

## JENNIFER PILOTTI & JULIE BLANDIN

### A Discussion on Postural Restoration Institute—PRI

This is Jenn Pilotti from Be Well Personal Training. I'm here with Julie Blandin of Integrated Core Dynamics. Julie is a Postural Restoration Institute certified physical therapist. She's going to give us an overview of what PRI is and what it can do for the fitness industry.

Thank you for joining me, Julie. What is neurologically based movement and what is PRI?

**[JULIE]:** Neurological-based movement respects the brain and the neurological system to superiorly influence muscles, movements and posture. The brain organizes all movement, and since it's so plastic, it changes itself through experiences and movement throughout life. Various reflexes, movement and sensory experiences influence motor control and movement patterns.

Posture is neuro-reflexively regulated and is based on the brain's control of many systems. Posture is not just based on length-tension relationships of the musculoskeletal system.

For example, you can have anterior chest wall tightness that's adaptively shortening and contributing to dyssynchrony and poor organization of the thoracoscapular muscles. This adaptation may be occurring on the right side more than the left, so you can see changes in musculoskeletal balance around the right shoulder that are contributing to symptoms like impingement pain, tendonitis or irritation with overhead work.

If you look deeper, you could discover neurological and respiratory imbalances contributing to why that musculoskeletal adaptation is occurring. A neurological-based movement approach will first address those underlying neurological factors before ever touching the musculoskeletal affected area. When we address the neurological factors first, we see things objectively change—like posture, available joint motion and muscle balance.

Neurological-based movement includes concepts like addressing tone—what's hypertonic

and what's hypotonic (over-facilitated, dominant and strong versus inhibited, weak and just not working properly), what muscles need to be activated or retrained, and what muscles need to be shut down and inhibited.

Neurological-based movement also includes concepts of respiration because breathing is autonomically regulated. Respiratory dynamics heavily influence the balance between the sympathetic and the parasympathetic nervous system. Influencing this nervous system with respiration can dramatically change movement patterns.

Neurological-based movement also includes concepts of incorporating motor programming and looking at neurological lateralization patterns. Neurological lateralization patterns are how the brain may program motor control to be stronger or dominant on one half of the body compared to the other. We look at these dominant patterns, and we look to balance them through neurology and reciprocal motion.

Neurological-based movement incorporates reactions to various reflexes—neuromuscular reflexes, primitive reflexes, stretch reflexes, proprioceptive reflexes, and writing and equilibrium reactions. Visual and vestibular reflexes can also be incorporated into movement.

Going back to the shoulder, there may be a lateralization pattern affecting pelvis and ribcage balance contributing to a respiratory imbalance, locking up the ribcage and causing the shoulder muscles to adapt around an imbalanced ribcage. If you fix the neuromotor imbalance at the pelvis and ribcage, the shoulder will sit better and symptoms can be eliminated. The affected musculoskeletal area initially untouched. We addressed the neuromotor influences happening around and below the shoulder.

Postural restoration is one of several neurological-based movement approaches. It is

~1~

This is the transcript of Jenn Pilotti & Julie Blandin's *A Discussion on PRI* audio lecture.

If you've received this material, do not own the audio lecture and would like to learn about it, visit [movementlectures.com](http://movementlectures.com).

For more from Jenn, visit her at [bewellpt.com](http://bewellpt.com). For more from Julie, visit her at [integrativecoredynamics.com](http://integrativecoredynamics.com).

taught by the Postural Restoration Institute out of Lincoln, Nebraska, and was founded by a brilliant man named Ron Hruska.

It's a pretty young institute that's growing quickly. Because of its sound, integrated application, it's teaching healthcare professionals, coaches and trainers. When I say young, I mean the first certified class of clinicians coming out of the Postural Restoration Institute was in 2004, so there aren't many of us yet. To date, there are just over 100 across the United States. If you visit the Postural Restoration website and click on "Find a provider," hopefully you'll locate one near you.

The Postural Restoration Institute teaches a science that's bringing old information forward. It's putting an up-to-date twist on principles that incorporate respiration and neurology to provide movement experts with a more holistic way to address and treat postural kinematic movement dysfunction.

PRI is the application of human anatomy of biomechanics. It provides a framework to look at human movement and various anatomical relationships. It's a head-to-toe philosophy and engages the clinician to be aware of ascending and descending influences contributing to various postural adaptations and symptoms.

PRI teaches a respect of asymmetrical function, side-dominance and our internal asymmetrical design. When applying the science of asymmetry, it's extremely valuable to helping develop the balanced client—what we in PRI call the neutral client.

Achieving symmetrical neutral or balanced function is not only beneficial for those involved in rehabilitation or injury prevention, but also for those looking to enhance athletic performance and create movement efficiency.

There are three 'S' bones we are interested in balancing in PRI, the sacrum, the sternum and the sphenoid. These three 'S' bones are interdependent, and their balanced function is extremely powerful in regulating multiple systems of the body.

Around each of the three 'S' bones are paired bones—the innominates or coxal bones, the scapula

and the temporal bones. The 'S' bones form an integrated ring-shaped complex—the pelvic girdle, the thoracic cage and shoulder girdle, and the cranium. These complexes regulate and influence one another, meaning that movement, or the lack of movement, on one side of the complex will influence and balance the other two.

This viewpoint presents a new twist on balancing postural integrity and symmetrical function. PRI teaches us to value reciprocal alternating function and teaching how important it is to keep reciprocal alternating function balanced through the pelvis, thorax and cranium.

When reciprocal alternating movement is not balanced around the three 'S' bones, strong patterns of adaptation occur, creating structural weakness, instabilities and musculoskeletal pain syndromes.

Reciprocal, alternating function includes various push-pull relationships that influence one half of the body—the right half is pulling while the left half is simultaneously pushing. Reciprocal, alternating function also includes cross-lateral exercises and contra-lateral global patterns by pairing the upper extremity on one side of the body to the lower extremity on the opposite side. Reciprocal alternating function also includes alternating triplanar movement seen in gait or crawling movements. The thorax rotates one way while the pelvis rotates the other.

Balanced reciprocal function is a big deal in PRI. Managing it and maximizing its triplanar control is the ultimate goal with the postural restoration program.

[JENN]: Excellent. How did you become interested in PRI?

[JULIE]: I've always been interested in methods that talk about proximal stability and distal mobility issues.

I was initially intrigued with integrating Pilates into my rehabilitation program design early in my career. I continued to evolve and learn advanced concepts that incorporated pelvic and shoulder girdle control with extremity-based rehabilitation.

I was also very intrigued with looking at various anatomy trains and kinetic chain relationships. For example, how various foot and ankle patterns relate to the hip complex, or how the left hip relates to right shoulder function.

In February of 2008, I went to my first PRI course. It was *Myokinematic Restoration*,

*An Integrated Approach to the Treatment of Patterned Lumbo-Pelvic-Femoral Pathomechanics*, and I was attracted to the material presented, but I was extremely overwhelmed. I wasn't getting the language and the time needed to process it. The instructor was talking way too fast for my brain to process it all. I left the course thinking it was pretty cool, but I had no clue how to apply it in the clinic on Monday morning.

A few months later, another course was being offered nearby, so I went to that. I was absolutely fascinated on the discussion of work with the diaphragm. This was a postural respiration course.

At the time I was working with a large orthopedic physician group, seeing a lot of shoulder patients. I couldn't believe the changes I was seeing in shoulder range of motion, and some chronic patients were getting relief for the first time in years, so I repeated that course in August of 2009.

After I repeated the respiration course, I was hooked and couldn't get to the rest of the courses fast enough. Going to all of the courses within a year helped me understand the language associated with the methodology, and kept me motivated to learn the framework of application.

I knew I had to devote time and energy into learning the system because of the many paradigm shifts it was challenging me with. I had to wrap my head around integrated concepts not taught in mainstream, traditional rehabilitation.

Since 2009, I have attended over 20 PRI continuing education courses. I share to point out that learning PRI is a journey. Unless you went to physical therapy school or perhaps if you were trained in another country, you will not understand

PRI by just going to one or two courses. Not everyone needs to go to 20 PRI courses to get the material. Let's just say I'm a slow learner and I enjoy going to courses.

I respected the integration that PRI science was teaching, and it's a methodology that fits my practice style. My PRI journey will continue and I'll continue to attend more PRI courses along with incorporating other health, physical medicine and fitness concepts. I have no regrets in making that commitment in devoting the time and energy needed to dissect and understand the material. It has 100% made me a better clinician.

[JENN]: Has PRI influenced the way you treat patients and if so, how?

[JULIE]: PRI provides a framework to apply the details of biomechanics and anatomy. My application of anatomy and biomechanics is now more wholesome. I value my understanding of the postural kinematic movement function on a more systemic and holistic model. I don't get caught up in every little detail in isolated or segmental areas of the body.

Instead, I'm better able to look at the big picture of human. No matter who the patient or client—meaning no matter their age, occupation or sport—I explain the way I evaluate the body and the PRI screening I do.

The PRI screening gives me a framework to understand relationships through the axial skeleton and shows me where to start treatment. The screen takes a maximum of 10 minutes. I explain to the clients that even though they may have symptoms on the right side of the neck or in the right shoulder, they may have movement dysfunction or joint restrictions in other areas of the body contributing to why the pain or symptom is there.

When I teach and explain the screening, I use the analogy of a Rubik's cube. Most patients connect with this analogy pretty well, so I tell them I'm going to divide the exam into three parts. I describe it like cubes on a Rubik's cube.

The bottom square represents your hips and pelvis. The middle square represents your thorax and ribcage. The top square represents your head and neck. I want to see if those three segments or regions of the body are lining up well and if they're all orienting in the same direction. Perhaps the pelvis is turning to the right, the thorax is turning to the left and the head and neck is turning to the right.

We do the test in PRI to assess triplanar position of the body and to determine if there is any soft tissue or bony pathology as a result of compensation. We want to understand the underlying position in anatomical relationships contributing to pathomechanics or impaired movement patterns.

I hate chasing symptoms and I hate feeling exhausted after doing a ton of manual therapy. I hate feeling patients are dependent on me to get better. PRI has provided me with an educational framework to teach clients how to be in control of their body frames. It's also allowed them to be aware of how their repetitive movements or sustained postures may be contributing to their imbalances or pain.

[JENN]: That's very cool. Do you think PRI has a place in the fitness community or is it applicable just to the therapy setting?

[JULIE]: Absolutely, yes. PRI teaches principles that can be incorporated in the fitness community, whether based off developing relationships and referral sources or actually having trainers learn the material to help them better understand human anatomy.

The Institute has a credentialing program for those in the fitness industry, which includes strength coaches and athletic trainers. Many people are incorporating PRI principles into their fitness-based program designs already.

I'm a huge advocate for helping to educate and mentor trainers, instructors and strength coaches or any movement specialists how to apply the principles of biomechanics and neuroanatomy. There's so much to learn.

It's overwhelming for an entry-level fitness specialist to be able to differentiate what's a trend, gimmick or a person just trying to make a buck in what is sound science, but I can assure you, PRI is sound science. If you're going to spend time learning it, you will better respect the rationale behind why you're doing what you do and why you pick certain exercises for different clients and different body types.

PRI also has a place to better define the core in core strengthening or core-based routines. Ideally, the industry as a whole has a pretty good grasp on extremity function. If I were to get a group of trainers, therapists and coaches in a room and ask them what about normal flexion and extension of the knee, ankle or elbow, we would get pretty consistent answers.

However, if we asked that same group of trainers, therapists and coaches what's normal flexion and extension of the spine or an axial skeleton, and how to train it, we would get much more inconsistency, as well as many more opinions and variations.

There are a lot of strong opinions about what the core is and what clients need to do for core strengthening and core function. Yet the industry is missing the objectivity and consistent anatomical application of core muscles. Take, for example, the application of the diaphragm in functional training. Some people ignore that muscle altogether, yet the diaphragm is one of the most proximal muscles of the body. It attaches to the spine; it's one of the largest muscles of our human anatomy.

The first thing we do when we're born is breathe, and it's the last thing we do before we die, so to me, the diaphragm is a valuable muscle. Diaphragm tension and tone are regulated by the abdominals, and the abdominals are a huge part of the core.

PRI is a tool that taught me how to objectively evaluate the core and the axial skeleton. I have a better understanding what healthy flexion is, what over-extension is and how to generate optimal rotation and power with core muscles. PRI helped me define what the neutral spine is and what neutral movement is through an axial skeleton.



[JENN]: What's the best way for a trainer to learn PRI?

[JULIE]: Without hesitation, I would say attend a live course.

The Institute has three introductory courses. I recommend attending at least two of those and at least one of the advanced courses, like an impingement and instability course. It's important to understand that each PRI course builds off the other and no one course is exclusive to introduce how we use the system.

The respiration course is probably one of the most important courses to attend because it's the course that talks the most about the ribcage and the diaphragm. It introduces some of the main manual techniques we use to keep the thorax mobile for healthy respiratory mechanics.

The Institute also has home study courses, but my opinion, they're not comparable to attending a live course. I might see those home study courses being used more as an adjunct to people learning the PRI system to help refresh the concepts of a course they may have already attended. However, attending a live course is the way to go.

You can visit the Postural Restoration website or the blogs on the Hruska clinic website. They're very helpful because they are from the Hruska clinic physical therapists who are huge advocates for helping to teach the concepts of PRI.

It's important to understand this is post-graduate, advanced material, so it's going to challenge a lot of the concepts taught in traditional thinking or traditional education. It took me a lot of time to wrap my head around some of the concepts—for example, the concept of how the ribcage could be rotating around the shoulder blade.

Before PRI, I scap-squeezed and over-retracted the heck out of everyone's scapula in a hope to attain good posture. When I started learning about how the pelvis and ribcage affect shoulder blade alignment and shoulder mechanics, it was a huge paradigm shift. It took a while for me to wrap my

head around the fact that I could pull the ribcage back to a shoulder blade. In other words, be patient in learning PRI.

[JENN]: Do you think PRI has a role in sports-specific conditioning, or do you think it's primarily more post-rehabilitation?

[JULIE]: Absolutely. Think about the running gait and any rotational sport. The pelvis goes one way while the thorax goes another. Sagittal plane strength moves like the squat, clean-and-jerk or bench are not going to prepare athletes to maximize reciprocal relationships.

PRI has a place in the sports-specific conditioning industry because it teaches a systematic way to attack and maximize triplanar movement and neuromuscular balance for athletes to move more efficiently. You can't just force rotation on the human body when it's locked up in the sagittal plane.

PRI helps to provide a framework to learn how to inhibit a sagittal plane, re-train stability in a frontal plane and help prepare athletes to integrate and reciprocally move and rotate in a transverse plane. If you're a coach or you work in the sports industry, I encourage you to reach out and find a PRI-trained professional to help your athletes move more efficiently.

There are many colleges and professional teams who see the value in incorporating a PRI program and have hired a PRI-trained professional on their staff. It's only a matter of time before others catch on.

Besides incorporating PRI into athlete's rehabilitation programs, you can apply PRI principles to pre-hab or warm-up drills. This helps organize and promote symmetrical form and function of proximal muscle groups before practice or intense workouts.

You can also incorporate PRI principles and circuit-based workouts for post-workout recovery and cool-down routines. This will help maximize and achieve a better rest position to help prevent muscle soreness and injury post-workout.

[JENN]: You've been part of the fitness industry for a long time, about 14 years—or I should say the physical therapy industry. Have you seen the industry changing in terms of education and philosophy? Do you think neurologically that the methodology such as PRI will continue to have a bigger influence on the way trainers train?

[JULIE]: In my career in the fitness industry, I started off as a personal trainer, a strength coach, an athletic trainer and then I got into physical therapy.

I don't see the basic training changing anytime soon. I think the industry is pretty stuck in the way things are initially taught, but the best trainers, coaches and therapists continue to push educational boundaries and seek out post-graduate or post-credential educational opportunities. I see these people influencing the industry markets with their web presence, and this is going to continue to grow and evolve.

Social media and other technological advances help people learn and stay connected with like-minded movement professionals regardless of where they practice. The web will help people in the journey of learning PRI or other neurological-based movement approaches. I think we're going to hear these are incorporated more frequently into people's educational track, and changing people's philosophies.

I also see PRI and neurological-based movement approaches growing simply by supply and demand. Neurology will always win, and eventually more people will catch on to how valuable it is to incorporate neurological principles into fitness or movement programs.

If you attack movement first by applying traditional musculoskeletal and orthopedic principles, you will eventually be behind the curve as more people get wind of how powerful neurological-based movement is in producing long-term successful outcomes.

[JENN]: What's your opinion regarding the team approach? Do you think this could be better utilized in the industry as a whole?

[JULIE]: I'm a huge advocate for getting multiple disciplines to work together under one roof.

PRI teaches and is an advocate of integration with other professions. Once a year Ron Hruska puts together an interdisciplinary integration seminar where we bring different disciplines together to talk about concepts we see in postural restoration.

The concept of a team approach is something I hope the industry learns to embrace for the sake of job satisfaction and long-term successful incomes. Some of the best training facilities around the country already get this and are working in a more integrated way, combining expertise and specialization.

We don't need to cross over into each other's scope of practice, but we need to learn how to communicate, work together and embrace relationships to help maximize clients' outcomes.

[JENN]: Is there evidence that exists to support PRI? Is there research that supports PRI?

[JULIE]: Absolutely. The Institute is built around sound, scientific principles. If you look under each course on the PRI website, there's a reference link. The reference will link to multiple research studies talking about the principles.

At the Postural Restoration Institute, they have dedicated space to a reference library. There are a ton of resources in that library, where you can visit the Institute, but most importantly, the way PRI works is you're constantly doing experimental designs on every client you teach.

I've always been a big test-retest person. What I mean is, I've always techniques where I test baseline measures and do a technique. Then I retest that technique and retest the baseline measures that were initially tested.

That's one of the reasons why I was so attracted to PRI because they use this A-B-A single-subject experimental design with every client. If your clients are not showing objective changes, you don't do PRI. You refer out, possibly to integrate with another

discipline, or you abort PRI, try something else, or refer to a doctor. If the anatomy is not changing or if the tests aren't changing, there's a reason.

If you're big on understanding what the research says, there's research to support the principles, but most PRI practitioners like myself are clinicians. I'm a clinician first, a mentor and educator second, and a researcher last. I don't have any desire to do research, but I respect there's a need for it.

If you're a researcher and are looking for a good research study, connect with a PRI clinician. We would love to have more researchers on our team to help get the word out, support the literature and help there be supportive literature for people who need that evidence base.

[JENN]: Is there anything else you'd like to share about PRI as a system?

[JULIE]: I'd like to take a couple of minutes to explain some of the language unique to PRI, as well as introduce one of the key concepts of the system. That's the assessment of the diaphragm, ribs and the zone of apposition.

In the language of PRI, we talk about polyarticular chains of muscles. The chains of muscles are used to help teach and communicate about patterns we commonly see in anyone who walks or breathes. Yes, that's pretty much everyone.

We see a common pattern of postural kinematic movement dysfunction among all human beings. When you start looking for the patterns, it's amazing how people fall into various easily treatable categories.

The four pair of chains we talk about in PRI influence movement and control around an axial skeleton. The balance of these chains is needed for balanced reciprocal activity, which includes breathing and walking.

Through the PRI objective tests, we can tell when one chain is more active or dominant than its mate. When this occurs, it causes an undesirable rotational pattern to act on the axial skeleton. When the axial skeleton becomes torqued, the body will

continue to move in compensatory or degenerative ways.

The four pair of chains in PRI are the AIC chain, the PEC chain, the BC chain and the TMCC chain. These chains all influence each other through their connection to one of the 'S' bones.

The AIC chain is the anterior interior chain, located on the anterior side of the body, interior to the intrinsic core. It includes muscles like the diaphragm, the iliopsoas, the lateral quad and hamstring down the lateral outside of the leg to the knee. It attaches the middle of the body—the diaphragm—to the outside of the knee.

There are two AIC chains—one on the right side of the body and one on the left side. When the right AIC chain activates, it pulls the right hemi-pelvis forward, rotating the pelvis to the left, pushing a person into a left stance. When the left AIC chain activates, it pulls the left hemi-pelvis forward, rotating the pelvis to the right, pushing the person into a right stance. We often find the left AIC chain is the more dominant chain.

The BC chain is the brachial chain, covering the anterior neck and chest. We have a right BC chain and a left BC chain. When the right BC chain activates, it pulls the thorax forward and rotates the thorax to the left. When the left BC chain activates, it pulls the thorax forward and rotates the thorax to the right.

For a common understanding, a left AIC chain and a right BC chain, and vice versa, work together for contralateral global patterns or reciprocal gait.

PRI's language also contains a lot of acronyms. You might hear FAIR, AFIR, ST, GH and HG. When you hear those acronyms, the first letter describes what is moving. The second letter describes what it's moving on. The last set of letters describes the direction of movement.

If you hear HGIR versus GHIR, HGIR is the humerus moving on a glenoid in internal rotation, whereas a glenoid moving on a humerus into internal rotation would be like the closed-chain movement of that motion.

With AF and FA, FA is when a femur is moving on an acetabulum, and AF is when an acetabulum is moving over a femur.

We also have ST and TS. ST is looking at scapulothoracic mechanics on a ribcage, and TS is looking at the thoracoscapular influence of how the thorax is moving underneath the ribcage.

The last thing is the zone of apposition. The zone of apposition is the zone of healthy diaphragmatic movement a thorax should have the capacity to move through. When you inhale, the diaphragm contracts and the fibers shorten to flatten out and descend the diaphragm.

When you exhale, the diaphragm lengthens to ascend and dome up inside of the thoracic cage. As you exhale, the ribcage and spine has to have the available motion to move downward so the diaphragm can dome up inside.

When the ribs lose the ability to move in and out of the zone of apposition, the ribs will lose the ability to reciprocally move and rotate, and the spine loses the ability to flex and rotate. The assessment of how the ribcage moves as a unit and how the ribs move in and out of inhalation and exhalation patterns is important for flexion and rotational-based exercises.

The right and the left diaphragm are not the same size. The right one is larger than the left. It's held in a better position to move in and out of the length-tension relationships because of its orientation with the liver.

The right diaphragm is used in respiratory activity more than the left, so we often see a hyper-inflated left chest wall. The right diaphragm fills up the left chest wall and the left diaphragm fills up the right chest wall.

When you look at a person's chest wall and you see a left hyper-inflated chest wall or a right lower shoulder, think about PRI. When the right diaphragm contracts, it fills up the left chest wall and the thorax will begin to rotate to the left. When the left diaphragm contracts and fills up the right chest wall, the thorax will rotate to the right.

In gait, if you observe the thorax rotating to the left, you're going to see more of a left arm swing behind the body as the person is walking away from you. You might see the right arm being held at its side and the right arm is not swinging. If you see this gait pattern, think about PRI.

I also encourage listeners to start looking at infrasternal angles, ribcage orientation and movement associated with abdominal use. The abdominals and obliques cover the ribcage. The external obliques come up and attach to the lower eight ribs.

If the ribs aren't moving upon exhalation, the oblique abdominals are probably not working because the back is so tight. The ribcage needs to have the flexibility to take the abdominals in and out through the length-tension relationships.

We want to make sure to keep the ribcage mobile. We want to keep back tone down, so the abdominals and the ribcage can move in and out of core activities.

[JENN]: Do you have a way people can contact you if they have questions and are there resources people can check out?

[JULIE]: Absolutely. They can reach me via email at [julieblandin@hotmail.com](mailto:julieblandin@hotmail.com). I can also be found on the Postural Restoration website at [posturalrestoration.com](http://posturalrestoration.com).

I encourage people to contact a PRI clinician in their areas to learn more, or contact the Institute where they'll be more than happy to help direct someone on an educational journey, or to provide more information.

[JENN]: Excellent. Thank you so much everyone for joining us.