

Functional Assessment of the Pelvic Floor

By Joseph Schwartz

Introduction

The pelvic floor is often overlooked and misunderstood during movement assessment. The pelvic floor is integral to both breath and movement.¹ This is good news, as it allows us to use movement to assess the pelvic floor. This is important because of the sensitivity of the pelvic structure. More invasive approaches like direct palpation of the pelvic floor compromises safety of both practitioner and client. Starting with movement assessment builds safety in the nervous system. In addition, movement assessment also allows pelvic floor assessment to be accessible to practitioners where direct contact with the pelvic floor is out of their scope of practice.

There are a few principles of movement assessment to consider with pelvic floor assessment. These include functional assessment, the biomechanics involved, and how to keep the container safe. Differentiating how the nervous system is responding from structural response becomes the foundation of functional assessment. Next, we need a clear understanding of the biomechanics involved. Because the pelvic floor is fundamental to the breathing apparatus, the pelvic floor is virtually participating in every possible movement. And perhaps most important, how we keep the container safe. The pelvic floor is a sensitive, limbically driven, aspect of our structure, and we must use caution so that we do not overstimulate the nervous system.

What is Functional Assessment?

Let's break down functional assessment to its essence. There are two major categories to this process: nervous system and structural response. Each has unique nuances and progressions.

The first category is nervous system response. The nervous system must be normally responsive in order to proceed with any form of assessment process. This establishes a baseline that we can continually return to. Without this baseline we would not know when the nervous system shifts from the parasympathetic mode to the arousal of the sympathetic mode of the autonomic nervous system.

¹ "Due to their contribution to modulation of intra-abdominal pressure (IAP) and stiffness of the sacroiliac joints, the pelvic floor muscles (PFM) have been argued to provide a contribution to control of the lumbar spine and pelvis." https://www.researchgate.net/publication/6500075_Postural_and_respiratory_functions_of_the_pelvic_floor_muscles?fbclid=IwAR2odT5W2DZr3AYb1xRI1O4rE058zMp78I6qy6M8PqFtA8NINOUOwoZFy24

With a no/low load of stimulus, the nervous system should have the capacity to respond appropriately, or act normally responsive. This is the parasympathetic mode of response. We can define normally responsive in a few specific ways.

One way to define normally responsive is to assess how the nervous system responds to a specific stimulus. Mechanoreceptors have known responses when the nervous system is in the parasympathetic mode. Those normal responses change with the arousal of the sympathetic nervous system.² This is how we sophisticate from a flawed binary conversation with movement. We are not simply evaluating movement response. We are evaluating movement response in combination with nervous system response. In order to optimize our assessment, these two parts must be combined in a process to evaluate how the nervous system is responding to that movement.

The second aspect is structural response. There is a progression from gentle to provocative, and from simple to sophisticated. We use incremental progression so that we can find the specific threshold where the nervous system has the capacity to appropriately respond to the point at which that movement stimulates the arousal response of the sympathetic nervous system. This is the sweet spot where we can then further vet the causation of sympathetic response.

When we are working with the pelvic floor, caution must be exercised. The pelvic floor is limbically connected to survival, elimination, sex, and reproduction. Our spectrum of experience ranges from pleasant to traumatic. Those experiences then become associations. Those associations have thus embedded the neurological inputs that occurred at the instance when the event became an experience. When we stimulate the pelvic floor with breath or movement, we are also stimulating the associations that are related to those past experiences. These experiences and their associated sensations may be conscious or unconscious. While working with the pelvic floor, monitoring the arousal of the sympathetic nervous system is essential.

² “sympathetic hyperactivity are factors of influence for the development and maintenance of musculo-skeletal disorders...for the first time the modulatory action exerted by the sympathetic nervous system on muscle contractility and motor unit discharge rate has been investigated during voluntary contractions, in individual motor units, and under physiological sympathetic activation in humans.”
https://www.ncbi.nlm.nih.gov/pubmed/17036216/?fbclid=IwAR16siBO7IZnxN9TvtiAGYOoGCUYpHNGrSO37_KXVDv7vFypkgcgMygL9ug
https://www.ncbi.nlm.nih.gov/pubmed/18818247?fbclid=IwAR16siBO7IZnxN9TvtiAGYOoGCUYpHNGrSO37_KXVDv7vFypkgcgMygL9ug

Just as our client's nervous system is vigilant with perceived threat, as practitioners we must be vigilant to toning down any perceived threat during assessment. The movement progression that I take you through below is a potent assessment set that has the potential to over stimulate limbic associations. In order to keep the container safe, we must ask the nervous system if it is safe along the way.

The Breathing Apparatus

This is a general overview of the breathing apparatus so that we can specifically focus on how the pelvic floor is interacting with breath and breathing. The Intrinsic Kinetic Chain, virtually affects every system in the body: the symphony of biomechanics, four circulatory systems, and the nervous system. The Intrinsic Kinetic Chain is truly remarkable.

The four circulatory systems are comprised of two unique attributes: two passive and two active systems. The circulation of cerebrospinal fluid and the lymphatic system are passive systems; movement acts as the pump for these systems. On the other hand, the cardiovascular and pulmonary systems have active pumps - the diaphragms. The pelvic floor is the diaphragm at the bottom of our core cylinder. As such, the pelvic diaphragm is highly responsive to breath and breathing.³

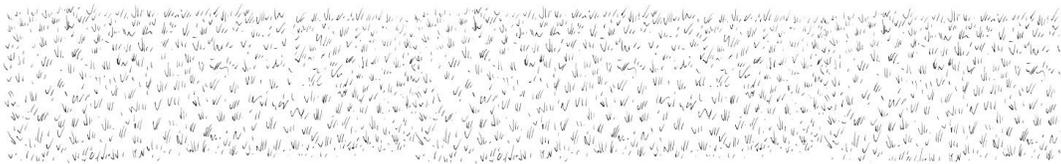
The pulmonary system is also referred to as an oxygen-carbon dioxide exchange. The lungs are essentially a sponge, they have no contractility capacity on their own. Instead, the lungs rely on pressure differential between the intra-thoracic cavity and atmospheric.

As intra-thoracic pressure drops, atmospheric pressure fills that void. Likewise, as intra-thoracic increases, the gases in the lungs are expelled into the atmosphere. This also could also be described as soaking and squeezing.

Likewise, intra-thoracic pressure is also in relationship with intra-abdominal pressure. In a normal breathing response, this relationship is functionally opposite. During the inhalation phase, intra-abdominal pressure is going up and intra-thoracic pressure is going down. The opposite is happening during the exhalation phase, intra-abdominal pressure is going down and intra-thoracic pressure is going up.

³ "The results of this study suggest that PFM strengthening exercises should be included in respiratory rehabilitation programs because the PFM can affect diaphragmatic motion and pulmonary function."

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4540829/?fbclid=IwAR0K7TQxIjQlxx_ShwsQ3fjPc3B80rMTZ0GshvzFjEwyukR-hvnlwUi1mOs



During these breath phases, the thoracic diaphragm is an upward facing dome, and the pelvic diaphragm is a downward facing dome. During a normal breath, these diaphragms move in sync. Both moving upward or both moving downward.

Because these domes face in opposite direction, their muscular action is also opposite. During the inhalation phase the thoracic dome is moving downward in concentric action while the pelvic dome is moving downward in eccentric action. The opposite is

happening on the exhalation phase. During the exhalation, the thoracic dome is moving upward in eccentric action and the pelvic dome is moving upward in concentric action.⁴

Recognizing the phases of breathing and its relationship to pelvic dome action is important for the assessment process. If we evaluate in the opposite action to phase, we create a paradox for the nervous system. While evaluating the paradox is necessary, we must still honor incrementally challenging the nervous system. We start with normal soma response before paradoxical.

The paradox of normal breathing response refers to the circumstances when the biomechanics are moving out of sync. There are reflexive survival strategies when this occurs. The startle reflex is one of these strategies. The startle reflex is a fear response where our nervous system interprets impending harm. For example, you're walking across the street, and a car approaches and honks its horn. Your body has a response. This response is a reflexive movement resulting from the arousal of the sympathetic nervous system: flight, fight, or freeze.

Paradoxical breathing up-regulates our sympathetic nervous system. Depending on frequency, and stress tolerance, our nervous system can and will adapt to paradoxical breathing as 'normal.' This keeps our nervous system sympathetically driven and in a state of chronic stress. Sadly, chronic stress is an epidemic in our stress-reward culture.

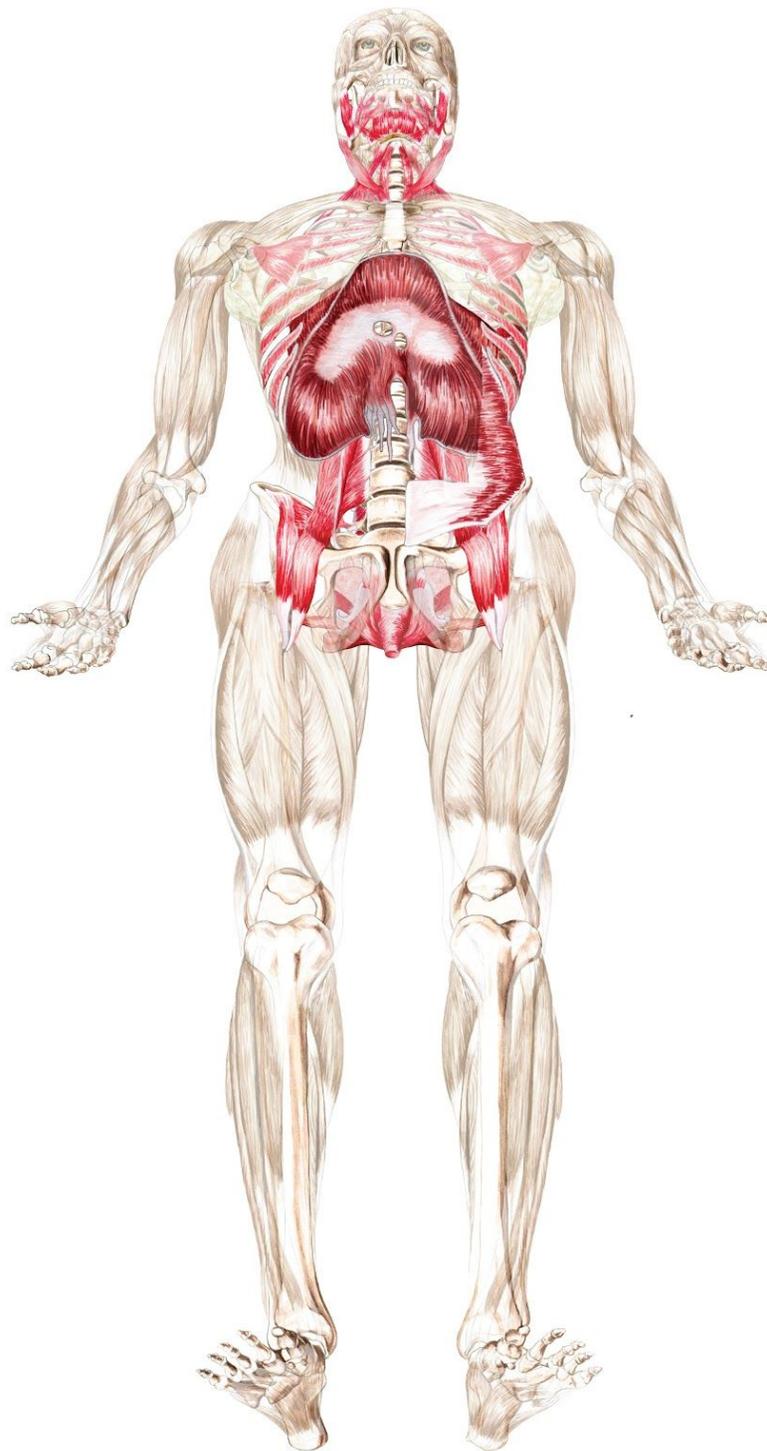
Assessment of breath integration and restoring appropriate breathing response is paramount to the regulation of the parasympathetic and sympathetic nervous system. This is why we draw the analogy "The one ring to bind them all" in reference to the Intrinsic Kinetic Chain.⁵

⁴"These data confirm that activity of the pelvic floor muscles is influenced by respiration; activity increased during both inspiratory and expiratory efforts. Furthermore, the data convincingly show that pelvic floor muscle activity is more closely coupled with changes in activity of the lateral abdominal muscles (TrA, OI and OE) than changes in intra-abdominal pressure. Although intra-abdominal pressure differed between inspiratory and expiratory efforts, pelvic floor and lateral abdominal muscle EMG did not....These findings provide further evidence of tight neural coupling between the activity of the pelvic floor and abdominal muscles during function. This suggests that coordination of abdominal and pelvic floor muscle is likely to be important and rehabilitation of pelvic floor dysfunction."

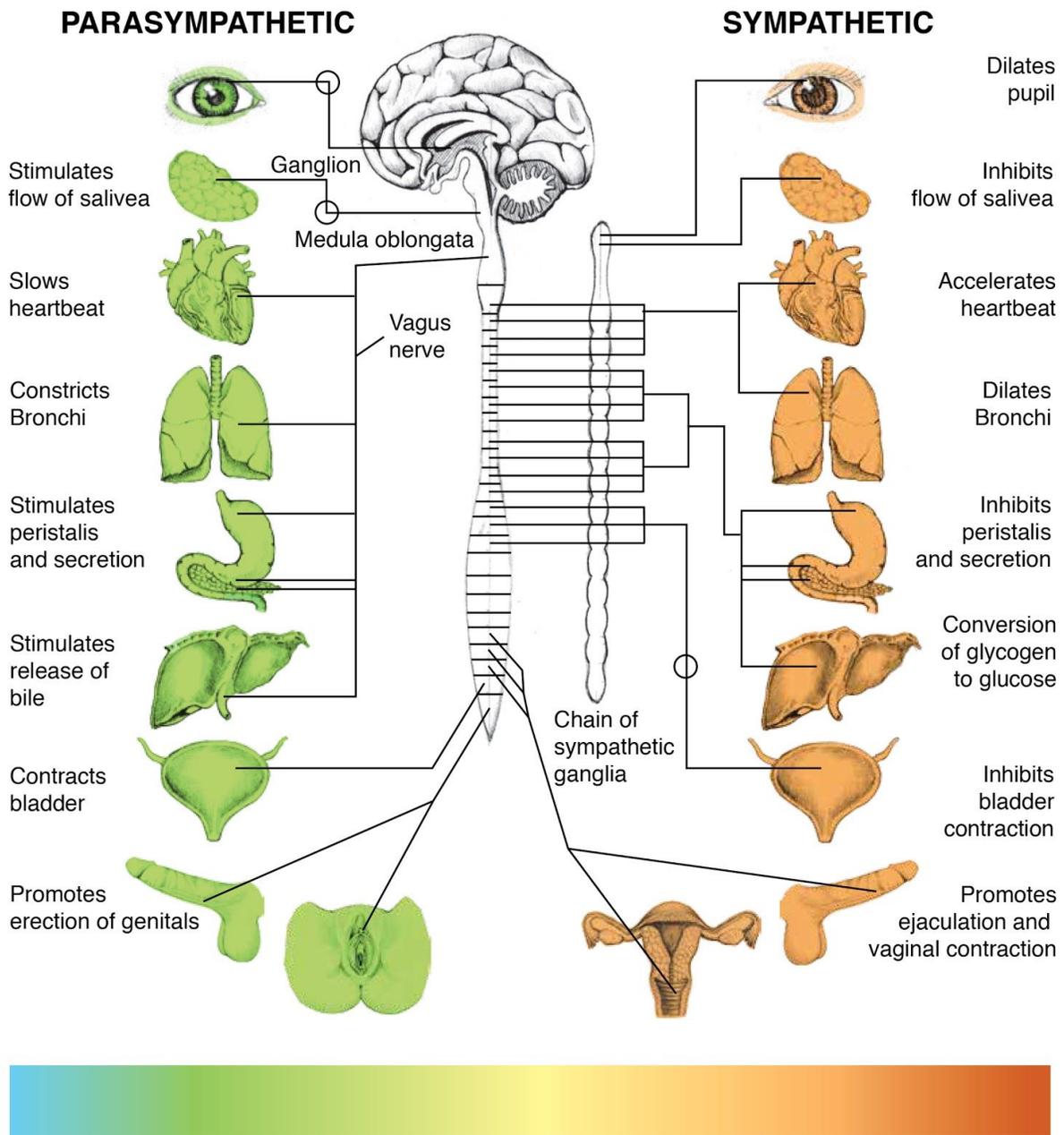
<https://www.ics.org/Abstracts/Publish/46/000390.pdf?fbclid=IwAR1nid0997ISQ3RyQAFVMpQ8eHvjnoRoJkIieSTOHX3V9gQDGuu0PUwbxQ>

⁵ Schwartz, Joseph (2016) The 5 Primary Kinetic Chain: Desktop Edition

<https://dna-assessment.com/the-5-primary-kinetic-chains/>



The illustration of the Intrinsic Kinetic Chain provides a visual reference how the pelvic floor is integrating with breath and breathing. [Click to read more about The 5 Primary Kinetic Chains.](#)



The Autonomic Nervous System

The autonomic nervous system is the regulator of bodily functions. The monitoring of the function of our organs, glands, and circulatory systems is largely unconscious. We do not have to think about these functions. Breath and breathing, the quality of our breath, is one conscious action we can do that can directly affect the autonomic nervous system.

The peripheral autonomic nervous system has two divisions: the parasympathetic and sympathetic. The parasympathetic division is regarded as rest, digest, and rejuvenate. When our nervous system is in the parasympathetic mode, we feel safe. When we feel safe, our bodily processes can recover and restore. Our innate healing process happens when we feel safe. Conversely, the sympathetic division is regarded as fight, flight, or freeze. When our sympathetic nervous system is aroused, we go into reflexive survival mode. Its main priority is to keep us safe from perceived threat. This is an absolutely necessary function, as we have survived as a species because of our capacity for the sympathetic nervous system to keep us safe.⁶

Heart rate variability is one tangible benchmark for evaluating parasympathetic/sympathetic regulation. Anatomically, the pericardium shares connective tissue with the thoracic diaphragm. Movement of the diaphragm affects heart rate. Heart rate in turn affects parasympathetic sympathetic regulation. Stress tolerance is measured by the ability for the heart rate to increase to the threshold of cardio respiratory distress and then the recovery time it takes to return to a resting rate; this correlates to the capacity to sympathetically arouse the autonomic nervous system and the time it takes to down-regulate back to the parasympathetic mode. While this is a provocative assessment of autonomic regulation, the more subtle parasympathetic/sympathetic response occurs with each breath we take. When we focus on our exhalation, we are encouraging parasympathetic response.

The phrases of breath also affect our autonomic nervous system. During the inhalation phase, the thoracic dome is moving downward. This concentric action acts on the pericardium tissues causing the heart rate to increase. The nervous system response to this is stress, resulting in the arousal of the sympathetic nervous system. The converse is true for the exhalation phase of the breath. When we exhale, the thoracic dome is moving upward in eccentric action. The eccentric action acts on the pericardium tissue restoring perceived safety, the heart rate decreases, and the sympathetic nervous system down regulates back to the parasympathetic.

Our breath becomes an access point where we can directly affect our autonomic nervous system. For centuries, martial and yogic practices have been manipulating breath to build stress tolerance to both internal and external environment. For example, expert level marksmanship is skill that includes breath manipulation. At the bottom of

⁶ “We feel that the accumulated evidence provides new insight that should be used as the impetus to rename motor neurons along the entire neuraxis according to more consistent principles.”

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5641259/>

the exhalation, the control pause, the marksman has optimal access to their skill sets.⁷ In between each heartbeat, is the optimal stillness from movement. It is in this sweet spot the marksman will find maximal accuracy. We all have the potential to find the stillness of that in-between space. However, it requires a process of incrementally challenging the nervous system to develop that capacity.

Incremental Progression

The following progression has been refined over decades of my personal practice. Consider this a roadmap for gently and incrementally challenging the capacity of the nervous system to respond appropriately to movement.

Important: This is not a starting point. Working with the pelvic floor is only appropriate after engaging the preliminaries of creating safety in the container. This starts with qualifying that the nervous system is normally responsive, followed by some global assessments, and then dissecting each of the local building blocks of movement. The first two intrinsic subsystem muscle groups, the sacrospinalis/multifidus and transverse abdominis should be thoroughly vetted and mapped before pelvic floor assessments. This progression is then added to the mapping process, while being mindful not to over stimulate the nervous system. Overstimulating the sympathetic nervous system will not only lock you out from having a productive conversation with the nervous system, it can also escalate the symptoms of the individual. These symptoms are the coping strategy that their nervous system has engaged to keep them safe.

Pelvic floor movement cannot be assessed using feed-back strategies. The pelvic floor can only be assessed with movement in feed-forward strategies. This actually has many advantages. The motor planning stage of movement allows the nervous system to capitalize on its preferred strategy. This gives the practitioner optimal opportunity to assess the nervous system. Completing the Feed-Back loop is one of The 5 Essential Skills of [Dynamic Neuromuscular Assessment](#)[™]

⁷ Sonnon (2006) FlowFit: Breath Mastery
Sonnon, Scott. (2008). Prasara Yoga: Flow Beyond Thought. Rmax.tv Publications.

Incremental Progression: Movement Assessment

Combination

The combination of external and internal pelvic floor (PF) assessment utilizes movement of the appendicular skeleton to act on the pelvic floor.

bi-lateral internal femur rotation ~ anterior PF concentric/posterior PF eccentric
bi-lateral external femur rotation ~ posterior PF concentric/anterior PF eccentric
supine clamshell - use one block for the fixed leg so the feet have height differential, feet are ischium distance apart ~ fixed leg PF side is isometric/ clamshell side PF is eccentric

Concentric

The concentric action of the pelvic floor is commonly known as the Kegal. We can get very specific with the concentric function of different zones.

pee-gal ~ cutting of the stream of urine

poo-gal ~ contraction of the anus

va-gal ~ drawing the vagina up and in

Paradoxical

cough/sneeze ~ diaphragms moving away from each other

Intra-abdominal pressurization ~ diaphragms moving toward each other

startle response - flexion and bi-lateral appendicular internal rotation with inhalation and intra-abdominal pressurization.

Note: The startle response is a high level stimulus that would only be used if all previous movements are normally responsive.

Eccentric

supine dead bug position - hands to knees stacking the joints from shoulders to ankles.
Gentle counter activation, long full deep breaths.

Note: Eccentric PF activation is a high level stimulus that would only be used if all previous movements are normally responsive.

Global

Continuing to advance the movement challenge. These challenge the integration of the appendicular skeleton acting on the core cylinder.

Dead bug variations:

closed chain hands

closed chain feet

open chain

contralateral arm/leg extension

Blowing up a balloon ~ these challenge the integration of movement and developing intra-abdominal pressurization

closed chain feet

open chain

bicycle feet

Intra-abdominal/intra-thoracic balloons activation - this is the highest level movement stimulus that simulates cardio respiratory distress.

Caution: Balloons activation is only for highly conditioned athletes

Summary

The pelvic floor is a highly sensitive structure that is often overlooked in the assessment process. When working with breath and breathing it is absolutely essential that the pelvic floor receives appropriate assessment. Restoring appropriate nervous system response to the pelvic floor can have profound if not life changing benefit for your clients.