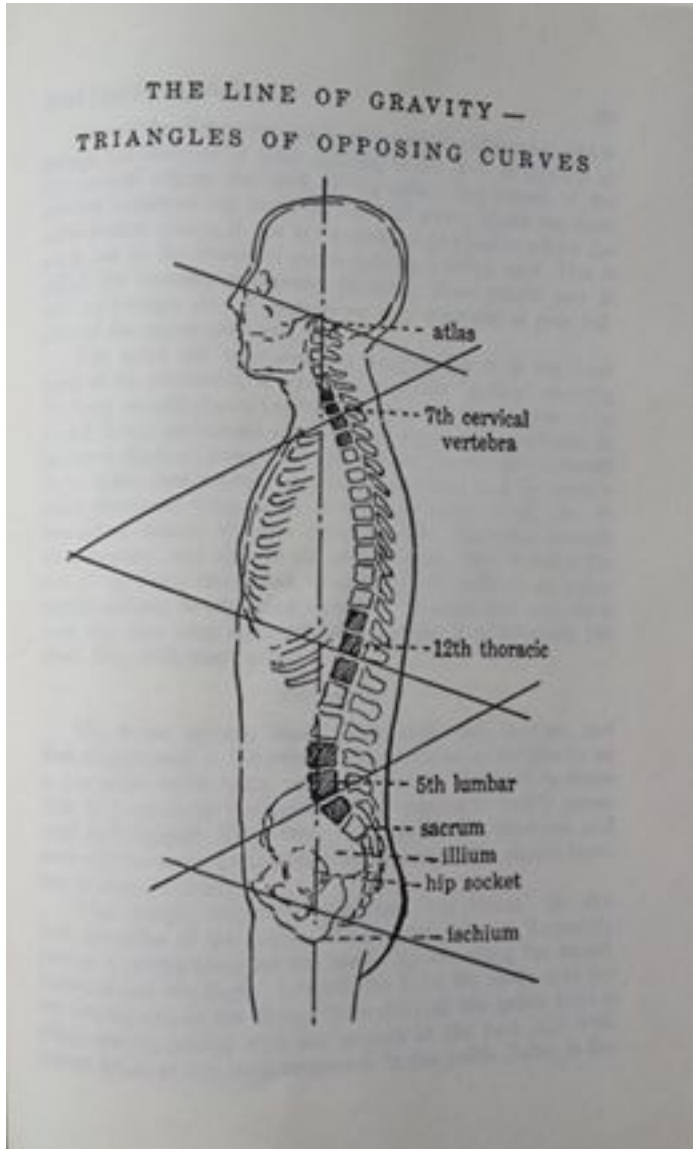


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ILLUSTRATIONS

Two images from Mable Todd with appreciation to Stéphanie Menasé!



'Line of gravity,' from *The Thinking Body* by Mabel Todd, p. 98; published by Dance Horizons

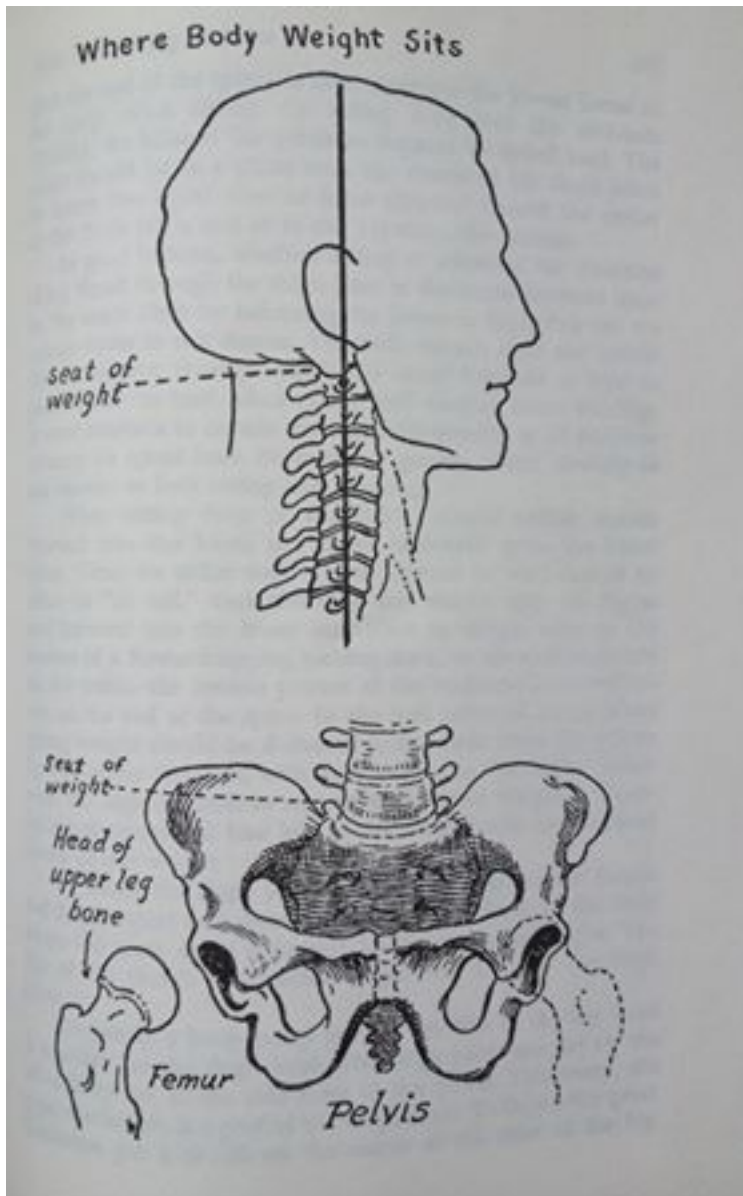
It is a republication of the original 1937 edition.

Original © 1937 Paul B. Hoeber

© transferred 1949 to Mabel Elsworth Todd

© transferred 1959 to Lulu F. Sweigard

(appreciation to Stéphanie Menasé)



'The seats of weight' from *The Hidden You* by Mabel Todd, p. 101

Fine Books, Eastford, CT, 2018 isbn 978 1 68422 249 0

re-edition from Exposition Press, NY, 1953

(appreciation to Stéphanie Menasé)

List of images inspired by Ian McCarthy, Osteopath, annotations with Katarina Halm

Link to the images (typo yet to be corrected 'tilted pelvis')
<https://thinkinginmovement.ca/wp-content/uploads/2020/08/Feldenkrais%C2%AE-Osteopathy-Developing-Collaboration-with-Ian-McCarthy-5-annotated-drawings-200814.pdf>

A Neutral pelvis

B Anteriorly tilted pelvis from stretched hamstrings

C Flared rib cage added

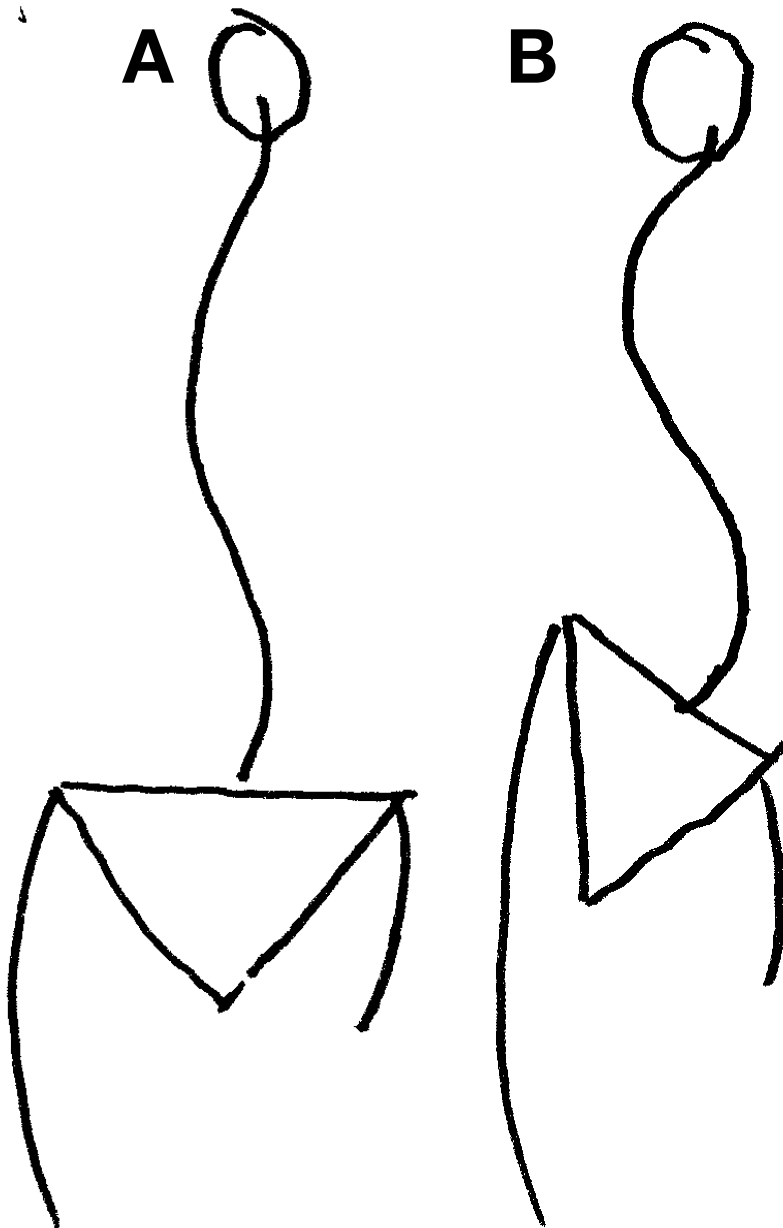
D Stretched/weakened abdominals & tightened lower back

E Equal tension (angles) for stable knee

F Tension skewed by weak quad, which must work harder (and tires, thus destabilizing the knee)

(A) NEUTRAL pelvis & spine /

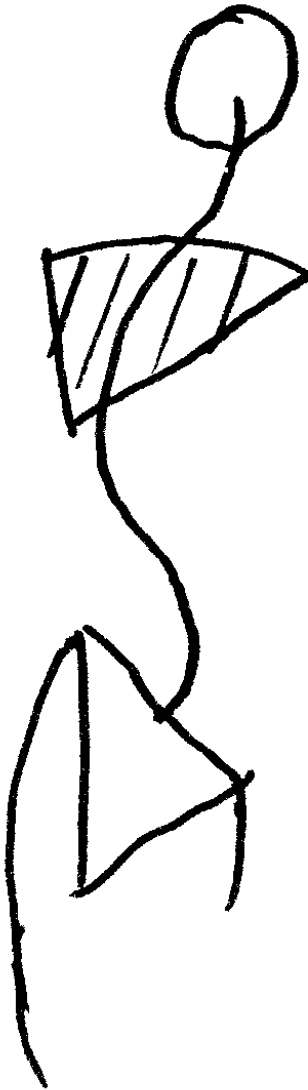
(B) ANTERIORLY TITLED pelvis



(A) NEUTRAL pelvis & spine

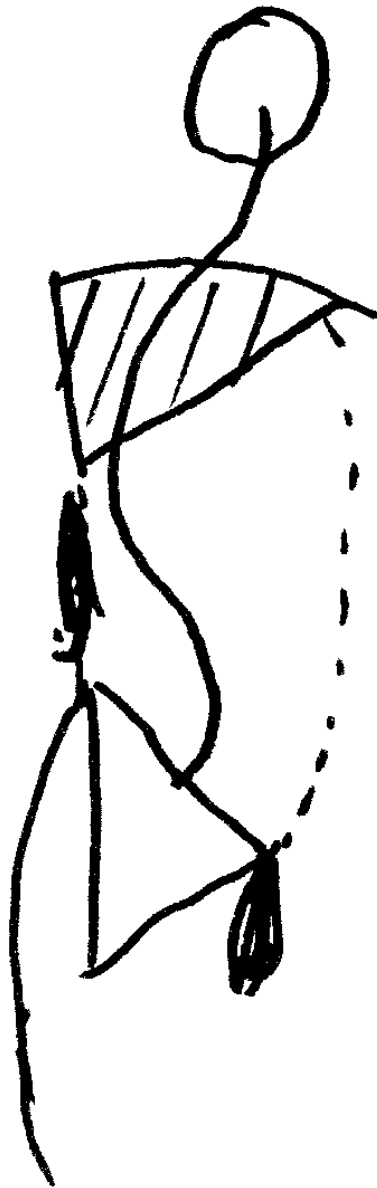
(B) ANTERIORLY TITLED
pelvis
RESULTING from
LENGTHENED hamstrings
causing INCREASED
LORDOSIS in spine

(C) Flared rib cage

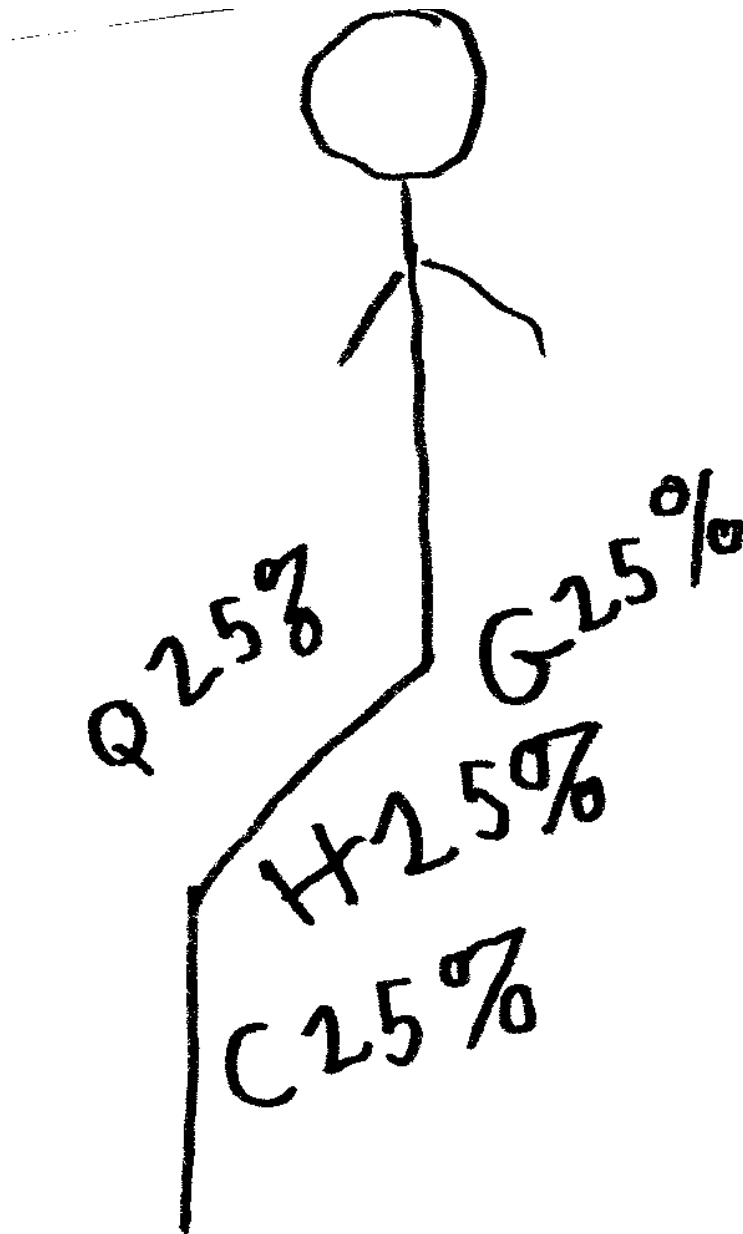


Longer weaker ABDOMINALS usually present in the presence of longer weaker HAMSTRINGS. In this position the DIAPHRAGM is put into a shortened or contracted position. This COMPROMISED position limits thoracic mobility. The ribs can no longer go down properly for the exhalation. The ideal relaxation of the ribs/diaphragm is impeded.

(D) Stretched/weakened abdominals & tightened lower back



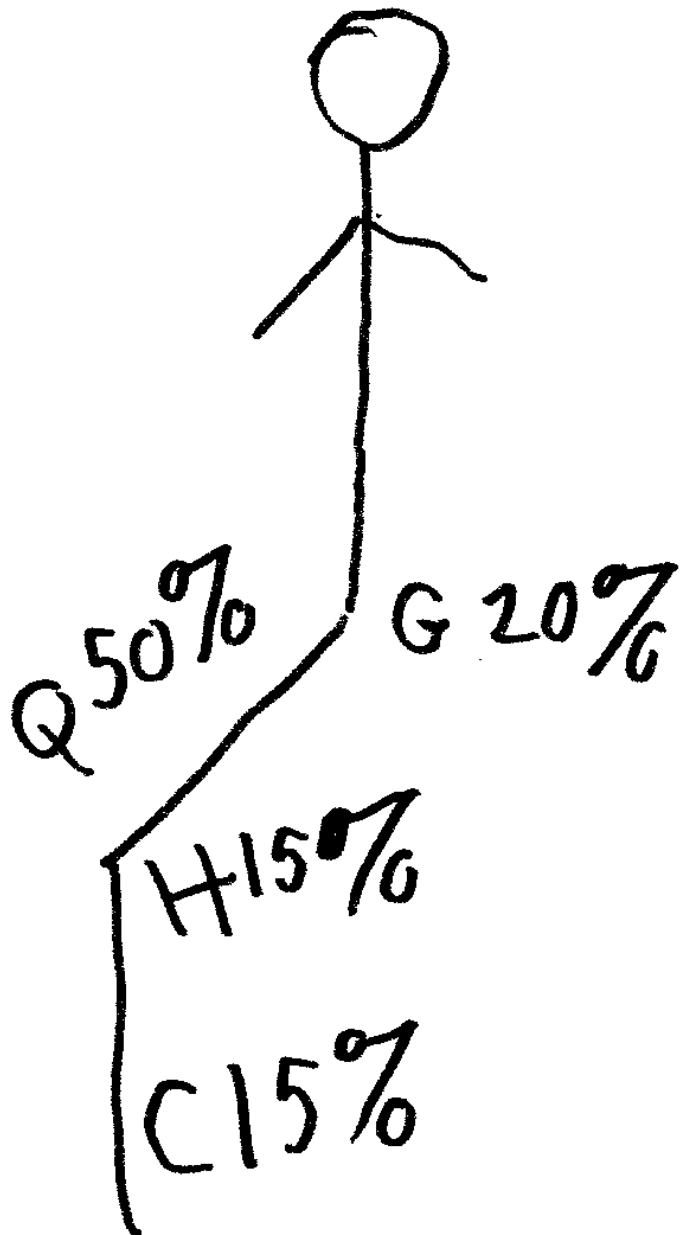
(E) Normal co-contraction for stable knee



- C – Calf muscle
- G – Gluteal muscle
- H – Hamstring muscle
- Q – Quadriceps muscle

All the muscles are stressed equally

(F) Tension skewed by an over-active quadriceps, which is working harder and tires, thus destabilizing the knee



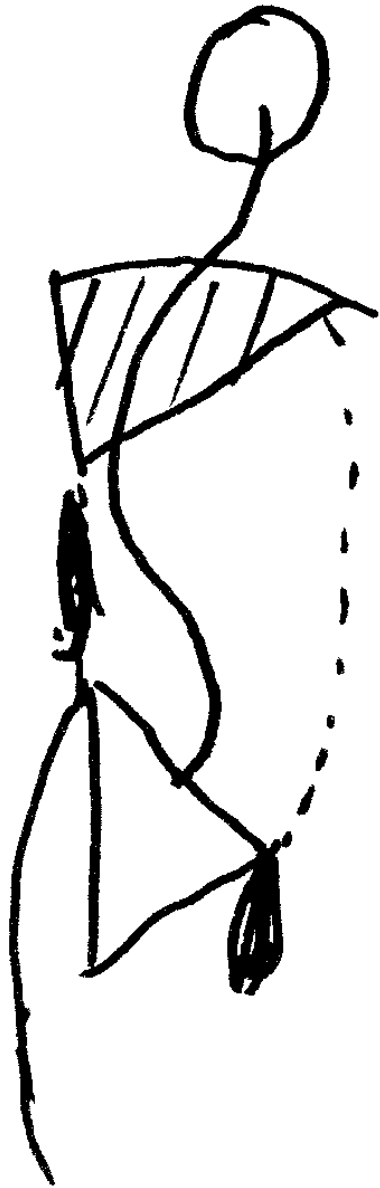
- C – Calf muscle
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- Q – Quadriceps muscle

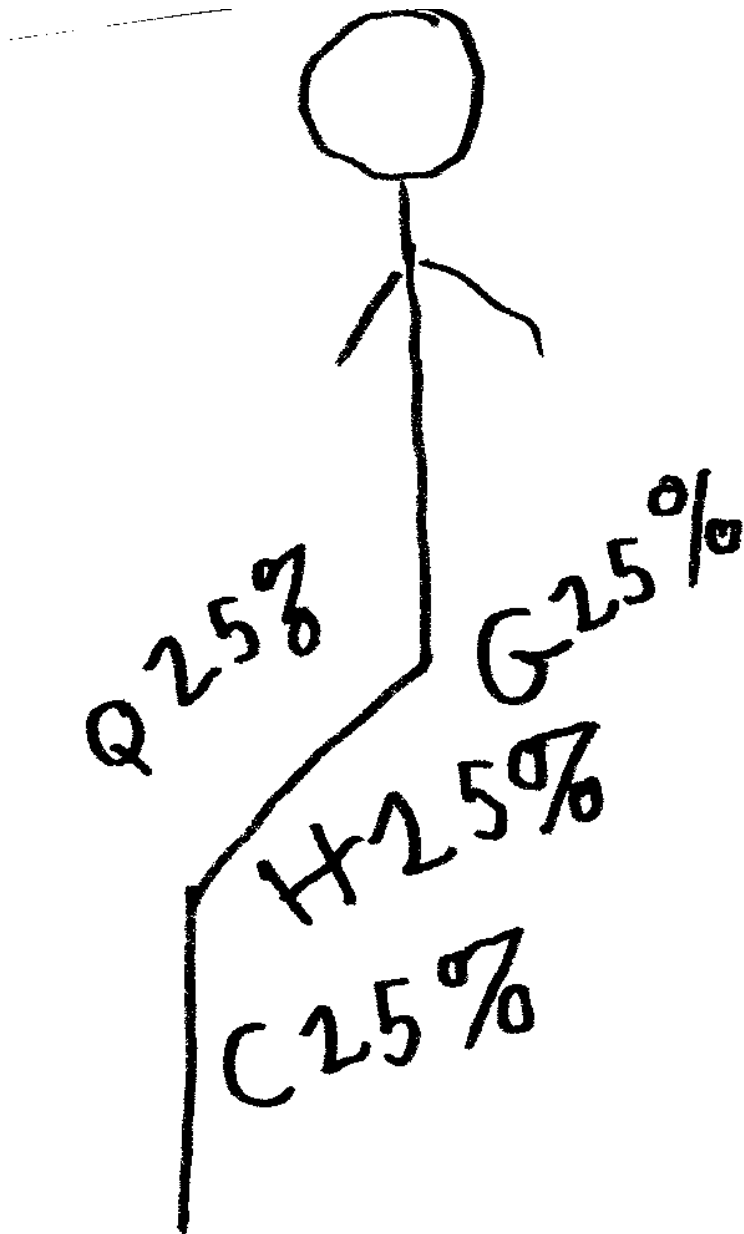
(C) Flared rib cage

Longer weaker ABDOMINALS) are usually present in the presence of longer weaker HAMSTRINGS. In this position the DIAPHRAGM is put into a shortened or contracted position. This COMPROMISED position limits thoracic mobility. The ribs can no longer go down properly for the exhalation. The ideal relaxation of the ribs/diaphragm is impeded.



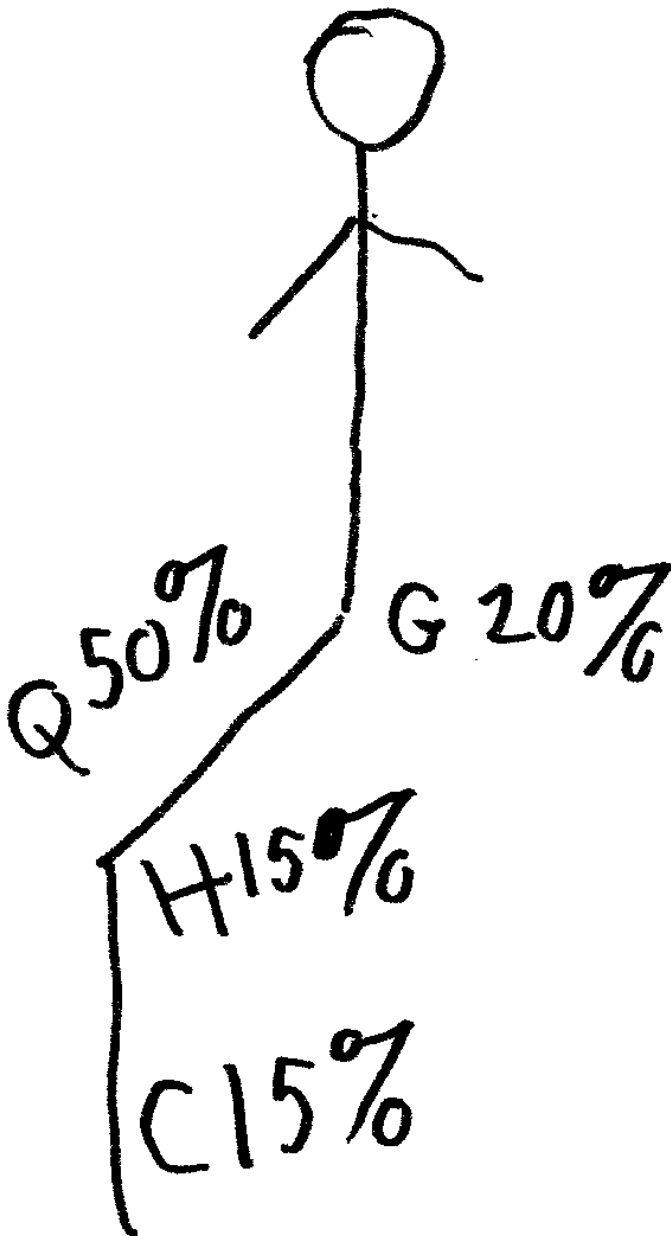
(D) Stretched/weakened abdominals & tightened lower back





(E) Normal tension for stable knee
C – Calf muscle
G – Gluteal muscle
H – Hamstring muscle
Q – Quadriceps muscle
All the muscles are stressed equally

(F) Tension skewed by weak quad, which must work harder (and tires, thus destabilizing the knee)



(notes compiled by Katarina Halm).

Length/tension muscle relationship

There is something called a length/tension relationship. All the muscles in the body must be a certain length. If they are **ELONGATED** they are **WEAK** and basically **NOT** able to **STABILIZE**.

Likewise, if they are in a **SHORTENED** position they tend to be **OVERACTIVE** and very often contribute to pain and dysfunction and length on the opposite side of the joint.

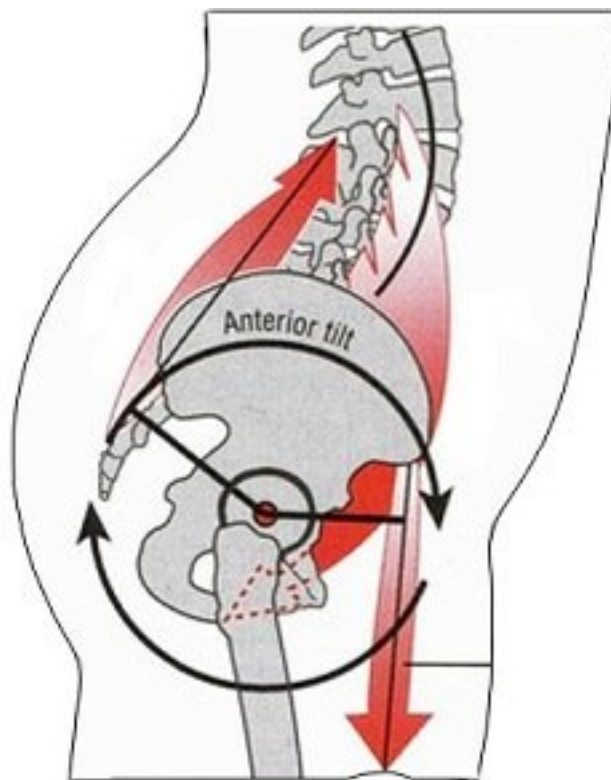
So, as a rule of thumb, if you can put your palms flat on the ground, without being there one can assume that most of that flexibility is coming from the hamstrings. 80 degrees of hamstring flexibility is considered anatomically normal. Anything beyond that is excessive.

Effects of the muscle length dis-balance on the body

If you have more length in your hamstrings than you are supposed to have, what typically occurs is an anterior pelvic rotation. What we fail to realize sometimes is that also affects the rib cage.

Typically we are supposed to have a nice S-shaped deviation in the spine, so a little bit of lumbar lordosis and a little bit of cervical lordosis.

However, when the pelvis tips anteriorly because of long, weak, over-stretched hamstrings that will put this into an anterior pelvic tilt which creates the necessity for a deeper lordosis both in the lumbar and cervical spine.



<https://www.theptdc.com/5-steps-dealing-anterior-pelvic-tilt>

If you have an anteriorly rotated pelvis you must come up with your chest to try and balance the centre of gravity.

If you get an anterior pelvic rotation you are then going to flare your rib cage up and out. If this was a normal rib cage, what happens in an anteriorly rotated pelvic position is that it rotates up and you get what is known as a RIB FLARE.

Ribs go into what is known as EXTERNAL ROTATION. So the ribs come up and out.

So, when the ribs FLARE and the pelvis anteriorly rotates, you will get a long WEAKENING also of your abdominal muscles. So long, weak hamstrings occur in conjunction, very often if not almost always, with long weak overstretched abdominal muscles.

That then creates TIGHTER, SHORTER, more RESTRICTED LOWER BACK.

So you will get tightness in the front, your hip flexors and quads actually become tighter because they are in a shortened position, and so too do the muscles, ligaments, tendons and fascia in the lower back. It is in opposition.

Now the minute your RIBS are in the FLARED position your DIAPHRAGM becomes SHORTENED. This is where the NECK issue can start to occur. It is not possible to have a pain-free neck if you have a restricted thoracic spine.

From a pure osteopathic perspective the DIAPHRAGM is connected to the lung and the LUNG is connected to the NECK, because we have something called our SUSPENSORY LIGAMENTS which attach into C1, C2 and C3 - upper cervicals - and they will pull and tug and lock those cervicals therefore forcing C4, 5 and 6 to try and do MORE WORK than they are designed to do, creating inherent instability in the lower neck.

There is static and dynamic. People say they do not feel or see their anterior pelvic tilt, but what happens when you are moving or walking around? The hamstrings are not contributing to stability anymore and then that whole cascade things kind of curves higher up. So there is a difference between static and dynamic.

You want to add strength - shorten hamstrings and calves because then you allow for more posterior rotation of the pelvis and for an opening of the anterior chain and a lessening of the lordosis.

Think about it this way: Your ligaments and muscles, potentially in your lower back here, are only in a shortened state because of the position they are in.

There are three ways to lengthen a muscle:

1 - the first is to massage it or provide some soft tissue - EASE

2 - the second is to STRETCH it.

3 - the third is to REPOSITION a muscle. And that is what you are essentially trying to do. You are going to strengthen through progressive exercises like hamstring bridges and single leg / double leg bridges and hamstring curls.

That is also going to strengthen your abdominals because often in similar situations abdominals are long, weak and over-stretched.

BLOOD FLOW RESTRICTION TRAINING

A big post-surgery challenge is building back the strength of the quads, hamstrings and groins. You are going to lose a lot of muscle mass.

It is hard to combat that because you cannot load your body. Blood flow restriction training is a possible option for you to kind of bypass that while getting the same results.

So, it is a medical tourniquet that you can put at the upper arm or upper thigh and you start exercising anaerobically. That means under low threshold.

Let us say I am going for a very light jog. The muscles of the body are receiving oxygen from the pumping of the blood, but when we start to exercise beyond a certain threshold we can no longer deliver oxygen to the muscles. Then they start working what is known as 'anaerobically'.

You may have felt this in the past. If you do a hard workout you feel your muscles start to burn after a minute. Say, if you are doing squats, after a minute you start to get this really heavy burning sensation in your legs. That is because the muscles are no longer receiving oxygen. As a result they are producing lactic acid.

Lactic acid is a good thing because in the response to it the body releases growth hormone, which is essential for growing the size of the muscles.

When you use these medical tourniquets to restrict blood flow you are bringing yourself into the anaerobic threshold almost instantaneously. As you keep exercising research shows you can actually increase the amount of percentage of lactate by approximately over 350%.

In response to that the body increases the production of growth hormone by over 300%. The amount of research out there on post-operative studies for things like hip or knee replacement or a fractured humerus or wrist is amazing. It drastically slows down the amount of muscle loss you experience in the first few weeks and will maximally increase the amount of hypertrophy.

So, building muscles size to get you back to where you were a lot faster.

The last and most beautiful thing about blood flow or friction training is that it allows you to achieve the same production of lactate while exercising at 20% of your maximum rate, as opposed to if you were exercising normally.

In other words, in order for muscles to grow you must lift over 65% of your maximum ability to lift - what we call your One Rep Max.

So for argument's sake, say you are able to squat 100 kg of weight. In order to stimulate muscle growth you need to start lifting 65 kg. But you had surgery and cannot lift 65 kg. So with the blood flow restriction training you will be able to lift 20 kg - let's say your body weight - and achieve the exact same outcomes as someone lifting with 65 kg. That allows you to get there two or three months head of time.

You can go online and order a set of Blood Flow Restriction Cuffs and use them according to the protocols.

You can get started on these exercises straight away because the surgeon will probably give you some exercises like simple raises.

They will get you doing those. But even your ability to do those with the cuffs on will seem like you are running a marathon, because of the amount of lactate you are producing.

ABOUT KNEE TENSION

Internal rotation in the knees occurs because of having long posterior chain. That is not something I discussed earlier, but when the pelvis rotates forward in that direction you actually get an internal rotation of the hip sockets which creates what they call knock-knee, when you are rotated in.

For anterior knee pain, see the following diagram. Q for Quads and H for hamstring and C for Calf and G for gluts. So that is basically somebody's body.

Most anterior knee pain comes from a mismanagement about the forced production in the lower body. So when we are walking and our foot hits the ground we need what is called a co-contraction of all the muscles groups to stabilize the position of the knee.

With this, each of these would contribute about 25%, for argument's sake. So your quads, hamstrings and calves should all contribute about 25% to stabilization of the knee joint once your foot hits the ground when you are walking.

I would say probably 80% if not more of anterior knee pain, so where you are describing your pain, comes when this happens. When the quads do way too much. So you are saying the quads are doing 50% but your hamstrings are doing 15 and your calves also weak at 15. So all of a sudden you are left with the gluts at 20%. The quads are doing too much of the work.

If you look at x-rays the likelihood is you will see some form of osteoarthritis in the knee, but everybody has a little bit, who cares. Everybody has a bit of damage in their knees. But, according to research, the number one muscle that you must strengthen to reduce knee pain in osteoarthritis are the QUADS. There is so much research out there saying the vast majority is due to a weakness in the quads. They are not strong enough.

If you have a muscle group that is weak and working 50% compared to the rest, it will be a huge driver towards your knee pain. So for you I would recommend doing a lot of BRIDGING to start with to take pressure off your quads.

Do a lot of bridge work focusing on pushing through specifically the MIDDLE of your FOOT because you want to get your CALVES and HAMSTRINGS co-contracting together to improve the activation and take the PRESSURE OFF the QUAD.

However, BEFORE doing that, it's likely that just above your kneecap you will get a lot of tenderness. So it's good to use something like a ROLLING PIN - or your knuckles, or a foam roller, or some kind of ball - to press in and release out the distal quads which are closest to the kneecap. Release that out FIRST on both sides. Spend about five/ten minutes doing that. Then IMMEDIATELY follow that up with lots of bridging in this position, pushing through the HEELS to ACTIVATE the BACKSIDE [of the legs]. You can progress to pushing the legs further out, like that [feet are further away from the knee so the legs are less bent]. That is harder to do. [The muscles have to work harder].

Then eventually you can progress to doing single leg [bridges] in different positions [foot further out or further in towards the midline]. That would also help with the POSTERIOR chain [all the muscles along the back of the let and entire leg to spine] . These are only BASIC exercises. This is like level one basic. There are lots more progressions from there.

IAN MCCARTHY with MATILDA & CELESTE JULY 14, 2020

© content Ian McCarthy © prepared by Katarina Halm July 2020

~~ MATILDA ~~

MATILDA is interested in the proximal distal relation with the legs coming in and out, doing the frog movement. She had a hip surgery 15 years ago. It was avascular necrosis, in the right femur. Feldenkrais practice and physiotherapy helped her in the rehabilitation. But she still gets tightness in the knee and the leg sometimes loses strength and cant flex. Symptoms include pain in the IT band area and the thigh, pinching in the groin; dropping the knee out to the side is possible sometimes but not always.

No clicking, locking or clunking in the hip itself. Her right gluts is weaker than the left gluts. Bringing the knee to the chest when lying down is also not always possible. She also has a herniated disk.

IAN:

The pelvic position actually has a lot to do with what we call the acetabulum, the sockets of the hips.

Your range of motion within those hip sockets can become limited due to the position of the hip.

I am a big advocator of making sure the hip is essentially neutral, because if the pelvis is anteriorly rotated, you typically drift. You lose motions like hip extension. You also lose motions like hip internal rotation, because you are already internally rotated so it is very hard to rotate internally even more.

You can also lose hip adduction, the knee going across the midline. Sometimes that will also create a pinch in the front of the hip.

RELEASING THE DIAPHRAGM

If you release your diaphragm on the right side through kind of rotational stretches with breathing, very often that will reduce the pinching you get in the front of the hip.

The physiology behind that is that the inner core is made up of the diaphragm on the top, the pelvic floor at the bottom, the transverse abdominus at the front and the multifidus at the back. They say that is the inner box, the inner core.

When the diaphragm becomes restricted or gets put into a less than optimum position that then changes the length/tension relationship of the pelvic for the transverse abdominus and the multifidus.

In osteopathy there is a model of tensegrity. That is big in Feldenkrais too. If you look at that model, changing the structures of the top will change the whole structure of the bottom, back and front etc.

So the quickest way to change a hip impingement syndrome in either left or right hip is to actually work on your diaphragm and your rib cage mobility. You tend to see almost instantaneous increases in your hip range by just working on the diaphragm and rib cage.

FABER TEST

Very often if you train the abdominals to become flatter and bring the rib cage down into a depressed position will increase what is known as the faber test, which is actually like the frog position. You drop the leg out to the side and maybe get an okay range of motion.

But if you were to get a band and tie it to something behind you and pull the bands down to your sides and then repeat the test, very often you find the hip drops out further. That happens because when you pull the bands down to your side to create tension, it gets the ribs down, depresses them down, tightens the abdominals, rotates the pelvis back and then all of a sudden your leg may drop out more to the side.

It is not a guarantee that will work, but it is worth testing because it will tell us that if all of a sudden you have a much larger range of motion in the faber test, it tells you that your hip is being restricted due to a loss of core stability. If it did work for you it would be less than optimal to keep on trying to stretch your hip when you really should be working on stability of the lumbo-pelvic region to produce mobility.

IT BAND OR VASTUS LATERALIS?

IT Band itself is not a muscle. It does not contract, but it does become short a lot of the time out of positional problems. If it is put into a position where it is in a shortened state, of course it is not actually contracted because arguably fascia does not contract. I mean, it does contract, but not like a muscle does.

So very often the IT Band tightness that people feel is actually the vastus lateralis muscle, so the outer quad. Just a few centimetres ahead of the IT Band is the vastus lateralis, and interestingly, if you look at the anatomy, that also appears posteriorly behind the IT Band. So where you think you are digging into your hamstring at the back, again if you look at your anatomy, that actually is the vastus lateralis.

So, if you have got a weaker right gluteus minimus, medius or maximus, which are responsible for keeping the leg in external rotation, the body will try to pick up the slack by contracting the vastus lateralis, which is also an external rotator. It may end up doing twice the work to try to pick up the slack for the weak gluteus minimus and gluteus maximus on

the right hand side. Very often if you get tightness in that area, it is a symptom of the under-activity of the glutes, whatever fibres rotate externally.

The old way of doing a hip replacement was cutting right through the middle of the gluteus maximus and even twenty years later, no matter how hard you work on it, it is very difficult to regain the full hypertrophy and size of the muscle. So you are up against it for sure, but it is not impossible because neurologically if you can get strong enough it will not be an issue for you.

Any form of myofascial release to the vastus lateralis, the outer quad muscle, I would do before doing any glut strength work. There is a goal in rehab where we say 'mobility precedes stability'.

So you have got to take activity away from the muscles that are overworking before trying to activate the weaker inhibited muscles

LEFT AIC PATTERN

There is a very common pelvic pattern in the body known as the Left AIC Pattern which predisposes us as humans to have a slightly weaker gluteus maximus on the right hand side, because of the way we are constantly standing on one leg.

In the Left AIC Pattern position the right SI joint actually becomes hyper-mobile, too much movement. Now, as an osteopath even I cannot tell the difference, whether my SI joint is hyper or hypo mobile. I just know it is painful. So, there is a possibility it good be hyper. Without feeling it I cannot know, but if you have a weaker glute on the right side I would hazard an educated guess that it might be hyper-mobile. *read more about left AIC pattern further down.

DISK HERNIATION

The evidence is changing very quickly on this in the last five years in particular, so the good news is that I can almost guarantee that all four of us in this conversation right now have herniated discs in our lower backs. By the age of 80, 98% of us have degenerative disc disease, a narrowing and bulging or herniation of the discs.

From a physiological perspective it is important to remember that it is okay to have a bulging or herniated disk to a certain extent, as long as the lower back and core are stable they never need to become symptomatic.

ISOLATED EXERCISES

I am not a big advocator of picking a muscle like the glut medius and individually strengthening it through a thera band exercise, like the clamshell. Muscles work in chains and patterns, and from a motor control perspective it is important to increase the strength of the muscle within the chain as opposed to strengthening it individually.

STRETCHES

1. Very often you will find if the thoracic spine is restricted that people's hip extension is restricted so that their flexors are in a shortened position.

So I will describe an advanced stretch to progress on from the thoracic opener.

I am using a foam roller, but you can use anything - a ball, yoga blocks, even a stack of towels will work just great.

Put your leg fully on your side to start with. Step one is to put the top leg at least 90%. Then you will go opposite hand/opposite leg, so the hand grabs the opposite leg behind you.

Lay fully on your side, inhale, exhale and then rotate and come back. This is stretching my left quad and hip flexor. By having my knee up it is getting my right glut. By twisting I am stretching my rib cage, thoracic spine and abdominal fascia.

The key to this is remembering not to tense your neck, your neck must be fully supported on the pillow.

You also do not want to roll back from the lower back. You have to keep your belly button close to the floor as you are rotating.

That will help to open up the rib cage. It is a bit more advanced than what you were doing, but it will also help to open up your hip extension, the flexors, quads and abdominal fascia. It actually changes the deep crossed fascial chains in the body.

2.

RNT bridges and lunges

I will tie an elastic band to the wall, then step into the band so it is pulling across in this direction Then bring your left knee to your chest.

From here you are going to raise up and slowly back down. This feeds a bad pattern in your brain, meaning if I have a weak gluteus maximus my knee is going to cave in, and very often your brain will be unaware of that. It is a subconscious thing where you are causing a collapse of the knee inward.

When the band pulls your knee inward it exacerbates your pattern problem so much it actually makes the brain consciously aware that your hip is now in an abductor position, forcing you to use your abductors and external rotators to keep you out of that position.

That is a really nice progression of the clamshell exercise and logically you can make that even harder by bringing it into a standing position.

You can do the same with the lunge.

The further your feet are away from you in one direction, the more hamstring work you get. The closer your heels are, the more glut you get. So if you cannot bend the knee past 90% on the side, that is actually not the worst thing. It just means you are going to focus more on lifting through your hamstring as opposed to your glut.

~~ CELESTE ~~

Celeste has had a problem with her knees since the age of 12. They get dislocated, subluxed. When she was 16 the left knee had surgery. The doctors changed the ligaments in order to give the knee more stability, but she did not want to do the same thing with the right one because it was not a pleasant experience. So she has been living with asymmetry with the left side strong and the right side dislocated.

Ian asks Celeste questions used to diagnose Benign Joint Hyper-Mobility Syndrome which he suspects might be the cause of her problems:

Q1: Have you ever been able to put your palms flat on the floor?

Yes.

Q2: Can you touch your thumb off your forearm on both sides?

Yes.

Q3: Would you bend your baby finger back as far as it will go?

Yes.

Q4: Do you consider yourself to be double-jointed, very very flexible? When you were a child or teenager did you show your friends how you could bend things in certain positions?

Yes.

Q5: Have you ever had any gastro-intestinal problems, like digestive issues?

Yes.

Q6: Do you have a family history of any cardiovascular related diseases?

Yes.

Q7: Did you mother, grandmother, any sisters or do you yourself have any varicose veins?
Not too much.

Q8: When you go to the dentist do they have to give you extra anaesthetic?
No.

Q9: How is your circulation? Do you have cold hands and feet?
Cold feet, not too much, but some.

Q10: Did you dance when you were younger, maybe ballet or any form of gymnastics?
No.

BENIGN JOINT HYPER-MOBILITY SYNDROME

It is a hereditary connective tissue disorder which does not just affect the musculoskeletal system, your muscles and joints, but can also affect your heart, lungs, gastrointestinal and even reproductive system. It is a genetic disorder where there is a laxity within the connective tissue.

BEIGHTON SCALE

<https://www.ehlers-danlos.com/assessing-joint-hypermobility/>

The objective criteria for Beighton Scale is if you score more than 5 out of 9 in the testing.

Celeste actually did because she listed five things. So Celeste objectively tests as having Benign Joint Hyper-Mobility Syndrome.

But as well as having those objective measurements, you must also have subjective criteria. The prominent one is a history of joint subluxation.

We can say with approximately about an 80% certainty that you have Benign Joint Hyper-Mobility Syndrome.

That is both a good thing and a bad thing. It is good because it actually may give justification to why you have digestive tract issues. It also ties in with why your mother might have had heart issues or why you have varicose veins or other things - fatigue is another big one.

The bad news is that there is no official cure for it. But there is a management, and 99% of the stuff you need is not mobility treatment. It is very much stability and strength training. The good news is that this syndrome gets less problematic as you age, because we naturally become stiffer. So all of a sudden the kneecap is not as mobile as it used to be and it usually becomes less and less of a problem.

You will also need a bespoke, or guided, strength and conditioning and stability program. If you go to a therapist where you are living and say you have Benign Joint Hyper-Mobility Syndrome, at least then straight away they know what they are dealing with, because it is very commonly misdiagnosed or completely missed, so not even thought of.

With the history of kneecap subluxation, you are obviously going to need strong quads. So overall you will need a lot of strength and eventually once you get stronger the best thing for you would be to actually do some strength work, in a gym or even at home.

Pilates no machines is a great start. Non-weight-bearing, under controlled supervision. Ultimately we would like to supplement that. So you could do pilates let's say twice a week to start with and then perhaps do some whole and mat pilates - there is a lot of stuff online now for free. But eventually once you are stronger and very very good at that, maybe a few months time you can start proper resistance training.

I know people are afraid of that, thinking of someone in their 50s and 60s lifting weights in a gym, but in reality this what we all should be doing. All the evidence suggests that.

Stretching does not prevent injury.

There was a large scale meta-analysis study with over 23,000 subjects to look at whether stretching prevents injuries and they found no correlation. However, resistance and strength training statistically reduced over-use injuries in the body by over 50%. So that tells us we need to move away from thinking about mobility and more towards strength training.

Every muscle in the body needs to work within a certain length. If it is too long it is weak. If it is too short it is weak. Tight hip flexors are weak hip flexors. Long hamstrings are weak hamstrings. Hopefully when the hamstrings start engaging more with a bit more posterior rotation, the quads go into a slightly longer position and then all of a sudden the connectivity in the brain starts to fire those muscles a little bit more efficiently.

Pilates would be a great start because I know particularly on the reformer machines they do a lot of activation work where you bring the legs up and push down. Those are really good exercises for hamstrings, and that will bring your quads and hip flexors back online working efficiently again.

SOLUTIONS

1. Ian recommends the same RNT bridges and lunges

2. Lay on your back, with a straight leg on top of a table or chair, and do some single leg hamstring raises. If that is too difficult, where you cannot actually get your butt up, no problem - just pull up and hold and do isometric holds. Just hold ten seconds and slowly lower back down. As you get stronger you will notice that you will be able to get higher and higher.

Effect of the syndrome on the body

It can affect your thyroid for example, I believe. And certainly it can affect your digestive system because if you have a slower digestive system you have food sitting longer in your gut. It is very common in Benign Joint Hyper-Mobility Syndrome to have low blood pressure and low digestive motility. It can even affect the reproductive system. Everything is looser and slow and does not happen as well as it should do. That is why they get varicose veins, because they are kind of a laxity and sloppiness of the veins that ultimately culminates in pooling of blood. Sometimes you get varicose veins. Sometimes you get poor circulation in your feet and hands because there is no rigidity to the cardiovascular structures that need rigidity to contribute to fluid dynamics in the body. So weight gain seems also very plausible. I cannot 100% guarantee that, but it seems plausible to me that it would be one of the issues.

The general rule of thumb I give to most of my patients: mobility always precedes stability. It is good to do a little bit of mobility work to the muscles that are in a shortened position before activating the muscles that are in a lengthened position.

WEIGHT TRAINING

The term “dead lift” may be scary but we all should be doing some form of resistance training. Tendon rigidity is immensely important for force production. Ultimately, muscles themselves contract, but it is through the tendon where most of the force is transferred. And the strength there is achieved through actions like dead lifts.

Questions for Ian:

Q: BONNIE and her client

Bonnie is asking about a client who believes she has a problem with “hyper-elasticity” and having too much collagen in the body which results in pain. Is the diagnosis accurate?

Ian suggests performing the same BJHS test.

BJHS syndrome is a softer version of "Ehlers-Danlos syndrome (EDS) which is a severe condition.

"(EDS) is a disease that weakens the connective tissues of your body. These are things like tendons and ligaments that hold parts of your body together. EDS can make your joints loose and your skin thin and easily bruised. It also can weaken blood vessels and organs" <https://www.webmd.com/a-to-z-guides/ehlers-danlos-syndrome-facts#1>

LEFT INTERIOR CHAIN PATTERN

There is a very common pelvic pattern that I find very prevalent in the population. Left interior chain pattern. We are not perfectly symmetrical as humans. Anatomically we have a heavy liver on the right side, heavy heart on the left side, so lots of visceral asymmetries. Larger right diaphragm. Neurologically we are predisposed to sit and walk on the right leg more than on the left. We are fighting to be symmetrical.

Does anyone have a patient who has more flared ribs on the left side than on the right?

We are more predisposed to stand on our right leg. When we stand more on the right leg, then the left pelvis anteriorly rotates. And the right one posteriorly rotates. Then you get shorter left hip flexors and long left hip extensors.

So if you are standing on your right leg, the following muscles will be short:

Left hip flexors
Right medial hamstrings
Right adductors

And these muscles will be long:

Left medial hamstrings
Right hip flexors

Right glutes and external rotation muscles
Left groin

Eventually my pelvis turns to face the right side. Now my femurs want to match that, my right leg will externally rotate. But you cannot walk or run like that. The body fights it.

So your brain will shorten and contract your adductors on the right to turn you back forward.

Postural Restoration Institute claims about 85% population are in this pattern. I believe a good chunk of population will have that. I would make the argument that a lot of people would benefit from having left hamstring strengthening and the right glut is strengthening to get the balance back in place.

If you are working with stability and strength, you should get 20% more hamstring work on the left. You want to try and shorten it to pull the pelvis back into its neutral position.

One you are more square, the overworking muscles can start firing correctly. That's only step 1.

So if you're walking with this pattern, it is difficult to watch someone and pick this up by just looking. But you can assess it.

Lastly - strengthen your right ABDUCTORS and EXTERNAL ROTATORS. It is very important to understand when you are working with people. But that is not for everybody. I encourage you to test it.

A typical left IC pattern is commonly paired together with another pattern, BC pattern. The upper body has to turn back to the left hand side, the right shoulder has raise itself up and the neck has to derogate to get square. So you'll get tighter right diaphragm, tighter muscles on that side. So if your patient is lying down and their left ribs are flaring up higher, so weaker left diaphragm. That we are genetically supposed to have.

One simple test to check if the hamstrings are overly long is to check their straight leg raise. (shows) Left leg might lift higher than the right one.

The second test is [Clarify with Ian here]

The third test is check their lumbar rotation. Their lumbar spine may already be rotating right, so they might have very little right rotation. But a lot of left rotation. Knees together on the table... [Clarify with Ian here]

Hamstring length:

you typically find the vast majority of the population have a longer left hamstring than a right one and a shorter left hip flexor which was the test to grabbing that knee and falling back and see how far the leg drops down.

Again, on the left side you will typically find it will be much higher, so the hip will not drop in the extension as well.

Typically patients will have limited right lumbar rotation compared to left because they are already in right rotation.

Manual muscle testing and strength

The other test you want to look at are manual muscle testing and strength testing of the gluteus medius and minimus on one side

which is typically done by sitting on your side and testing the top layer and back in an extended position here, and resist the patient - they are pushing up as you are typically pushing down into their hands. How strong are they here?

[Clarify with Ian here]

And then you will flip them over and try the same on the opposite side to test the strength of the gluteus medius minimus and the ab and ADDUCTORS. For groin testing there is something called a Copenhagen Lift, which is basically like a sideline hip abduction exercise.

To test the strength of the groin you can also just get the patient to lie on your back. It is a little easier test that I tend to do if I am in a hurry.

Lay on your back this way and just resist the pushing in on the right versus the pushing in on the left.

Again, the vast majority of the population will typically have a weaker left than right groin.

Another worthwhile test some people might even want to try now. It is not an official test, but is something I have been playing around with myself. The 90/90 hip position, where you put one hip in exterior rotation 90 and the back in internal rotation 90 and the key is to try to stand as straight as you can.

A good chunk of the population will struggle when the right leg is in front in external rotation and the left behind, because in this position the right diaphragm internally - the transverse abdominus etc - needs to open as the left side needs to compress.

But because of the Right BC Pattern that we are typically predisposed to be in, we will really resist that and will want to be more in this type of position, when I am compressed on the right.

[Diagram here?]

Even I find this easier, and you might find the same. It is easier for me to stay here because my right diaphragm is in a compressed position and my right obliques are in a compressed tightened position, which is what we prefer, than the left side.

Because the left side just needs to open up and this is easier because it is already opened up in a Right BC Pattern. This is typically longer, weaker, overstretched. And in this position here that is exactly what it is - longer and weaker and is going to be overstretched, but I need to contract the right side. It is kind of frees this position to be in that pattern.

So that is the 90/90 hip position.

This is kind of a roundabout way of saying this, but talking about hip abduction and adduction and length/tension relationships, I think it is a really good idea to make sure patients are or are

not in a Left AIC Pattern before deciding what to do with their hip ab and ADDUCTORS. But, again, most of the population will need stronger right gluts and stronger left groins.

Now, you might be wondering what type of pain would patients come in with that are in a Left AIC Pattern. Numerous, is the answer. Everything from knee pain to neck pain really, because you will typically find in this pattern, with the lower back turned to the right and side, you typically get right SI joint hyper-mobility and left SI joint compression. So they actually complain of SI joint pain.

If they come in and say they have a history of a bulging disc or slipped disc (awful term, because we all know that discs do not slip), it will typically be on that right side because the peak of the rotation occurs in that area on the right side. It would very often be right-sided back pain.

Then piriformis syndrome on the left side. Pop question, can you guess why it would be on that side? If you can get close you are rock stars.

Okay, if the left femur is internally rotated to match the orientation of the sockets. But what muscles are working triple time to try to keep your left leg rotated. My left femur is turned in this way because the pelvis is turned right. My gluts and external rotators are going to be working super hard to try and keep the left leg rotated outward.

Now, you will very often get piriformis syndrome on the left side in these patients because their external rotators are working insanely hard to try and keep themselves balanced. They can also complain of anterior knee pain, on the kneecap, on either side because if you think about it a weaker left groin on the left with an over-dominant... I should not say 'groin' - let me be more specific.

I will take it one layer deeper, just to confuse everybody.

When I say the left leg and internal rotation and the external rotators are working really hard, I talked about the glutes, piriformis, gemella, those deep external rotators on the left, but actually another muscle that externally rotates the femur is the vastus lateralis. Your outer quad muscle externally rotates your leg. Your outer hamstring also externally rotates the leg. So these muscles are also in a shortened position. If your vastus lateralis is working much harder than your groin on the inside, that is one of the major drivers behind knee pain. So that is another ab- and adductor tie in there.

It is the exact opposite on the right hand side. If you have got an over-active shortened groin, but you have weaker external rotators, like the glutes, periformis, gamella etc, that can also cause anterior knee pain.

So that is it for SI joint pain and lower back pain and anterior knee pains.

Then of course there is the upper body. With the right BC pattern they will tend to get a lot more tightness on the right shoulder because in the Left AIC Pattern the right shoulder is lower. So, trying to make the body level, the brain will fire the upper trap muscle to square the

shoulders up, it will turn the neck through here to there, so you get a lot of tightness in the upper left neck and the right shoulder region to try and keep square.

Very often, you can tell this by just looking at how somebody sits in a chair in front of you. Sometimes I even say that to them. They will complain about neck pain, headaches etc etc and I say okay is there anything else you have had in the past or are currently experiencing and they will say - oh yes left knee pain and oh yeah I have been getting chiropractic treatment for my right SI joint for the last six months.

I had a patient this morning I saw for the second time and that was exactly it. I know what is wrong with her already, by seeing the way she was sitting, way back in her chair on her right side. You could see her belly button and torso was turned to the right hand side, and then she is listing all these complaints in all of the muscular areas that are technically short in the Left AIC Pattern, Right BC Pattern, so you can kind of put things together before you even assess them.

Then you go through two or three quick assessments, look at their hamstrings, groin and glutei strength, their rotation and one other main test that I cannot show you without someone else being here. So you do all these tests and realize they are in a Left AIC Pattern and they go home with left hamstring strengthening, left groin strengthening and right glutei strengthening.

Q: In some of the lessons we do in Feldenkrais we are asked to work from one side more than the other. I think that could match with what you are saying because we do not know why he did it that way. We think one side learns from the other, but I think some of the times the lessons are structured because we do have to work more with the right side. Mostly it is the right side.

IAN

Most certainly. Particularly in the thorax, because of the larger right diaphragm, the liver being on the right. We are innately, primitively if you will, predisposed to working very hard in this region. I find as an osteopath that does a lot of visceral manipulation and release that you typically get a lot more tightness on the right side than you do the left. That is why I say the rib flare on the left side is more prominent in the population.

So I agree, I think we work far too much from the right side, particularly in the thorax.

I have not taken any Feldenkrais training, so that is interesting. I learn from you as much as you do from me. It would be interesting to see specific details of what you learn in your courses and training and if that ties in with the whole Left AIC / Right BC Pattern, because of course in medicine there is more than one way to skin a cat and they could be identifying many of the same things.

But, personally in my career so far I have found that is actually the most detailed accurate description of what actually happens in a lot of pelvises in the body. I think it is probably one

of the best courses I have taken. I have taken a lot but I think that is well out there with being one of the best because it is so damn accurate.

When you do identify somebody in that pattern the changes are amazing. The patient I saw this morning, a senior who spent two or three years battling a right SI joint problem, getting cracked up the wazoo with a chiropractor adjusting that joint. But that joint is actually hyper-mobile because she is in that pattern, and I saw her two weeks ago and when she came for the second appointment she was already better.

Now, she is only just learning how to stand and walk to get away from that right side, so it will be really interesting to see her in three weeks when she adds more strength to the glut and hamstring and stops sitting, walking and standing on the right side. I have a feeling she will probably be pain-free in about six weeks. So it is pretty cool.

Maybe you could merge the left hamstring and right groin/glut strength work with some Feldenkrais and kind of put your own spin on it, because as I say there is more than one way to fix it. There is no one way. I bring in aspects from my athletic therapy, from osteopathy, some from sports medicine and mix it all together and find out the best way of doing things.

So there are multiple right ways.

Again, I would only maybe watch, think and hear again to match everything together, because there is lots of information. I get the idea as a general sense but to be precise I am a bit lost, because of the English.

Concerning my exercise, I found in the lesson of .???.?... Hebrew .???.?... the ATM lessons, from developmental process, the fifth and sixth, especially the sixth, lesson has this movement. He said to me to do it, the bridge. Doing the bridge but also for walking because Lessons 5 & 6 from .. .???.?... book, I did one of the lessons for the child ... movement to start walking.

Maybe look for some of this position that you said before, having the leg backwards and the other one in front. I was thinking maybe from Esalen - choose to listen from Esalen because I think that is like a mini-training and we can find all the variations and themes from Moshé in those lessons. I will take a look and tell you.

Q. From the Feldenkrais® method, if there is a disfunction, we will ask - “how does the body do that”? And then bring new input, for the brain to learn other ways of doing it.

Ian McCarthy: Developmental kinesiology is definitely something I work with. There are mobility (joint mobility, or any kind of tissue extensibility) and stability (motor control) dysfunctions. If I is stability, then the works is from the ground up. I would have patients with back issues rolling on the floor first.

Very often with patients who have neck issues, an osteopath might mistakenly diagnose it as mobility disfunction. But we should not be assuming that. So I would start by laying the

patient down and performing their range of motion test again. It is amazing how often that happens.

STABILITY & MOTOR CONTROL

4x4 matrix

4x4 Matrix	
1. Supine/Prone	1. Assisted/Unloaded
2. Quadruped	2. Unloaded
3. Tall/Half Kneeling	3. Assisted Loaded
4. Standing	4. Loaded

<https://www.physiodave.com/the-4x4-matrix/>

There are 4 positions we can teach patients in:

1. Prone / supine - not weight bearing
2. Quadruped -a bit of weight
3. Half kneeling and tall kneeling - a bit of weight
4. Standing: squat, lunge, step up (single stance) - full weight bearing

That's nature's progression. That's how babies learn.

There are four loading levels:

1. assisted / unloaded (Reactive Neuromuscular Training (RNT))
2. unloaded (no load)
3. assisted / loaded (RNT + resistance)
4. loaded (resistance)

This is the motor learning perspective, the neurological perspective.

Say, a patient is standing and can not turn their head. That would be 4x2. So I would trace it to the level he can do it, all the way to 1x2. IF they can not do that, then 1x1. So you'll notice that I am not adding any resistance to the exercise. When I add weight to the exercise, I am basically telling you "I love how you move". But if the motor control is poor, I do not want to put weight on top of that and reinforce a bad pattern.

Let's say someone has poor thorax mobility. IN a clinic setting, I would suggest stretching, tissue relaxation.

If I do not do anything more, that will not last. It'll tighten up again. Because the brain is used to having stiffened thoracic spine. So the motor patterns have not been addressed.

So we need to follow up with the stability work. 1x1, 1x2, etc.

There are two ways of thinking about it. If you pick and isolate a muscle, does that change motor patterns? Post-surgical cases are different.

Let's say you have weak gluteus medius bilaterally. I could advise clam shells. But I will not because the issue is not there.

My whole point is, as patients come to us, they are going to have one of the two issues, stability or mobility. Or both. And in different places. This results in a joint-by-joint approach. Certain joints are designed inherently to be stable, others - to be mobile.

There has been change in how therapists treat patients, say when a patient comes in with a neck issue ... the sight of pain is rarely the sight of the issue. "He who treats the sight of pain is lost". We have to identify the most dysfunctional part of the body.

FURTHER READING AND REFERENCES:

<https://www.otpbooks.com/advances-in-functional-training-excerpt/>

Owens Recovery Science - Blood Flow Restriction Rehab

<https://www.owensrecoveryscience.com/?>

[gclid=CjwKCAjwmf_4BRABEiwAGhDfSTuiXsuV2RCE3STsbuCQqSiIXBeWKI4-ZknXbYS9kZ6qduzli4JIMxoCMisQAvD_BwE](https://www.owensrecoveryscience.com/?gclid=CjwKCAjwmf_4BRABEiwAGhDfSTuiXsuV2RCE3STsbuCQqSiIXBeWKI4-ZknXbYS9kZ6qduzli4JIMxoCMisQAvD_BwE)

<https://www.sciencefocus.com/the-human-body/why-is-the-heart-slightly-to-the-left-in-the-chest/>

https://pdfs.semanticscholar.org/786b/69a90f65a1bb84ee952b7a624eb580de5988.pdf?_ga=2.219319184.880133068.1595969347-263879530.1595969347