Also known as:

DDD; Lumbago, if located in the lumbar region; Cervical Disc Disease, if in the neck; Thoracic Disc Disease, if located in the mid-back

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Degenerative Disc Disease

Definition: A gradual deterioration of the intervertebral discs.

GENERAL INFORMATION

- Common causes: normal aging, prolonged sitting, spinal trauma
- Contributing lifestyle factors: repetitive, prolonged heavy lifting and twisting; abdominal obesity; smoking; poor nutrition
- Accelerated by trauma at any age
- Genetic predisposition
- Equal frequency among athletes and nonathletes
- Usually occurs during third, fourth, and fifth decades of life, with higher prevalence in women

Morbidity and Mortality

More accurately termed a "condition" than a "disease," DDD is often asymptomatic (manifesting no symptoms) because it results from the normal aging process. In fact, MRI studies indicate asymptomatic DDD is present in 25% of 40-year-olds and 60% of those older than 40 years of age. While the statistical prevalence of a sometimes symptomatic, ubiquitous condition is impossible to measure, low-back pain (LBP), the primary manifestation, is certainly measurable. From that standpoint, DDD statistically contributes to LBP prevalence, which is the leading cause of disability in the U.S. affecting those older than 45 years of age. In addition, 60–90% of the adult population annually suffers from LBP.

The prognosis, severity, and complications are directly related to the stage at which DDD is diagnosed and how promptly and effectively it is treated. The extent to which the disc can self-repair is unknown. Untreated, the degenerating discs can injure the nearby spinal cord or nerve roots, causing spinal stenosis (a narrowing of the canal through which the spinal cord passes), producing muscle weakness, and leading to damaged, nerve-related bowel and bladder dysfunction. Saddle anesthesia (perineal numbness) requires nerve-repairing surgery, which may relieve the pain but does not necessarily restore structure or function to the damaged disc itself. Intractable pain requiring surgical intervention is the most complicated and serious treatment of irreversible DDD.

PATHOPHYSIOLOGY

Understanding the healthy structure and function of the fibrocartilaginous spinal discs is essential before discussing pathophysiology. These lubricated, mini shock absorbers allow normal spinal movements of flexion, extension, hyperextension (leaning backward), rotation, and lateral bending (Figure 13-1). Spine stabilizers also include the longitudinal ligaments, deep musculature (erector complex), abdominal and hip muscles, flexors, extensors, and abductors.

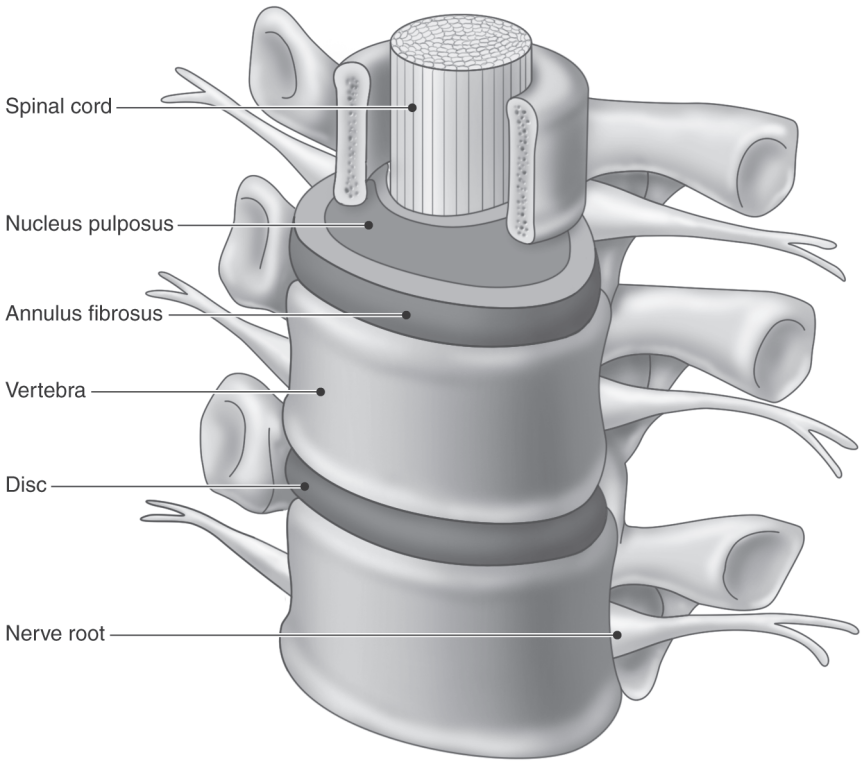

FIGURE 13-1 The fibrocartilaginous spinal disc. Tightly nestled in between each vertebra in the spine, a disc is composed of a jelly-like interior, the nucleus pulposus, and a series of tough, concentric outer rings, the annulus fibrosus.

The relationship between the abdomen and the spine is key to explaining the causes of DDD. If you think of the classic image of a pregnant woman in her third trimester, holding onto her back as she attempts to sit, you can easily understand the relationship between strain on the spine due to temporary or permanent anterior forces and DDD. Weak and stretched abdominal muscles (secondary to pregnancy or obesity), combined with tight hip flexors, can contribute directly to spinal instability and pain, thereby exacerbating the normal aging process of the spinal discs.

Just as increasing age leads to dry skin and brittle bones in even the healthiest of individuals, the intervertebral discs alter in structure and function after the second decade of life. The spinal disc's nucleus (center portion), normally consisting of 85% water, dries substantially with age, and the disc's annulus (concentric outer rings) turns from a relatively spongy consistency to that of old, tough, drying rubber. The height of the disc, usually about 0.25 inch, decreases, explaining in part why a person loses height with advancing years. Because of stiffness, and the lack of water, blood, and nutrients flowing into and out of the disc, the speed at which the disc can heal or repair itself is compromised.

Since it is not possible to function normally without sitting, twisting, and side-bending—all of which create insidious, accumulative tears in the discs—DDD occurs in stages that result in either serious dysfunction, mild back discomfort, or no symptoms at all.

Instability occurs first, as the usually tight-fitting discs start to slide around, bumping into nerve roots. The person may experience pain and discomfort. If treated at this stage, the condition can stabilize, and pain can be therapeutically controlled. During the second stage, osteophytes (new tiny bone growths [spurs]) begin to form from the constant, unusual wear and tear on the surrounding spinal joints. This further compromises nearby nerves and also causes stiffness. The damage from accumulated osteophytes is usually permanent. Finally, during the stabilization stage, the bony spurs have decreased spinal range of motion (ROM), stenosis may occur,

Massage Therapist Tip

Dermatomes

A dermatome is an area of skin where sensation is supplied by a single spinal nerve. For example, cervical spine impingement can manifest in numbness and tingling in the fingers. The nerves in the neck form an anatomic trail that feeds the motor and sensory function of the hand; thus, when the "electrical wire" in the neck is pinched in any way, the "circuit" does not work effectively, setting up signals "down the line." Another typical dermatomal signal used for massage assessment is "down the back of the leg pain," indicating a sciatic nerve compromise in the lumbar spine region.

Thinking It Through

Protective spasming, or protective hypertonicity, is a counter intuitive concept to most massage therapists. Let's think this through together, and give the muscles and bones a little personality in the process.

First, trauma or weakness to a joint sends a signal to the surrounding tissue that says, "Hey! The bones can't do their job in holding this joint stable just now; can we get some help from nearby tissue?!" Next, surrounding muscles "attempt" to take up a stabilizing role by "over reacting" to a nearby joint's weakness and establishing a protective hypervigilance, of sorts, in an effort to hold the bones in place. Physiologically, bone is stronger than muscle, so ultimately, the muscle "loses the battle," but not until a serious attempt has been made. This "serious attempt" causes hypertonicity and muscular spasms *that must remain untreated* until the joint can, once again, perform its normal stabilizing function.

Protective spasms typically occur after a motor vehicle accident when the patient has experienced whiplash, the neck joint is inflamed and unstable, and the surrounding muscles spasm and tighten to keep the neck erect. *It is an absolute contraindication to try to soften the muscles involved in protective hypertonicity.* If the therapist prematurely softens muscles before the joint has stabilized, the joint can actually seriously misalign, causing further damage.

bone may be grinding on bone, voluntary splinting causes secondary pain in adjoining tissues and joints, and the entire trunk now compensates to adjust to an irreversible and very painful condition.

Other age-related conditions that mimic the symptoms of DDD include osteoarthritis of the spinal joints, herniated disc, ligament sprain, spinal stenosis, and, most seriously, spinal tumor.

A medical diagnosis is essential both to determine the stage of this condition and to rule out other symptom-mimicking conditions. A DDD diagnosis is confirmed with the aid of a physical examination, an assessment of movements that reproduce pain, X-rays, CT scan, and/or MRI.

OVERALL SIGNS AND SYMPTOMS

- Intermittent pain, worsening with prolonged sitting, twisting, or lifting
- Episodic pain characterized by flare-ups alternating with periods of moderate discomfort
- Radiating pain and/or pins-and-needles sensation following a dermatome pattern (see online at http://thePoint.lww.com/Versagi)
- Muscle weakness in the area directly supplied by the affected (impinged) nerve
- Decreased spinal ROM

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- The small, sturdy, stabilizing erector muscles that wrap around the spine become hypertonic as they attempt to hold the now unstable spine in place. The inevitable hypertrophy, muscle spasm, and pain-spasm-pain cycle can be relieved by massage therapy.
- The decreased ROM (and therefore secondary pain) resulting from prolonged immobility can be treated with massage techniques.
- The stress that accompanies living with chronic pain can be decreased with massage therapy.

TREATMENT OPTIONS

Treating symptomatic DDD ranges from conservative therapies to invasive surgery. Treatment goals include pain relief, increased ROM, and attempts to slow the normal degenerative process. If treated in the early stages, pain subsides within 1–4 weeks and a conservative treatment course follows.

During early treatment, the patient is encouraged to make symptom-reducing lifestyle changes. These include losing abdominal weight for the obese patient; quitting smoking for the cigarette smoker; avoiding high-impact, twisting sports for the athlete; and observing more efficient body mechanics and proper ergonomics, combined with regular stretches, for the desk jockey.

The application of heat for an aching back and cold for a severe flare-up is also considered conservative self-care during the early stages.

Physical therapy to improve lifelong poor postural habits and strengthen the abdominal core and surrounding back muscles, combined with retraining for safer bending and lifting, are additional effective conservative treatments. Traction can be effective if used judiciously. Exercise is considered essential, and a regimen of gentle, low-impact aerobic workouts, such as biking, swimming, and/or walking, is often combined with hamstring stretches and core strengthening.

Although, intuitively, bed rest seems appropriate for back pain, it is prescribed for very short-term periods of merely a day or two. Certainly, if the patient is experiencing intractable pain, bed rest will be called for. However, the secondary effects of immobility exacerbate DDD, and bed rest is not a common treatment. For the same reason, immobilizing back and neck braces is considered of limited, short-term

value because the extended use of a brace, again, ultimately weakens surrounding muscles.

Chiropractic adjustments, application of TENS (transcutaneous electrical nerve stimulation performed by PTs), and epidural injections of anti-inflammatory steroids offer some relief. Long-term studies on the various treatment options show no single proven effective approach; the choices of modalities are usually based on an individual patient's preference and the physician's history of successfully treating DDD.

If unrelenting, severe pain and muscle spasm consistently interrupt the patient's activities of daily living and make normal functioning impossible, surgical intervention is the last viable treatment option. Surgery is considered only after 4–6 months of aggressive therapy, medication, PT, and lifestyle changes have garnered no relief. Surgical options include a spinal fusion or a disc replacement, each carrying a measure of risk and accompanied by side effects.

Medications are used to decrease the secondary symptoms caused by DDD, but no medication has yet been formulated that can stop or slow the ultimate degeneration of the disc.

Common Medications

- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil)
- Adrenocorticosteroids, such as prednisone (Deltasone, Orasone, Meticorten)
- Nonopioid pain relievers and fever reducers, such as acetaminophen (Tylenol, Feverall, Anacin, Panadol)
- Skeletal muscle relaxants, such as cyclobenzaprine hydrochloride (Flexeril)
- Opioid analgesics, such as oxycodone hydrochloride (OxyContin)
- Synthetic analgesics, such as tramadol hydrochloride (Ultram)
- Anti-inflammatory analgesic and fever reducers, such as celecoxib (Celebrex)

MASSAGE THERAPIST ASSESSMENT

Performing as an informed and responsible health care team member is the only arena in which a massage therapist will be treating and therefore assessing a patient who has DDD. The condition's symptomatic similarity to both serious and chronic disease, combined with the risk of doing great harm with a simple well-intentioned leg or hip stretch, makes working with a PT or orthopedic surgeon imperative. It is very helpful to have, and completely appropriate to ask for, a copy of the written X-ray, CT scan, or MRI report, which will clarify the exact location and extent of degeneration.

With that understanding, the following assessment techniques *are not intended for the therapist to assess the presence of DDD, but rather to assess the appropriate treatment for that day's session*. The assessment and the remaining focus of this chapter are for the treatment of DDD of the lumbar spine region:

- Palpation for paraspinal spasms
- Checking for trigger points and referred muscular tenderness, most commonly found (in lumbago) in the gluteal area and the hamstring complex
- Asking the patient if it is difficult to find a comfortable sitting or lying position
- Palpation of the hamstrings, gluteus maximus and minimus posteriorly, and the rectus femoris and the iliopsoas muscles anteriorly to determine hypertonicity

THERAPEUTIC GOALS

The chronic pain-spasm-pain cycle, trigger points, decreased ROM, and increased stress caused by DDD provide a clear-cut map for treating these patients. The therapist's job is to attempt to provide symptomatic relief of pain, spasm, and stress. Further, deep-breathing exercises are essential to help bring the patient into a parasympathetic state, help maintain vigorous breathing capability, and help prevent secondary pneumonia, so often brought on by age and debilitating conditions.

Thinking It Through *(cont.)*

During an acute flare-up phase of DDD, the paraspinal muscles often attempt to perform the job of the surrounding weakening, bony tissue. This creates extreme hypertonicity and muscle spasm that the therapist will be able to palpate. Here are some important questions for the therapist to think through—and perhaps ask her patient:

- Is the patient experiencing an unusual amount of pain? If the answer is yes, he may be having a flare-up, and massage of the back muscles is inappropriate. Relaxation techniques, not performed on the back, may be more helpful.
- Is the patient experiencing a typical "bad day" of pain? If the answer is yes, then the heat application and deep work to the back are appropriate.
- Is the patient experiencing the chronic pain and stiffness that usually accompany DDD? If so, the protocol in this chapter is appropriate.
- Is the patient holding his breath, wincing upon movement, and unable to find a comfortable sitting or lying position? These are sure signs of the presence of protective spasming, and the session should end with a call to the patient's physician.

Massage Therapist Tip

Application of Heat and Cold

The use of a rice bag or other nonliquid medium for applying heat is *ineffective*. Although it might feel good, dry heat has no therapeutic value. A hot water bottle or a microwaveable gel pack (wrapped in a pillowcase) provides the needed weight and moisture for the heat to work into the muscle belly. The hot pack can be left in place—not placed directly on the skin—for as long as it's comfortable. Advise your patient not to fall asleep with a hot pack in place.

Cold application of ice requires more attention. The ice pack should be wrapped in a pillowcase or thin towel to prevent skin damage. To reduce spasm or inflammation, the ice pack must be left in place for about 5–10 minutes, *and then removed for about 30 minutes*. The cycle can be repeated a few times throughout the day. Ice packs left in place for a prolonged time ultimately *produce heat*, which is the exact opposite of the desired result.

MASSAGE SESSION FREQUENCY

- 60-minute sessions twice a week for 1 month, during active back discomfort, pain, and stiffness
- 60-minute sessions once a week until pain subsides and ROM increases
- 60-minute sessions at least monthly for maintenance

MASSAGE PROTOCOL

This therapy is hard work, as you knead and petrissage some of the strongest and largest muscles of the body. Focusing on the exact points of lumbar hypertonicity, muscle spasms, and radiating pain, you'll be working on the gluteal complex, hamstrings, rectus femoris, iliotibial (IT) band, iliopsoas, quadratus lumborum (QL), and the entire set of erector spinae muscles (Figure 13-2). (Check your anatomy text to review the origins and insertions of these muscles.) Also, remember you can (carefully) use your forearms and elbows to get into the deeper gluteal muscles as well as the QL. If you have not been taught how to find and release the QL or the iliopsoas, spending an hour with a more experienced colleague could be helpful.

Getting Started

Comfortable positioning is vital; your patient may not be able to tolerate a flat prone or supine position. Have plenty of pillows available.

You'll use hot packs to help soften hypertonic tissue and cold packs to quiet a flare-up or muscle spasm.

Although your therapeutic inclination will be to perform leg and spine stretches to address his limited spinal and hip joint ROM, these are best performed by the PT or orthopedic surgeon with whom you are consulting. For this reason, stretches are not included in the step-by-step protocol.

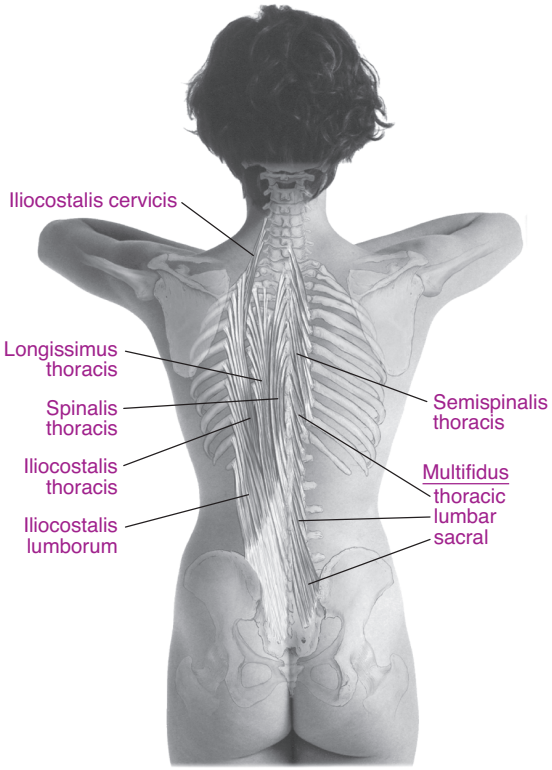

FIGURE 13-2 The erector spinae muscles. This group is the deepest set of back-stabilizing muscles. From Clay JH, Pounds DM. *Basic Clinical Massage Therapy: Integrating Anatomy and Treatment*, 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 2008.

Step-by-Step Protocol for Degenerative Disc Disease of the Lumbar Spine

Technique	Duration
Greet the patient's body with general warming compression. (The patient is lying comfortably prone.) Slaying-the-dragon techniques can include a scalp or foot massage.	3 minutes
Digital palpation, starting with medium pressure and working as deeply as the patient will allow. Feeling for trigger points, muscle spasms, and areas of tenderness. • Superior, middle, and lower trapezius • Rhomboids • Latissimus dorsi and into the thoracolumbar fascia • Gluteus maximus and medius • Serratus posterior • External obliques • Quadratus lumborum (QL) • Erector spinae	3 minutes
Apply a moist, heavy hot pack to the most compromised area based on the earlier mentioned palpation. During this time, simply lay your hand on the patient's back, perform further slaying-the-dragon techniques, sit in silence, or even leave the room to allow the patient to completely relax.	5 minutes
Remove the hot pack and place it on one upper leg on the superior hamstring region, as you prepare to work on the back. Effleurage, medium pressure, evenly rhythmic • The back from the base of the neck to the sacrum	3 minutes
Effleurage, deep pressure, evenly rhythmic • The back from the base of the neck to the sacrum	3 minutes
Focusing on areas of hypertonicity, spasm, and/or tenderness (assuming lumbar spine area involvement), digital or fist kneading, medium pressure, evenly rhythmic • Thoracolumbar fascia • Gluteus maximus and medius • Serratus posterior • External obliques • QLs	8 minutes
Digital or fist kneading, deep pressure, evenly rhythmic • Thoracolumbar fascia • Gluteus maximus and medius • Serratus posterior • External obliques • QLs	8 minutes
Stripping techniques, deep pressure, slow and evenly rhythmic, staying aware of your patient's possible flinching or wincing reactions • Erector spinae, thoracic and lumbar regions	8 minutes

(continued)

Massage Therapist Tip

Establishing a Long-Term Relationship

The physical duress of dealing with a condition that can easily alter the way your patient sits, stands, plays, and sleeps can be monumental. Add the emotional component of anticipatory fear, as he wonders if he'll have to take narcotics or undergo extensive spinal surgery. Try to develop a compassionate and diplomatic therapeutic relationship with this patient as you work together through his cycles of frustration, relief, and anxiety. Listen to him at the beginning of each session to determine his needs *for that session alone*. Show your professionalism by staying in touch with his PT and/or orthopedic surgeon. You have a real opportunity to establish a long-term professional association with this patient, who may continue experiencing symptoms for years.

Technique	Duration
Stripping techniques, deep pressure, slow and evenly rhythmic • Piriformis	3 minutes
Effleurage, deep pressure, a little more swiftly than your initial effleurage technique • The back from the base of the neck to the sacrum	3 minutes
Standing at the side of the table, reach across the body, place one hand below the rib cage and above the iliac crest, and "rake" your fingers deeply toward the spine, using an alternating hand-over-hand technique. Use enough force to slightly tug the body off the table. • QLs • External obliques • Lateral latissimus dorsi Repeat on the other side.	2 minutes, each side 4 minutes total
Effleurage, deep pressure, a little more swiftly than your second effleurage technique • The back from the base of the neck to the sacrum	2 minutes
Place the hot pack on the other hamstring set. Effleurage, petrissage, digital kneading, effleurage • Hamstrings, focusing on the insertion up under the gluteus maximus	3 minutes
Remove the hot pack. Effleurage, petrissage, digital kneading, effleurage • Hamstrings on the other leg, focusing on the insertion up under the gluteus maximus	3 minutes
Turn your patient supine and place him in a comfortable position. Instruct him to take full breaths at least 3 times, inhaling deeply, holding the inhalation for a few seconds, exhaling slowly and thoroughly.	1 minute

Contraindications and Cautions

- **Your patient's inability to find a comfortable lying position on the table or to lie still for any length of time is an indication that he needs to see his physician promptly.**
- **Suggesting or performing hip or spinal ROM exercises without knowing the exact status of the spinal disc involvement is contraindicated.**
- **Applying heat during a flare-up can lead to exacerbation of an inflammatory process and is therefore contraindicated.**
- **Performing manual traction to the spine, even simply involving myofascial releases, should not be performed without knowing the exact status of the spinal disc involvement.**
- **Knowing your patient's pain tolerance, combined with the knowledge of whether he's taking narcotics and/or muscle relaxants, will determine the depth of your work and the accuracy of your patient's response.**

HOMEWORK

If your patient is seeing a PT, he will already be performing daily exercises and stretches. Encourage him to demonstrate these exercises at the end of your session and to continue in his efforts at home. If he is obese, you can diplomatically suggest a weight-loss program and/or give him a registered dietitian's card. If he is a smoker, tactfully suggest a smoking-cessation program.

Without moving outside your scope of practice while simultaneously attending to the many lifestyle and preventive elements of your patient's long-term care, you can recommend the following homework assignments. Notice that each point includes instruction and encouragement; your patient will often be overwhelmed after months or years of doctor's appointments, and he may be taking narcotics. You want to make sure he understands *why* you are asking him to perform certain tasks.

- Take full, deep breaths throughout the day. Because you are in so much pain and your back is getting stiffer, it's easy to fall into the habit of holding your breath or not breathing deeply. This habit can lead to more problems and

sometimes pneumonia, which, of course, you want to prevent. Several times throughout your day, take a really deep inhalation, hold it for a few seconds, and then force out all the air with a strong exhalation.

- Keep moving. Immobility will only worsen your DDD. Check with your physician and consider taking the stairs instead of an elevator, parking your car farther away from the store, and walking instead of driving to do a nearby errand. Create excuses to keep moving.
- Apply moist hot packs to your back when you're experiencing deep, aching pain. Apply ice packs when you're experiencing a flare-up or when you feel the pain is particularly bad.
- Try not to slump when you're sitting; sit upright. Good posture provides much better support for your spine and helps prevent the risk of further disc problems.

Review

1. What is DDD, and how common is it?
2. Is DDD always symptomatic?
3. List conservative, moderate, and aggressive treatment options.
4. Why should you treat DDD only while performing as part of a health care team?
5. Why is it important to ask whether a client is taking narcotic pain medication?

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14

Also known as:
DOMS

Delayed Onset Muscle Soreness

Definition: A gradual increase in muscle soreness and pain a day or two after vigorous exercise, diminishing to complete recovery within 1 week.

GENERAL INFORMATION

- Caused by increasing an already established exercise regimen and/or initiating a new, overly aggressive workout program
- Occurs specifically in the overused muscle set, not the entire body
- Affects adult men and women at all levels of athletic prowess

PATHOPHYSIOLOGY

Since "muscle soreness" is ubiquitous in the medical literature, any discussion of pathophysiology begins with what DOMS is *not*. The normal muscle weakness or total body fatigue experienced during a vigorous workout is not DOMS. Further, DOMS is clearly distinguished from the acute, activity-halting pain indicative of a muscle strain or ligament sprain, accompanied by immediate, visible swelling and bruising.

Interestingly, the condition is an often sought-after source of pride by the weekend warrior who uses it as an indicator of the intensity of his new workout regimen.

During physical activity, microscopic tearing and subsequent swelling in the muscle fibers are the normal result of unusual force applied to a specific muscle and/or muscle complex. Muscles tear and rebuild, resulting in greater stamina and strength as the process is repeated and the exercise regimen continues. Examples of overexertion resulting in muscle tearing are a downhill skier taking an advanced hill too soon after mastering the bunny slopes, and a weight lifter adding both weight and repetitions before the muscles have adapted to the lower-weight workout.

Lactic acid buildup in muscles is the result of normal athletic activity, but this accumulation of an expected waste by-product does not cause the soreness that accompanies DOMS. Lactic acid washes out of the body after only a few hours of everyday movement.

The pain manifested during DOMS results from the following chain of events:

1. The muscle is pushed beyond its normal capacity.
2. Muscle fibers tear on a microscopic level, setting up a local inflammatory response.
3. Phagocytes (specialized white blood cells that respond to inflammation) rush to the area (a normal response to local trauma).
4. Swelling occurs, and then edema affects the surrounding tissues by *pushing fluid onto surrounding nerve endings.*
5. This phagocytic accumulation in a tightly enclosed area causes the pain associated with DOMS.

Many massage therapists incorrectly believe that postexertion muscle pain results from the accumulation of lactic acid. However, lactic acid is washed out of the body regularly, and its presence alone does not cause pain.

OVERALL SIGNS AND SYMPTOMS

- Localized pain, soreness, tenderness, and very mild swelling to a specific muscle or muscle set
- Sensitivity to touch and movement
- Decreased mobility secondary to pain
- Worsening pain within the first day or two after exertion, gradually decreasing to complete cessation after 1 week

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- The removal of lactic acid buildup and the painful by-products of localized inflammation by increasing circulation to muscles constitute the baseline of most massage therapy techniques.
- The efficacy of massage therapy on DOMS is clinically well supported. One study reported a 30% decrease in DOMS in those who received a massage anywhere from 30 minutes to 14 days postexercise. Another study indicated massage could reduce myalgia (muscle pain) associated with DOMS by 25–50%, depending on the massage technique used.
- Other data support massage as moderately effective in facilitating recovery from repetitive exercise.

TREATMENT OPTIONS

The prevalence of DOMS in both professional and occasional athletes has contributed to the large body of sports rehabilitation research. Professional athletes' blood levels, diets, stretching methods, and pre- and post-event workout regimens are extensively studied, and weekend warriors search the lay literature for advice about pain relief. Passive recovery—doing nothing, letting the condition and the pain pass on their own—is one effective option. Many people, however, are not willing to withstand a week's worth of pain if the discomfort can be shortened or, better yet, prevented. Most treatment options include increasing blood flow to the affected muscle, decreasing the inflammatory process, or treating the muscle nutritionally.

Vibration of the muscle belly has been found to be an effective means of increasing blood flow. To decrease inflammation (which is *not* physiologically separate from increasing blood flow to the muscle), cold-water immersion and hot/cold water contrast baths have been found to be effective. (The image of the NFL linebacker still in uniform, submerging his entire lower torso postgame into a huge drum of ice water comes to mind.) In the nutritional approach, amino acid supplementation, a single protein meal during DOMS, and a postexercise protein mixture have been successful in muscle restoration and pain reduction.

People with DOMS are strongly urged to wait for an improvement in their condition before returning to the same causative exercise regimen.

Several preventive techniques are worth mentioning for two reasons: because exercise benefits lifelong health and because pain is not always a side effect of a dedicated exercise regimen.

1. Although stretching is not conclusively proven effective in preventing DOMS, a period of warm-up and cool-down stretches makes intuitive sense.
2. Experiments with increasing aerobic cardiac output before intense weight-lifting regimens have reduced DOMS.
3. Avoiding sudden increases in an existing exercise regimen, or gradually and slowly beginning a new workout program, can help reduce DOMS.
4. Limited evidence suggests that taking nonsteroidal anti-inflammatory drugs (NSAIDs) *a few hours before activity* may reduce DOMS.

Thinking It Through

Most people have had the experience of seeing a physician who seems ill-suited to give advice in his field. An example would be an obese sports medicine specialist or a smoking pulmonologist. Since massage therapists are part of a health care team, it is essential that they represent a healthy lifestyle. Treating clients with DOMS provides a good opportunity to show that the therapist "talks the talk and walks the walk" when it comes to regular exercise. Questions a massage therapist might ask herself include the following:

- What do I do to keep myself on a regular exercise regimen?
- How do I treat DOMS when my muscles ache?
- What do I see as the most essential benefits of a long-term exercise regimen?
- When I stop exercising for any length of time, what effects do I notice?
- How does regular exercise affect my moods?
- How important is the fact that I may be serving as an example for those around me?

Common Medications

- NSAIDs, such as ibuprofen (Motrin, Advil) and naproxen (Aleve, Anaprox, Naprelan, Naprosyn)

MASSAGE THERAPIST ASSESSMENT

Of all conditions treated by massage therapists, DOMS may well be considered "home base." Much of the professional's work includes ridding the body of waste products, increasing circulation to muscles, and stretching joints to reduce stiffness. Assessing clients for the presence of DOMS will be second nature to most therapists.

A client will likely seek massage therapy for what she considers to be inexplicable stiffness and/or soreness after an extraordinary workout regimen. If her complaints indicate *postexercise* discomfort and local muscle involvement not accompanied by noticeable swelling or redness, the therapist can move ahead in treating DOMS with no assistance from another medical professional. The therapist can also, with caution, palpate the affected muscles and ask the client to demonstrate her limited range of motion (ROM). A painful client reaction that results from even slight palpation further confirms the presence of DOMS.

Massage Therapist Tip

Application of Topical Products

The labels on heat- or cold-producing, anti-inflammatory topical products promise increased circulation, increased warmth, decreased inflammation, and any combination of these. Available as lotions, creams, salves, sprays, and roll-ons, you can use these products and remain well within your scope of practice. Of course, no single product works for all clients, and the strong smell can be objectionable to both clients and therapists, regardless of effectiveness. Before planning to apply a product to your client's skin, call the manufacturer, and ask for the lab results and clinical studies indicating the exact effect you and your clients can expect. Also, ask about common allergic reactions. Reputable companies will be glad to send you literature and free samples. Always ask your client before applying any substance that has a potentially objectionable smell on her skin.

THERAPEUTIC GOALS

There are three primary therapeutic goals in the treatment of DOMS: increasing blood circulation to and removing waste products from the affected muscle set, increasing ROM at the proximal and distal joints, and breaking down adhesions that might have formed secondary to immobility.

There is one secondary therapeutic goal: resuming exercise. Exercise is proven to effectively limit the devastating effects of such conditions as Alzheimer's disease, cancer, and excessive, sustained stress. It is extraordinarily important for the therapist to encourage the client to continue her workout regimen and to praise her for her efforts. By reducing the client's pain, massage therapy can speed her return to regular exercise and sweating. The therapist should discourage the client from using the temporary pain caused by DOMS as an excuse to halt a potentially life-extending exercise program.

MASSAGE SESSION FREQUENCY

- Ideally: 60-minute sessions, twice during the week DOMS occurs
- Minimally: 60-minute sessions up to 1 month after DOMS diminishes

MASSAGE PROTOCOL

The session will combine careful assessment and vigorous therapy. Your client—whether a middle-aged housewife or a golf pro—is in pain, so your palpating assessment must be cautious.

You can easily use hot and cold packs as you "slay the dragon" elsewhere on the body. If you regularly employ a mechanical muscle vibrator, apply it directly to the appropriate muscle belly any time during the protocol. If you are using your hands for vibrating techniques, these following instructions, with the thigh as an example, may be helpful: Place your clenched fists on the lateral and medial surfaces of the thigh, and pump your fists up and down while maintaining tight contact with the thigh tissue. This will provide an effective vibration technique. Also, firmly planting your flat palm on any muscle belly and shaking your hand back and forth while applying firm downward pressure provide effective vibration.

Since your therapeutic goals include bringing blood to and removing waste from muscle tissue, you will frequently utilize deep, long (well-lubricated) effleurage techniques.

Step-by-Step Protocol for Delayed Onset Muscle Soreness of Bilateral Lower Extremities

Technique	Duration
With the client positioned comfortably supine, evaluate the extent of DOMS by palpating thighs and calves, noting the client's reaction. Assess bilateral knee and ankle range of motion (ROM).	2 minutes
Apply a heavy cold pack, wrapped in a pillowcase, to one thigh. Apply a heavy hot pack, wrapped in a pillowcase, to the contralateral (opposite) thigh. Ask your client to watch the clock and inform you after 5 minutes. Switch the cold and hot packs to the opposite thighs. This 5-minute rotation continues for the first 15 minutes of this extended (75-minute) protocol, during which you can allow the client to rest or slay the dragon by massaging shoulders, head, or feet.	(15 minutes of therapy applied before the usual 60-minute protocol begins.)
Remove hot/cold packs. Dry the skin. Effleurage, starting medium, working to deep pressure, slow and even rhythm, using your forearm or flat palm of your hand. • Lateral, anterior, and medial surfaces, right thigh	1 minute
Digital or knuckle kneading combined with muscle stripping, starting medium, working to deep pressure, slow and even rhythm • Lateral, anterior, and medial surfaces, right thigh	3 minutes
Digital kneading, deep pressure • Around the entire circumference of the patella and knee joint	2 minutes
Effleurage, deep pressure, slow then a little more quickly • Lateral, anterior, and medial surfaces, right thigh Repeat the entire sequence, working on the left thigh.	1 minute (7 minutes)
Position the client comfortably prone. Apply a heavy cold pack, wrapped in a pillowcase, to one calf. Apply a heavy hot pack, wrapped in a pillowcase, to the contralateral calf. Ask your client to watch the clock, and inform you after 5 minutes. At that point, switch the cold pack and hot pack to the opposite calves. This 5-minute calf-to-calf rotation of hot and cold packs continues as you work on your client's posterior thighs.	2 minutes
Effleurage, starting medium, working to deep pressure, slow and even rhythm, using your forearms • From just above the popliteal fossa until you feel the ischial tuberosity, right hamstrings	1 minute
Muscle stripping, starting medium, working to deep pressure • From just above the popliteal fossa until you feel the ischial tuberosity, right hamstrings	3 minutes
Effleurage, deep pressure • From just above the popliteal fossa until you feel the ischial tuberosity, right hamstrings Repeat the entire sequence, working on the left hamstrings.	3 minutes (7 minutes)

(continued)

Contraindications and Cautions

- **If the client's muscle pain persists beyond 7 days and has not decreased in intensity, refer her to a sports medicine specialist or an orthopedic surgeon. Massage therapy is appropriate, but the session will focus on anxiety relief rather than pain reduction, and the importance of seeing a physician should be stressed.**
- **If the client presents with acute muscle pain, limited ROM, visible swelling and/or bruising indicative of a more serious soft tissue or ligament injury, local massage is contraindicated.**
- **Since transitory, multisite soreness and muscle pain may indicate a serious, systemic condition such as lupus, fibromyalgia, chronic fatigue syndrome, or multiple sclerosis, the client presenting with non–exercise-induced pain (or pain following very mild exercise) can receive a gentle Swedish massage; however, you should refer her to a physician.**

Technique	Duration
Effleurage, starting medium, working to deep pressure, slow and even rhythm • Left gastrocnemius, soleus, plantaris, and popliteus muscles (the entire calf complex)	1 minute
Petrissage using a slow rolling motion, starting medium working to deep pressure • Left calf	2 minutes
Muscle stripping, starting medium, working to deep pressure • From the distal attachment at the Achilles tendon to just below the popliteal fossa	2 minutes
Effleurage, deep pressure • Left calf Repeat the entire sequence on the right calf.	1 minute (6 minutes)
Position the client comfortably supine. Perform hip, knee, and ankle passive ROM stretches (you do the work, the client surrenders the limb). Remember the stretch involves moving the joint to its "comfortable" point of resistance, asking the client to take a deep breath and then moving the joint slightly beyond the comfort zone. Do not create pain.	8 minutes
Vibration techniques, deep pressure • Entire left leg • Entire right leg	 3 minutes 3 minutes
Effleurage, medium pressure at a brisk pace • The entire leg, from ankle to hip, bilaterally	2 minutes

Be sure that stretching techniques are performed only after warming the tissue with effleurage, petrissage, and kneading.

Getting Started

This step-by-step protocol utilizes hot and cold packs but will not incorporate the use of a mechanical vibrator or a topical product. Involve your client in her own therapy by asking her to time the 5-minute intervals for the hot/cold contrast therapy.

The techniques can be used on any affected muscle set. The protocol focuses on bilateral lower extremities affected by an overly exuberant new running regimen; it begins after your client informs you of her thigh and calf muscle pain, combined with knee and ankle stiffness.

Be sure to work the entire muscle set by including origins and insertions. Deep work into tendon insertion points will feel particularly soothing and will help prepare the limb for stretches.

HOMEWORK

Encourage your client to slowly return to her exercise regimen as soon as the pain decreases; there is no need to wait until she is completely asymptomatic. With an eye

toward preventive measures, as well as treating the present DOMS, suggest the following homework assignments:

- Drink plenty of water before, during, and after your exercise sessions.
- Be sure to warm up before and cool down after working out.
- Work another part of your body, such as upper body weight lifting, while your legs, for example, are healing from DOMS. Consider cross-training in order to rotate muscle use, rather than repeatedly stressing the same muscle sets.
- Place alternating cold and hot packs on your potentially sore muscles following your next intense workout: 5 minutes of heat alternated with 5 minutes of cold for about 30 minutes.
- See your massage therapist the day of or the day after your next intense workout.

Review

1. What is the cause of the pain associated with DOMS?
2. List several standard treatments for DOMS.
3. If you intend to use topical preparations, what are your first steps?
4. Why is it important for a massage therapist to be fit?
5. Above and beyond the physical treatment of DOMS, why is it important to encourage a continued exercise regimen?

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15

Also known as:

FMS; Fibromyalgia Syndrome

Fibromyalgia

Definition: A deep and superficial, soft tissue aching pain of at least 3 months' duration, characterized by specific tender points in 11 of 18 locations.

GENERAL INFORMATION

- Primary FMS: cause unclear; evidence suggesting neuroendocrine dysfunction
- Secondary FMS: caused by traumatic physical or psychological insult
- Duration measured in years; lifetime involvement not unusual
- Occurs in children and adults of all socioeconomics levels; strong prevalence in females aged 40–50
- More common with family history of depression and/or alcoholism and/or personal history of childhood physical and sexual abuse, drug abuse, or eating disorders
- Genetic predisposition

Morbidity and Mortality

About 3–6 million Americans (2–6% of the U.S. population) suffer from FMS. This condition often mimics similar diseases, and diseases occurring simultaneously with FMS can contribute to a confusing clinical picture. Associated conditions include menstrual difficulties, anxiety, depression, headaches, insomnia, temporomandibular joint (TMJ) dysfunction, bowel difficulties, chronic fatigue syndrome, noncardiac chest pain, myofascial pain syndrome, peripheral neurogenic pain, and some forms of arthritis.

Symptoms are exacerbated by overexertion, stress, long periods of immobility, depression, insufficient sleep, extreme weather changes, and the presence of simultaneous infectious illnesses.

There are no statistics to indicate prognosis. The severity of the chronic condition fluctuates, and complications often occur that affect the person's quality of life rather than the medical course of the syndrome. The pain is pervasive, and the condition can endure for decades. However, it is not progressive, does not deteriorate the joints or organs, and is not fatal.

PATHOPHYSIOLOGY

After years of labeling FMS as a psychological aberration or a nonexistent condition, clinicians have narrowed the pathophysiology to a probable central nervous system and/or endocrine disorder. A woman with FMS has hypersensitive pain-signaling activity in her brain and spinal fluid, and a dysfunction in the pain receptors in her muscles. The brain of a fibromyalgia patient reacts differently while reporting pain, and FMS patients show measurable abnormalities in nonpainful stimulus tests, in addition to sensitivity to light touch.

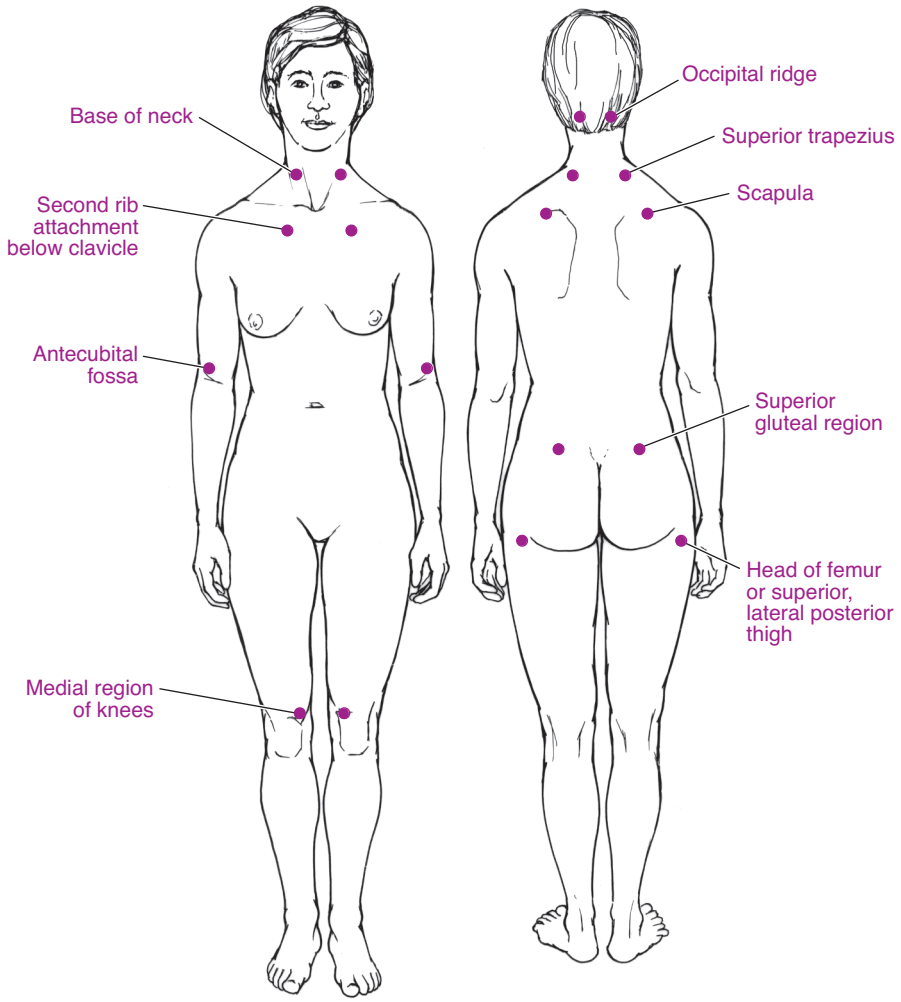

FIGURE 15-1 Fibromyalgia. Locations of the tender points. Adapted from Werner R. *A Massage Therapist's Guide to Pathology*, 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 2002.

Laboratory tests, MRIs, and muscle biopsies to determine the presence of FMS are usually nondiagnostic. According to criteria established by the American College of Rheumatology, the clinical diagnosis depends on confirmation of at least 11 of 18 tender points on the body, as shown in Figure 15-1.

OVERALL SIGNS AND SYMPTOMS

- Allodynia (a normally nonpainful stimulus perceived as painful)
- Pain lasting at least 3 months
- Pain and/or tenderness palpable in at least 11 of 18 points
- Generalized muscular aching
- Lack of restorative sleep, unrelated to the number of hours slept
- Pain and depression exacerbated by insomnia
- Pain exacerbated by exertion
- Moderate to profound fatigue
- Generalized stiffness, worse at the beginning and end of the day and after periods of immobility
- Distal paresthesia (numbness, tingling, burning, and stinging in the hands and feet)
- Cold intolerance

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- Allodynia can be addressed with careful desensitization techniques.
- Decreasing the perception of pain is well within the massage therapist's scope of practice.
- Insomnia and its attendant anxiety and irritability can be addressed by placing the patient in a deep parasympathetic state.
- Generalized stiffness can be relieved with respectful and thorough range-of-motion (ROM) exercises, combined with gentle joint stretches.
- Breathing restrictions that typically accompany chronic pain and stress can be addressed during the massage therapy and homework sessions.

TREATMENT OPTIONS

There is no cure for fibromyalgia. Interdisciplinary and self-treatment regimens, which include exercise, physical therapy, talk therapy, medications, and lifestyle changes, can effectively manage the condition. Although the standard treatment is largely pharmaceutical, the wise patient does not rely on medication alone to relieve her symptoms, because all the suggested medications have long-term side effects.

Acupuncture, biofeedback, and chiropractic manipulations have met with some success. Physical therapies are reported as helpful; and aerobic exercise, combined with flexibility and strength training, is especially effective—when not undertaken too aggressively. Psychological approaches include cognitive behavioral therapy, hypnotherapy, and meditation. Alternative treatments include dietary supplementation, homeopathy, and a vegan diet.

Common Medications

Low doses of antidepressants help the person attain deep sleep, while increasing serotonin levels and decreasing pain. Research suggests that pregabalin (Lyrica), a medication traditionally classified as an antiepileptic, may help block nerve pain in patients with fibromyalgia, but the long-term side effects are yet to be determined. Lyrica is the first FDA-approved medication for the management of FMS.

The following medications are often given in combination, in an effort to control lifelong symptoms:

- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil) and naproxen (Aleve, Anaprox, Naprelan, Naprosyn)
- Tricyclic antidepressants, such as amitriptyline hydrochloride (Apo-Amitriptyline, Endep)
- Nonopioid pain relievers and fever reducers, such as acetaminophen (Tylenol, Feverall, Anacin, Panadol)
- Skeletal muscle relaxants, such as cyclobenzaprine hydrochloride (Flexeril)
- Synthetic analgesics, such as tramadol hydrochloride (Ultram)
- Tricyclic antidepressants, such as doxepin hydrochloride (Sinequan)
- Selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine hydrochloride (Prozac), paroxetine hydrochloride (Paxil), and sertraline hydrochloride (Zoloft)
- Anticonvulsants, such as pregabalin (Lyrica)

Massage Therapist Tip

Discovering Tissue Abnormality with Sensitive Hands

The tissue in and surrounding the typical FMS tender points may feel different. If you gently lay your hands or fingers on an identified tender point, you may feel what seems like thicker, leathery, fibrotic, mildly spasming, or "stuck" tissue with a significantly different texture than the healthy surrounding tissue. This is a confirming sign that your work in this area needs to be thorough yet gentle.

MASSAGE THERAPIST ASSESSMENT

The initial assessment of an FMS patient is based on excellent history taking and not on the therapist's manual evaluation. The assessment could last at least half of the initial hour-long session. The patient will have had many medical misdiagnoses, and her frustration may need to be vented on the listening ear of a compassionate massage therapist. Trust must be built, and knowledge gained, before the tender patient is palpated.

Because FMS is a common condition, the subject pervades the lay literature; therefore, the massage therapist must use caution when planning to treat a possibly self-diagnosed patient. Although it is outside the scope of massage practice to determine the 11 or more tender points, the therapist can ask whether the patient has been officially diagnosed with FMS and expect her to generally identify each area of pain.

The therapist should take detailed notes outlining each location of pain and its severity, using the 0–10 pain scale for each point. Exact initial intake is important, because this will serve as a map for future inquiries before each session.

The therapist should ask about the efficacy of other modalities that his patient is using to manage her FMS; this will help him plan the nature of the massage therapy session and guide future homework assignments. Of course, knowledge of pain-relieving and mood-altering medications is essential to help determine the patient's ability to respond to the depth of the massage treatment.

THERAPEUTIC GOALS

It is not reasonable to develop specific therapeutic goals when treating FMS. Pain that seems intolerable and diffuse during one session can disappear completely by the next session, when the patient's primary complaint might be profound fatigue secondary to nonrestful sleep. The only reasonable goal in treating FMS is to attempt to relieve one or two presenting complaints. Each therapy session, however, should address the patient's overall compromised physiologic state.

MASSAGE SESSION FREQUENCY

As mentioned, the first session includes a prolonged intake, so the actual hands-on session may last only 30 minutes. This is best, because a body in deep, chronic pain cannot usually tolerate a full-hour session initially.

- 30-minute sessions until the patient is comfortable and reports no side effects
- Increased session length to match the patient's tolerance
- Ideally: 60-minute sessions once a week for the duration of the condition

MASSAGE PROTOCOL

If you bring to mind your last bout of the flu, you will have some idea of the energy-sapping state your FMS patient daily inhabits. The pain, tenderness, and fatigue are unrelenting—and yet many of the suggested therapeutic modalities demand that she move her body when all she wants to do is lay on the couch. Your deep compassion must be combined with your responsibility to get her moving again. The pain-spasm-pain cycle must be stopped, circulation must be increased. Thorough charting is essential for mapping progressions and digressions.

Deep-breathing exercises are critical for maintaining thoracic capacity and preventing pneumonia and other infectious diseases. Pretreatment heat, or rotating the presence of a hot pack around the body during the session, can provide great comfort and prepare an area for treatment. (Cold is not applied to FMS patients.) Soothing, light-to-moderate pressure (you will rarely apply deep pressure) will help gain the patient's trust, while easing her into a parasympathetic state and increasing circulation.

The protocol below focuses on two bilateral points of tenderness, deep-breathing exercises, and almost full-body stretching and ROM techniques. Consider using the following technique in working on a tender point:

- Lay the tips of your fingers on a tender point; wait a moment, just rest.
- Slowly and carefully stretch the superficial skin out and away from the central point of pain, stretching the skin and tissues just below the skin, not engaging superficial muscle on this first move.

Thinking It Through

There is a clear clinical difference between a trigger point and a tender point, and the effective treatment of the FMS patient depends on the therapist's understanding of significantly different approaches. Trigger point work is rarely performed on a patient with fibromyalgia, because the deep insult could produce post-session pain. (Chapter 43 focuses on trigger points.) The therapist should keep the following in mind:

- FMS tender points are bilateral, are typically found in the areas indicated in Figure 15-1, manifest in localized pain or discomfort, and are transient.
- Trigger points can be bilateral but are often unilateral; they have a different character of pain in that they are deeply aching and constantly present. Trigger points also cause referred pain—pain that travels to another area of the body as a result of the myofascial compromise at the locus of the trigger point.
- FMS tender points are not deeply palpated directly and must be approached gingerly for effective, pain-free treatment.
- Trigger points are palpated, worked aggressively with an expected amount of discomfort, and can be treated with direct heat or cold and ROM exercises at the proximal or nearby joint.

Massage Therapist Tip

Desensitizing the Skin

Desensitizing an overly sensitive patch of skin may help your patient endure the previously intolerable weight of a heavy blanket or a seemingly scratchy sweater fabric. Although your inclination is to avoid touching exquisitely sensitive skin, this is exactly what you must do. By touching the area, stroking it, then slowly applying deeper pressure and then stroking again, you desensitize the skin so it can tolerate normal touch in the future. Not stimulating the area only exacerbates the extraordinary sensitivity. Saying, "Allow me to help this area become less sensitive" as you gently proceed will help your patient understand your motive and relax into the treatment.

- Stop and rest. If the patient tolerated the first step, repeat the move, now engaging not only the skin but also the superficial muscle layer below the skin.
- Stop and rest. Repeat this technique until your hands engage the muscle belly below the tender point.
- Repeat this process, progressively moving deeper to the patient's tolerance.
- Finish the work with thorough, localized effleurage.

Getting Started

Clearly understand your patient's chief complaint before the session begins; have hot packs and plenty of pillows ready. Allow your patient to lead the way, yet remember that the most beneficial session includes addressing only one or two tender regions, increasing circulation, helping her breathe more efficiently, and stretching stiff limbs. This protocol addresses bilateral tender points above the scapula and in the lumbar region.

HOMEWORK

If a physical therapist and/or personal trainer are part of your patient's health care team, she is on the road to physically managing her condition. The following homework assignments, however, assume she is relying on you for motivation to get

Step-by-Step Protocol for Fibromyalgia

Technique	Duration
Starting with the patient supine, ask her to inhale deeply, hold it for a few seconds, and then forcibly exhale. Repeat 3 times.	1 minute
Compression, light pressure, using your whole hand • Entire anterior surface of the body, including the head and neck	2 minutes
Taking one of the patient's arms and cradling it securely with both of your hands, perform gentle stretching and ROM. Work slowly and rhythmically • At the shoulder joint • At the elbow joint • At the wrist joint Ask her to make a tight fist and to open her hand several times. Attempt to stimulate and to engage every muscle and joint of the upper extremity. Repeat on the contralateral arm.	4 minutes (8 minutes total)
Taking one of the patient's legs and cradling it securely with both of your arms, perform gentle stretching and ROM. Work slowly and rhythmically • At the hip joint • At the knee joint • At the ankle joint Ask her to tightly curl and uncurl her toes several times. Attempt to stimulate and to engage every muscle and joint of the lower extremity. Repeat on the contralateral leg.	5 minutes (10 minutes total)

(continued)

Technique	Duration
Ask your patient to inhale deeply again, hold it for a few seconds, and then forcibly exhale. Repeat 3 times.	1 minute
Turn the patient prone. Apply a moist hot pack to the bilateral suprascapular region.	1 minute
Compression, light pressure, using your whole hand • Entire posterior surface of the body, including the head and neck Move the hot pack to the lumbar region.	2 minutes
Using the technique described previously, place your fingers on the tender point above the spine of the left scapula. Compression, light-to-medium pressure, using your fingertips • Skin and superficial tissue only, no muscle involvement Stretch the superficial skin and some subcutaneous tissue • Away from the central area of the tender point Compression, medium pressure, using your fingertips • Superficial tissue and first layer of muscle Stretch the superficial tissue and first layer of muscle, using your flat hand. • Away from the central area of the tender point Compression, as deep as the patient can tolerate, using fingertips and hand • Working into the muscle as deeply as the patient will allow Stretch the deep tissue, using your hand • Away from the central area of the tender point Effleurage, slow, even, rhythmic strokes • Toward the ipsilateral axilla Repeat on the right side.	5 minutes (10 minutes total)
Remove the hot pack from the lumbar spine region after about 5 minutes. Repeat the previous procedure, starting first on the left side of the upper gluteal area, and then moving to the right side, and repeat the same procedure. (Final effleurage strokes will be directed toward the lateral area of the gluteal region.)	(10 minutes total)
Effleurage, slow, even strokes, medium pressure • Entire back from the lumbar region to the base of the neck	5 minutes
Position the patient supine. Compression, slow, even strokes, medium pressure • Entire anterior surface of the body	2 minutes
Stroking, using open fingers, slow, even, light pressure • Through the hair, from the top of the forehead out through the length of the hair	2 minutes
Allow the patient to rest, untouched, or ask if there is one more relaxation technique she might enjoy for the final few minutes.	

Contraindications and Cautions

- **Deep work or aggressive overstretching is usually contraindicated.**
- **Modify pressure based on the patient's medication intake.**
- **Sleep may be induced as a result of the massage therapy session, so be sure driving arrangements have been made for the possible groggy patient post-session.**
- **Some research indicates a parallel between FMS and joint hypermobility. When performing stretching exercises, be aware if the patient moves too easily into hyperextension or hyperflexion, and adjust ROM and stretches accordingly.**

moving. As with the focus of each massage session, self-care is for increasing circulation, stretching a stiff body, and maintaining efficient breathing. Emphasize that an element of each of these goals must be performed daily.

- One goal is to increase your ability to perform a gentle aerobic routine, with your final aim of a consistent 30-minute workout most days.
- You can choose dancing, walking, bike riding, swimming—any form of low-impact movement that you enjoy.
- If you can only start moving for 5 minutes, that's acceptable. The point is to move every day to the best of your endurance and ability.
- Keep an exercise journal to chart your progress.
- During your exercise, be sure to breathe deeply.
- While watching TV or driving, inhale deeply, hold your breath for a few seconds, and then exhale forcibly. Do this a few times every day. (Don't do this while driving if it makes you light-headed.)
- Before you get out of bed in the morning, stretch your whole body. Lay on your back and stretch your arms up over your head and out to the side; bring your knees up off the bed, roll your hips from side to side; tense and release your abdomen and gluteal muscles; roll your head from side to side; shrug your shoulders.
- In the shower, support yourself and try to stretch every joint and muscle; vigorously wash your hair and soap your body.
- If your budget and time allow, get a personal trainer or physical therapist who understands fibromyalgia, and ask him or her to help you create a progressive exercise routine.
- No matter how tired you are, try to move, breathe deeply, and stretch every single day.

Review

1. What is fibromyalgia?
2. Name the locations of several tender points.
3. What is the difference between a trigger point and a tender point?
4. List some lifelong interdisciplinary self-care techniques used by people with FMS.
5. Is there a diagnostic test to determine the presence of FMS?
6. What are your primary goals during each session?
7. Discuss a typical initial intake session with someone who has fibromyalgia.

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16

Frozen Shoulder

Also known as:

Adhesive Capsulitis

Definition: An inflammatory thickening of shoulder synovial joint membranes characterized by functionally restricted and/or painful joint movement.

GENERAL INFORMATION

- Primary frozen shoulder: etiology unknown
- Secondary frozen shoulder: resulting from trauma, shoulder surgery, inflammatory disease, and/or previous shoulder conditions
- Onset between ages 40 and 70
- Duration depends on timing of diagnosis; usually resolves in 1–2 years
- Slight prevalence in females; rare in children

Morbidity and Mortality

Shoulder pain is the third most common musculoskeletal complaint in the workplace, followed by low-back pain (LBP) and neck pain. About 2% of the population suffers from frozen shoulder. It is more common in patients with diabetes, hyperthyroidism, and hypertriglyceridemia (increased triglyceride blood level), making these conditions possible risk factors for developing frozen shoulder. Researchers have been unable to determine whether these disorders are comorbidities or causative factors.

Although commonly unilateral, the condition occurs bilaterally in 16% of patients with a diagnosis of sequential frozen shoulder (one shoulder is affected, and then the other). In about 14% of these cases, the contralateral shoulder is affected before the first shoulder's symptoms resolve. Although 10% never recover full normal shoulder range of motion (ROM), relapse is unusual.

PATHOPHYSIOLOGY

X-rays rarely indicate previous joint abnormalities. The medical literature supports an inflammatory component, which may help explain the onset of subtle, gradual clinical symptoms, followed by remarkable pain and loss of function, and then, a waning of symptoms—all indicative of other inflammatory processes.

One common pathophysiologic explanation is as follows: An inflammatory process (of unknown origin) in the joint's synovial tissue creates a thicker synovial membrane, leading to tiny tears as the head of the humerus moves through normal ROM at articulating surfaces, where bone contacts bone (Figure 16-1). This low-level chronic inflammation leads to further local fibrosis (scar tissue), causing more inflammation upon movement as the cycle continues. Postoperative pathologic specimens support the preceding theory; however, similar reliable evidence is not available to indicate a strong inflammatory presence in the earlier stages of the condition.

Frozen shoulder occurs in three phases:

- *Phase 1 (acute stage), 2–9 months*: Pain of unknown origin usually originates at night, disturbing sleep; no significant functional loss, although pain can be felt at the far end of normal shoulder ROM.

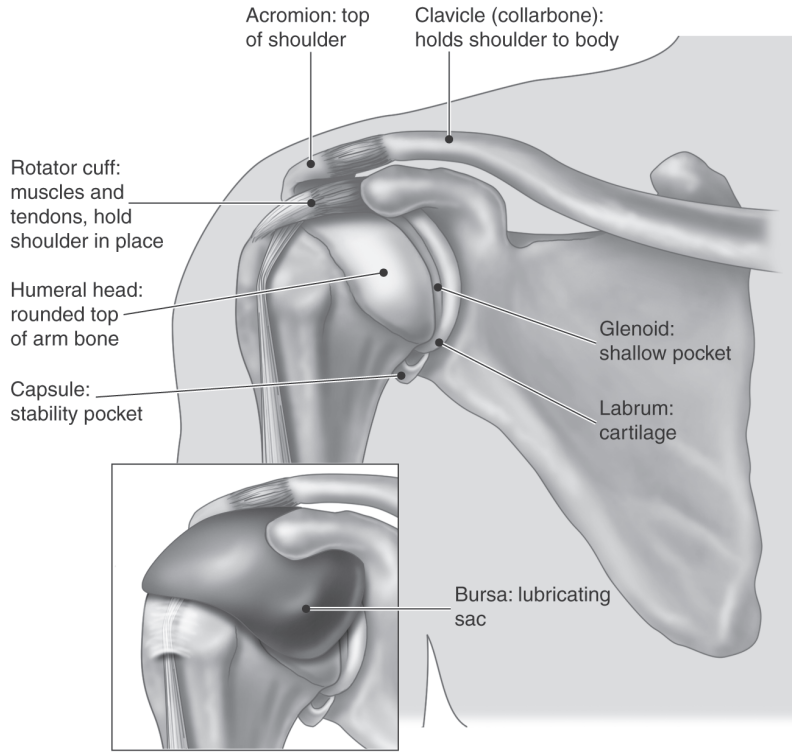

FIGURE 16-1 Anatomy of the shoulder joint. Synovial fluid is found at all articulating joints.

- *Phase 2 (subacute stage, stiffening phase), 3–9 months*: The shoulder feels frozen; ROM is functionally limited. Pain persists but is generally milder than in phase 1.
- *Phase 3 (chronic stage, thawing phase), 12–24 months*: Pain decreases significantly and ROM increases until the condition resolves.

Only a small percentage of patients complain of long-lasting ROM restrictions and pain.

Although it seems counterintuitive, frozen shoulder does not develop from disuse of the shoulder joint. No research supports increased diagnoses after stroke or paralysis in which functionality is dramatically decreased.

Diagnostic tests include bone thermography and Doppler. Arthroscopic findings indicate synovial tissue inflammation accompanied by intra-articular tendon thickening, scar tissue, and chronic inflammatory cells. However, physicians usually prefer a clinical (hands-on, noninvasive) diagnosis determined by the patient's oral history, pain level, and limited ROM.

OVERALL SIGNS AND SYMPTOMS

- Progressive unilateral shoulder pain, usually beginning at night, interrupting sleep
- Progressive shoulder functional restriction during normal ROM
- Pain while at rest and exacerbated with all shoulder activities
- Progressive worsening pain during vibration of the arm, psychological stress, and/or weather changes, especially exposure to cold

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- The anxiety and breathing restrictions that accompany pain and loss of joint movement can be relieved with massage therapy techniques.
- Joint restrictions can be relaxed and low-level inflammatory debris can be cleansed from surrounding tissue with appropriate therapy.

TREATMENT OPTIONS

Although the etiology and pathophysiology of this condition remain unclear, treatment protocols supported by research relieve pain, increase ROM, and return the patient to normal or near-normal function.

Because no single approach has proven consistently effective, a combination is often prescribed. A progression from the least to the most invasive therapies includes the application of heat, oral pain medications, home exercise regimens, physical therapy (PT); PT combined with intra-articular corticosteroid injections, nerve blocks, arthroscopic release, including manipulation of the joint and scar removal, and, finally, open surgery. The medical literature indicates that early and aggressive treatment is most effective. Optimally, frozen shoulder can improve without surgery if diagnosed and treated during phase 1.

The best treatment is prevention, although preventing a condition of unknown etiology that presents with often subtle symptoms may be nearly impossible. Early mobilization and therapy during symptomatic onset may deter progression into later stages. Those performing repetitive or vibratory upper-extremity activities are counseled to attend to proper body mechanics, set up an ergonomically effective work environment, engage in preventive manual therapies, and rest frequently.

Common Medications

Typically, a patient will start a regimen of oral over-the-counter (OTC) analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) to control both pain and inflammation. If pain is not relieved, the patient will typically be prescribed with oral corticosteroids, then, steroidal injections directly into the joint. Narcotics are the medication of last resort.

- Nonopioid pain relievers and fever reducers such as acetaminophen (Tylenol, Feverall, Anacin, Panadol)
- Anti-inflammatory analgesics and fever reducers such as celecoxib (Celebrex)

MASSAGE THERAPIST ASSESSMENT

The massage therapist can *assess for treatment purposes only.* He does not assess for the existence of frozen shoulder, but rather to determine the therapy necessary for each specific session.

While sitting in a chair, the client is asked to demonstrate full shoulder joint movement, or active ROM (a standing position would alter the determination of true shoulder ROM). She should indicate the exact point at which the movement creates pain or "feels stuck." While the therapist keeps detailed notes, the client works through the shoulder's entire ROM capabilities including flexion, extension, abduction, adduction, circumduction, and internal and external rotation. The therapist should also record answers to questions about restrictions of daily activities. For example, difficulties with hair washing, bra fastening, reaching for the seatbelt, or lifting a gallon of milk can help determine the extent of the pain and lack of function. The therapist then performs the full shoulder ROM for the client (passive ROM) and makes any significant notes.

Finally, carefully probing the entire shoulder girdle and pectoralis complex, the therapist notes any point of tenderness, as well as hypertonicity and/or trigger points in the shoulder, upper chest, and arm.

THERAPEUTIC GOALS

Reducing the perception of pain, helping to improve ROM, decreasing breathing restrictions, reducing anxiety, and providing comfort are worthy goals in the treatment

Massage Therapist Tip

Becoming Part of the Health Care Team

Although massage therapy alone cannot alter the course of frozen shoulder, your soft tissue work can directly influence your client's path toward wellness, as she works with her PT and physician. Ideally, a massage therapy appointment immediately preceding your client's PT appointment can prepare the tissue for a very effective (and less painful) PT session. To become a part of this health care team, you can call, with your client's permission, either the treating physician and/or the PT to diplomatically inform them that you, too, are treating their patient. You might say something like this: "I'm also treating your patient, Mrs. Smith, and would like to know how I can help your efforts to reduce her pain and increase her range of motion." A diplomatic massage therapist can often be rewarded with return phone calls from a PT or physician who understands that you share common goals and, in no way, are attempting to treat independently of medical counsel.

Thinking It Through

Treating frozen shoulder is an excellent time for a therapist to realize that his personal expectations and attitude while treating a client can profoundly affect treatment outcome. Since most frozen shoulders do resolve (often as mysteriously as they appear), therapy can be an exercise in diplomatic, cautious optimism that can be remarkably infectious to the hopeful client. The therapist can perform a "mental check" while treating not only frozen shoulder but also many chronic conditions.

- Am I expecting this client's symptoms to resolve?
- Are my verbal instructions during treatment and homework assignments presented optimistically?
- Am I seeing the client as "ill or handicapped" rather than on a progressive journey toward wellness?
- Am I asking the client to take full responsibility for her progress, or am I treating in such a way as to keep her dependent upon my therapy?
- Do I diplomatically remind the client, when she is feeling particularly defeated, that there is relief in sight and that research supports her full recovery?

of this complicated condition. The therapist must remember that he may encounter the client/patient at any stage, along her possibly long struggle with frozen shoulder, and functional restrictions fluctuate.

MASSAGE SESSION FREQUENCY

- Ideally: 60-minute sessions once a week
- Minimally: 60-minute sessions every other week
- Infrequent, inconsistent therapy will produce limited results

MASSAGE PROTOCOL

The following protocol is based on massage therapy for unilateral frozen shoulder at any phase of the condition. Since pain, limited ROM, breathing restrictions, and anxiety are always present with frozen shoulder, and given the assumption that you are working in conjunction with a PT or primary health care practitioner, you can modify the protocol according to the severity of your client's symptoms.

Your work will be very local and detailed to address extreme hypertonicity, deep in the client's shoulder joint. Contralateral attention to the uninvolved shoulder provides balance to the body. Positioning for contralateral therapy should not require the client to lie on the painful, involved shoulder; comfortable prone or supine positioning should be possible. Since you will require movement of the entire upper extremity through most of its functional capabilities, be sure to carefully and securely support the arm so the client can relax. Fear of an arm being accidentally dropped—and producing pain—will prevent her from reaching deep relaxation.

Your therapy will focus on bony prominences, muscle origin and insertion points, and especially at articulating surfaces in the shoulder joint where synovial fluid is created.

Although you will attempt to reduce breathing restrictions, it is not necessarily the anatomic diaphragmatic restriction that you are addressing but, rather, the psychological component of breath holding that accompanies chronic pain and anxiety. Therefore, your breath work will involve asking your client to breathe deeply throughout the session.

Maintain detailed intake, treatment, and progress notes that you can periodically share with the client's physician or PT.

Getting Started

Positioning is always dictated by the client's comfort level; in this case, your work is performed with the client side-lying on the unaffected shoulder. Contralateral work is performed with the client lying supine or prone. You will need moist hot packs and a "teddy bear" pillow (placed as if the side-lying client is holding a large, favorite teddy bear) that will provide support for the painful shoulder.

HOMEWORK

Although studies indicate that early, aggressive, and consistent stretching and strengthening programs at home can profoundly hasten a client's return to normal shoulder function, it is outside your scope of practice to assign any regimen beyond modest and noninvasive homework. You can assign the following with the knowledge that you are working within your scope, while simultaneously helping your client reach wellness:

- Apply heat to your shoulder regularly, except on days when you receive a shoulder injection or when the pain is acute.
- Roll your shoulders both forward and backward at least a dozen times throughout the day.
- Take deep breaths throughout the day by inhaling deeply, holding your breath for a few seconds, and exhaling with vigor. Do this at least 10 times a day.

Step-by-Step Protocol for Frozen Shoulder

Technique	Duration
Position the client side-lying with the unaffected side on the table. Place a small pillow under her neck and a larger pillow between her arms so the cervical spine is aligned and the affected shoulder rests in a correct anatomical position. Place a moist hot pack at the location of the head of the humerus so it drapes across the anterior and posterior portion of the shoulder girdle. Leave the pack in place; ask the client where she would like you to perform a few minutes of simple relaxation techniques.	5 minutes
Remove the hot pack. Effleurage, medium pressure, evenly rhythmic. • Pectoralis major, pectoralis minor, below the clavicular ridge all the way from the manubrium to the acromion process.	5 minutes
Effleurage, medium pressure, evenly rhythmic. • All muscles, tendons, bony prominences, and articulating joints of the shoulder girdle, especially focusing around the head of the humerus.	5 minutes
Effleurage, palmar and digital kneading, deep pressure, evenly rhythmic. • All muscles, tendons, bony prominences, and articulating joints of the shoulder girdle, especially focusing around the head of the humerus.	5 minutes
Ask the client to pinpoint where her shoulder feels "stuck" as you passively move her arm through its arc of ROM. Return the arm to its comfortable position. Follow these steps: • Warm the region using deep effleurage. • Move the arm to its painful or stuck point. • Stop movement and securely hold the arm. • Perform deep, slow, focused cross-fiber friction and kneading as near to the restricted area as the client's anatomy will allow. • Return the arm to a comfortable position and allow it to rest a moment. • Return the arm to the stuck or painful point following your client's input. • Ask the client to take a deep breath. • Move the arm to at least 1 inch beyond its previous point of pain or immobility; hold this position for a few seconds. • Return the arm to a relaxed position. • Effleurage, medium-to-deep pressure, to this entire area.	10 minutes
Effleurage, slow, medium pressure. • Anterior and posterior shoulder girdle area.	3 minutes
Find another area of shoulder restriction or pain and repeat the enumerated steps.	10 minutes

(continued)

Contraindications and Cautions

The presence of scar tissue, the client's desire to increase ROM, and her frustration with a "stuck" shoulder may tempt you to use more aggressive measures than are justified. It is not your job to "break up adhesions" or perform excessive scar work.

Pain relief and increased ROM will occur slowly in response to a combination of techniques. Neither you nor the client should expect immediate results.

Shoulder problems mimicking frozen shoulder symptoms include fracture, dislocation, rotator cuff tear, tumor, and infection. Do not treat self-diagnosed frozen shoulder until a physician has ruled out other more serious conditions.

An impingement is indicated if the client reports pain in the midrange of flexion or abduction accompanied by no pain at the beginning or end of the movement arc. Refer her to a physical medicine specialist.

Recent shoulder intra-articular corticosteroid injections are a contraindication for local massage therapy.

Technique	Duration
Position the client supine, maintain the pillow under her neck, remove the "teddy bear" pillow, reapply the hot pack to the anterior surface of the head of the humerus/shoulder girdle region (do not allow the client to lie on the hot pack). Ask the client to perform three rounds of deep breathing as she inhales deeply, holds the breath for a few seconds, and then forcibly exhales.	3 minutes
Effleurage, petrissage, effleurage, knead, effleurage. • The entire shoulder girdle and pectoralis major and minor complex of the unaffected shoulder.	10 minutes
Perform a few minutes of relaxation techniques before the client leaves the table.	4 minutes

- Self-massage your shoulder. Cup your palm around your shoulder, and then, as deeply as you can tolerate without creating pain, dig your fingers into your shoulder joint and massage it for a few minutes. You can do this while reading or watching TV.
- Move your arm to the point of pain or stiffness, and perform the above self-massage directly over the affected area.

Review Questions

1. What is frozen shoulder also called?
2. What causes frozen shoulder?
3. What are the symptoms of frozen shoulder?
4. What other conditions often coexist with frozen shoulder?
5. How many phases are there, what are they called, and what are their characteristics?
6. How is frozen shoulder usually clinically diagnosed?
7. What is the typical treatment regimen, from least to most invasive?
8. Does frozen shoulder typically resolve?

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