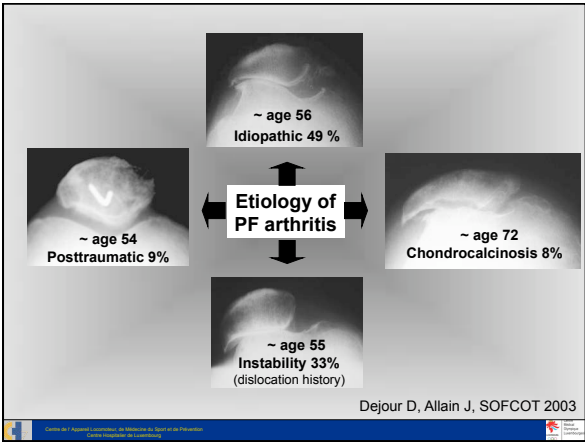
### Patterns of OA in symptomatic knees

N = 819; > 50 years

- 40 % tibiofemoral AND patellofemoral OA
- 32 % normal x-rays
- 24 % isolated patellofemoral OA
- 4 % isolated tibiofemoral OA

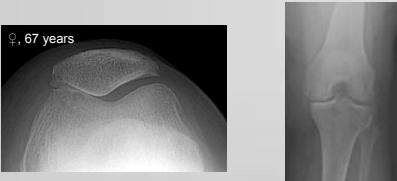
Duncan R, Rheumatology 2006





### Predisposing factors

Medial patellofemoral osteoarthritis



Association with symptomatic medial tibiofemoral OA: 12 %

Bernageau J, Goutallier D, 1999

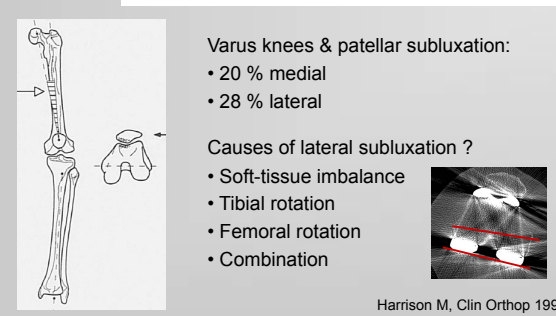
### Predisposing factors

Varus knees & patellar subluxation:

- 20 % medial
- 28 % lateral

Causes of lateral subluxation ?

- Soft-tissue imbalance
- Tibial rotation
- Femoral rotation
- Combination



Harrison M, Clin Orthop 1994

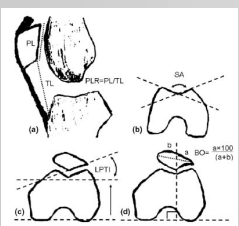
### Predisposing factors

Malalignment

Association between PF OA and:

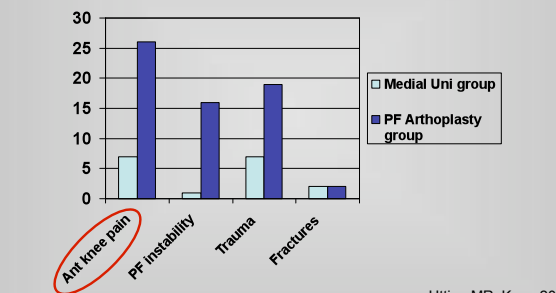
- Patellar height
- Patellar tilt
- Patellar offset

No analysis of trochlear dysplasia !



Kalichman L, Arthritis Res & Therapy 2007

### Predisposing factor: Adolescent anterior knee pain ?

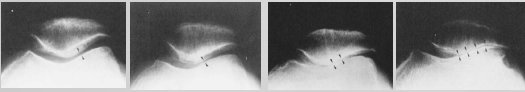


Category	Medial Uni group	PF Arthroplasty group
Ant knee pain	~7	~26
PF instability	~1	~16
Trauma	~7	~19
Fractures	~2	~2

Utting MR, Knee 2005

### OA progression ?

Slow evolution from stage 1 to stage 4: 18 Years +++



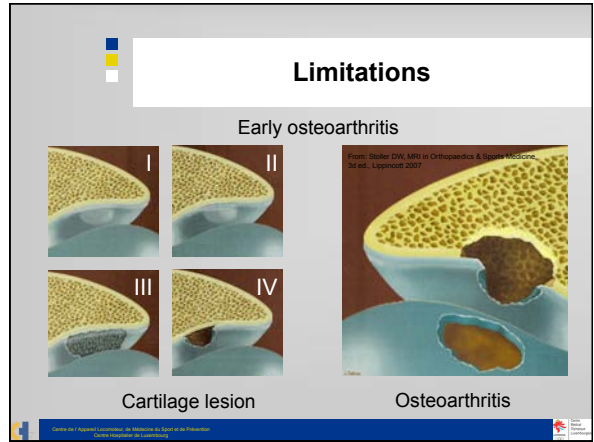
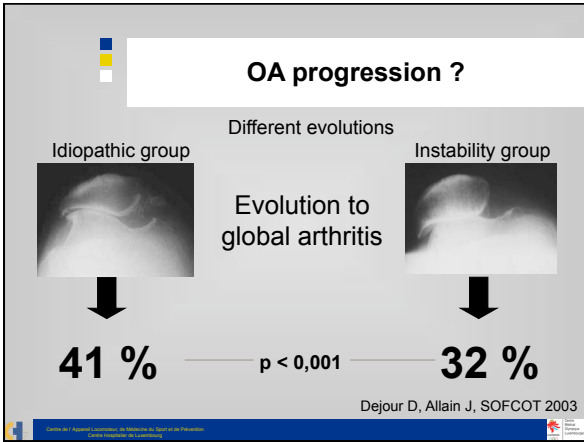
Dejour D, Allain J, SOFCOT 2003

### OA progression ?



The presence of a PF joint OA predicts the development of TF joint OA over a period of 30 months !

Mazzucca S, Ann Rheum Dis 2006



[www.sportsmedicine-chl.lu](http://www.sportsmedicine-chl.lu)