

Functional Anatomy of the Pilates Core

An Illustrated Guide to a Safe and Effective
Core Training Program

Exam Edition

Evan Osar and Marylee Bussard

NielAsher.

Advanced Trigger Point Techniques



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Marylee Bussard

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Abbreviations

ANS	autonomic nervous system
ASIS	anterior superior iliac spine
BAS	Breath Activation Strategy
CNS	central nervous system
DMS	deep myofascial system
FAI	femoroacetabular impingement
GERD	gastroesophageal reflux disease
GI	gastrointestinal
HIIT	high-intensity interval training
IAP	intra-abdominal pressure
ITB	iliotibial band
KI	kinesthetic intelligence
PMA	Pilates Method Alliance
PNS	peripheral nervous system (can also stand for parasympathetic nervous system)
SIJ	sacroiliac joint
SMFR	self-myofascial release
SMS	superficial myofascial system
SNS	somatic nervous system
TFL	tensor fasciae latae
TL	thoracolumbar
TLJ	thoracolumbar junction
TPC	thoracopelvic canister
TVA	transversus abdominis

Introduction to the Pilates Principles

1

“Why boast of this age of science and invention that has produced so many marvelous wonders when, in the final analysis, we find that man has in the race for material progress and perfection, entirely overlooked the most complex and marvelous of all Creations—Man himself!”

J.H. Pilates in *Your Health*, 1934

By the time he wrote these words, Joseph Pilates was fifty years old. He was living in New York City at the height of the Great Depression, having left behind his native Europe during the short peace between two world wars. His life also corresponded with an unparalleled pace of discovery and invention that utterly transformed civilization, in the form of the automobile, airplanes, color photography, sound movies, radio, television, penicillin, and the theory of relativity. For all the rapid change and upheaval of the early twentieth century, Pilates could scarcely have imagined the “marvelous wonders” that were waiting for humanity, just around the corner. And yet, in today’s Internet Age, Joseph Pilates’ call to remember the body, “the most complex and marvelous of all Creations,” resonates across the decades with more relevance to people living today than ever before. Why boast of all

our accomplishments, wrote Pilates, when we have lost touch with our very own bodies? Our bodies, organic and receptive, have adapted to changing work and home environments, deferentially molding themselves to the technology upon which we have come to rely. This trend is famously captured in the cartoon that charts man’s evolution from primate to bipedal hominid, to early human hunter, to modern slouching desk worker. An unfortunate by-product of our “race for material progress and perfection,” in other words, seems to be a profusion of humans with chair-shaped spines.

Against civilization’s overwhelming historical march towards “progress,” Joseph Pilates stood—with his strange machines fashioned from reconfigured wheelchairs, bedframes, and beer kegs—to re-enliven humanity, as do

we who carry forward his work today. The son of a gymnast and a naturopath, Pilates put forth a model for physical life that enabled modern people to reconnect with their natural somatic instincts. It is said that, as a child, Pilates spent long hours in the woods

watching animals, and that the movements of stray cats provided inspiration for him during his wartime internment on the Isle of Man, where the early seeds of what we now know as Pilates took root in his mind.

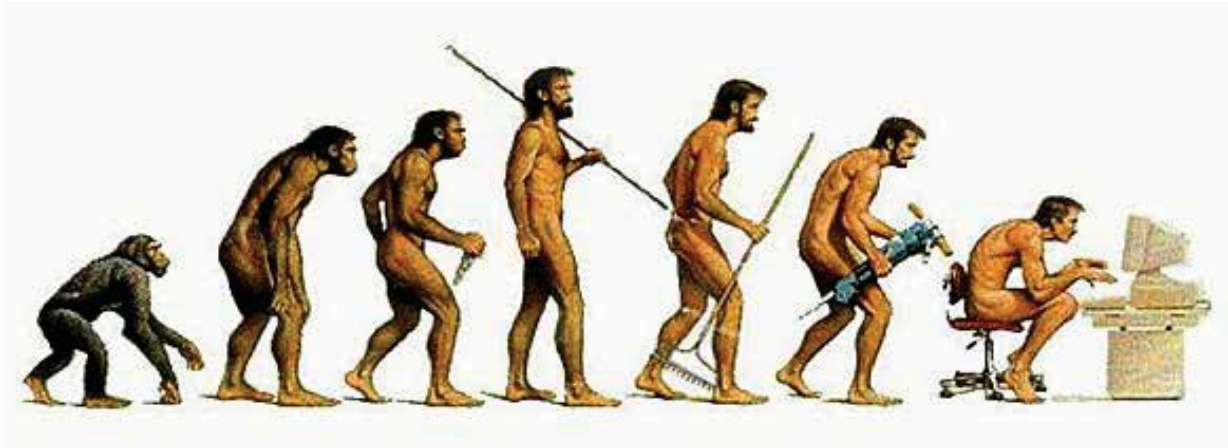


Figure 1.1: Evolution from primate to bipedal hominid, to early human hunter, to modern slouching desk worker.

Eventually, he brought these keenly developed powers of observation across the Atlantic to bear upon the deteriorated physical state of his fellow urban dwellers in New York. He criticized the “brutalizing training regimens” and “artificial exercise” widely considered to be the path to health but which seemed to him to disregard scientific and functional principles. He decried the misguided ways in which children’s innate physical intelligence was stifled by adults, “whose physical and mental balance was either deranged or, perhaps, never even attained.” Perhaps it is no coincidence that back pain is now the leading cause of disability globally, stifling productivity and enjoyment of life for countless numbers of otherwise prosperous people of *all* ages.

My (Marylee’s) grandmother was a little girl living in New York at the time Pilates wrote these words. Two generations later, I watched helplessly as failed back surgery after failed back surgery robbed her of vitality. With all of technology’s promise of a more connected world and a better quality of life, no quick-fix device or innovation has emerged in the past century to reverse the growing incidence of age- and lifestyle-related spinal disorders. It is common to assume that these kinds of degenerative change are just an inevitable part of the aging process, but I think Pilates was on to something. If everyone could find a way to restore what was stifled and eventually lost in the children Pilates observed, then maybe we could rewrite our own twenty-first century endings and remain active and pain-free until our final days.

The Lost Wisdom of Kinesthesia

It has been said that you cannot outsource exercising; in other words, no one can do it for you. We would add that you cannot “tune out” truly functional exercise. Today, many exercise programs emphasize fast pace and high intensity, in the hopes that we can squeeze more benefit into shorter workouts. Like the “brutalizing training regimens” Pilates described in the early twentieth century, for the average person such workouts leave little room for *subtlety, centering, precision, curiosity,* and awareness—all principles that awaken the “innate physical intelligence” to which Joe was referring.

Fortunately, more and more personal trainers, physical therapists, and body workers are beginning to grasp the importance of kinesthetic awareness—how our body moves and the ability to be “present” in our body and aware of its sensations. Without kinesthetic intelligence, we are disconnected from our bodies; we miss out on the physical dance of life, and many of the body’s countless daily requests to adjust, stretch, and express itself physically are tuned out, making us more prone to stiffness, pain, injury, and degenerative changes. Science is beginning to support the notion that the *quality of our attention* can have transforming effects on all systems of the body: neurological, circulatory, respiratory, visceral, psycho-emotional, energetic, and myofascial. Slowing down and paying attention so that kinesthetic awareness can awaken is—or at least, ought to be—the very essence of the rehabilitative process.

The great news is that holistic fitness programs like yoga and Pilates are now widespread. From enlightened Baby Boomers who suffered overuse injuries during the “no

pain, no gain” fitness days of the ‘80s and ‘90s, to college and pro sports teams, people who need a sustainable exercise strategy are looking to us. This growing trend foretells a shift, not just in the nature and content of our workouts, but also in the role of exercise itself as an indispensable piece of the healthcare continuum. With a growing aging population and lifestyle diseases such as diabetes, heart disease, and osteoporosis on the rise, the general population requires sensible exercise choices that nurture functional strength and awareness in preference to punishing routines and unrealistic goals.

Pilates instructors are uniquely positioned to lead the way in this holistic fitness revolution. Whether your Pilates training is “classical” or “evolved,” Pilates is, and always has been, a corrective exercise program at its core, conceived and designed to restore modern (wo)man to a more optimal alignment and more efficient patterns of movement. During the past fifteen years in particular, practitioners from diverse disciplines—including dance, gymnastics, yoga, Feldenkrais, manual therapies, personal training, sports medicine, and physical therapy—have added new dimensions to the work of Joseph Pilates. With this book, we bring together ideas from these various fields to help ensure that this century-old program remains as relevant and beneficial today as it was in Pilates’ time. We also hope that Pilates teachers and enthusiasts will gain a better understanding of the “complex and marvelous ... Creation” that we are. May the ideas explored here help you further Joe’s wish to enliven body, mind, and spirit and awaken you to your true nature.

Pilates for the Twenty-first Century

While considerable diversity exists in the ways that Pilates is practiced and taught today, six principles derived from Joseph Pilates' writings are widely accepted and cited in the Pilates community as the defining features of this exercise system. They are as follows: Centering, Concentration, Control, Precision, Breath, and Flow. Let's look at each of the six principles of Pilates through a modern lens. In particular, we will consider how these excellent foundational guidelines are reinforced and complemented by principles emerging out of recent discoveries in two dynamic fields of research: neuroplasticity and fascia.

Neuroplasticity is the brain's ability to reorganize itself by developing new neuronal connections. It was once believed that this ability of the brain to change itself was limited after a certain age, but in recent years discoveries have revealed that the brain is learning and changing throughout one's lifespan. We can leverage the brain's plasticity to create the changes we want to see in our lives, including our bodies.

The lessons of neuroplasticity suggest that practicing Pilates can be much more than executing graceful choreography to strengthen and elongate the muscles of the body. Pilates can also be a vehicle for creating a vibrant mind. Like food for the nervous system, curious and attentive states of mind attract new neuronal activity. Sensory nerves swim like fishes to those areas where our attention summons them, and in a Pilates session that can mean an oceanful of kinesthetic "swimming" and brain rewiring.

Being playful, interested, and exploratory in our routines and cueing fosters greater mental and physical dexterity. As we practice new skills and master subtle changes, we notice and

concentrate, try and fail, adapt and try again. Through this process, function improves, not necessarily because we will it to, but because the body discovers more-efficient options it previously did not know that it had. By this logic, Pilates is not only about precisely executing exercises; it is about exploring and adapting them in order to create new options for the body.

Fascia refers to the connective tissues of the body, including the alternately viscous, tough fibrous, and delicate web-like matrix within which everything inside the body floats. Previously considered to be mere "packing material" for the cells and organs of the body, fascia is now understood to be involved in much more. Because of its dense innervation with mechanoreceptors, fascia's role includes sensing and adapting to the mechanical forces placed upon the body. For example, wherever continuous loading occurs, the fascia reorganizes itself by thickening in response to the greater demand placed upon it. Most sports injuries relate to connective tissue (fascia) as opposed to muscles or bones, and increasing numbers of sports teams are beginning to incorporate exercises (like Pilates and Yoga) that improve fascial elasticity and resiliency.

There is also an important perceptual dimension to fascial training and fascial injury prevention, which we will discuss next.

Exercising the Neuromyofascial System

In fact, the brain/nervous system and the muscle and fascial systems are intimately intertwined. Pioneers in the developing field of exercise known as *fascial fitness* (Robert Schliep, Divo Muller, and Tom Myers), as

well as specialists focused on improving brain function through movement and exercise (such as Anat Baniel, who is a protégé of Moshe Feldenkrais and works with adults and children with developmental and cognitive impairments), offer scientifically grounded

insights into improving function in what many are now referring to as the *neuromyofascial system*. In the next section, we will explore how these discoveries can transform your Pilates practice.

The Six Pilates Principles (Reimagined)

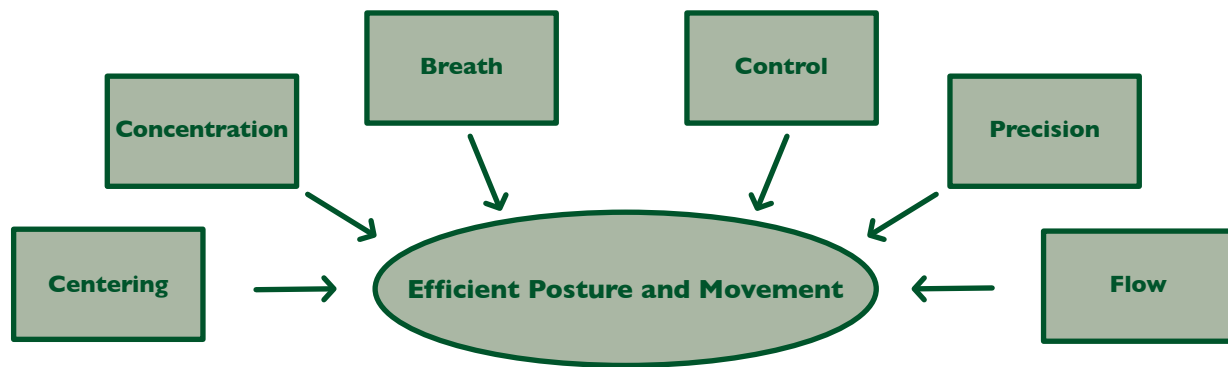


Figure 1.2: The six Pilates principles (reimagined).

I. Centering

The principle of **Centering** is Pilates' *defining characteristic*. This principle reflects Joseph Pilates' understanding that all movement begins and emanates from the center. The center of gravity of the body lies in front of the sacrum, about three finger-widths below the navel (this is known as the *lower dantian* in martial arts). As we move through our daily activities, this center of gravity shifts when we carry shoulder bags and use our arms and legs for reaching and balancing. Core stability enables us to coordinate these varied movements with grace and efficiency.

The Pilates Method Alliance (PMA) has recently articulated two additional Pilates principles, which could also be considered an extension of the principle of Centering: *whole body movements* and *balanced muscle development*.

Whole Body Movements

The Pilates system of movement is a holistic exercise program that emphasizes whole-body conditioning. This is one of the characteristics that make Pilates such a natural method for exploring fascial fitness concepts. Dynamic, whole-body movements and stretches are inherent in the Pilates repertoire, a departure from the single-muscle focus of traditional stretching and weight training. A fascial approach to exercise tends to focus on stretching and training long myofascial chains of muscles in movements that are more functional and intuitive, as an animal might move or stretch.

Balanced Muscle Development

Centering is not only about functionally coordinating the proximal and distal structures of the body. We can also think about it as achieving a functional balance of deep and superficial tissues (i.e., tissues

proximal and distal to the joints). Later in this book, we discuss what happens when local (deep) stabilizers become inhibited and global (superficial) muscles become overactive or adopt a bracing strategy. Performing Pilates exercises under a watchful eye is an excellent way to identify and correct these patterns and we will show you how.

2. Concentration

Concentration is the *state of mind* we cultivate in a Pilates session. Joseph Pilates insisted that his exercises be performed purposefully (as opposed to, in his words, “just going through the motions”). To practice his method absent-mindedly, as just another set of callisthenic exercises, would mean missing out completely not only on the corrective nature of the system for the human structure, but also on its ability to revitalize one’s entire sense of well-being.

Principles derived from both fascial and brain research support this idea. “Movement with Attention” is the first of Anat Baniel’s nine essentials, and it states that, as the brain organizes the movement of the body, so does movement organize the structure of the brain. From a fascial perspective, we know that the fascia is home to ten times as many sensory nerve receptors as the muscles. When we move in a distracted or uninterested way, we restrict the communication of sensation to the central nervous system; this contributes to a habit of sensory dampening, which can lead to dysfunction and injury. In contrast, by paying attention to our movement, we are enhancing kinesthesia and proprioception, improving function over time and reducing the likelihood of injury.

We can think of the Pilates principle of Concentration as the principle that conveys the importance of our *state of mind* during exercise. There are several ways we can

purposefully direct our state of mind during Pilates to unlock the full benefit of the exercises. Some suggestions from fascial and brain fitness include:

- **Awaring:** We can train our minds to be alert and aware (Baniel calls this awaring)—that is, we can generate awareness by noticing what is going on around us.
- **The learning switch:** We can learn to recognize whether the brain is in a learning state, or not. We only learn new things when we direct our attention towards learning—that is, when we turn the *learning switch* on. Baniel aims to activate the learning switch in her movement lessons, and so should we, as Pilates teachers and students.
- **Variety:** In order to remain alert and interested, the brain and the fascia require *variety*. Variation in activities can help you avoid getting stuck in rigid patterns of thinking, feeling, and being. When environments offer fresh and unexpected challenges, the mind and body stay awake and adaptable. The Pilates studio provides infinite ways to keep the mind engaged and the body pleasantly challenged. The Pilates apparatus enable us to work with different movement patterns in different planes of gravity. You should experiment also with movement *qualities* (e.g., tempo, micro-movements vs. fuller range, intensity, or “volume” of muscular contractions, focal points, etc.). Whatever you do, do not make the mistake of repeating the same routine or cues over and over again until you or your student begins to mentally “check out.” To offer and receive the greatest benefits to mind and body, keep it fresh.
- **Enthusiasm:** Another Anat Baniel essential asks that we summon *enthusiasm* as a way of communicating to the brain that something we are working on is important. Like the previous examples, enthusiasm is a state of mind that puts the brain into a learning mode.

- **Pleasure:** One of the most effective ways to train the fascia, according to Tom Myers, is to follow the *pleasure principle*. In other words, moving in ways that feel good and natural, and noticing how you feel, is good for your brain *and* your fascia.

3. Breath

Joseph Pilates wrote that, before the full benefit of his method could be obtained, breathing must be corrected. Restoring the **Breath** is the *foundation* for Pilates. This process is a biomechanical, neurological, and even spiritual one.

As our constant companion, and our most immediate anchor to the present moment, the breath is a gateway to awareness. The simple act of focusing on the breath can have tremendous benefits for the autonomic nervous system, offering a shift out of our daily fight-or-flight, hustle-and-bustle state and into a state of relaxation. The brain-fortifying effects of meditation are well documented. If focusing on the breath for an hour a day were the only benefit of a regular Pilates practice, it would be life changing for many people.

But as it turns out, breathing is also a key component of core stability. We will discuss the biomechanics of breathing in a later chapter and we will also explore how to identify faulty breathing habits (and how to overcome them) with the help of the Pilates repertoire.

4. Control

Joseph Pilates originally called his exercise system *Contrology*, so named because he taught his students that if they practiced his exercises daily, complete control over all the movements of the body would result. **Control** was the *goal* of the Pilates system. This process of developing incredibly finely

tuned awareness and physical dexterity was what we today call *building kinesthesia*, kinesthetic intelligence (KI), or “waking up” areas of the body. For example, learning to roll through the spine, not treating it as one long board but as individual bones moving one at a time, demands a dynamic interplay between stability and mobility that is delicately coordinated by the nervous system.

If we consider control as the goal of Pilates, then we might consider Anat Baniel’s eighth essential, “Imagination and Dreams,” as a natural extension of this principle. “Imagination and Dreams” states that imagining new possibilities stimulates the neuronal connections in the brain and helps us overcome our present limitations. The Pilates principle of Control, which stems from Joe’s radical idea that the average person could develop total mastery of the body (essentially “waking up” every muscle in the body), was visionary in his time, and still is today. What an inspiring possibility! This radically imaginative quality of Contrology’s creator, the dream of new physical possibilities, is something that we as Pilates practitioners should strive to preserve. In doing so, we will be stimulating our minds and stretching ourselves to new levels that we may not have imagined for our practice.

5. Precision

Precision is the high *standard* asked of Pilates practitioners and teachers, and it is also the *prerequisite* for change.

This requirement for precision is the reason why the same Pilates exercise that is appropriate for a total beginner is just as likely to challenge a competitive athlete. Many people, including some athletes, have unwittingly adopted inefficient muscle activation strategies and have become good

compensators in their activities of daily life and play. Through the requirement of precise stabilization and movement patterns, our individual weaknesses are revealed. This allows awareness of our usual patterns and helps us discover a more efficient approach.

Performing exercises correctly and with precision may require you to start all over, to become a beginner again. This can be unsettling at first, but to gloss over this principle is to proceed with a false sense of accomplishment, as overeager muscles may continue to dominate, masking the decline of the primary muscles better suited to the task. Whether athletes or desk jockeys, many of us have adopted some faulty compensatory patterns of movement, and these unfortunately take us only so far before we develop acute or chronic injuries. The reward of doing the precise work to correct these patterns is a deeply rooted strength that can sustain and enrich the body through a lifetime of physical activity.

To the Pilates principle of Precision, we can add the Anat Baniel essential, “Slow.” The idea here is that you cannot make a change or master a new skill unless you slow down. Moving fast only grooves in patterns that are already automatic. Cueing a client to move slowly is a way to wake up the brain when it has fallen into a habitual mode of doing. Slowing down a great deal enhances perception and allows changes to be made.

Another Anat Baniel essential, “Subtlety,” states that when we reduce the amount of force, we increase the brain’s sensitivity and thus its ability to perceive differences (essential for the brain to learn and be successful). This essential supports the case for incorporating lower-load exercises into all training regimens, particularly those with a corrective aim. When we encounter chronically stiff or unstable patterns in our clients, we can conclude that

these areas lack kinesthetic nuance. Bringing awareness of subtle differences through observation, touch cues, and rhetorical questions—such as “How does it feel when you lift here?”—can spark the brain’s search for more-efficient movement choices.

6. Flow

Unlike the previous principle, where slow and precise movement is emphasized, **Flow** is the pinnacle expression, where we learn to bring the right amount of coordinated effort to the exercise, always recognizing and adjusting for jerky, bulging, heavy, or overly braced movements.

Psychologist Mihaly Csikszentmihalyi described Flow as a state of focused absorption in the activity in hand, in which the skill of the participant and the challenge of the activity are equally matched. The result is a sense of timeless, egoless engagement, not that different from what Anat Baniel describes as a state of total awareness in which the brain functions at its highest level.

Some Pilates teachers consider Flow as a reward to be enjoyed only once a student has mastered fundamental patterns. As the previous principle suggests, we cannot change our patterns when we move fast; we can only do what we already know how to do. For the beginning Pilates student, “flowing” for 60 minutes in a class setting is likely to direct their focus away from the kinesthetic nuances that are so important to, in Joe’s words, “attaining physical and mental balance.” If we are more focused on keeping up with others than on the subtle points of the exercise, then Pilates loses its depth and becomes just another group fitness class.

But at the same time that mastering foundations is important, flowing can also

encourage sensory exploration and learning, especially when done to one's own rhythm. We suggest exploring basic movement patterns—that have also been learned slowly—in this way, and then moving on to compound movements. Executing choreography in sync with others makes a beautiful performance, but in a Pilates class, dance to your own inner rhythm and never sacrifice the other Pilates principles for this one.

We can add another dimension to our traditional understanding of Pilates Flow by considering the elastic nature of fascial tissue. We all are familiar with the idea that muscles contract and change length, pulling onto “passive” tendons, which cross the joints and generate movement. Fascia researchers have discovered another, highly efficient, mechanism of movement, referred to as the *catapult mechanism*, or *elastic recoil*. In this model, the muscles do not change length, but the fascial tissues store and release tension, like a spring; this is how kangaroos create their powerful jumps. Training with this mechanism in mind can improve resiliency and stamina in physical activities such as running. Fascial fitness specialists recommend incorporating bouncing movements, preparatory counter movements, and soft and flowing “ninja-like” hops into the movement repertoire. Whether through jumpboard work on the reformer, or creative adaptations of other Pilates repertoires, there is ample opportunity for training this elastic quality of the fascia within the Pilates context, and about which we will offer some ideas later in the book.

Other Tips from Fascial and Brain Research

Although the following ideas do not fit neatly within the six Pilates principles, they are useful tips for Pilates practitioners nonetheless:

- **Sustainability:** Fascia changes more slowly than muscle, and outside change may be hard to perceive right away. Have patience, because the cumulative effects will be felt and seen in the form of a stronger and more resilient fascial architecture.
- **Recovery and rest:** Pay attention and take regular, purposeful breaks to allow fascial tissue hydration.
- **Flexible goals:** Anat Baniel points out that we have as much to learn from failure as from success. Stay curious and encouraged, even when you cannot do an exercise.

The Functional Core

The Role of the Thoracopelvic Canister

2

Joseph Pilates aptly named the core the “powerhouse” of the body. Throughout this book we will refer to the core, or the “powerhouse,” as the *thoracopelvic canister* (TPC). The TPC consists of the thorax (thoracic spine and ribcage), the lumbar spine, and the pelvis. Together, this osseous framework, along with the soft tissue structures (muscles, fascia, and ligaments), forms an anatomical canister. Unlike an actual rigid canister, however, optimal function necessitates that the TPC also be flexible.

This chapter will discuss how core stability is developed, including which muscles are involved as well as the systems and strategies that are used to create optimal levels of stability for efficient movement. It will also look at the ramifications of a non-optimal TPC stabilization strategy for the development of common postural and movement dysfunction. The goal of this chapter is to leave you with the fundamental knowledge about how TPC (core) stabilization is achieved so that you:

- possess a working knowledge of how the TPC functions that is substantiated by a blend of the industry’s best practices, available research, and clinical observations and anecdotes;
- have an understanding of how inefficient TPC stabilization strategies develop, and are able to identify the common signs of a dysfunctional strategy;
- have the tools and awareness to institute a corrective exercise strategy and progressive exercise program that helps you or your clients achieve lifelong health and fitness goals.

A highly integrated system is required for developing and maintaining optimal function of the TPC. How efficiently we are able to functionally control our TPC depends on the coordination of three key systems: the nervous system, the osseoligamentous system, and the myofascial system. These systems are seamlessly coordinated to provide the stability and control required to produce

efficient posture and movement. While we will touch briefly upon each of the systems, the focus will be primarily on the myofascial system, since this system provides us with the access—a “way in,” so to speak—required for developing, improving, and influencing the function of virtually every other system.

The Nervous System

The nervous system governs every function in the human body. It constantly monitors the information it receives from the proprioceptors located in the skin, muscles, fascia, ligaments, and joint capsules, as well as from the somatosensory system—the visual and vestibular systems—and uses this information to determine the most efficient strategy for stabilization and movement.

The nervous system is developed and maintained through the right amounts of diverse physical and intellectual stimulation. Child development perfectly exemplifies how neuroplastic we are in our early years; virtually every day it is possible to notice developing levels of motor control as well as increases in intellectual and emotional aptitude. These early months and years of development are crucial for forging the neural networks required for posture and movement throughout our lifetime. Crawling, for example, develops the TPC (core) and contralateral limb control that will ultimately be required for efficient upright posture and gait.

Improve Neural Connections

Unfortunately, because of our sedentary lifestyle, lack of diverse physical stimulation, and artificial types of exercise, our posture and movement patterns often begin to deteriorate. The great news is that because our nervous system retains neuroplastic qualities

throughout our lifetime, by incorporating the proper types and amounts of physical and intellectual challenges, we can improve at any age. Pilates then becomes an excellent medium through which we improve the neural connections—as well as develop some new ones—required for supporting a healthy and active lifestyle.



Figure 2.1: Crawling develops the TPC (core) and contralateral limb control.

Divisions of the Nervous System

The nervous system is the control system for our body; everything that happens within our body is driven by, and influences, the nervous system. It comprises two primary divisions (Figure 2.2): the central nervous system (CNS) and the peripheral nervous system (PNS). The brain and spinal cord make up the CNS, while the PNS is composed of the cranial and spinal nerves. The CNS processes and integrates the information provided by the PNS and sends out the appropriate commands required to elicit a specific activity or bodily function.

The PNS is further subdivided into the somatic and autonomic nervous systems. The somatic nervous system (SNS) controls the skeletal muscles, fascia, joints, and skin and is the region that controls our voluntary muscle activity. The autonomic nervous system (ANS) is responsible for our smooth muscle, cardiac muscles, and glands; essentially, it is involved in the bodily functions that keep us alive. Although it is largely under subconscious control, we can develop some control over our visceral, cardiac, and respiratory systems with conscious attention and through specific training. For example, through diaphragmatic breathing and getting into a relaxed mental state, we can consciously lower our heart and respiratory rates.

The ANS is further divided into the sympathetic (fight-or-flight) and parasympathetic (rest-and-digest) nervous systems. Because of our fast-paced lives, technology-driven overstimulation, lack of adequate rest, stimulant dependency (caffeine, medications, etc.), and daily responsibilities, many of us in this modern society live our lives in a sympathetic-dominant state. Being able to consciously lower our heart and respiratory rates through a proper breathing strategy is of huge benefit, as we can quickly move from a sympathetic-dominant state to a more parasympathetic one. The longer we are able to exist in a parasympathetic state, the more our bodies can efficiently carry out the functions required to thrive (digest, repair, detoxify, reduce inflammation, etc.) rather than just survive. This is an important component in developing overall health and longevity as well as in improving posture and movement.

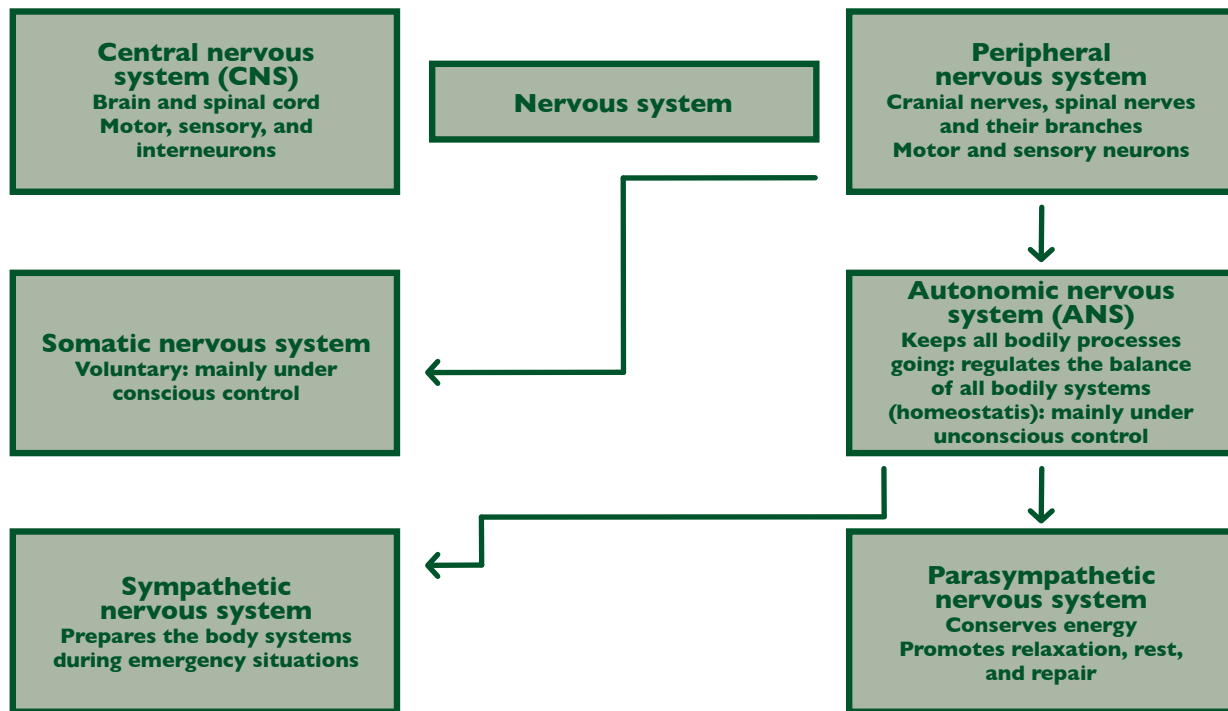


Figure 2.2: Central and peripheral nervous systems.