

# Doron Sher

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**Dr Doron Sher**  
**Knee & Shoulder Surgery**

# High Tibial Osteotomy

**Doron Sher**

MBBS MBiomedE FRACS



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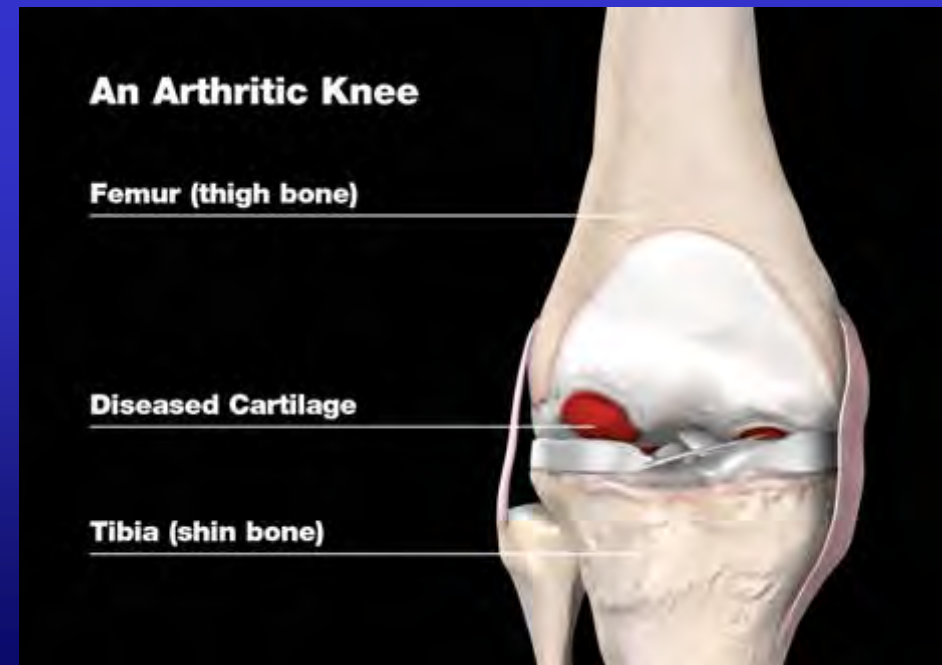
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# How much cartilage do I have to cushion the joint?

- Femur 4mm !!
- Tibia 3mm !!
- Patella 5mm !!

To last a modern lifetime!



# Osteoarthritis. Who gets it?

- Everybody,  
Providing you live long enough...



# How does it progress? What are the driving factors?

- Genetics
- Malalignment
- Abnormal mechanics
- Unequal force transmission

regardless of the  
initial circumstances...



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# Biomechanical Basis of Osteotomy

Transfer weight bearing forces from the arthritic portion of the knee to a healthier location in the knee joint to increase the lifespan of the knee

- Realigns the weight bearing forces
- Unloads the worn out joint



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# Goals of Realignment Osteotomy

- Pain relief
- Functional improvement
- Permit heavy demands
- Buy time before arthroplasty



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# Osteotomy is different nowadays

- Intervene earlier
  - Smaller angular corrections
- Combined Procedures
  - ACL, PCL, Cartilage work



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# Contra-indications

- Diffuse knee pain
- Patellofemoral pain as primary complaint
- Moderate/severe instability
- Diffuse arthrosis
- Inflammatory disease



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Unrealistic patient expectations

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# Relative Contra-indications

- Age > 60 yrs
- ROM < 90°
- Obesity (1.3x)
- Severe arthrosis
- Tibiofemoral subluxation (1 cm)



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# Results

- 80% still good at 5 years
- 60% still good at 10 years
- The operation is expected to fail
- It buys time for the patient to be active before their TKR



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# Arthritis in the active patient

- TKR relieves the pain
- Lose motion
- No good for labourers
- Can't run or jump
- Can't ski
- Very limiting

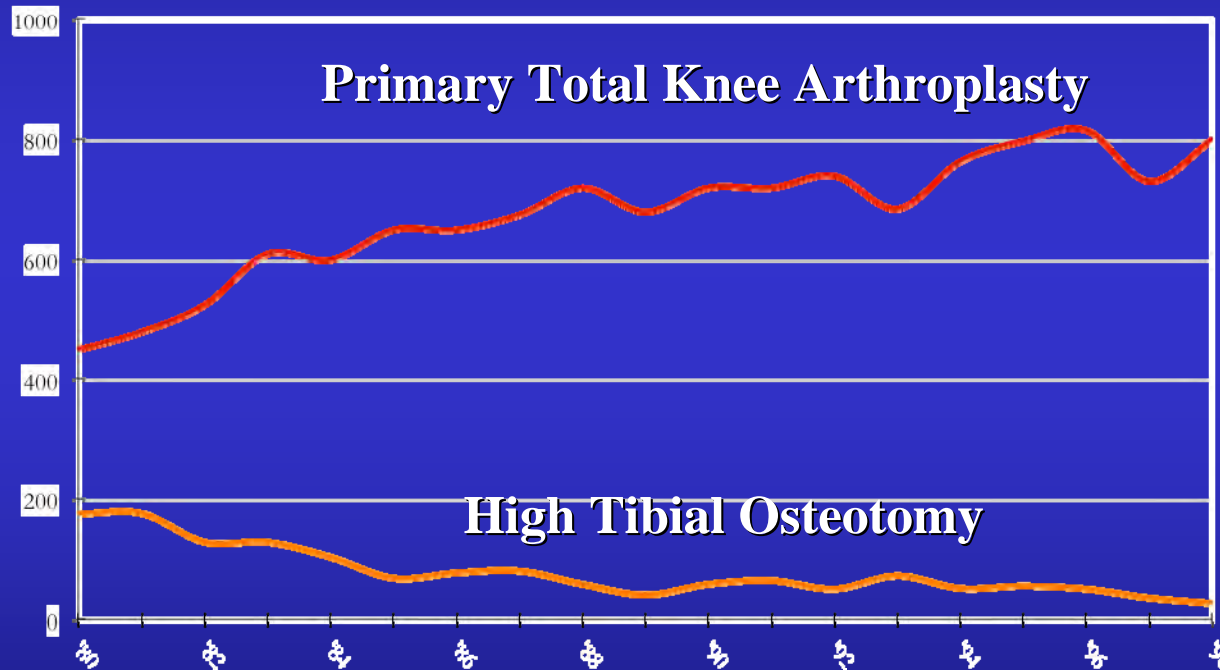


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# Incidence of HTO vs TKA



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# Revision to TKR

- The operation must not compromise the final TKR
- Uni knee to TKR
  - POOR results
- Closing wedge HTO to TKR
  - Reasonable results
- Opening wedge HTO to TKR
  - Nearly as good as primary TKR



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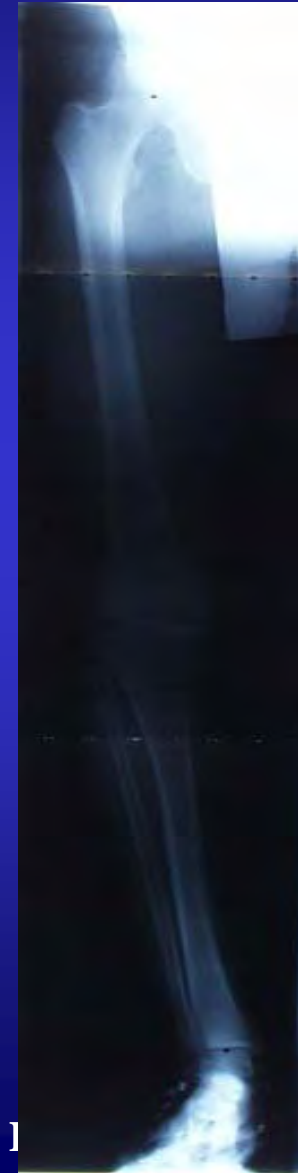
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# Pre-operative Planning

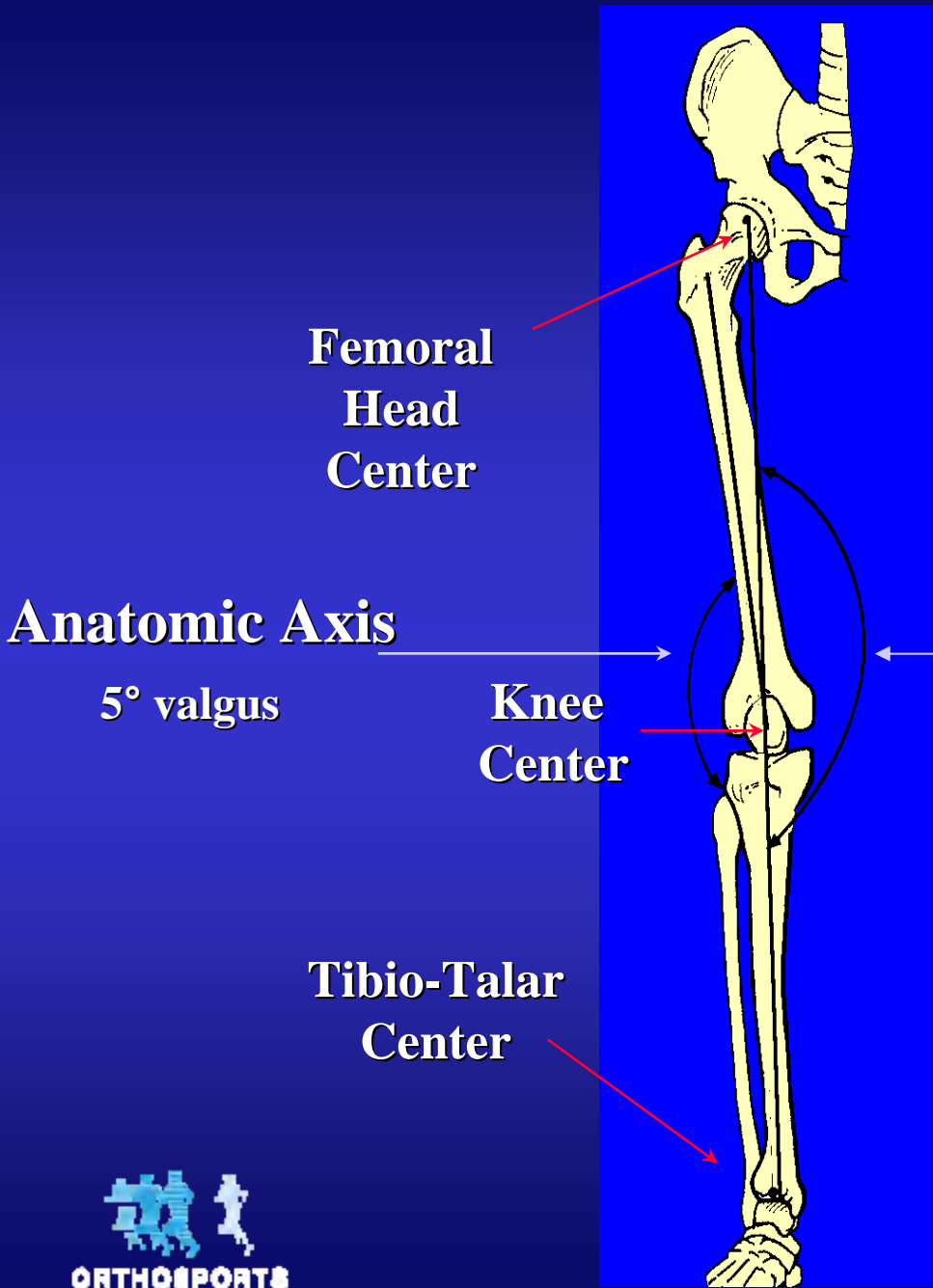
- Lateral



- Single/double leg standing hip-to-ankle

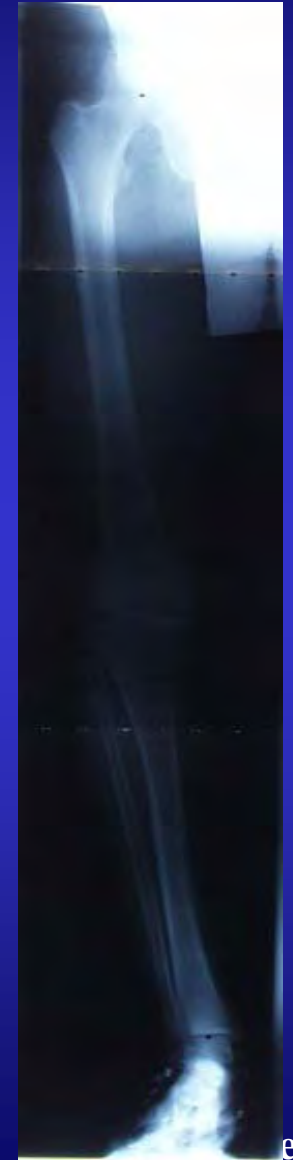


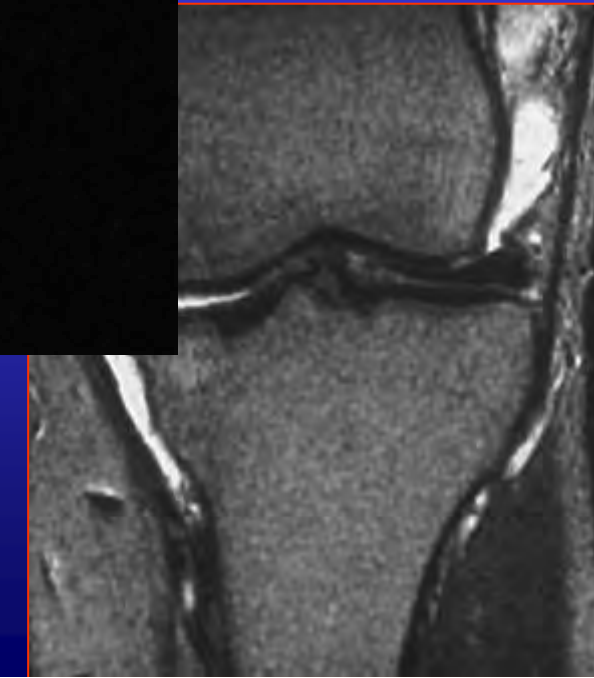
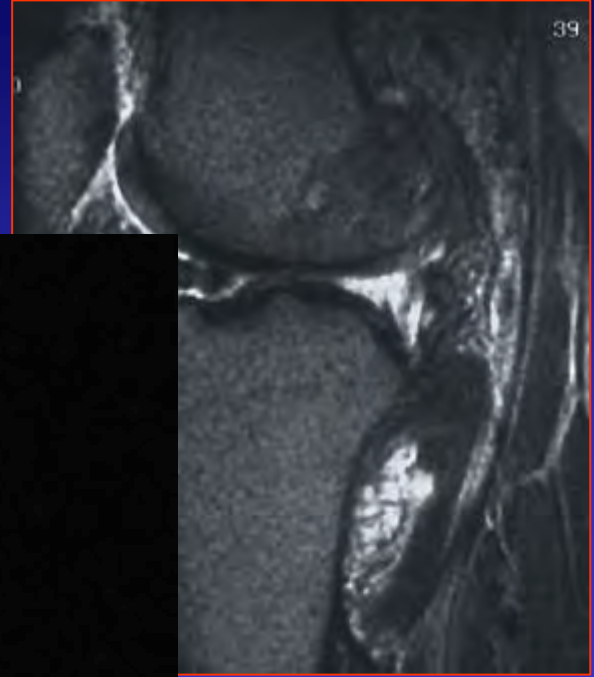
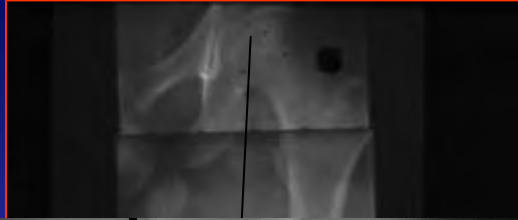




**Mechanical Axis**

**1.2° varus**





# Types of Osteotomy

- Wedge
  - opening
  - closing
- Dome
- Distraction



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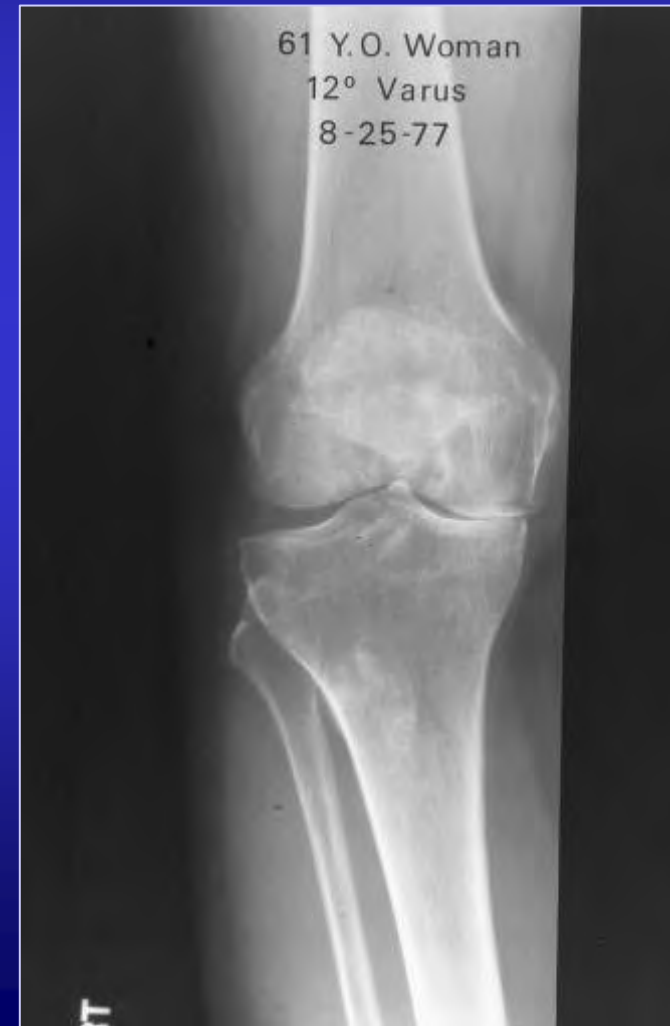
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# Proximal Tibial Osteotomy

## Specific Amount of Desired Correction

	Varus Deformity
Maquet	2-4°
Robert Leach	8-10°
Coventry (1973)	10-13°
Insall (1974)	5-15°
Kettlekamp (1976)	5-11°
Hsu (1985)	3-5°

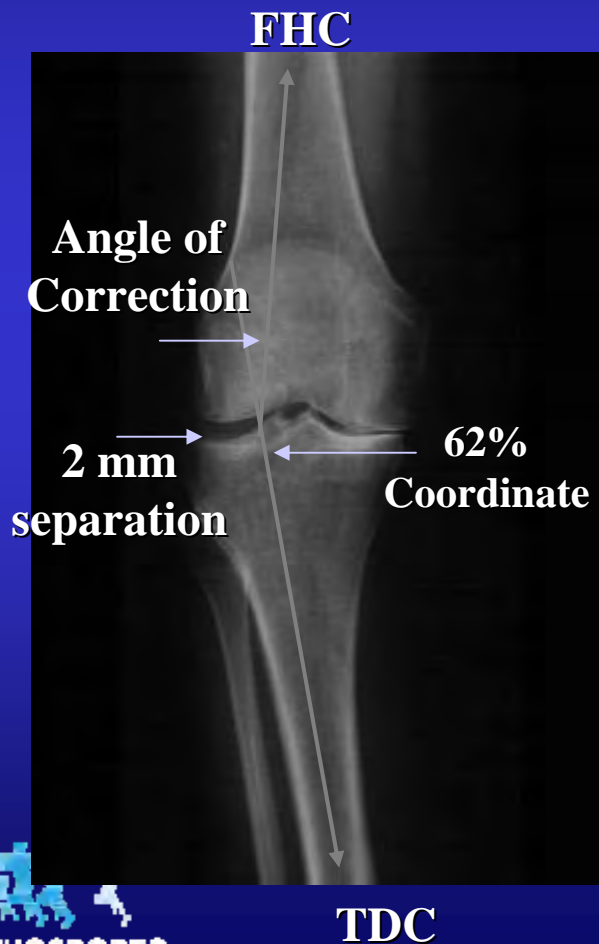


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# Weight Bearing Line Method



Define 62% coordinate

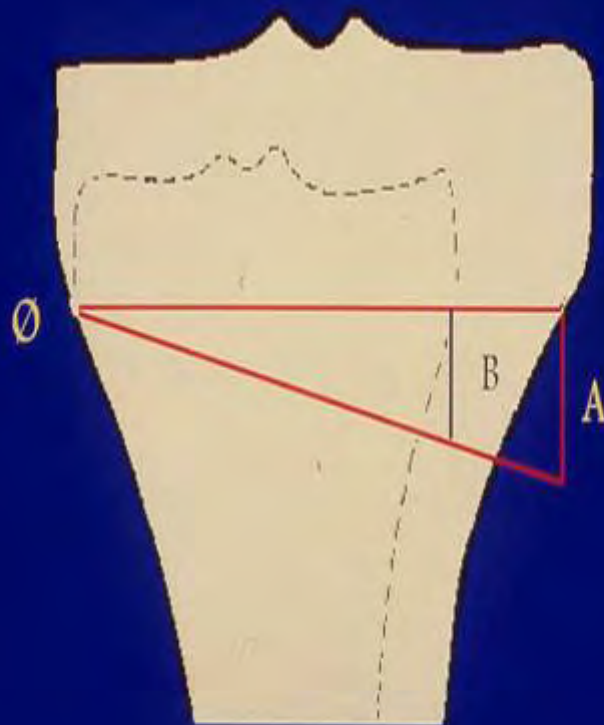
Determine angle of FHC & TDC to 62%

Subtract for joint line separation

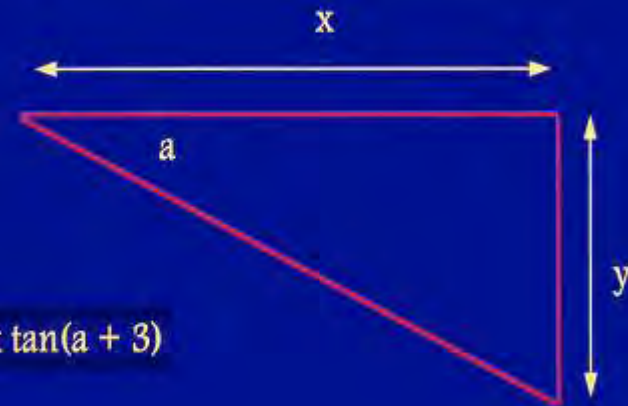
Wedge calculated by tracing on radiograph

Adjust for magnification

# Tibial Size



## Trigonometric Method



$$y = x \tan(a + 3)$$



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# Opening Wedge

## Interposition Stepped Plate

### Surgical Indications

- Varus arthrosis
- Posterolateral instability and varus thrust
- ACL deficiency and medial compartment degenerative arthritis



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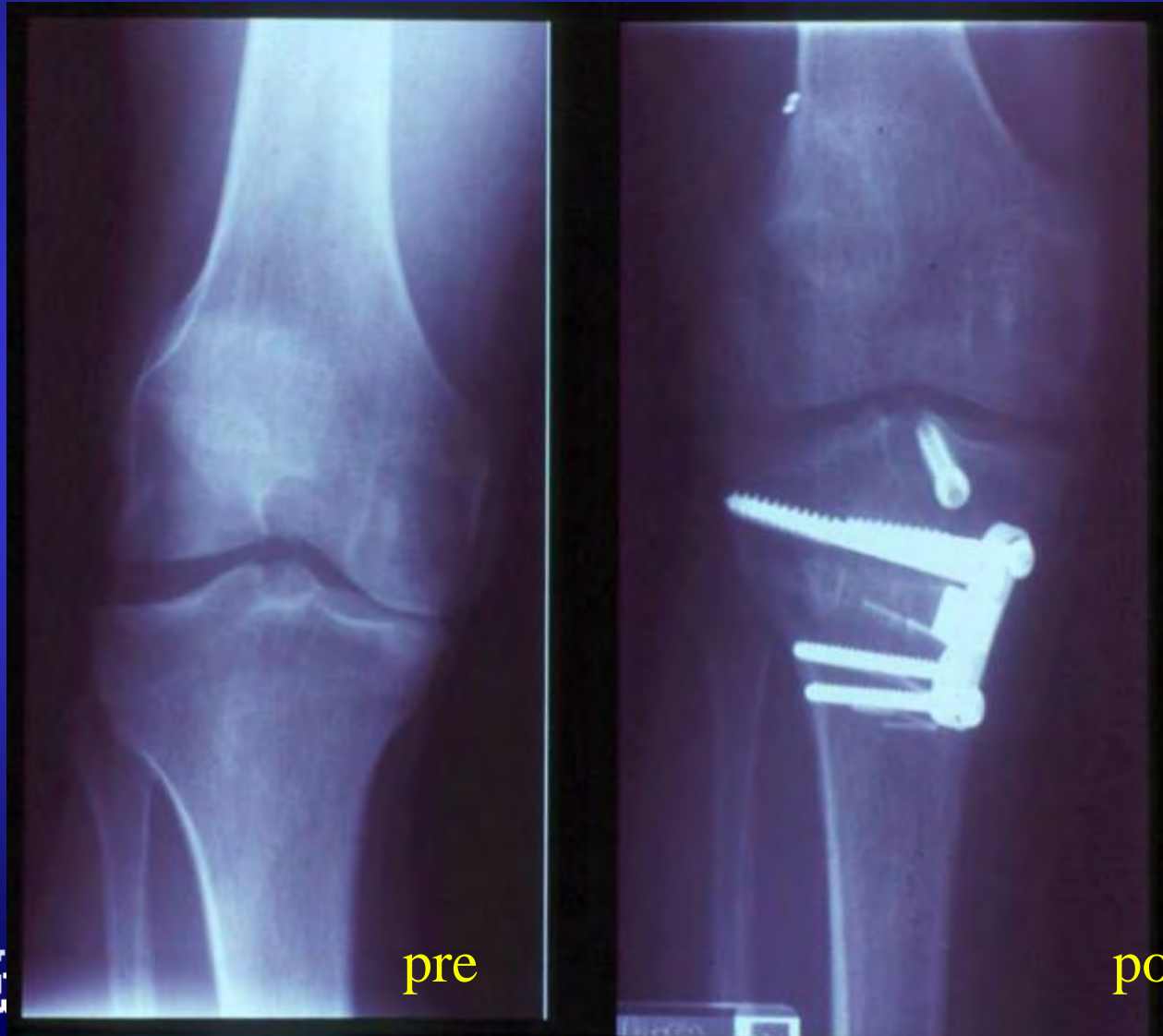


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# Medial Opening Wedge HTO



pre

post Dr Doron Sher  
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# Post-Operative Management

- Hinged brace
- Full range of motion
- Touch → protected weight-bearing – over 3 months



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# Post-Operative Management

## Return to:

- ADL 3 - 4 months
- Work (standing)  
4 - 6 months
- Sports 4 - 6 months



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# Realignment Osteotomy

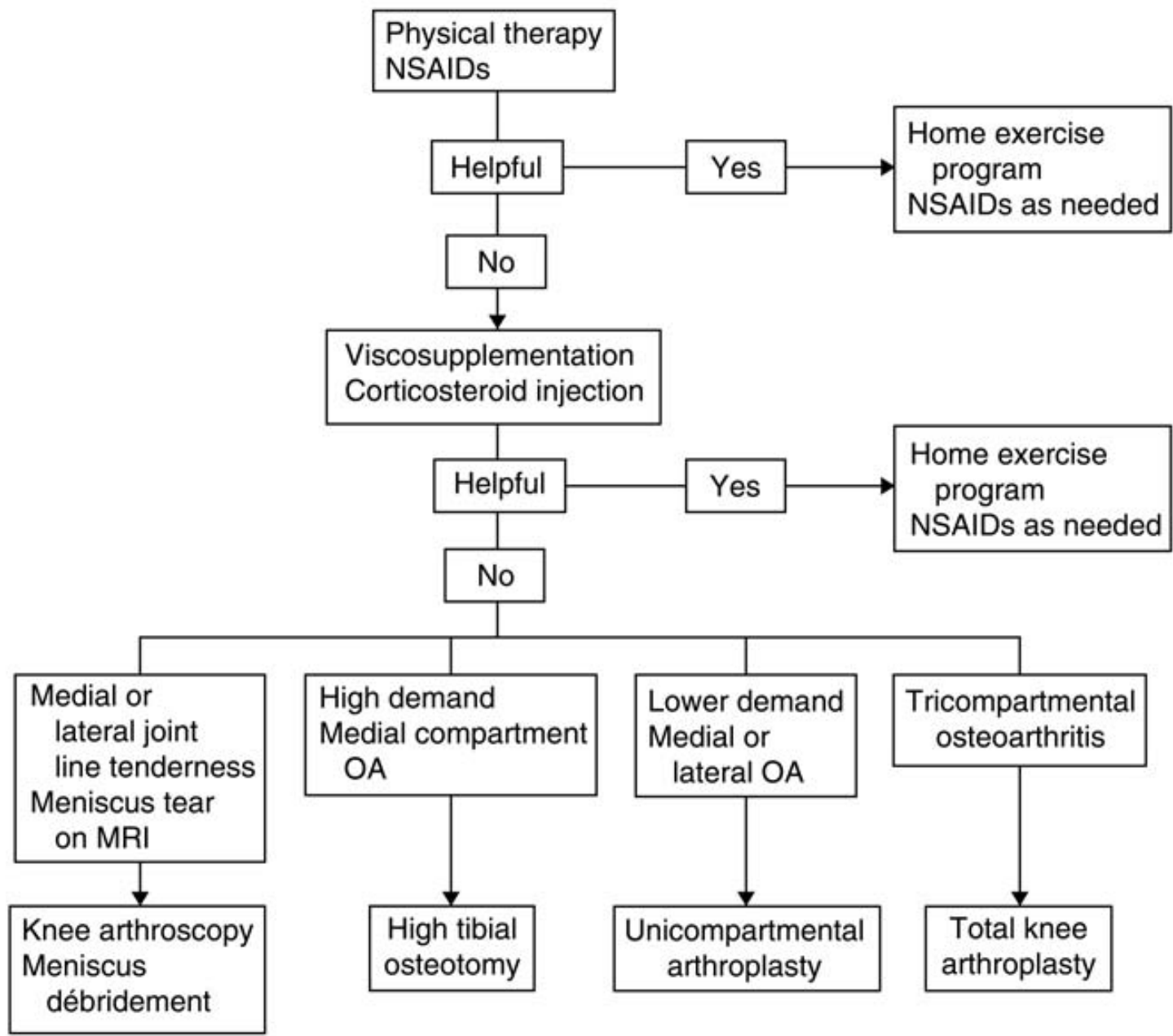
- Active population / increasing longevity
- Current indications narrow
- Patient selection
- Accurate surgical technique



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