

***Somatic Patterning***  
**Supplemental Instructor Materials**  
**Chapter 9: Postural Stabilization**

*Note: Numbered points in the chapter's reading list, objectives, and summary are correlated and focus on topics that I think will be most relevant for massage students.*

*Please contact your education director for answers to the chapter questions.*

**Chapter 9 Suggested Readings**

1. Introduction, *Patterning for Postural Stability*, pp.226-227
2. Guidelines for Patterning Postural Stabilizers, p. 227
3. Using Minimal Effort, pp. 227-228
4. Diaphragmatic Breathing, p. 228
5. Inhibiting Phasic Contractions and Stretching, pp. 228-229
6. Spinal Stabilization and Neutral Posture, pp. 229-230
7. The Dissociation of Joint Motion, pp. 230-231
8. Assessing Which Muscles to Train, pp. 231-232
9. The Pelvis and Lumbar Stabilizers, p. 233
10. The Transversus Abdominis and Perineum, pp. 233-234
11. The Psoas Major, the Lumbar Multifidus, pp.234-238
12. Stabilizers of Scapula Neutral, pp. 238-239
13. The Trapezius, the Serratus Anterior, Finding Scapula Neutral, pp. 239-241
14. Stabilizers of the Cervical Spine, pp. 243-246
15. The Co-contractions of Spinal Stabilizers, p. 246

**Chapter 9 Objectives**

1. Define postural stabilization and describe a progressive patterning process for it.
2. Identify guidelines for core control/coordination and contrast with core strengthening.
3. Identify the guidelines for contractile effort, feedback, and duration and their rationale.
4. Discuss why and how diaphragmatic breathing is used in patterning postural stabilizers.
5. Describe the problems caused by over-facilitated mobilizers and how to address them.
6. Define neutral spine and discuss its role in patterning postural stabilizers.
7. Define the dissociation of motion and the rationale for using it in patterning.
8. Identify seven guidelines for assessing which postural muscles to train.
9. Identify three local postural stabilizers of the pelvis and lumbar spine.
10. Describe the stabilization functions of the transversus abdominis and perineum.
11. Describe the stabilization functions of the psoas major and lumbar multifidus.
12. Define scapula neutral and describe its benefits.
13. Describe the stabilization functions of the trapezius and serratus anterior.
14. Identify the stabilizers of the cervical spine and describe how they work.
15. Describe the process of co-contracting the spinal stabilizers.

## Chapter 9 Summary

1. Postural stabilization is the process of patterning or training postural muscles to support the body in its optimal alignment and to stabilize the joints. Postural stabilization is a progressive process of developing motor skills from simple to complex and from intrinsic muscles to extrinsic prime movers. The steps in this progression involve the isometric control of single postural muscles, the co-contraction of two or more postural muscles, and the integration of co-contractions into activities of daily living.
2. Two key guidelines in patterning postural stabilizers are core control and coordination, which differ from core strengthening. Core control involves lightly contracting a postural muscle, independent of joint movement, with a goal of coordinating an optimal firing sequence of the muscles. Core strengthening involves training core muscles and prime movers for strength with load-bearing activities.
3. While training postural stabilizers, first touch the target muscle to get feedback that it is contracting. Then contract the muscle with a slow isometric contraction using minimal muscular effort (one-third maximal effort recommended), hold each contraction for ten seconds, and relax. These guidelines ensure that a person is getting feedback that the target muscle is contracting, that slow fibers are engaged, and that the contraction is light and sustained.
4. Once a postural muscle is contracted, it is important to practice diaphragmatic breathing to coordinate respiratory motion with postural muscle control and to integrate neuromuscular pathways between the upper body and lower body. To practice diaphragmatic breathing, inhale into the lateral expansion of the lower ribs.
5. When the mobilizers are over-facilitated, their habitual and strong phasic (fast) contractions make it difficult to isolate and contract the stabilizers. This leads to adaptive shortening of the mobilizers in chronic contractures. To achieve muscle balance, the mobilizers first need to be stretched with muscle energy techniques that relax their phasic contractions, then actively inhibited during the training of postural stabilizers.
6. Neutral spine is the optimally aligned and maximally stable position of the spine, which occurs when the spine is extended but is not hyperextended, flexed, or rotated. Neutral spine minimizes postural stress on the spinal structures and prevents injury. It is important to train the postural stabilizers in a position of neutral spine to achieve the most advantageous muscular efficiency and coordination.
7. The dissociation of motion involves moving one part of the body independently of another. This skill is used in patterning to improve motor control and break up muscular holding patterns that restrict movement.
8. Seven guidelines for assessing which postural stabilizer needs training: 1) When the lower abdomen protrudes, train the transversus abdominis and perineum. 2) When the lower back is flat, train the psoas major. 3) When the lower back is hyperextended, train the lumbar multifidus. 4) When the buttocks are flat, train the gluteal muscles. 5) When

the neck is hyperextended, train the posterior neck stabilizers. 6) When the neck is flat, train the anterior neck stabilizers. 7) When the scapulae wing and the shoulders become rounded, train the middle and lower trapezius and the serratus anterior muscles.

9. The local postural stabilizers of the pelvis and lumbar spine are the transversus abdominis, psoas major, and the lumbar multifidus.
10. The transversus abdominis (TA) wraps the waist and its tonic contraction compresses and supports the abdominal viscera, stabilizes the lumbar curve by increasing tension in the thoracolumbar fascia, and stabilizes the sacroiliac joints by drawing the pelvic halves together. The perineum provides a supportive pelvic floor and co-contracts with the TA.
11. The psoas major stabilizes the anterior lumbar spine by drawing the vertebral bodies together and increasing axial compression. It also stabilizes the head of the femurs in their sockets. The lumbar multifidus stabilizes the posterior lumbar spine by stiffening the lumbar curve in a position of maximal length, also increasing axial compression.
12. Scapula neutral is the ideal position of the scapulae. It places the medial scapular border parallel to the spine and flat against the ribs and can only occur when there are balanced pulls in shoulder muscles. The scapula neutral position minimizes tensional stress on the shoulder girdle, thoracic spine, neck, and head; allows for optimal respiratory motion; and improves the coordination of upper-body movement patterns.
13. The lower trapezius anchors the scapula's spine and inferior angle in a neutral position; the middle trapezius and serratus anterior stabilize the scapula and place the shoulder girdle in an ideal posture that is neither protracted nor retracted.
14. Several muscles stabilize of the cervical spine: The anterior and posterior suboccipital muscles balance the head over the upper cervical vertebrae between a position of flexion and hyperextension; the semispinalis lengthens and stabilizes the posterior cervical curve; and the longus colli lengthens and stabilizes the anterior cervical curve.
15. The process of co-contracting the spinal stabilizers involves learning how to simultaneously contract two or more stabilizer muscles while using diaphragmatic breathing. Co-contracting all the spinal stabilizers is a training goal that indicates an advanced degree of motor control.

**Chapter 9 Questions**

*Note: Make sure to pay attention to the italics in some of the questions because they ask you to identify the statement that **does not** refer to the topic of the question.*

1. Which of the following statements *does not* describe postural stabilization?
  - a. It involves training postural muscles for optimal alignment and joint stability.
  - b. It is a strength training process that involves loading extrinsic muscles.
  - c. It is a progressive training process that gradually builds motor skills.
  - d. It involves the isometric control of single muscles followed by co-contractions.
2. Which of the following guidelines should a person follow to engage the slow fibers in postural muscles?
  - a. Use sustained isometrics that occur independent of joint motion.
  - b. Use ballistic movements that strengthen the spinal flexors.
  - c. Use phasic contractions that engage large extrinsic muscles.
  - d. Use maximal effort and contract for one second per round.
3. To practice diaphragmatic breathing,
  - a. breathe into the shoulders to expand the upper ribs.
  - b. breathe into the abdomen while depressing the lower ribs.
  - c. breathe into the lateral expansion of the lower ribs.
  - d. breathe into the posterior ribs while flexing the spine.
4. When training the postural stabilizers, inhibit fast contractions in the phasic muscles in order to
  - a. relax over-inhibited muscles and facilitate joint motion.
  - b. engage over-facilitated muscles and increase range of motion.
  - c. relax postural muscles and facilitate phasic contractions.
  - d. relax over-facilitated muscles and inhibit joint motion.
5. Which of the following statements *does not* describe neutral spine?
  - a. It is the extended position of the spine.
  - b. It is a posture of optimal joint alignment and stability.
  - c. It minimizes postural stress on the spine and prevents injury.
  - d. It is the flexed, hyperextended, or rotated position of the spine.
6. What is the dissociation of motion?
  - a. Moving one part of the body independently of another.
  - b. Engaging co-contractions of the prime movers in the limbs.
  - c. Relaxing overworked postural muscles along the spine.
  - d. Coordinating the simultaneous actions of a series of joints.
7. When the abdominal wall distends, the postural muscle that need to be trained is the
  - a. psoas major.
  - b. lumbar multifidus.
  - c. transversus abdominis.

- d. lower trapezius.
8. When the lower back has an exaggerated lumbar curve and sways, the postural muscle that needs to be trained is the
    - a. psoas major.
    - b. lumbar multifidus.
    - c. transversus abdominis.
    - d. lower trapezius.
  9. The transversus abdominis stabilizes the sacroiliac joints by
    - a. compressing and supporting the abdominal viscera.
    - b. drawing the pelvic halves together in the lower abdomen.
    - c. increasing tension in the thoracolumbar fascia.
    - d. increasing axial compression along the lumbar spine.
  10. Scapula neutral is maintained by the
    - a. pectoralis minor.
    - b. semispinalis.
    - c. upper trapezius.
    - d. lower trapezius.

## Chapter 9 Suggested Learning Activities

*Note: Any exercise titled “Patterning Exercise” can be found in the current edition. Page numbers for these exercises (inserted in parentheses) are included to help instructors utilize activities during lessons that may be based on other segments of the book. . “Skills Exercises” are not found in the current edition but will be included in the 2<sup>nd</sup> edition of SP.*

### **Skills Exercise: Assessing which Postural Stabilizers to Train** (pp. 231-232)

Each numbered item in this exercise covers a faulty postural pattern that indicates a dysfunctional stabilizer muscle. Although each individual item identifies single faulty postural pattern, you'll see that often one faulty pattern will occur with another, which is covered in a separate step. At the end of each step, the patterning exercise to train the postural muscle is identified, along with the page number for that exercise.

#### *Objectives:*

- To practice visual observation and postural assessment skills.
- To assess functional relationships between
  - a faulty local postural pattern,
  - the dysfunctional postural stabilizer that causes it,
  - adaptively shortened and stretch weakened muscles that develop as a result of the faulty postural stabilizer,
  - and the global pattern that affects other parts of the body.

#### *Exercise:*

*Getting ready:* Have your partner stand where you can observe her postural alignment from the side. If all her postural muscles are engaged, her head, thorax, and pelvis will align along the line of gravity. If specific postural muscles are not engaged, this will show up in areas of her body that fall either in front of or behind the line of gravity. Use the following checklist to identify two or more of the following elements:

- a. The local postural pattern.
  - b. A postural muscle that need to be trained.
  - c. An adaptively shortened muscle that needs to be stretched.
  - d. A stretch weakened muscle that needs to be facilitated.
  - e. A global postural pattern.
1. *If the lower abdomen protrudes*, the transversus abdominis needs to be trained. A distension of the lower abdomen usually hyperextends the lower back, which anteriorly tilts the pelvis. As a result, the erector spinae and the hip flexors (rectus femoris and psoas major) become adaptively shortened and need to be stretched. (*Patterning Exercise #86, p. 235*)
  2. *If the lower back is hyperextended and the pelvis is anteriorly tilted*, the lumbar multifidus muscle needs to be trained. This pattern usually occurs with the abdominal protrusion pattern (described in #1), so the erector spinae and the hip flexors (rectus femoris and psoas major) become adaptively shortened and need to be stretched. A person with this pattern needs to avoid making a common correction of posteriorly tilting

the pelvis because doing so tends to create another holding pattern in the hip muscles without addressing the postural muscle imbalance. (*Patterning Exercise #88, p. 237*)

3. *If the lower back is flat and the pelvis tilted posteriorly*, the psoas major needs to be trained to restore the lumbar curve. This is a relatively rare pattern, and it usually occurs with the pattern described in #4 (*Patterning Exercise #87, p. 236*)
4. *If the buttocks are flat*, the gluteus maximus is inhibited and weak. This is a common pattern. A person with this pattern needs to get the gluteus maximus to fire and will also need to strengthen it. The pelvis is often posteriorly tilted in people with this pattern, which means the hamstrings are adaptively shortened and need to be stretched. The erector spinae may also need to be strengthened in people with this pattern. (*Patterning Exercise #75, p. 212*)
5. *If the head is forward of the body and hyperextended*, the posterior cervical stabilizers need to be trained. The upper trapezius, levator scapula, sternocleidomastoid, and scalenes are usually adaptively shortened in people with this pattern and need to be stretched. (*Patterning Exercise #92, p. 245, steps 1-6*)
6. *If the posterior cervical spine is flat and the head tipped forward*, the anterior cervical stabilizers need to be trained. The suboccipitals are probably taut and stretch weakened, and need to be engaged to extend the head and recenter it over the cervical spine. This is a relatively rare pattern; it is sometimes seen among ballet dancers with too strong a vertical tension and lift in the back of the neck. This pattern can occur with either a flattened lower back (described in #3) or a hyperextended lower back (described in #3). (*Patterning Exercise #92, p. 245, step 7*)
7. *If the scapulae wing and the shoulders are rounded*, the middle and lower trapezius and the serratus anterior need to be trained to return the scapula to a neutral position. This pattern often occurs with a collapsed spine, abdominal protrusion (described in #1), and a forward head posture (described in #5). The pectoralis minor and major will probably be adaptively shortened and need to be stretched. (*Patterning Exercise #90, p. 242*)

**Patterning Exercise #93: Co-contracting the Postural Stabilizers** (p. 246)

*Adapted for practicing in an upright, seated posture. Practice each step several times before putting all the steps together.*

*Objectives:*

- To develop control over postural muscle co-contractions.
- To improve an upright posture.
- To practice skills that can be used in client education.

*Exercise: (10 minutes)*

1. *Transversus abdominis:* Begin in a seated neutral spine posture with both feet flat on the floor. Slowly and lightly pull your lower abdominal wall straight back, right above your pubic bone. Make sure to only use one-third maximum effort.
2. *Perineum:* Slowly and lightly pull your sit bones together. Your gluteal muscles and lateral hip rotators should remain relaxed. This is the same action you use when you have to urinate and contract the perineum to hold it until you get to a restroom.
3. *Diaphragmatic breathing:* Take several breathes into the width of your lower ribs as you maintain a contraction of the TA. Repeat this in each subsequent step.
4. *Lumbar multifidus:* Place your fingertips in the lamina groove of your lumbar spine to track this muscle. Keeping your back straight, lean forward flexing the hips about 30 degrees. You should feel the lumbar multifidus contract and bulge into your fingertips. Keeping it contracted, return to an upright posture. If this muscle is inhibited, which it is on a lot of people, it will relax and soften in an upright position. If it does, lean forward again to get it to contract, then focus on keeping it contracted as you return to neutral spine. (If your lower back is flat, it should lift and slightly arch. If your lower back is overarched, the arch should flatten somewhat, but not all the way.)
5. *Psoas major:* Place your fingertips over the distal attachment of the psoas major in the inguinal areas. Keeping your back straight, lean backward about 30 degrees. You should feel the psoas major contract and the front of your pelvis and lower spine lengthen. Then slowly lean forward keeping it contracted. Alternate steps 4 and 5 by leaning forward to contract the multifidus, then backward to contract the psoas major.
6. *Lower trapezius:* Widen your shoulders in the front and back, slightly externally rotate your upper arms, and lightly draw your shoulder blades down toward your lower back. If you can, reach one hand behind you to feel your medial scapula to see if it is lying flat.
7. *Cervical stabilizers:* Reach through the top of your head and lift your occiput without lowering your chin. This should lengthen your neck and your upper trapezius while keeping an elongated curve in your neck.