Yoga Therapy (Yoga Wellness RYT-300)

www.WhiteCrowYoga.com

Postural Assessment

- **ALWAYS ASK permission to touch!**

- Ask and ask again – let clients know you are about to touch them and do not do anything that could make them uncomfortable.

- Watch their body language.

Postural Assessment (Source: Jane Johnson *Postural Assessment* – optional book)

- **What?** – Way of viewing the body to see if client is asymmetrical or how far away from "ideal posture" they are (see next slide)
- **Why?** – Establish baseline, bring out surgeries/injuries/known issues (chance to ask about scars, etc.), treat holistically
- **When?** – Initial visit (unless client is too anxious or other prevailing reasons), and again after several visits to re-assess
- **Who?** – Healthy enough, not overly anxious
- **Where? Discuss** privacy, informing client, staying warm
- Postural assessment is **only ONE part** of an assessment (**verbal, visual, hands-on**). Diet, lifestyle, gait, emotions, and more play into a client's pain

Postural Assessment (Jane Johnson book – Chapter 1)

- “Ideal” posture might be slightly different for all of us. - Physiological compensations to keep us upright might vary, based on soft tissues, bone size/length/angle.

- Think about how we see differences in Down Dog or Cobbler’s Pose based on compression/tension in different bodies. It doesn’t make one person’s down dog ‘wrong’ or ‘worse’ than the other persons

- Don’t miss ‘low hanging fruit’ when doing assessments. Often, an easy-to-spot issue is the one that will yield the most results if corrected.

What Impacts Our Posture? (Jane Johnson book – Chapter 1)

Factor	Examples
Structural or anatomical	▪ Scoliosis in all or part of the spine ▪ Discrepancy in the length of the long bones in the upper or lower limbs ▪ Extra ribs ▪ Extra vertebrae ▪ Increased elastin in tissues (decreasing the rigidity of ligaments)
Age	Posture changes considerably as we grow into our adult forms, with postures in children being markedly different at different ages.
Physiological	▪ Posture changes temporarily in a minor way when we feel alert and energised compared to when we feel subdued and tired. ▪ Pain or discomfort may affect posture as we adopt positions to minimise discomfort. This may be temporary or could result in long-term postural change if the position is maintained. ▪ Physiological changes that accompany pregnancy are temporary (e.g., low backache before or after childbirth), but sometimes result in more permanent, compensatory postural change.

Postural Factors (Jane Johnson book – Chapter 1)

Pathological	▪ Illness and disease affect our postures especially when bones and joints are involved. Osteomalacia may show up as genu varum; arthritic changes are often revealed when joints in the limbs are observed. ▪ Pain can lead to altered postures as we attempt to minimise discomfort (e.g., following a whiplash injury a client may hunch the shoulders protectively; abdominal pain may lead to spinal flexion). ▪ Mal-alignment in the healing of fractures may sometimes be observed as a change in bone contour. ▪ Certain conditions may lead to an increase or a decrease in muscle tone. For example, someone who has suffered a stroke may have increased tone in some limbs but decreased tone in others. ▪ As elderly adults, we tend to lose height as a result of osteoporotic changes and so develop stooped postures; postmenopausal women may develop a dowager's hump.

Postural Factors (Jane Johnson book – Chapter 1)

Occupational	Consider the postural differences between a manual worker and an office worker, and between someone active and someone sedentary.
Recreational	Consider the postural differences between someone who plays regular racket sports and someone who is a committed cyclist.
Environmental	When people feel cold they adopt a different posture to that when they feel warm.

Postural Factors (Jane Johnson book – Chapter 1)

Social and cultural	People who grow up sitting cross-legged or squatting develop postures that are different from those of people who grow up sitting on chairs.
Emotional	▪ Usually, the posture we subconsciously adopt to match certain moods is temporary, but in some cases it persists if the emotional state is habitual. Consider the posture of a person who is grieving, or the muscle tone of a person who is angry. ▪ Clients who fear pain may adopt protective postures.

Big 5 Assessments

We will look at what I call “The Big 5” for postural assessments. These 5 areas are:

- Feet/ankles
- Knee
- Lumbo-pelvic girdle
- Thoracic spine and shoulder
- Head and neck

Foot and Ankle

Common Deviations Associated With the Foot and Ankle

There are two main deviations that cause pain and injury in the foot and ankle area. They are:

1. Overpronation
2. Lack of dorsal flexion.

Pronation is a normal function in the body that occurs when the foot collapses inward toward the midline of the body. This movement causes the heel to roll inward and the medial longitudinal arch of the foot to elongate and flatten. **Overpronation**, however, occurs when the foot collapses too far inward for normal function and disrupts proper functioning of the entire body.

Dorsal flexion involves bringing the foot toward the shin or visa versa. This can happen when the foot is in contact with the ground, such as when squatting and the shin moves forward over the foot, or when swinging the leg forward and lifting the foot up to clear the ground as when walking. Dorsal flexion is a natural and necessary function of the foot and ankle. When people lose their ability to dorsiflex through a full range of motion, it impairs other movements of the body as well.

Feet/Ankle Assessment: Ask Clients About

- Arthritis
- Activities (sports, gardening, etc.)
- Occupation
- Pain? Coincide with other pain or certain activities?
- Pain or limitations that stop them from engaging in activities?
- What makes pain go away or less intense?

Talk about WHY these things are important!

Feet/Ankle Assessment: Cont'd

ANTERIOR VIEW

Begin the assessment by looking carefully at the feet and ankles. Look closely for any swelling, calluses, or irregularities between the feet, ankles and toes.

Feet/Ankle Assessment: Cont'd

Pronation

In order to visually determine the extent and type of pronation in a client's feet, ask the client to stand on both feet facing you. The client's foot may be overpronated if the arch is dropped or absent and/or a bulge of flesh sticks out on the inside of the foot.

Example of Overpronated Foot Position

Feet/Ankle Assessment: Cont'd

Supination

To visually assess the extent and type of supination in a client's feet, look at the top of their feet. If it appears that all their body weight is on the outside of their foot then this may be an indication that the client's feet are oversupinated.

Example of Oversupinated Foot Position

Feet/Ankle Assessment: Cont'd

Note: Oversupination is much more rare than overpronation and is much more complex. Because of this, we wont' focus as much on oversupination, but we do want to have a resource for it.

When we get to into fascial release, we'll cover some material that will benefit both overpronation and oversupination. In the meantime, here is a good link for oversupination:

https://livewell.jillianmichaels.com/foot-supination-exercises-4430.html

Feet/Ankle Assessment: Cont'd

An overpronated client may abduct his foot because overpronation causes the knee to move toward the midline of the body. Therefore, the client may turn his foot outward in order to align the knee to face forward. (see pic on next slide)

Feet/Ankle Assessment: Cont'd

Example of Abducted Foot Position

Feet/Ankle Assessment: Cont'd

Exception: The case just stated is the norm (foot turned away from body to compensate for overpronation to try to point the knee forward). However, if a client is bow-legged (Genu Varum), his knee will naturally point toward the outside of the body. In this case, client may turn the foot inward to try to line up the knee.

Summary: A client with overpronation WITHOUT Genu Varum will usually turn foot outward (abduct).
Client with **overpronation AND bow-legged** condition will usually turn foot inward (adduct).

Feet/Ankle Assessment: Cont'd

Bunion: Painful swelling on the first joint of the big toe.
Hallux Valgus: This joint is gradually subluxed (lateral deviation of the joint) resulting in an abduction of the first metatarsal while the phalanges adduct(often called one disorder – actually 2 things, but usually are together – bump and abduction). See next slide

Overpronation causes **foot** to **collapse** which transfers weight to center line of body. This **transfer of weight** across the foot **before it can pass over the end of the big toe** can cause inflammation on the inside of the first joint of the big toe **(Bunion).**

Why does overpronation sometimes cause these issues and sometimes not?
Possibly genetics. Clients who have bunions may have a short first metatarsal bone and/or hypermobility of the first metatarsal bone or Morton's toe – where the 2nd toe is longer than the big toe.


Hallux Valgus

Feet/Ankle Assessment: Cont'd

Lesser Toe Abnormalities:

Hammer Toe: Bends **down toward the floor at the middle toe joint**. This causes the middle toe joint to rise up. It usually affects the second toe. (usually overpronation, improper footwear)

Mallet Toe: Bends **down at the joint closest to the tip of the toe**. It often affects the second toe, but it may happen in the other toes too. (usually muscle imbalances, genetics, arthritis, improper footwear)

Feet/Ankle Assessment: Cont'd

Lesser Toe Abnormalities:

Claw Toe: Often affects the four smaller toes at the same time. The toes **bend up at the joint where the toes and the foot meet**. They **bend down at the other joints.** This causes the toes to curl down toward the floor. (usually improper footwear, muscle imbalance)

Feet/Ankle Assessment: Cont'd

Feet/Ankle Assessment: Cont'd

Talus Bone Assessment

It is important to assess the position of the talus bone as it sits in the ankle because this will help confirm if the client is overpronated. The talus bone lies in the ankle and helps dissipate some of the side-to-side stress of the foot and ankle during weight bearing activities.

Feet/Ankle Assessment: Cont'd

1. To assess the position of this bone, place your thumb and index finger on either side of the ankle just below the ankle bones. You will feel a dimple or indentation on both sides. On the inside of the ankle, the dimple is just below the large tendon of the muscle that pulls the big toe toward the shin (i.e., extensor hallucis). On the outside of the ankle, the dimple lies just below the tendon that lifts the lesser toes toward the shin (i.e., extensor digitorum).

Feet/Ankle Assessment: Cont'd

2. Position your thumb and forefinger and press firmly in the center of the dimples on the inside and outside of the ankle. Then ask the client to raise or lower the arch of their foot (pronate or supinate). As they collapse the arch you will feel pressure under your thumb on the inside of the ankle. This is the talus bone pushing into your thumb. As they raise their arch you will feel pressure under your forefinger. This is the talus bone moving the other way. Coach your client to pronate and supinate until the pressure under your thumb and forefinger feels even.

Feet/Ankle Assessment: Cont'd

Assessing the Position of the Talus Bone

Feet/Ankle Assessment: Cont'd

3. When you feel even pressure on thumb and forefinger, instruct client to hold this neutral position. Let them know neutral positon may feel strange to them if they are used to overpronating, as many of us are.

4. If available to the client, have him use his hands to feel this – either bending down or on your ankle.

5. Help him be able to find neutral on his own.

Feet/Ankle Assessment: Cont'd

- Overpronation causes the foot collapse and the heel to roll inward, pulling on Achilles tendon, gastrocnemius and soleus.
- Calf muscles become sore and lose ability to function properly
- If calf can't stretch fully, foot and ankle won't be able to dorsiflex. This is why overpronation and lack of dorsiflexion are often seen together (see next slide).

Feet/Ankle Assessment: Cont'd

When the foot overpronates, it causes the tibia and femur to internally rotate and the heel bone (calcaneus) to fall inward toward the midline of the body (evert) too much. Since the Achilles tendon attaches the posterior calf muscles to the calcaneus, the calf muscles can be pulled out of alignment via the heel when the foot overpronates. When the calf muscles get pulled and twisted, the tissue becomes damaged and begins to lack flexibility. A lack of flexibility in the posterior calf directly impacts the ability of the foot and ankle to dorsiflex. Hence, overpronation is usually accompanied by a lack of dorsal flexion.

Cont'd on next slide

Feet/Ankle Assessment: Cont'd

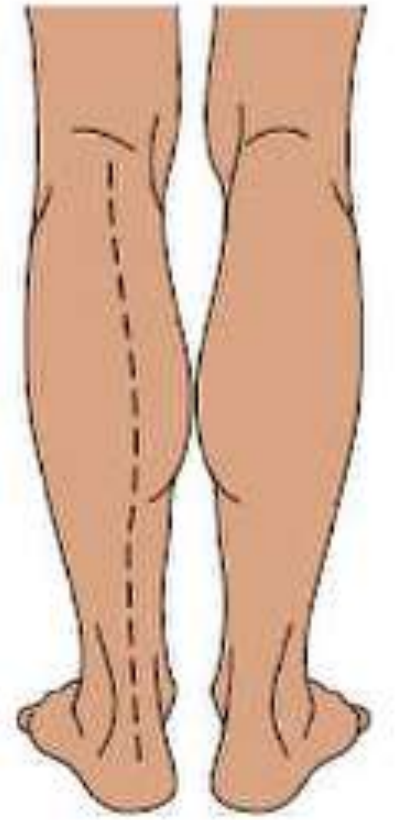
The internal movement of the tibia and femur also result in a medial (inward) displacement at the knee. As the knee moves medially, it can cause stress to the knee joint and may result in tracking problems of the knee where the kneecap (patella) does not glide smoothly as it should. Furthermore, the inward rotation of the upper and lower leg can also cause the top of the femur to be displaced within the hip socket (acetabulum) which affects the movement of the hip, pelvis, and lower back.

Feet/Ankle Assessment: Cont'd

- Are calf muscles atrophied?
- Calf nodules, scar tissue, sore spots?
- One calf larger than the other? (could indicate overuse on one side)

Feet/Ankle Assessment: Cont'd

Calf Midline (Johnson, page 62)



TIP One way to understand how hip rotation can affect the position of the calf is to draw the vertical calf lines on your client and then stand back and observe these lines when you instruct the client to alter her hip position. Ask her first to stand with one foot pigeon-toed. Compare the calf line on this leg with that of the other leg, and you will see that the line has moved outwards, away from the midline of the body, as the client has rotated the hip internally to stand pigeon-toed. Then ask her to turn her foot out on that side while keeping the other foot facing forwards or in a neutral position. This time the opposite happens: the calf line moves inwards, towards the midline of the body, as the client contracts the external hip rotators.

Feet/Ankle Assessment: Cont'd

Table 3.4 Calf Line and Corresponding Effects on Feet and Leg Muscles

	Calf line appears lateral	Calf line appears medial
Hip or tibia position, or both	Indicates internal rotation of the hip, the tibia, or both	Indicates external rotation of the hip, the tibia, or both
Foot position	Sometimes the client stands pigeon-toed	Sometimes the client stands with the feet turned out
Muscles that may be shortened	Internal rotators of the hip: Gluteus minimus Gluteus medius (anterior fibers) Adductors Pectineus Gracilis	External rotators of the hip: Gluteus maximus Gluteus medius (posterior fibers) Piriformis Quadratus femoris Obturator Gemelli muscles Psoas* Sartorius

*The psoas is not a definitive rotator, yet recent research suggests it may be more involved in stability of the spine, including rotation, than originally thought.

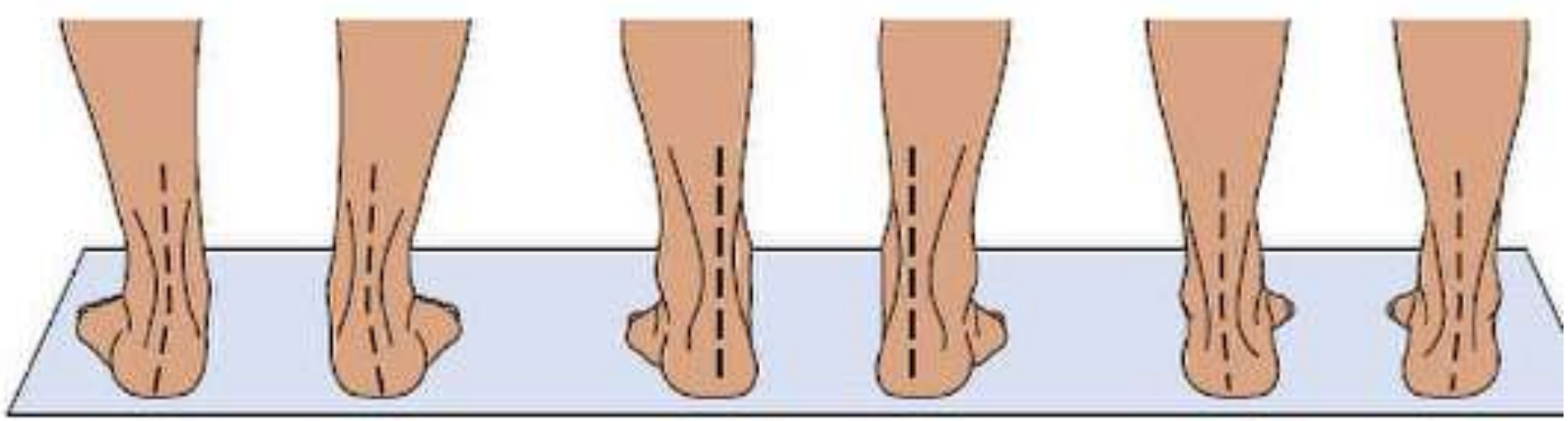
Feet/Ankle Assessment: Cont'd

Achilles tendon (Johnson, page 63)

Take a look at the Achilles tendon and the position of the calcaneus. If necessary, draw a line vertically down the Achilles tendon, over the calcaneus and to the floor. Then stand back and observe the lines you have drawn. Is the tendon straight, concave, or convex? Do the feet appear to roll out or to roll in?

Feet/Ankle Assessment: Cont'd

Notice if the line from the Achilles tendon to the midline of calf is straight (center) or curved as in the right and left examples. This can help you see if the client is in excessive supination or pronation.



Feet/Ankle Assessment: Cont'd

The Plantar Fascia

The plantar fascia is a broad, dense, fairly rigid tissue that runs the length of the underside of the foot and helps give the arches of the feet their shape and structure. Forces from the body above and reaction forces from the ground below put stress on the plantar surface of the foot when a person is weight-bearing, walking, or running. Overpronation places enormous pressure on the plantar fascia and, over time, leads to the tissue becoming overstressed, dysfunctional, and painful.

Feet/Ankle Assessment: Cont'd

To assess Plantar Fascia: Press thumb and fingers into the arch and sole of the foot from heel to toe.

Make note of pain/tenderness. May indicate areas of fascia that could benefit from release.

Feet/Ankle Assessment: Cont'd

Assessing the Plantar Fascia

Feet/Ankle Assessment: Cont'd

Assessment Checklist

Before you move on to assess the knees, you need to have answered the following questions about the feet and ankles:

- ☑ Do you fully understand what type of pain the client is experiencing in their feet and ankles and what affect this has on the function of their feet and ankles?
- ☑ Are the client's feet overpronated?
- ☑ Are the client's feet abducted or adducted?
- ☑ What is the condition of the client's big and lesser toes?
- ☑ What is the condition of the client's calf muscles and plantar fascia?
- ☑ Does the client know how to achieve a neutral foot and ankle position when standing?
- ☑ Do you know how the client's feet and ankles relate to their knees (and can you explain it to your client)?

Feet/Ankle Assessment: Cont'd:

Sample Check List for Feet/Ankles

CHECKLIST	Y	DETAILS
Feet and Ankles:		
Pain?	Y	lateral R ankle
Arthritis?	N	none reported
Function?	Y	limited dorsiflexion
Aggravating Factors?	Y	running
Causal Links?	Y	medial knee R leg
Visual Irregularities?	Y	slight swelling on inside of R ankle
Pronated?	Y	R foot O/pronated
Ab/Adducted?	Y	R foot abducted
Condition of Toes?	Y	big toe normal, lesser flexed on R foot
Plantar Fascia?	Y	very painful R side
Condition of calves?	Y	tight both sides
Client Knows Neutral?	Y	can attain

Knee

Knee Assessment

- Most knee pain from foot/ankle or lumbo-pelvic hip girdle issues

- Common Deviations include:

  * Medial Displacement (problems with side-to-side alignment)

  *Tracking issues with Flexion/extension

Knee Assessment (cont'd)

Side-to-side alignment problems can occur when the knee moves toward the center (i.e., medial displacement) or outside of the body without the muscles and soft tissue structures helping dissipate forces to the knee joint. Over time this can cause stress and/or injuries to the knee.

It is important to note that most people will have a **medial displacement** of one or both knees.

Knee Assessment (cont'd)

Tracking problems during flexion and extension can occur when the patella does not glide smoothly over the bottom of the femur (femoral groove) as it should. An incorrect position of the kneecap places an abnormal amount of pressure on the underside of the patella when the leg either bends or straightens. Over time this can cause pain and dysfunction. This displacement of the patella happens when the femur and tibia are not moving together in a synchronized manner as they bend, straighten, move to the side, and/or rotate.

Knee Assessment (cont'd)
Verbal assessment

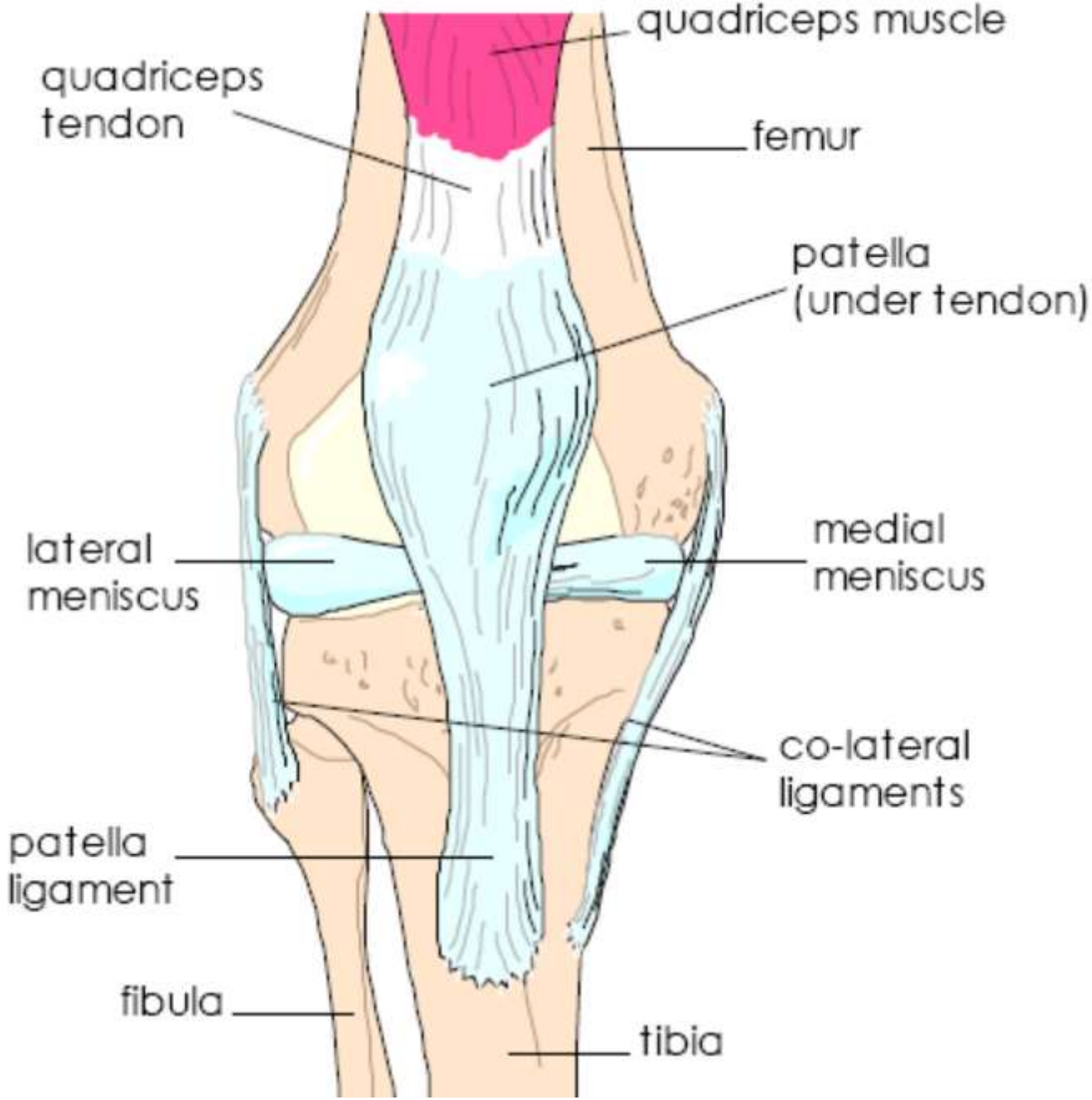
- Specifically where is pain?
- Arthritis? Surgeries?
- Activities?
- What causes more pain?
- What relieves pain?
- Occupation?
- Pain keeping you from doing anything you want to do?

Visual and Hands-on

Look for swelling, muscle size difference, scarring, etc.

Perform both standing and seated

Do they stand with knees hyperextended? Could damage ACL and lead to pain/arthritis and misalignments


quadriceps muscle
quadriceps tendon
femur
patella (under tendon)
lateral meniscus
medial meniscus
co-lateral ligaments
patella ligament
fibula
tibia

Knee Assessment (cont'd)
Visual and Hands-on

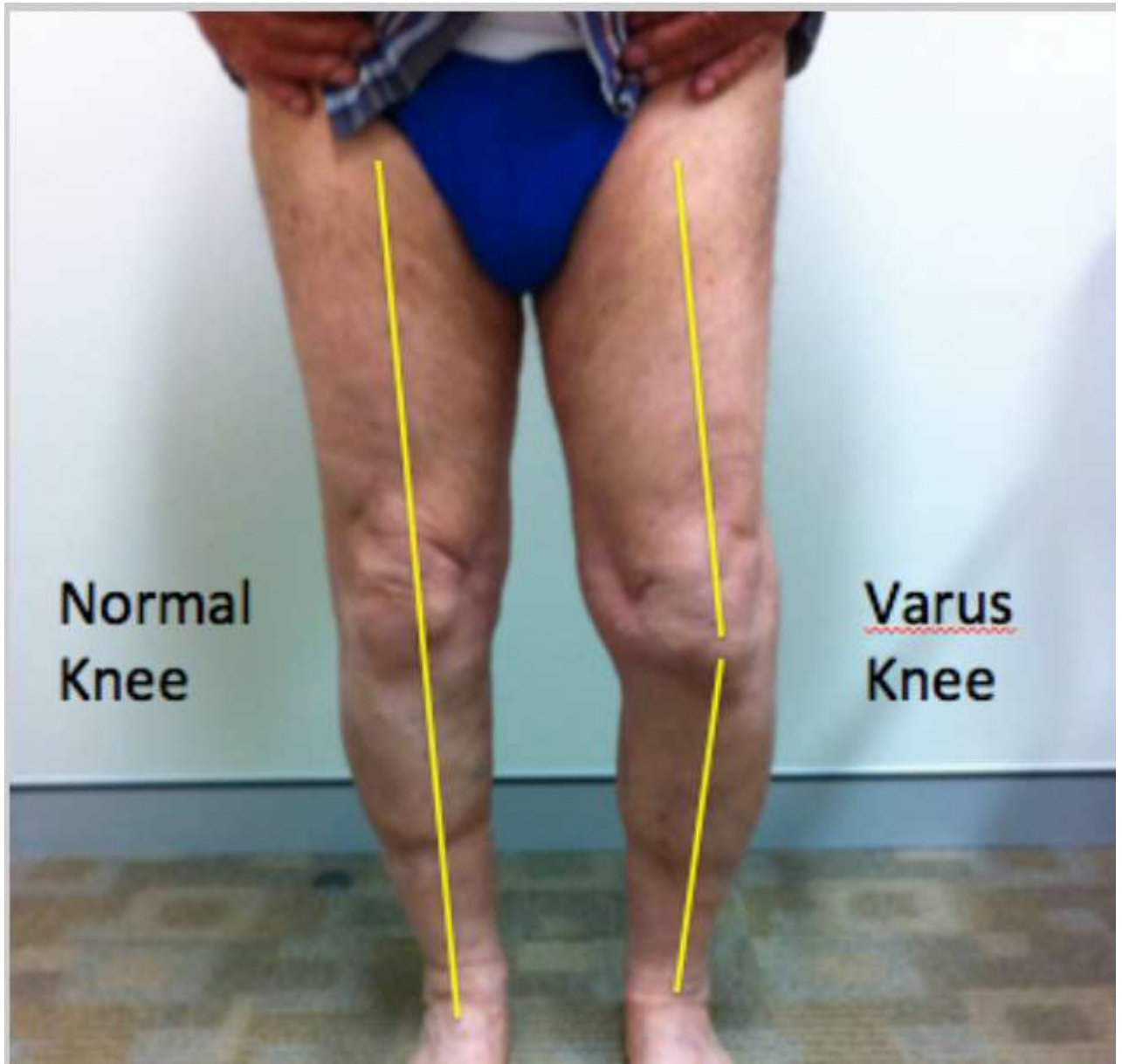
Look at the middle of your client's kneecap (patella). Draw an imaginary line from the kneecap to the middle of the ankle. Draw another imaginary line from the kneecap to the center of the front of your client's upper leg where the quadriceps muscles meet the hip. Make a note if the intersection of the two lines (at the kneecap) is deviated excessively inward (i.e., a valgus knee) or outward (i.e., a varus knee).

Knee Assessment (cont'd)
Visual and Hands-on

Example of Valgus Knee

Knocked-Knee (Valgus)

Knee Assessment (cont'd)



Bow-Legged (Varus)

Knee Assessment (cont'd)

Ask the client to stand on one leg. While the client is in this position ask them to bend their knee to about 30 degrees. As they move, watch the center of their kneecap and make a note of whether the kneecap moves excessively either toward (medially) or away (laterally) from the center line of their body.

Note: It is normal for the knee to move toward the midline of the body as a person squats. In this assessment you are looking for excessive motion toward the midline.

If client has severe knee pain, DO NOT ask them to do this. Just observe with both feet on the ground WITHOUT squatting.

Knee Assessment (cont'd)

Example of Medial Displacement of the Knee

Knee Assessment (cont'd) Single Leg Squat Posterior View

As client squats, **center of glutes** should sit down **just to the side of the center of the heel.** If hip moves away from center of body ("Salsa dance"), knee usually moves excessively toward midline of body, indicating alignment issues.

Knee Assessment (cont'd)

Example of "Salsa Hip" Shift and Medial Knee

Knee Assessment (cont'd)

Patella Tracking

Assess for problems with patella tracking while the client is in a supine position. Stabilize their bent leg with your leg and knee. Place one hand on the client's kneecap and use your other hand to bend and straighten their leg two to three times. Do not press down excessively on either their kneecap or lower leg as you perform this assessment. As you flex and extend the leg, feel the kneecap as it glides over the end of the femur and back. If you hear or feel any grinding, crunching, cracking, or popping noises, then there is likely a patella tracking issue. If the client experiences pain of any kind, stop the assessment immediately.

Knee Assessment (cont'd)
Assessing patella tracking

Knee Assessment (cont'd)

Any imbalances in foot/ankle or pelvis/lumbar region will usually impact knee health and alignment. You probably won't get pain-free knees without addressing these issues

Notice how interrelated everything is. For example, a valgus knee (knock-knee) in single leg squat usually shows overpronated foot, which causes shift in pelvis. As knee and foot collapse inward, low back arches excessively, so the pelvis rotates anteriorly to accommodate.

Knee Assessment (cont'd)

Get up and try this (do so ONLY within your safe, pain-free limit). Try to let your knee come in with a 30 degree one leg squat, and see what happens. Your hip shifts outward, lumbar curve increases and pelvis anteriorly tilts.

Knee Assessment (cont’d)

Coach your client to try to find a neutral knee position. Many times, simply bringing awareness and correcting overpronation will greatly improve knee misalignment.

When you teach your client what neutral looks and feels like, and give him tools and motivation to work toward neutral, your client’s chance of getting out of pain greatly increase.

Knee Assessment (cont'd)

Assessment Checklist

Before you move on to assess the lumbo-pelvic hip girdle, you need to have answered the following questions about the knees:

- ☑ Do you know what type of pain the client is experiencing and what affect it has on the function of their knees?
- ☑ Are there any visual irregularities between the client's knees?
- ☑ Is there a medial displacement of the client's knee(s)?
- ☑ Are there any problems with the client's patella tracking?
- ☑ Does the client know how to achieve a neutral knee and foot position when standing?
- ☑ Do you know how the foot and ankle and lumbo-pelvic hip girdle relate to knee (and can you explain it to your client)?

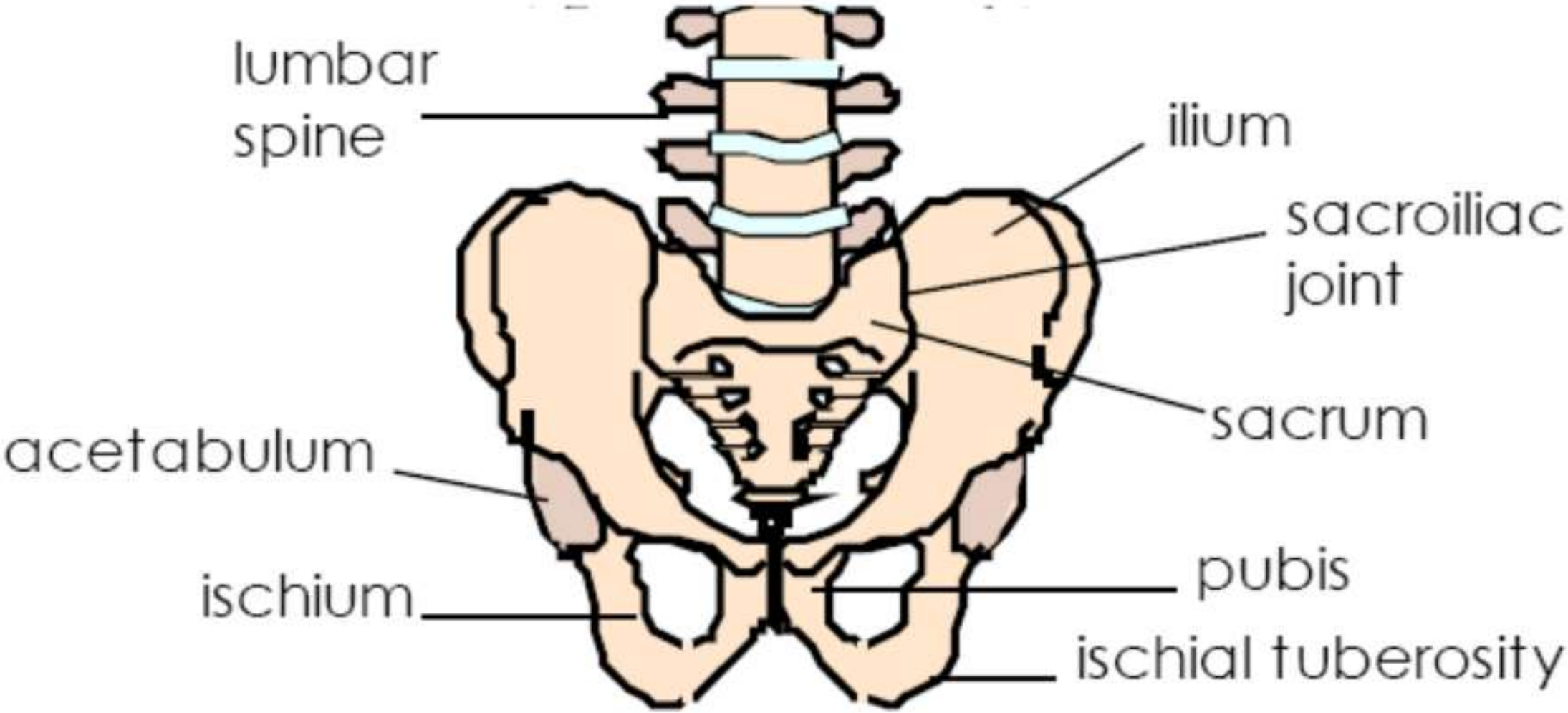
Lumbo-Pelvic Girdle

Lumbo-pelvic Girdle Assessment

This is where the lumbar spine, pelvis and top of legs come together

The main components of the lumbo-pelvic hip girdle are the lumbar spine, the sacrum, the sacroiliac joint, the pelvis, the acetabulum, and the head of the femur

Lumbo-pelvic Girdle Assessment



Lumbo-pelvic Girdle Assessment

There are two main deviations that cause pain and injury in the area of the lumbo-pelvic hip girdle. They are:

1. Rotational malalignment of the pelvis
2. Excessive lumbar lordosis.

Lumbo-pelvic Girdle Assessment

The most common misalignment of the lumbo-pelvic girdle is excessive lordosis. This is a ‘sway back’ that is caused by an excessively anteriorly rotated pelvis. In most clients, the pelvis is naturally anteriorly rotated around 10 degrees (some studies show a different number, but 10 is a good middle ground for our purposes).

Another misalignment is the opposite of this and is excessive posterior tilt, which causes a flat lumbar spine (think “tucked”). This is not as common as lordosis, but is sometimes seen more often in older male clients.

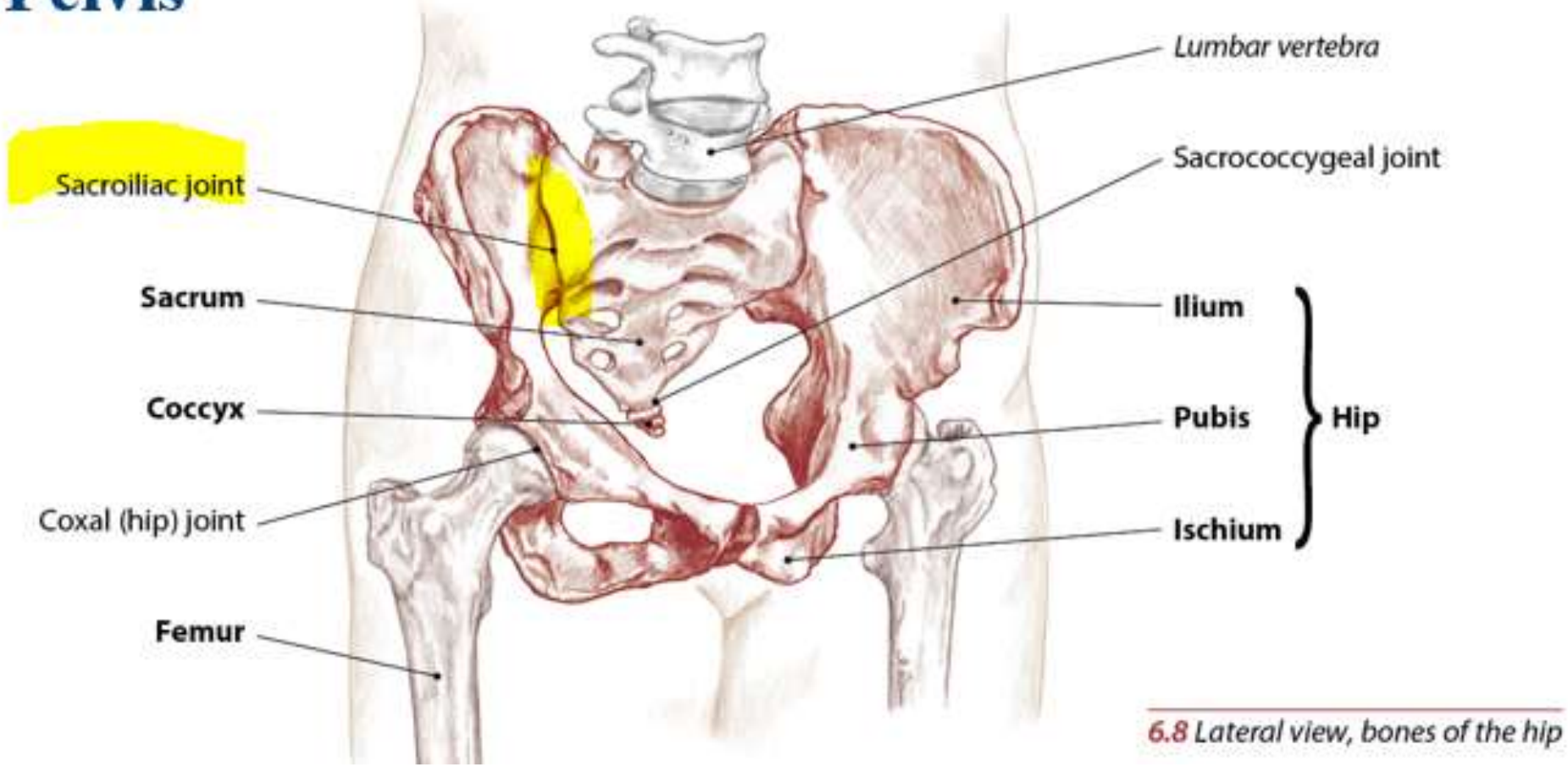
Two other misalignments might be seen. One is an elevated hip (think about one hip being ‘hiked up’ higher on one side than the other. The other condition is a rotation of the hips. If you view the client from the side and one hip juts forward more than the other, there may be a rotation at the hip. It could also include the rib cage, so it might not be coming from the hip but it is possible.

Lumbo-pelvic Girdle Assessment

Excessive Lumbar Lordosis refers to an excessive curvature of the lumbar spine. When a person is standing, the spine has a lordotic curve in the lower back. This is a natural, slight curve that forms a "C"-shape if a forward-facing person is viewed from the left side. However, when the curve of the lower back is excessive it can cause pain and dysfunction.

Lumbo-pelvic Girdle Assessment

Bones of the Pelvis and Thigh



6.8 Lateral view, bones of the hip

Lumbo-pelvic Girdle
Verbal Assessment

Ask Clients if they have pain, and where it is located (be specific).
Pain keeping you awake at night? (Important: Sleeping posture may be an issue)
Arthritis? Surgeries?
Name Activities and Occupation
When do they feel more or less pain? Causal links?
Pain preventing them from doing anything?

Lumbo-pelvic Girdle
Visual and Hands-on Assessment

The easiest way to assess the lumbo-pelvic girdle is to view the client from the side. Do you notice excessive curve or flattening? Do you notice one hip jutting forward? Then, view them from the front and back to see if you notice one hip more elevated than the other.

However, if you don't trust your eyes to pick up these differences, yet, Justin Price offers some tips on the next slide.

Note that he refers to "rotational malalignment" to mean rotation back to front; in other words, too much anterior or posterior tilt. When I am talking about rotational misalignment, it is not the same as what he means by "rotational malalignment". Again, he means tilt of the pelvis. I am talking about one hip rotating forward more than the other hip and this can be viewed from the side of the body.

While Justin's tips give you a starting point if you don't yet trust your eyes, note that you have to take into consideration a person's clothing and their size when using clues such as where the waist band sits or how many fingers you can get behind a person's back. These are not 'wrong' but I simply draw your attention to this because it can skew your findings if you are not careful in your consideration of all factors. However, these methods can be very useful for beginning therapists who need a starting point and have not yet developed the skill to assess by looking.

Lumbo-pelvic Girdle
Visual and Hands-on Assessment

Rotational Malalignment of the Pelvis

In order to more easily determine whether a client has an anterior pelvic tilt, view the person from the side as they are standing.

1. Look at the front and back of the pelvis. If the back of the pelvis appears higher than the front of the pelvis by a large degree then this indicates that the pelvis has rotated forward excessively, or anteriorly, around the middle of the hips (acetabulum). The way a person's waist band sits on their hips can also help you assess the rotational position of the pelvis. If the waist band is a lot higher in the back than in the front, this may also be indicative of an anterior pelvic tilt.

Lumbo-pelvic Girdle
Visual and Hands-on Assessment

Example of Excessive
Anterior Tilt

This is more common than
Excessive Posterior Tilt

Lumbo-pelvic Girdle
Visual and Hands-on Assessment

Excessive Lumbar Lordosis

In order to determine whether a client has hyperlordosis, look at the curvature of their lumbar spine. You should see a slight curve, or concavity, in their lower back. However, if the curve of their lower back looks markedly arched then the client is considered to have excessive lumbar lordosis.

Lumbo-pelvic Girdle **Excessive Lordosis**

Example of Excessive Lumbar Lordosis

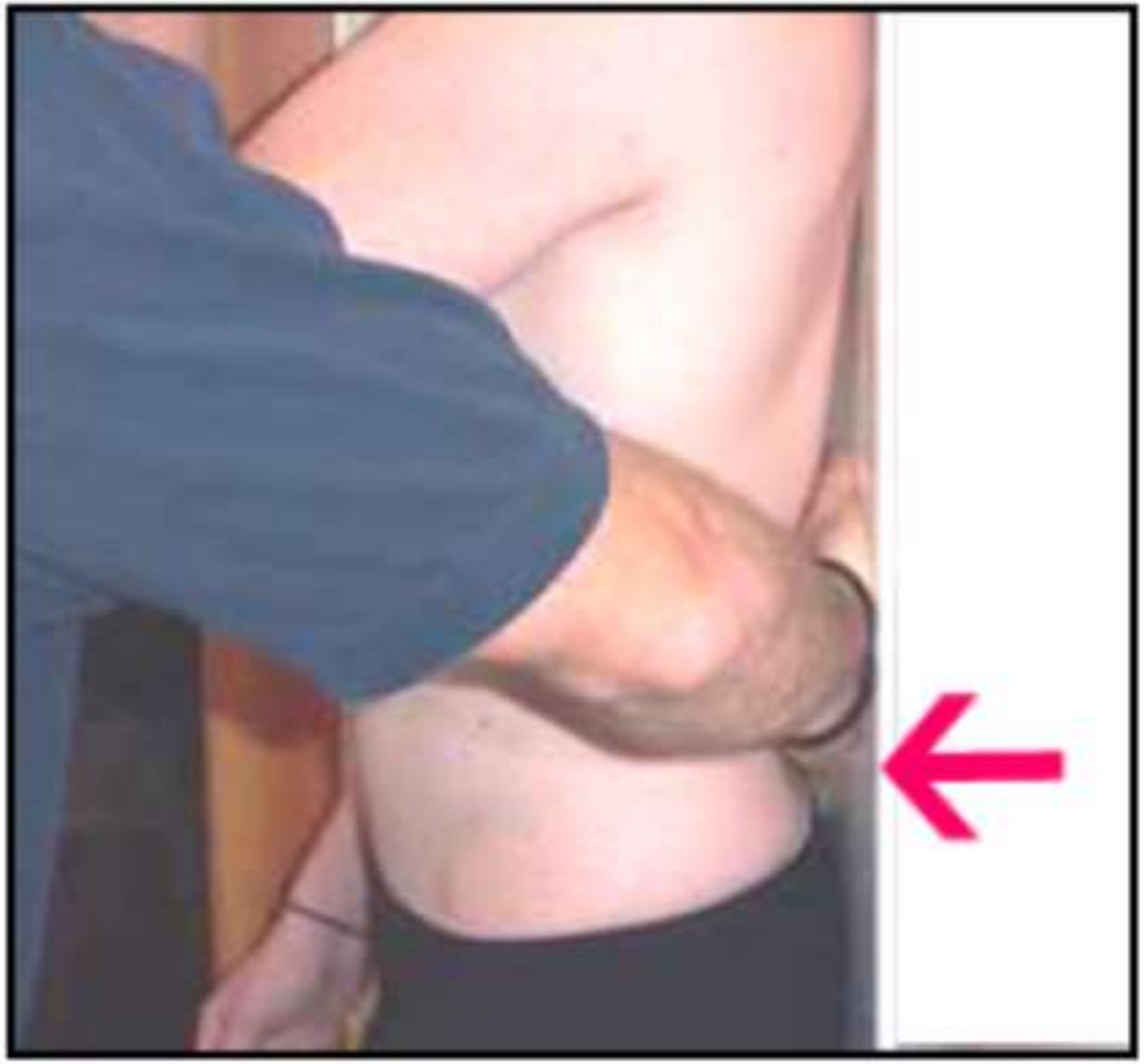
Lumbo-pelvic Girdle **Excessive Lordosis**

Degree of Lumbar Lordosis

When using the hands-on assessment technique for an excessive curvature in the lumbar spine, it will be necessary to have your client stand in bare feet against a flat surface such as a door or wall. Ask your client to stand with their back against the wall with their heels, buttocks, shoulders, and head touching the wall. To assess the degree of lordosis, place your hand, palm down, on the wall and slide it behind their lower back. Evaluate the space between their lumbar spine and the wall. When a person has an acceptable degree of lumbar lordosis, you should only be able to slide your fingers behind their lower back up to and in line with about your second knuckle. If the space between their back and the wall is big enough for you to slide your whole hand or arm through, then your client has hyperlordosis, or excessive lumbar lordosis. The greater the space is between the wall and their lower back, the more extreme their deviation or imbalance.

See next slide

Lumbo-pelvic Girdle **Excessive Lordosis**



Lumbo-pelvic Girdle **Excessive Lordosis**

If someone has a large gluteal complex and their sacrum (base of their spine) is not in contact with the wall during this assessment, then you will need to make an allowance for the additional space you will find. Use your best judgment to determine whether the lumbar curvature is excessive.

Lumbo-pelvic Girdle **Coach to find Neutral**

When your client has their shoulders, head, heels, and butt back against the wall, ask them to tilt their pelvis posteriorly (i.e., bring the front of their waistband up) to try to flatten their lower back to the wall. Keep your hand behind their lower back to feel the space decrease. Coach them to keep tilting their pelvis until you can slide only about the first two knuckles of your hand into the space between their lower back and the wall. As they posteriorly tilt their pelvis their knees should remain straight and their heels should be against the wall. This is now a relatively neutral position for the pelvis when they are standing.

See Next Slide

Lumbo-pelvic Girdle **Coach to find Neutral**

Lumbo-pelvic Girdle

Lumbar Lordosis

You can also assess the degree of lumbar lordosis in a client's lower back while they are in a supine position.

NOTE OF CAUTION: If a client has severe lower back pain it is advised that you do not ask that client to lie on their back on the floor with their legs straight. This may exacerbate their condition.

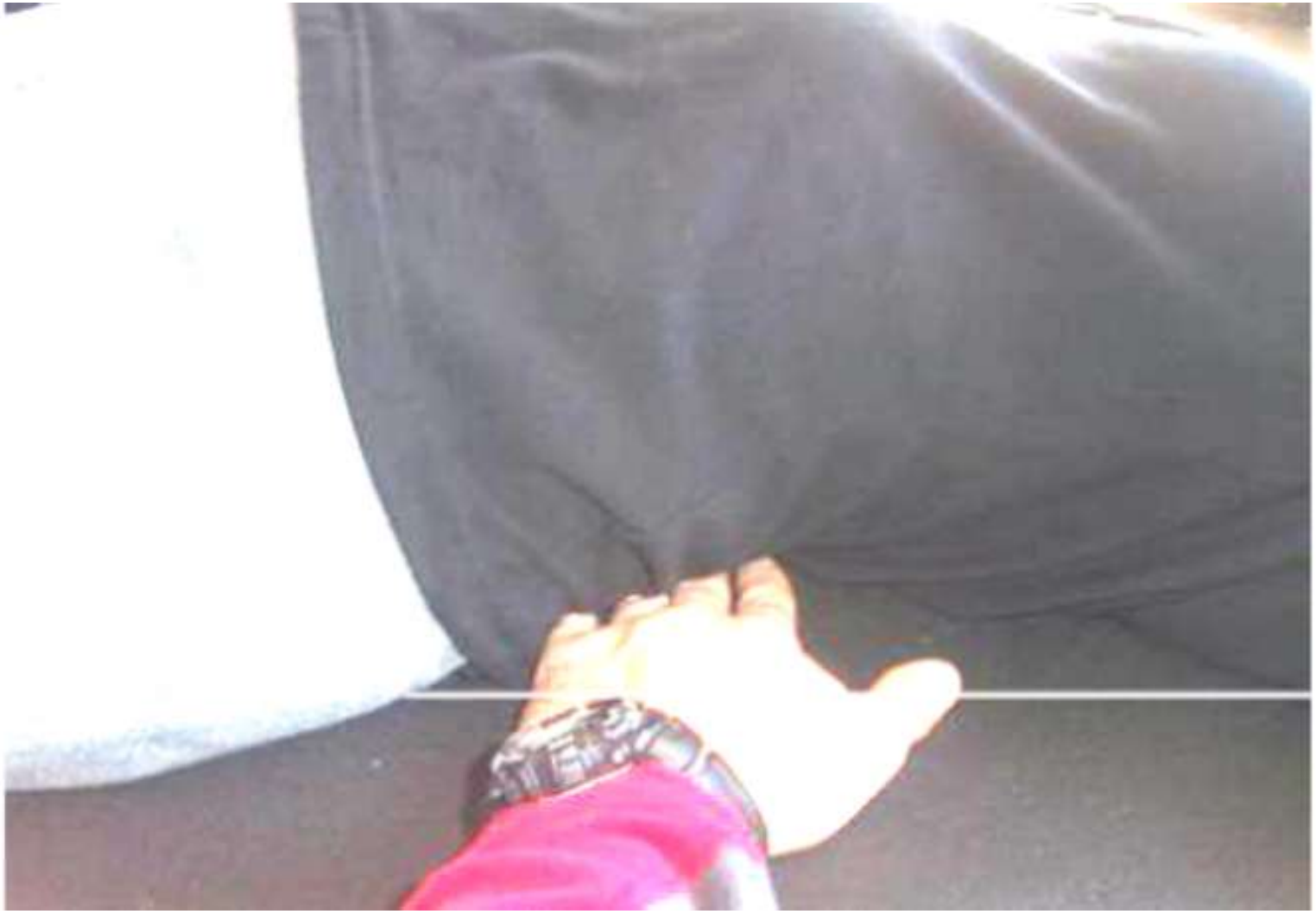
Lumbo-pelvic Girdle

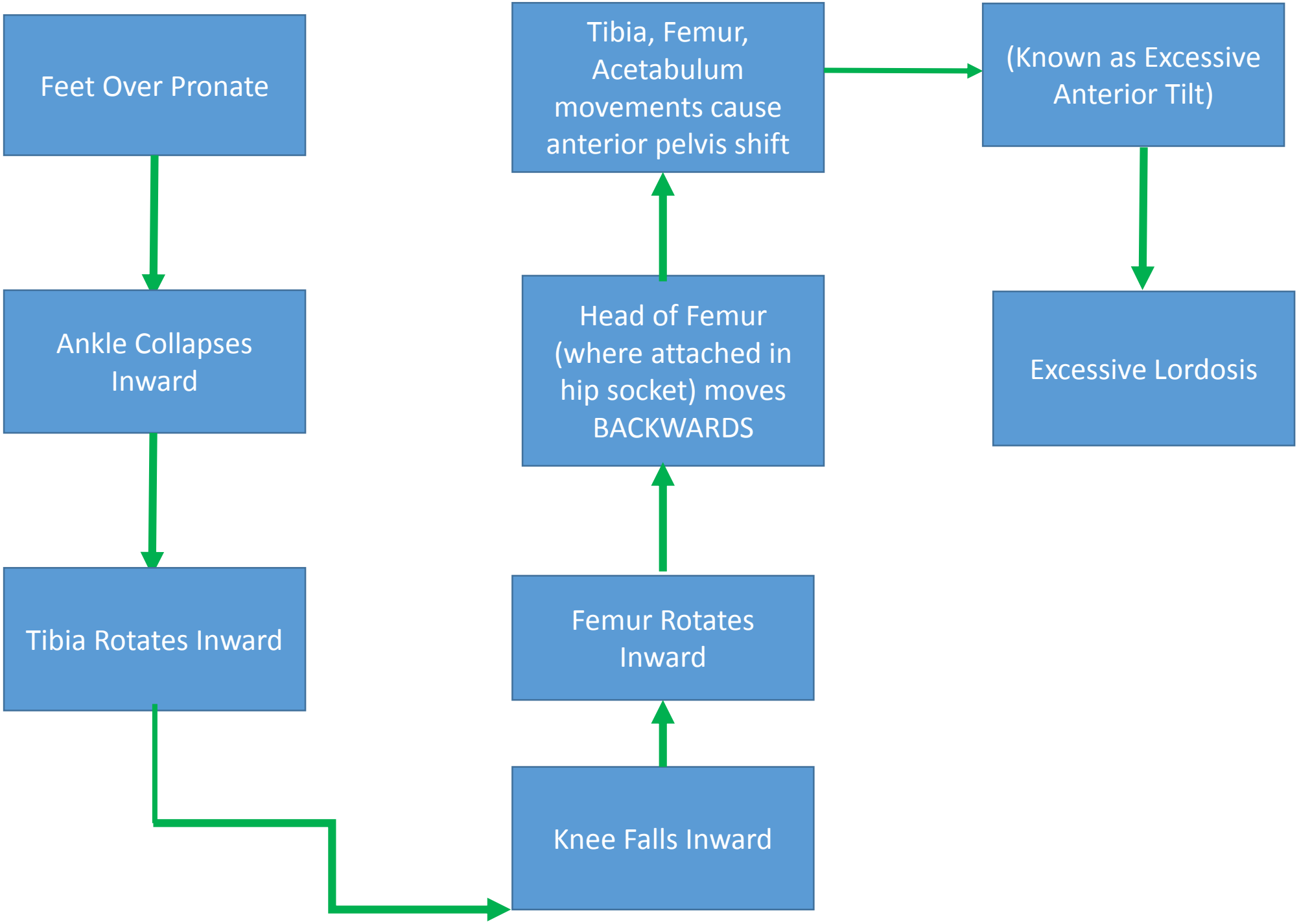
Ask your client to lie on the floor on their back with their legs straight. Have them keep their knees and toes pointed toward the ceiling. Evaluate the arch in their lower back by sliding your hand under their lumbar spine. The same space for just the second knuckles to fit applies to this lying assessment position.

Lumbo-pelvic Girdle

Supine Lumbar Lordosis test does not work well with heavier clients

Lumbo-pelvic Girdle



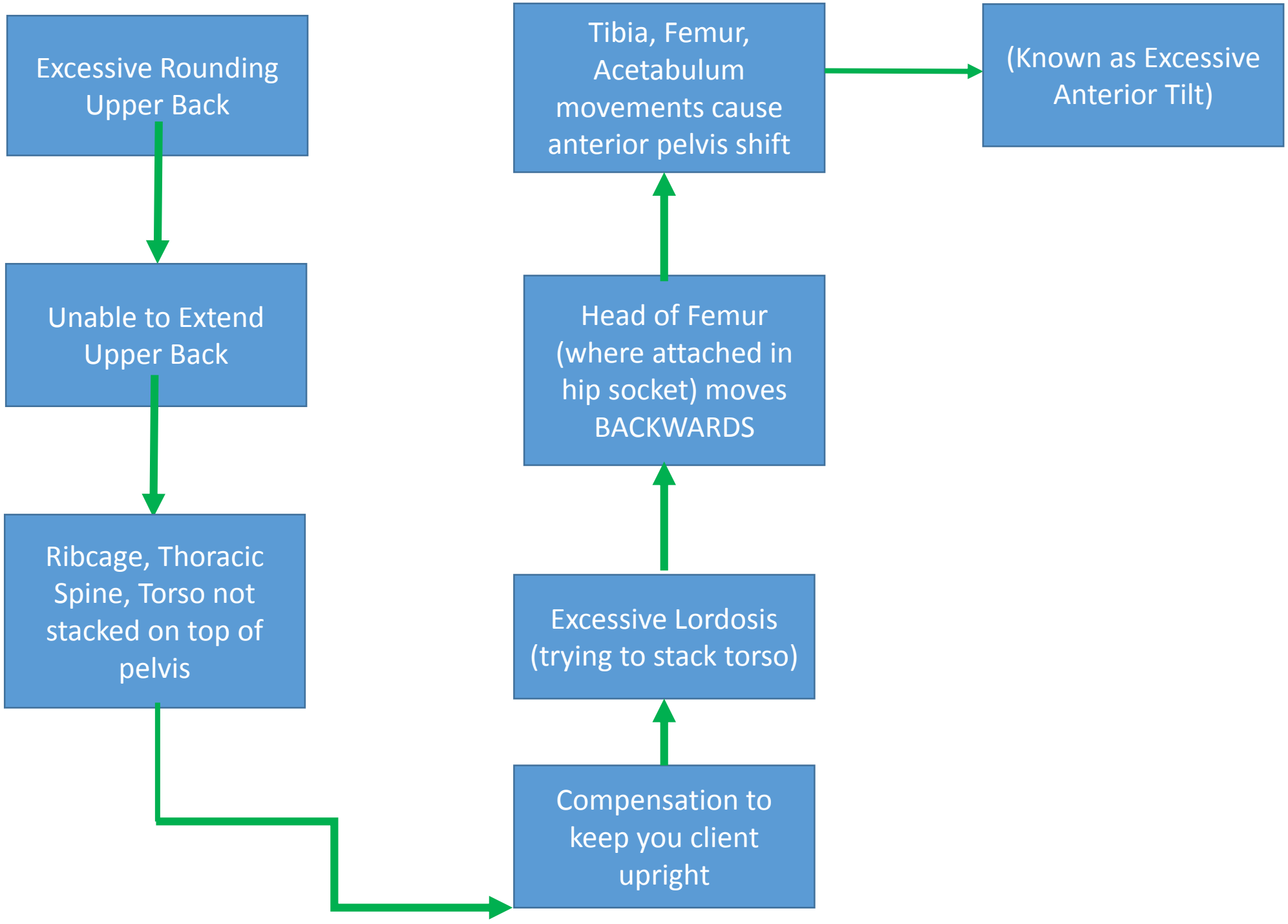

Feet Over Pronate
Ankle Collapses Inward
Tibia Rotates Inward
Knee Falls Inward
Femur Rotates Inward
Head of Femur (where attached in hip socket) moves BACKWARDS
Tibia, Femur, Acetabulum movements cause anterior pelvis shift
(Known as Excessive Anterior Tilt)
Excessive Lordosis

Lumbo-pelvic Girdle

In the previous sections, you learned that as the feet pronate and the ankle collapses inward to the midline of the body the tibia rotates inward. This internal rotation of the tibia causes the knee to move toward the midline of the body. As the knee moves medially, the femur also rotates inward and toward the midline of the body. This causes the head of the femur, where it attaches into the hip socket, to move backward. These movements of the tibia, femur, and hip socket cause the pelvis to anteriorly rotate. If these movements are excessive, they can lead to an abnormal anterior rotation of the pelvis and cause the lumbar spine to arch excessively, thereby resulting in excessive lumbar lordosis.

Lumbo-pelvic Girdle

The series of events in the lower kinetic chain described above can also be caused by an excessive forward rounding in the upper back. If a client has rounded shoulders, they will most likely not be able to extend their upper back and bring their ribcage, thoracic spine and torso to its correct position on top of the pelvis. In order to compensate for this, the lower back has to arch excessively, acting as a crane to try to keep the torso upright. It is easy to see that an imbalance in one area of the body is usually a compensation for an imbalance somewhere else.


Excessive Rounding Upper Back
Unable to Extend Upper Back
Ribcage, Thoracic Spine, Torso not stacked on top of pelvis
Compensation to keep you client upright
Excessive Lordosis (trying to stack torso)
Head of Femur (where attached in hip socket) moves BACKWARDS
Tibia, Femur, Acetabulum movements cause anterior pelvis shift
(Known as Excessive Anterior Tilt)

Lumbo-pelvic Girdle

Help your clients understand how each of the items listed in the previous slides in linked. Demonstrate it and have them feel it

Assessment Checklist

Before you move on to assess the thoracic spine and shoulder girdle, you need to have answered the following questions about the lumbo-pelvic hip girdle:

- ☑ Do you know what type of pain the client is experiencing and what affect it has on the function of their hips and back?
- ☑ Does the client have an anterior pelvic tilt?
- ☑ Does the client have an excessive curvature in their lumbar spine?
- ☑ Does the client know how to achieve a neutral position for the pelvis when standing?
- ☑ Do you know how the lumbo-pelvic hip girdle relates to the lower kinetic chain (and can you explain it to your client)?

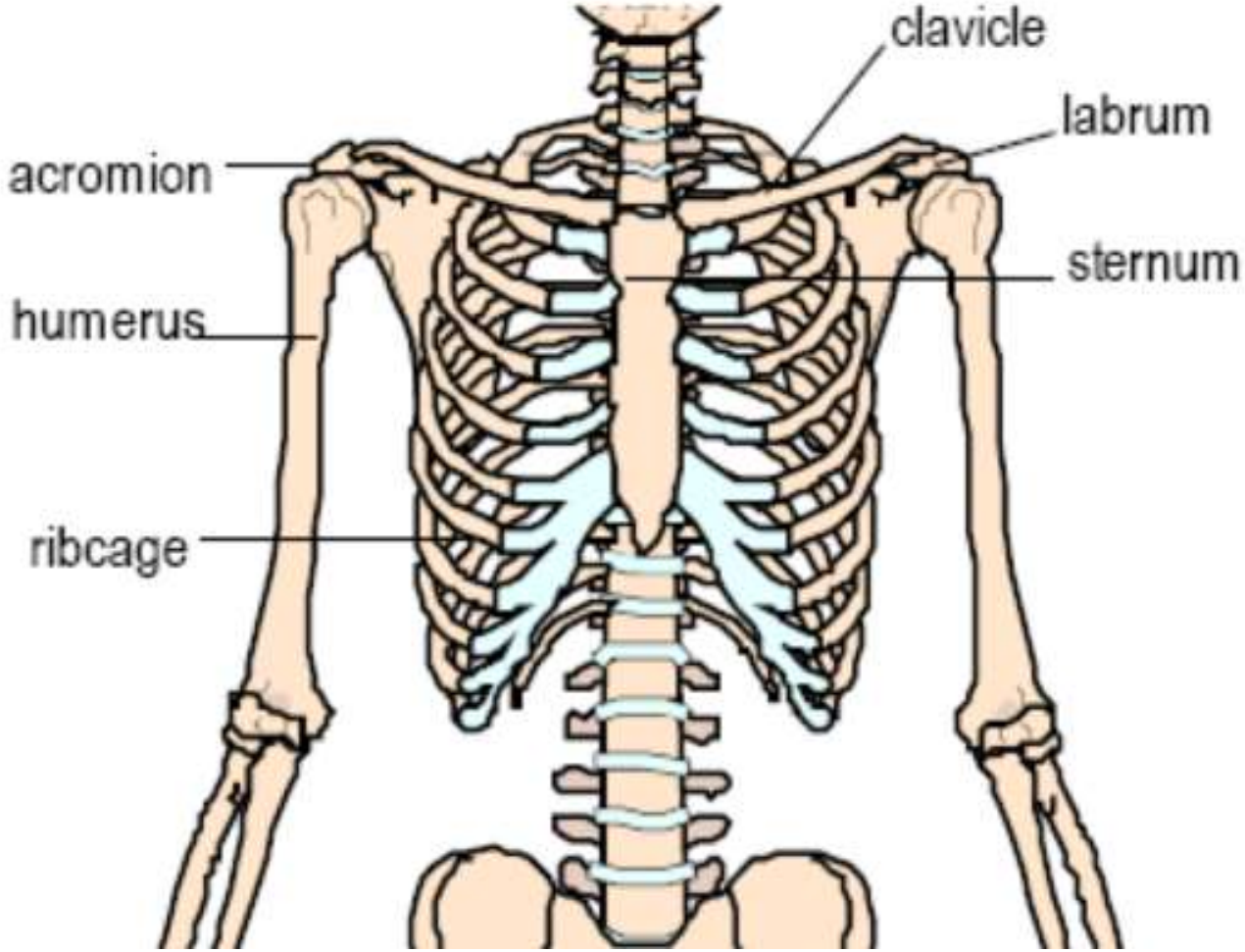
CHECKLIST	Y	DETAILS
Lumbo-Pelvic Hip Girdle:		
Pain?	Y	top of R butt near back of hip
Arthritis?	N	none reported
Function?	Y	tight after playing tennis
Causal Links?	Y	R hip – R foot/ankle?
Aggravating Factors?	Y	tight in morning after sleeping
Visual Irregularities?	N	none
Excessive Lordosis?	Y	excessive curvature
Anterior Rotation?	Y	anterior tilt
Client Knows Neutral?	Y	can achieve – difficult to maintain

Thoracic Spine and Shoulder Girdle

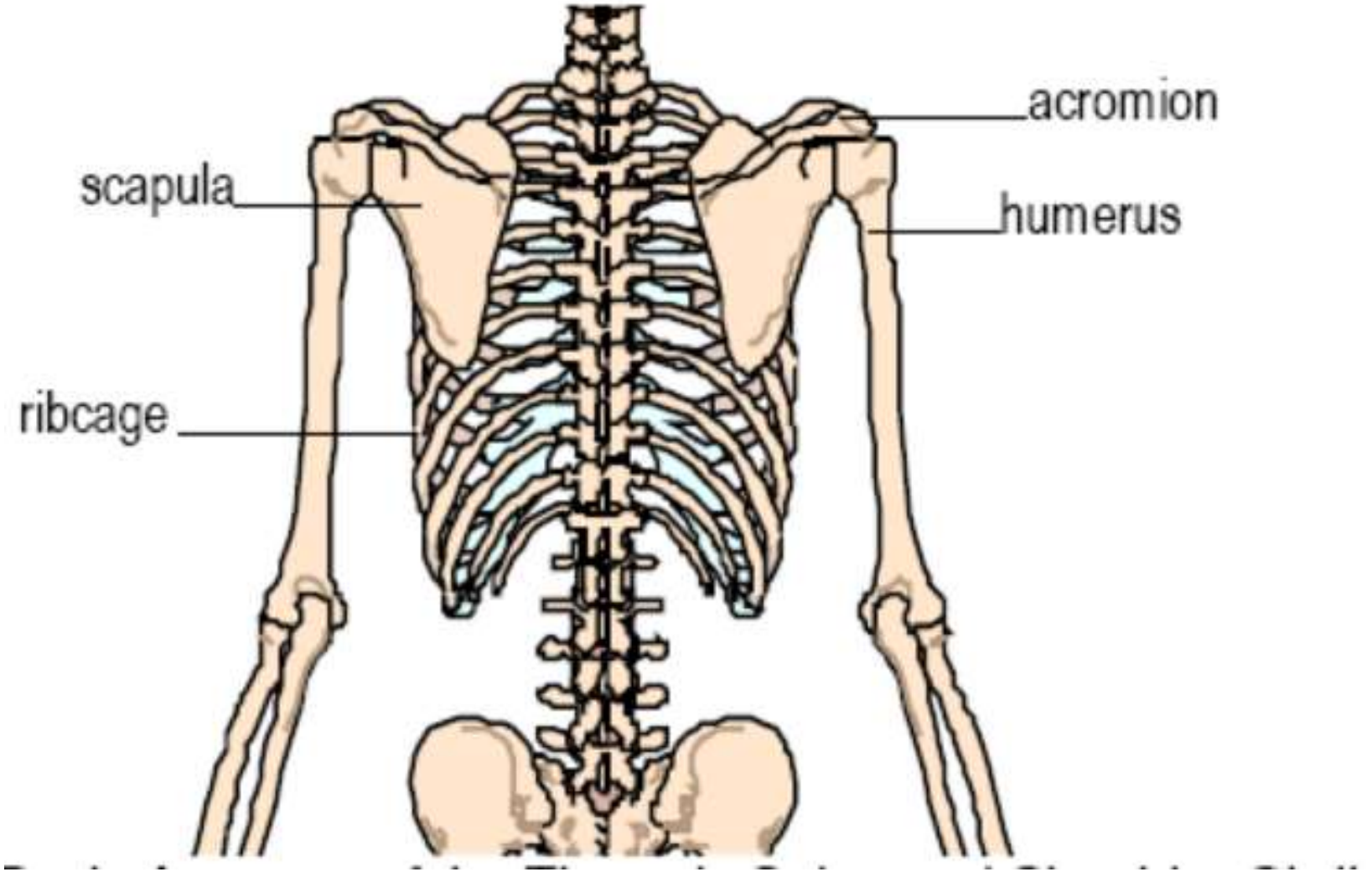
Thoracic Spine and Shoulder Girdle

Thoracic Spine - 12 vertebrae
Ribcage - 24 ribs (12 on each side) attach via cartilage to sternum and thoracic spine – bottom 2 sets do not attach to sternum and are “floating”
Sternum – t shaped, clavicles attach to sternum
Scapulae – broad, flat shoulder blade
Acromion – part of scapulae that extends into shoulder joint
Humerus – upper arm bone
Labrum – ring of cartilage on edge of scapulae which provides cup-shaped socket

Thoracic Spine and Shoulder Girdle



Thoracic Spine and Shoulder Girdle



Thoracic Spine and Shoulder Girdle

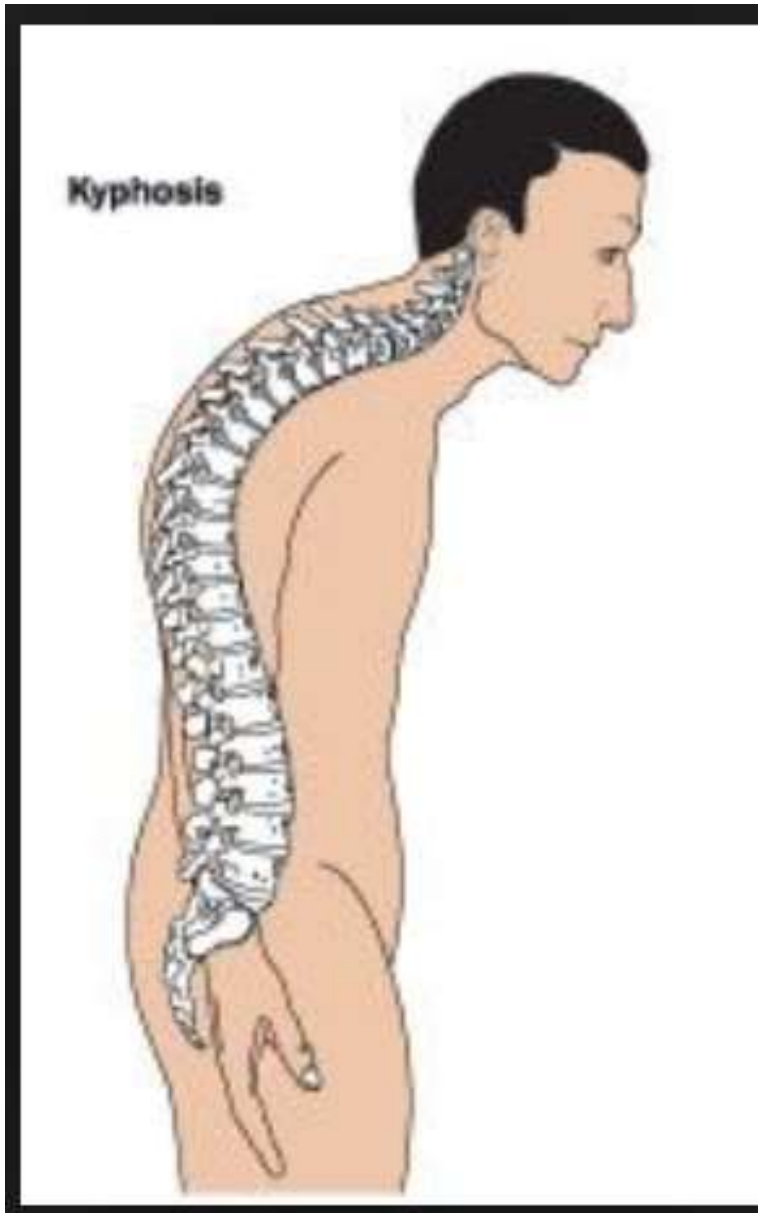
Common Deviations Associated With the Thoracic Spine and Shoulder Girdle

There are four main deviations that can cause pain and injury in the area of the thoracic spine and shoulder girdle. They are:

1. Excessive thoracic kyphosis
2. Protracted shoulder girdle
3. Internally rotated arms
4. Elevated scapula.

Thoracic Spine and Shoulder Girdle

Kyphosis – Greater than normal curvature of thoracic spine



Thoracic Spine and Shoulder Girdle

A **protracted shoulder girdle** occurs when the shoulder blades move away from the spine and cause the vertebral border (edge closest to the spine) of the scapula to move forward on the ribcage.

Thoracic Spine and Shoulder Girdle

Internally rotated arms refers to the position of the upper arm (humerus) in the shoulder joint. When the shoulder blades protract, they cause the humerus to rotate inward toward the midline of the body. When this happens the entire shoulder joint can become misaligned which can lead to pain and/or injury.

Thoracic Spine and Shoulder Girdle

An **elevated scapula** refers to an unnatural upward position of the scapula resting upon the ribcage. A protracted shoulder girdle and internally rotated arms cause the shoulder blades (scapula) to elevate in a dysfunctional "shrugging" motion. Over time, this compensatory movement pattern limits shoulder function and range of motion.

Thoracic Spine and Shoulder Girdle – Verbal Assessment

Pain in these areas? Be specific.
Arthritis? Surgeries?
Tingling in hands/arms?
Carpal tunnel?
Lose of strength in hands?
Activities and Occupation?
Pain/limitations stopping you from doing any activities?
Problem/pain coincide with other issues?
Under chronic stress?
Anything make pain better or worse?

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Back/Heels against Wall

Coach into neutral pelvis (against wall – second knuckle position)

Look Straight Out – sight parallel to the floor

Center of shoulder (acromion) should be in line with fleshy skin that covers opening of front of ear (the tragus)

If acromion is further forward than tragus, indicative of excessive kyphosis

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Example of Excessive Thoracic Kyphosis

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Again, I want to say that I share Justin's methods of assessment with you because I want you to have a starting point, but I believe after a short period of practice you will be able to do most of your assessments by carefully looking at your client without having them go to the wall in most cases.

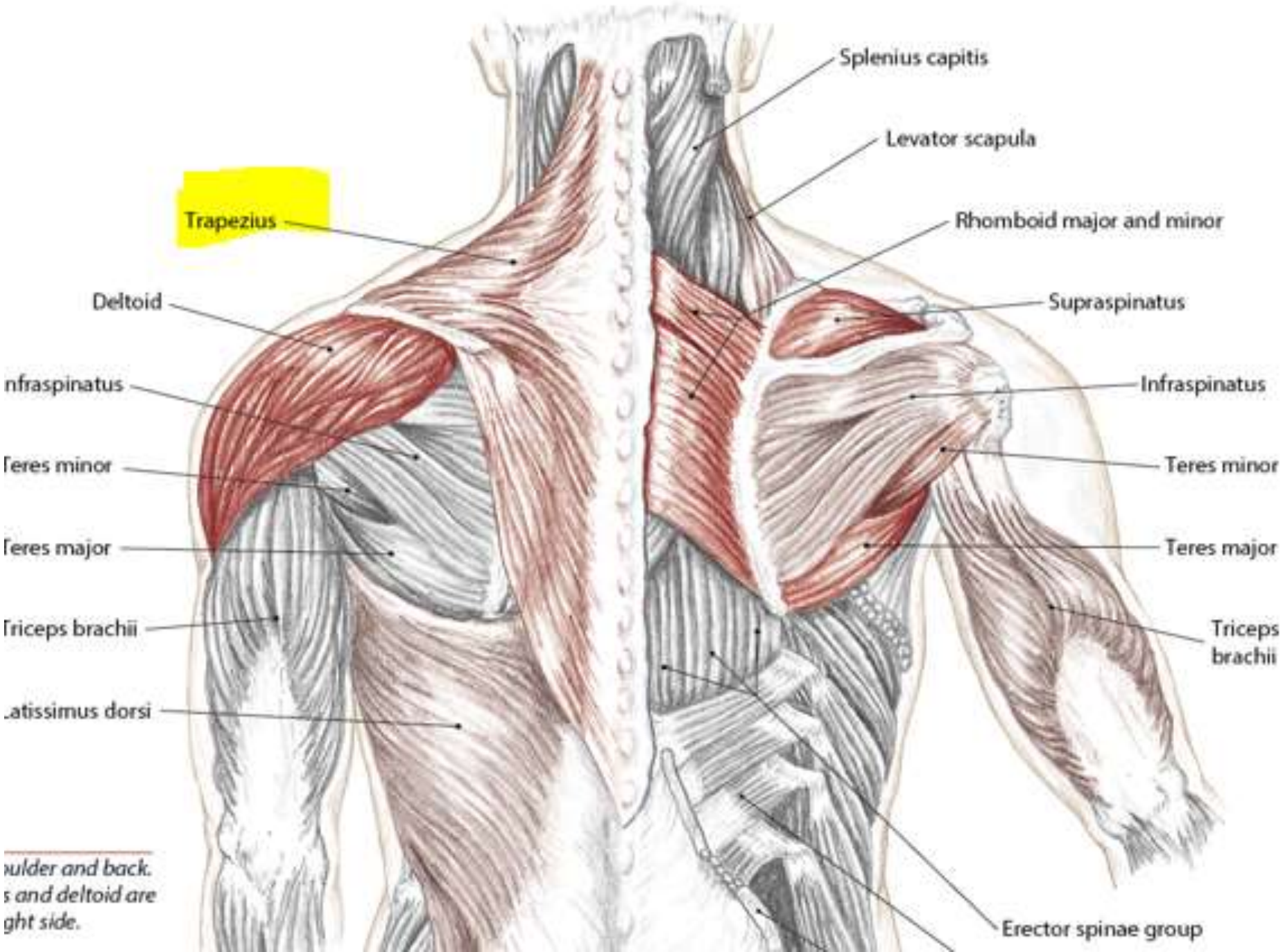
As I mentioned earlier, take into consideration all factors that might change your test results when you have someone come to the wall. For example, a person with larger buttocks may not be able to get her shoulders to the wall or stand with heels to the wall simply due to body mass. You can't assume that if they can't get their shoulders to the wall, they have a kyphotic posture, because that may not be true. But, it can be a valuable starting point in many cases.

Elevated Scapula

One way to get an indication of correct shoulder girdle function is to assess whether the scapula is sitting back and down on the ribcage when your client is in a standing position with their arms at their side. You can visually and manually assess the height of each scapula by standing behind your client and evaluating the top of each of their shoulder blades. Use your fingers to feel for the top border of your client's shoulder blades and place your forefingers on this part of the bone. Visually assess the positioning of each scapula. Ideally, the shoulder blades should be the same height. Make a note, however, of any discrepancies between the shoulder blades or if one appears to be higher or lower than the other.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Example of Elevated Scapula



ulder and back.
s and deltoid are
ght side.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Elevated Scapula (Muscle Tension Checks)

You can also check to see if one or both shoulder blades are elevated by assessing muscle tension in this area. Place your thumb on the back and forefinger on the front of your client's upper trapezius muscle on the top of their shoulder. Feel the muscle between your fingertips and assess any differences in tension between the two sides. Make a note if the muscles in general feel excessively tight or have any obvious knots.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Assessing for Muscle Tension

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Protracted Scapula

The border of the shoulder blade closest to the spine (vertebral border) should sit relatively flat to the ribcage when your client is standing with their arms at their sides. You can visually and manually assess whether your client's shoulder blades have moved away from their correct position with the following assessment techniques:

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Look at the edge of the shoulder blades where they are closest to the spine. Ideally, the shoulder blade should sit relatively flat on top of the ribcage. If one or both of the shoulder blades appear to stick out away from the body, this may be indicative of a protracted scapula.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Example of Protracted Scapula

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Also, place your fingers on the vertebral border (scapula close to spine). Is it lying flat to the back of the ribcage? If it sticks out or you can easily grab the border of the scapula with your fingers, it indicates a protracted scapula.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Assessing for Protracted Scapula

Internally Rotated Arms

You can determine whether a client has internally rotated arms by looking at the position of their hands and wrists.

1. Locate the dimple at the bottom of your client's forearm where the thumb ends and meets the wrist. If you ask your client to straighten their thumb this dimple will become more evident. This dimple is known as the styloid process.

2. Ask your client to let their arms hang by their side while they are standing in their normal relaxed state. Look at the positioning of the styloid process on each of their hands. Ideally, the styloid process should only be turned inward toward the midline of the body approximately 15 degrees. If you can almost see the entire back of your client's hands when they are standing, then the styloid process will be turned inward greater than is considered normal. This is an indication that that the arms are internally rotated and the shoulder girdle is out of optimal alignment.

Thoracic Spine and Shoulder Girdle – Visual and Hands-on Assessment

Example of Internally Rotated Arms

Thoracic Spine and Shoulder Girdle

Neutral Position for the Thoracic Spine and Shoulder Girdle

Just as with the lumbo-pelvic hip girdle, there is an optimal and neutral position for the thoracic spine and shoulder girdle when standing. The ability to achieve and maintain this neutral position while standing upright is the key to helping eliminate pain and dysfunction in this area.

Thoracic Spine/Shoulder Girdle – Finding Neutral

Ask the client to retract their shoulder blades so that their arms rotate outward. Coach them not to shrug the shoulders or arch the lower back as they pull the shoulder blades back. The scapulae are in a neutral position when they sit relatively flat to the ribcage and the arms are rotated inward no more than 15 degrees (as measured at the styloid process).

See Next Slide

Thoracic Spine/Shoulder Girdle

This shows neutral position

Ask client to stand in neutral stance (not overpronated) with heels at wall.

Pull head back and chin inward. Back of skull comes within about 1/3 of an inch of the wall without head tilting back.

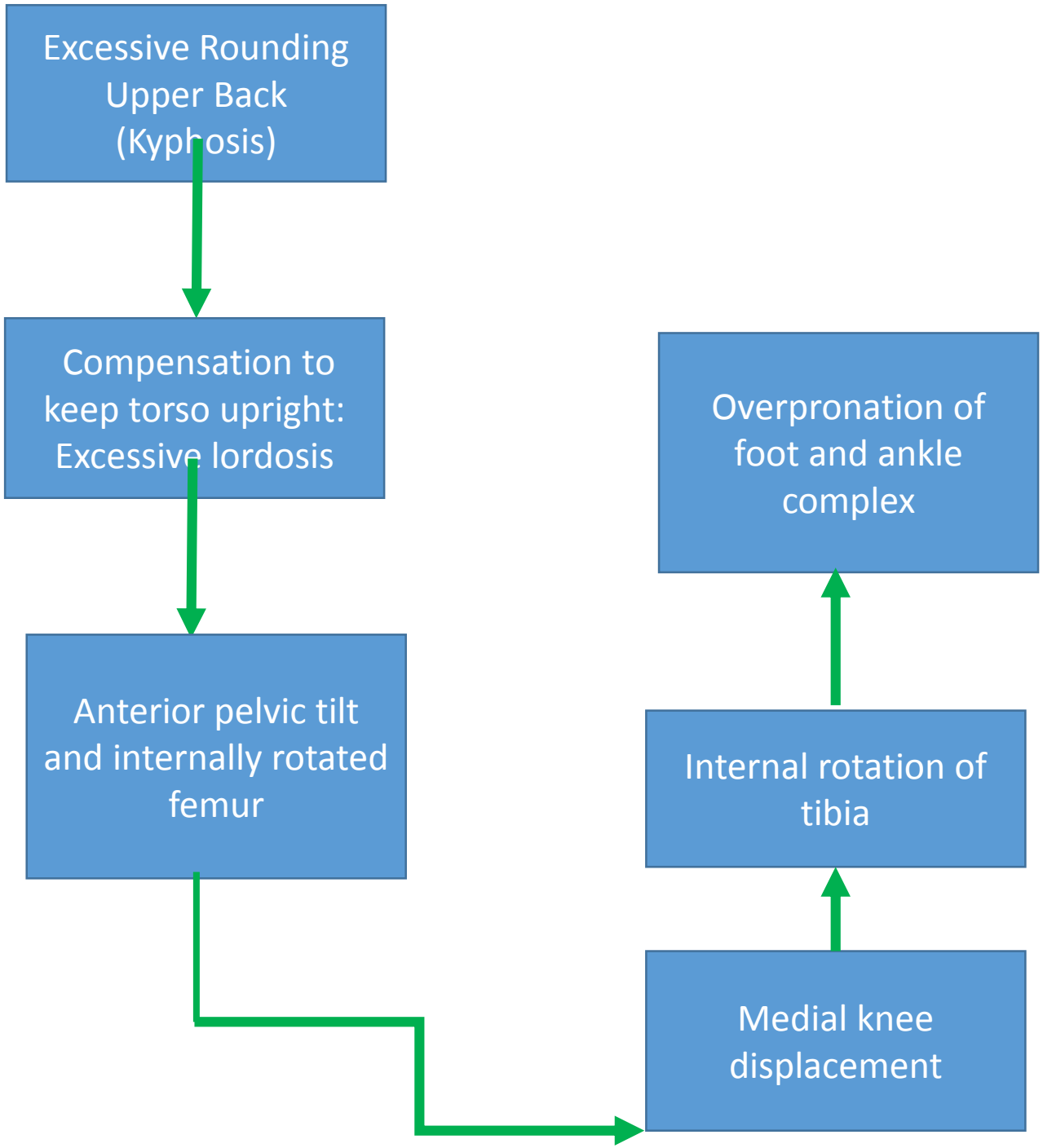
Eyes remain parallel to floor.

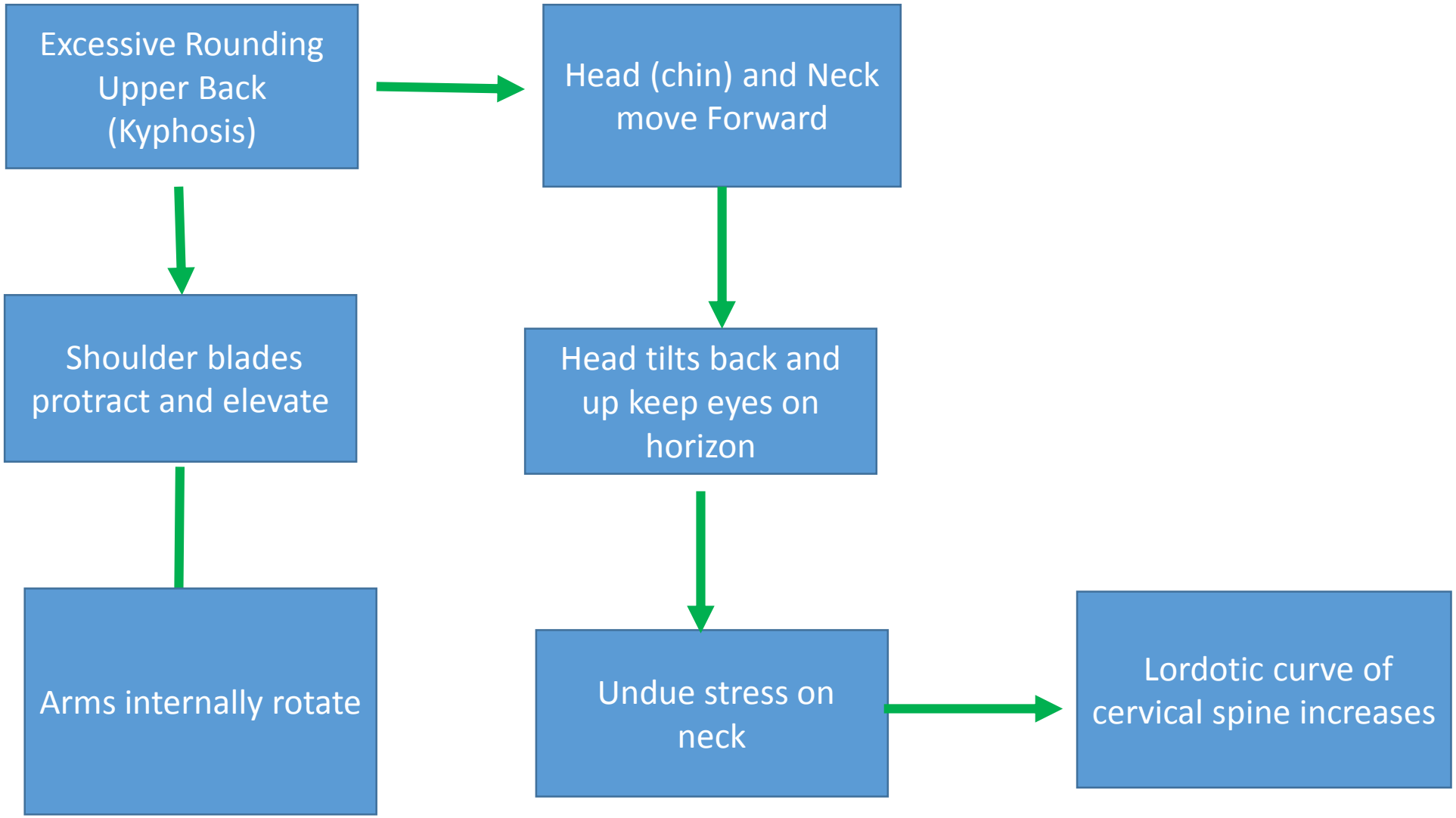
Low back is only “two knuckles” away from the wall.

Pull shoulders and upper back toward the wall without changing position of head or back, without bending knees or collapsing feet.

Thoracic Spine/Shoulder Girdle

This shows neutral position


Excessive Rounding Upper Back (Kyphosis)
Compensation to keep torso upright: Excessive lordosis
Anterior pelvic tilt and internally rotated femur
Medial knee displacement
Internal rotation of tibia
Overpronation of foot and ankle complex


Excessive Rounding Upper Back (Kyphosis)
Head (chin) and Neck move Forward
Shoulder blades protract and elevate
Head tilts back and up keep eyes on horizon
Arms internally rotate
Undue stress on neck
Lordotic curve of cervical spine increases

Assessment Checklist

Before you move on to assess the neck and head, you need to have answered the following questions about the thoracic spine and shoulder girdle:

- ☑ Do you know what type of pain the client is experiencing and what affect it has on the function of their upper back, shoulders and arms?
- ☑ Does the client have an excessive curvature in their thoracic spine?
- ☑ Is one or both of the client's shoulder blades elevated?
- ☑ Is there muscle tension or excessive tightness in the client's upper traps?
- ☑ Is one or both of the client's shoulder blades protracted?
- ☑ Is one or both of the client's arms internally rotated?
- ☑ Does the client know how to achieve a neutral position for the thoracic spine and shoulder girdle?
- ☑ Do you know how the thoracic spine and shoulder girdle relate to the neck and head (and can you explain it to your client)?

CHECKLIST Thoracic Spine/Shoulder Girdle:	Y	DETAILS
Pain?	Y	top of R shoulder sometimes
Arthritis?	N	none reported
Function?	Y	pain after long period computer use
Causal Links?	Y	torso affecting hips?
Aggravating Factors?	Y	using computer mouse
Excessive Kyphosis?	Y	yes
Protract./Elevated scapula?	Y	more on R
Int. rotated arms?	Y	both- more on R
Muscle tension?	Y	top of R shoulder
Client Knows Neutral?	Y	can achieve-watch for lumbar comp.

MOVEMENT #1

Trial A:

Round your upper back and shoulders. Try to lift your arms over your head and back toward your ears while still keeping your upper back and shoulders rounded forward.

Make a note of how high you can lift your arms back to your ears.

Trail B:

Now correct your posture in your thoracic spine and shoulder girdle and try to lift your arms again. You will notice that your arms can lift much higher and further back to your ears when your thoracic spine and shoulder girdle are in alignment.

MOVEMENT #2

Trial A:

Round your upper back and shoulders. Try to rotate your torso to the right and then to the left while still keeping your upper back and shoulders rounded forward.

Make a note of how far you can rotate to the right and to the left.

Trail B:

Now correct your posture in your thoracic spine and shoulder girdle and try to rotate your torso to the right and then to the left again. You will notice that you can rotate much further when your thoracic spine and shoulder girdle are in alignment.

MOVEMENT #3

Trial A:

Round your upper back and try to rotate your arms outward and behind you so that the palms of your hands rotate away from your body. Be sure to keep your upper back and shoulders rounded forward as you perform the movement.

Make a note of how far your arms and shoulders rotate back.

Trail B:

Now correct your posture in your thoracic spine and shoulder girdle and try the same movement again. You will notice that you can rotate your arms and hands much further back when your thoracic spine and shoulder girdle are in alignment.

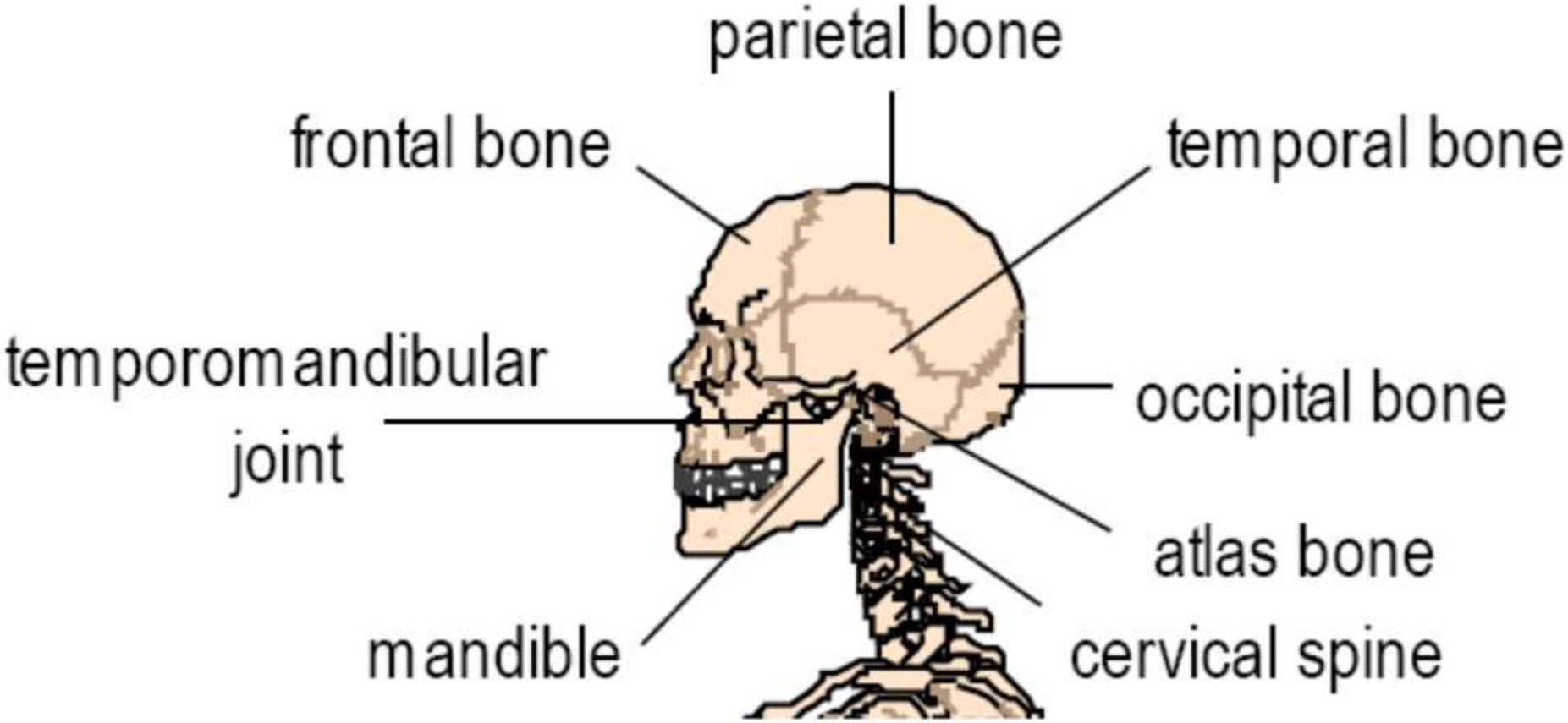
Neck and Shoulder

Head and Neck Assessment

Average head weights 9 – 12 lbs. (about 8% of body mass)

For every inch forward of its optimal position, the weight of the head effectively doubles (pressure on rest of the body)

Head and Neck Assessment



Head and Neck Assessment

The Most Common Deviations Associated With the Head and Neck

There are two main deviations that cause pain and injury in the area of the neck and head. They are:

1. A forward position of the head
2. Excessive cervical lordosis.

Head and Neck Assessment

A **forward position of the head** refers to when the head is excessively forward of its neutral position in relation to the rest of the body. The further the head moves forward of the shoulders, the more the neck has to arch (or the head has to tip up and back) to keep the eyes aligned to the horizon.

Head and Neck Assessment

Excessive cervical lordosis is the term given to the increased curvature of the neck that accompanies a forward head position. The cervical spine naturally contains a slight lordotic curve, but when the curve is greater than what is considered its normal range it can result in pain and/or dysfunction in the head and neck, as well as the rest of the body.

Head and Neck Assessment - Verbal

Ask about headaches, neck pain, dizziness, pain in top of shoulders (be specific).
Arthritis? Prior surgeries?
Activities, Occupation?
Pain limiting their activities?
Pain coincide with anything?
Anything make it better or worse?

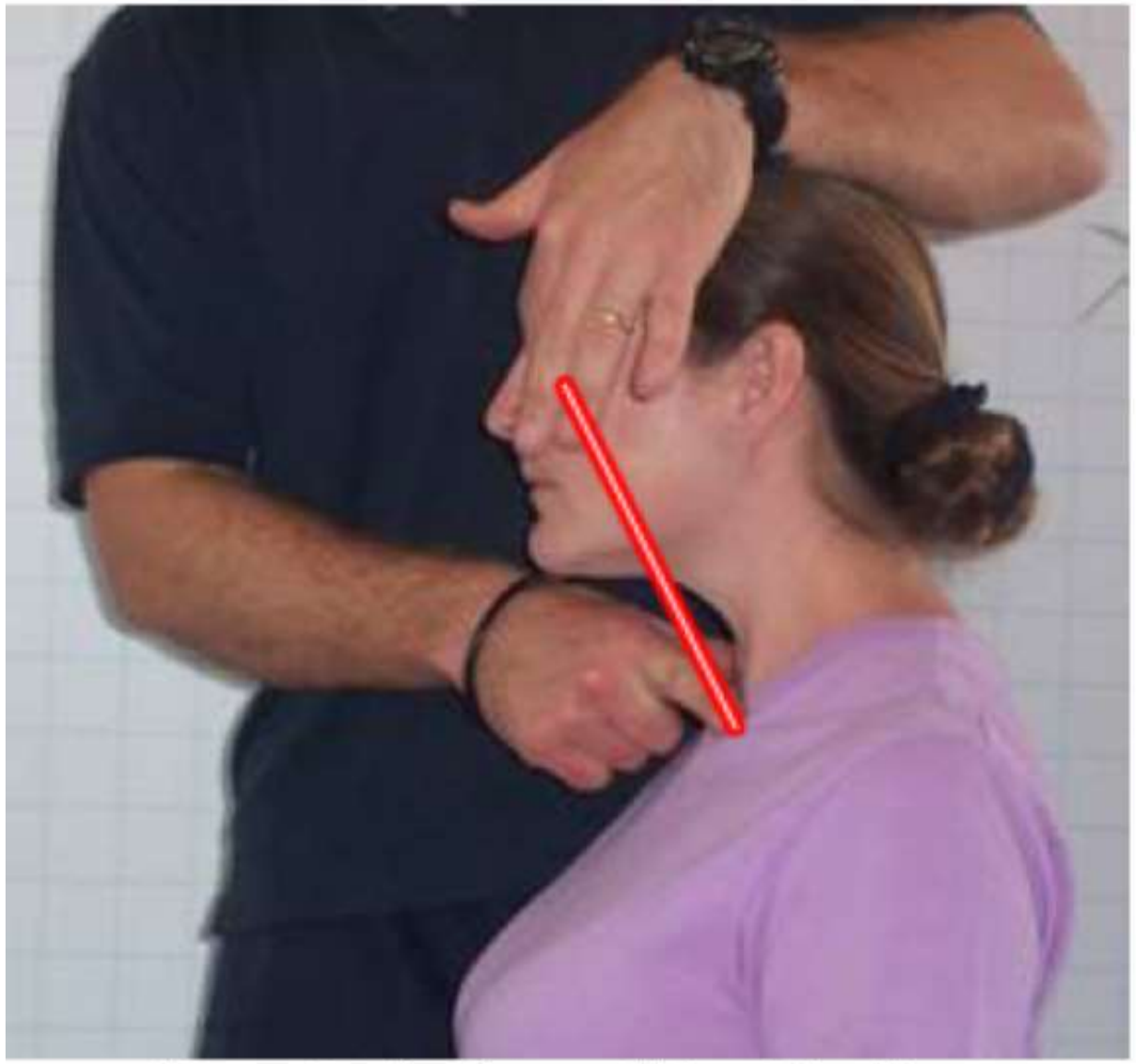
Head and Neck Assessment – Visual/hands on

Forward Head Position

To evaluate whether a client's head is forward of its optimal position in relation to the rest of the body, view the person from the side. Ask the client to sit on a gym ball or the edge of a chair with their feet and head facing forward. Look at the client's cheek bone just below their eye where it protrudes the most. Place one forefinger on that part of the client's cheek and the other on their collarbone below that same cheek. Determine the position of your forefingers in relation to each other. Ideally, they should be vertically aligned. If the top forefinger is forward of the bottom forefinger, this is indicative that the head is too far forward from optimal alignment.

See Next Slide

Head and Neck Assessment – Visual/hands on



Example of a Forward Head Position

Head and Neck Assessment – Visual/hands on

Coach client into “2 knuckles” neutral as earlier in assessment

Ask them to pull their head to wall without changing anything in the back

Ask them to relax slightly so head is about 1/3 of an inch from wall

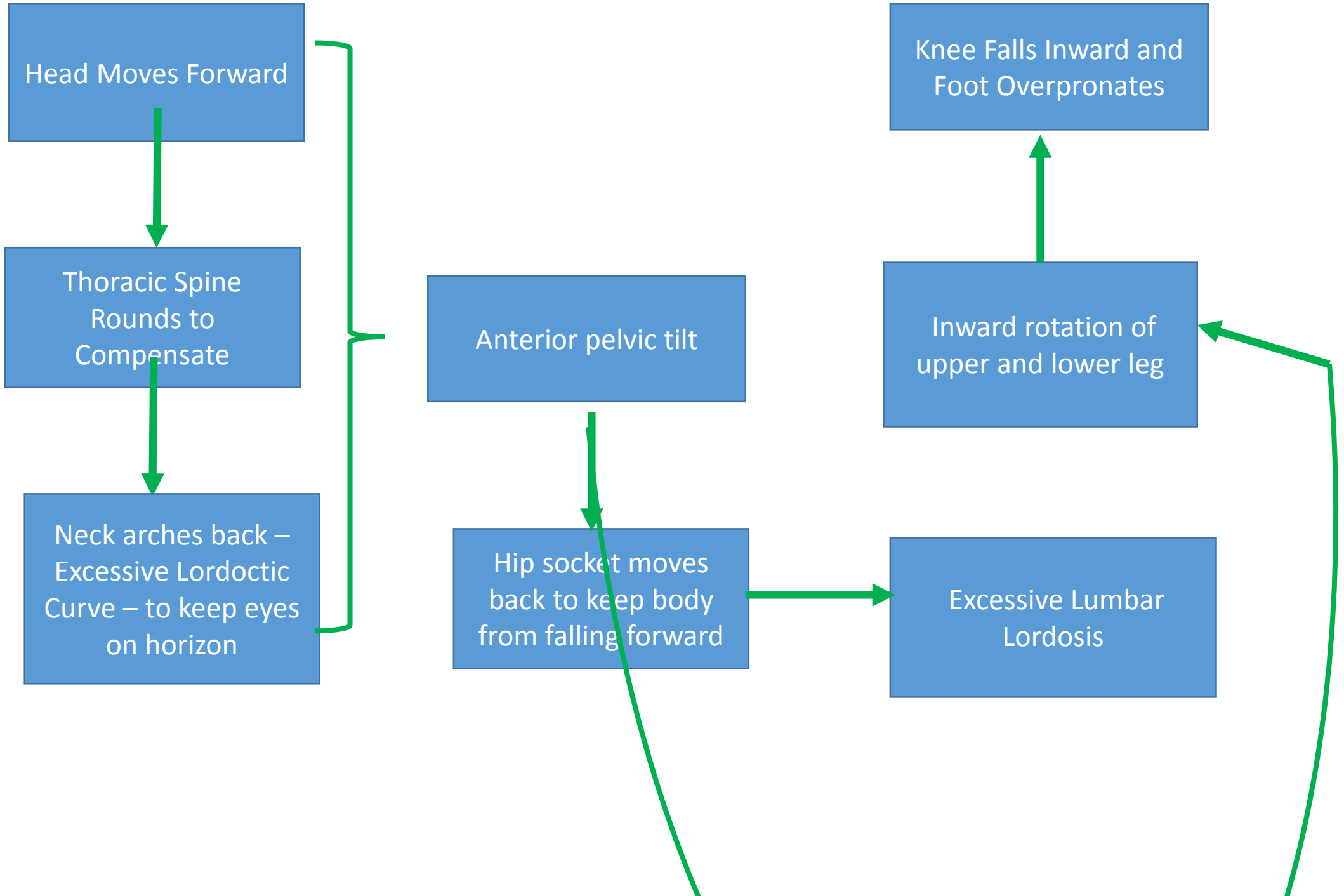
Assess their line of sight: Draw imaginary line from corner of their eye to center of their eyeball and out into the room. If this is not parallel to the floor, they likely have excessive cervical lordosis

See next slide

Example of Excessive Cervical Lordosis

When the head moves forward of its optimal position, the thoracic spine rounds further forward to accommodate this forward shift in body weight. As this happens the neck may arch backward into an excessive lordotic curve to keep the eyes in line with the horizon. This forward shift in the thoracic spine and head and neck will usually cause the pelvis to drop forward or anteriorly rotate. As this happens, the hip socket moves backward to try to keep the body from falling forward. This shift in the pelvis will cause the curve in the lumbar spine to increase leading to excessive lumbar lordosis. This shift in the pelvis and lumbar spine leads to an inward rotation of the upper and lower leg causing the knee to move toward the midline of the body and the foot to overpronate.

See Next Slide


Head Moves Forward
Thoracic Spine Rounds to Compensate
Neck arches back – Excessive Lordoctic Curve – to keep eyes on horizon
Anterior pelvic tilt
Hip socket moves back to keep body from falling forward
Excessive Lumbar Lordosis
Inward rotation of upper and lower leg
Knee Falls Inward and Foot Overpronates

Grid Lines

I find a Posture Grid very helpful. Have clients stand in front of the grid to help you easily spot misalignments. I purchased mine from https://npionline.org/products/posture_grids/posture_grid_gromets.html but I'm sure there are others on the market. They are fairly self-explanatory to use.