Developmental Patterning

As mentioned in Chapter 1, we all move through roughly the same stages of early motor development from conception to walking. This process of neuromotor development is complex, yet the stages are predictable. Traditionally, the therapeutic application of developmental patterning has been to treat children and adults with movement pathologies. Developmental movement specialist Bonnie Bainbridge Cohen changed that when she developed an experiential learning process for developmental movement patterns and began teaching her approach to healthy adults. Most of the information in this chapter is based on her work.

Serious problems in neuromotor development can result in severe developmental disabilities and retarded growth, although minor gaps are common. Although we all pass through roughly the same movement stages, each person's journey is unique. Every person has some developmental stages that are strong and others that are weak. But humans are extremely adaptable and can overcome developmental movement gaps with clever compensations. Weaknesses in some stages are balanced by strengths in others. A healthy baby will find her own unique pathway to standing and walking, despite many obstacles. The unique compensations that people learn during neuromotor development underlie the exclusive style of each person's somatic traits.

A study of early motor patterns can be the most direct route to the source of body problems rooted in developmental processes. It leads us on a journey back through the discoveries, moods, and frustrations we experienced in infancy and early childhood. Since this approach is a systematic review of the series of developmental patterns, it illuminates weaknesses and gaps in sensorimotor learning, which can be provocative. This study can take a person directly into the developmental basement of the psyche and stir up deep psychomotor issues. Because early motor development predates verbal and cognitive development, students of developmental patterning often experience gaps as vague and frustrating movement problems that are hard to describe, difficult to comprehend, and overwhelming to feel. The psychological effects of developmental patterning are beyond the scope of this text, yet they are mentioned here to prepare anyone practicing the developmental exercises for these possible ramifications.

Still, the journey through developmental patterning has great value. Developmental patterning can uncover movement gaps, which in turn can point a person to the most effective corrective pattern for a specific movement problem. Developmental patterning addresses the root of most somatic patterns, thus giving us a chance to redo a learning process originally left to chance.

Although an infant doesn't [always] establish the most efficient pathway of development, that pathway isn't closed—its potential remains for future development.

—Bonnie Bainbridge Cohen
Although this chapter is about patterns of early motor development, adult movement patterns are also discussed to link the two and to provide assistance in identifying the developmental roots of an adult pattern. The developmental patterns are presented in two basic categories: the four neurological actions (yield, push, reach, and pull) and the eight developmental pathways (four correlate with patterns of the prevertebrate species, and four with the patterns of vertebrate species). While the prevertebral patterns and the vertebral patterns are presented here in a linear fashion, motor development consists of a series of revolving spurts, plateaus, and regressions in which the simpler patterns manifest then disappear as they are integrated into more complex patterns, and then reappear in more sophisticated coordinations. Thus, a person could approach developmental patterning in a linear mode or begin anywhere along the continuum by exploring a weak or undeveloped pattern.

THE NEUROLOGICAL ACTIONS

All movements are some combination of four basic neurological actions: yield, push, reach, and pull. Each action has a unique tone quality that spans a continuum from passive to active, compression to elongation, and inner to outer focus. One action underlies the next, and the tone of each action builds upon the foundation of the previous action. Yield underlies push, which underlies reach, which underlies pull. Most movements involve compositions of all four actions, yet a single action will crystallize and become evident during different stages of a movement sequence.

Push and reach patterns organize lines of force in the body, particularly through the skeletal framework. Push patterns take the body into compression and direct force inwards, organizing a compressed relationship between joints that work together in a chain. Conversely, reach patterns move the body out into the environment, stretching out any slack in the myofascias or compression in joints, and lengthening the body. A reach usually culminates in grasp and pull, the most complex of the patterns that draws an object toward the body or the body toward the object. When yield, push, reach, or pull patterns sequence through the entire body, they create a continuity of tone along the pathways of movement. If the force of a push, reach, or pull becomes blocked in a localized area, failing to make a complete sequence from one endpoint (hand or foot, head or tail) to another, the action is incomplete and usually inefficient.

Each person has affinities toward varying combinations of the yield, push, reach, or pull actions. Each action has a tone or personality that shapes the quality of movement in a person's tissues and posture. For example, a power lifter probably has strong push patterns, a ballerina probably has strong reach patterns, and an easy-going relaxed person probably has strong yield patterns. Also, one part of the body can have an affinity toward one action while another part has an affinity toward another, which will be evident in the resting tone of that part. Consider a person with a long, lanky upper body and compact, short legs, who probably has an affinity for push in the lower body and reach in the upper body.

Our upright human posture has a natural affinity toward pushing down with the feet and tail and reaching up with the head. During standing, a supportive push from the legs sends a counterforce up through the spine and head, but only if the force of the push sequences all the way through the spine. Push creates integrity in the intervertebral joints in the spine, particularly if the force of the push is traveling as close to the center of the joints as possible. This integrity provides a stable base for a reach or extension, with the head.

Ideally, each action sequences through the whole body with continuity. For example, when a person pushes something heavy, the force of the push can travel from his hands through his trunk and all the way into his feet. If he only pushes with his arms and shoulders, the push will not be as efficient.

Each of these actions can also be used as an antidote for body problems: the yield to relax tense areas, the push to stabilize and strengthen loose or disconnected areas, the reach to lengthen compressed areas, and the pull to enhance overall coordination.

Yield

To yield is to let down, to surrender on a deep, physiological level, and to generally relax. Some people mistake yielding for collapsing and going limp, but there is a difference.
Patterning Exercise #55: Yielding

1. **Yielding while resting**: Find a warm and quiet environment in which you can deeply relax. Explore yielding in different resting positions—on your belly, your back (called the "corpsé pose" in yoga), your side, or curled into a fetal position (PE Fig. 55a-b). Lie in whatever position is comfortable for you, then spend about 20–30 minutes yielding your body's weight into the supporting surface underneath you.

2. On each exhalation, feel and/or visualize your body sinking down through the floor. Sense and/or imagine your body melting into and merging with the earth. How heavy can you get? How deeply can you let go into the supporting surface under you?

3. Again, while still focused on yielding and resting, mentally scan your body—head, neck, ribcage, pelvis, right arm, left arm, right leg, left leg—allowing weight to sink through each part. Then mentally scan your organs—brain, throat, heart, lungs, stomach, liver, kidneys, intestines, and bladder—allowing each area to sink and become heavier.

4. **Yielding your upper body while moving your arms**: Lie on your back (PE Fig. 55c). Raise your arms toward the ceiling. Sense your shoulders and upper body sinking and relaxing as you move your arms in different ways, such as moving them in small circles, or slowly folding your arms across your body and then slowly unfolding them.

5. **Yielding your back while moving your legs**: Pull your knees to your chest and let your back relax, sink, and widen (PE Fig. 55d). Slowly lower your legs, one at a time, while continuing to yield in your back. Explore flexing and extending your legs while keeping your lower back relaxed and heavy.

6. **Yielding organs while moving limbs**: Explore yielding your organs as you move your arms or legs. For instance, imagine your kidneys or lungs as sandbag counterweights on your legs or arms; as you raise a limb, yield and sink through these organs (PE Fig. 55e).

7. **Yielding while moving with the "sandbag body"**: Lie on your back. Slowly roll to your side. Imagine your body as a sandbag with liquid sand slowly pouring into the side you are rolling toward. Continue to roll from one side to the other using the image of liquid sand to help you yield into changing sensations of internally shifting weight.

8. **With a partner**: Have a partner lie comfortably in a prone or supine position. Scan your partner's body and notice where you sense she is unable to yield. To see if you're both on the same page, ask her where she feels tension and wants to yield and relax. Then place your hands on this area, allowing your hands to be heavy and relaxed to encourage your partner to yield and sink in this area (PE Fig. 55f). Gradually move your hands over her whole body to help her yield throughout.

9. **With a partner you trust and are comfortable making physical contact with (a good partner choice for this exercise is a lover because it could bring up intense and perhaps sensual feelings)晨, lie down together in a comfortable position. One of you can hold the other, or cradle each other in a spoon position. Then consciously focus on yielding together, melting and merging into each other as well as into the supporting surface under both of you. Afterwards, discuss how it felt.

The ability to yield reflects the ability of the autonomic nervous system to let down into a deep parasympathetic state of relaxation. Yielding can be learned through practicing relaxation exercises, sensing body weight releasing into the floor, working with nurturing touch, or exploring slow, organic movements. Yielding sets the physiological baseline from which all changes in tone arise, a topic that will be revisited. Since yielding underlies the other three neurological actions, beginning patterning with relaxation training recapitulates the developmental processes.

A primitive reflex that underlies resting tone and is associated with yielding is the tonic labyrinthine reflex. It is stimulated by tactile receptors in the skin and the movement of tiny inner ear "stones" called otoliths. For example, as a person rolls on the ground, tactile stimulation to the skin and the direction the otoliths fall increase the tone of
Stimulating Yielding with Touch and Movement

The four steps for eliciting the tonic labyrinthine reflex are: 1) slowly and gently move your client’s head, 2) wait for the fluid in the inner ear to settle, 3) feel the response and change of tone in your client’s body and spine, 4) nudge your client to move with the response.

To stimulate the tonic labyrinthine reflex while your client is lying on a massage table, first help your client sink into the table by using a weighted, mostly passive, fluid and nurturing touch, a quality of touch that encourages her body to trust your hands and to relax and sink under your hands. (See the Patterning Exercise #117 titled “Cellular Holding Exploration with a Partner” in Chapter 11.) Suggest that your client sense or visualize the fluids in her inner ear sinking to the back of her head and toward the ground, like pearls sinking through viscous liquid soap. Also, suggest that she sense the undersurface of her body melting into the support under her, and use your touch to evoke this.

Lastly, teach your client how to practice subtle organic movement while lying or sitting on a massage table or on the floor. (See Patterning Exercise #54.) As she slowly moves, give her a supportive cellular touch that encourages her to yield while moving. Make sure you follow her movement rather than directing her, unless her movement starts to get habitual and produce tension; then give her light nudges to encourage relaxation during motion.

the muscles on the underside of the body. Usually people associate relaxing with a decrease in tone, yet the tonic “lab” is an unusual reflex because tone rises as the body yields. This phenomenon is emphasized because it is a state the average person, particularly those with chronic fatigue, rarely reach. Most people function at a rest deficit. Reaching the point where the body relaxes as activity increases seems to be an advanced state of function, one that requires having many traditional elements aligned: nutrition, adequate rest, exercise, mental well-being, and the self-regulation of somatic patterns, including posture and movement.

When a person rolls from back to side to front, the oto-liths in the inner ear sink slowly through thick endolymph fluid in the direction of gravity and pull on tiny, cilia-like nerve receptors that stimulate the tonic lab reflex. The body yields in the direction that the head is turned, and flexor tone increases on that side. When the oto-liths sink toward the face, flexor tone increases along the front of the body. When the oto-liths sink to one side and that side yields into gravity, extensor tone balances with extensor tone. When the oto-liths sink toward the back of the head, extensor tone increases along the back of the body.

It is very important for the body to be physically supported in order for a person to learn to yield. Newborns need to be held with ample support, especially for the

Patterning Exercise #56: The Tonic Labyrinthine Reflex

This exercise is helpful for grounding, releasing rigidity, and release your body’s weight into its supporting surface.

1. Lie on your back with your knees straight or bent. Relax your back. Sense the resting tone of your body (PE Fig. 56a). Slowly roll to your side, then onto your belly. Then reverse the action and roll back to center, then over to the other side. As you roll, focus on the parts of your body making contact with the floor, allowing these areas to sink. Sensing your contact surface wakes up proprioceptors in the skin.

2. Now slow the sequence down, sensing each step of the exercise. Begin by slowly rolling your head to the right. Sense or imagine the fluid in your inner ear sinking into that side. Wait for and sense any changes in tone that you feel in your body. If the tonic “lab” reflex is active, you will feel your right side become heavy and have an urge to roll that direction. Once you feel this change, roll to the right side and rest (PE Fig. 56b). If you do not feel any change, still roll to the side, it may take awhile to wake up the reflex. As the oto-liths fall to the side, flexor and extensor tone balance each other out.

3. Next, slowly roll your head so that your face faces the floor and rest (PE Fig. 56c). Sense or imagine the fluid of your inner ear sinking toward your face. Wait for any changes in tone. You should feel the tone increase on the front of your body, which will pull your body into deeper flexion. Curl into a fetal curve and rest. As the oto-liths fall toward the face, flexor tone increases.

4. Reverse the motion by slowly rolling your head back to the side and rest. Sense or imagine your inner ear fluid sinking into your lower ear. Wait for any changes in tone. You will sense your body slowly and spontaneously uncurl from flexion. Roll back to the side-lying posture and rest (PE Fig. 56b).

5. Lastly, slowly roll your head back to the original position, so that your face is facing the ceiling and rest. Sense or imagine your inner ear fluid sinking toward the back of your head. Sense any tone changes in your body, then roll your whole body back to your original position, lying on your back (PE Fig. 56a). As the oto-liths fall toward the back of the head, extensor tone increases.

6. Repeat steps 2 to 5 on the left side.
head, until they develop tonic reflexes and equilibrium mechanisms in the eyes and inner ears to support the head when vertical (Figure 7.2).

The movement of the oto-liths within the inner ear along with visual input from the eyes gives a person feedback about where the body is positioned in space. When the information coming from the eyes does not match the information from the inner ear, a person is likely to suffer motion sickness or become nauseous.

Push

Push sends lines of force that either press the body up and away from what is being pushed against, or pushes something away from the body. The push begins when a hand, foot, the head, or tail presses into a supporting surface. During a push, the muscles around the active limb concentrically contract. The compression from the push loads the joints and condenses the tissues (Figure 7.2).

The compression from pushing also provides kinesthetic feedback about where the physical body ends and the outside world begins, increasing internal proprioceptive awareness and establishing a physical sense of containment and the psychological sense of boundaries. Cohen calls this sense a “mind of inner attention.” In contrast, a spiral reach extends the intervertebral joints, increasing the sense of external proprioception, or what Cohen calls the “mind of outer attention.” Push is an act of will that requires strength and inner focus. When it is time for the infant to separate from his mother, he literally pushes away from her, and begins to realize his autonomy.

Since our joints can only be compressed to a certain point in the push, once that point is reached, an action naturally sequences into another action. A push can culminate in a reach, or in a recuperative action such as a yield. This sequence is of the utmost importance because a push sustained over a long period will take enormous effort and

Patterning Exercise #57: Exploring Push and Yield

1. Sit in a chair. To yield, scan your body and relax any parts that you feel tension in, allowing these parts to become heavier. Imagine or sense the area you are focusing on either sinking or melting. Continue to yield. Let your bottom merge into the chair you are sitting on and your feet sink into the floor.

2. Sense the soles of your feet on the floor. Slowly push them against the floor (PE Fig. 57a). Make sure the entire surface of each foot pushes evenly. Push until you feel the counterforce of the push travel up your legs into your trunk, which will create a feeling of lift as it moves up your spine.

3. Let the push go, and yield your legs and feet into the floor. Once they are completely relaxed, push again, then yield again. Alternate yielding then pushing both feet at the same time.

4. Put both hands on the sides of your chair next to your hips. Yield the weight of your arms and hands into the chair without collapsing your thorax. Slowly push down through both hands, sensing how the force of the push travels up your arms into your shoulders and down your spine. Yield again, and sense how the yield sequences down your arms. Alternate yielding and pushing several times. Avoid hiking your shoulders (PE Fig. 57b).

5. When your are ready to stand, push your feet down to stand up (PE Fig. 57c).

6. Sit back down by aiming your sit bones toward the chair.

7. Explore alternating yielding with pushing in any limb (hands, feet,
cause chronic joint compression. A stubborn person who constantly “digs in her heels” may develop tension and pain from the damaging effects of bearing down. Reach elongates the joints, modulating the compression of the push. Yield relaxes the body, modulating the exertion of a push.

A push naturally follows the relaxed and weighted tone of a yield. The usual rhythm of a developing push in an infant alternates between cycles of pushing and yielding, similar to the rhythm of birthing contractions. In birthing, each push-yield cycle of the contractions increases with strength until the final push moves the newborn out of the mother’s body. After birth, the baby’s motor process progresses in a similar rhythm, only now the baby generates one push after another until he builds enough strength to push up to sitting and standing. Each push recruits more muscle fibers in a contraction, slowly building the tone a baby needs to shift levels. Each yield allows the body to recuperate from the exertion of the push, establishing a natural rhythm between cycles of action and rest. It is important that the push and yield modulate each other because a push without an underlying yield can be stiff, spastic, and tense.

Reach

Motor development involves simultaneous cycles of yield-and-push, push-and-reach. Whereas the push orients the body toward weight and gravity, reach orients it toward space and levity. Push compresses the joints and limbs, developing a stable, grounded connection in the body and base from which to reach out. Reach elongates the joints and limbs, extending a person into space and into relationship.

The head has a natural affinity for reach patterns initiated by its refined sensory apparatus—vision, speech, hearing, smell, and equilibrium. Of these five, people are probably the least educated about equilibrium mechanics, although they are the most crucial for balanced posture and movement. The semicircular canals in the inner ear provide feedback about when the head is upright and when it is not. The head rights on the body in a refined balancing reflex that requires a freedom of motion in the joints between the skull and first vertebrae. All too often this freedom is blocked by chronic neck tension, which also restricts blood circulation and nerve supply between the brain and body. Anyone who suffers tension headaches would benefit from learning how to reach with the head and exploring head righting reactions (see Chapter 11).

Push provides a base of support for the reach (Figure 7.3a-b). The transition from a push to a reach involves going from an internal focus to an external focus. Each time a baby pushes, she adds to the inner strength and stability in her body to be able to reach out without tipping over. A baby reaches toward her mother by extending her arms and head, which lengthens the muscles around the reaching limb. In an infant, reach initiates from intrinsic desires such as hunger or thirst, and as the baby grows, from a desire to explore the environment. The reach has an attitude of curiosity, a desire to extend into the unknown and interact with other people, to be connected with something outside of oneself, to be interested and motivated to learn, and to grasp new information and pull it in (Figure 7.4).

Reach extends the body beyond its sphere, pulling the joints open and elongating the limbs. A reach without an underlying push can be unstable and can hyperextend the joints.

Although the reach stretches the body, a reach differs from a stretch by the intention of its functional action and its ongoing rate. However, we can reach our way into a position of stretch and increase a stretch by reaching beyond it.

Whereas the push gathers a fixed strength to press away from something, the reach extends toward something with a single momentum and thrust. It is difficult to suspend a reach toward something without hanging in space mid-motion, although we do this when we reach through a stretch. Although reaching out increases the stretch, the motivation to stretch is intrinsic; it comes from a desire to lengthen tight tissues. In contrast, the motivation to reach is extrinsic; it comes from a desire to make contact with something outside of us.

Pull

A reach usually culminates in a grasp and pull. A pull occurs when we take hold of...
Patterning Exercise #58: Differentiating Push and Reach

1. While sitting on the floor, lean forward and push one hand into the floor as you reach with the other (PE Fig. 58a). Sense how reach elongates one arm while the push compresses the other arm.

2. Lie on your back on the floor in a comfortable position. Bend one leg, placing the foot flat on the floor. Straighten the other leg by reaching through the toes on that foot (PE Fig. 58b). Let the extension of the reach travel into the pelvis, lengthening your hip and back on that side. As you reach through your toes, keep your leg weighted and the back of your knee relaxed. Then push through the heel of the extended leg (PE Fig. 58c). Alternate reaching and pushing with your foot, and feel the difference between the two actions. Switch legs and repeat.

3. Now contrast a reach in the extended foot and leg with a push in the bent leg. Continue to reach through the toes of one foot while you push down through the sole of the other. Sense the contrast in tone between the two actions. How does it affect your hips? Switch legs and repeat.

4. Next, push both feet up toward the ceiling (PE Fig. 58d). Then contrast this with reaching through both feet (PE Fig. 58e). Sense how reach elongates the joints in your legs.

5. Finish by coming back to a spinal action. Do this by bending both legs and placing both feet flat on the floor, then simultaneously push down through both feet (PE Fig. 58f). Sense how the push in a closed chain (with the feet connected to the floor) compresses your joints all the way up through your spine. Compare this with a push of your feet through an open chain (PE Fig. 58d).

6. Explore reaching with one foot while pushing with the other as you walk.

something and draw it toward us or draw our body toward it. If the object being pulled on is stationary, our effort will pull the body toward the object (Figure 7.5). If the object is mobile (and light enough), we pull the object toward the body. Pulling leads to a shift in position or the acquisition of something new. Pull is motivated by both biological needs for nourishment and by maturation with its accompanying desires to grasp new experiences, take them in, and learn from them.

The action of pulling initiates from a desire to change relationship, either to pull the body from A to B, or to grasp something or somebody we want. The pull establishes lines of tension in the tissues as it sequences through the body. If the pull makes a contiguous sequence, its tensional forces will translate along an entire limb and/or the spine, elongating tissues from one joint to the next along a sequence between endpoints. But the force of the pull can become stuck in one part of the body if a person pulls against herself. For example, when a person stands from a seated position, a strong reach with the head can pull the entire spine up (Figure 7.6a). A simultaneous push with the feet will give the action even more efficiency. In contrast, a person might lift herself out of the chair using her arms, having one part of the body haul another part up in an awkward move made cumbersome by the lack of support from the underlying push and reach patterns (Figure 7.6b).

It is common in patterns of poor posture that one part of the body fixates against the pull of another. There are a lot of variations on this pattern. To name a few, people chronically pull the shoulders up or back, pull the head forward, or pull the elbows back, which distorts the neutral alignment of the spine (Figure 7.7a-b). These postures tend to weaken the integration between the limbs and

Figure 7.5 Pull with the arms
core, and they block the full sequence of an action, be it push, reach, or pull. Excessive pulls on already weak joints or tendons could predispose a person to injury. Seniors often tear their shoulders when they go to lift something heavy but lack the strength for the exertion. Then the force of the pull, rather than moving the object they intend to lift, pulls and rips the already weak tendons or muscles in their arms or shoulders. Contrast the man in the photo who pulls against himself, and then who pulls the hose (Figure 7.8a-b). A person who habitually holds the shoulders up toward the ears is actually pulling the shoulder girdle up off the rib cage. Older people often do this by pulling their shoulders up to their ears to lift themselves out of a chair. A more efficient way to stand up from sitting would be to push the feet into the ground, allowing the combined push of the lower body and the reach of the head to lift the body out of the seated position (see Figure 7.6a-b).

PREVERTEBRAL PATTERNS

Every person has an innate movement vocabulary that recapitulates the primary patterns of many species that preceded us in evolution. The earliest of these species—such as earthworms, jellyfish, and sharks—lack bony skeletons and hence are classified as prevertebral. The motor responses of the primitive invertebrates are incredibly fluid and amoeboid. For example, the pseudopodia flow of amoebas follows the path of least resistance, achieving locomotion by pushing a tendril out the cell wall, then oozing protoplasm into this newly formed tendril. These early patterns are most apparent in the fluid stream of undulations of newborn babies, yet as adults we can still retain these innate fluid qualities if our bodies remain flexible and intrinsically articulate.

This next section examines the prevertebral patterns of four invertebrates—amoeba, starfish, sea squirt, and lancelet—and their corresponding movements in humans—cellular, navel radiation, mouthing, and prespinal movement.

Cellular Movement

The difference between a response and a reaction is that the former is the result of an impulse to act, whereas the later is a reflexive "knee-jerk" response to a threat. Cellular responses are the building blocks of sensorimotor processes while cellular reactions are the bases of our defense responses. By understanding cellular movement, and even sensing or visualizing it, we can access this deep biological process within us to cultivate a foundation for inner motility in all patterning processes.

In unicellular organisms, such as the amoeba, physiological events occur either inside or outside the cell. The cell wall (plasma membrane) separates the organism from its environment. This semi-permeable and selective membrane allows some substances to pass through while keeping other substances out, thus functioning as a primitive nervous system that makes choices to regulate what substances move into or out of the cell. Multicellular organisms such as humans have extensive intercellular spaces (as discussed in Chapter 1). These spaces are filled with interstitial...
Patterning Exercise #59: Exploring Reach, Grasp, and Pull

1. To find energetic support for a reach, imagine something that you really want. It may be figurative, such as joy or good health, or it may be actual. Visualize it being several inches away from your fingertips. Allow your desire or visualization to wake up your fingertips. Feel the sensations this creates in your fingertips, move them a little, then reach from this feeling. Let the reach travel through your arms and into your trunk. How far can you feel the reach sequence into your body?

2. Explore reaching with your head, your mouth, your eyes, your ears, your tail, and your feet, initiating the reach by visualizing something you desire right of reach. How far can your limbs reach before your trunk is pulled along?

3. Now reach and grasp some movable object, then pull it toward you. Notice how your muscles work differently when reaching, grasping, and pulling.

4. Next, grasp onto monkey bars on a playground, or something stable around the house such as a door jam. Explore pulling your body toward it, then pushing away from it (PE Fig. 59b). Feel where you need to yield and push to reach to effectively and pull. Notice how one action cycles into the next. Explore pulling your entire body back and forth. Then contrast pulling while reaching with your tail, then tucking it under and not reaching with it.

5. Reach and grasp a seated friend's hand, then pull her to standing (PE Fig. 59c-d). In what parts of your body do you need to push to get the support to pull her to standing?

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fluid, which creates an inner “ocean” in an organism. The trillions of cells in the human body communicate with each other within this ocean on a systemic level via a multitude of floating chemical messengers such as hormones.

A point about which scientists have speculated is the idea that a rudimentary level of intelligence exists within cells, and it manifests in their fundamental ability to seemingly “make decisions” about what substances pass through their membranes. Biologist Bruce Lipton refers to this primitive system of cellular information processing as the “organellar equivalent of a brain.” Each cell has approximately one million docking sites for hormonal molecules that regulate many metabolic functions. Whether a specific hormone can latch on or not reflects a level of cellular consciousness. Thus each cell within our bodies is a body unto itself, with its organellar equivalent to a respiratory system, a digestive system, a muscular system, and so on. The cells actually breathe, taking in oxygen and expelling waste. Cellular respiration is the basis of cellular metabolism.

Communication occurs not only across cell walls, but also among many single cells, among large groups of cells within various tissues, and among body systems. Cellular communication even extends between people within a field of somatic, vibrational resonance that people feel as “vibes.” Positive vibrations are usually accompanied by an expansive sensation in the body, whereas negative vibrations tend to create a body sensation marked by tightening and contraction. This level of communication occurs most directly during tactile interactions.

As discussed in Chapters 2 and 4, touch elicits deep somatic responses. Tactile experiences are among the earliest stimuli thought to shape patterns of cellular consciousness. Touch elicits one of two basic responses: a movement toward or a retraction away from touch. These two patterns constitute the most primitive movement responses of single-celled creatures, a pattern basic to all systemic responses.

Whether or not a person can actually feel cellular processes is questionable, but we can certainly feel the effects of them. The placebo effect demonstrates the power of the mind to actually change the physiology of cells. Many of the somatic therapies seek to cultivate cellular awareness within movement and touch in order to access the innate intelligence of biological life; to affect it through sensory awareness, intention, and visualization; and to heal and enliven our body tissues. For example, Cohen uses cellular breathing and cellular holding as a basis for feeling cellular responses during somatic patterning (see “Body-Mind Centering” in Chapter 11). Also, people use cellular visualization to boost immune responses and evoke deep healing (see “Psychoneuroimmunology” in Chapter 13).
Navel Radiation

A cell is generally pictured as spherical with small tendrils extending from the center out. This radial pattern shows up again in the second prevertebral pattern of navel radiation, which is found in the starfish. To visualize the evolution from the single-celled creature to one with limbs, imagine tendrils of the amoeba extending out to form five limbs, and each limb moves in a pattern of radial symmetry to the core. The starfish pattern shows up in some of our earliest motor patterns, when movement begins to differentiate between the core and the limbs.

Newborns and infants often initiate movement at the navel, extending out or drawing in all the limbs in a simultaneous movement that initiates from an impulse in the belly (Figure 7.9). As infants gyrate in a continuous flow of organic, unformed movements, their limbs flex and extend from an impulse that initiates in the center of their bodies. A newborn baby will often throw his head back from movement that actually began in the belly.

Navel radiation underlies full-body movements that simultaneously extend or condense (draw in) the entire body in one coordinated action (Figure 7.10). Each limb has an equal relationship to the center, a pattern seen in the graceful extension of a sky diver or the tight curl of a gymnast doing an aerial somersault. The pattern is also seen in a jellyfish shooting through the water in an umbrella-like shape.

The photoreceptors on the ends of starfish limbs are reflected in the abundance of sensory nerve endings at the end of each human limb—the fingers, toes, face, and pelvic floor. This configuration enables the arms of a starfish to extend into the environment to gather sensory input. Likewise, our limbs enable us to sequence between our inner impulses and the outer world. Our hands and feet, head and tail, are, metaphorically speaking, the gateways to relationship.

Navel radiation is important for integrating the movement of the extremities with the core of the body. The spatial pathways that emerge in navel radiation encompass all the potential pathways into which the developmental movements eventually differentiate, such as spinal, homolateral, homologous, and contralateral (see Chapter 1 for definitions). If there are any weaknesses in the connection of any limb to the core in the pattern of navel radiation, this will show up in specific weaknesses in a more complex pattern during later stages of development, such as walking or running.

A reflex that underlies the pattern of navel radiation is called the Landau reflex. This reflex is obvious when babies lie on their bellies and extend all their limbs at the same time, assuming a “flying position” (Figure 7.11). Holding an infant face down and gently lifting it at the waist stimulates the Landau reflex in which all the limbs simultaneously extend in one action. If the Landau is strong, the core connection of the limbs to the navel will usually be strong, and vice-versa. Also, this early reflex organizes tone in the extensor muscles along the spine; therefore, an imbalance in the spinal muscles can be addressed by practicing the Landau.

Looking for Full-Body Integration in the Starfish Pattern

You can assess your client’s patterns through the starfish template. Watch her as she walks into your office, as you take a history, and during your opening discussion, looking for relationships in the movement between her limbs and navel. Imagine the arms, legs, and spine as “highways” for movement. Along which pathway is the flow of movement strong? Along which is the flow of movement weak? Where are there roadblocks? How do the patterns you observe relate to your client’s body problem?

While working with your client, suggest that she tune into a particular pathway. For example, when you give her traction in the neck, suggest that she sense it pulling along her entire spine through her navel down to her hips. Or have her reach through both feet while you traction her neck to make a vertical connection. You can also help her become more aware of the connection between her navel and limbs by slowly brushing each pathway (navel to one hand, the other to one foot, the other to the head, and then the tail). Encourage her to relax along each pathway. Be creative in helping your client gain an awareness of the connections along the movement pathways.

Making a full-body connection through all the pathways at once is integrating and helpful to do at the end of a session. To do this, suggest that your client reach through all her endpoints at once while you give each limb (including the head and tail) a gentle pull to take the slack out from her navel to her limbs and spine.
The Landau reflex underlies many athletic moves (photo courtesy of E. Foster).

The Landau reflex underlies integrated patterns of full-body extension that we see in many sports that require extension, such as a swan dive or skydiving (Figure 7.12). If a person has strong flexor tone, practicing the Landau could help develop more extensor tone (as in the case of Henry in Chapter 4). The Landau can also help integrate the movement of the limbs with the spine and coordinate full-body extension. The initial phases of the Landau can be practiced to activate and control the deeper stabilizer muscles along the spine, particularly the multifidi muscles. (See Chapter 9 for more information on this muscle.)

Mouthing Patterns

As first mentioned in Chapter 1, mouthing patterns recapitulate the patterns of a sea squirt, the primitive invertebrate that lives attached to the bottom of the ocean floor and filters all nutrients and waste products through its tube-like body. The sea squirt even births its offspring out the top. Some sea squirts have small openings on the bottom to secrete waste, which is akin to the bottom of a human’s digestive tract—the anus.

The mouthing pattern begins in utero when preborns start to suck their thumbs. A newborn’s world revolves around mouthing patterns (Figure 7.13). The smell of his mother’s skin stimulates the infant’s oral rooting reflex, causing him to search for the nipple. Rooting impulses

**Patterning Exercise #60: The Landau Reflex**

**Caution: If you have lower back pain or lower back problems, only practice the initial phases of this exercise (1–3), and consult a physician for an evaluation. Stop immediately if anything causes pain.**

1. Lie face down over a large physioball with your eyes closed. (If you do not have a ball, lie on your belly on the floor). Breathe and relax. Allow your limbs and spine to sink and stretch away from your navel on each exhalation (PE Fig. 60a).

2. Next, open your eyes and look at the floor (PE Fig. 60b). Feel the length and lift that this optical support gives your spine, especially your neck. (If you do not feel a lift, practice Patterning Exercise #3.)

3. Now slowly reach all the limbs out simultaneously, including your head and tail, fingers and toes. Keep reaching and rest your fingers and toes on the floor to balance yourself on the ball (PE Fig. 60c). As you reach, sense the connection of your navel to the ball, and balance all your limbs evenly around your navel. Allow the reach to lengthen your spine and limbs. Avoid hyperextension of the spine until you feel intrinsic muscular support in an extended position.

4. Raise your legs and balance for a moment, then lower them (PE Fig. 60d). Then raise your arms and balance for a moment, then lower them. Then lift your legs with the soles of your feet together and balance a moment, then lower them (PE Fig. 60e). Putting the soles of your feet together provides a midline connection that makes balancing easier.

5. While resting on your fingers and toes, reach through them until you feel the urge to lift all four limbs at once into a “flying” position (which indicates the Landau reflex has been activated). This will arch your spine into a long, gentle hyperextension (PE Fig. 60f). Hold this position as long as you can balance, then relax, letting your body drape over the ball and elongate. (If the Landau reflex was supporting your hyperextension, your spine will arch effortlessly. If the Landau was not supporting the movement, your back muscles will feel as though they have overworked, most noticeably in the lumbar and cervical regions.)

6. If your extensors muscles are weak, explore reaching your limbs out slowly, at whatever level you feel supported, without going into a full extension. If your extensor muscles are tight and chronically contracted, explore the first 3 steps of this exercise. This develops intrinsic muscles along the spine which helps the larger extensors to relax.
initiate a mouthing sequence that works its way through the baby’s entire digestive tract, milking nourishment along many twisting and bending tubes and pouches in the digestive organs, from head to tail. This process creates incredibly organic spinal movements, obvious as babies quietly wiggle, squirm, and push their inner processes along the digestive tract and spine between the head and tail. It is as though the churning and pushing movements were working paste through a tube. Movement at one end reflects movement at the other end, obvious on a grimacing and squeezing face as an infant pushes a pocket of gas out the bottom.

A starfish grasps its food by extending its primitive gut through a mouth out the end of one limb. Likewise, our mouth is the first limb to reach in the rooting reflex that is active right after birth. It is, in a sense, the end of the digestive tube reaching out. This action not only builds a baseline of tone in the digestive tract; it also has great musculoskeletal implications. Mouthing begins the differentiation of extensor tone along the spine, which is a segmental process, building tone in muscles along one vertebral segment at a time. Babies are born curled into strong fetal flexion; hence flexor tone precedes extensor tone. Extensor tone builds along the back every time the infant lifts her head to reach for the nipple or to look up. When the infant lifts her head to root, the small muscles at the base of the skull contract. The first time the infant lifts and extends her head to root, she rocks the head on the first cervical vertebra, which tones and coordinates muscles at the base of the head. The next time she lifts her head to root, the action strengthens another segment. Each successive movement engages more of the extensor muscles along the spine, and extensor tone progressively builds from the head to the tail. To visualize this process, imagine picking up the end pearl on a string of pearls, then the next time picking up two, then three, and so on. The small muscles along each vertebral segment develop in a similar progression. Thus, mouthing patterns underlie the postural mechanisms involved in head righting, in the development of postural tone along the spine, and in integrated spinal patterns.

Neuromuscular development follows a set pathway from the center out, the top down, the front to back, and the center or midline to the periphery. Movement initiated by the organs, such as mouthing, underlies neuromuscular coordination. This is apparent when we contrast the strength of the infant’s movement initiated by mouthing patterns and associated reflexes with the strength of muscles in a newborn’s neck and spine, which are not yet strong enough to hold the newborn’s head up. Mouthing movements evoke the asymmetrical tonic neck reflexes (ATNR), which underlie the homolateral patterns that will be discussed shortly. Mouthing movements also pattern hand-mouth coordination, which evokes a coupled joint motion of spinal side-bending with flexion. As an infant looks around and simultaneously reaches for the breast to root, this

**Patterning Exercise #61: Exploring Mouth and Throat Movement**

1. Get in a comfortable position and close your eyes. Become aware of the inside of your mouth, your tongue and teeth, your upper palate, and the inside of your throat. Lightly stroke your lips to wake-up sensation in them (PE Fig. 61).

2. Use your tongue to explore the soft tissue lining of your mouth. Cover the entire surface area: top, bottom, sides, front, and back. Keep your jaw as relaxed as possible as you move your tongue.

3. Next make slow random movements opening and closing your mouth, initiating the movement from the soft tissues on the inside in actions such as yawning, swallowing, gumming, and sticking out your tongue. Use the exploration to loosen and stretch your TMJ, jaw muscles, and tongue.

4. Now place your thumb in your mouth (make sure it’s clean!) with the pad of your thumb behind your front teeth on your upper palate. Gently massage your upper palate. Then start sucking. Notice how the movement gently rocks your head on your spine and sequences down your throat and neck. Keep your neck as relaxed as possible.

5. Then lie comfortably on your back. Explore turning your head by first reaching to one side with your mouth. (You might need to gently stroke the areas around your lips to wake up rooting reflexes in order to strengthen the initiation of movement with your mouth.)

6. While still lying on your back, explore rolling over. Initiate the movement by reaching with the mouth, then allow your spine to follow. To reverse the movement and roll back, initiate the roll reaching with your mouth. Roll again, yet contrast it from before by leading with the tail.
Using Mouthing Patterns to Relieve Neck Pain

A client named Sue came in with chronic neck pain. She had found relief through massage therapy and chiropractic, yet the pain always returned. During a patterning bodywork session, Sue explored both subtle movements of the mouth and tongue, and skeletal movements in the temporomandibular joint (TMJ) while her practitioner held trigger points in the chronically contracted muscles of her neck. The pressure helped Sue relax tight muscles; at the same time, the subtle mouthing movements helped her to engage and organize deeper muscles in her mouth and neck.

Whenever tight muscles release chronic tension, new muscles need to engage to support the area previously held in contraction. In this case, the subtle mouthing movements helped facilitate the intrinsic, stabilizing muscles along the spine, which, in turn, helped facilitate the release of chronically contracted, extrinsic muscles as well as the release of autonomic nervous system tension. Although Sue’s neck pain was complicated by numerous factors (facet joint damage, head injuries, car accidents), during this session, Sue became more aware of the tension she held in her mouth. She was then able to use this awareness to begin practicing subtle mouthing movements to relax her neck during the course of her day.

As adults, we follow mouthing impulses every time we eat. The smell or even thought of food can stimulate salivation and gustatory movements in a hungry person. The movement of the mouth is coordinated with the arms and spine so that we can reach out, grasp our food, and take it in.

Prespinal Movements along the Soft Spine

During early fetal development, at about 15 days, the structure of the fetus is similar to a small, eel-like creature called the lancelet. This primitive fish has a flexible yet stiff rod called a notochord that runs the length of the torso and is, in the fetus, the precursor of the bony spine (Figure 7.15a-b). As the fetus develops, the notochord is gradually absorbed into the spine and becomes the nucleus of the intervertebral discs.

The early fetus, like the lancelet, has two parallel tubes that run the length of its body on either side of the notochord—a spinal cord and a primitive gut. Since the eel-like lancelet lacks a bony skeleton, it relies on the notochord to serve as a stiffening rod for its soft spine. In the human embryo, the notochord provides a central rod from which the somites

Patterning Exercise #62: Hand-Mouth and Hand-Eye Coordination

1. Lie on your back. Take a few deep breaths. As you exhale, allow your body weight to sink into the floor. Relax the areas along your back that feel tight.

2. **Hand-mouth coordination:** Bring your thumb to your mouth while turning your head toward your thumb (PE Fig. 62a). Notice how your spine flexes and rotates toward the thumb side.

3. Repeat the same movement on the other side. Turn your head as you bring your thumb to your mouth. The lateral flexion and rotation of your spine should sequence into your hip and leg on that same side. Your tail should point to the foot on the flexed side.

4. Alternate sides until the transitions from side to side are smooth.

5. **Hand-eye coordination:** Still lying on your back, extend one arm along the floor, first out to your side and then above your head. Watch your hand as you move it to establish hand-eye coordination (PE Fig. 62b). Notice how your spine extends and rotates to that side. The extension should sequence into your leg on that side as well.

6. Repeat on the other side.

7. Alternate sides until the transitions from side to side are smooth.

8. Lie on your belly. Take a moment to relax the weight of your organs into the floor. Bring your hand to your mouth, feeling flexion with rotation on that side of your body. Repeat on the other side. Then alternate sides until the transitions from side to side are smooth.

9. While prone, extend one hand along the floor, out to the side and above your head. Watch your hand as you move. The extension should sequence down that side of your body into your leg. Repeat on the other side. Then alternate sides until transitions from side to side are smooth.

Figure 7.14 Hand-mouth and hand-eye coordinations evoke right-left differentiation (photo courtesy of L. Bright).
arise that eventually develop into the segmented column of vertebrae, ribs, muscles, and nerves along the spine (Figure 7.16).

Like many aquatic species without vertebrae, such as jellyfish, the lancelet propels its long, tubular body through the water like a tadpole, leading with the head and propelling with the tail. Movement ripples along its soft spine with a flexible, serpentine quality. A similar quality of prespinal movement is observed in the squirming, snake-like undulations of the newborn’s spine. In the newborn, prespinal movement initiates either along the front of the body in the mouth, or along the back of the body in the sense organs of the eyes and ears.

The prespinal quality of movement is rarely seen in adults. Exceptions are the rippling undulations of a belly dancer or the wavy curves that a hip-hop dancer carves through space with her spine; each gives the illusion that the bony spine is supple and pliable.

**VERTEBRAL PATTERNS**

Recall from Chapter 1 that the vertebral patterns correlate with the primary movements of species that have bony skeletons—the spinal patterns of fish, the homologous movements of amphibians, the homolateral movements of reptiles, and the contralateral movements of mammals. The vertebral patterns establish neuromuscular pathways during the exploratory movements of a baby’s first few years and gradually build musculoskeletal tone. As a group, the vertebral patterns organize lines of force along skeletal pathways and coordinate neuromuscular pathways for all subsequent and more complex patterns of movement. Spinal patterns sequence through the vertebrae and organize pathways along the core. Homologous patterns of the limbs differentiate movement between the upper and lower body. Homolateral patterns differentiate movement in the right and left side. And contralateral patterns establish diagonal and cross-crawl connections in the body.

**Spinal Patterns**

As discussed above, the prevertebral spinal patterns begin to develop in the movement through the soft spine while a preborn is in utero, sucking its thumb and squirming in its limited space. The vertebral patterns crystallize at birth when the newborn’s head pushes out through the

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**Patterning Exercise #63: Prespinal Movement**

1. Sit or stand in a comfortable position. Imagine a spotlight from the top of your head shining up on the ceiling.
2. Shine the light above you, then begin moving your head in such a way as to slowly draw imaginary shapes on the ceiling with your headlight (PE Fig. 63a-b). Draw whatever shapes are easiest for you—lines, circles, arcs, or figure eights—then reverse the motion.
3. Let the movement of your head pull your entire spine into a wave-like, undulating motion all the way down to your tail in a manner akin to how a kite pulls its tail.
4. Get into the quadruped position, on your hands and knees. Explore the same quality of wave-like motion in your spine, leading with the top of your head (PE Fig. 63c-d).
5. Then switch and explore leading with your tail. Imagine a spotlight shining from your tail and shine it behind you along various pathways (PE Fig. 63e).
mother's pelvis and the infant begins looking about with a spinal reach. Over time, the infant moves through many different combinations of spinal flexion, extension, and rotation, pushing, reaching, and rolling over with movements that initiate in the head or tail. Although spinal pushes and reaches are patterns that we all go through, some of us develop either a push or reach with either the head or tail more strongly than others.

Spinal patterns echo the movement of a fish, which is guided in its propulsion through water by its specialized sensory receptors along its lateral line that sense water currents. Humans also have an imaginary lateral line along the sides of the body, established by spinal movements that differentiate the front of the body from the back (Figure 7.17). A person that is structurally balanced between the front and back has a defined lateral line that bisects the body from the ears to the toes. We clarify the lateral line by making clear movements transitions between spinal flexion and extension.

Perception of a lateral line is subtle and probably most well developed in athletes and dancers who have a clear spatial awareness of their bodies. The clarity or murkiness of the lateral line reflects the strength or weakness of all the patterns, particularly the spinal patterns. If parts of the spinal pushes or reaches become frozen in a held posture anywhere along the spine, creating compression in one area and/or wobbliness in another, this imaginary line becomes blurred as tight fascias and disorganized muscles migrate to either the front or the back of it. Since spinal pushes differentiate the front and back of the body, they can be practiced to develop continuity of tone along the spine and establish a clear lateral line.

The Spinal Push
The spinal push establishes a core strength and stability along the body’s spine. Push has been associated with tonic contraction; therefore, push patterns may play an important role in the early organization of postural muscles along the spine. As the push condenses the spine into itself, it compresses the intervertebral joints and engages deep spinal muscles.

A spinal push with the tail initiates with flexion in the coccyx, taking the pelvis into flexion (Figure 7.18). The push then sequences up the front of the spine through the vertebral bodies and disks, ending at the head. As the compressive force of the push travels from one end to the other without breaking anywhere in the middle section, the spinal column flexes and bows as a unified whole.

When the body is supported on the head, as in a head stand, a spinal push with the head takes the spine into extension (Figure 7.19). It initiates at the top of the head, extending the skull on the spine at the uppermost cervical joints, then progressively extends the entire spine, taking the spine into a compressed extension. When an external weight is supported on the head, the spinal push with the head creates an upright, stable posture, such as that which we observe in some elegant tribal women who easily balance loads in baskets on their heads.

The human posture has a natural affinity for reach with the head and push with the tail. A person can energetically push through the head by bearing down through the head, and might feel this action while ducking through a low doorway. Most people feel a push with the tail while defecating; it may sequence all the way to the head, in which case it would flex and curl the entire spine. Women feel a strong spinal push while giving birth. A stubborn child might push through his spine and his feet during a tantrum much like a stubborn mule digs in to avoid being pulled forward. Sumo wrestlers, defensive linebackers, and power lifters usually have an innate and/or well-developed spinal push pattern, which predisposes them to excel at these sports.

A person with a strong spinal push usually has a sturdy trunk and a solid kinesthetic sense of the spine, both physically and psychologically. The spinal push brings one’s attention back in, centering a person in
Patterning Exercise #64: Spinal Push

Caution: Do not do this exercise if you have a herniated disc or spinal compression that causes pain. If you have neck problems, be very careful bearing weight on your head, and use gentle pressure to push through your spine. Stop if you feel any sharp or shooting pain. For an easier version of the spinal push, see Patterning Exercise #4.

1. Get into a position in which your weight is supported by your shins, forearms, and forehead (PE Fig. 64a). Without moving, push down through your shins and forearms to sense how the homologous connection through the limbs creates a platform of support for the spinal patterns. Keep this connection during the entire exercise.

2. Push with the tail: To begin, take your coccyx into flexion by gently bearing down in the pelvic floor, pushing your tail toward your pubic bone. Continue pushing, pressing each vertebral segment into flexion, one segment at a time, compressing your spine until you are pushing the top of your head into the floor (be careful not to push too hard).

3. If imagery helps you, imagine your spine as a tube of paste with your tail scooping under like a shovel to push the paste through your trunk toward your head.

4. Push with the head: Now reverse the action by pushing with your head against the floor. It should rock your skull on your first cervical vertebra, extending it. Then sequentially extend the spine one vertebra at a time until you return to your original position.

5. Alternate between pushing up with the tail, then pushing back with the head. Move slowly at first, sensing the push sequence through each vertebral segment of the spine. Focus on any vertebra that you feel you have skipped over.

6. Once you are comfortable with the action, repeat it in a faster, more fluid manner. Rock between a push with the tail and with the head. This will help you coordinate the action as a more reflexive, organic motion.

7. Variations on push with the head: Get a large book and balance it on the top of your head. Or push your head into your hands, sensing the push through your entire spine (PE Fig. 64c). Notice the alignment of your spine. Is it different from your normal alignment? Walk around with the book on your head. Does your walk change? Remove the book, yet still imagine balancing it on your head.

8. Variations on push with the tail: Get in a quadruped position and back your tail up to a surface such as a soft couch or a physioball (PE Fig. 64d). Push, then release. Repeat several times. How far up your spine and how far down your arms does the force of the push travel?

the body and mind. A weakness in this pattern can underlie a collapsed spine that lacks structural integrity. The forward head posture, now sometimes called “computer neck,” is a classic sign of a weak spinal push with the head.

The Spinal Reach

Like the spinal push, the spinal reach with the head also crystallizes during a normal vaginal birth. Once the head clears the canal, the newborn is free to look around. When a reach with head or tail sequences through the entire column, it elongates and pulls slack out of the spine, taking each intervertebral joint into an open-packed position, and organizing lines of pull along the backbone.

Spinal reaches can be stationary or they can pull the spine through space. As mentioned earlier, we have a natural propensity for reach with the head, which aligns the head over the body and is supported by the head righting reflex. Also, we continually reach out through the perceptual organs of the head to take in the environment around us, a myriad of sights, sounds, and smells. A baby playing peekaboo or sound games spontaneously lifts the eyes or ears, elongating the entire spire (Figure 7.20). A person usually reaches through the head during level changes, from lying to sitting and sitting to standing. We also reach with the head to get out of a car, or to stick our head out a door to look out. On a psychological level, a reach with the head expresses alertness and curiosity. It is difficult to be attentive or energized when the head hangs, a posture usually associated with depression or lack of initiative.

On the other end of the spine, a spinal reach with the tail allows us to search the ground under us and adjust our center of gravity accordingly. Adults use a reach with the tail to search for a seat in

Figure 7.20 A spinal reach with the head (photo courtesy of L. Bright).
Patterning Exercise #65: Spinal Reach

1. Get in a quadruped position. Subtly or energetically reach your tail toward your feet until you feel the reach begin to pull you backward, elongating your spine, so that eventually you will be sitting on your forelegs (PE Fig. 65a).

2. Next, subtly or energetically reach up and forward with the top of your head. Sense the reach with your head elongating your spine, and when it does, return to the quadruped position (PE Fig. 65b).

3. Now move back and forth between reaching with the tail and reaching with the head, rocking in the quadruped position.

4. Sit in a chair. Reach with the top of your head (and push down with your feet) to stand up. Then reach with your tail to sit back down. Repeat several times, maintaining a simultaneous reach with both your head and tail as you stand up and sit down.

a dark theater; babies reach with the tail when they sit back into a quadruped position. Reaching with the tail tends to be a vague and difficult pattern for a lot of people to feel. Perhaps humans tend to have a weakness in this pattern because the human coccyx is only a rudimentary tail. If this pattern is weak, sensing a distinct reach with the tail can wake up sensations in the pelvic floor that might be confused with sexual feelings. With practice, reach with the tail can be strengthened, which is helpful because it lengthens the lower spine and helps a person to adjust and balance the lower body to changing positions. It can also bring subtle articulations to the lower pelvis and hips.

An overly strong spinal push coupled with a weak reach can create compression in the spine and limit the range of movement. On a psychological level, this pattern shows up when a person stubbornly tucks the pelvis under and digs in the heels into the ground, refusing to be moved, a pattern also found in the classic masochistic character of Reichian psychology. A weak spinal push, on the other hand, shows up in a backbone that lacks integrity and easily buckles. This pattern is found in the classic oral character type in which a person feels empty and collapsed from a lack of emotional nourishment and support (see the section on “Bioenergetics” in Chapter 15).

The compressive forces of spinal pushes balance the tensile pulls of spinal reaches. Ideally, a person is able to sense the difference between the two actions along the spinal pathway. A balanced combination of spinal push and reach is evident in the flexible grace yet poised strength of certain tribal people who balance heavy loads on their heads and then walk with ease. To cultivate a flexible strength in the spine, a person can explore spinal pushes and reaches, differentiating sensations from the compression of pushing with the tensional pull of reaching.

Homologous Patterns

Homologous means the same on both sides. There are four homologous patterns made up of combinations of upper or lower body push and reach patterns. These include a push with both arms, a push with both legs, a reach with both arms, and a reach with both legs. The upper homologous push is one of the first actions a baby takes to make a level change on his own. A baby also scoots backward with a homologous push through both arms, reaches backward with both feet to slice down off a step or stool, or pushes down with both feet to stand up.

The homologous patterns recapitulate the movements of amphibians. Take, for example, the frog, which hops by pushing off its back legs while reaching with its front legs. Children explore homologous movement in the game of “leap-frog.” Since homologous patterns are symmetrical, they tend to lack spinal rotation. The frog springs forward, jumping out of the water or into it, without the option of twisting because its pattern lacks a right/left differentiation of movement. In contrast, the next species up the evolutionary ladder, the reptile, can push with one side while reaching with the other, which rotates the spine.

Homologous movements differentiate the upper body from the lower body. Homologous support in the arms and legs provides a platform on which the spine can move along its vertical axis (Figure 7.21). Since homologous patterns lack rotation, they limit spinal movement to flexion and extension.

Figure 7.21 Note how the strength and symmetry of the limbs in this homologous pattern keeps the spine centered.
The more parts of the body moving in the same direction, the more direct and strong the movement. Therefore, homologous patterns, particularly patterns of locomotion, tend to be inherently stronger and faster than homolateral or contralateral patterns of locomotion. For example, when a cheetah, one of the fastest runners among mammals, begins chasing its prey, it starts out in a contralateral gait. As it speeds up, its gait shifts to homolateral. When it hits top speed, it begins stretching out its forelegs and hindlegs in a graceful yet incredibly swift homologous gait (Figure 7.22). (The cheetah has been clocked at up to 70 miles per hour.)

On a psychological level, the homologous patterns reflect a full commitment to the action. If a baby reaches with both arms, we know that she really wants to be picked up. In our culture, people usually take on a relaxed, one-legged stance, but the homologous person “stands on her own two feet.” Two people meeting in mutual homologous stances end up meeting face to face, in direct opposition to each other physically, a position associated with power and confrontation. Most people converse from a comfortable, one-legged stance that actually gives them the flexibility to shift, rotate, and look around.

On a mechanical level, the homologous stance provides maximum musculoskeletal support if the legs are directly under the hips and all the joints are in a neutral position—being neither flexed nor hyperextended—through the knees, hips, and spine. This balanced support is important for a person with an unstable pelvis or sacrum because standing on one leg can twist the pelvis and further destabilize already dysfunctional joints.

In a seated posture, the sit bones replace the feet as our base of support. Sitting with one sit bone higher than the other, which often happens when a person crosses the legs, can twist the pelvis and spine.

In general, homologous postures and movements give the spine a more stable base of support because they lack rotation. Thus anyone having difficulties with unstable spinal joints can benefit greatly from practicing both spinal and homologous movement that stabilize the spine. For example, working out on a rowing machine is homologous because the arms and legs are moving symmetrically. This does not mean that a person should avoid rotational patterns but that practicing spinal and homologous movement will establish a centered core stability for subsequent activities that twist and turn.

**Homologous Push Patterns**

In adult movement patterns, the spine tends to support the body leaving the limbs free to move. This supporter/mover relationship is reversed in babies—they tend to support the body through the limbs, freeing the spine for movement. During the upper homologous push, the baby’s arms support weight, which frees the head and upper spine for movement (Figure 7.23). Small babies might be found rocking the spine back and forth on the homologous base of the hands and shins. This action resembles a chair or couch sliding back and forth on its gliders.

The upper homologous push establishes lines of force that travel through the arms into the spine, creating a dimensional cross between them, and providing support for extension and hyperextension of the spine. The lower homologous push sends lines of force from the feet through the legs and pelvis into the trunk, extending the lumbar spine. Both upper and lower pushes, when organized and symmetrical, are marked by a widening across the shoulder girdle and/or the pelvic girdle. This widening creates more space for the spine in between the limbs. Take, for example, the cat arch exercise, a basic homologous pattern (Figure 7.24a-b). The posterior muscles along the neck and base of the skull insert along the thoracic spine, thereby rooting the neck between the shoulder blades. Given this, chronic tension between the shoulder blades can restrict head and neck movement, as well as the structural balance of the shoulder girdle.

**Taking a Stance**

Notice the position you tend to stand in. Do you rest on one leg or two? Are your knees straight, bent, or locked? How do you stand as you are talking to other people? Explore changing your stance. If you tend to stand on one leg, practice standing on two. Put your feet under your shoulders for optimal support. Try it for several days and see if you begin to feel any different. At the very least, you should feel more supported.
If a person pinches the shoulders together, the cervical spine will not be free to extend. By reaching through the head and keeping the shoulders wide, a person can lengthen the neck and free the cervical spine during movements that extend and hyperextend the spine.

A strong and balanced homologous push, either lower or upper, helps organize patterns of symmetry in the legs or arms. Our vertical human posture requires a strong lower homologous push to stand on both legs. Look at a room full of people standing around and those with a homologous stance will be obvious: both legs will be planted firmly under the torso. As mentioned earlier, the homologous stance provides a stable foundation, whereas a homolateral stance on one leg provides a more flexible foundation.

The strength of the homologous pathways shows up in the symmetry of the limbs and the relationship the hips and shoulders keep with the spine during movement. For example, when there is a strong underlying homologous support, the shoulders and hips will remain relatively

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**Patterning Exercise #66: Homologous Push through the Limbs**

This exercise will help strengthen lines of force from your limbs into your spine, as well as improve symmetry in your body. If you tend to hike or round your shoulders, the homologous push can also help straighten them out.

**Caution:** If your shoulders and hips are tight, the prone homologous position will stretch them and you might be sore afterwards; therefore, remain in it only as long as you are comfortable. Also, if you have a lower back pain, this push could aggravate it. To protect your lower back, tuck your toes under and contract your lower abdominal muscles. Skip this exercise if you have a disc problem.

1. Lie on a padded floor on your belly. Turn your head to one side, or rest your forehead on a small pillow or rolled up towel.

2. Put both your arms out to the sides. Bend your elbows so that your forearms are at right angles to the upper arms (PE Fig. 66a). Make sure your palms are flat and all five fingers are touching the floor. Widen and sink across the front of your chest. Reach your elbows out to the sides to widen across your shoulders. Keep your neck long by reaching out the top of your head. Yield into this position by focusing on widening and sinking through your chest, forearms, and hands.

3. **Upper homologous push:** Slowly press your entire hands and forearms into the floor. Sense the force of the push traveling up your arms, into your back, and down your spine. Make sure not to pull your arms up or in, but continue to push them out and down. Gently push, then release. Do this several times.

4. Repeat the push and progress into lifting your head and chest off the floor (PE Fig. 66b-c). Look at the floor to engage optical support for your head. Then rest.

5. Now explore a rhythmic push with the hands and forearms in a motion that rocks the whole body. Then yield in this position a minute before going on.

6. Stay in the same position with one variation: scoot close enough to a wall that you can put your feet flat against the wall with your knees bent (PE Fig. 66d). Keep your knees and thighs relaxed and weighted. Feel the contact your pelvis makes with the floor; widen across the front of your pelvis so that you feel your pubic bone and hip sockets widen and sink into the floor.

7. **Lower homologous push:** Now slowly push against the wall, feeling the push travel up your legs, into your pelvis, and up into your spine. Your heels will come off the wall so that you are only pushing with your toes. Push several times, then release. The push will straighten your knees and inwardly rotate your legs.

8. **Upper and lower together:** Combine the upper and lower push by pushing simultaneously with both your hands and feet, then release. Sense how the forces from the upper and the lower meet along the spine.

9. Then explore rhythmic pushing that rocks the body, alternately pushing with the arms, then the feet.

**Feedback:** Do your right and left sides push with symmetry? If so, the shoulders and hips will remain square in relation to each other. Get up slowly and stand, then walk around. Do you feel any changes in your posture or movement? (Most people feel that their shoulders and chest seem wider and more open, and their legs more connected to the ground.)
square to the spine, even when a person twists the spine (Figure 7.25). When homologous patterns overpower spinal patterns, the flow of movement between the upper and lower halves of the body along spinal pathways may become disrupted. As a result, a person might habitually hinge in the lower back or neck, resulting in an exaggerated lordotic curve in either place. This hinging pattern is common in forward head posture, where the flow of movement along the spine is lost between the shoulders.

**Homologous Reach Patterns**

The homologous push patterns compress the limbs into the trunk, whereas the homologous reach patterns do just the opposite, extending the limbs away from the trunk. Therefore, reach patterns establish lines of tension and pull between the limbs and spine. This relationship can be observed in a baby who reaches in earnest to be picked up and stretches through her whole body. On a psychological level, her action is earnest because reaching with both arms represents a full commitment to being picked up, whereas a baby who only sort of wants to be picked up might just extend one arm in a half-hearted attempt.

When the homologous reach pattern make a full sequence through the core, it pulls the spine along. In adult patterns, the movement of the arms might pull the trunk along during a hug, or extend the spine while reaching for a heavy box on a top shelf (Figure 7.26). Whether or not the homologous reach patterns...

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**Patterning Exercise #67: Homologous Reach Patterns**

To truly reach with your arms and legs, initiate the action in the fingers and toes, then allow the reach to extend the center of your limbs.

1. **Reach with the upper**. Sit either on your forelegs or in a cross-legged position (PE Fig. 67a). Reach with both arms, initiating in the fingertips. Allow the reach to sequence into your spine, pulling you into a quadruped position (PE Fig. 67b).

2. **Return to the original position**, then reach again, using more effort so that the reach pulls you up and over your hips, extending your lower limbs so that you land in the upper homologous push position (see PE Fig. 66c).

3. **Reach with the lower**. Sit on a small physioball or a soft chair. Reach down and out with both feet until the reach extends your body and slides you off the ball or chair onto the floor.

4. **Lie on your back with your legs straight**. Slowly reach through the toes of both feet, allowing the reach to pull the slack out of your legs, lower back, and spine (PE Fig. 67c).

4. **Now reach both hands toward the ceiling**. Sense how the reach gradually sequences up your arms and shoulders, pulling the slack out of your tissues. Sense the reach sequencing into your spine and taking out the slack in tissues between your shoulder blades. Explore reaching symmetrically with both arms in many different directions.

5. **Alternating upper and lower reach**. Lie over a physioball on your belly, with both legs bent. Slowly reach through both hands until the reach rocks you onto your hands (PE Fig. 67d). Then, with your legs straight, slowly reach back with both feet until the reach rocks you back onto your feet.
of the limbs sequence into the trunk is a matter of personal habit.

The homologous reach with the lower body is probably the least common of the four patterns because our feet are usually planted on the ground. Reach patterns tend to occur in an open chain through the free end of a limb, although it is possible to energetically reach through the feet while still standing on both feet. We reach with one foot while pushing with the other as we walk. A baby might reach with both feet to slide backward off a lap. We also see this pattern in sports. A long jumper reaches with the legs to cover more distance; a pole vaulter builds up momentum, then uses a combination of strong push with the upper, followed by a reach with the lower to thrust the body up and over the bar (Figure 7.27).

Homolateral Pushes

The homologous patterns show up in a square shape between the shoulders and hips, whereas the homolateral patterns show up in side bending (Figure 7.28). As patterns progress to homolateral, they begin to rotate the spine. The homolateral push recapitulates the pattern of a reptile, the first species to adapt to life on land, in its ability to turn right or left via limb initiation. The homolateral pattern initiates from a push with either one hand or foot, which extends one side of the body while flexing the other. There is no homolateral reach because a reach with one hand or foot sequences across the body diagonally, resulting in a contralateral pattern.

Homolateral push patterns organize lines of force and movement pathways along the sides of the body. They establish right-left differentiation and lateralization in the body. A push in one limb flexes one side of the body while extending the other, and the spine rotates in between. A shot putter throws a ball with great power harnessed from a homolateral push in the foot. During a homolateral crawl, the right and left halves of the body coordinate a lateral shift by alternating roles of support and mover. Hand-mouth and hand-eye coordinations, as well as head turning initiated by visual scanning, underlie homolateral patterns and rotate the spine.

The homolateral push with the arms slides the body backward, while the homolateral push with the legs propels the body forward. Homolateral locomotion appears in a “lizard-like” crawl that is initiated by a homolateral push, with the belly lifted off the ground while the pelvis is still in contact with the ground. During this crawl, the upper and lower girdles move in lateral shifts, causing the tail to swing from side to side pointing to the foot on the flexed side.

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**Patterning Exercise #68: Exploring Flexor and Extensor Reflexes**

*This is an excellent exercise to help you develop flexor and extensor reflexes that can protect you during a fall. Make sure you have a large area to practice in so that you do not bump into anything.*

1. Lie on your belly and chest over a physioball, bend your knees, and tuck your toes under.
2. Push off with both feet and reach out with your hands, landing with your weight on your hands (PE Fig. 68a-b).
3. Then push back to your original position.
4. Alternate pushing with feet, then your hands, to roll back and forth on the ball. Remember to reach with your hands while pushing with your feet and vice-versa. Push and roll in a rhythmic, fluid manner.
5. If there are any of the four patterns—upper push, upper reach, lower push, lower reach—that you want to explore, position yourself on the ball to do that movement, then slowly practice the movement.
6. Explore using the momentum of the lower push to lift your hips up over the ball (PE Fig. 68c).
This pattern is probably the hardest of the developmental patterns to learn, so do not get discouraged if you find it difficult. With practice, it will become easier.

1. Lie on your belly on a floor upon which you can slide (such as wood or linoleum). (You may need to wear kneepads or thick pants that can pad bony hips and knees.) Begin in upper homolateral push position, with both arms out to each side, bending your elbows at right angles. Flatten your hands and palms flat on the floor, making sure each finger is pressing down evenly. Do an upper homolateral push to press your thorax and head up off the floor (PE Fig. 69a). Hold this position.

2. **Upper homolateral push:** Push through one forearm until you feel the force travel into your spine and that side of your body (PE Fig. 69b). Your spine should side-bend away from the side of the push, with your coccyx pointing to the opposite foot.

3. Then push through the other forearm. Your weight should shift to that side of your body as your spine side-bends in the opposite direction.

4. Alternate pushing with one arm, then the other. Let the push slightly roll your pelvis from side to side, but still keep your pubic bone in contact with the floor. Sense when the push sequences through the pelvis and starts to flex the leg on the same side.

5. **Lower homolateral push:** Again, begin in upper homolateral push position and bring one foot up to the side (PE Fig. 69b). Next, push through the toes on that foot to extend that side of the body. The leg on the other side of your body should naturally flex. Then push through the toes in that side.

6. **This variation is easier:** Lie in the upper homolateral push position with both feet against a wall, legs bent. Gently push through one leg, then the other, sensing the force from each foot traveling up that side of your body.

7. **This variation may be even easier:** Lie over a small physioball with both hands on the floor. Gently push with one hand, sensing how that side of your body extends and the opposite knee flexes. Return to center and repeat on the other side. Alternate sides until the transitions are smooth.

Once a baby learns to push up onto his arms, a whole new level of the world becomes available for exploration. An underlying homolateral push creates a solid base of support to press the chest off the ground (which keeps lizards from scraping their bellies), while the homolateral push gives the baby support on one arm while freeing the other arm for movement (Figure 7.29).

With the ability to move one side of the body independently of the other, the baby expands his range; he is able to turn the upper body in any direction to explore the space all the way around him. To illustrate this point, think of the homolateral frog that can't turn very easily; it has to hop in a wide circle in order to face the opposite direction.

During a homolateral crawl, a baby pushes off with one foot that propels that side of the body forward while laterally shifting the weight to the other side. Babies usually crawl in a contralateral pattern but use the lower homolateral push to extend and turn that side of the body toward something they are reaching for. A baby might also initiate the homolateral action by turning her head to look to one side, which shifts weight onto one arm.

The homolateral gait, in which the leg and arm on the same side of the body move in unison, is unnatural in humans and may indicate a neurological disability (take, for example, Frankenstein's monster). When homolateral patterns have an underlying homolateral support, although they side-bend and twist the spine, if the rotation is even distributed through each vertebral segment, the spine moves with an even continuity of tone and remains fairly stable throughout the action. Conversely, when the homolateral push lacks homolateral support, the spine may collapse and move with chronic asymmetries or excessive rotations in certain segments. Of all the patterns, this one may be the most difficult to learn because it is transitional, halfway between lying down and being up on all fours.

### Contralateral Reaches

Four-legged mammals walk with a contralateral pattern in which one paw reaches and pulls the diagonally opposite limb through. Human gait patterns, such as walking or running, are examples of contralateral movement as well. Our gait is initiated by a reach with one foot, which sequences diagonally across the body to the opposite arm. During normal walking or running, the arms swing in opposition to the legs while the thorax rotates with the arm that swings, and the pelvis rotates with the leg that swings.
A movement pattern is only contralateral if it initiates from a reach with one hand or foot and sequences through the waist to the diagonally opposite limb. When a baby crawls in a contralateral pattern (officially called “creeping”), the reach of one hand sequences through the spine along a spiral-shaped pathway, pulling the opposite leg forward. The reach also sequences diagonally, counter-rotating the shoulder girdle with the pelvis.

A good place to observe the intricacy of the sleek counter-rotations of the contralateral movement is in a cat as it slowly stalks its prey. The cat’s backbone moves forward in a series of flexible yet controlled and subtly gyrating twists. Each major body mass—head, thorax, and pelvis—moves independently around its central axis, moving the cat’s spine through all three planes. In humans, the hips also sequence through all three planes during the bipedal gait. Stability is ensured only by the combined rotational mobility of many joints. In fact, contralateral movement sequences through the combined rotations of more than 130 joints along the spine, as well as numerous joints in the limbs. If each of these linked joints moves in its respective range and contributes its share of motion, the contralateral motion passes in a wave-like progression of rotations and counter-rotations along a series of linked joints from one limb, through the multi-segmented spine, into the opposite limb. Restrictions anywhere along the sequence can cause hypermobility somewhere else, limiting the intricacy and efficiency of the contralateral pattern.

Contralateral patterns in humans differ from those in other mammals for several reasons. First of all, the human spine is an upended beam; weight passes from head to tail.

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**Patterning Exercise #70: Quadruped Position and Contralateral Patterning**

*This exercise will help you check the underlying pathways of support in a neutral quadruped position, then crawl with this support.*

1. Get in a quadruped position. Make sure your knees are under your hips and your hands are under your shoulders (PE Fig. 70a). Use a mirror for feedback if you want to check your alignment.

2. Crawl forward and backward, taking note of the movement quality so that you can compare it to crawling after this exercise.

3. In the quadruped position, energetically push through the head and tail and sense a connection along the front of your spine. Then energetically reach through your head and tail to elongate your spine. Rock your spine back and forth, getting a sense of alternately reaching through your head, then through your tail, to elongate your spine.

4. Relax your lower back. It should hang like a bridge without collapsing. Then lightly pull your lower abdominal wall straight up by lightly contracting it, but keep your upper abdominal wall relaxed so you can breathe fully and easily.

5. Isometrically push down with both hands and feel the support this gives your across your shoulders. This push should lift your shoulders higher than your hips, as well as widen them.

6. Isometrically push down through both forelegs and knees and feel the support this gives your pelvic girdle.

7. Shift your weight to one side. If you still are energetically reaching with the head and tail and a pushing through your supporting arm and leg, you will be able to balance on one side without sagging or tightening. These underlying pushes will give your body the support you need to make a lateral shift to one side without losing the support of the other side.

8. Slowly reach one hand along the floor in front of you (PE Fig. 70b). Stay supported on your other three limbs. Keep reaching until you feel the opposite leg pull, through (PE Fig. 70c).

9. Come back to the quadruped position, then repeat step 8 on the other side.

10. From the quadruped position, slowly crawl, first reaching with one hand, then the other. Make sure to keep your shoulders wide, head up and reaching, and to maintain a strong push through your limbs. Also, make sure to lead each step by reaching with your hands. Let your lower back slightly sway so that the movement can sequence through it.

*Feedback: Compare crawling now with how you crawled at the beginning of the exercise. Is it easier? If so, how?*
rather than back to front like it does in our four-legged friends. Also, unlike four-legged mammals, our weight passes along the front of the spine, through the bodies of the vertebrae and the intervertebral discs, freeing the arms and shoulders from weight-bearing functions and allowing for more mobile and refined movement of the hands and arms. Also, the human head sits on top of the body, which increases mobility by allowing the head to turn in any direction. Given that our contralateral gait initiates in either the hand or foot, and each limb moves in either a slight external or internal rotation (unlike a quadruped whose limbs lack our rotational capacity), the possibilities for variations in contralateral patterns are broad (Figure 7.30).

A baby can move in any direction from a contralateral crawl. This quadruped pattern is crucial for sequencing between all fours and kneeling or standing. The spine moves forward and up, suspended between horizontal and vertical.

The success of contralateral patterns depends on underlying spinal, homologous, and homolateral support. The strength of the underlying patterns can be seen in the integrity of the spine in a quadruped position, where a person is supported on the hands and knees (Figure 7.31a-b). In this position, a spinal push creates a connection along the front of the spine. A spinal reach extends the head and tail, bringing the head closer to vertical and bringing the hips to a horizontal position. A homologous push through both arms maintains the integrity and width of the shoulder girdle, while a lower homologous push supports the sacrum and pelvic bones. The lumbar spine relaxes without sagging, forming a long bridge between the pelvis and thorax. An underlying homolateral push gives the body the support and flexibility to make a lateral shift to one side without losing the support of or collapsing the other side.

The contralateral pattern is thus the culmination of all the patterns. On a psychological level, it reflects an essential capacity of the uniquely human brain to reach for and take hold of an idea and make something creative (or destructive) out of it. The contralateral ape exhibits a rudimentary mental ability for rational and creative thought, although the contralateral pattern of the ape is more physical than mental. In humans, contralateral patterns are the most developed on both levels. The personality of the contralateral pattern is best seen in the cat, whose insatiable curiosity is always leading it into some kind of trouble. Likewise, on a behavioral level, our contralateral capacities to reach out in any direction drive us to continually explore new territory, to reach out and grasp new information, and to change the world to fit our ideals.

**Lumbar Reflexes, Rolls, and Gyroscopic Twists**

As mentioned earlier, each of the developmental patterns has a number of underlying reflexes. Lumbar reflexes, which side-bend and twist the waist, underlie all contralateral patterns. They allow a full sequence to occur between the upper and lower body and between the right and left sides. Although there is no actual reflex called a "lumbar reflex," a number of reflexive responses can be triggered in the sides of the waist. When active, they flex the trunk and rotate it toward the side of the waist in which the response is triggered. Some of these reflexes can be elicited by poking or stroking the front or back sides of the waist, which will cause a reflexive response of side-bending with flexion if stroked on the anterior side, or side-bending with extension if stroked on the posterior side. Other lumbar reflexes are triggered when the chest is rotated against the pelvis or vice-versa. They can be elicited in another person by lifting either her chest or pelvis while she is lying either prone or supine.

In a contralateral crawl or movement, the spine moves through space with a subtle gyroscopic turn. Babies
Patterning Exercise #71: Rolls and Gyroscopic Twists

The purposes of this exercise are 1) to establish a vertical connection along the spine while rolling to pattern neck righting on the body (NOB) and body righting on the body (BOB) reactions, 2) to differentiate between simultaneous and sequential movement of the spine, and 3) to differentiate between the initiation of spinal movement at the head and at the tail.

1. Lie comfortably on your back with your knees bent and with enough space to roll over in either direction. Slowly and gently roll your head back and forth from side to side to warm up your neck.

2. Roll your head and look to one side. Let your spine follow the movement of your neck so that you roll over on your side. Allow your body's weight to yield into your side.

3. Now reach your hand across and up. Keep reaching until you roll over (PE Fig. 71a).

4. Return to your original position by reaching with your tail to roll onto your back (PE Fig. 71b).

5. Explore the difference between rolling over in one simultaneous action that rolls the spine like a log and in a sequential action that rotates first the head and neck, then the thorax, then the pelvis.

6. Next, lie flat on your back in an X-shaped position. Visualize the surface you are lying on as a square. Then reach your right hand across your body to the upper left corner of the square (PE Fig. 71c). Watch your hand the entire way. Continue to reach until the pull of your hand and the rotation of your neck and thorax roll your body over to your belly. Reverse the action by reaching backward with your tail and rolling to your back (PE Fig. 71b). Repeat the pattern on the other side.

7. Continue to explore reaching to the corner and rolling over, then rolling back again, until you can move smoothly with ease.

8. Then bring one knee up to your chest and take it across your body, rotating the pelvis (PE Fig. 71d). Allow this initiation to roll you all the way over to your belly. Reverse and return to your starting position by reaching with your tail (PE Fig. 71b). Repeat the movement on the other side.

9. From a spread-eagle position, reach one foot across and down, and keep reaching until you roll over. To return, reach the arm back and up, and keep reaching until it rolls you back (PE Fig. 71e).

Caution: Explore #10 only if you feel you are very coordinated and in good shape, and have enough room to roll without crashing into something.

10. Lay over a ball and explore rolling over on your waist, extending your limbs for balance. Go both directions.

who accidentally flop over while reaching for something out of their range demonstrate gyroscopic turning. A fish flops around in a gyroscopic twist when out of water.

Gyroscopic rolling and twisting patterns integrate movement between lumbar and cervical areas of the spine. Reflexes that right the neck on the body or right the pelvis and the thorax also coordinate the gyroscopic spiraling of the spine. The neck righting on the body (NOB) reaction and the body righting on the body (BOB) reaction underlie integrated movement along the central axis of the body and are active during rolling and turning movements (Figure 7.32). For example, suppose someone seated in a chair is looking backward and begins to fall over backward.

His torso will twist in the direction he is looking in order to turn his spine to follow his head.

The NOB reaction has two levels—a simultaneous rolling motion or a sequential twisting motion of the spine, which are obvious in the movements of babies as well as adults. The first is a primitive reaction: the baby turns her head and reaches across her body's midline with one arm, which initiates a full-body movement, rolling the baby over like a log, twisting the neck without rotating the spine below the neck. The second level is a mature reaction: the baby turns her head and reaches across the body with one arm, and the spine rolls by twisting in sequential segments.
The purpose of this exercise is to strengthen your connection to midline.

1. Lie on your back. Bring your knees up and hold onto your feet. Gently rock from right to left, shifting your weight from one side to the other without rolling onto your side (PE Fig. 72a). As you go back and forth, sense when you are balanced on midline and when you are in lateral flexion. Ideally, you will feel symmetry in your back while rolling between sides.

2. Pull both knees to your chest. Now rock easily along midline from your head to your tail, as though your spine were a bowed leg on a rocking chair.

3. Next, lie on your back with your knees bent. Hold both hands together above your head. Leave one hand in this position and slowly open your other hand out to the side, watching it as you move it. Sense your neck rotating, taking your spine off center (PE Fig. 72b). Then bring your hand back to center, watching it and sensing the return to midline. Repeat with the other side.

4. Lie over a physioball on your belly (PE Fig. 72c). Roll a little to one side, then the other (PE Fig. 72d). Move slowly so that you do not fall completely. Use your hands to balance. Sense the fall from midline and then the return to midline.

is the connection between right and left sides, a psychological connection with one’s center and core self, and the ability to move off center while retaining a symmetrical connection of the limbs to the center of the body.

The movement of the spine tends to follow the head. Homologous movements usually keep the spine on midline, whereas homolateral patterns twist the spine to one side or the other. When the head and neck are straight (without rotation or side-bending), the spine usually follows and comes to a neutral alignment. When the head turns, the spine usually follows with a subtle homolateral side-bending that is coupled with either flexion or extension.

The midline connection is strengthened through spinal and homologous patterns and through all their underlying reflexes. The homolateral pattern is the first pattern to move off midline. The contralateral rotates around midline. All head/tail reaches and pushes establish movement pathways coordinated along midline. Also, upper and lower homologous pushes and reaches coordinate movement in the limbs above and below the centered symmetry of spinal flexion and extension.

Simple actions bring us to midline: when we eat, we center the body in front of the food and come to midline. Also, when a baby is fed straight on, his spine

Figure 7.33 Many forms of play bring children to midline.

Figure 7.34 Being seen helps a child develop a psychological sense of center (photos courtesy of L. Bright).
Helping Your Client Find Midline

You can help your client make subtle spinal and homologous connections in his body to help him find midline at the end of a bodywork session. It is usually best to begin with homologous patterns to establish bilateral support for the core before establishing core connections (which can be done by having your client do subtle pelvic tilts while you give him light traction in the neck).

To make the homologous connection when your client is lying prone, put your client in the starting position of an upper homologous push. Have him put both arms out to the sides, elbows at a right angle, with his forearms flat. (His arms may not fit on or may fall off of the massage table. If so, do the best you can with what you have if you can do so safely, or have him lie on a mat on the floor.) Then help him yield into this position by gently pulling his shoulders open to widen them and suggesting that he yield his chest and arms into the supporting surface.

Next, ask him to slowly and subtly push his forearms into the table using minimal muscular effort. Make sure he does not retract his shoulder blades or lift his arms. Put light pressure on the back of his forearms to help give him a sense of pushing from there.

If his chest is tight, the initiation of the push alone will stretch his chest muscles and will suffice to give him a sense of integration between his arms and chest. Or you can guide him to push all the way up, although this type of movement education may be beyond the scope of a bodywork session.

Then have him tuck his toes under and lightly push with his feet to make a connection into his spine from his legs. Suggest he keep his knees on the table while he lightly pushes, and watch his hips to make sure they are symmetrical. If they are not, help him find symmetry in the action.

End with your client on his back. Have him tilt his pelvis and hold it in flexion. Then give him light neck traction, holding the traction while he slowly unrolls and releases the pelvic tilt. Encourage him to gently stretch his lower spine away from your traction to make a connection along the core. If he is moving intrinsically, he may feel the dural tube around his spinal cord stretch.

stays on midline. Conversely, a baby suckling a breast rotates his whole spine around the midline axis to reach the breast.

The eyes converging on a single point in front of the body can bring one to midline (Figure 7.33). For example, when a baby holds a toy with both hands and looks at it, he straightens his spine to face the toy. Midline is also developed by seeing and being seen (Figure 7.34). When the caretaker’s and infant’s eyes meet, the infant reflexively brings his head to midline.

The Babkin reflex is evoked when a caretaker simultaneously presses both of an infant’s palms and the baby brings his head to midline while flexing his neck. Similarly, pressure or tactile stimulation on the top of the head or bottom of the tail will evoke a reflexive movement of the spine in either flexion or extension along the midline. A lack of midline coordinations and reflexes can show up in a right/left asymmetry in posture and movement, and also in the lack of a psychological ability to “meet something or someone head on.”

DEVELOPMENTAL PATTERNING TO INTEGRATE BODYWORK

The developmental patterns provide an excellent framework for a bodyworker to give a client movement cues while the bodyworker is stretching myofascial tissues. A bodywork client can, while lying on the table, lightly reach or push through any developmental pathway to integrate passive release with active movement and to reorganize the faulty pathways that tightened the client’s body in the first place.

The developmental pathways provide a direction for a particular action and can ensure that the client moves through an entire pathway. For example, a bodyworker could have a prone client reach through the hands as he stretches the client’s midthoracic area, or have a supine client reach through both feet as he stretches the client’s waist. Spinal patterns are also helpful for integrating the core of the body and bringing a client to midline. It is a good idea to always leave a client on midline for integration. This means ending a session with a core connection (via traction) and a core movement (via a pelvic tilt or spinal flexion and extension). To ensure both sensory and motor integration requires both sensing the kinesthetic connection between the head and tail, plus doing a spinal movement (such as a push or reach with the head and/or tail).

At the end of a bodywork session, after a client’s muscles have been loosened up and general tensions have been released, it is helpful for the client to move of her own volition to get ready to stand up. This is especially helpful when tight muscles that a client previously used for standing have relaxed; the movement patterns different support muscles. The client’s movement organizes new pathways and brings up muscle tone in preparation for standing. The client also learns to move from a passive state to an active state in a conscious way. This avoids the tendency to go back into the old pattern, the one that caused her to be tight enough to come for bodywork in the first place. It also addresses the common problem of clients returning for massage or bodywork session after session with the same problems caused by habitual poor body-use habits.

At the end of a session, the transition point from lying to sitting and standing also presents an opportune time to teach the client a new and more efficient movement to change levels, such as pushing down with the limbs while reaching with the head. Overall, by practicing new ways to move, the client not only learns how to move more efficiently, but she is able to take the stretching and lengthening she received from the bodywork into standing, and hopefully can integrate the new patterns into her daily activities.
SUMMARY
We all go through the same sequence of early motor stages. This series of developmental patterns recapitulates the sequence of evolution that can be traced from single-celled life forms to humans. Each of us had strengths and weaknesses in various stages of motor development, which underlie our body patterns as well as our emotional and cognitive affinities.

Although developmental patterning has traditionally been used to rehabilitate children and adults with neurological damages or disorders, it can be used by anyone to improve the overall coordination of movement. Developmental patterning is helpful for healthy adults who have coordination problems or even postural problems. And it is especially helpful for parents who want to promote healthy motor development in their children.

All movement can be analyzed through the developmental patterns, as will become evident in the study of the fundamental movements presented in Chapter 9. An understanding of the sequence of patterns of early motor development can guide a person during any movement endeavor, be it sports, daily activities, or postural support. A person can practice the basic actions—yielding, pushing, reaching, and pulling—at any time during the day on an energetic level. A person can also direct these actions along specific pathways—spinal, homologous, homolateral, or contralateral—to improve the coordination of movement.

Lastly, each pattern has underlying reflexes that support it. Exploring these reflexes will improve the subcortical coordination of movement and will strengthen neurological tone. More importantly, exploring the reflexes that underlie developmental patterns cultivates the protective and spontaneous reactions we need when our bodies suddenly fall or tip off balance, which can be an invaluable resource for aging gracefully and fearlessly.

Key Terms
asymmetrical tonic neck reflex (ATNR)
Babkin reflex
body righting on the body (BOB) reaction
gyrosopic hand-eye coordination
hand-mouth coordination
Landau reflex
lateral line
midline
neck righting on the body (NRB) reaction
neurological actions
oral rooting reflex
pull
push
reach
tonic labyrinthine reflex
tyield