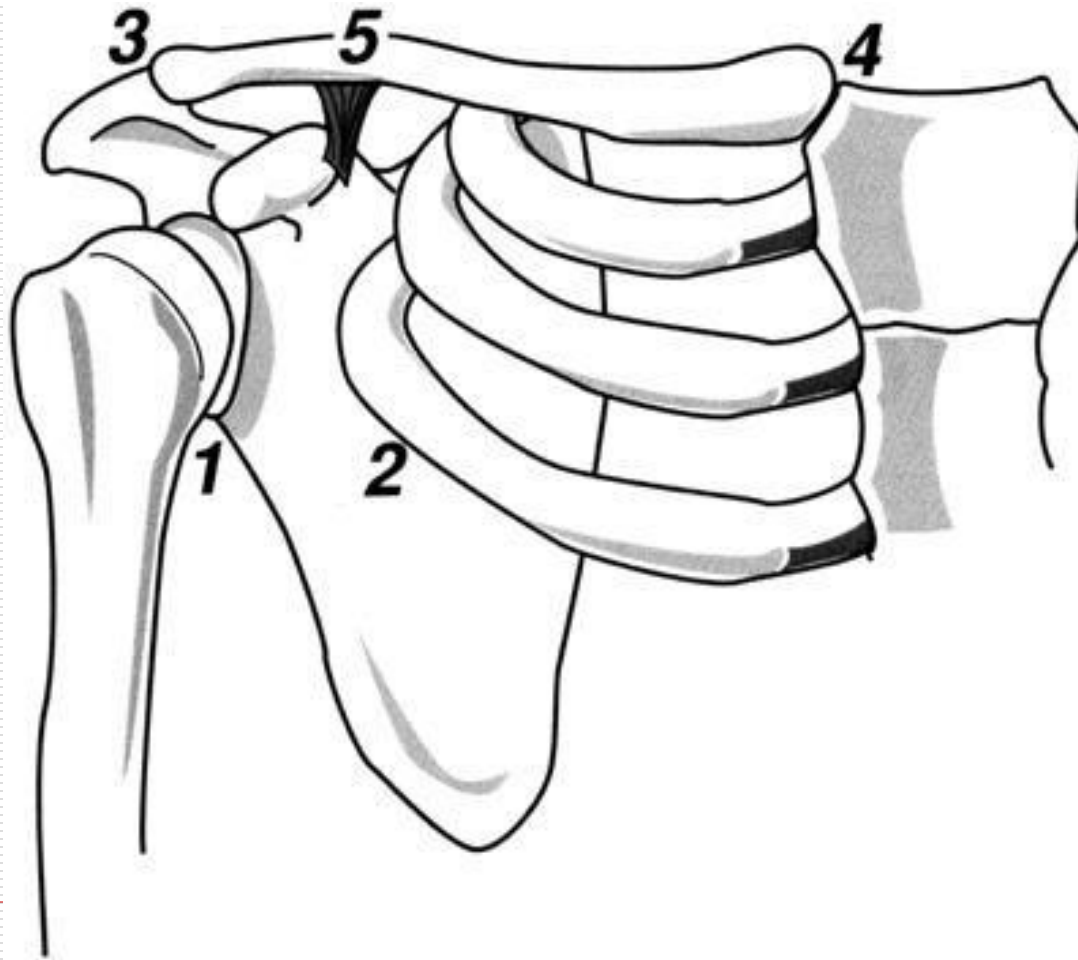

Anatomy & biomechanic of shoulder arthrolasty

M.N. Naderi, MD

R. Serri , MD

anatomy



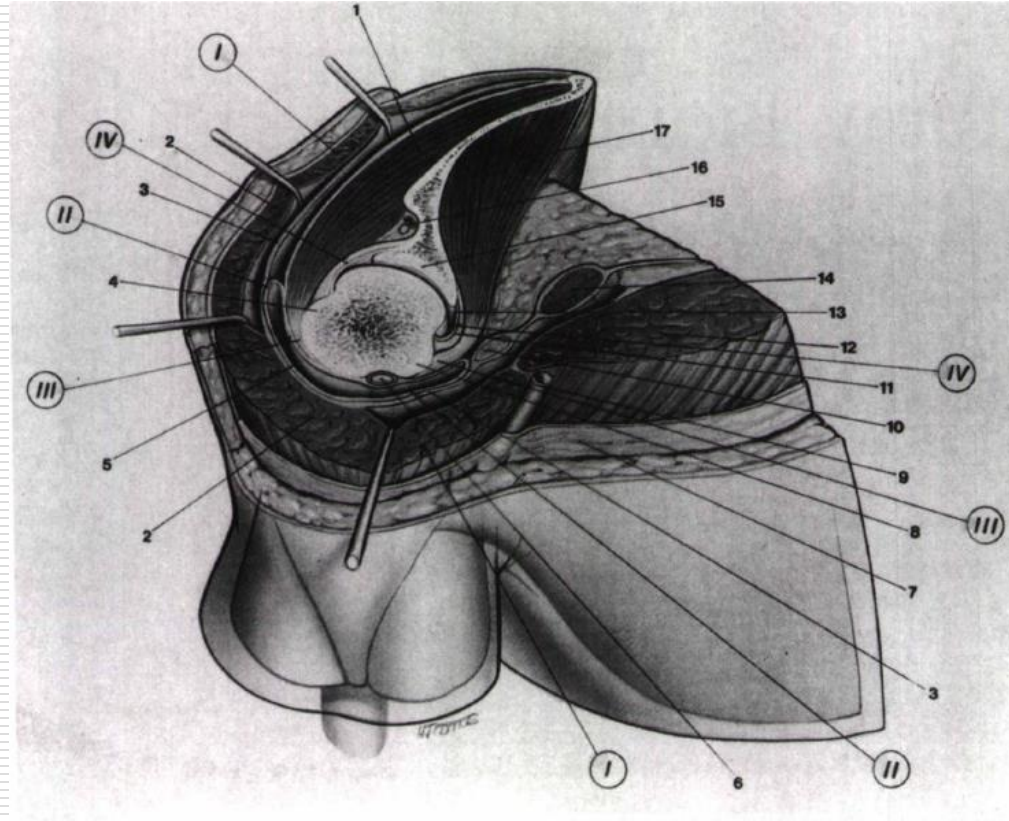
Supporting layers of the glenohumeral joint:

Layer I: Deltoid and pectoralis major muscles

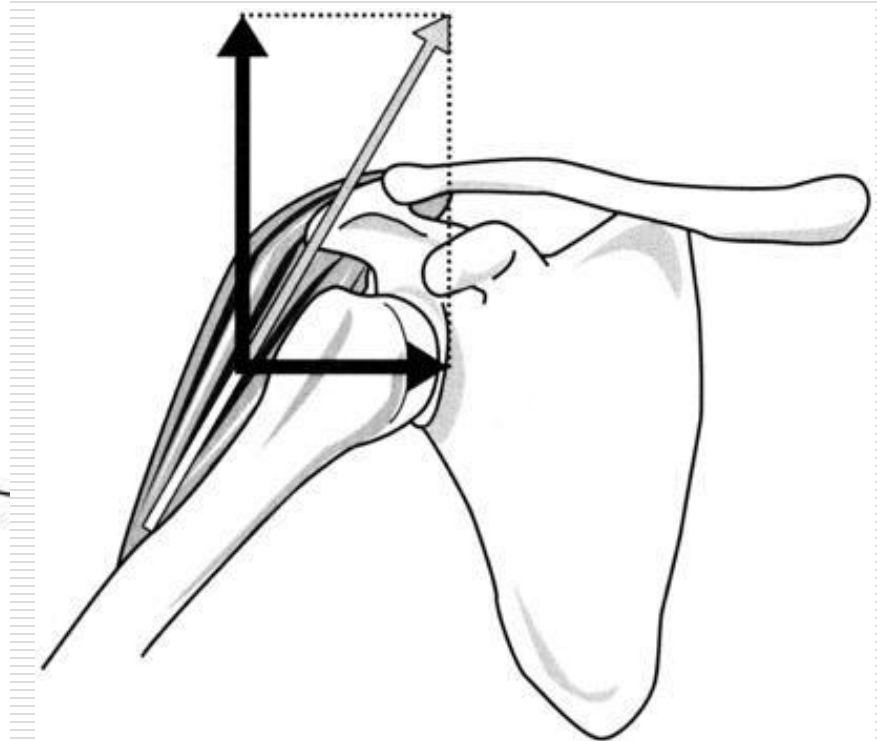
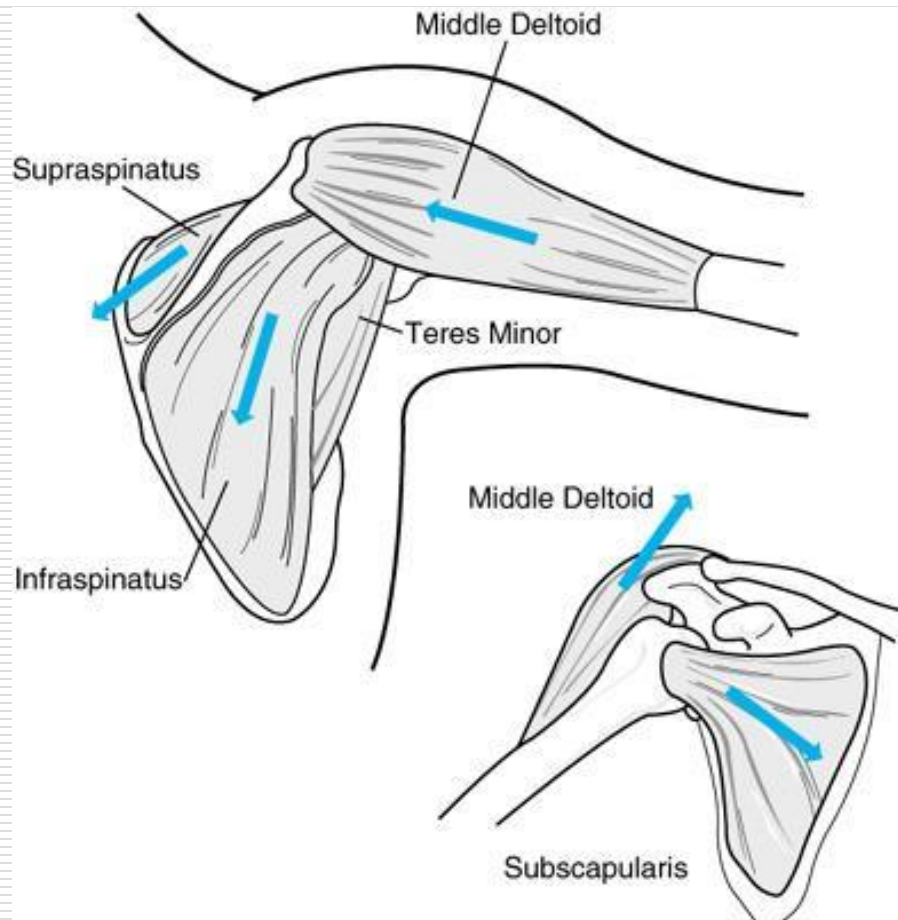
Layer II: Clavi pectoral fascia, conjoined tendon, coracoacromial ligament, posterior scapular fascia, and superficial bursal tissue

Layer III: Deep layer of subdeltoid bursa, rotator cuff

Layer IV: joint capsule, synovium, coracohumeral ligament.



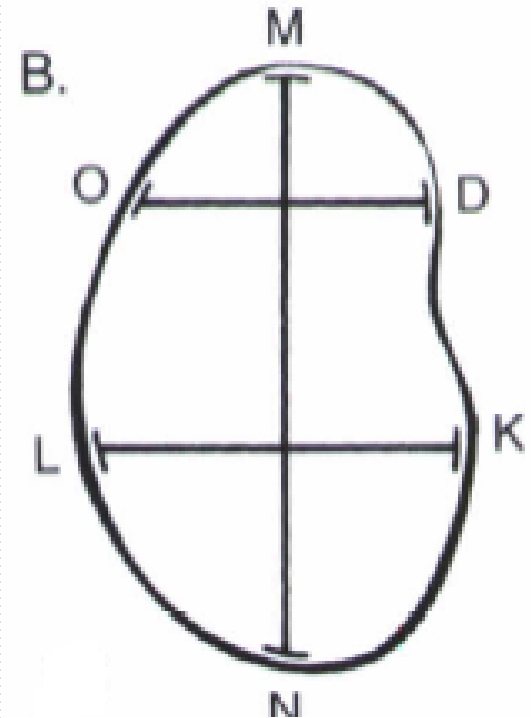
anatomy



Anatomical Characteristics of the Shoulder

Important for Prosthesis Design

- ❑ **Glenoid diameter**
 - Superior anteroposterior 18-30 mm
 - Inferior anteroposterior 21-35 mm
 - Superoinferior (height) 30-48 mm

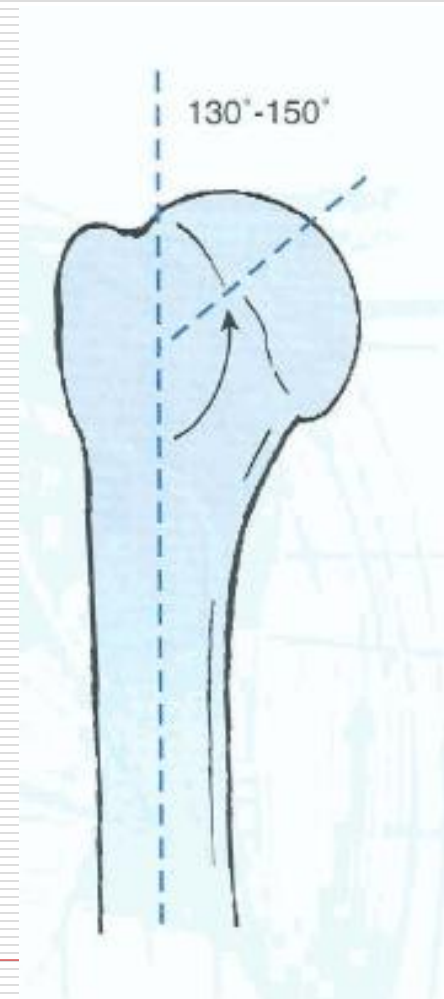


Anatomical Characteristics of the Shoulder

Important for Prosthesis Design

□ Inclination

- Humeral head 130-150 degrees
- Glenoid 4.2 degrees (-7 to 20 degrees)

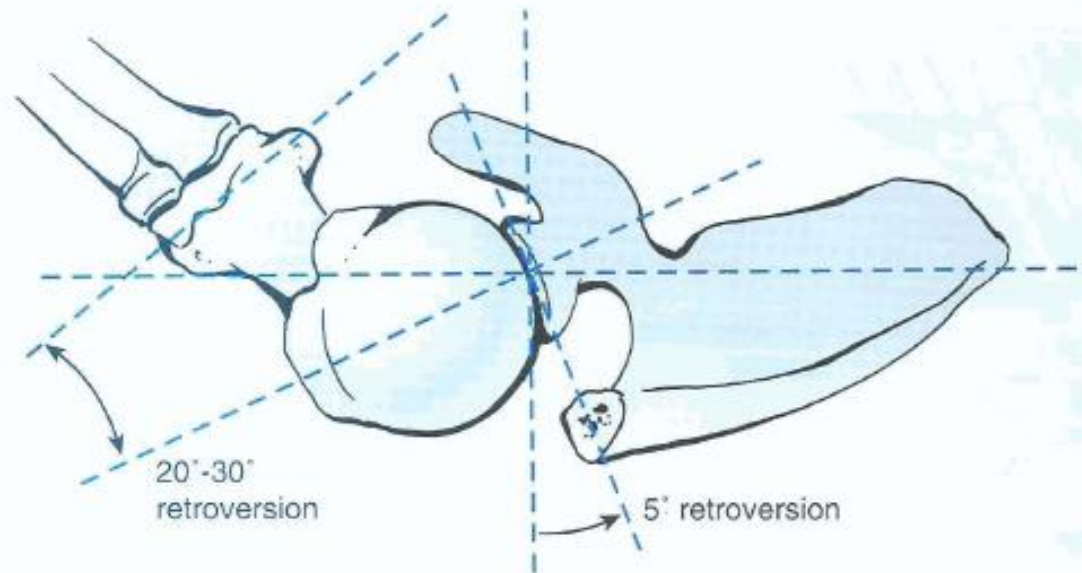


Anatomical Characteristics of the Shoulder

Important for Prosthesis Design

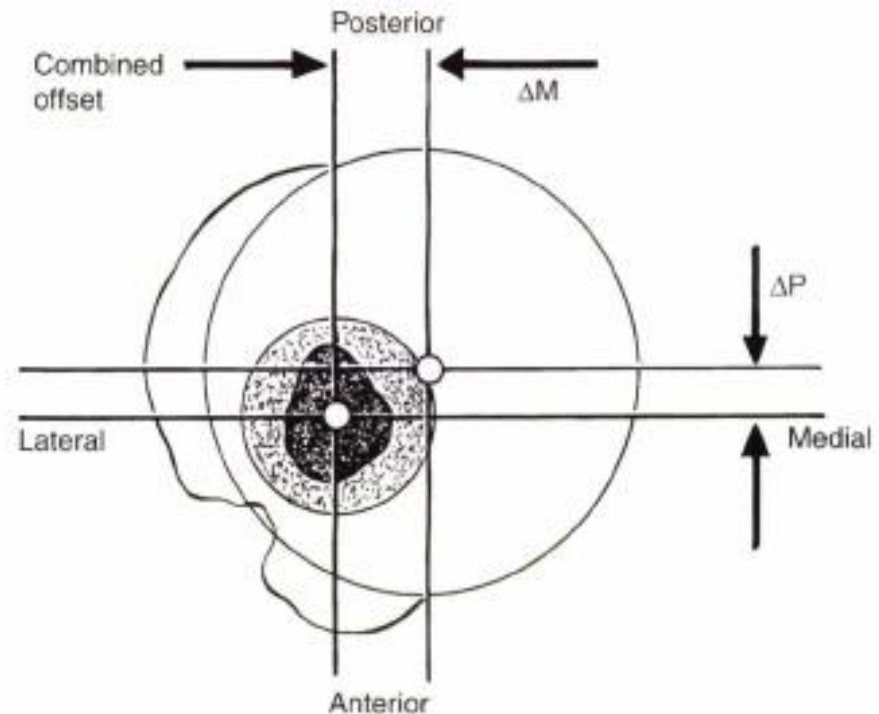
□ Version

- Glenoid 1.5 degrees retroversion (10.5 retroversion to 9.5 degrees anteversion)
- Humeral head 0-55 degrees retroversion



Humeral Head Offset

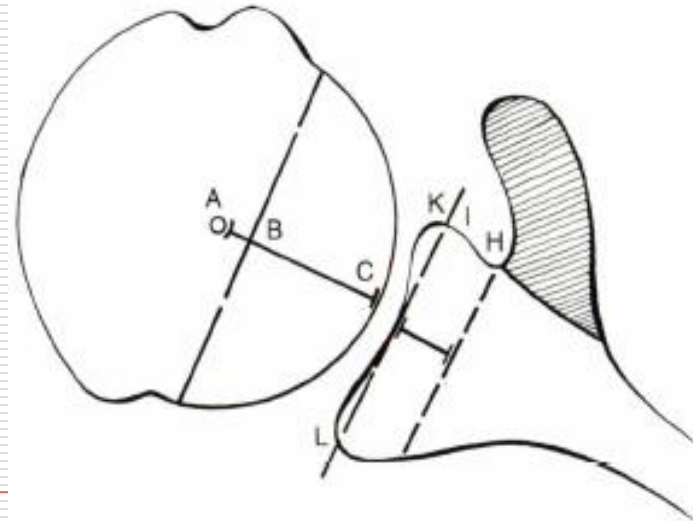
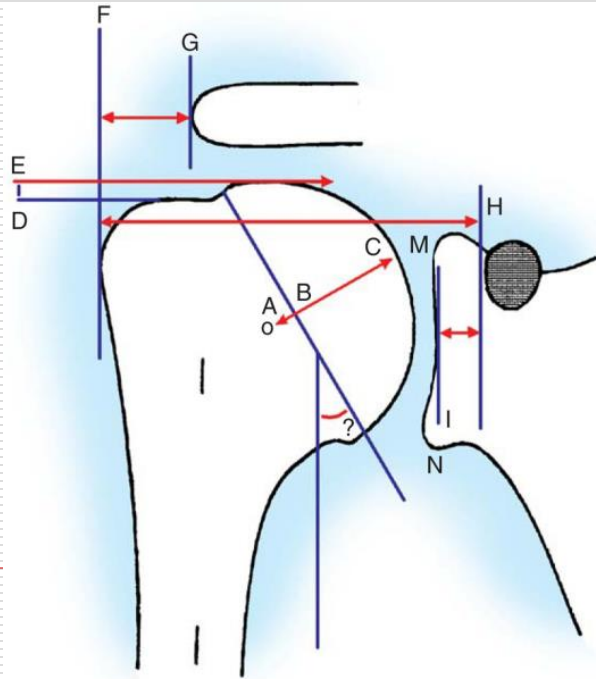
- distance between the center of the humeral head and the central axis of the intramedullary canal is defined as the humeral head offset.



Normal glenohumeral relationships

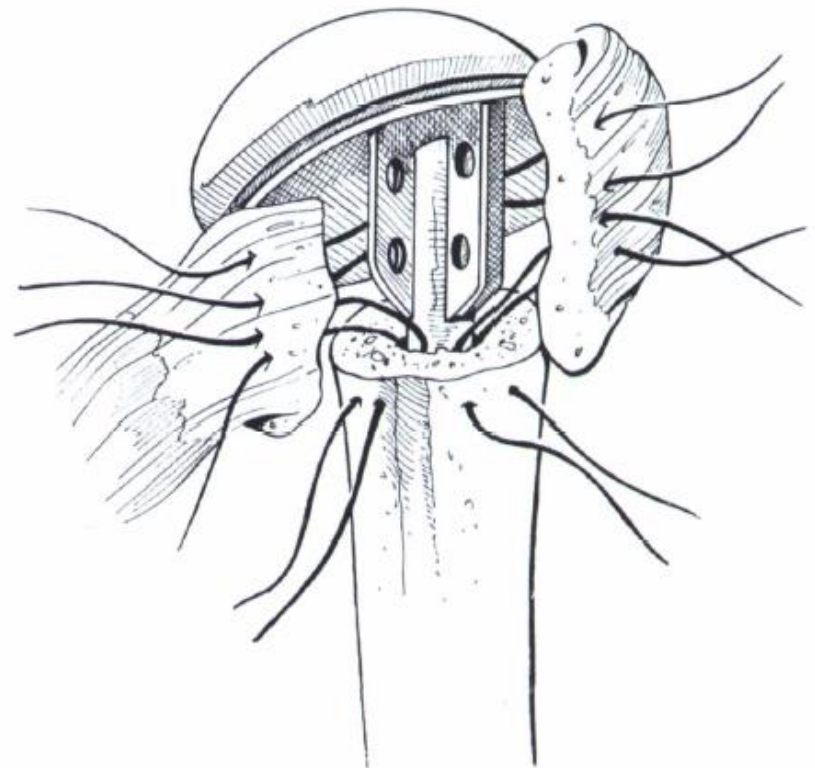
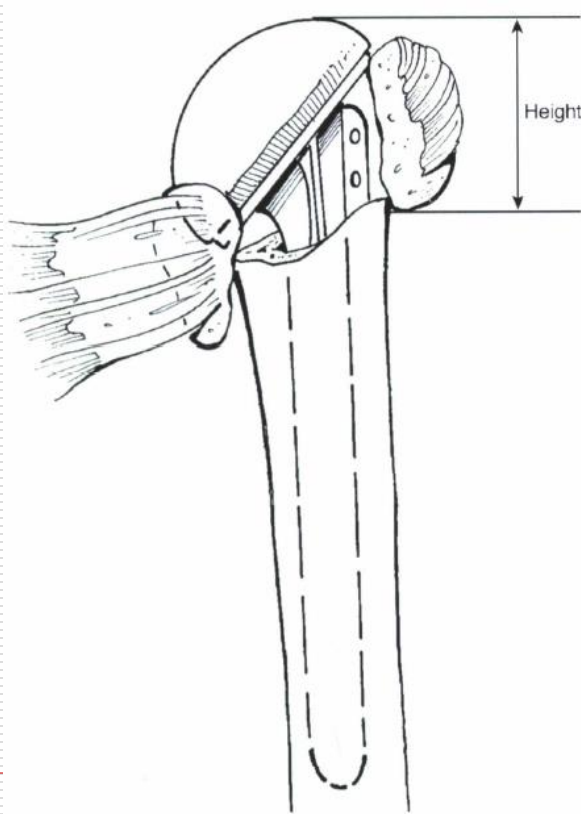
Humeral offset

- **Medial (coronal)** 4-14 mm
- **Posterior (transverse)** -2 to 10 mm
- **Head-shaft angle** 30-55 degrees



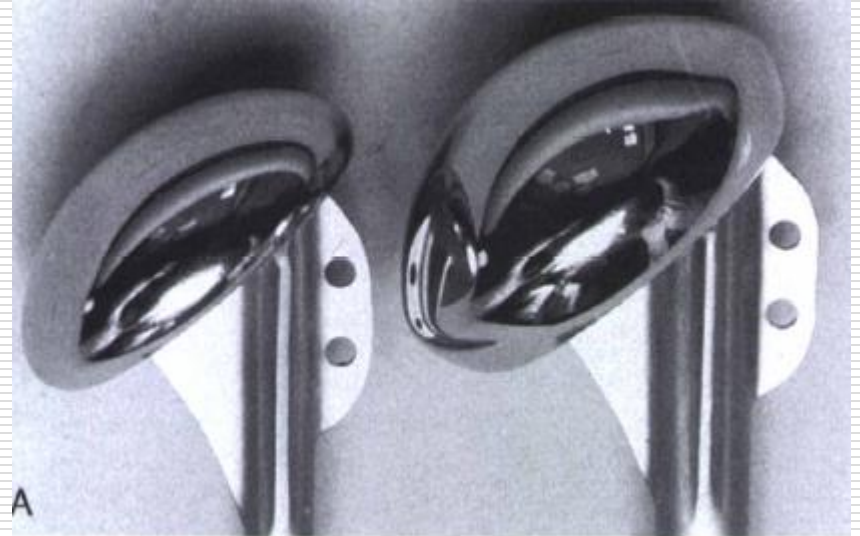
Importance of tuberosities

□ Secure fixation of tuberosities



Prosthesis Design

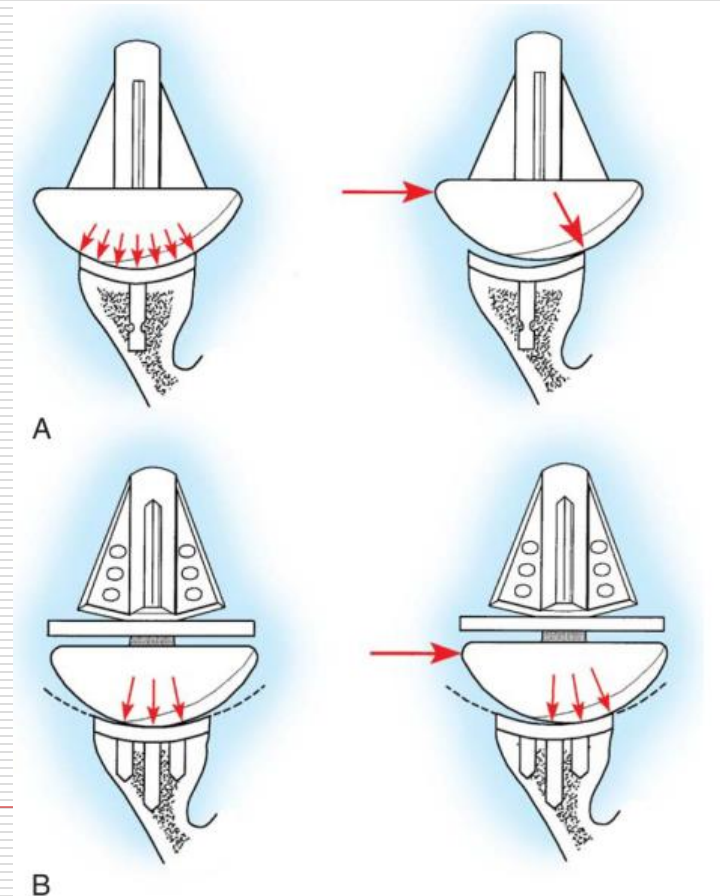
- ❑ **Prosthetic systems → Modular**
- ❑ **Position of head component → Anatomical**
- ❑ **Glenoid component → cemented polyethylene**



Glenoid components → Cemented or press-fit

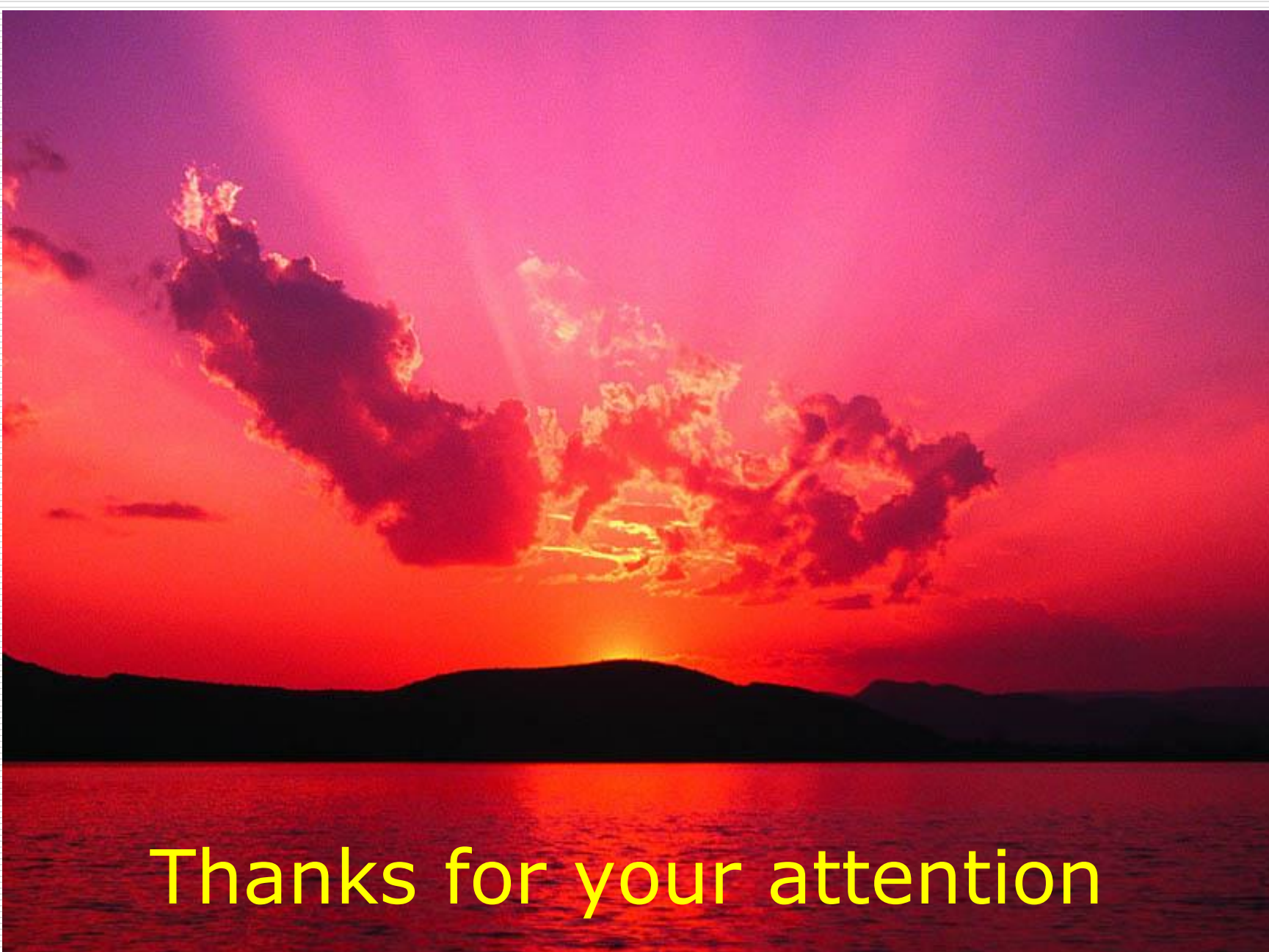
□ Fixation of glenoid component into the glenoid vault

- single central
- multiple pegs



Summary

- Importance of understanding of shoulder anatomy and function
 - New designs of shoulder arthroplasty may help for better result
-



Thanks for your attention