

Hyperlordosis and Massage Home Study Course

1 CE Hour

Text, Examination, and Course Guide

Presented by the:

Center for Massage Therapy Continuing Education

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Instructions for the Hyperlordosis and Massage home study course

Thank you for investing in the Hyperlordosis and Massage home study course, a 1 CE hour course designed to further your knowledge in the principles and practice of treating clients with signs and symptoms of hyperlordosis and low back pain. This guide will contain all of the instructions you will need to complete this course. This is a 1 CE hour course, so that means it should take you approximately 1 hour to read the text and complete the multiple choice exam and course evaluation.

The following are steps to follow in completing this course:

- 1. Read and review the exam and text in this file. The exam is provided for review before testing online and is the same as the online exam.**
- 2. When you are ready to test online, access the online examination by logging in to your account at <https://www.massagetherapyceu.com/login.php>.**
- 3. Complete your examination and print your certificate. The exam is open book and there is no time limit for completion.**

You must pass the exam with a 70% or better to pass this home study course. You are allowed to access and take the exam up to 3 times if needed. There is no time limit when taking the exam. Feel free to review the text while taking the test. This course uses the text *Hyperlordosis (Low Back Pain)*, an excerpt from *Condition-Specific Massage*, by Celia Bucci. All of the answers can be found in the text. It is advised to answer the exam questions in the study guide before testing online. That way, when you are testing you do not have to go back and forth through the online exam.

If you have any questions please feel free to contact us at 866-784-5940, 712-490-8245, or info@massagetherapyceu.com. Most state boards require that you keep your “proof of completion” certificates for at least four years in case of audit. Thank you for taking our Hyperlordosis and Massage home study course.

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It is the responsibility of the practitioner to determine the appropriateness of the techniques presented in terms within the scope of practice. This information is in no way meant to diagnose or treat medical conditions. Written medical opinions are always the best way to resolve any questions regarding contra-indications to or advanced treatment of hyperlordosis and/or low back pain.

Hyperlordosis and Massage Exam

1. What is hyperlordosis?
 - A. An increase in the natural lordotic curve
 - B. An increase in the natural thoracic curve
 - C. An increase in the natural cervical curve
 - D. An increase in the natural pelvic curve
2. Low back pain may be a symptom of all of the following more serious conditions EXCEPT:
 - A. Osteoporosis
 - B. Cervical/uterine cancer
 - C. Herniated lumbar disc
 - D. Torn rotator cuff
3. The primary contributing factors in most cases of functional lumbar hyperlordosis are:
 - A. Poor posture and congenital defects
 - B. Congenital defects and repeated activities of daily living
 - C. Poor posture and repeated activities of daily living
 - D. Injury and repeated activities of daily living
4. In cases of hyperlordosis, because the abdominals and hamstrings tend to be overstretched, it is:
 - A. Not advisable to perform myofascial release or a full stretch from origin to insertion on these muscle groups
 - B. Advisable to perform myofascial release or a full stretch from origin to insertion on these muscle groups
 - C. Not advisable to perform strengthening exercises from origin to insertion on these muscle groups
 - D. Not advisable to use heat or a localized pin and stretch technique to treat trigger points instead of full ROM stretches
5. When treating clients with hyperlordosis, why is it important to know if your client has been diagnosed with a condition such as osteoporosis, rheumatoid arthritis, or osteoarthritis?
 - A. Massage is contraindicated in systemic conditions such as these
 - B. The client may not be able to judge your pressure
 - C. Systemic conditions may cause changes in the client's center of gravity or may give you clues to how the condition began
 - D. Systemic conditions may contribute to signs and symptoms, may require adjustments to treatment, and may impact treatment outcomes
6. Which of the following tests is intended to assess sacroiliac joint mobility?
 - A. Resisted ROM
 - B. Stork test
 - C. Kemp's test
 - D. Valsalva maneuver

7. A common area of myofascial restriction with hyperlordosis is found:
 - A. Where the hip flexor tendons cross the hip joint
 - B. Where the hip extensor tendons cross the hip joint
 - C. Where the knee flexor tendons cross the knee joint
 - D. Where the knee extensor tendons cross the knee joint

8. Where are common trigger points found in the quadratus lumborum?
 - A. In the angle formed by the fifth rib and the spine, as well as in the flank midway between the fifth rib and the ilium
 - B. In the angle formed by the tenth rib and the spine, as well as in the flank midway between the tenth rib and the ilium
 - C. In the angle formed by the twelfth rib and the spine, as well as in the flank midway between the twelfth rib and the ilium
 - D. In the angle formed by the fourteenth rib and the spine, as well as in the flank midway between the fourteenth rib and the ilium

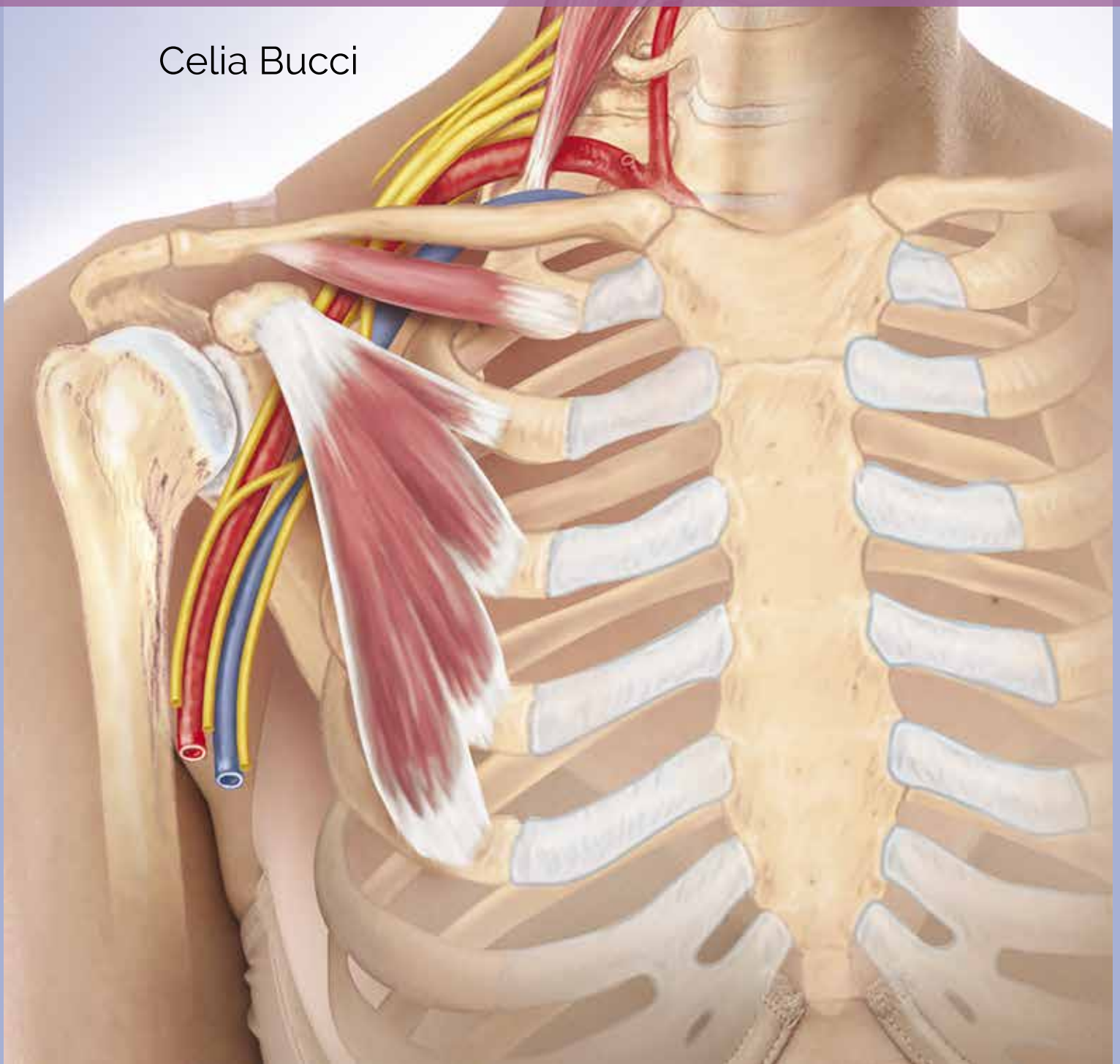
9. When instructing clients on stretching exercises, how long should the stretch be held for?
 - A. 15-30 seconds
 - B. 30-45 seconds
 - C. 45-60 seconds
 - D. 60-75 seconds

This completes the Hyperlordosis and Massage exam. Proceed to the next page to view the text.

Condition Specific Massage Therapy

SECOND EDITION

Celia Bucci



Chapter 8:

Hyperlordosis

(Low Back Pain)

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Hyperlordosis

Understanding Hyperlordosis

A healthy spine has four natural curves (Fig. 1). The two lordotic curves—cervical and lumbar—are anteriorly. The two kyphotic curves—thoracic and pelvic—are posteriorly. These curves are ideal for our species to maintain balance, absorb the impact of movement, and to allow maximum flexibility for our particular types of activity.

Hyperlordosis is an increase in the natural lordotic curve. This chapter focuses on lumbar hyperlordosis: an increased lumbar lordotic curve most often accompanied by shortened hip flexors, anterior pelvic tilt, and shortened lumbar extensors with weakened hamstrings and abdominals (Fig. 2). With the hips flexed, such as when sitting, the hip flexors are shortened. If this is a person's common posture, held for hours at a time, day after day, the muscles may develop a high resting tone, making it difficult to lengthen the muscle fully when necessary. As the individual extends the hips, such as when standing from the seated posture, the shortened psoas draws the lumbar vertebrae to which it attaches anteriorly, increasing the lumbar curve, while the iliacus and rectus femoris pull on the pelvis and tilt it anteriorly. The anterior pelvic tilt lengthens and weakens the hamstrings because the distance between the ischium and tibia is increased. The abdominals, which primarily function to maintain posture, weaken and fatigue against the force of the shortened, hypertonic muscles and the associated postural dysfunction. The anterior pelvic tilt and increased lordotic curve decrease the distance between the iliac crests and the ribcage, shortening the lumbar extensors, which may also become hypertonic when they are recruited to maintain an erect posture because the abdominals are not fully able to do so.

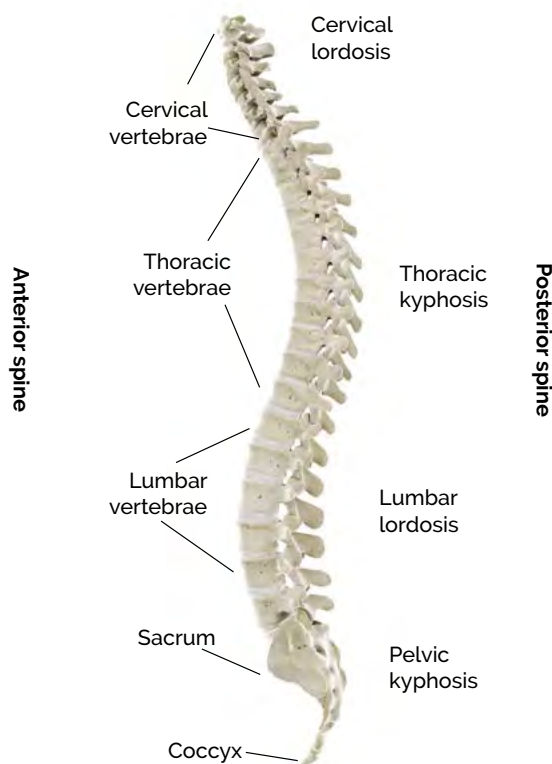


Figure 8-1 Curves of the spine.
Image Credit: SciePro/Shutterstock



Figure 8-2 Anterior pelvic tilt.

In a very short period relative to our evolution, human lifestyle has changed from being highly physical—hunting and gathering, walking, performing manual labor, and so on—to becoming increasingly sedentary. We spend a lot of time driving, sitting, working at a computer, watching television, and so on. These static postures put many of the body’s joints in flexion. The hips, knees, thorax, and shoulders are nearly immobile for hours at time. Because of this, hyperkyphosis and hyperlordosis have become two very common postural deviations that lead to chronic pain and limited ROM along the spine and in the shoulders and hips. Both of these postures may lead to other conditions, but you may find that normalizing the curves of the spine and leveling the ilia and scapulae will reduce this client’s pain and restriction and may facilitate your treatment of accompanying conditions.

FUNCTIONAL VS. STRUCTURAL POSTURAL IMBALANCE

The hyperlordosis described above is functional. Its cause is primarily soft tissue changes and postural deviations that result from an injury to the low back, pelvis, or hip joint or, more commonly, from activities of daily living and poor posture. These deviations can be treated with manual therapy, self-care, and postural awareness. The therapeutic goal for a client with functional hyperlordosis is to lengthen the muscles that have shortened and become hypertonic and that are pulling the bones out of alignment; to strengthen the muscles that have stretched and become weak; and to reset the neuromuscular system to recognize proper posture and diaphragmatic breathing as normal.

A structural hyperlordotic curve, in contrast, is primarily caused by changes in bones and joints. Bone fusions, bony prominences, bone spurs, fractured bones that were not properly set, osteoporosis, and degenerative disc disease are a few contributing factors. Manual therapy may offer this client pain relief, small increases in ROM, and may slow the progression of postural imbalance but is unlikely to reverse the dysfunction. When hyperlordosis is structural in nature, it is best to discuss the client’s condition with their health care provider to fully understand the causes. You may need to modify positioning, bolstering, length of treatment, and techniques to accommodate the client’s particular needs. In some cases, massage may be contraindicated.

MUSCLES OF THE LOWER CROSS

Lumbar hyperlordosis is also called lower cross syndrome. Coined by Vladimir Janda, MD, DSc, lower cross syndrome refers to an imbalance and dysfunction of the agonists and antagonists that move and support the pelvis (Fig. 3). You may find the iliopsoas, rectus femoris, tensor fasciae latae, the lumbar erector spinae, and quadratus lumborum to be short and hypertonic, while the abdominals, gluteus maximus, and hamstrings are stretched and weak. The weakened muscles become less able to oppose the actions of the agonists that function in hip flexion and lumbar extension. As this happens, the imbalance can become more profound and the body less able to reverse the process without intervention (Table 1).

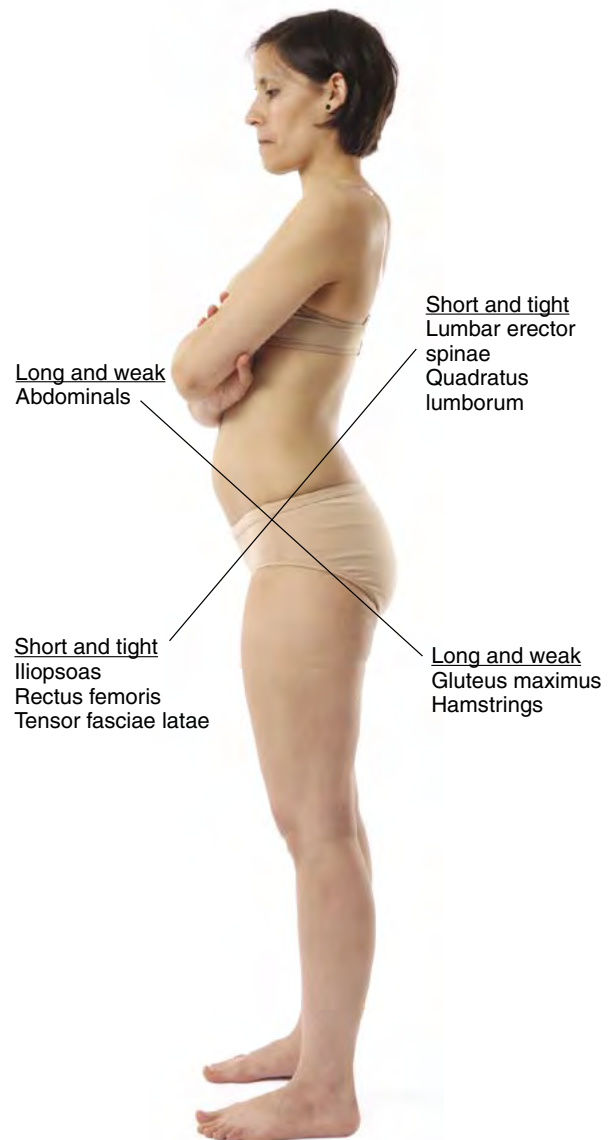


Figure 8-3 Muscles of the lower cross.

Table 8-1: Muscles of the Lower Cross with Actions That Contribute to Hyperlordosis

MUSCLES THAT ARE SHORT AND TIGHT (WITH AGONIST ACTION)	MUSCLES THAT ARE STRETCHED AND WEAK (WITH ANTAGONIST OPPOSITION)
Psoas (hip flexion, increased lumbar curve)	Gluteus maximus (hip flexion)
Iliacus (hip flexion, anterior pelvic tilt)	Hamstrings (hip flexion, anterior pelvic tilt)
Rectus femoris (hip flexion, anterior pelvic tilt)	
Tensor fasciae latae (hip flexion, anterior pelvic tilt)	
Latissimus dorsi (anterior pelvic tilt)	
Quadratus lumborum (lumbar spine extension)	Rectus abdominus (lumbar spine extension)
Lumbar erector spinae (lumbar spine extension)	External abdominal obliques (lumbar spine extension)
	Internal abdominal obliques (lumbar spine extension)

COMMON SIGNS AND SYMPTOMS

The most common symptom of developing lumbar hyperlordosis is low back pain. The short, hypertonic psoas pulls the lumbar vertebrae anteriorly, increasing the lumbar curve, while the short, tight iliacus tilts the pelvis anteriorly. This stress on the spine and pelvis can reduce the mobility of the vertebrae, sacroiliac joint, and hips. As the muscles of the lower cross shorten or lengthen around these postural deviations, they become less able to perform their actions fluidly. Shortened muscles may not lengthen fully, and weakened muscles may not be able to oppose the actions of the shortened muscles. For example, weak abdominals may not be strong enough to maintain an erect posture when seated or standing, leaving the posterior lumbar muscles to work harder. When standing, lengthened or weakened hamstrings have difficulty opposing the action of the rectus femoris and iliopsoas, which flex the hips and tilt the pelvis anteriorly. The combination of hypertonicity and weakness through the lower cross results in pain when the client needs to recruit these muscles to perform activities or maintain a stable, erect posture.

As the condition progresses, other patterns may develop. The hip adductors may become hypertonic as a result of the increased activity needed to maintain posture or oppose the lateral rotation of the hips. With lateral rotation of the hips, the piriformis shortens and may become hypertonic while the iliotibial band distorts and creates torsional force throughout the thigh. The sacroiliac joint may become hypomobile, and facet joints may become irritated, putting a client who frequently bends and stands at greater risk for a herniated lumbar disc. As the body adjusts to a new center of gravity, the arch of the foot may flatten as the weight of the body is shifted to the ball of the foot. Hip or leg pain may also be present, particularly if another condition such as piriformis syndrome, patellofemoral syndrome, or plantar fasciitis is present. If nerves become compressed by tight muscles or impinged between bones that have deviated from their natural alignment, numbness and tingling may also occur in the lower extremity. Compression of the vasculature or lymph nodes can lead to edema in the lower extremity.

The fascia across the anterior hip and the thoracolumbar fascia may be restricted. During palpation, you may find tenderness in the rectus femoris, particularly near the superior attachment, in the iliacus at the iliac fossa, and in the psoas deep in the abdomen. Tenderness may also be felt along the iliac crests, at the sacroiliac joint, over the sacrum, and around the greater trochanter. When extension of the lumbar spine contributes to hyperlordosis, the area between the lower ribs and iliac crests may be affected. The deep lateral rotators of the hips are likely to be tender if the hips are laterally rotated.

Whether a contributing factor to hyperlordosis or a result of it, compensatory hyperkyphosis may cause any or all of the pain patterns that are common in clients with an increased kyphotic curve, such as internally rotated shoulders and the head-forward posture.

POSSIBLE CAUSES AND CONTRIBUTING FACTORS

Low back pain may be a symptom of a more serious condition such as cancer, kidney stones, infection in the urinary system, endometriosis, spinal stenosis, or infection in the vertebrae. Refer to Table 2, and consult your pathology book to identify the client's signs and symptoms, and refer the client to a health care provider for medical assessment if you suspect a more serious condition.

Table 8-2: Differentiating Conditions Commonly Confused with or Contributing to Hyperlordosis

CONDITION	TYPICAL SIGNS & SYMPTOMS	TESTING	MASSAGE THERAPY
Osteoporosis	Bone and joint pain, bone fractures, loss of height, slouching	Bone mineral density test CT X-ray Urinary calcium test	Massage is indicated in the early stages and with the approval of a health care provider in the later stages; may reduce pain. Take care not to use force that may fracture a bone.
Spondylolisthesis	Begins in the lumbar spine and may proceed to the thoracic spine Lumbar hyperlordosis Pain in low back, buttocks, and thighs Stiff back	X-ray Straight leg raise test	Massage is indicated. Stretching and strengthening are encouraged.
Ankylosing spondylitis	Pain often begins in the low back unilaterally and progresses bilaterally to the upper back and throughout the thorax Fatigue and anemia may develop	MRI Blood tests	Massage is indicated to reduce pain, maintain mobility, and slow progress of spinal distortion.
Achondroplasia	Dwarfism Low back pain Abnormal body proportions Bowed legs Decreased muscle tone Prominent forehead Short arms or legs Hyperkyphosis Hyperlordosis	Prenatal ultrasound and amniocentesis Genetic testing X-ray of long bones	Massage is indicated unless an underlying condition such as increased fluid in the brain or spinal stenosis is present.
Urinary and kidney pathologies	Back and flank pain Pain or burning during urination Frequent urge to urinate Fever Pressure in lower abdomen Cloudy, bloody, or foul smelling urine Nausea	Urinalysis or urine culture Ultrasound MRI	Massage is contraindicated until the condition is resolved. Avoid percussive strokes to the back of clients with a history of kidney stones.

Table 8-2: Differentiating Conditions Commonly Confused with or Contributing to Hyperlordosis (continued)

CONDITION	TYPICAL SIGNS & SYMPTOMS	TESTING	MASSAGE THERAPY
Bone cancer	<p>Pain, frequently in the long bones</p> <p>Weak bones easily fractured</p> <p>Swollen, tender joints</p> <p>Fatigue</p> <p>Fever</p> <p>Weight loss</p> <p>Anemia</p>	<p>X-ray</p> <p>CT scan</p> <p>Ultrasound</p> <p>MRI</p> <p>Bone scan</p> <p>Tissue biopsy</p>	<p>Massage may be supportive during treatment and recovery. Work with the health care provider to plan treatment that is best for the individual. A client with bone cancer is susceptible to fractures; take precautions to avoid this risk.</p>
Prostate cancer	<p>Urinary problems</p> <p>Blood in urine or semen</p> <p>Swelling in the legs</p> <p>Pelvic pain</p> <p>Bone pain or fractures</p> <p>Compression of the spine</p>	<p>Prostate-specific antigen test</p> <p>Digital rectal exam</p> <p>Ultrasound</p> <p>Biopsy</p>	<p>Massage may be supportive during treatment and recovery. Work with the health care provider to plan treatment that is best for the individual.</p>
Cervical/uterine cancer	<p>Unusual vaginal discharge or bleeding</p> <p>Pelvic/abdominal pain</p> <p>Abdominal mass</p> <p>Pain during intercourse</p>	<p>Pap test</p> <p>HPV exam</p> <p>Ultrasound</p> <p>Cervical/uterine exam</p> <p>Biopsy</p>	<p>Massage may be supportive during treatment and recovery. Work with the health care provider to plan treatment that is best for the individual.</p>
Osteomyelitis	<p>Unrelenting back pain</p> <p>Fever, chills, nausea</p> <p>Swelling and redness</p> <p>Stiffness or pain</p> <p>Weakness, numbness, and tingling in the extremities</p> <p>Drainage at the wound site</p>	<p>X-ray</p> <p>CT scan</p> <p>MRI</p> <p>Blood test</p> <p>Culture to determine bacterial or fungal infection</p>	<p>Massage is contraindicated until infection is resolved and the health care provider approves the massage.</p>
Herniated lumbar disc	<p>Muscle spasm</p> <p>Weakness or atrophy</p> <p>Low back pain</p> <p>Pain in buttocks, legs, and feet, which worsens when coughing, laughing, or straining</p> <p>Numbness and tingling in the legs and feet</p>	<p>Physical exam including muscle reflexes and strength</p> <p>Straight leg raise test</p> <p>X-ray</p> <p>CT</p> <p>MRI</p> <p>EMG</p> <p>Myelogram</p>	<p>Massage is indicated with caution. Work with the health care team.</p>
Nerve root compression	<p>Muscle spasm, weakness, or atrophy</p> <p>Pain radiates to the extremities</p>	<p>Kemp's test</p> <p>Valsalva maneuver</p> <p>Neurological exam to test reflexes, sensation, and strength</p>	<p>Massage is indicated if cause and location are understood. Take care not to increase compression or reproduce symptoms.</p>

Pathologies that affect the integrity of bones often cause structural hyperlordosis. Porous bones (osteoporosis) become unable to bear weight and may cause the lumbar vertebrae, pelvis, and femur to collapse upon each other, resulting in increased curvature. Herniated discs in the lumbar spine not only cause low back pain but may also cause compensating structures to become stressed and the vertebrae to collapse upon each other, altering the curve of the spine. Scoliosis—a lateral curve in the spine—increases stress on the spine and the structures involved in moving the spine. Spondylolisthesis—a condition in which a vertebra slips forward relative to other vertebrae—may also cause hyperlordosis. This happens most often at L4-5 or L5-S1. Spondylolisthesis can be congenital or may develop from a degenerative disorder such as arthritis, from stress fractures, or from bone disease. Achondroplasia—a genetic disorder that slows the growth of bones—causes a variety of abnormalities affecting the length and shape of bones, particularly in the spine and extremities. Ankylosing spondylitis—an autoimmune disease that causes arthritis or swelling in the spine—may ultimately cause the bones to fuse, limiting the spine’s mobility. Nutritional deficiencies of calcium and vitamin D as well as increased consumption of calcium oxalate and carbonated beverages may affect the body’s ability to rebuild bone.

In some cases, contributing factors can lead to both structural and functional hyperkyphosis. In these cases, it is important to understand the level of stress to the bones before applying manual therapy to the muscles in order to avoid injury. Age may play a role in developing hyperlordosis because the bones become weaker and activity that keeps the joints mobile decreases with age. A sedentary lifestyle and lack of physical fitness reduce functionality and can lead to pain and dysfunction. Weight gain, particularly when it occurs in the span of a few months or a year, rapidly shifts the center of gravity and increases demands on the musculoskeletal system. The increased size and weight of the abdomen increases the load that the spine must support and may pull the lumbar spine anteriorly, increasing the lordotic curve. Pregnancy may contribute to this pattern, which often resolves itself after delivery. Previous injury or surgery around the low back, pelvis, legs, and abdomen may contribute to hyperlordosis. Injuries that were not properly treated to restore mobility and musculoskeletal function can initiate patterns of compensation that put stress on the muscles and bones. Surgery that produces scar tissue can affect the functionality of fascia and muscle by reducing contractile strength or the ability of those tissues to lengthen sufficiently.

The primary contributing factors in most cases of functional lumbar hyperlordosis, however, are poor posture and repeated activities of daily living. Prolonged standing and prolonged sitting as well as repeated resisted activities that involve bending, twisting, and lifting can cause dysfunction in the muscles of the lower cross and misalignment of the joints that they cross. For example, as mentioned above, when a client sits for long periods, the hip flexors may become shortened as the origins and insertions rest closer to each other while the erector spinae may fatigue from long-term, involuntary contraction in an attempt to keep the posture erect. This is particularly true when the client’s abdominal muscles are too weak to contribute to maintaining proper posture. When the client stands, the shortened hip flexors keep the joint from fully extending, and this can leave the hips in varying degrees of flexion. The tight rectus femoris and iliacus pull on the pelvis, causing an anterior pelvic tilt. Without adjusting the posture of the spine, the client’s eyes would be facing down. Because hip extension is restricted by the tight hip flexors, the lumbar spine extends without bringing the ilia and sacrum with it, which increases the lordotic curve, shortening the quadratus lumborum and the lumbar erectors.

Try it yourself: Slowly stand up from the seated position without fully extending your hips. Try to stand straight and look ahead. Feel your pelvis stabilized in an anterior tilt while your lumbar spine curves to compensate. You may also notice your knees locking into extension, and the adductors and the gluteal muscles contracting to maintain your center of gravity. When this becomes a common posture, the lumbar spine curves anteriorly. Moreover, when a client regularly holds this posture, the cervical spine must extend to allow the person to look forward, which can lead to hyperkyphosis if it is not already present.

When a person stands for long periods with weight on one leg, the hip on that side is often elevated, causing the sacrum to rotate and tilt. This may cause the sacroiliac joint to become less mobile. Postures that increase lateral rotation or adduction of the hip, as are common with dancers, may increase the risk of hyperlordosis. Wearing high heels displaces the center of gravity and encourages anterior pelvic tilt, increasing lordosis.

Table 2 lists conditions commonly confused with or contributing to hyperlordosis.

CONTRAINDICATIONS AND SPECIAL CONSIDERATIONS

- **Underlying pathologies.** Spondylolisthesis, osteoarthritis, osteoporosis, degenerative disc disease, bone spurs, or fusions may be present. If you suspect one of these (consult Table 2 and your pathology book for signs and symptoms), refer the client to a health care provider for medical assessment before initiating treatment. If the client is diagnosed with an underlying pathology that is not contraindicated for massage, work with the health care provider to develop a treatment plan that is appropriate for that individual.
- **Endangerment sites.** Be cautious near endangerment sites in the abdomen and femoral area. Gently palpate for the pulse of the abdominal aorta and the femoral artery before you begin working there. If you feel a pulse while working, back off slowly and reposition your stroke to avoid the endangerment site.
- **Menstruation.** Treating iliopsoas when a woman is premenstrual or menstruating may be uncomfortable. Offer to reschedule or to work all other structures, explaining that lengthening the iliopsoas is an integral part of treatment for hyperlordosis and may require followup after menstruation has ended. If you are unable to massage the iliopsoas, stretching the hip flexors by passively extending the hip is a good alternative.
- **Treatment duration and pressure.** If the client is elderly, has degenerative bone disease, or has a condition that diminishes activities of daily living, you may need to adjust your pressure as well as the treatment duration. Frequent half-hour sessions may suit the client better than prolonged treatment with long intervals.
- **Positioning.** Use bolsters to position a client for comfort as well as to reduce postures that may contribute to hyperlordosis. In the supine position, a bolster under the knees will keep the hip flexors from fully lengthening and may reduce lordosis and pressure on the lumbar spine. In the prone position, a bolster under the anterior superior iliac spines may reduce anterior pelvic tilt, and a bolster under the ankles may reduce stress on the low back.
- **Friction.** Do not use deep frictions if the client has a systemic inflammatory condition such as rheumatoid arthritis or osteoarthritis, if the health of the underlying tissues is compromised, or if the client is taking anti-inflammatory medication. Friction creates an inflammatory process, which may interfere with the intended action of anti-inflammatory medication. Recommend that your client refrain from taking such medication for several hours before treatment if their health care provider agrees.
- **Tissue length.** It is important when treating myofascial tissues that you do not lengthen those that are already stretched. Assess for myofascial restrictions first and treat only those that are clearly present. Likewise, overstretched muscles should not be stretched from origin to insertion. For example, because the abdominals and hamstrings tend to be overstretched, it is not advisable to perform myofascial release or a full stretch from origin to insertion on these muscle groups. If you treat trigger points in overstretched tissue, use heat or a localized pin and stretch technique instead of full ROM stretches.
- **Hypermobile joints and unstable ligaments.** Be cautious with mobilizations if the client has hypermobile joints or if ligaments are unstable due to injury, pregnancy or a systemic condition.

MASSAGE THERAPY RESEARCH

A thorough literature review found no research, case studies, or articles about the specific benefits of massage therapy for the treatment of hyperlordosis, lordosis, or lower cross syndrome. Much of the literature about the use of manual therapies to treat hyperlordosis comes from other disciplines, primarily physical therapy. Closer examination is needed on the benefits of massage therapy to lengthen shortened and hypertonic tissues along with self-care to strengthen lengthened, weak muscles.

Several articles, however, confirm the benefit of massage therapy for low back pain—the most common

symptom of hyperlordosis. In 2001, Hernandez-Reif et al. published a study titled “Lower Back Pain Is Reduced and Range of Motion Increased After Massage Therapy.” In 2008, Jada Bell described a case study titled “Massage Therapy Helps to Increase Range of Motion, Decrease Pain and Assist in Healing a Client with Low Back Pain and Sciatica Symptoms.” These studies are important because of the attention paid to hip flexion and to general areas or specific muscles known to contribute to hyperlordosis. Neither study mentions anterior pelvic tilt, and both also treated muscles that are not directly associated with hyperlordosis.

Hernandez-Reif et al. studied 24 participants who reported low back pain for at least 6 months prior, sought medical attention for the pain, and were cleared by their primary care providers to participate in the study. All participants were free of underlying conditions that can contribute to low back pain. The massage therapy group received 30-minute treatments twice per week for 10 weeks. The relaxation group (control group) was instructed to perform exercises for large muscle groups throughout the body. At the end of the study, the massage group reported less pain, less depression and anxiety, improved sleep, and improved ROM compared to the control group. Serotonin and dopamine levels, which are often depleted in patients with chronic pain, anxiety, and depression, increased in the massage group.

Bell’s case study involved a 58-year-old client presenting with a 9-month history of low back pain that radiated into the lower extremity. MRI revealed spondylosis and a herniated disc that caused no nerve root impingement. The client occasionally used nonsteroidal anti-inflammatory medication, muscle relaxants, and narcotic analgesics and was receiving chiropractic care as well as physical therapy. The 45-minute treatments were administered once per week for 6 weeks following a 4-week period during which base line measures were recorded. During the treatment period, activities of daily living and ROM improved and pain was reduced. A significant limitation of this study was the use of physical therapy in addition to massage. Although the client’s symptoms improved to a larger extent during the massage treatment period than the physical therapy period, it is impossible to determine whether massage alone or the combination of therapies produced these benefits.

In 2000, Michele Preyde published a study titled “Effectiveness of Massage Therapy for Subacute Low-back Pain: A Randomized Controlled Trial.” The study tested 98 subjects between the ages of 18 and 81 with low back pain for 1–8 months prior to the study and no other significant pathology. The subjects were randomly assigned to one of four groups: comprehensive massage therapy (soft-tissue manipulation, remedial exercise, and posture education), soft-tissue manipulation only, remedial exercise with posture education only, or a placebo of sham laser treatment. Participants received six treatments over the course of approximately 1 month. Participants in the comprehensive group received 30–35 minutes of soft tissue manipulation and were taught stretching exercises for the trunk, hips, and thighs. Those in the soft tissue manipulation group received the same soft tissue manipulation as those in the comprehensive group but no remedial exercise, and those in the remedial exercise group performed the same exercises as those in the comprehensive group but received no soft tissue manipulation. Those in the control group received only sham infrared laser treatment. Intensity of pain, quality of pain, and function measures were recorded after each treatment, after 1 month of treatment, and again 1 month after treatment ended. The comprehensive group showed significant improvement in function, pain intensity, and pain quality compared to the other groups. The comprehensive and the soft tissue manipulation groups showed clinically significant improvement in function. At the 1 month follow-up, no pain was reported by 63% of the comprehensive group, 27% of the soft tissue manipulation group, 14% of the remedial exercise group, and 0% of the control group. The authors conclude that massage therapy is beneficial for clients with low back pain. The study does not describe which soft tissues were treated, stating only that “The exact soft tissue that the subject described as the source of pain was located and treated with the specific technique indicated for the specific condition of the soft tissue.” Although hip flexion and extension were included in the remedial exercises, and these ROMs are relevant in assessing for hyperlordosis, further research is needed to determine the extent to which massage improves hyperlordosis specifically.

Several literature reviews also explore the benefits of massage for low back pain or compare the benefits of massage to other complementary and alternative therapies. In 2003, Cherkin et al. published a review titled “A Review of the Evidence for the Effectiveness, Safety, and Cost of Acupuncture, Massage Therapy, and Spinal Manipulation for Back Pain.” They concluded that massage has been found to be effective for persistent back pain, that spinal manipulation has minimal clinical benefits, and that the effectiveness of acupuncture is unclear. In addition, the review concludes that only massage is cost effective. In 2008, Imamura et al. published a review titled “Evidence-Informed Management of Chronic Low Back Pain with Massage,” which concludes that there is strong evidence suggesting massage has long-lasting benefits for nonspecific chronic low back pain and may be cost-effective by way of reducing visits to health care providers. The review also reports that further research into the specific mechanism of improvement with massage therapy is needed.

Working with the Client

CLIENT ASSESSMENT

Hyperlordosis is a common postural deviation causing chronic pain and restricted ROM in the low back and hips. It involves many joints and all of the muscles that cross them. A wide variety of possible factors can contribute to the development of hyperlordosis. All of these elements add up to many variations in how a client may present to you. For example, a client with increased lumbar curve and anterior pelvic tilt who often stands with more weight on one leg may present with lateral flexion of the thorax, an elevated iliac crest, sacroiliac joint immobility, and rotation in the hips or spine affecting the abdominal obliques, latissimus dorsi, multifidi and rotatores, and ligaments connecting the sacrum, pelvis, and spine. What follows are common presentations for hyperlordosis. However, it is essential to assess every joint to form an accurate picture for each individual client.

Assessment begins at your first contact with a client. In some cases, this may be on the telephone when an appointment is requested. Ask in advance if the client is seeking treatment for a specific area of pain so that you can prepare yourself.

Table 8-3: Health History

QUESTIONS FOR THE CLIENT	IMPORTANCE FOR THE TREATMENT PLAN
Where do you feel symptoms?	Location of symptoms gives clues to location of compression, trigger points, injuries, or other contributing factors.
Describe what your symptoms feel like.	Differentiate between the possible origins of symptoms and determine the involvement of muscles, joints, nerves, blood vessels, or viscera.
Do any movements make the symptoms worse or better?	Locate tension, weakness, or compression in structures producing such movements.
Have you seen a health care provider for this condition? What was the diagnosis? What tests were performed?	Bone density tests, blood tests, and other tests may indicate contributing factors.
Have you been diagnosed with a condition such as osteoporosis, rheumatoid arthritis, or osteoarthritis?	Systemic conditions may contribute to signs and symptoms, may require adjustments to treatment, and may impact treatment outcomes.
Have you had an injury or surgery, or did your symptoms begin during a pregnancy?	Injury or surgery and resulting scar tissue may cause adhesions, hyper- or hypotonicity, and atypical ROM. Changes in the center of gravity during pregnancy or other rapid weight gain may be a contributing factor.
What type of work, hobbies, or other regular activities do you do?	Repetitive motions and static postures that increase flexion of the hips or anterior pelvic tilt may contribute to the client's condition.

Table 8-3: Health History (continued)

QUESTIONS FOR THE CLIENT	IMPORTANCE FOR THE TREATMENT PLAN
Are you taking any prescribed medication or herbal or other supplements?	Medication of all types may contribute to symptoms or involve contraindications or cautions.
Have you had a cortisone shot in the past 2 weeks? Where?	Local massage is contraindicated.
Have you taken a pain reliever or muscle relaxant within the past 4 hours?	The client may not be able to judge your pressure.
Have you taken anti-inflammatory medication within the past 4 hours?	Deep friction initiates an inflammatory process and should not be performed if the client has recently taken anti-inflammatory medication.

Postural Assessment

Allow the client to enter the room ahead of you while you assess their posture and movements before they are aware that the assessment has begun. Look for imbalances or patterns of compensation for deviations common with hyperlordosis. Watch the client walk and look for reduced mobility in the hips or whether the client appears to be favoring one side. Have the client sit to fill out the assessment form, and watch to see if they lower into the chair cautiously or shifts around to find a comfortable position. Watch also as the client stands up to see if they are able to extend the hips fully and if standing from a seated position causes them to use the arms to lift themselves or to lean on a stable surface. When assessing the standing posture, be sure that the client is standing comfortably. If the client is asked to stand in the anatomic position, you will not get an

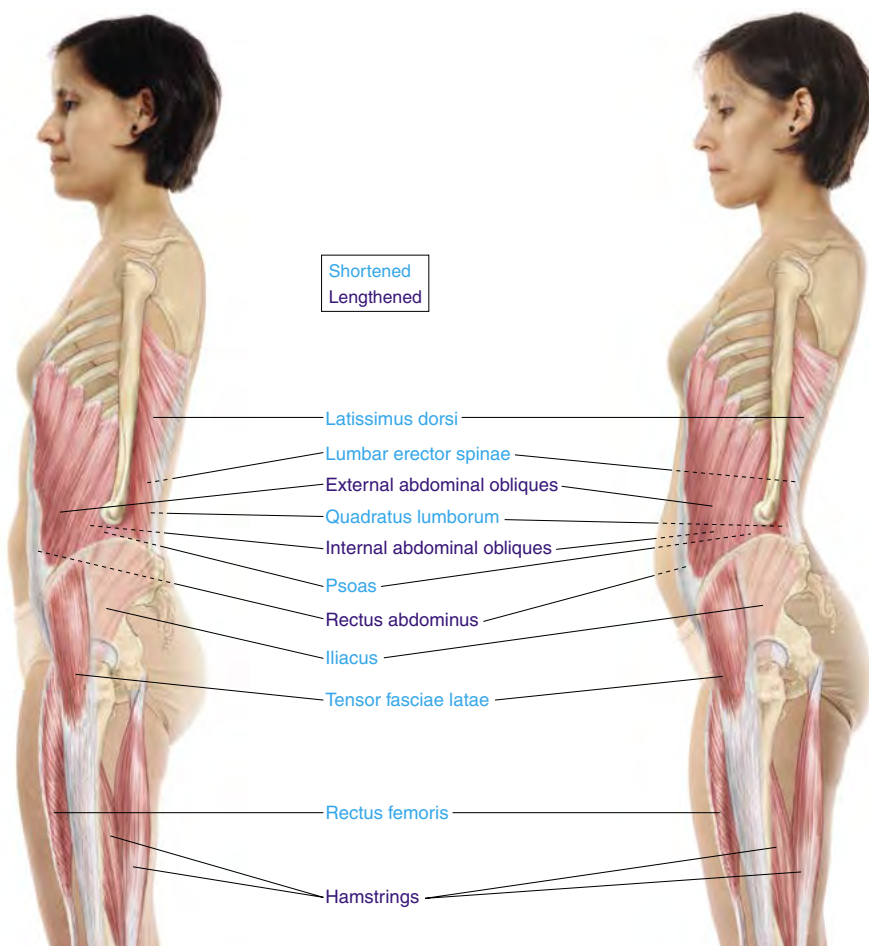


Figure 8-4 Postural assessment comparison.

accurate assessment of their posture in daily life. Look for anterior pelvic tilt, increased curve in the lumbar spine, hip flexion, rotation of the hips, hyperextended knees, and pronation or supination of the ankles.

Figure 4 compares healthy posture to a posture affected by hyperlordosis.

ROM Assessment

Test the ROM of the hips and lumbar spine as both agonists and antagonists. If hyperlordosis is structural in nature, do not perform ROM tests that move the affected joints into ranges that are inhibited by the altered joint structure or that may cause further damage. Since it allows the client to control the amount of movement and stay within a pain-free range, only active ROM should be used in the acute stage of an injury to prevent undue pain or re-injury.

Box 1 presents the average active ROM results for the joints involved in hyperlordosis.

Box 8-1: Average Active ROM for Joints Involved in Hyperlordosis

Trunk (at Lumbar Spine)

Flexion 50–60°

Rectus abdominis
External oblique (bilateral)
Internal oblique (bilateral)

Extension 25°

Spinalis (bilateral)
Longissimus (bilateral)
Iliocostalis (bilateral)
Multifidi (bilateral)
Rotatores (bilateral)
Quadratus lumborum (bilateral)
Latissimus dorsi (with arm fixed)

Lateral Flexion 25°

Spinalis (unilateral)
Longissimus (unilateral)
Iliocostalis (unilateral)
External oblique (unilateral)
Internal oblique (unilateral)
Quadratus lumborum (unilateral)
Latissimus dorsi (unilateral)

Ipsilateral Rotation 20°

Internal oblique (unilateral)

Contralateral Rotation 20°

External oblique (unilateral)
Multifidi (unilateral)
Rotatores (unilateral)

Pelvis

Anterior Tilt (downward rotation) (Angle from PSIS to ASIS) 0–10°

Rectus femoris
Iliacus
Sartorius
Tensor fasciae latae

Posterior Tilt (upward rotation) (Angle from PSIS to ASIS) 0–10°

Biceps femoris
Semitendinosus
Semimembranosus

Lateral tilt (elevation) 0°

Latissimus dorsi (unilateral)
Quadratus lumborum (unilateral)

Hip

Flexion 110–120°

Rectus femoris
Tensor fasciae latae
Sartorius
Psoas major
Iliacus
Gluteus minimus
Gluteus medius (anterior fibers)
Adductor magnus (anterior fibers)
Adductor longus
Adductor brevis
Pectineus
Gracilis

Extension 10–15°

Gluteus maximus
Biceps femoris
Semitendinosus
Semimembranosus
Gluteus medius (posterior fibers)
Gluteus minimus (posterior fibers)
Adductor magnus (posterior fibers)

Lateral Rotation 40–60°

Gluteus maximus
Gluteus medius (posterior fibers)
Gluteus minimus (posterior fibers)
Piriformis
Quadratus femoris
Obturator internus
Obturator externus
Gemellus superior
Gemellus inferior
Sartorius
Biceps femoris (long head)
Psoas major
Iliacus

Medial Rotation 30–40°

Gluteus medius (anterior fibers)
Gluteus minimus (anterior fibers)
Semitendinosus
Semimembranosus
Tensor fasciae latae
Gracilis

Hip (continued)

Abduction 30–50°

Gluteus medius
Gluteus minimus
Tensor fasciae latae
Sartorius
Gluteus maximus
Piriformis (with flexed hip)

Adduction 30°

Adductor magnus
Adductor longus
Adductor brevis
Pectineus
Gracilis
Gluteus maximus (low fibers)
Psoas major
Iliacus

Knee

Flexion 120–150°

Biceps femoris
Semitendinosus
Semimembranosus
Gracilis
Sartorius
Gastrocnemius
Popliteus
Plantaris

Extension 0–15°

Rectus femoris
Vastus lateralis
Vastus medialis
Vastus intermedius

Medial Rotation (When Flexed)

20–30°
Semitendinosus
Semimembranosus
Gracilis
Sartorius
Popliteus

Lateral Rotation (When Flexed)

30–40°
Biceps femoris

Active ROM

Compare your assessment of the client's active ROM to the values in Box 1. Pain and other symptoms may not be reproduced during active ROM assessment, because the client may limit movement to a symptom-free range.

- **Active posterior pelvic tilt**, particularly when the hip flexors are lengthened as when standing, may be restricted and cause pain.
- **Active extension of the hip** may be reduced when muscle tension, adhesions, and trigger points shorten hip flexors or weaken hip extensors. The client may resist full active extension of the hip if this produces symptoms during activities of daily living.
- **Active medial rotation** of the hip may be reduced or cause pain when shortened or hypertonic muscles hold the hip in lateral rotation.

Passive ROM

Compare the client's P ROM on one side to the other when applicable. Note and compare the end feel for each range.

- **Passive extension of the hips** may be restricted when the hip flexors are shortened or hypertonic.
- **Passive medial rotation of the hips** may be restricted when lateral rotators such as the iliopsoas are short and hypertonic, which could occur if lateral rotation of the hips becomes a compensating pattern.

Resisted ROM

Use resisted tests to assess the strength of the muscles that cross the joints involved. Compare the strength of the affected side to the unaffected side.

- **Resisted extension of the hip** may cause pain in the low back when the hip flexors are short and hypertonic and the hip extensors are weak. The client may rotate the pelvis to compensate.
- **Resisted flexion of the thorax** may be reduced when the abdominals are weak and stretched. This test is best performed with the hips and knees flexed to reduce the contraction of the hip flexors.

SPECIAL TESTS

The following special tests can help you to determine which muscles are contributing to pain and when a client should be evaluated by a medical professional using X-ray or other tools, which may reveal conditions that are contraindications for massage or require special considerations when planning treatment with massage.

The **Valsalva maneuver** may reveal a herniated disc, tumor, or other factor that increases pressure on the spinal cord. This test is used when the client complains of pain in a localized area along the spine, particularly when coughing or sneezing. A herniated disc does not contraindicate massage, but this test is not specific for the cause of increased pressure. For this reason, it is best to refer the client to a health care provider for further testing before performing the massage. To avoid even a temporary reduction in circulation, do not perform this test if the client has tested positive for vertebral artery insufficiency or has a cardiovascular disorder.

1. With the client seated and facing you, ask them to take a deep breath and then attempt to forcefully exhale against the closed throat (such as when forcing a bowel movement).
2. The test is positive if the client feels pain in a localized spot along the spine.

Kemp's test may reveal a disc lesion or irritation of the facet joint in the lumbar spine. Neither of these contraindicates massage, but it is best to understand the extent of damage and to be sure that these are not signs of something more serious before performing any deep tissue treatments.



Figure 8-5 Kemp's test.



Figure 8-6 Stork test.

1. With the client standing, ask them to slowly extend, laterally flex, and rotate the spine to the affected side as if reaching for the heel (Fig. 5). This action increases stress on the nerve root and facet joints.
2. The test is positive for nerve root irritation if the client feels radiating pain or numbness and tingling in the affected leg. Ask the client to describe the area of symptoms to help you determine which nerve root is affected.
3. The test is positive for facet joint irritation if pain is localized along the lumbar vertebrae. Very localized symptoms may help you to determine which vertebrae are affected.

The **Stork test** is intended to assess sacroiliac joint mobility.

1. The client should be standing near a stable surface or wall that they can lean on to maintain balance during the test.
2. Begin on the side you suspect is dysfunctional, and then compare the results of both sides.
3. Kneel or sit behind the standing client with one thumb on the posterior superior iliac spine of the affected side and the other thumb on the sacrum at the same level.
4. Instruct the client to flex the hip and knee on the affected side within their comfort range. Notice the relative movement of your thumbs while the client flexes the hip (Fig. 6).
5. When the sacroiliac joint is normally mobile, the ilium should rotate posteriorly, moving the thumb on the posterior superior iliac spine inferior. The test is positive for decreased sacroiliac joint mobility if the thumb on the posterior superior iliac spine moves superiorly while the client flexes the hip.

The **Thomas test** is intended to assess the client for shortened hip flexors. This test may not be comfortable for clients with severe low back pain.

1. Instruct the client to sit at the edge of the massage table so that the legs can hang freely, then assist the client to lie back.
2. Ask the client to flex one hip by bringing the knee toward the chest (Fig. 7). The unflexed hip is the one being tested. If you suspect that one side is primarily responsible for symptoms, instruct the client to flex the unaffected hip first.
3. If the hip flexors are shortened, the straight leg (the affected side) will come off the table, unable to extend fully because the hip flexors are unable to lengthen fully. If the rectus femoris is short and cannot lengthen fully, the knee of the affected leg will be slightly extended. These results indicate a positive test.
4. To assess the degree of the increased lumbar curve and anterior pelvic tilt caused by tight hip flexors, try to slip your hand under the lumbar curve. If your hand moves in easily, this is a sign that the extension the hips increases the lumbar curve and anterior pelvic tilt because the hip flexors cannot lengthen fully.
5. Repeat the test on the unaffected side for comparison. Although the client may feel symptoms only on one side, these muscles may be short on both.



Figure 8-7 Thomas test.

of

Palpation Assessment

Palpate the muscles of the lower cross to assess for hyper- and hypotonicity and myofascial restrictions. You are likely to find myofascial restrictions across the anterior aspect of the hip joint, from the iliac crest down into the quadriceps as well as along the posterior iliac crests and into the thoracolumbar fascia. Shortened, hypertonic muscles that may contain trigger points include the iliopsoas, rectus femoris, sartorius, and tensor fasciae latae anteriorly; posteriorly, these muscles include latissimus dorsi, the lumbar erector spinae and quadratus lumborum. If the client presents with lateral rotation in the hips, assess the lateral rotators of the hips including the piriformis, quadratus femoris, obturator internus and externus, and the gemelli superior and inferior. While the superficial gluteals may be stretched in clients with hyperlordosis, the deeper gluteal muscles with varied functions may be tight and adhered. If the client presents with an elevated iliac crest or lateral flexion of the thorax or lumbar spine, assess the latissimus dorsi, internal and external obliques, serratus posterior inferior, and the thoracic erector spinae on the affected side. A compromised serratus posterior inferior can also affect respiration. Although the focus here is on the muscles that are directly related to the postural imbalance occurring in hyperlordosis, it is essential to assess the synergists and antagonists in each ROM for these joints. For example, although the rectus femoris is a hip flexor involved in hyperlordosis, it also extends the knee. In this example, you may find adhesions between the rectus femoris, vastus lateralis, and vastus intermedius. While the internal and external obliques both laterally flex the thorax to the same side, internal obliques rotate the thorax to the same side while external obliques rotate the thorax to the opposite side. When muscles are short or otherwise compromised, any of their actions may be compromised and any of the synergists and antagonists for each of their actions may be affected.

Overstretched muscles that may contain trigger points include the rectus abdominis, gluteus maximus (particularly the lower fibers), and the hamstrings. If lateral rotation of the hip is present, the adductor magnus, longus, and brevis as well as the gracilis, and pectineus may be overstretched and weak. However, if the adductors are regularly recruited to maintain posture or are overworking to antagonize lateral rotation, they may be hypertonic.

CONDITION SPECIFIC MASSAGE

Because hyperlordosis may have a structural cause, it is essential to understand the client’s health history before initiating treatment. If a systemic condition or a degenerative bone or disc disease is present, discuss treatment with the client’s health care provider and adjust the treatment accordingly. If hyperkyphosis, piriformis syndrome, patellofemoral syndrome, or plantar fasciitis is present, refer to those courses for special testing and consideration of neuromuscular characteristics.

It is essential for the treatment to be relaxing. You are not likely to eradicate the pain associated with hyperlordosis or any of the associated conditions in one treatment. Do not try to do so by treating aggressively. Be sure to ask your client to let you know if the amount of pressure you are applying keeps them from relaxing fully. If the client responds by tensing muscles or has a facial expression that looks distressed, reduce your pressure. Remember that you are working on tissue that is compromised.

Ask the client to let you know if any part of your treatment reproduces symptoms, and always work within their tolerance. When deep palpation of a trigger point reproduces symptoms, explain this to your client and ask them to breathe deeply during the technique. As the trigger point is deactivated, the referral pain will also diminish. Common trigger points and their referral points are shown in Figure 8.

If any other symptoms are reproduced, adjust the client to a more neutral position, reduce your pressure, or move slightly off the area, and make a note about it because this may help you understand more clearly exactly which neuromuscular condition is contributing to the client’s symptoms. Instruct your client to use deep but relaxed breathing to assist in relaxation.



Figure 8-8 Common trigger points and referral. Common trigger points associated with hyperlordosis and their referral patterns.

The following suggestions are for treatment that considers several factors involved in hyperlordosis. Because several joints and many muscles are involved in this condition, your treatment will likely fill the entire session.

Treatment Goals:



Increase circulation



Reduce adhesions



Reduce tone/tension



Lengthen tissue



Treat trigger points



Passive stretch



Clear area

- Begin in the supine position with the knees bolstered.



- If you have access to moist heat, place it on one rectus femoris. After heating one rectus femoris, move the heat to the other side, and begin treating the heated side. After heating the other rectus femoris, you can move the heat to the abdomen.



- Before applying emollient, assess the tissues of the leg and hip for myofascial restrictions, and release them if indicated. A common area of myofascial restriction with hyperlordosis is found where the hip flexor tendons cross the hip joint. You may also find adhesions along the iliac crests. If the rectus femoris is shortened, you may find adhesions anywhere along its length, and it may be adhered to any of the muscles that surround it.



- Treat the thigh generally to soften tissues and reduce hypertonicity.



- Apply lengthening strokes along the rectus femoris and assess for trigger points. Note the varied fiber directions of the rectus femoris. Treat the trigger points if any are found. Common trigger points in the rectus femoris are found near the superior tendon and refer pain along the muscle into the knee.



- Treat the tensor fasciae latae for hypertonicity and trigger points if found. Because this area may be sensitive or ticklish, begin slowly with firm (not deep) strokes. Trigger points in the tensor fasciae latae refer pain along the iliotibial band.



- If your assessment revealed shortened or hypertonic adductors or iliotibial band, treat these. Assess and treat any trigger points found.



- Passively Stretch any muscles treated for trigger points.



- Before treating the iliopsoas, warm the abdominals to be certain that the superficial tissues are prepared to allow you to access the deeper tissues. When warming the abdomen, it is important to work in a clockwise direction to move the contents of the intestines toward the rectum. Your client may feel the need to pass gas during this treatment. Instruct them not to hold this back because that would cause muscle tensing.



- With fingers resting on the medial aspect of the iliac crest, instruct the client to take a deep breath into the abdomen, and as they exhale, gently move into the iliac fossa to treat the iliacus. The depth of your access into the iliac fossa will depend on the texture of the tissues surrounding it. If you cannot access the fossa, spend a little more time on softening the superficial tissues and try again. Trigger points in the iliacus refer pain into the quadriceps area and into the low back and gluteal muscles.

- Treating the psoas directly requires proficiency in the anatomy of the abdomen. There are many vessels and viscera that could be damaged when deep pressure is applied to the abdomen, and it is essential to know which structures you may be compressing as you approach the psoas. If you have not had detailed instruction on safely accessing the psoas or do not feel familiar enough

with abdominal anatomy to avoid vessels and organs, stretch the psoas by extending the hip when the client is prone.

- If you have had training in safely accessing the psoas, assess it, and treat it for hypertonicity and trigger points. One safe way to access the psoas is by placing your fingers at the level of the iliac crests and, very slowly, move medially toward the psoas. When you believe you have reached the psoas, ask the client to flex the hip and feel for a contraction.



- To ensure that the client has control over the amount of movement and pressure applied in the abdomen, ask them to slowly flex and extend the hip and feel the psoas move under your fingers. If the client reports nausea, pain, or other sensations that may suggest compression of a vessel or organ, discontinue treatment of the psoas, and give the client a minute to breathe and relax.



- Turn the client prone and bolster the ankles. Stretch the rectus femoris and iliopsoas by performing passive hip extension if this does not reproduce symptoms. If you notice the client's hip rotating or elevating during the stretch, stabilize the sacrum and ilium with the palm of your free hand while extending the hip. If hip extension causes pain beyond the client's tolerance, try to stretch the rectus femoris alone by flexing the knee. Apply postisometric relaxation techniques to the hip within the client's tolerance to encourage the lengthening of the hip flexors.



- Assess and treat any myofascial restrictions found in the thoracolumbar fascia before applying lotions to the back.



- Once you are ready to apply lotions, warm the full back. If the client has had symptoms in the upper back, treat these as thoroughly as time permits.



- Treat the latissimus dorsi and serratus posterior inferior for hypertonicity and trigger points.



- Assess and treat the muscles of the lumbar spine. The attachment sites at the iliac crests, transverse and spinous processes, and lower ribs may be tender. Warm and soften the tissues attached to these bones to release tension in these muscles.



- Treat the bellies of the lumbar erector spinae and the deeper quadratus lumborum for adhesions, hypertonicity and trigger points. Apply cross-fiber strokes to separate the fibers and open the area for deeper work. Treat trigger points if any are found. Follow this with lengthening strokes.



- Once the erector spinae have softened and allow access to deeper tissues, apply lengthening strokes to the quadratus lumborum. Note the variety of fiber directions in the quadratus lumborum. Common trigger points in the quadratus lumborum are found in the angle formed by the twelfth rib and the spine, as well as in the flank midway between the twelfth rib and the ilium. Take care not to apply excessive force to the floating 11th and 12th ribs.



- Assess the hamstrings for adhesions and trigger points and treat if indicated. It is likely that the hamstrings are overstretched and should not be stretched further by using muscle stripping.



- From the prone position, ask the client to use their arms to slowly move the body without stressing the low back, bringing the buttocks toward the ankles, to stretch the quadratus

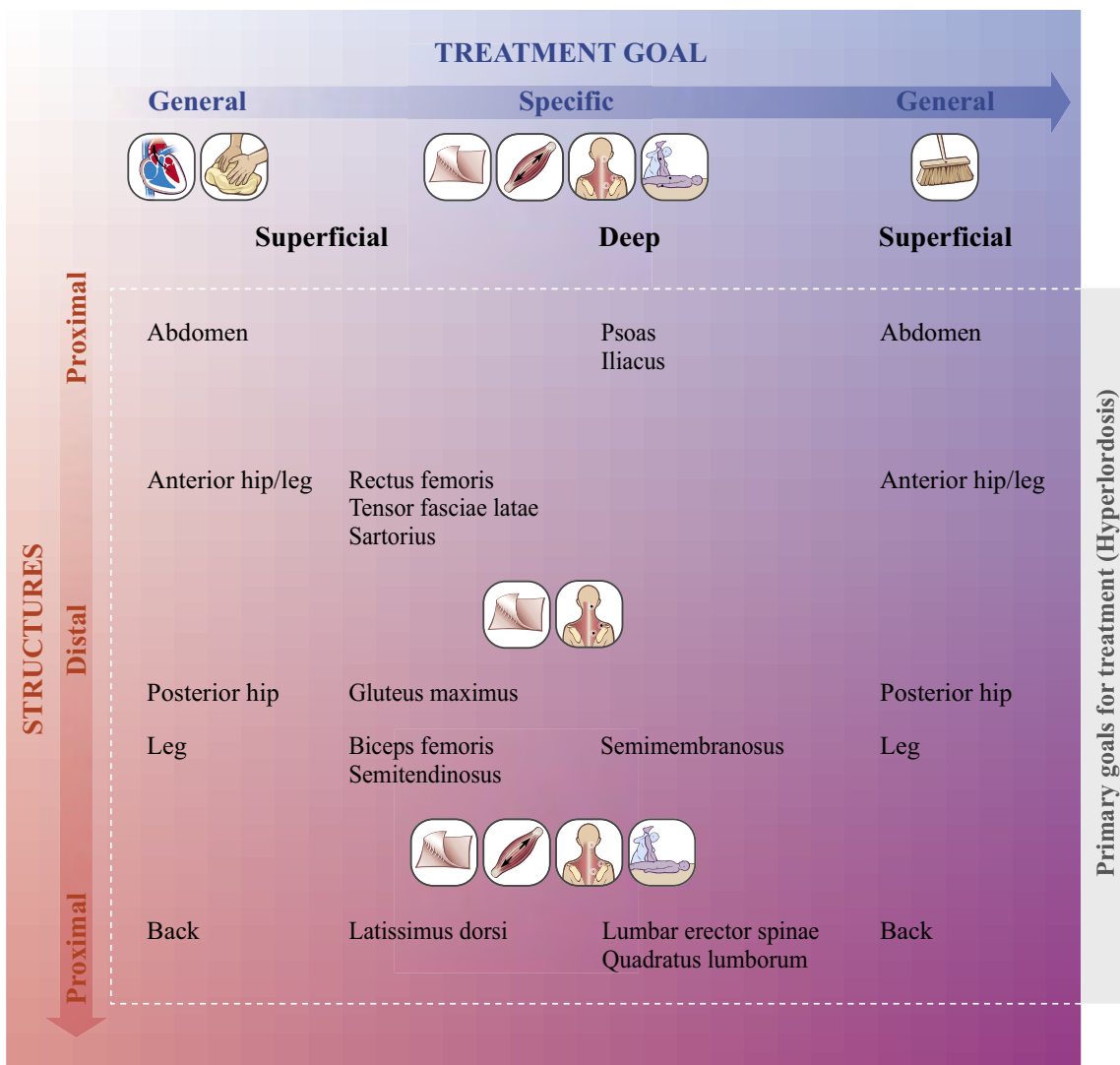
lumborum, erector spinae, and the latissimus dorsi (Fig. 9). When the client returns to the prone position, end with clearing strokes to the whole back.

- With the remaining time, consider the other possible conditions that may develop with hyperlordosis and treat these areas. External or internal rotation of the hip suggests treatment to the piriformis and other external rotators or the



Figure 8-9 Stretch quadratus lumborum and the lumbar erector spinae.

adductors, respectively. Flat feet suggest treatment to the muscles of the lower leg and feet. If hyperkyphosis is also present, refer to the hyperkyphosis course for additional treatment. You may not have time to treat all of these fully, but you can pay attention to some of them in each session. As the signs and symptoms of hyperlordosis decrease, you can increase the amount of time you spend in other areas.



CLIENT SELF-CARE

The following are intended as general recommendations for stretching and strengthening muscles involved in the client's condition. The objective is to create distance between the attachment sites of muscles that have shortened and to perform repetitions of movements that decrease the distance between the attachments of muscles that have weakened. If you have had no training in remedial exercises or do not feel that you have a functional understanding of stretching and strengthening, refer the client to a professional with training in this area.

Clients often neglect self-care because their daily lives are busy. Encourage them to follow these guidelines.

- Instruct the client to perform self-care throughout the day, such as while taking a phone call, reading e-mail, washing the dishes, or watching television, instead of setting aside extra time. When performing activities while standing, contracting the abdominal muscles or “sucking in the stomach” as well as tilting the pelvis posteriorly by squeezing the gluteal muscles may decrease pain and weakness in addition to toning these weakened muscles. This should be done only if it is comfortable and if it does not cause the client to breathe shallowly.
- Encourage the client to take regular breaks from repetitive actions.
- Demonstrate gentle self-massage to keep adhesions and hypertonicity at bay between treatments.
- Recommend that the client avoid sleeping with the hips flexed.
- Instruct the client on how to maintain proper posture in the standing and seated positions to keep pressure off the weakened joints. Sitting in a chair that supports the back and allows the client to rest the feet flat on the floor with the knees and hips flexed at approximately 90° may reduce muscle strain and stress on the joints.
- Instruct those whose exercise is focused on strengthening the quadriceps to stretch these and to strengthen the hamstrings by performing extensions of the hip, resisted or not, depending on their capability. Walking is a low-impact activity that helps keep the joints mobile.
- Instruct a client who regularly performs heavy lifting to bend the knees, and lift with the legs instead of the spine.
- Demonstrate all strengthening exercises and stretches and have the client perform these in your presence before leaving to ensure that they are performing them properly and will not harm himself or herself when practicing alone. Stretches should be held for 15–30 seconds and are performed frequently throughout the day, within the client's limits, during an active flare-up. The client should not force the stretch or bounce. Exercises should be slow, gentle, and steady while the client tries to keep every other muscle as relaxed as possible.

Stretching

Instruct the client to stretch their hip flexors by kneeling with one knee on a soft surface such as a pillow on the floor and the other foot on the floor with the hip and knee flexed (Fig. 10). The client should then



Figure 8-10 Hip flexor stretch.



Figure 8-11 Lumbar stretch.

slowly move the pelvis forward with the spine erect, lengthening the quadriceps and iliopsoas on the side of the unflexed hip. Switch legs to stretch the other side.

It is also important to reduce anterior pelvic tilt. While this may occur when lengthening the hip flexors, for some, it will be necessary to add a little push. Instruct the client, particularly when standing, to squeeze the gluteal muscles together toward the midline. This action will tilt the pelvis posteriorly while strengthening the gluteals.

To lengthen the lumbar erectors and quadratus lumborum, simple forward bends performed periodically throughout the day are helpful. To add an additional stretch with the pelvis stabilized and hip flexion minimized, instruct the client to stand approximately 12 inches from a wall with the dorsal surface of the hands along the edges of the sacrum as shown in Figure 11 A&B. With the hands on the sacrum, instruct the client to lean their back against a wall with the knees slightly bent. The hands help stabilize the sacrum and pelvis while the client extends the knees and slowly bends forward at the hips, stretching the low back.

Strengthening

While it may be important to strengthen the abdominal muscles for core strength, it is essential that these exercises do not include resisted flexion of the hips. Crunches are best performed with the knees bent to inhibit the hip flexors. While performing crunches this way, the client need not flex the thorax completely, since this might place strain on the low back. Small crunches held for 3–5 seconds will strengthen the abdominal muscles without undue stress on the lumbar spine.

Extension of the hip strengthens the hamstrings and gluteal muscles. The hamstrings are also strengthened by flexing the knee. These exercises can be performed while standing and leaning against a wall or other stable surface for balance or while positioned on the hands and knees (Fig. 12). An elastic band around the ankles can be used to add resistance within the client's tolerance.



Figure 8-12 Strengthen hamstrings and gluteal muscles.

Suggestions For Further Treatment

Ideally, a client with hyperlordosis will have treatments twice a week until the client can perform activities of daily living with minimal or no pain for at least 4 days. Reduce frequency to once per week until symptoms are absent for at least 7 days. When the client reports that they have been pain-free for more than 7 days, treatment can be reduced to twice per month. If the client is pain-free for 2 or more consecutive weeks, they can then schedule once per month or as necessary. With structural hyperkyphosis, treatment goals are limited to pain relief and minor increases in ROM, and these may be temporary. With functional hyperlordosis, there should be some improvement in both pain and posture with each session. If this is not happening, consider the following possibilities:

- There is too much time between treatments. It is always best to give the newly treated tissues 24–48 hours to adapt, but if too much time passes between treatments in the beginning, the client’s activities of daily living may reverse any progress.
- The client is not adjusting their activities of daily living or is not keeping up with self-care. As much as we want to fix the problem, we cannot force a client to make the adjustments we suggest. Explain the importance of the client’s participation in the healing process and encourage them to follow your recommendations, but be careful not to judge or reprimand a client who does not.
- The condition is advanced or involves other musculoskeletal complications that are beyond your basic training. Refer this client to a massage therapist with advanced clinical massage training. Continuing to treat a client whose case is beyond your training could turn the client away from massage therapy altogether and hinder healing.
- The hyperlordosis is structural or there is an undiagnosed underlying condition. Discontinue treatment until the client sees a health care provider for a medical assessment, and work with the health care team to plan massage treatments.

If you are not treating the client in a clinical setting or private practice, you may not be able to take this client through the full program of healing. Still, if you can bring some relief in just one treatment, it may encourage the client to discuss this change with their health care provider and seek manual therapy rather than more

aggressive treatment options. If the client returns for regular treatments, the symptoms are likely to change each time, so it is important to perform an assessment before each session. Once you have released superficial tissues in general areas, you may be able to focus more of your treatment on a specific area. Likewise, once you have treated the structures specific to hyperlordosis, you may be able to pay closer attention to compensating structures and coexisting conditions.

Professional Growth

Case Study

Tangelique is a 38-year-old married mother of two children. She cares for her children during the day, which includes home-schooling, and works evenings in a high-end department store, giving perfume samples to customers. In the past year, she has made the consumption of locally grown, whole foods a priority in her home after her husband received a diagnosis of diabetes. Prior to this, processed food and carbonated drinks had been common in their diet. She has had minor low back pain for years, but recently the pain has intensified, and she feels weak when standing for long periods.

SUBJECTIVE

The client complained of low back pain and weakness when standing for more than 30 minutes. She has had minor back pain since her first pregnancy, and 2 weeks ago, she felt a sharp but diffuse pain across her low back when standing up from sitting. Since then she has had more severe back pain, sometimes causing her to hunch, and she feels weak after standing. She spends 4–6 hours each day home-schooling her children and 4 hours on 3 nights each week in a department store. When home-schooling, Tangelique is often seated for several hours at a time. At the department store, she stands the whole time and is required to wear contemporary fashions with high-heeled shoes.

The client reported no systemic conditions and is taking no medication currently. She reported having no abdominal pain or difficulty urinating or with bowel movements. When asked if she feels any numbness or tingling or has experienced any swelling in her legs, Tangelique stated only that on occasion she feels “electricity” on the front of her right leg. When asked if she wears hip huggers or tight belts low on the waist, she responded “Yes.” The client is not currently pregnant, premenstrual, or menstruating.

OBJECTIVE

Postural assessment revealed a significant increase in the lumbar curve with anterior pelvic tilt. She displayed a minor lateral rotation of hips bilaterally. Valsalva and Kemp’s tests were negative for space-occupying lesions and disc involvement. The Stork test was negative for sacroiliac joint dysfunction. The Thomas test was positive for short hip flexors. Tinel’s sign was positive for irritation of the femoral nerve. This may be due to compression by tight clothing around the hips.

Palpation revealed fascial restrictions across the hip joint bilaterally and into the quadriceps area on the right thigh. The thoracolumbar fascia is thickened and adhered. The rectus femoris is dense and adhered bilaterally, but particularly on the right. The right tensor fasciae latae and iliotibial band are tender and adhered. The client was ticklish near the iliac fossa initially but was able to relax enough to reveal hypertonicity in the iliacus. Moderate pressure to the psoas caused pain in the low back. The latissimus dorsi contained adhesions at the lateral ribcage bilaterally. The quadratus lumborum and the lumbar erector spinae are tender, hypertonic, and adhered.

ACTION

I began in the supine position with a bolster under the knees. I applied myofascial release to tissues across the anterior hip joint and leg, taking care not to compress the femoral nerve. I applied general effleurage and petrissage to the anterior leg followed by muscle stripping to the rectus femoris, vastus lateralis, tensor fasciae latae, and the iliotibial band. There was a trigger point in the superior aspect of rectus femoris that referred down into the anterior leg. The client stated that this referral was similar to the area where she occasionally felt “electricity.” Muscle stripping did not reduce the referred pain. I followed two rounds of compression with effleurage, which reduced the referred pain from level 6 to 2. I then applied clearing strokes to the legs and the hips.

I applied slow but firm petrissage around the anterior iliac crest to reduce tickling followed by deep petrissage in the iliac fossa. The area was very tender to the client at first, but the tenderness reduced quickly as each layer of tissue was released. No trigger points were found in the iliacus, and there was no reproduction of symptoms. I applied superficial, clockwise effleurage to the abdomen to warm the tissues. The psoas was hypertonic bilaterally, particularly on the right. I applied muscle stripping to the psoas in 1-inch increments. A trigger point was found in the mid belly of the right psoas, which referred into the back. Compression reduced the referred pain from level 8 to 6. I cleared the area, and then instructed the client to turn to the prone position, using the arms as much as possible to reduce the possibility of straining the low back.

I applied a passive stretch to the hip flexors bilaterally. I used myofascial release including skin rolling across the thoracolumbar fascia. I applied petrissage to the muscle attachment sites along the iliac crests, sacrum, and lower ribs. I also applied petrissage and firm effleurage to the latissimus dorsi bilaterally. No trigger points were found here. I used deep effleurage followed by muscle stripping to the lumbar erector spinae and quadratus lumborum. A trigger point was found in the mid muscle belly of the lateral portion of the right quadratus lumborum. Compression followed by muscle stripping reduced the referred pain from level 8 to 4. I cleared the area. I followed deep petrissage to the lateral rotators of the hip with a passive stretch.

Following treatment, the client reported feeling “looser” but stated that getting off the table did cause some discomfort in her low back.

PLAN

I explained that the shortened hip flexors pull on the spine and pelvis when she stands because they are unable to lengthen fully. I demonstrated the stretches for the hip flexors and the lumbar spine. I demonstrated strengthening for hamstrings and abdominals but encouraged her to wait for 24–48 hours to see how she responded to treatment before stressing the low back with abdominal strengthening exercises. I advised her to proceed cautiously, with the hips and knees flexed, if she chose to do the strengthening exercises.

I explained that tight clothing around her ilia may be compressing the femoral artery, causing the “electricity” she feels. I suggested that she wear looser clothing or bands and belts that do not rest on the pelvis. I also explained that high heels may be contributing to the postural imbalance, although I understand that this is part of her uniform, and she may not be able to stop wearing them. I recommended wearing lower heels as much as possible and to practice posterior pelvic tilt and calf stretches after wearing high heels.

The client is unable to schedule treatments biweekly, but she scheduled one appointment for next week and stated that frequency will depend on financial restrictions. A sliding scale was offered if she felt she needed more frequent treatments, and I encouraged her to call if she had questions about more intensive self-care if she is unable to return regularly for treatment.

CRITICAL THINKING EXERCISES

1. Develop a 10-minute stretching and strengthening routine for a client that covers all of the muscles involved in hyperlordosis. Use Table 8-1, Box 8-1, and Figure 8-4 as a guide. Remember that a stretch increases the distance between the origin and insertion of a muscle and is important for those muscles that are shortened while strengthening is performed by actively bringing the origin and insertion closer together and is important for the antagonists of shortened muscles. Describe each step of the routine in enough detail that the client can refer to these descriptions in your absence and perform them without harm.
2. A client calls to schedule a massage for low back pain. She explains that she had a caesarian section 7 years ago that left a scar above her pelvis. Discuss the role her surgery may have had in the development of her chronic pain, the essential questions to ask her and her health care provider before initiating treatment, and the cautions and considerations to take when planning treatment.
3. In the assessment of a client with chronic low back pain, he tests negative for short hip flexors and has no anterior pelvic tilt. The client has a right rotation of the pelvis, his left hip is elevated, his thorax is flexed to the left, his right hip is laterally rotated, and his left ankle is everted. His left hamstrings are hypertonic compared to his right. Use Table 8-1 to determine which muscles are short and which may be lengthened. Put yourself in this posture to figure out how this client's activities or posture may be contributing to his pain. Design a treatment plan describing massage therapy as well as self-care.
4. Conduct a short literature review to learn how the following conditions may put a client at greater risk for developing hyperlordosis:
 - Nerve root compression
 - Obesity
 - Rheumatoid arthritis
 - Vitamin D deficiency
 - Spondylolisthesis

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