



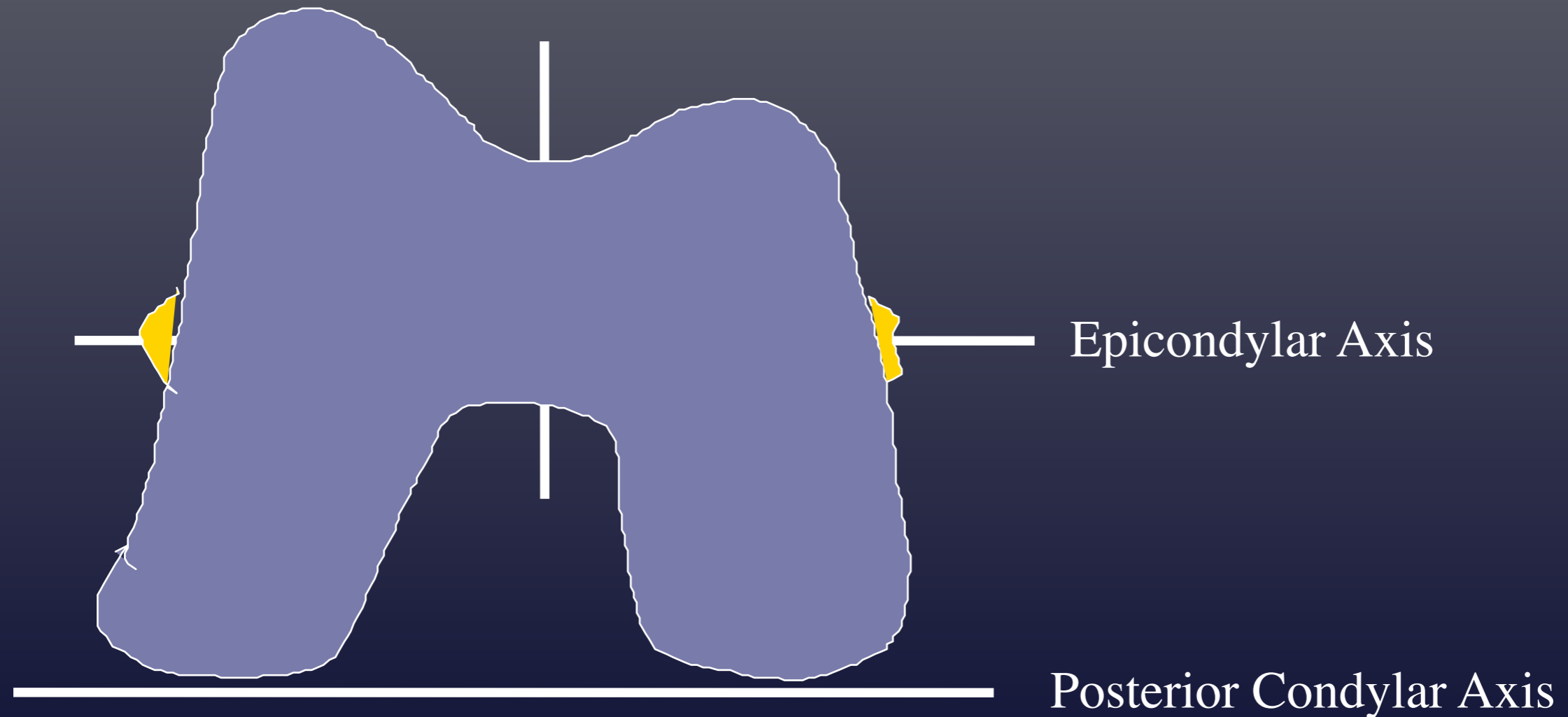
AP Wt Bearing



30° Flexed
AP Wt Bearing

Femoral Axes

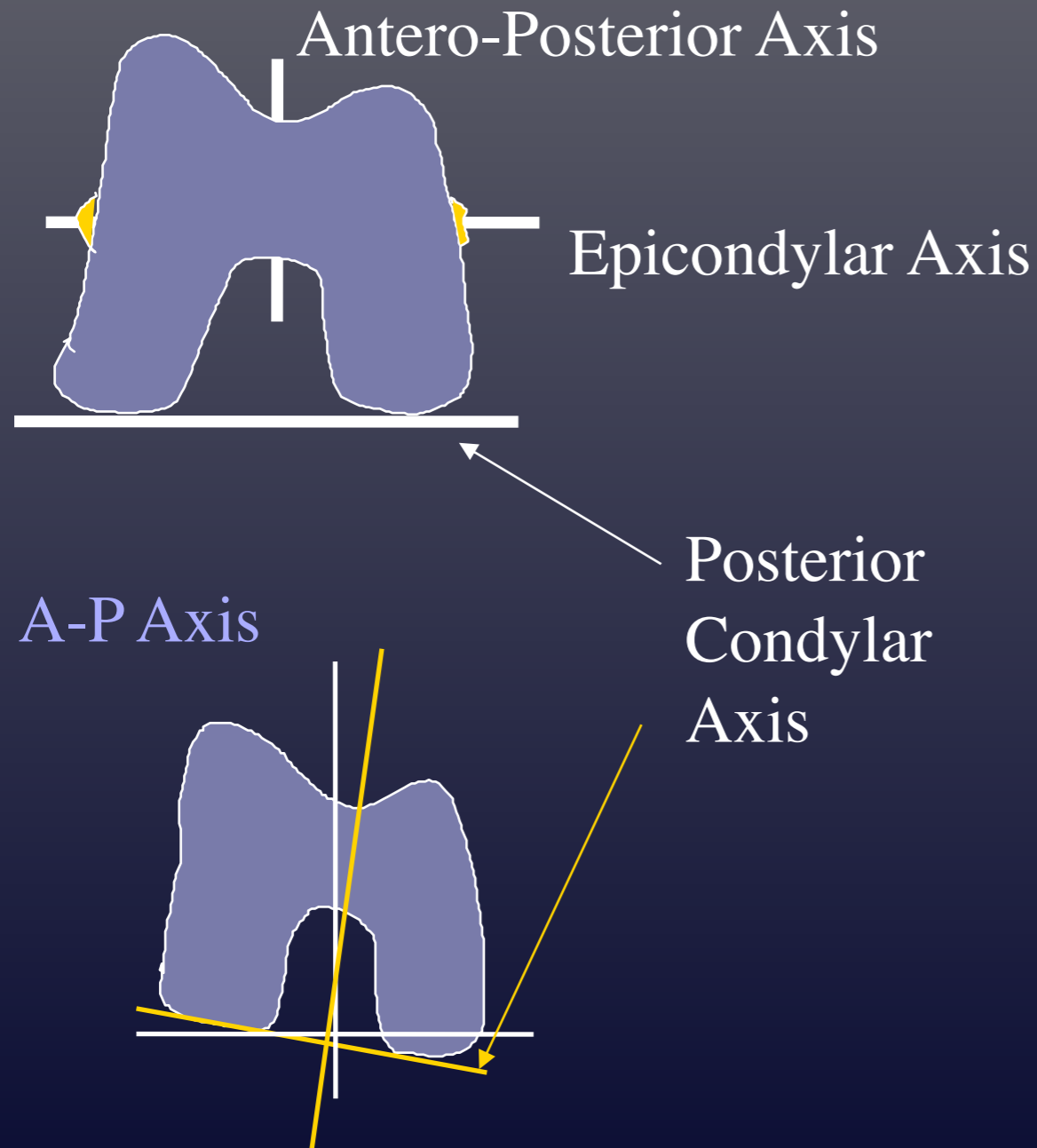
Antero-Posterior Axis



Epicondylar Axis

Posterior Condylar Axis

Femoral Axes



- In a normal or varus knee all methods of finding the correct axis are similar
- In a valgus knee the posterior condylar axis will lead to internal rotation of the femoral component

Placing the Femoral Component

- Recognise the Deformity
- Control Rotation from Inter-epicondylar line
- Use Whitesides line
- Take Rotation from Tibia



29-Aug-2019
09:16

Case 2
84 yo male
Bilat primary TKR
Revision L TKR
Now painful



27-Feb-2017
14:54

NG

SE: 1

SE: 3 Lateral

15:18

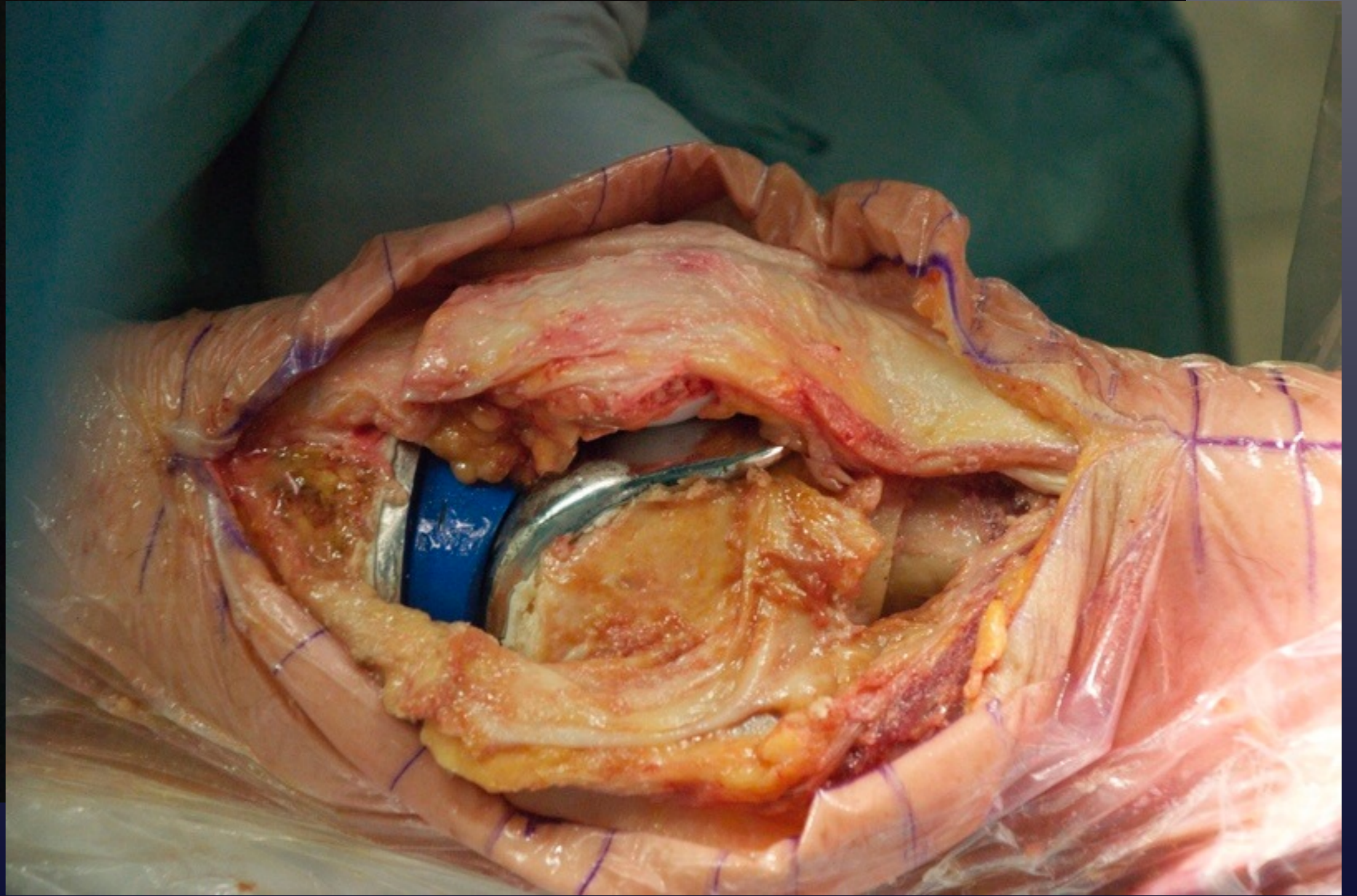
August 15

Case 3
72 year old man
RTA age 17
Injury R knee
Treated on traction
Painful Knee for 15 years
Very bad last 3 years



- Plan
- This operation is done before you get to the operating theatre!







- Femoral sleeve
- used to fix the
- osteotomy and
- align the knee



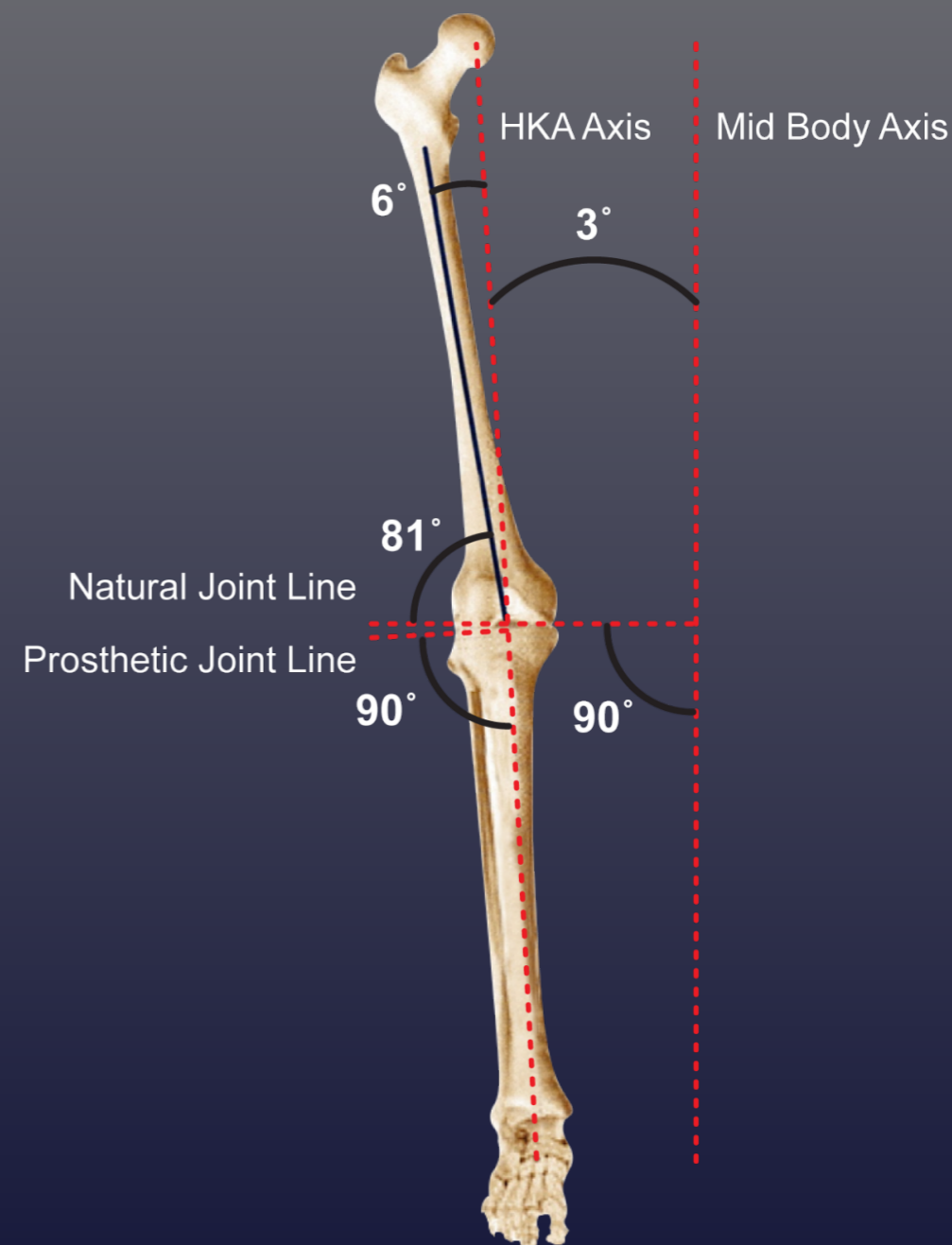
8 Year Follow-up



Asymptomatic

Severe Deformity

- Mechanical Alignment is a main goal in TKR
- Extra Articular Deformity may need resolution to obtain this
- Intra Articular Deformity correctable with soft tissue releases and



Extra-Articular Deformity

- The Problem
 - Can we correct the extra-articular deformity in the joint?
 - Doing so may correct alignment, but there will be an effect on soft tissue balance

Extra-Articular Deformity

- When is an osteotomy appropriate?
- When can we do it as part of the joint replacement and when should we do a 2 stage procedure?

Extra-Articular Deformity

- The influence of the site of the deformity
- The influence of the size of the deformity
- The influence on the bone cuts on ligament balance

The Effect of Extraarticular Varus and Valgus Deformity on TKA

Wolff A, Hungerford D, Pepe C,
Clin Orthop 271:35-51, 1991

- Landmark paper
- Series of graphs defining the correlation between site, magnitude and functional laxity resulting from asymmetric cuts

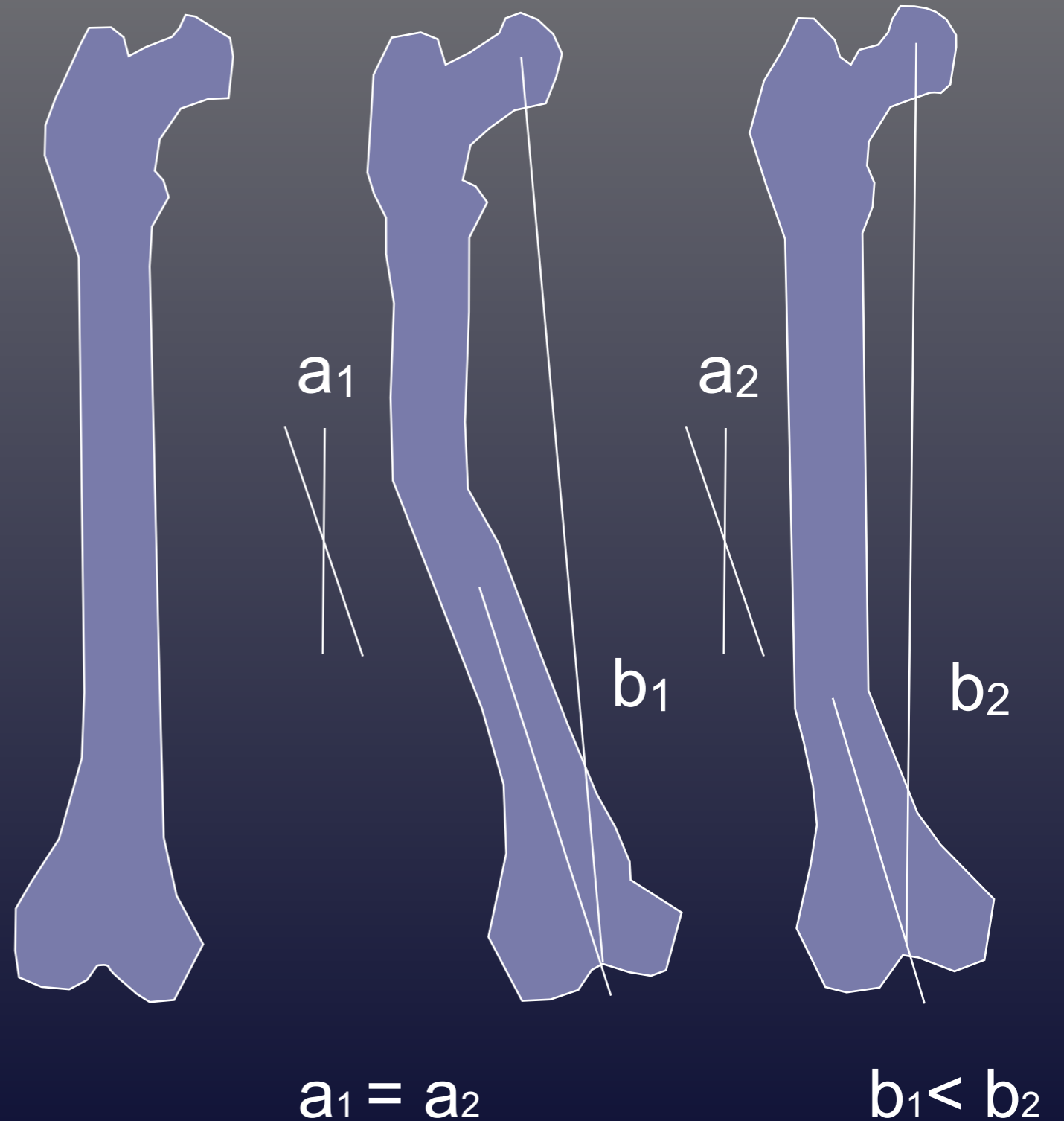
Femoral Deformity

Effect of the Site of the Deformity

- The closer to the knee the more the effect on the knee

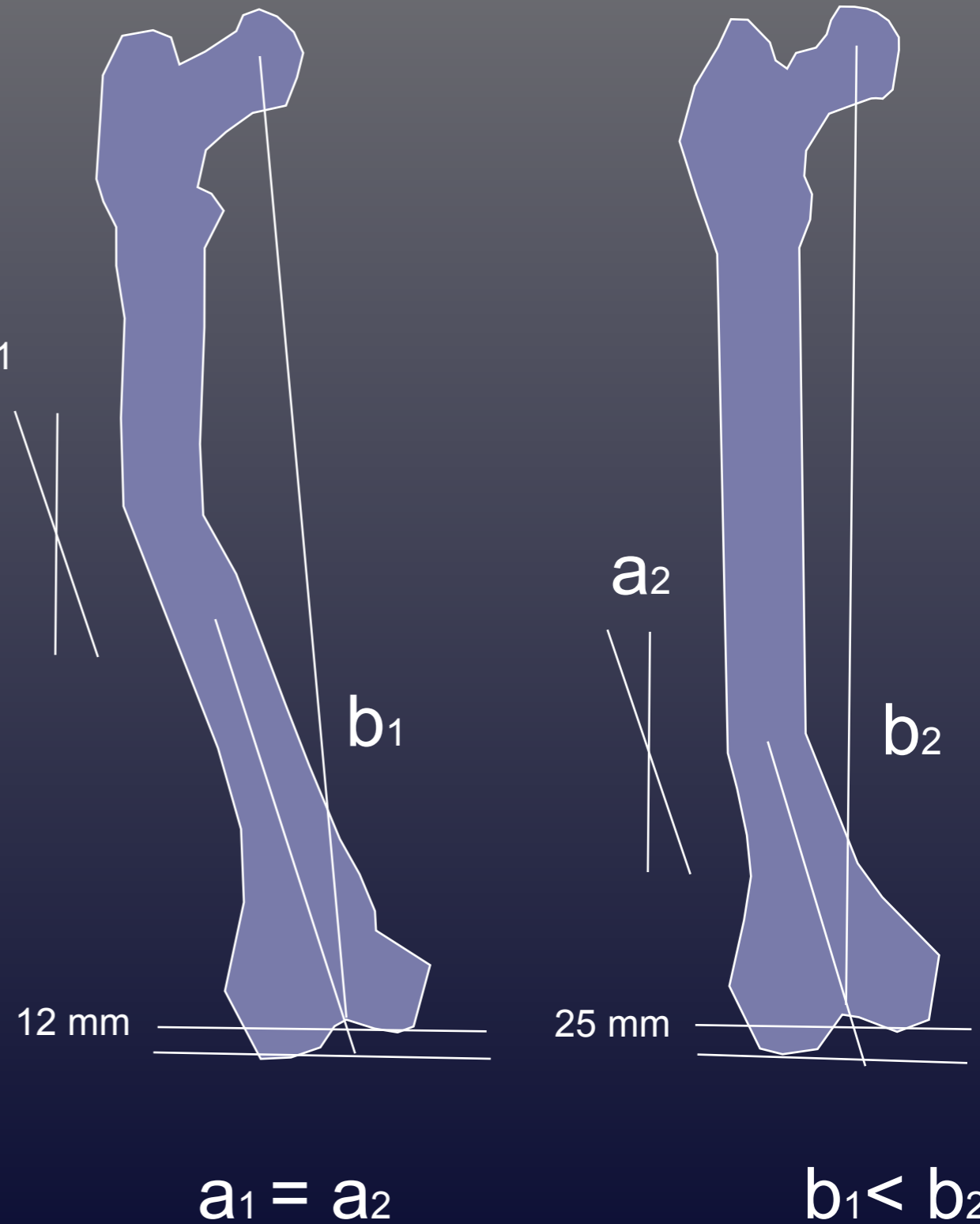
The Compensatory Angle for a 20° deformity at different levels

Distance from Knee	Compensatory Angle
10%	18°
30%	14°
50%	10°
70%	6°
90%	2°



Femoral Deformity

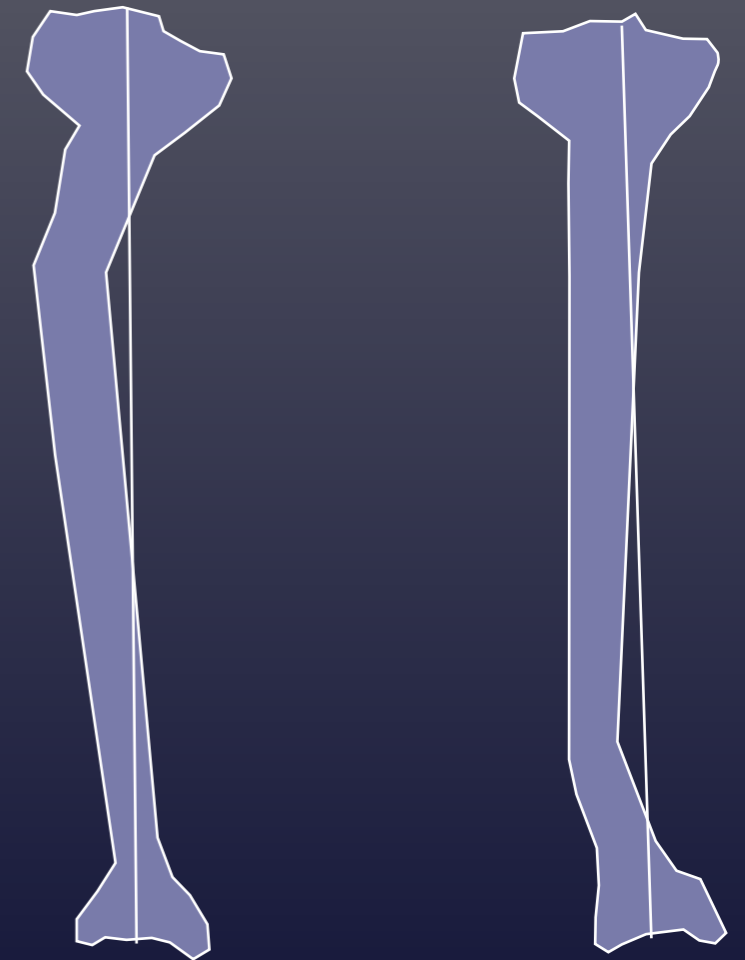
- Deformity in the femur leads to asymmetric cuts when the implant is perpendicular to the mechanical axis
- The magnitude varies with the distance of the deformity from the joint line



Distance from Knee	Compensatory Angle	Ligament Lengthening
10%	18	30.9
30%	14	24.4
50%	10	17.5
70%	6	10.5
90%	2	3.2

Tibial Side

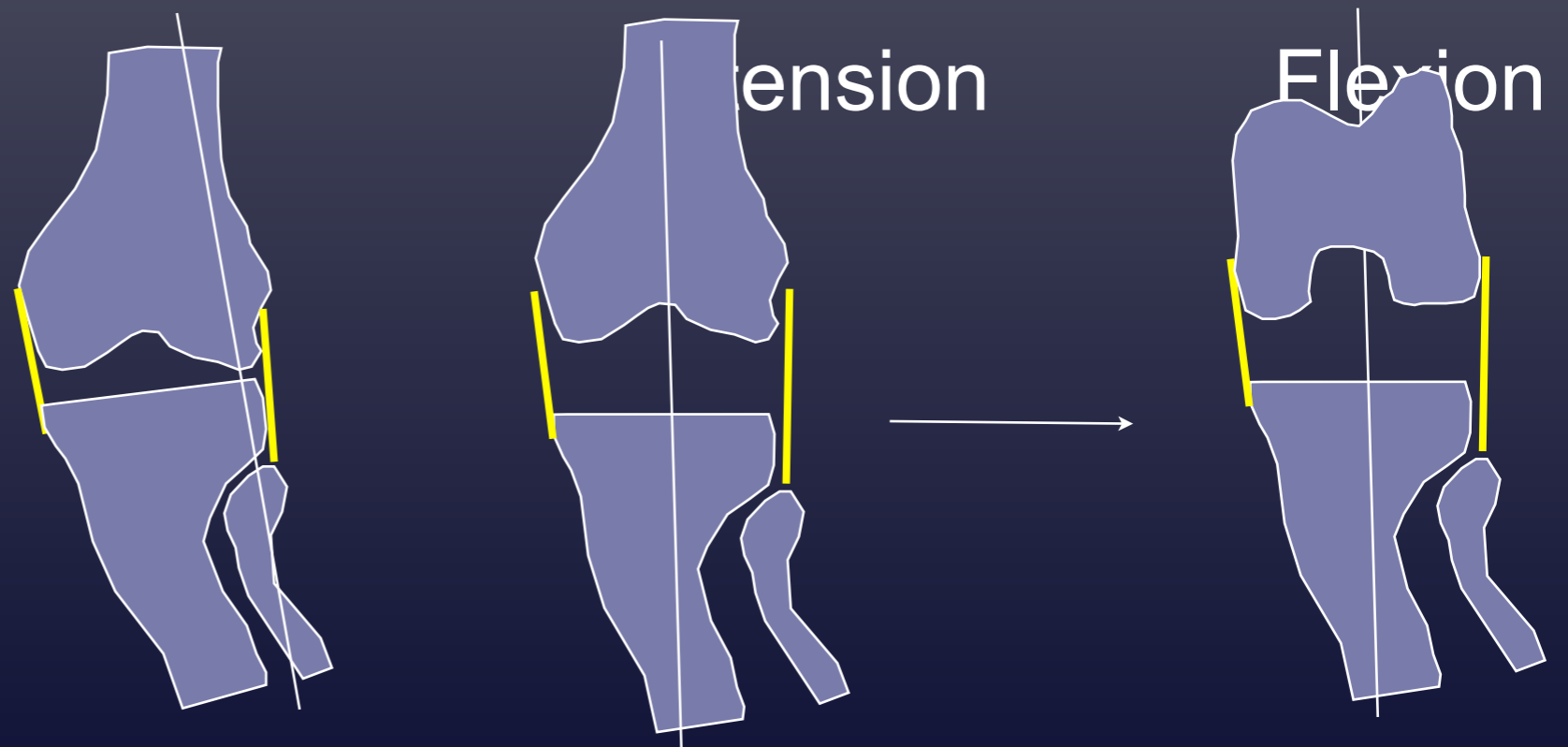
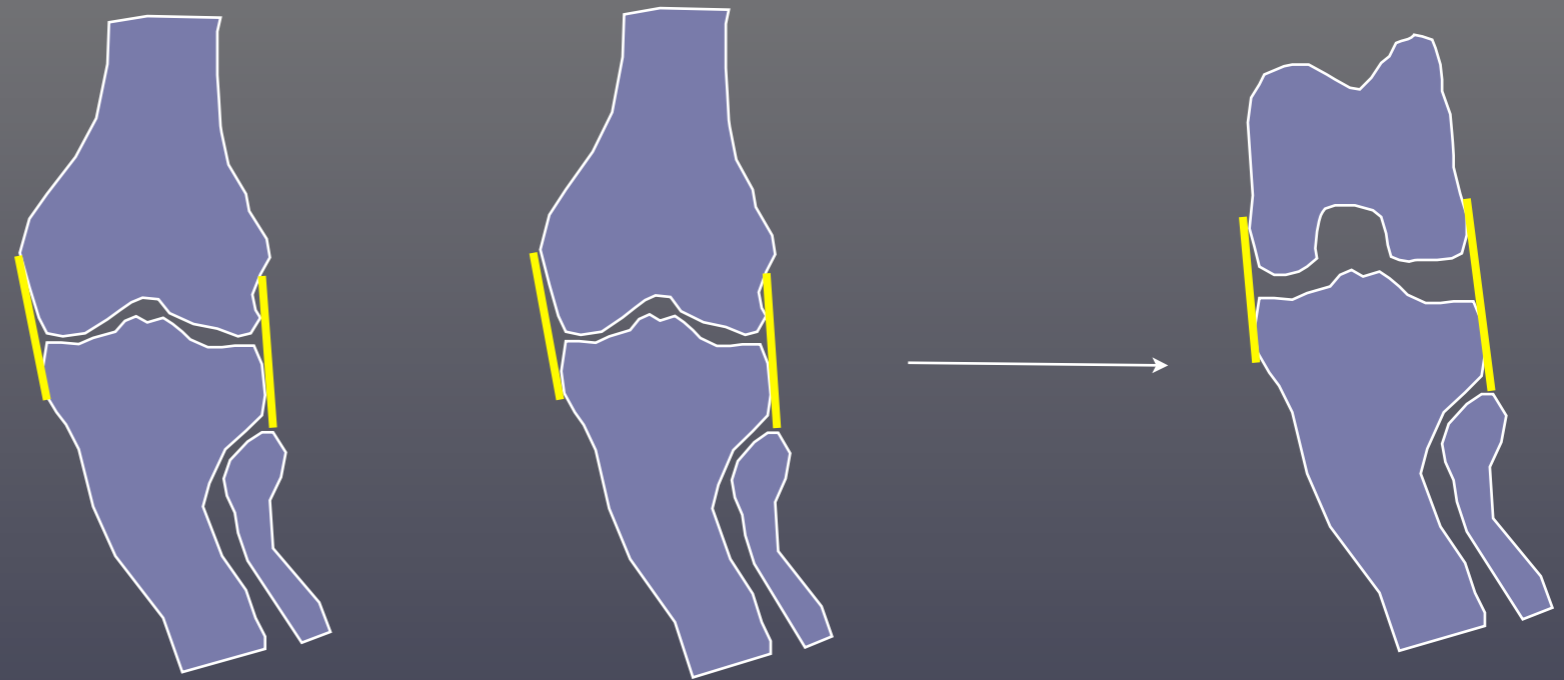
- The same as the femur
- More distal deformities have less effect on angulatory deformity
- More distal deformities have less effect on symmetry of bone cuts



Effect on Ligament Balance

Tibial Side

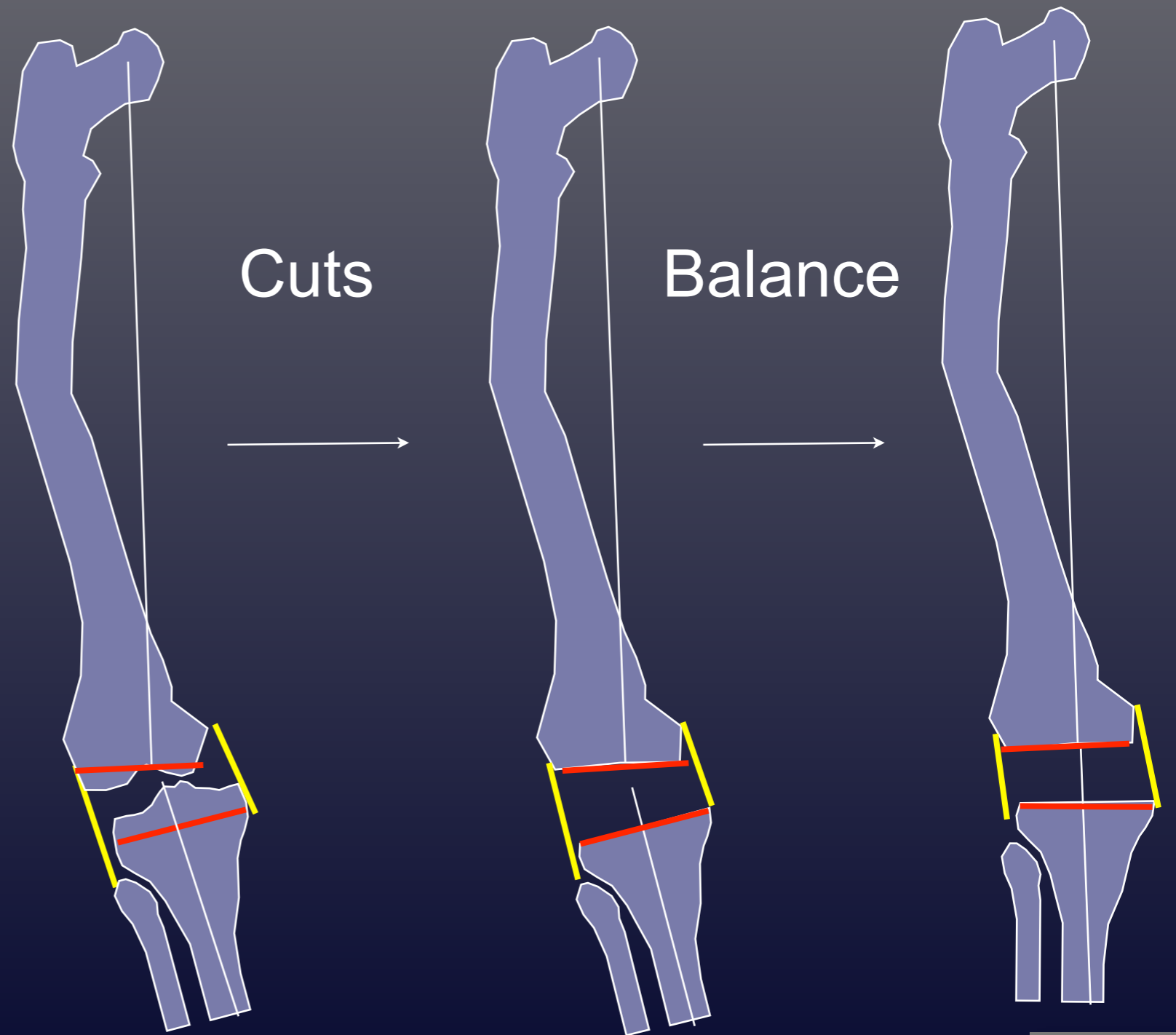
- Effect of release equal in flexion and extension
- Balance easy (relatively)



Femoral Side

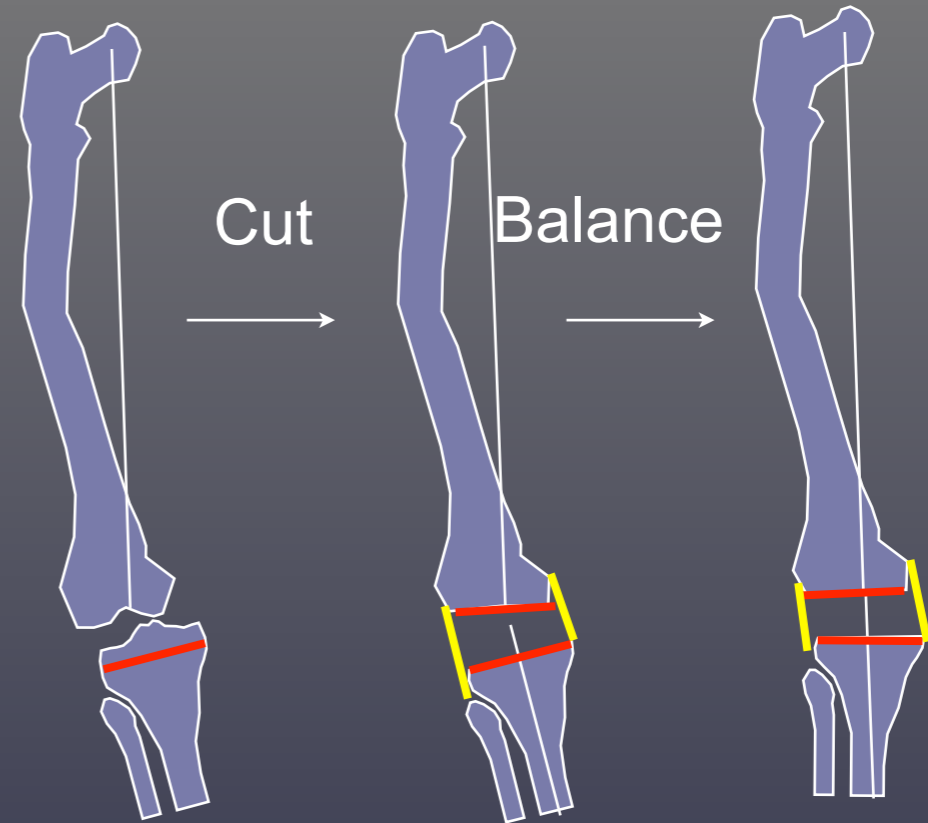
Femoral Side

- Asymmetric Cut Leads to Laxity
- Balancing by ligamentous release



Femoral Side

- Balanced in extension
- Unbalanced in Flexion



- Options

- More constraint: TC3
- Cheat by rotation of femoral component
- Beware there is a limit

