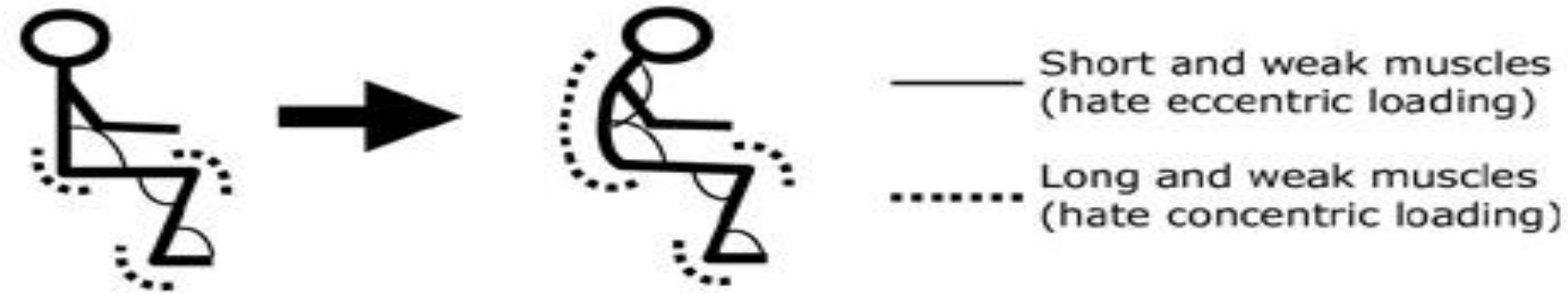
Postural Assessment

Posture

- **Posture**: position in which you hold your body upright against gravity while static or dynamic
- It allows your center of gravity (center of mass) to be maintained over your base of support
  - Center of Gravity is close to the navel
  - Base of Support is our feet in contact with the ground
- It is under control of the Central Nervous System
  - Brain and spinal cord
  - The cerebellum in the brain regulates and coordinates movement, posture and balance. Also involved in learning movement.

Posture

- **Dynamic Posture**:
  - Posture when moving
- **Static Posture**:
  - Posture when stationary (sitting, standing, sleeping)
  - Posture that your body is in for the majority of the day
- **These are your clients:**



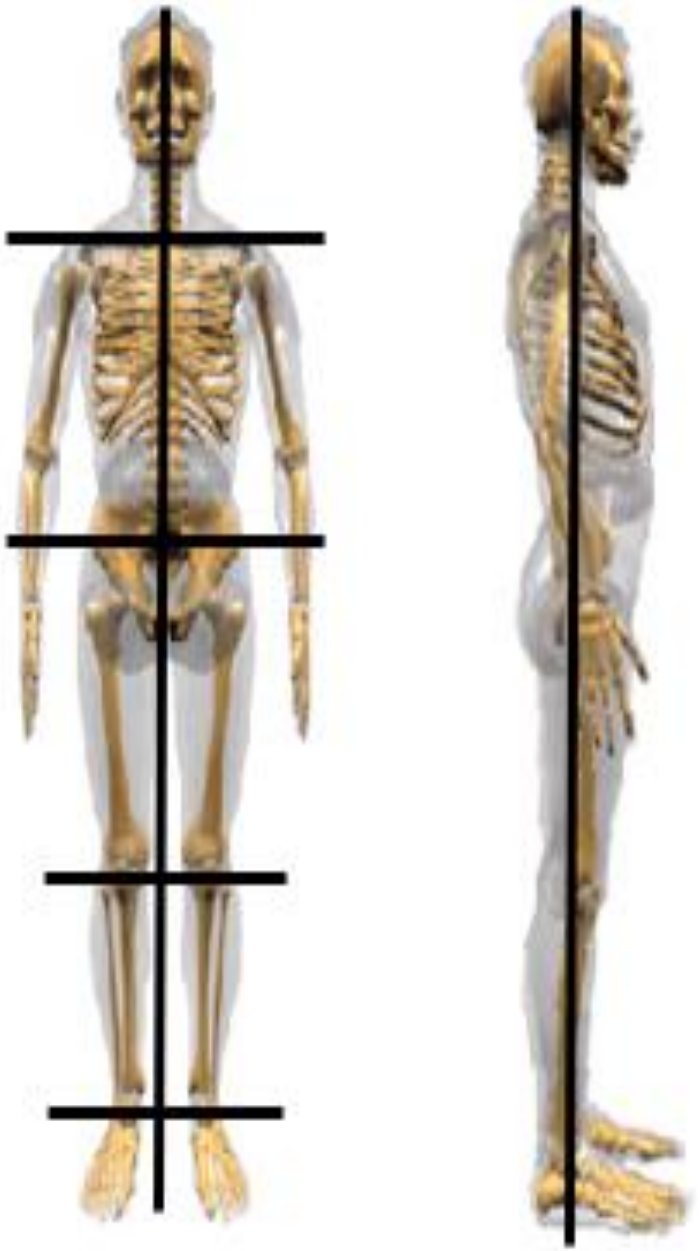
Sitting at 8 am → Sitting by 3 pm

Correct Posture = Neutral Spine

- Correct Posture:
  - Reduces the stress to the structures of the spine
  - Minimizes muscular effort by aligning the joints in their natural resting position
- Neutral Spine:
  - Anteriorly and posteriorly tilt the pelvis to end ranges, and find the middle range, where there is the least amount of strain to the spine
  - This position provides optimal position of the spinal curves for muscle length and joint position as well as distributing forces along the spine

Neutral Spine

- A straight line from your ears, shoulders, hips, knees and ankles
- Head is centered
- Shoulders, hips and knees are of equal height
- If you hung a string from the earlobe, the line would hang straight through the middle of the ankle.



Correct Posture

- Allows the nervous system to communicate with the muscular system
- Allows the neuromuscular system to produce functional strength
  - "Functional strength is the ability of the neuromuscular system to contract eccentrically, isometrically, and concentrically in all three planes of motion" (*NASM*)
  - **Training movement, not muscles!**

Requirements for Correct Posture

- Good muscle flexibility
- Normal motion in the joints
- Strong postural muscles
- A balance of muscles on both sides of the spine
- Awareness of your own posture, plus awareness of proper posture which leads to conscious correction
  - With much practice, the correct posture for standing, sitting, and lying down can gradually replace your old posture

Poor Posture

- Postural problems exist when natural spinal curves are exaggerated or diminished
- All muscles must be activated to work in complete synergy (i.e., an orchestra)
- May cause muscle imbalances, which can place stress on the joints

Contributors to Poor Posture

- Obesity
- Pregnancy
- Weak muscles
- Tight muscles; decreased flexibility
- High-heeled shoes
- Poor work environment
- Poor sitting and standing habits
  - People spending hours hunched over a computer whether for work or play
- Children carrying huge overloaded backpacks
- Adults carrying briefcases/purses
- Injury

Poor Posture

- Muscle Imbalance:
  - Occurs with adaptive changes to the length and strength of a muscle on one side of a joint, resulting in the asymmetrical forces across the joint
  - Results in diminished participation of one muscle, leading to disuse atrophy or excessive motion in the dominant muscle

What Is A Postural Assessment?

- Observing a client in an attempt to notice the relationship between different parts of the body
- **Why should I do a postural assessment?**
  - To get more information
  - To save time
  - To serve as a benchmark
  - To demonstrate caring/professionalism
- **How should I do postural assessment?**
  - With client consent
  - With the client standing normally, in a relaxed position
  - Assess client anteriorly, posteriorly and laterally

Postural Assessment

- Ask your client to wear shorts and/or tank top
- Ask your client to remove their shoes
- Assess client anteriorly, laterally and posteriorly
- **Work from the ground up**
- Use a checklist
  - Feet, ankles, knees, hips, shoulders/arms, head/neck

Postural Assessment Checklist

- Set the feet-foundation
- Secure the pelvis
- Stabilize the scapulae
- Position the head
- *Everything links. Posture can be structural (how you were born) or functional (how you cope with your body weight or have adapted over time). Dr Michael Colgan*

Anterior/Posterior Static Postural Assessment

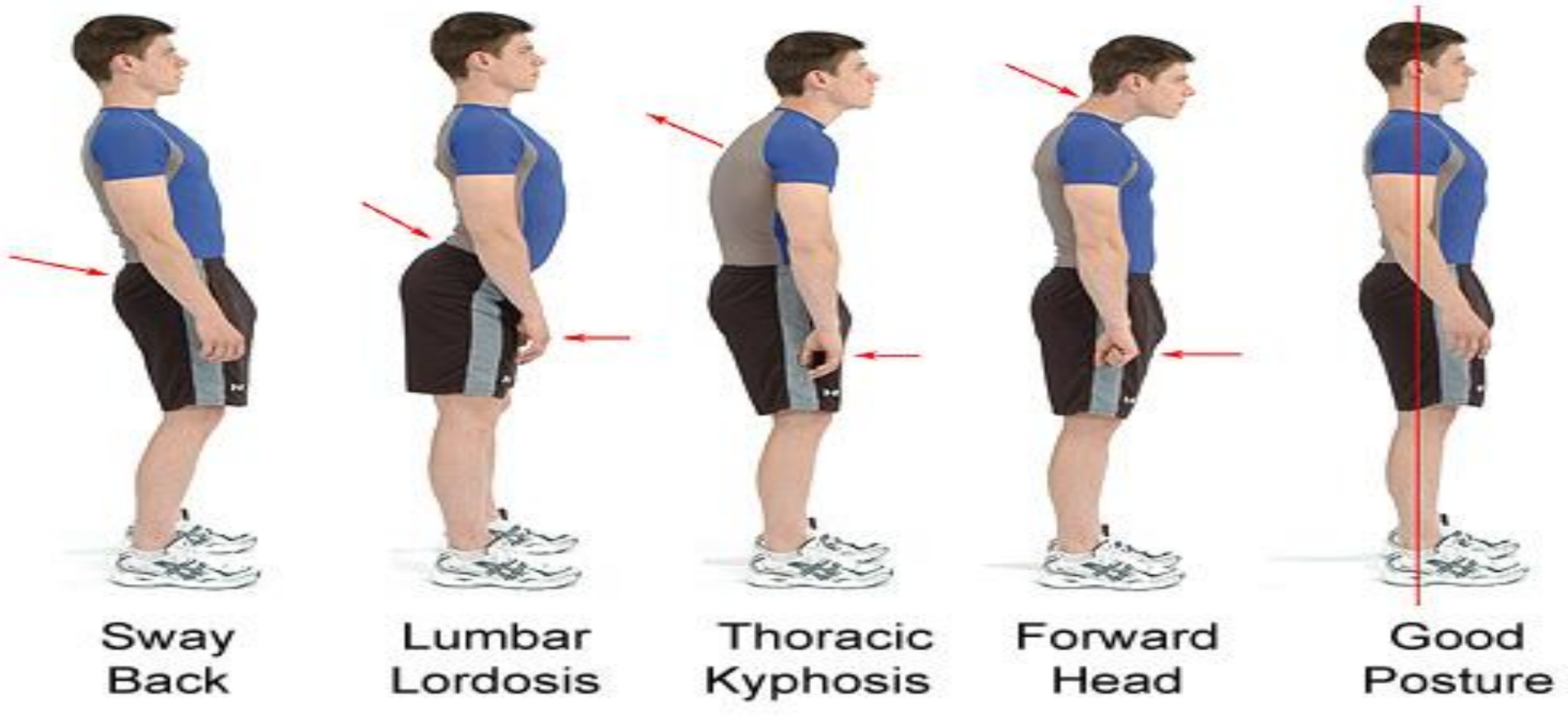
- Ask client to stand normally, in a relaxed position
- Don’t cue them as to how you want them to stand
- Make your assessment from the ground up
- You are looking for **Asymmetries**:
- **Order:**
  - Feet
  - Ankles
  - Knees
  - Hips
  - Shoulders/Arms
  - Head/Neck

Anterior/Posterior Static Postural Assessment

- **Going from the ground up**, observe differences between the right and left sides of the body
- Feet:
  - **Do the feet/ankles turn in or out?**
- Knees:
  - **Is the patella is pointing in or out?**
- Hips:
  - **Is one hip is higher than another?**
- Shoulders:
  - **Is one shoulder higher than another?**
- Neck:
  - **Does the head naturally tilt in either direction?**

Lateral Static Posture Assessment

- Is the client's spine flat or arched?
- Are the client's shoulders rounded forward?
- Does the client have a forward head posture?



Assessment of Dynamic Posture

- Observing movements to assess how muscles and joints work together
- Movement observations should relate to basic functions
  - Squatting
  - Pushing
  - Pulling
  - Balancing

Overhead Squat Assessment

Purpose:

- Assess dynamic flexibility on both sides of the body and total body strength
- To perform a correct squat, you need full range of motion at all of your joints, as well as core stability to coordinate and execute the movement against gravity

Overhead Squat Assessment

- **Position**
  - Client stands with feet shoulder-width apart and pointed straight ahead
  - Have client raise his or her arms overhead, with elbows extended
- **Movement**
  - Instruct client to squat to roughly the height of a chair and return to the start position
  - Have the client repeat the movement five repetitions in each position (anterior and lateral)
- **Observation**
  - Observe **feet, ankles, and knees anteriorly and posteriorly**
  - Observe the **lumbo-pelvic-hip complex, shoulder, and cervical complex laterally**

Overhead Squat Assessment

- **Anterior View**
  - Do feet turn in or out?
  - Do knees move in or out?
- **Suggested Exercises**:
  - Stretch gastrocnemius and soleus (calves)
  - Stretch hip adductors
  - Lateral tube walk
  - Lateral step-up

Overhead Squat Assessment

- **Lateral View**
  - Do the arms fall forward?
  - Is there an excessive forward lean in the lumbo-pelvic hip complex?
  - Does the low back arch?

Overhead Squat Assessment

- **Comments and Suggested Exercises**:
  - If the arms fall forward, may be due to tight latissimus dorsi, teres major, pectoralis major and minor
  - Strengthen the rhomboids, middle trapezius, and rotator cuff muscles
  - Standing cable row
  - Lateral and medial rotation with tubing
  - Lat stretch with SB-kneeling with 1 arm
  - Lat Stretch with SB- kneeling with 2 Arms
  - Foam roll gastrocnemius and soleus
  - Stretch gastrocnemius and soleus

Overhead Squat Assessment

- Excessive forward lean
- Low back arches
- **Comments**:
  - May need more core strength
  - Hip flexors may need stretching
  - Erector spinae may need stretching
- **Suggested Exercises**:
  - Supine bridge
  - Partner hip flexor stretch
  - Kneeling hip flexor stretch
  - Standing hip flexor stretch

Overhead Squat Assessment

- **Posterior View**
  - Do the heels elevate?
- **Comments**:
  - This puts the client into plantarflexion
- **Suggested Exercises**:
  - Dorsiflexion
  - Foam roll gastrocnemius and soleus
  - Partner stretch gastrocnemius and soleus

Single-Leg Squat Assessment

- **Purpose**:
  - Assess ankle proprioception, core strength, and hip joint stability
- For some clients, the single-leg squat assessment may be too difficult to perform (e.g., older client).
- Options include single-leg balance

Single-Leg Squat Assessment

- **Position**
  - Client should stand with hands on the hips and eyes focused on an object straight ahead
  - Feet should be pointed straight ahead, and the foot, ankle, and knee, and the lumbo-pelvic-hip complex should be in neutral
- **Movement**
  - Instruct client to raise one leg and place it parallel to the stance leg
  - Have client squat to a comfortable level
  - Perform up to five repetitions
- **Observation**
  - Observe the knee anteriorly

Single-Leg Squat Assessment

- Anterior view
  - –Does the knee move in or out?

Single-Leg Squat Assessment

- **Suggested Exercises:**
  - Stretch hip adductors
  - Strengthen hip abductors
  - Lateral tube walk
  - Lateral walk on treadmill
  - Lateral step-up

Lunge Assessment

- **Purpose**:
  - Assess mobility around the pelvis in relation to core stability; also balance and stability of the entire kinetic chain.
  - Lunging requires your client to open up at the hips, moving in opposite directions with each leg, while maintaining core stability and balance

Lunge Assessment

- **Position**
  - The client stands with feet together
- **Movement**
  - Instruct client to step forward, landing one foot directly in front of the other.
  - Have client lunge to a comfortable level
  - Perform up to five repetitions
- **Observation**
  - Observe the feet, ankles, hips, spine, shoulders and head anteriorly, posteriorly, and laterally

Lunge Assessment

- **Anterior/Posterior View**
  - Does the trailing foot turn in or out?
- **Observations**:
  - Trailing leg keeps laterally rotating or difficulty maintaining the in-line position
- **Comments**:
  - Lateral hip rotators may need stretching
- **Suggested Exercises**:
  - Supine piriformis stretch
  - Hamstrings straight leg stretch with medial Rotation

Lunge Assessment

- **Lateral View**
  - Is there an excessive forward lean?
  - Does the low back arch?
- **Comments**:
  - May need core strength
  - Hip flexors of the trailing leg may need stretching
- **Suggested Exercises**:
  - Posterior pelvic tilt on floor or standing against wall
  - Supine bridge on floor
  - Supine bridge on Swiss Ball
  - Kneeling hip flexor stretch

Pushing Assessment

- **Purpose**
  - Assess mobility between the shoulder girdle and glenohumeral joint. Shoulder girdle and glenohumeral joint should work together.
- **Position**
  - Using cables or tubing, instruct the client to stand with abdomen drawn inward, feet in a split stance, and toes pointing forward (standing may be too demanding and may be performed seated)
- **Movement**
  - Instruct client to press handles forward and return slowly
  - Perform up to 10 repetitions in a controlled manner

Pushing Assessment

- Observe the spine, shoulders and head posteriorly and laterally
- **Posterior View**
  - Do the shoulders elevate (shrugging)?
- **Comments:** May indicate tight upper trapezius and weakness in the lower trapezius and serratus anterior
- **Suggested Exercises:**
  - Stretch upper trapezius
  - Stretch levator scapula
  - Strengthen rhomboids, middle and lower trapezius
  - Strengthen serratus anterior

Pushing Assessment

- **Lateral View**
  - Does the low back arch?
  - Does the head protrude while pushing?
- **Suggested Exercises:**
  - Chin tuck (imagine there is a ball tucked under the chin and don’t drop it)
  - Stretch upper trapezius and levator scapula
  - Stretch hip flexors
  - Stretch erector spinae
  - Strengthen gluteus maximus and hamstrings
  - Strengthen the lumbo-pelvic-hip complex

Pulling Assessment

- **Purpose**
  - Assess mobility between the shoulder girdle and glenohumeral joint. Shoulder girdle and glenohumeral joint should work together.
- **Position**
  - Instruct client to stand with abdomen drawn inward, feet shoulder-width apart, and toes pointing forward (standing may be too demanding and may be performed seated)
- **Movement**
  - Instruct client to pull handles toward their body and return slowly
  - Perform up to 10 repetitions in a controlled manner

Pulling Assessment

- Observe the spine, shoulders and head posteriorly and laterally
- **Posterior View**
  - Do the shoulders elevate (shrugging)?
- **Suggested Exercises:**
  - Stretch upper trapezius
  - Stretch levator scapula
  - Strengthen middle and lower trapezius
  - Strengthen serratus anterior
  - Strengthen rhomboids

Pulling Assessment

- **Lateral View**
  - Does the low back arch?
  - Does the head protrude while pulling?
- **Suggested Exercises:**
  - Chin tuck (imagine there is a ball tucked under the chin and don’t drop it)
  - Stretch upper trapezius and levator scapula
  - Stretch hip flexors
  - Stretch erector spinae
  - Strengthen gluteus maximus and hamstrings
  - Strengthen the lumbo-pelvic-hip complex

Common Muscle Imbalances and Conditions

- Upper Cross Syndrome:
  - **Forward Head, Rounded Shoulders**
- Lower Cross Syndrome:
  - **Anterior Pelvic Tilt**

Upper Cross Syndrome

- Also known as “student syndrome” or “corporate syndrome”
- Effects people who sit all day in front of a computer or at a desk
- The shoulders appear slumped or rounded forward, and there is a noticeable rounded appearance of the thoracic spine.

Upper Cross Syndrome

- Muscles that tend to become tight:
  - **Upper Trapezius**
  - **Sternocleidomastoid**
  - **Levator Scapula**
  - **Pectoralis Minor/Major**
  - **Latissimus Dorsi and Teres Major**
- Muscles that tend to be weak:
  - **Rhomboids**
  - **Lower Trapezius**
  - **Serratus Anterior**
  - **Posterior Deltoid**
  - **Infraspinatus**
  - **Teres Minor**
  - **Deep Cervical Flexors**

Upper Cross Syndrome

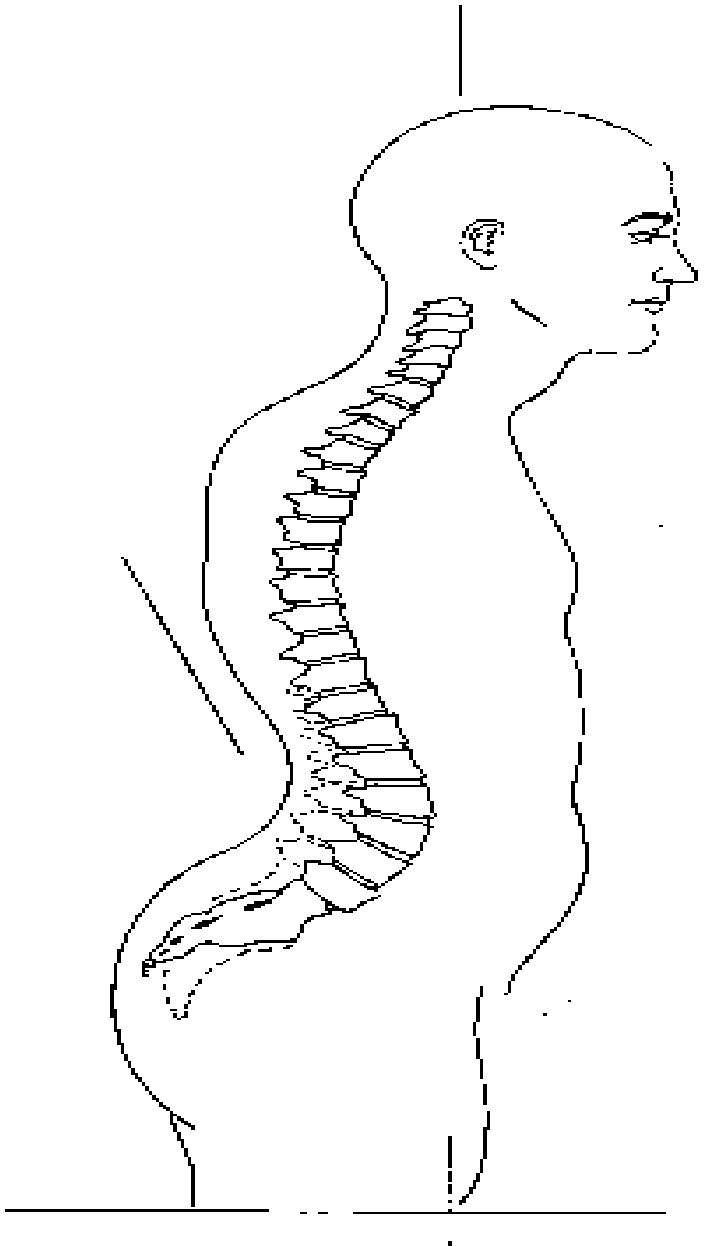
- CORRECTIVE EXERCISES:
  - Stretch tight muscles and strengthen weak muscles
  - Perform Chin Tucks
    - Without tipping the head in any direction, pull your chin and head back
    - It's as though you are trying to make a double chin!
  - Perform scapular stabilization exercises (elevation, depression, protraction and retraction)
  - Proper diaphragmatic breathing
  - Teach proper body alignment

Upper Cross Syndrome

- Remind clients to maintain correct postural alignment as often as possible
  - Cues such as "Pull your shoulders back", and "Tuck your chin"
- Have your client perform these corrections every hour on the hour, even when they perform their cardio exercise
- Performing stretches for 3 sets each for 30 seconds will serve to decrease neural impulses sent to the muscles and prevent over-recruitment during exercises
- Exercises can also be added at the end of their routine to assist in strengthening the weaknesses.

Lower Cross Syndrome

- Top of pelvis rotates forward and spine is pulled forward
- Imagine your pelvis as a bucket of water, and you were to pour water onto your toes, that would involve the bucket of water tilting forward and down. That is what's referred to as an **Anterior Pelvic Tilt.**
- This is common and correlates to lower back pain



Lower Cross Syndrome

- Muscles that tend to become tight:
  - **Psoas Major**, which by its anatomy can cause increased lumbar extension and hip flexion, causing the pelvis to tip anteriorly
    - When the psoas is tight, it increases hip flexion and tightens the hip flexor muscles
    - Gluteus maximus, which contributes strongly to hip extension, will be inhibited by psoas major, causing the hamstrings to pick up the extra force

Lower Cross Syndrome

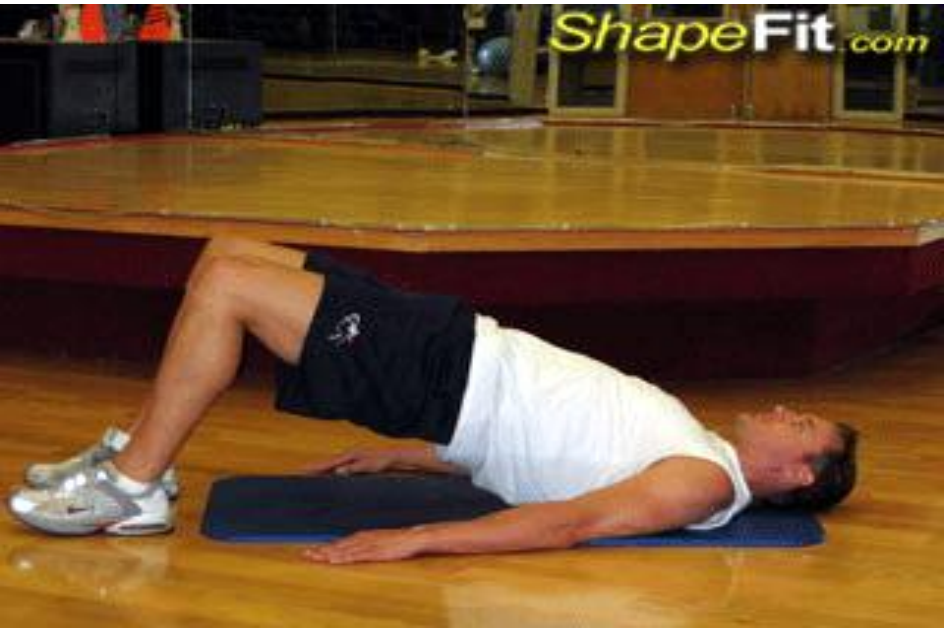
- Muscles that tend to become tight:
  - **Quadriceps**, particularly the rectus femoris, which also contributes to hip flexion
  - **Lumbar Erectors**, which cause lumbar extension.
  - **Quadratus Lumborum**, if bilaterally tight, can cause increased lumbar extension.
  - **Hip Adductors**, anterior pelvic tilt results in internal rotation of the femur. This will shorten the adductor musculature

Lower Cross Syndrome

- Muscles that tend to be weak:
  - **Gluteus Maximus**, which causes hip extension and opposes the psoas major
  - **Hamstrings,** this muscle can be tricky, it may be weak but appear tight simply because it is a synergist to the gluteus maximus and may be compensating
  - **Deep Abdominal Wall**, this includes the **transverse abdominus, and internal obliques** which may become weak due to tight lumbar erectors

Lower Cross Syndrome

- Corrective Exercises
  - –Stretch the tight muscles
  - –Strengthen the weak muscles
  - –Postural cueing



Lower Cross Syndrome

- **Kneeling Hip Flexor Stretch**
  - Perform a posterior pelvic tilt
  - Hold your pelvis in position, then shift your weight forward until you feel a stretch
- **Supine Floor Bridge**
  - Hips and knees are hip width apart
  - Perform a posterior pelvic tilt
  - Do not arch the back
  - Perform for 30 seconds isometrically
  - Repeat this sequence until 3-5 minutes of total tension is reached
  - Eventually, your client should be able to work up to 3-5 minutes isometrically