PLEASE CLICK ON THE FOLLOWING LINK TO WATCH THE LECTURE ONLINE:-

https://www.youtube.com/watch?v=4P5P8vmQfP4&list=PLuBRb5B7fa_dtajIUw2Eo1E-8Uv8vVNmR&index=5

PRINCIPLE OF DEFORMITY ANALYSIS AND CORRECTION

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Normal Limb Alignment and Joint Orientation

The CORA method represents a system by which one can assess long bones for angular deformity.

The technique requires that one understand the parameters of what is considered normal limb alignment.

Bone alignment is objectively assessed through examination of bone axes,
and joint orientation is evaluated using joint orientation lines.

The intersection of an axis and a joint orientation line forms a *joint orientation* angle that defines the relationship of the joint to the rest of the bone.

The bone axes (anatomic and mechanical), joint orientation lines, and joint orientation angles constitute the basic building blocks for determining what is "normal," so that affected bones can be assessed objectively.

Defining Frontal, Sagittal, And Transverse Planes

Deformities can occur in one OR more of three planes: frontal, sagittal, or transverse.

A *plane* is defined as a flat surface, the position of which is determined by three points in space.
Radiographic images are used to assess planes.

The frontal plane is examined from a cranial-to-caudal radiographic image and is used to evaluate for valgus or varus deformity (lateral or medial deviation, respectively).

The sagittal plane is assessed from a lateral-to-medial radiographic image and is used to evaluate for procurvatum (cranial bowing) and recurvatum (caudal bowing).

The transverse plane is studied from an image obtained with the beam directed axially along the bone and is used to evaluate for torsional deformity.
Some bones have deformities in more than one plane. Six possible deformational directions have been noted.

By convention, a *deformity* is described in terms of the relationship of the distal portion of the bone or joint to the more proximal portion of the same structure.

Bone Axes

Standardized methods are important in assessing each bone.

The method used should remain consistent, regardless of bone or observer.
Bones are evaluated in both frontal and sagittal planes; however

additional radiographic views can be obtained if needed.

The first tool for assessing a bone consists of determination of bone axes.

Axes are defined as *anatomic* or *mechanical* and can be established for an entire limb or for a specific bone.

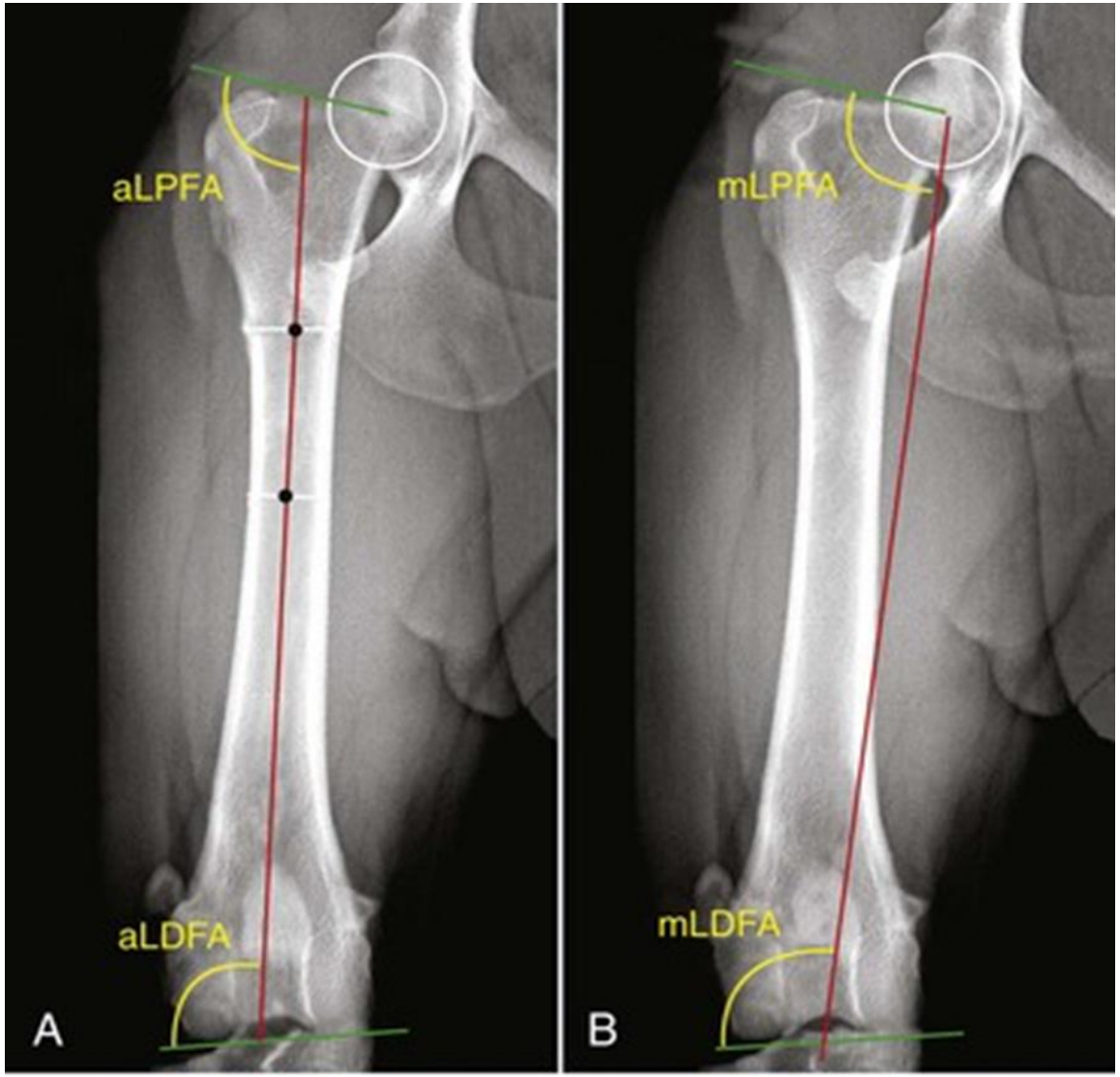
The anatomic axis is defined as a line that passes though the center, or mid-diaphysis, of the bone in the frontal or sagittal plane.

Because the anatomic axis follows the geometry of the bone, if the bone is very straight, only one line will be centered between the two cortices.

The mechanical axis is defined as the straight line connecting the center points of the joints proximal and distal to the bone in the frontal or sagittal plane .
The mechanical axis is always a straight line and represents the weight-bearing axis of the bone. Clinically, the anatomic axis is most easily used to assess bones that are normally straight in a particular plane (e.g., the canine radius in the frontal plane), and the mechanical axis is most easily used to define a bone that is normally curved

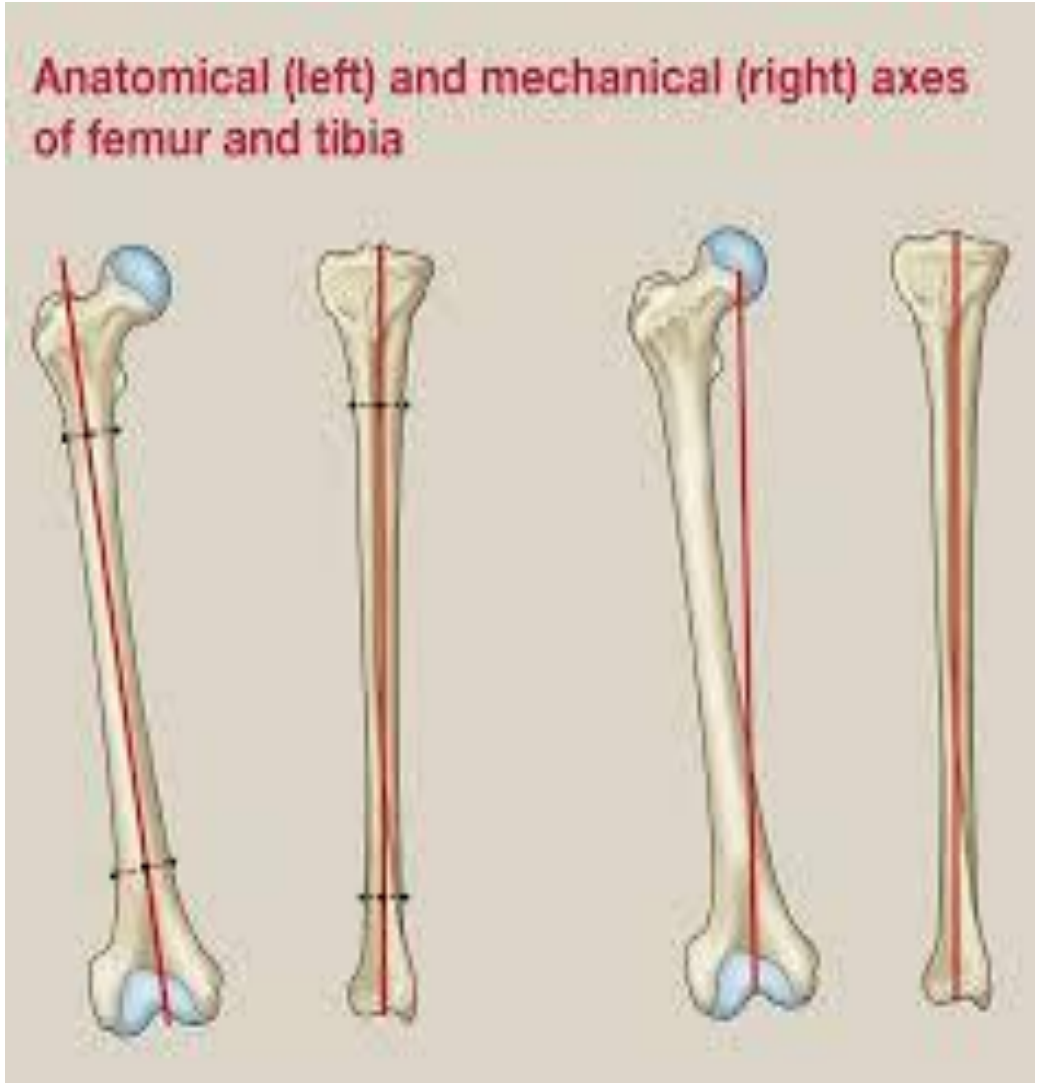
Femur

Similar to the other bones, the femur must be positioned in a true craniocaudal orientation and parallel to the table top if it is to be accurately measured. Characteristics of a well-positioned femur include the appearance of the walls of the intercondylar notch

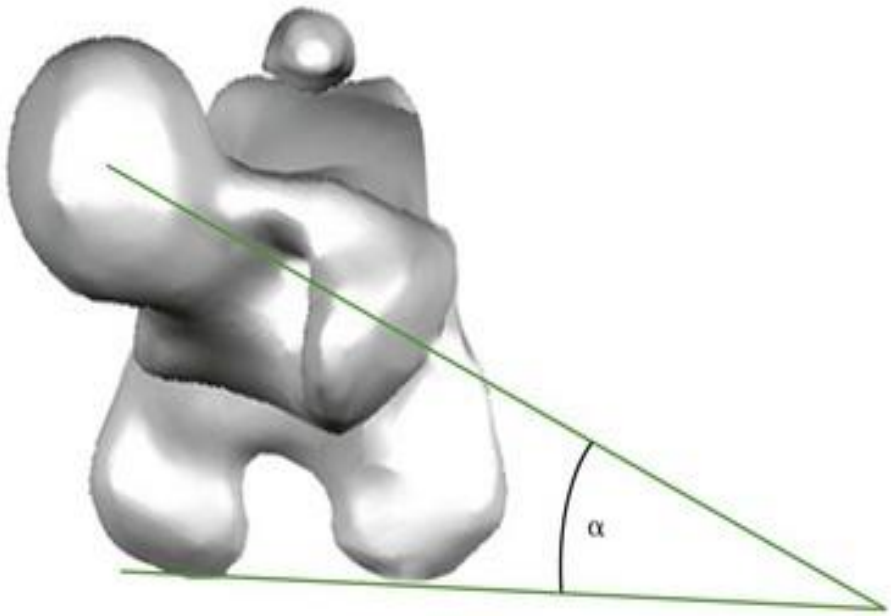


Tibia

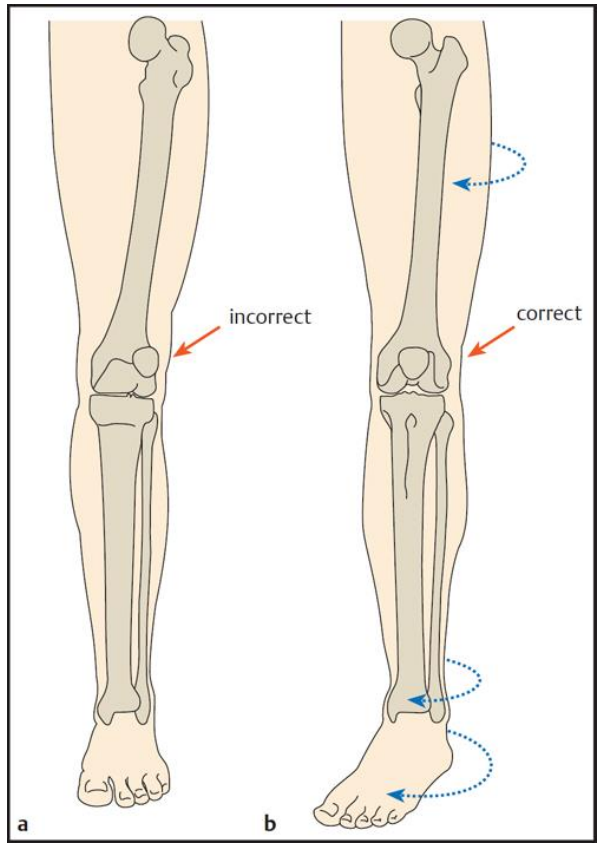
When the tibia is radiographed in the frontal plane, the criteria described for the distal femur can be used to ensure "knee straight" radiographs, which also allow straight positioning of the proximal tibia if no stifle joint subluxation is present. In the sagittal plane, the medial and lateral condyles of the tibial plateau should be superimposed. A standardized method used to measure the tibial joint surface angles, in relation to the mechanical axis, in the frontal and sagittal plane

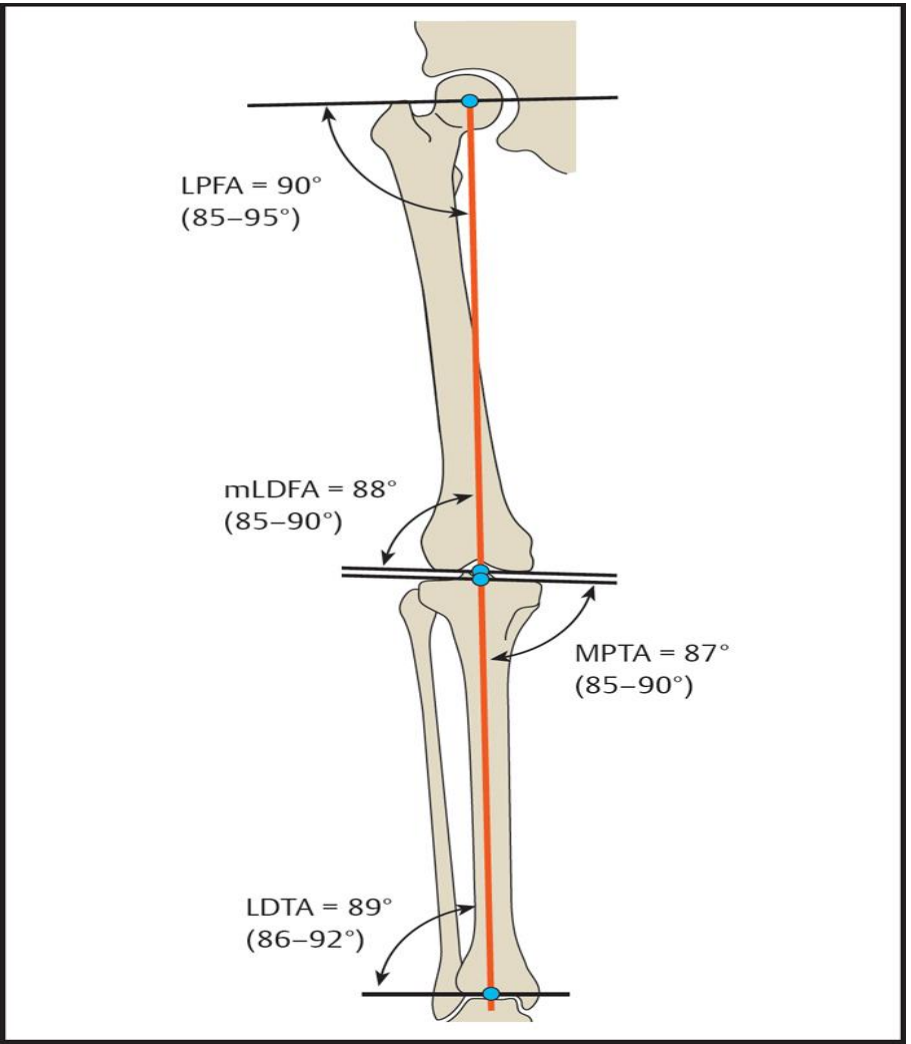


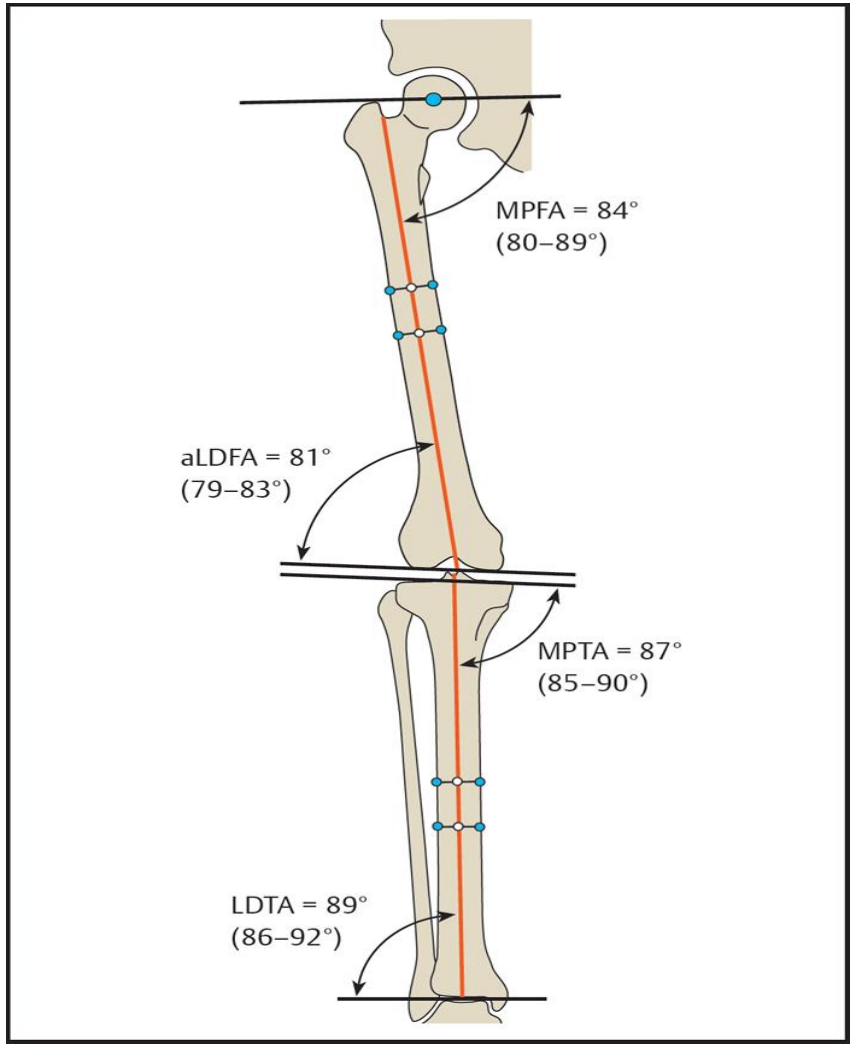
The anteversion angle of the femoral head and neck is defined as the angle between the neck and the frontal plane, as described by the caudal aspect of the femoral condyles.
The anteversion angle can be determined with the use of computed tomography (CT) or axial radiography, or it can be calculated by oblique planar analysis using graphical or trigonometric methods.
A line is drawn from the center of the femoral head to a point that bisects the femoral neck. A second line is drawn so that it just touches the caudal aspect of the femoral condyles.
The angle formed by the intersection of these two lines is the anteversion angle.

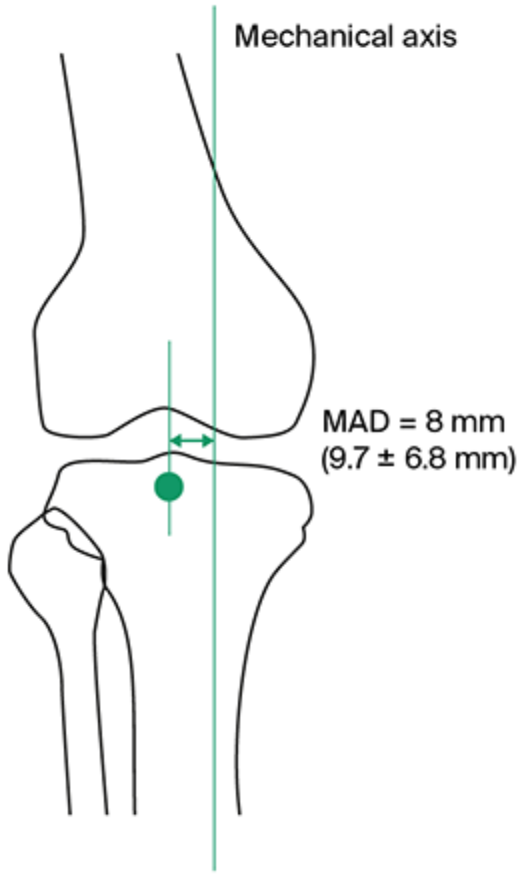


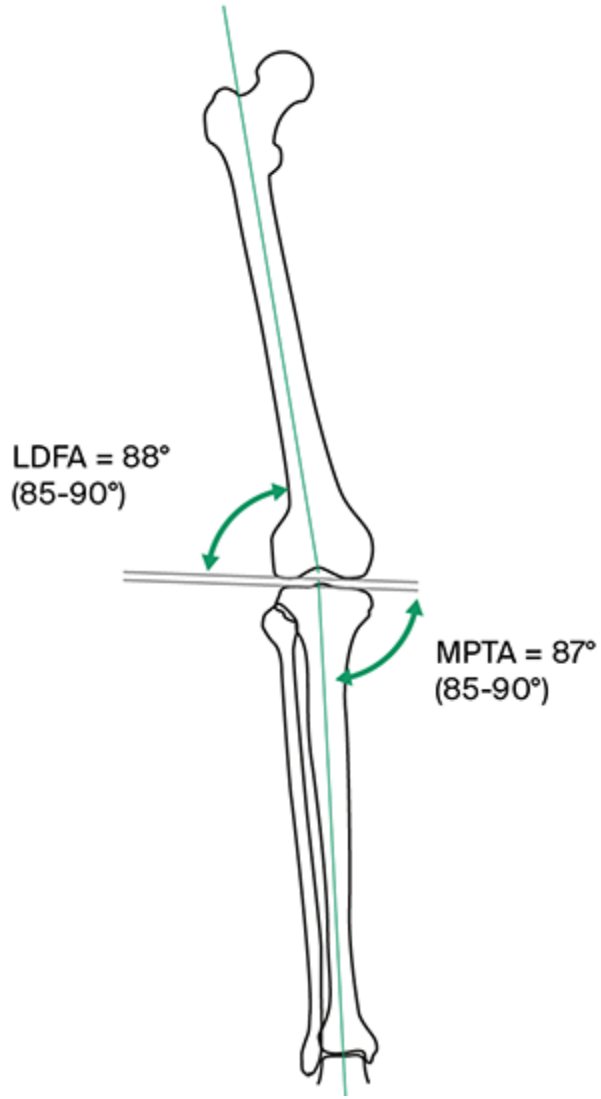
Radiographs of the lower limbs are obtained in orthogonal reference planes: frontal plane, AP view; sagittal plane, LAT view. The true AP view of the knee is obtained in the knee forward position (patella centered on the femoral condyles). The knee forward plane corresponds to the frontal plane. For standing radiographs, the radiography technologists are usually taught to position the patient with the feet together in the “stand at attention” posture. If the patient has external or internal tibial torsion, such positioning will result in the kneecap’s pointing inward or outward, respectively The correct method is to orient the patella forward, irrespective of the foot position. To orient the patella forward, feel the patella with the index finger and thumb of one hand and rotate the foot until the patella is pointing forward The radiograph confirms the correct position, showing the patella centered between the femoral condyles.

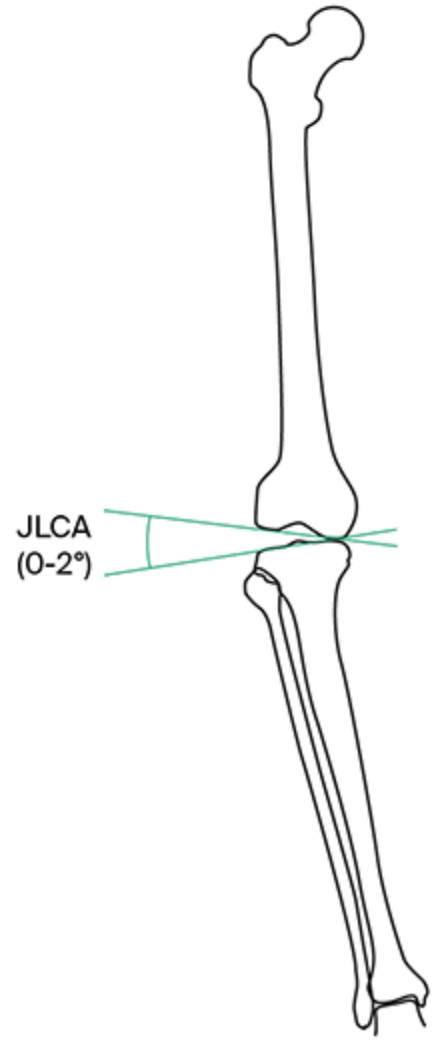


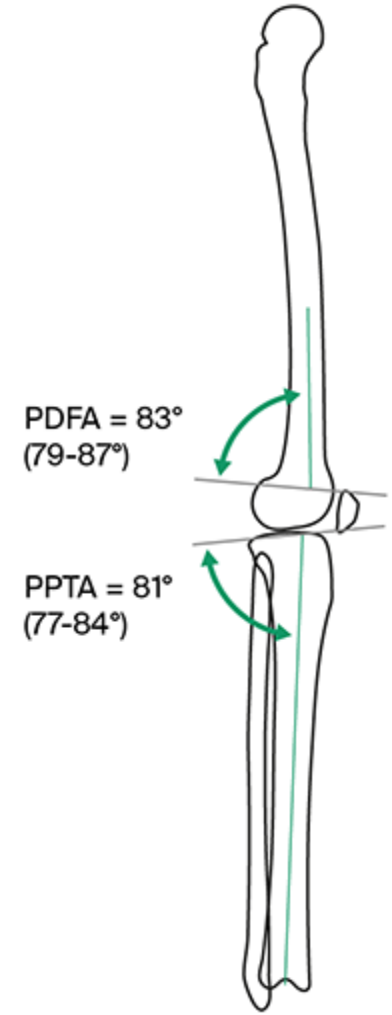

LPFA = 90°
(85–95°)
mLDFA = 88°
(85–90°)
MPTA = 87°
(85–90°)
LDTA = 89°
(86–92°)

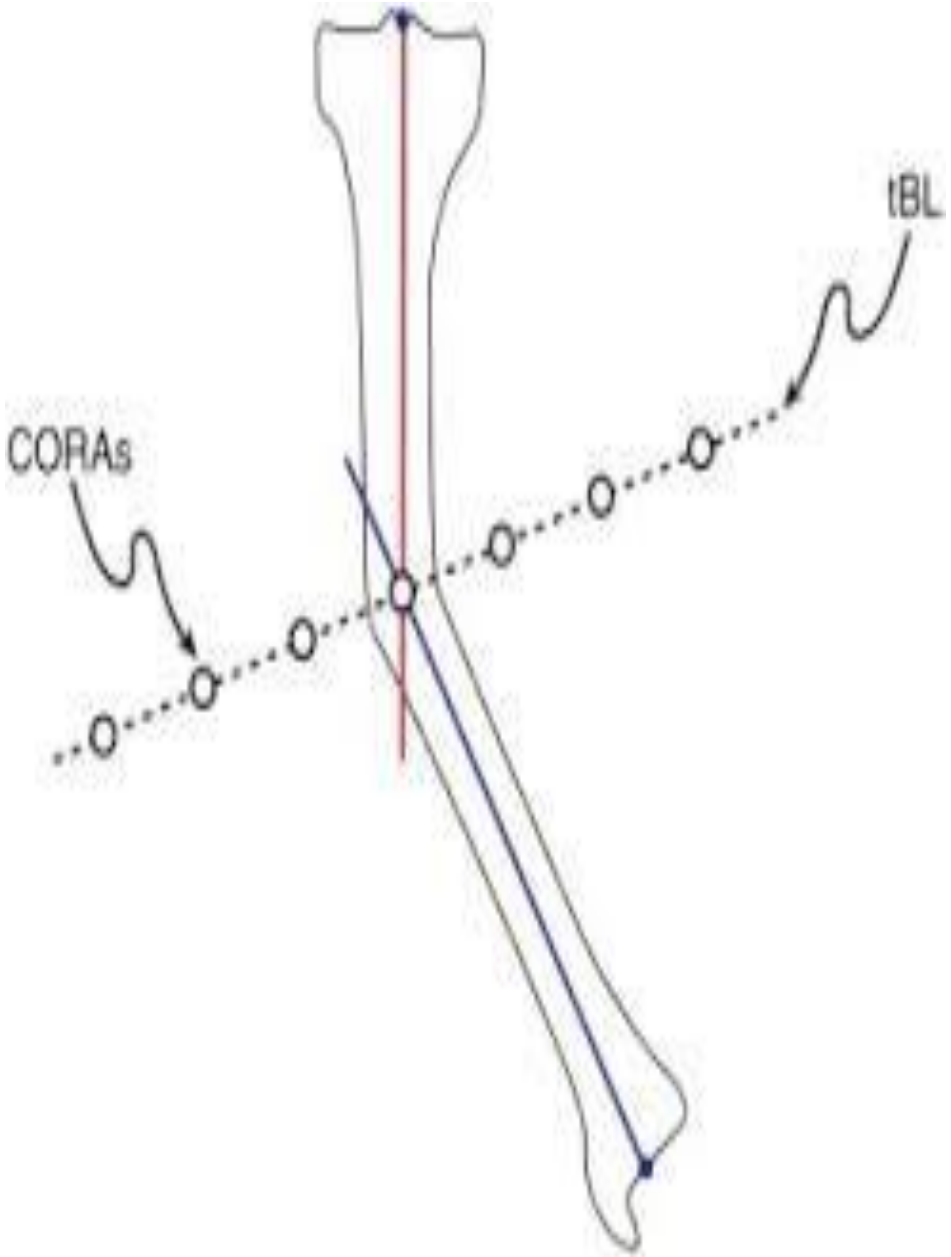

MPFA = 84°
(80–89°)
aLDFA = 81°
(79–83°)
MPTA = 87°
(85–90°)
LDTA = 89°
(86–92°)

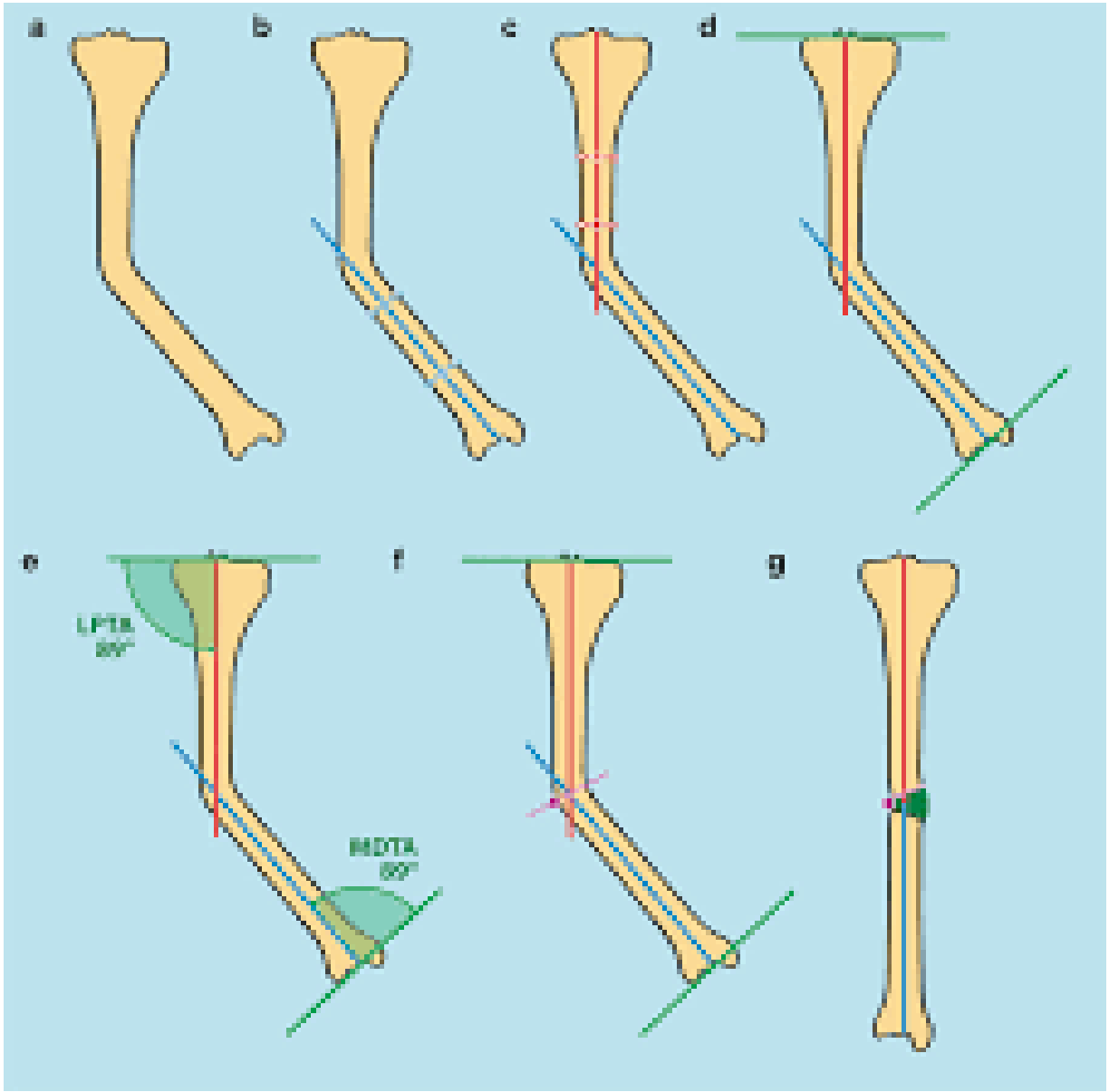

Mechanical axis
MAD = 8 mm
(9.7 ± 6.8 mm)


LDFA = 88°
(85-90°)
MPTA = 87°
(85-90°)

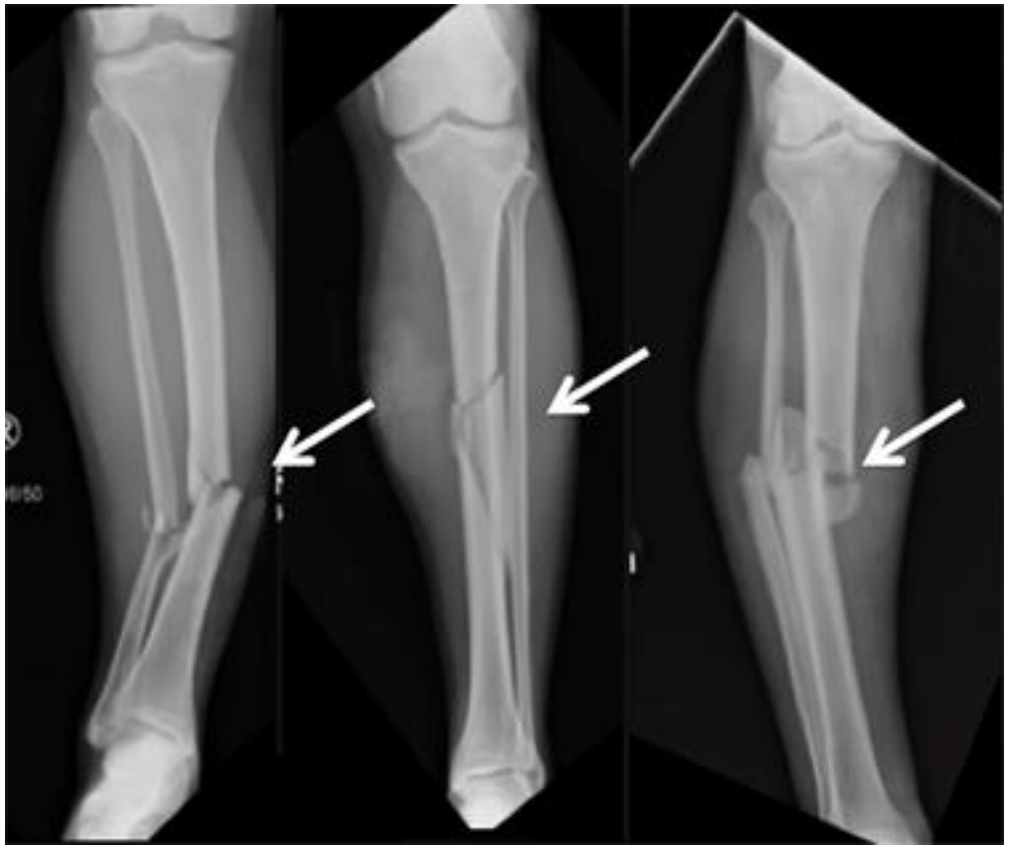

JLCA
(0-2°)


PDFA = 83°
(79-87°)
PPTA = 81°
(77-84°)


IBL
CORAs


a
b
c
d
e
f
g
LPTA
89°
MDTA
89°


COLLES FRACTURE
- The fracture is sometimes referred to as a "dinner fork" deformity due to the shape of the fractured forearm.



osteotmoy

Introduction

Osteotomy is the surgical cutting of a bone, to allow for re-alignment. It is a surgical procedure which requires careful planning during recovery period and is done under a general anaesthetic. The purpose of osteotomy varies for different joints.[1]

Indications

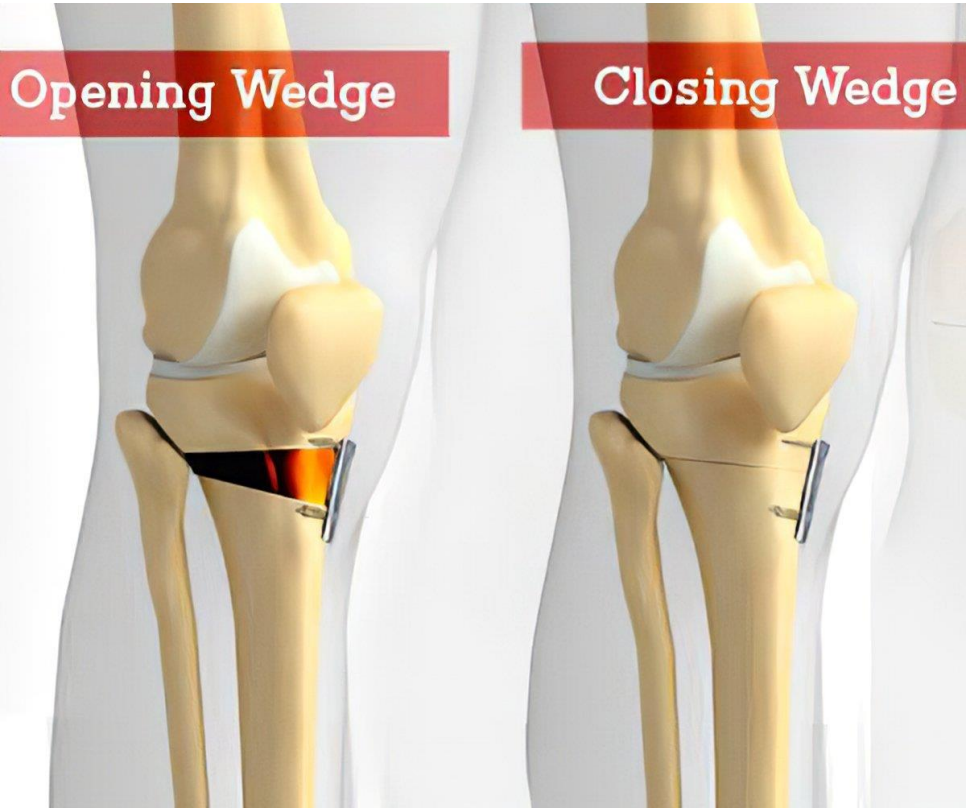
Generally, people who are under 60 years old, active, and overweight are considered appropriate candidates for osteotomy. It is mainly done to:[2][1]

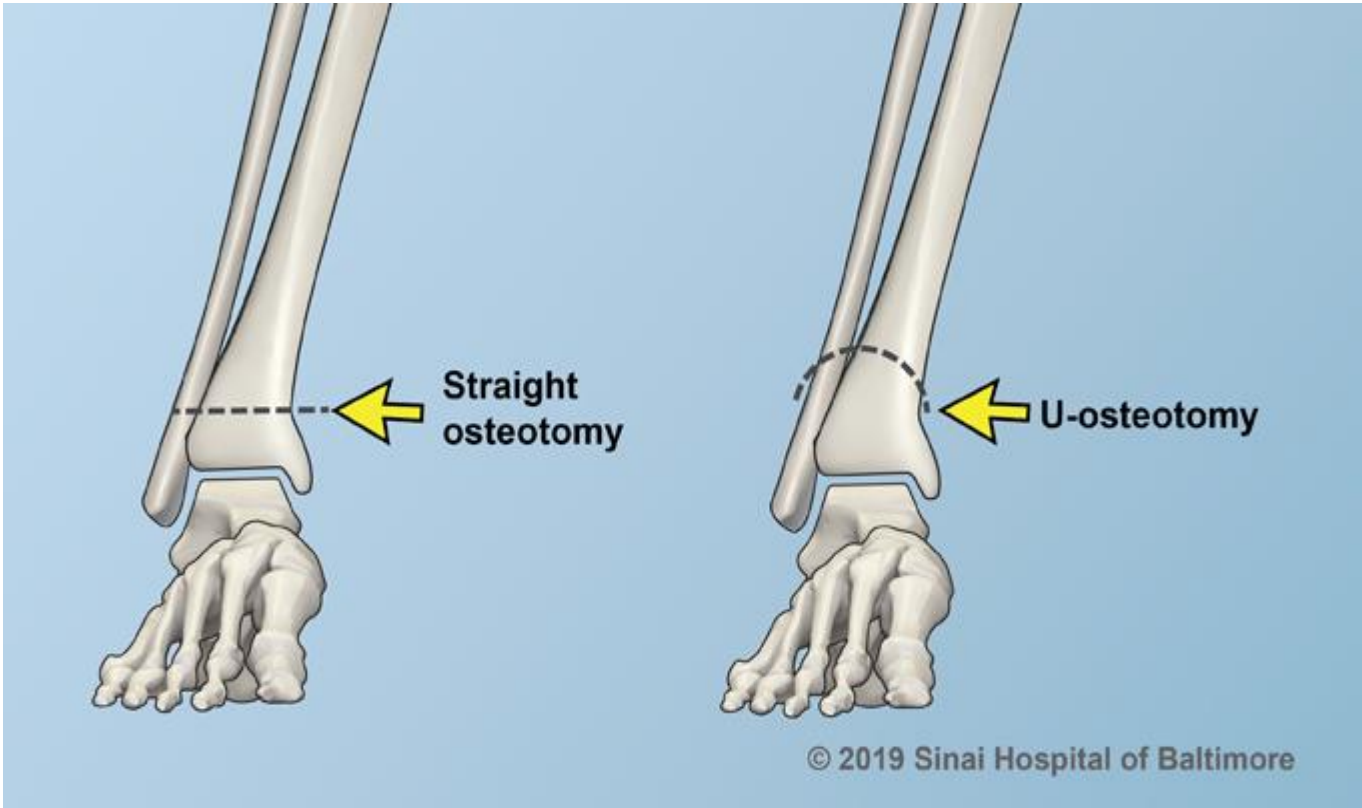
- To correct excessive angulation, bowing or rotation of long bones.

- To correct mal-alignment of a joint due to mal-union or deformity like coxa vara, genu valgum, and genu varum etc.

- To permit elongation or shortening of a bone in cases of Leg Length Discrepancy.

- To relieve pain in arthritis, especially of the hip and knee.


Opening Wedge
Closing Wedge


Straight osteotomy
U-osteotomy
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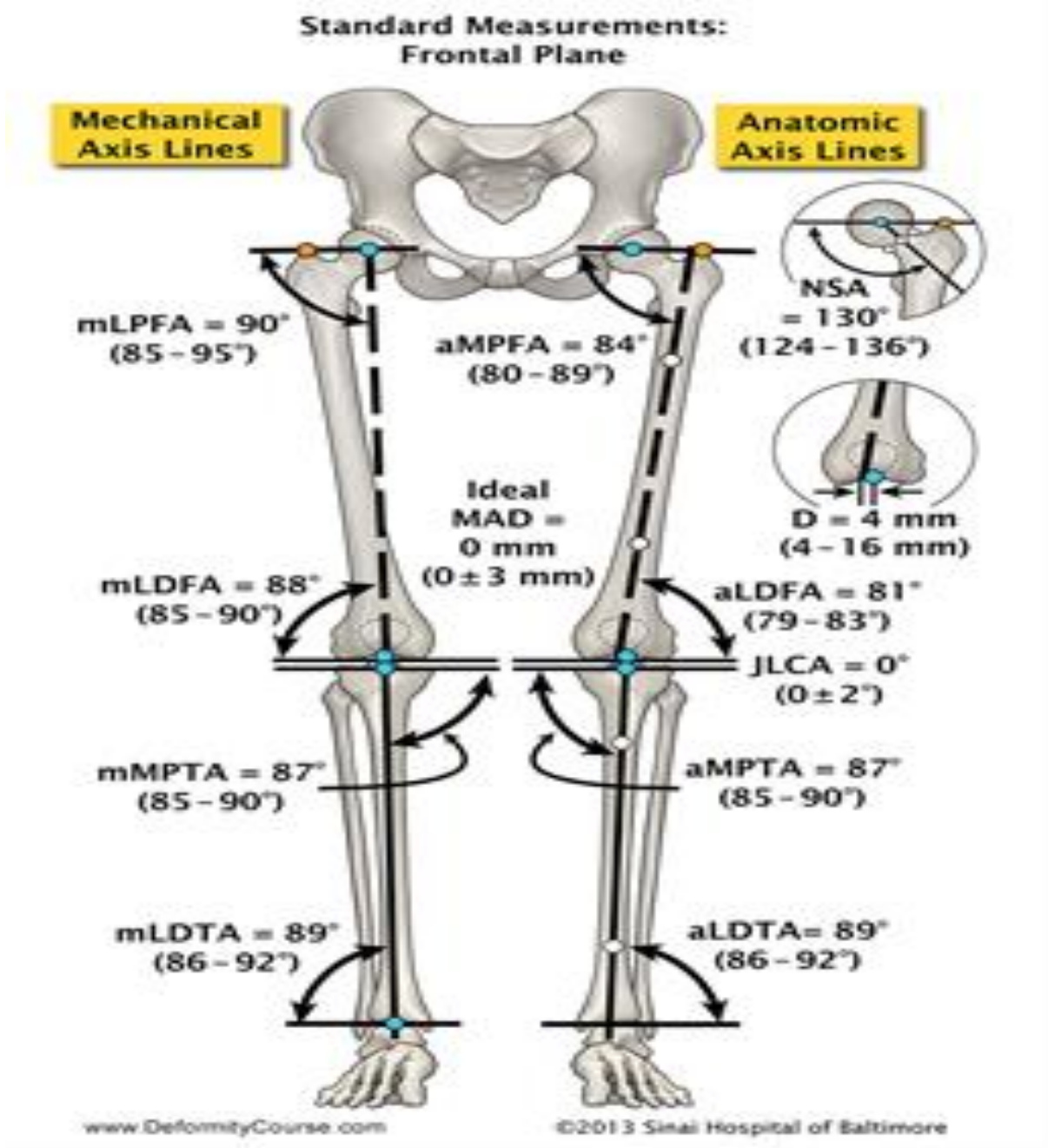
Standard Measurements:
Frontal Plane
Mechanical Axis Lines
Anatomic Axis Lines
mLPFA = 90°
(85 - 95°)
aMPFA = 84°
(80 - 89°)
NSA
= 130°
(124 - 136°)
Ideal
MAD =
0 mm
(0 ± 3 mm)
D = 4 mm
(4 - 16 mm)
mLDFA = 88°
(85 - 90°)
aLDFA = 81°
(79 - 83°)
JLCA = 0°
(0 ± 2°)
mMPTA = 87°
(85 - 90°)
aMPTA = 87°
(85 - 90°)
mLDTA = 89°
(86 - 92°)
aLDTA= 89°
(86 - 92°)
www.DeformityCourse.com
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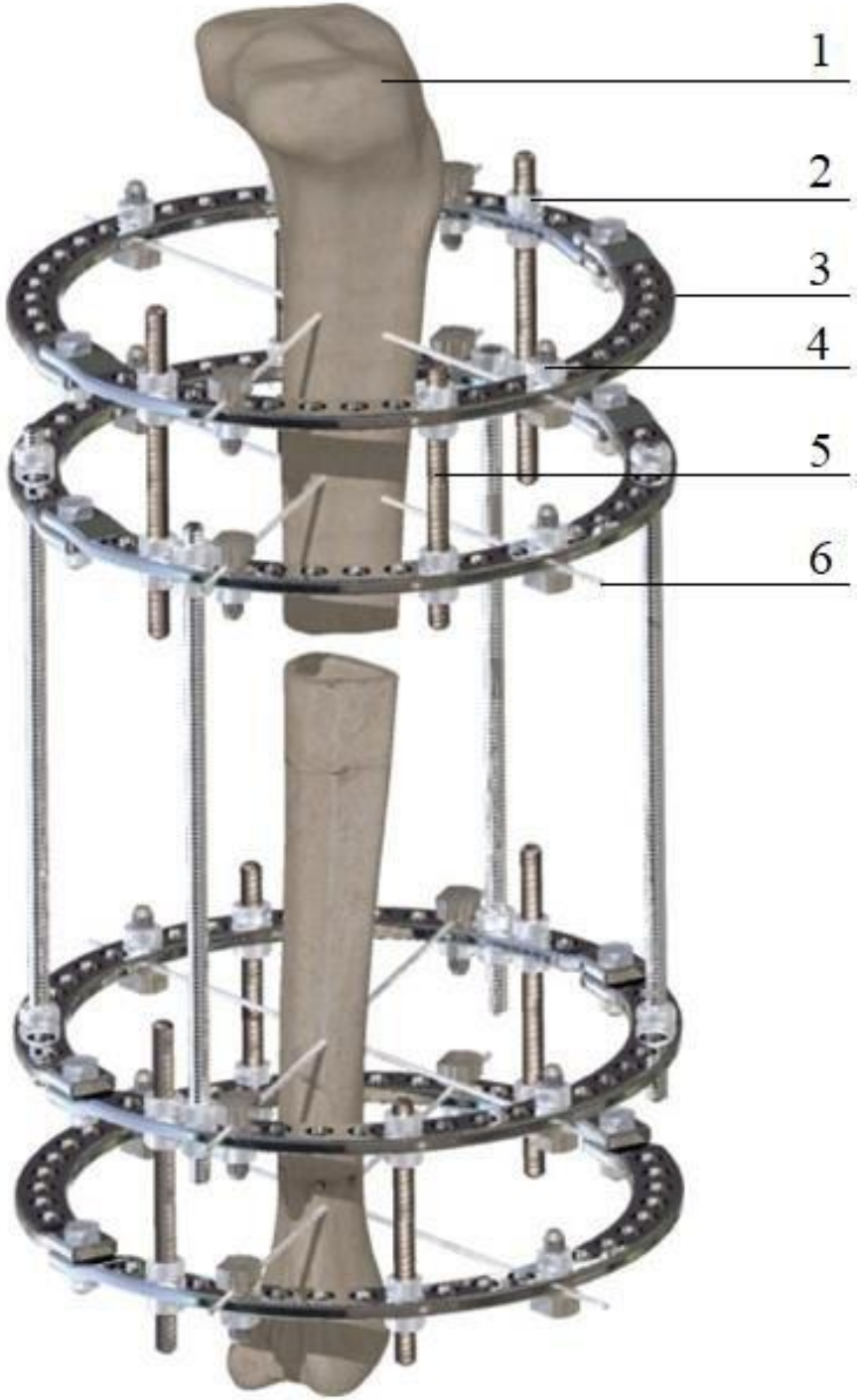
0806463
8 Apr 1970
4 yrs
M
R
CG


a
b


1
2
3
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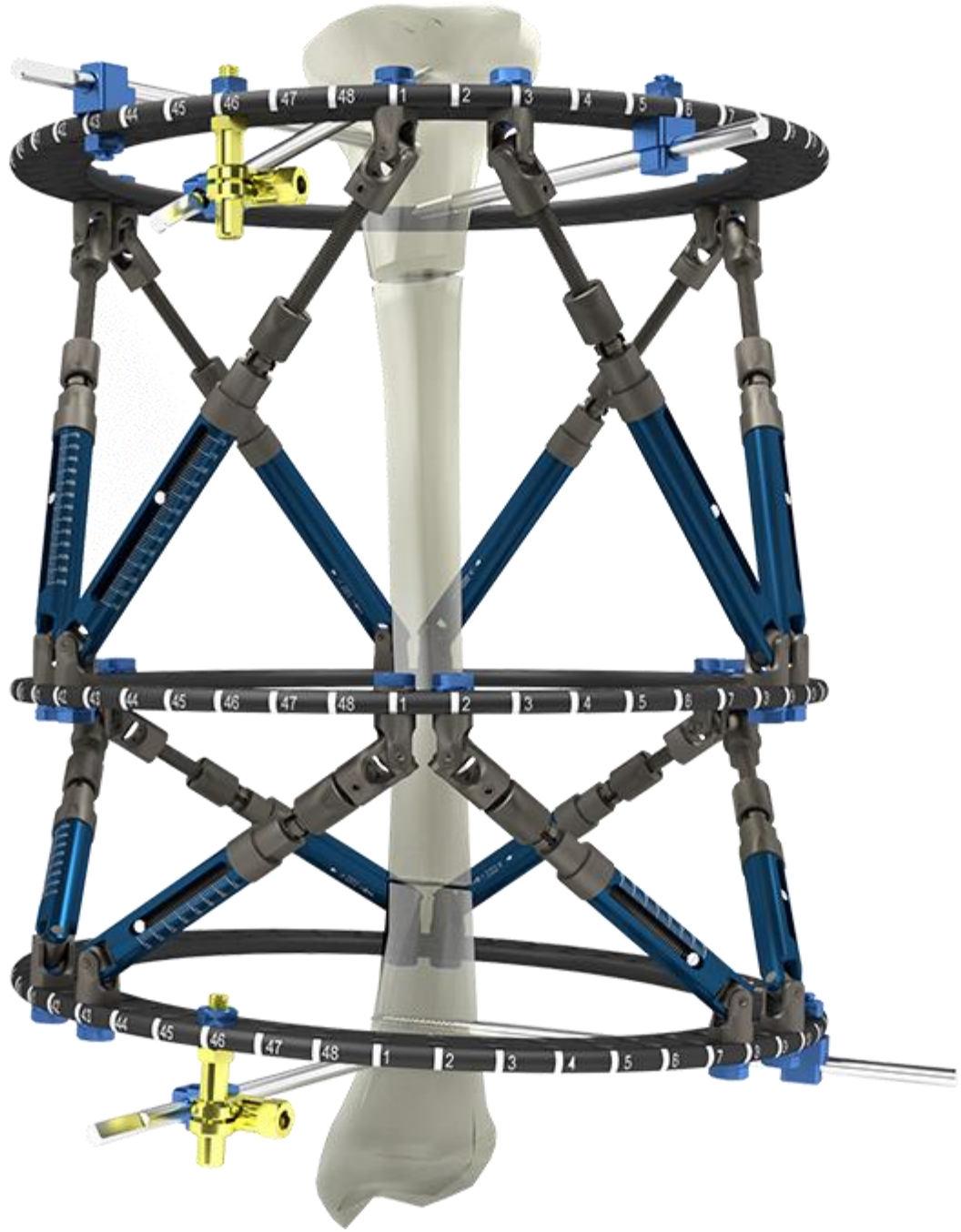
5
6



Thank you