Natural Sciences 360 Legacy of Life Lecture 18 Dr. Stuart S. Sumida

Synapsida Mammalia Eutheria Primates (HUMAN SEXUAL DIMORPHISM)



Male and female hips are of differing proportions:

Males: taller, narrower, pubic angle less than 90 degrees, circular opening.

Females: wider, pubic angle greater than 90 degrees, oval opening.





Females: Shorter torsos, longer legs.

Males: longer torsos, shorter legs.



### Female skull and juvenile skull (8 year old boy).



### Female skull and juvenile skull (8 year old boy).



### Male skull and juvenile skull (8 year old boy).



### Male skull and juvenile skull (8 year old boy).

Sexually dimorphic cranial differences:

# Males

# Females

- \* Heavier jaw
- \* Heavier brow ridge
- \* Eye sockets smaller

- \* Lighter, less angular jaw
- \* Little or no brow ridge
- \* Eye sockets relatively larger (more juvenile)



# HUMAN LOCOMOTION: WALKING

### Walking: Has a Double Support Phase

### **Support Phase = when foot is on the ground.**



# The leg is like an inverted pendulum when walking...



Compliance of the hip, knee, and foot help to smooth out walking.

Some of the Important Factors Influencing Human Walking:

- 1. Pelvic Rotation
- 2. Pelvic Tilt
- 3. Lateral Displacement of Pelvis
- 4. Bending of the Knee
- 5. Compliance of Foot

# 1. Pelvic Rotation

Lateral-medial axis of pelvis rotates about the center when walking.



# 2. Pelvic Tilt

Hip tilts to compensate for the weight of the swing leg.



# 3. Lateral Displacement of Pelvis

Hips move from side to side to keep center of mass over support limb.











# 4. Bending of the Knee

### Knee bends between heel-strike and pushoff.



# 5. Compliance of Foot

### Flexibility of foot smooths oscillation at other joints.



