



## **19MEO303 – INDUSTRIAL SAFETY**

**Anatomy, posture and body mechanics: some basic  
body mechanics**



# POSTURE

- Relative alignment of body segments with one another.
- Good alignment: provides minimal stress to segments.
- Poor alignment: creates imbalances → ↑ stress → adaptations efficiency.
- Static posture used as the defining reference in evaluations.



# STANDING : ANTERIOR VIEW

- Plumb line bisects the body into symmetrical segments.
- Line bisects nose, mouth, sternum, umbilicus, and pubic bones.
- Feet are equidistant from plumb line.
- Palms face lateral thigh.



# STANDING : ANTERIOR VIEW



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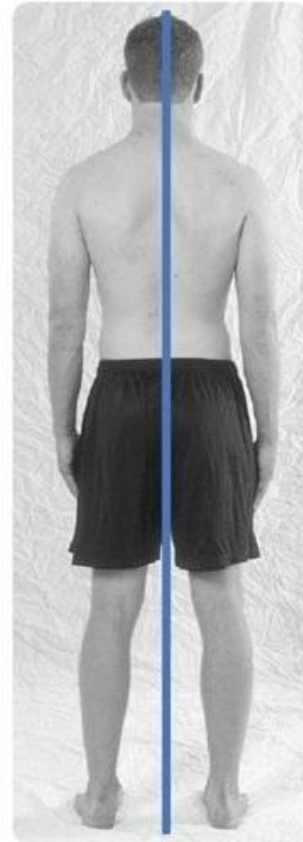


# STANDING : POSTERIOR VIEW

- Plumb line bisects head and runs over spinous processes.
- Level left to right: earlobes, shoulders, scapulae, hips, posterior superior iliac spine, gluteal fold, posterior knee creases, medial malleoli.
- Scapulae lie against rib cage: T2-T7.
- Calcaneus: straight with Achilles perpendicular to floor.
- Symmetrical muscles.
- Weight equally distributed.



# STANDING : POSTERIOR VIEW



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# STANDING : LATERAL VIEW

- Plumb line is slightly forward of lateral malleolus.
- Line passes through external auditory meatus, earlobe, bodies of cervical spine, center of shoulder joint, and greater trochanter.
- Line passes midway between back and chest, back and abdomen.
- Line runs slightly posterior to hip joint, slightly anterior to knee joint (behind patella).



# STANDING : LATERAL VIEW



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# SITTING POSTURE

- Seat height: allows feet flat on floor-90° at hips, 90° at knees.
- Seat depth: front edge 1 to 2 in. from posterior knee.
- Back height: to lower scapulae and support lumbar spine, thoracic spine.
- Arms: allow shoulder relaxation and permit forearms to rest with elbows 90°.



# SITTING POSTURE AT DESK

- Chair height: allows forearms to rest on desk with relaxed shoulders.
- At keyboard: elbows at 90° or slightly more, wrists in neutral, fingers able to rest on keyboard.
- NOT: forward head, rounded shoulders, flat lumbar spine, excessively curved thoracic spine, hyperextended wrists.



# EFFECTS OF BAD POSTURE

- Slow changes over time: adaptation to stresses applied.
- Shortening of some structures, lengthening of opposing structures.
- Secondary weakness of both shortened and lengthened structures (length-tension relationship).



# RESULT

- Efficiency of movement is impaired.
- Stress on specific segments during sport activities increases.
- Muscles must work harder to maintain posture, increasing fatigue.
- Individual becomes susceptible to injury.
- Injury may become exaggerated with increased stresses already in place.



# PATHOLOGICAL ALIGNMENT

- Pelvis
- Spine segments
- Lower extremity
- Upper extremity