The Role of Physical Therapy in Obstetric–Gynecologic Practice

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- **Upper Gastrointestinal Tract, Biliary, and Pancreatic Disorders** [Update June 2017]
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This monograph is designed to enable the obstetrician–gynecologist to do the following:

- Understand the principles that provide the basis for physical therapy practice
- Screen and monitor patients for conditions likely to benefit from physical therapy, including common musculoskeletal conditions, obesity, and pregnancy
- Initiate simple physical therapy regimens
- Identify women who may benefit from referral to physical therapy

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Many obstetrician–gynecologists include nurse practitioners, physician assistants, and certified nurse midwives in their collaborative teams; however, only a few practitioners think to involve physical therapists in their daily practices. A growing number of practitioners have access to physical therapists within multidisciplinary urogynecology clinics. Although these physicians often reach out to physical therapists when providing care to patients with pelvic floor disorders, they may not readily consider physical therapy for patients with knee pain or low back pain, obesity issues, lymphedema, headache, carpal tunnel syndrome, abdominal wall pain, or incisional pain. This monograph is published to help fill this void. The author is a practicing physical therapist with a special interest in women’s health care. She addresses a wide variety of neuromusculoskeletal conditions, whose proper management can substantially enhance women’s health outcomes; pregnancy and postpartum issues that are common and often not resolved with routine office visits in our clinics; and issues unique to the care of elderly women. You should find this manuscript to be a valuable resource for providing comprehensive women’s health care.

Russell R. Snyder, MD
Editor
**ABSTRACT:** This monograph addresses the diagnosis and management of many neuromusculoskeletal conditions that both obstetrician–gynecologists and physical therapists encounter in their practices. Collaborative care initiated by the physician through consultation with a physical therapist can considerably enhance women’s health outcomes associated with these conditions. Physical therapy techniques are described to enhance physician understanding of the scope of this treatment option. Information is presented in the chronological sequence of a woman’s reproductive life cycle, although some information is universal and affects multiple stages of a woman’s life. Separate sections are devoted to problems of the pelvic floor muscles, pregnancy, and postpartum care, and conditions common in older women.

**Physical Therapy and Women’s Health**

Physical therapists are health care professionals who restore and enhance the physical movement, activity, and health of patients so that they can achieve optimal function and improved quality of life. The physical therapist may help decrease or eliminate the patient’s pain, improve her strength and range of motion, and instruct her in the safe performance of daily tasks through various approaches, such as manual therapy, exercise, patient education, and other modalities. Physical therapy (PT) is appropriate for individuals of all ages who already have or may develop impairments, activity limitations, or participation restrictions related to a musculoskeletal, neuromuscular, cardiovascular, pulmonary, or integumentary condition (1). Like physicians, physical therapists can be generalists or specialists who treat specific populations, such as pediatric, geriatric, orthopedic, or neurologic patients. A physical therapist who specializes in women’s health has additional training in evaluating and managing problems associated with the pelvic floor muscles and other specific impairments, such as lymphedema and pregnancy- or postpartum-related musculoskeletal issues.

The field of PT dates back to Ancient Greece and has evolved into a modern evidence-based allied-health discipline (2). As of 2015, all accredited and developing PT programs in the United States are clinical doctoral programs. Physical therapists are required to complete a graduate physical therapist program and pass a state licensure examination. The more than 200,000 physical therapists in the United States are all licensed by their respective state boards of PT and are organized by the American Physical Therapy Association (APTA). Approximately 3,000 therapists specialize in women’s health issues and should be included in the interdisciplinary team that provides care for women from adolescence through the reproductive years and well into advanced age (3). Typically, physical therapists who specialize in women’s health work either in a women’s health primary care setting or an outpatient orthopedic setting. The section “Resources” includes further information and guidance on finding a local or regional women’s health physical therapist.
Referral to a physical therapist is a conservative and low-cost option for the resolution of incontinence, worsening pregnancy- or postpartum-related musculoskeletal issues, or exercise-related problems because it may help avoid the unnecessary cost of protective garments or potential negative lifestyle sequelae, such as avoiding exercise because of urinary leakage or avoiding sex because of pain (Box 1). For example, mild symptoms of stress urinary incontinence (SUI) may resolve with conservative PT and exercise, thereby postponing or avoiding the need for surgical repair. Pregnant patients with low back pain or pelvic girdle pain may remain active through pregnancy and avoid analgesics after learning proper body mechanics and receiving manual therapy to align the pelvis. Diastasis recti, a separation of large abdominal muscles, that does not resolve on its own within the first 8 weeks after childbirth, may plateau or deteriorate without patient instruction on proper breathing, exercise, and body mechanics for handling the infant (see the section "Diastasis Recti").

An evaluation by a physical therapist is appropriate if a patient has stopped exercising for a significant amount of time and wishes to start exercising again, if she is interested in trying a new type of exercise (especially any type of weightlifting or running), or if she wishes to restart her exercise regimen after an injury. The physical therapist may use a functional movement screening tool to assess the status of a referred patient, determine her areas of impairment, and use this information to develop an individualized exercise program for the patient to avoid injury and dysfunction. Particularly, after giving birth or undergoing abdominal surgery, a physical therapist ensures the patient is activating abdominal and pelvic floor muscles properly. The physical therapist works with the patient to set goals that are reasonable, attainable, and healthy.

Obstetrician–gynecologists can gain valuable information by incorporating some of the muscular examination techniques used by physical therapists into their standard pelvic examination. Indications for a pelvic floor muscle examination include urinary or fecal incontinence, pelvic prolapse, pelvic pain, sexual dysfunction, pelvic problems during the postpartum period, or initiation of exercise after a period of inactivity.

**Box 1. Referral to a Physical Therapist**

- Musculoskeletal pain: back, hip, neck, shoulder, and knee
- Physical inactivity, obesity, and consultation before starting an exercise regimen
- Pelvic floor pain, vulvodynia, dyspareunia, and vaginismus
- Urinary incontinence or fecal incontinence
- Pregnancy- and postpartum-related pain (eg, pelvic girdle pain, back pain, neck pain, and carpal tunnel syndrome)
- Postpartum diastasis recti
- History of falls
Visual examination of the perineum and a simple digital examination give information about muscle tone, sensation, symmetry, volume, and pain reproduction, as well as the patient’s ability to contract, relax, or bear down. Determining whether the pelvic floor muscles are short, tight, long, weak, painful, or uncoordinated dictates the strategy for recovery from the dysfunction observed. It is appropriate for the obstetrician–gynecologist to give verbal instruction to patients regarding pelvic floor contraction and relaxation, commonly known as Kegel exercises, if they are comfortable with muscle examination and treatment techniques and no pain is present. If the patient is uncoordinated (for example, strains when asked to lift), she reports pain with pelvic floor muscle examination, or if the obstetrician–gynecologist believes that the patient would benefit from further instruction or intervention, referral to a physical therapist is appropriate.

Although the term “pelvic floor” refers to the bony pelvis, the muscles, the fascia and ligaments, and the viscera, only the pelvic floor muscles will be discussed in this section. The superficial muscles of bulbocavernosus and ischiocavernosus are responsible for clitoral erection, and the superficial transverse perineal muscle is responsible for supporting the perineal body. The deeper muscles of the pelvic diaphragm support the viscera and are referred to collectively as the levator ani. The levator ani muscle group includes the pubovisceral muscle, the puborectalis, and the iliococcygeus (4).

During visual examination of the perineum, the position of the perineal body at rest and during contraction should be evaluated. Detailed instructions for this evaluation are provided in Box 2.

The instructions to contract and relax the pelvic floor muscles should be repeated while examining the patient with single digital palpation of one side of the superficial pelvic floor muscles, on the other side, and again on both sides at the deep layer of muscles.

**Box 2. Instructions for Perineal Body Evaluation**

- Observe the perineal body at rest.
- Ask the patient to contract the muscles (“pull the pelvic floor up and in”). During the contraction, the perineal body should elevate, the clitoris should shift down (“nod”), and the anus should tighten into a smaller shape (“wink”).
- Ask the patient to relax (“let go”) and observe the perineal body return to baseline.
- Ask the patient to bear down (“push the muscles out as if you are allowing yourself to pass gas or straining to have a bowel movement”) and observe the muscles distend.
- Ask the patient to cough (“clear your throat”) and observe the pelvic floor lift and brace in response to increasing intraabdominal pressure.
The muscles should be assessed for any asymmetry and any weak or uncoordinated superficial or deep layers. A patient with a strong and coordinated pelvic floor should be able to produce a fair squeeze with a definite lift (5, 6) that can be sustained for 3 seconds or longer (7). If the patient cannot perform a contraction with a fair squeeze and a definite lift or if the patient cannot sustain the contraction for at least 3 seconds, the pelvic floor may be weak, and further evaluation is necessary to determine if the muscles are short and tight or if they are simply long and weak.

The patient should be asked to perform a 1-second contraction and full relaxation. If she can contract but not fully relax, the pelvic floor muscles may be tight, the patient may be uncoordinated, or both. Furthermore, this may be accompanied by pain. If the patient can do what was asked, she should perform as many repetitions of a quick contraction and full relaxation as possible within 10 seconds. If the patient can perform seven of these “fast-twitch” contractions, her pelvic floor muscle function can be considered normal (8).

**Diagnosis and Management**

Recognizing signs and symptoms of common musculoskeletal conditions and screening for functional impact allows obstetrician–gynecologists to establish a diagnosis and initiate appropriate management. Physicians may provide practical advice and refer the patient to PT, if necessary, for further evaluation and management.

**Nonpregnant Adult Women**

**Stress Urinary Incontinence**

Stress urinary incontinence typically stems from long and weak pelvic floor muscles. The patient is unable to contract the pelvic floor with enough power, endurance, or both to sustain continence while coughing, laughing, sneezing, or jumping. A patient with mild SUI may manage her condition by wearing a protective garment or absorbent product and avoiding exercises that involve jumping and running. The incidence of SUI in young, nulliparous female athletes is high (9, 10). It is higher in athletes who participate in repetitive, high-impact sports than in pregnant women or those in the postpartum period (11). Although SUI is underreported and, therefore, underdiagnosed and undertreated, it negatively affects a woman’s quality of life and predicts urinary incontinence in later adulthood (12). Many women believe surgery is the only way to resolve SUI symptoms and, therefore, do not consider conservative treatment. Women’s health specialists should routinely ask patients if they are experiencing SUI symptoms and refer them to PT for evaluation and treatment.

Verbal instruction is appropriate for patients with mild SUI if they demonstrate proper contraction and full relaxation with cues. Exercise cuing is similar to the instructions given in Box 2, which is to “pull the muscles up and in” and to hold for a certain length of time that is based on the number of seconds the patient can hold the squeeze and lift plus one more second.
If the patient is uncoordinated, has pain, or needs further cuing, referral to PT is helpful. When assessing the feasibility of pelvic floor strengthening, a physical therapist considers the duration of exercise, accessory muscle use, and the potential for developing painful trigger points. For example, a patient may be able to hold a pelvic floor contraction for only 1 second before the muscles start to give out. Instead of having this patient lift and squeeze her pelvic floor during wide leg squats, it is more effective to have the patient lie on her back and lift her hips to benefit from gravitational assistance as she squeezes the pelvic floor for 2–3 seconds. Accessory muscles of hip adductors, glutes, and abdominals can help the pelvic floor in creating a co-contraction. If it is not possible to elicit a proper contraction at all, a physical therapist may have the patient use a vaginal probe with electrical stimulation to help reeducate the pelvic floor muscles. If the patient has pain with palpation, the physical therapist may use manual techniques to resolve active trigger points (discussed in the section “Pelvic Floor Muscle Pain”) before initiating a pelvic floor exercise program.

**Pelvic Floor Muscle Pain**

The pelvic floor muscles are constantly active to maintain continence and pelvic organ support, and this constant activity complicates treatment when the muscles become impaired (13). Pelvic pain is caused by pelvic floor muscles that are too tight, nerves in the pelvic floor that are inflamed, connective tissues that are restricted, or a combination of these issues. The onset of these problems may be related to childbirth, straining from constipation, repetitive activities, or diseases of the urinary, bowel, or reproductive system (13). Palpating both superficial and deep pelvic floor muscles in a standardized order can help the patient, physician, and therapist to identify the problematic muscles and guide a plan of care. Vulvar pain, vulvodynia, dyspareunia, and vaginismus all require similar treatment from a PT perspective.

If increased tone is detected in the pelvic floor muscles during a pelvic examination, the obstetrician–gynecologist should consider referring the patient to a women’s health physical therapist for evaluation and treatment. High-tone pelvic floor pain is more difficult to treat once it has become a chronic issue; thus, it is imperative to seek treatment for this condition as early as possible (14). Patients appreciate practitioners who listen without judgment, understand their needs, and offer support and effective treatment (15). Almost all patients benefit from instruction in the “pelvic floor drop” (Box 3), which refers to the ability to relax the pelvic floor muscles consciously and fully. The pelvic floor drop helps patients relieve pain and reestablish normal muscle tone.

The Vulvar Pain Assessment Questionnaire (see “Resources”) was developed specifically to assess functional limitations caused by pelvic floor pain (16). The questionnaire encompasses global functional activities, such as sitting, standing, and traveling, but also addresses abdomen hypersensitivity, bladder and bowel function, and sexual response (17). The questionnaire was the first condition-specific functional outcome measure for vulvar pain, and it is consistent, reliable, and valid (16). It is accessible online with instructions
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for grading and interpretation. A physician or physical therapist can use this questionnaire to assess baseline functionality or evaluate progress at a follow-up appointment.

If the patient reports point tenderness with palpation, the presence of myofascial trigger points should be considered. Muscles that become too short (ie, fibers are overlapped) or too long (ie, fibers are stretched) become vulnerable to their development (13). Trigger points are discrete, hyperirritable nodules in a taut band of skeletal muscle that are palpable and tender during examination (18). They can be associated with pain in the immediate surrounding tissue, at distant sites in referred pain patterns, or both (19). Pain may be exacerbated and reproducible by firm digital pressure to the trigger point (19). Trigger points in the pelvic floor musculature can refer pain to places, such as the coccyx, sacrum, and rectum (13). Physical therapists use manual techniques, such as ischemic compression, transverse friction massage, and dry needling (Box 4), to decrease the pain originating from myofascial trigger points. During ischemic compression, the physical therapist holds firm pressure to a muscle or tissue until it relaxes. During transverse friction massage, the therapist uses a deep tissue technique at the site of the pain to break down scar tissue and remodel it to become more pliable and functional.

Connective tissue is designed to support, connect, or separate different types of tissue and organs. Connective tissue includes ligaments, tendons, and cartilage, but it is also the loose tissue that surrounds blood vessels and nerves and attaches the skin to the muscles (13). Connective tissue becomes restricted when dysfunction occurs in the

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**Box 3. Pelvic Floor Drop Instructions for Patients**

- Start with full awareness of your breathing. Just observe; do not judge.
- As you inhale, the pelvic floor descends and expands as if receiving the expanding breath in the abdomen.
- As you exhale, the pelvic floor recoils into its resting position.
- Practice deep breathing while you are lying down in a safe, quiet place and bring awareness to the relaxation of your pelvic floor as you breathe.
- Once deep breathing becomes natural, try performing the pelvic floor drop. The drop is the conscious feeling of pelvic floor relaxation. It should feel similar to the feeling of relieving yourself in the bathroom after you have been holding the urine for a while.
- Do not push or strain; just drop. It may be easiest to begin by lying down, so experiment in various positions and find the one that works best.
- Once you are comfortable performing the pelvic floor drop in one position, try it in other positions and also in stressful situations to help release tension in the pelvic floor.
Dry Needling: The insertion of monofilament needles, without the use of injectate, to treat pain and dysfunction in neuromusculoskeletal conditions. Needles are inserted into, alongside, and around nerves, muscles, or connective tissues with the purpose of decreasing pain and dysfunction*. The procedure is similar to acupuncture, but the terminology, theoretical constructs, and philosophies differ†.

Joint Manipulation: A quick (high-velocity) thrust of small amplitude at the end range of movement aimed to separate the articular surfaces of the joint and relieve pressure within the joint cavity.

Joint Mobilization: Oscillating movements of small or large amplitude at differing ranges that stretch the joint capsule and tissues that passively support and stabilize the joint.

Low-Level Laser Therapy: A treatment modality that uses radiation with a single wavelength of light to affect the connective tissues targeted; effective in the treatment of nonspecific chronic low back pain in conjunction with exercise therapy‡.

Lumbar Mechanical Traction: A technique that uses equipment to place horizontal traction to the lumbar vertebrae; effective in increasing the disc height of lower lumbar levels§.

Manual Physical Therapy: Application of skilled hand movements to improve tissue extensibility; increase range of motion of the joint complex; mobilize or manipulate soft tissues and joints; induce relaxation; change muscle function; modulate pain; and reduce soft tissue swelling, inflammation, or movement restriction.

Muscle Energy Technique: Voluntary muscle contractions of varying intensity performed by a patient against the resistance of the therapist in a precise direction resulting in relaxation and lengthening of the muscles needed to normalize the range of motion of the joint.

Taping: Use of fixed or flexible tape to correct alignment or manage muscle imbalance; the most common types of tape are McConnell tape, which is a thick rigid tape that restricts motion, and elastic therapeutic tape, which is thin and porous and either facilitates the contraction of injured muscles or prevents muscle overuse by inhibiting contraction||.

Transcutaneous Electrical Neuromuscular Stimulation: A therapeutic modality that uses low-voltage electrical current for pain relief. It involves a small, battery-powered unit with two electrodes that are placed on the patient’s skin in the area of pain or at a pressure point, creating a circuit of electrical impulses that travels along nerve fibers. The units are popular and affordable but have low-quality evidence except when combined with dry needling and other types of treatment¶.
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Connective tissues in a patient’s abdomen, inner and outer thighs, hips, buttocks, around the pubic bone and ischial tuberosities, and perineum should be evaluated to determine the direction of further examination. In addition to manual tests and palpation, physical therapists assess local symptoms of dysfunctional connective tissue, which include hypersensitivity, itching, redness, and impaired integrity (13). Often, patients report physical discomfort when the physical therapist is evaluating dysfunctional connective tissue, and the therapist will note inconsistencies and immobility. Normal connective tissue is mobile and consistently dense. It does not produce pain when touched. Physical therapists use a manual technique called connective tissue manipulation (Fig. 1) to improve blood flow, decrease thickness, and restore mobility to the tissues (13). In this technique, the therapist drives the tips of the thumbs through the patient’s tissue while the other fingers are used to bring the tissue back toward the thumbs (as if rolling the skin).

Peripheral nerve problems also can cause symptoms. Patients typically describe these symptoms as sharp, shooting, burning, or stabbing pain or numbness and itching in the areas that are supplied by the nerve. Even without trauma, nerves can become compressed,
entrapped, or injured. Physical therapists treat peripheral nerve problems with connective tissue manipulation and with neural mobilization.

Patients typically do not equate intercourse or other sexual activity with exercise, but it is helpful to patients with muscular pain to consider sexual activity a muscular activity. Because the abdominal muscles, gluteus maximus muscles, and hip adductors all can contribute to tightness in the pelvic floor, sexual positions where the patient is in a weight-bearing position or is trying to bring her knees toward each other can be especially painful. The physical therapist may suggest that the patient lie supine with legs abducted and supported and incorporate relaxation strategies to avoid an overactive pelvic floor.

In patients with vaginismus, the pelvic floor muscles are so tight that the patients cannot tolerate a pelvic examination. A well-trained women’s health physical therapist can teach the patient (sometimes over several visits) to minimize fear (20) and maximize trust during the examination. The physical therapist may use manual treatment of connective tissue manipulation to the abdomen, adductors, lumbar erector spinae, gluteus maximus muscles, and hamstrings to decrease muscle tone and improve circulation. The physical therapist may focus on deep breathing and patient awareness of the pelvic floor muscles. This will enable the physical therapist to teach the patient how to relax the pelvic floor and accessory muscles. Once the patient reports that she is ready for a pelvic examination, the physical therapist should refer the patient back to the obstetrician-gynecologist for ongoing gynecologic care. When the patient is ready, the physical therapist also can perform hands-on internal techniques to stretch and relax the pelvic floor muscles and can teach the patient superficial self-stretching techniques to use daily at home. Vaginal dilators or trainers are tools used to stretch the pelvic floor muscles.
Circumferential. They can be used in the clinic by a pelvic floor physical therapist and at home. Dilators come in sets or as singles in varying sizes and are made from plastic or silicone. The physical therapist first prescribes the appropriately sized dilator for the patient to insert into the vaginal canal for 10 minutes in a resting position. Once the patient can tolerate that dilator for 10 minutes without pain, she can incorporate hip and leg motions with the dilator still in place. Once the patient has undergone several sessions of PT with internal techniques, the therapist can instruct the patient to use a smaller dilator to find myofascial trigger points and apply firm pressure until the pain resolves. Upon discharge from PT, the patient may continue to use dilators daily, weekly, or before engaging in sexual activity.

CASE NO. 1. A 35-year-old nulligravid woman reported severe dyspareunia that developed after an episode of pelvic inflammatory disease. She reported that she had always had painful menstrual periods but no other significant past medical history. She and her husband attempted vaginal intercourse one time, but it was so painful that she was terrified to try again and has avoided all sexual contact. She expressed the desire to become pregnant within the next year. During superficial pelvic floor muscle testing, the patient reported a 4/10 pain (a score of 4 on the scale of 0–10) that was worse on the left side than on the right side. She had a good lift and squeeze, but the pain increased with contraction. When asked to perform a 1-second contraction followed by full relaxation, she was unable to consciously perform relaxation and strained. With deep muscle palpation, the patient reported a 7/10 pain bilaterally. The obstetrician–gynecologist referred the patient to PT for further evaluation and treatment.

At the PT appointment, the patient sat with excellent posture but was anxious and overly talkative as she gave her history. She reported that this issue interfered with her plans to have a child before age 35 years and caused overall frustration. She was a ballet dancer as a child and had continued to attend ballet barre exercise classes several times a week for exercise and stress relief. The physical therapist counseled the patient about pelvic floor muscle spasm and instructed her on the proper technique of diaphragmatic breathing. The physical therapist also pointed out the patient’s tendency to stand with a gripped pelvic floor and gluteal muscles and taught her strategies for relaxation in a standing position. The patient and her husband were counseled to discontinue any attempts at vaginal penetration but encouraged to spend time daily practicing nonsexual touch. The patient was encouraged to try voiding positions, such as propping feet on a stool to enhance relaxation of her pelvic floor musculature during urination and bowel movements.

The physical therapist used dry needling to the gluteus medius, gluteus minimus, and piriformis bilaterally coupled with electrical stimulation during eight visits over the course of 8 weeks. Furthermore, the physical therapist used connective tissue manipulation to the lumbar erector spinae, gluteus medius, gluteus minimus, gluteus maximus, hamstrings, and adductors and performed deep manual tissue technique to the bilateral iliopsoas muscles to lengthen and relax them. Treatment included biofeedback and exercises for pelvic floor muscle relaxation and manual therapy internally for pelvic floor stretching and trigger point release.

The patient spontaneously tried vaginal intercourse after 6 weeks of treatment and was successful. She reported a 3/10 pain during penetration, but this improved over time in supine and supported leg positions. She demonstrated proper pelvic floor relaxation with cuing (see the section
Stress Urinary Incontinence showed improved coordination (i.e., she could do seven quick contractions within a span of 10 seconds).

Low Back Pain

Approximately 80% of adults experience low back pain at some point during their lifetimes. At any given time, approximately 25% of adults report that they have experienced low back pain in the past 3 months (21). Therefore, the likelihood of a patient reporting low back pain to her obstetrician–gynecologist is high. Lumbar sprains and strains are the most common types of acute pain reported, and most resolve spontaneously within the first 2 weeks after injury (21). If the patient reports pain that has lasted longer than 2 weeks and it is affecting her functional activities, it is appropriate to ask further questions and then refer for treatment. The Oswestry Disability Index (see the section “Resources”) is a quick functional questionnaire that generates a percentage of disability that back pain (and sometimes leg pain) is causing. It is the most commonly used outcome measure in patients with low back pain and it has shown good psychometric properties (22). Pain intensity and issues related to lifting, walking, sitting, and standing endurance are rated to give a full picture of the patient’s ability to manage daily life activities. The tool is readily accessible online with instructions regarding scoring and interpretation and can be used to establish a baseline at the initial visit or progress at subsequent visits with minimum detectable change of 10%. A score of 20–40% indicates moderate disability, usually managed by conservative means, such as physical therapy (22). A score of 40–60% indicates severe disability that mandates a more detailed investigation and referral to a physician who specializes in managing back pain (22). For patients with a score between 0% and 40% or patients with mild-to-moderate low back pain, a short physical examination is appropriate before PT referral. The patient should be instructed to indicate whether the pain is broad or focal, if it is affecting one side or both sides, and if it radiates into the lower extremities. The patient’s standing posture should be observed, and spinal motion should be assessed for range and pain. The spine may move smoothly, or the patient may compensate with other muscles. The area of pain should be palpated to appreciate tightness or swelling.

Patients can present with unilateral or bilateral lower abdominal pain alone or with accompanying back pain that can be attributed to muscle spasm of the iliopsoas. The iliopsoas muscles attach from the transverse processes of the lumbar spine into the femur and are the only muscles that attach the spine to the lower body. Their prime function is hip flexion, but they can take over for other muscles when the abdominals are weak or postural dysfunction is present. Sitting for long periods each day causes iliopsoas muscles to shorten. Sleeping in a side-lying fetal position or wearing high heels regularly are additional causes of short iliopsoas muscles. The Thomas test is a reliable indicator that the iliopsoas muscle is tight and could be the cause of pain. To perform the Thomas test, the patient should sit on the end of the examining table and then lie back while pressing
one knee to her chest (Fig. 2). The hip flexion angle of the contralateral leg should be noted. If the knee is level with the table or above it, the iliopsoas muscle on that side is tight and may recreate the pain. The test should be repeated on the contralateral side for comparison.

A positive Thomas test result accompanied by abdominal pain, low back pain, or both is an appropriate reason for PT referral. The physical therapist will evaluate the patient’s static and dynamic posture, spinal mobility, and alignment in addition to tightness in bilateral iliopsoas muscles. The physical therapist may perform a manual release on either or both iliopsoas muscles, counsel the patient about proper posture and body mechanics, and teach the patient how to stretch the iliopsoas muscles and how to strengthen the gluteal muscles and abdominals.

A physical therapist further evaluates a patient’s static posture, functional movements, joint mobility, strength, and range of motion. The physical therapist then categorizes the impairments based on the following descriptions:

- Is the problem acute or chronic?
- How troublesome are the symptoms?
- How severe is the pain?
- Does the pain radiate down one or both extremities?

Based on the presentation of the patient, the physical therapist may use manual therapy, exercise, positioning, body mechanics education, dry needling, and taping or bracing (Box 4). Physical therapists use modalities, such as low-level laser therapy, lumbar
mechanical traction, transcutaneous electrical nerve stimulation, and application of ice or heat as adjuncts for pain relief (Box 4). Limited evidence supports the use of ice and heat modalities for back pain, but they are accessible to patients and can provide short-term relief. Using heat therapy (especially pads and similar products wrapped around the patient) is more effective in the treatment of acute low back pain than cold therapy (23).

**Obesity and Inactivity**

Approximately 38% of women in the United States are obese (24). Although obesity can be triggered by genetic, environmental, behavioral, social, psychologic, and cultural factors, a sedentary lifestyle and a surplus in caloric intake have been the two factors primarily responsible for the increase in obesity during the past 20 years (25). Only one out of five adults meet the physical activity guidelines as recommended by the U.S. Department of Health and Human Services (26). These guidelines suggest at least 2 hours and 30 minutes of moderate-intensity exercise (or 1 hour and 15 minutes of vigorous-intensity exercise) per week and 2 days per week of muscle strengthening exercises that target major muscle groups. Physicians should elicit current exercise regimens from their patients and, if the patients are inactive, PT should be considered for assistance with starting an exercise program. Because obesity contributes to chronic disease and increases the risk of early death, obesity must be considered a medical condition that increases the risk of medical morbidity and treated as such.

Physical therapists determine if obese and inactive patients have barriers to exercise, such as pain, balance issues, limited functional ability, or a lack of knowledge about how to exercise, that can prevent their return to physical activity. The patients are screened for strength and range of motion deficits in both upper and lower extremities and the trunk in addition to assessment of overall fitness. The physical therapist can then recommend a type of exercise based on the barriers present with considerations of access to place to exercise, cost, schedule, and child care needs. Recent research has focused on high-intensity interval training because of its low cost and time commitment, which makes it a favorable component of moderate intensity continuous exercise in terms of enjoyment and, therefore, adherence (27, 28). It is particularly important for individuals considering this type of skilled and fast-paced exercise to be screened and given instruction on how to safely begin a regimen. Further evaluation and possibly rehabilitation may be indicated before further participation in sports, so that injury risk is minimized.

**Knee Pain**

After low back pain, anterior knee pain is the most common musculoskeletal problem of women seeking medical care (29), and lateral knee pain is a common problem of runners, particularly female runners (30). Subjective reports of pain in this area are enough to justify diagnosis; it is appropriate to refer the patient to PT without further special testing or radiography. Rest, application of cold (ice), and elevation of the knee before PT evaluation should be recommended.
Pain directly in or around the kneecap is known as patellofemoral pain syndrome, and it occurs from the friction between the undersurface of the patella with the distal femur. Pain accompanies squatting, transitioning from sitting to standing or after sitting for a prolonged period, walking up and down stairs, or increasing a level of activity too quickly. Tenderness can be palpable around the borders of the patella. An audible clicking sound can occur when the patient straightens and bends the knee. It is classified as an “overuse” syndrome and can arise from weakness or tightness in the hip and leg muscles or improper tracking of the patella in its trochlear groove.

The physical therapist evaluates the patient’s abdominal, hip, and leg strength; hip and knee range of motion; muscle length; and the resting position of the patella and how it tracks along the trochlear groove during quadriceps contraction. The physical therapist may analyze the patient’s gait pattern in walking and running and may watch the patient step up and down to determine the mechanical breakdown of the joint motion. To treat patellofemoral pain syndrome, the physical therapist combines interventions to reduce pain as a short-term treatment and improve function as a long-term treatment (31). A combination of hip and knee exercises is recommended (31). Using foot orthoses, patellofemoral or foot tape, and braces to limit pressure to the patellofemoral joint during exercise, can decrease pain (31, 32). The physical therapist uses sport-specific activities as well as functional exercises, such as running, jumping, and stair climbing, to resolve faulty movement patterns and weak links.

Pain on the lateral side of the knee where the iliotibial band attaches through soft tissue with the lateral femoral condyle is known as iliotibial band syndrome (33). The pain can be sharp and stabbing. Usually, it occurs right before or right after the foot strikes the ground during walking. It comes from poor alignment or muscular control of the lower body (34) and occurs when an individual starts a new exercise regimen too quickly; performs repetitive knee flexion activities, such as running or cycling; or spends prolonged periods in one position.

The physical therapist evaluates strength, flexibility, and range of motion of the hip and knee as well as foot position in standing, walking, and running mechanics. Treatment includes using a foam roller, massage stick, or other soft tissue tool to decrease pain, strengthening exercises to normalize alignment, and advising on footwear and running mechanics to guide the patient’s safe return to exercise.

**LYMPHEDEMA**

*Lymphedema* is defined as swelling that occurs in any extremity because of a blockage in the lymphatic system. Patients who present with lymphedema will report swelling in one or both shoulders, arms, hands, and fingers or in one or both legs. The skin in the affected areas may feel thicker or tighter than the surrounding areas, and pitting of the tissues can persist even after the obstruction to lymphatic drainage is relieved. The affected extremity can be achy, weak, or hard to move when it is swollen.
Lymphedema can be primary (congenital deficiency of adequate lymphatic drainage) or secondary. Primary lymphedema affects women twice as often as men, is three times more likely to involve the legs than the arms, and is most often bilateral (35). Secondary lymphedema is more common than primary lymphedema. It occurs with a known injury to the integrity of the lymphatic system, such as removal, blockage, fibrosis, or damage of lymph capillaries, lymph vessels, or the lymph nodes resulting in the accumulation of the lymphatic fluid in that region of the body (35). Secondary lymphedema can cause disfigurement, physical discomfort, and functional impairment. It can contribute to anxiety, depression, and emotional distress, which can affect social relationships, body image, and self-esteem (36).

Cancer treatment is the most common cause of secondary lymphedema in the United States (35). Surgical removal of a tumor, the infusion of chemotherapy, and courses of radiation treatment can all create scar tissue. The lymph nodes can get damaged from the scar tissue, the use of chemotherapeutic drugs, or radiation therapy and, therefore, be unable to accept lymphatic fluid from its original designated region (35). Other causes of lymphedema include trauma, tumor growth, liposuction, and surgery (35). Early physical therapy can help prevent and reduce secondary lymphedema in the first year after breast cancer surgery, which involves dissection of axillary lymph nodes (36). The preventive benefit may persist after the treatment has ended (36).

Complete decongestive therapy is the standard treatment for patients with lymphedema and it is undertaken by a physical therapist. The goals of complete decongestive therapy are “to reduce the volume of the limb and soften the indurated tissue, restore mobility in the joints and connective tissue, prevent infection, improve cosmesis, improve quality of life and psychosocial awareness, and maintain independence in self-care” (35). It is divided into a treatment phase that extends from 2 weeks to 6 weeks and a self-care phase that is continuous for the remainder of the patient’s life (35).

During the treatment phase of decongestive therapy, the physical therapist attempts to redirect lymph flow from a nonfunctioning region to a functioning one. A hands-on technique called manual lymphatic drainage helps to redirect lymph flow and to stimulate new lymphatic circulation. The therapist applies short-stretch compression bandages to reduce fibrosis and to maintain reduction of the limb. The patient performs therapeutic exercises called limb clearance exercises throughout the day to stimulate lymph-vessel activity. These exercises are by design slow and rhythmic and are performed while the patient is wearing compressive bandages or a compression garment. Exercises include diaphragmatic breathing, yoga, functional activities, and aerobic activities, such as swimming, walking, or cycling (35).

The patient is ready for the self-care phase when she has achieved the desired volume reduction. The goal of this phase is to maintain the desired lymphedema reduction. The physical therapist assists with ordering a compression garment to be worn by the patient 24 hours per day. The patient will continue to perform her own manual lymphatic drainage and limb clearance exercises daily (35).
CASE NO. 2. A 45-year-old woman developed secondary lymphedema after a lumpectomy and radiation therapy to treat right-sided breast cancer. She had returned to work as an elementary school teacher and reported heaviness and tightness in her dominant (right) arm that got worse as the day went on. She reported that she was unable to write on the board because of the difficulty reaching overhead or forward. She had not returned to wearing rings or bracelets on her right side because of the discomfort in her hand and wrist.

On evaluation, the patient presented with normal range of motion of her neck but limited shoulder flexion, abduction, and external rotation. She had less grip strength in her right hand than her left hand despite her right hand being dominant. Her girth measurements were bigger throughout her right upper extremity, but there was no evidence of palpable or visible edema in her trunk. The patient was advised not to lift any item heavier than 15 pounds and to avoid overheating. She was counseled about good skin health and infection prevention. She had an exercise history of regular yoga practice that she has stopped during her treatment, and the therapist reviewed proper diaphragmatic breathing to use before treatment and at home on a daily basis. The patient was seen 5 consecutive days per week for 3 weeks and then twice per week for 2 weeks. At each session, the physical therapist performed manual lymphatic drainage and bandaged her right upper extremity with short stretch layered bandages. The patient performed limb clearance activities that included shoulder rolls; elbow and wrist flexion and extension and pronation and supination; and light stress ball squeezes while wearing the compression bandages. By discharge, the patient was able to demonstrate self-massage that she performed daily, and she could apply and remove her compression garment. She reported a decreased feeling of heaviness in her arm and was able to write on the board for a limited time. She returned to an alignment-based yoga practice twice weekly in addition to her daily self-care to maintain the edema reduction.

Pregnant Women

Pregnant patients often will report musculoskeletal symptoms to their obstetrician–gynecologists. Referring these patients for PT evaluation and assistance is a common course of action. A physical therapist can treat the musculoskeletal symptoms that arise during pregnancy using a combination of patient education, exercise, and manual techniques. A knowledgeable physical therapist is a great resource for an obstetrician–gynecologist’s interdisciplinary health care team.

As the woman’s body changes during pregnancy, there is an interplay of forces that can challenge a patient’s previously balanced posture (37). These changes can create or exacerbate pain and dysfunction. The volume and weight of breast tissue increases, pulling the shoulders anteriorly and placing increased stress on the cervical spine. The abdomen grows exponentially, and the patient’s center of gravity shifts forward and upward. The abdominal contents are compressed as the uterus expands and the ribs flare laterally. The feet increase in size and flatten, losing height in the arches (38). The cumulative effect of these changes typically leads to a pregnancy posture characterized by an exaggerated kyphotic thoracic spine and an exaggerated lordotic lumbar spine (37). The hip flexors and lumbar erector spinae both shorten as the abdominals and hip extensors
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weaken (37). During the third trimester, the lordosis in the lumbar spine can reverse and become kyphotic because of the marked weight gain (39).

Two systems serve to provide pelvic stability—form closure and force closure. Form closure refers to the pelvic and ligamentous structures that make up the structural foundation of the pelvis (37). Force closure is the fascial system (including muscles) that adds strength to the pelvis by its contractility force (37). Both systems change during pregnancy to widen the pelvis and increase its mobility.

The two principal treatments that physical therapists use for pregnant patients are exercise and manual therapy. Exercise likely will consist of proper breathing, stabilization and strengthening, lengthening and stretching, or using proper mechanics for functional tasks. Manual therapy techniques often include mobilization, manipulation, and soft massage. Therapists also may use taping, bracing, and stabilization as well as shoe orthoses or inserts and support belts to aid in adjustments and rehabilitation of pregnancy and postpartum-related body changes. Although maternity support belts have not been shown to be helpful, pelvic compression belts (described in the section “Low Back Pain of Pregnancy”) are effective in decreasing pain and increasing daily activity tolerance.

The pelvic floor muscles are especially taxed during pregnancy because of the weight of the growing fetus in the uterus, postural shifts that change a patient’s center of gravity, and the hormonal changes that relax and prepare the pelvis for passage of the fetus during labor and delivery. Although the pelvic floor musculature is designed for these events to occur, several factors, such as an unstable pelvis, maternal employment that requires repetitive motion, or several pregnancies in quick succession, can affect the woman’s capacity to compensate for these challenges to her body.

A physical therapist can safely evaluate pelvic floor musculature during pregnancy. This evaluation is especially important for patients who report new-onset pelvic floor pain, SUI, or both. Treatment is similar to that of nonpregnant individuals and education is similar to that of pregnant women with low back pain and pelvic girdle pain. The physical therapist will instruct the patient on how to improve motor control of the pelvic floor, including activities to strengthen or relax the musculature, to help in preparation for delivery.

Low Back Pain of Pregnancy

Because low back pain is commonly experienced during pregnancy, women may anticipate its development and consider it a necessary challenge that they will have to endure throughout pregnancy and perhaps beyond. However, a physical therapist can treat a patient with low back pain, especially if the pain is affecting the patient’s quality of life and reducing her functional level. It is important to inquire about a history of low back pain that antedates pregnancy. A physical therapist should determine if there has been any major event (ie, fall or motor vehicle accident) that may have initiated the pain not
related to pregnancy. Other risk factors for lumbar pain include lack of exercise before pregnancy, increased body mass index, a dramatic weight increase, depression, and anxiety (39, 40). A detailed medical history should be obtained, and a physical examination should be performed to exclude serious pathology. If it is determined that the patient’s pain has a musculoskeletal origin, the patient should be referred to a physical therapist.

Often, low back pain of pregnancy is related to the growing uterus and associated postural changes. Patients will describe this sort of pain as achy and sore that worsens with activity and improves with rest, change of position, and sometimes application of cold or heat. The pain can be central at the low back above the sacrum. Paravertebral muscle tenderness may be present on palpation (40).

After referral, the physical therapist performs a musculoskeletal examination before initiating treatment. The physical therapist instructs the patient in proper body mechanics for housework, caring for small children, and lifting. If the patient’s occupation requires long hours of standing or long hours of sitting, the physical therapist works with the patient to adjust the work environment to provide support. The physical therapist teaches the patient strengthening exercises for her low back, abdomen, and hips to provide the most support as her fetus grows and may use manual techniques, such as joint mobilization, joint manipulation, or soft tissue massage for pain relief.

Because the sacroiliac joint is close to the site of low back symptoms, patients may report low back pain when they are in fact experiencing the more common pelvic girdle pain. The physical therapist should be able to distinguish the two and treat the patient appropriately.

**Pelvic Girdle Pain**

Pelvic girdle pain can manifest in two related forms: 1) sacroiliac dysfunction and 2) pubic symphysis dysfunction. Because of the hypomobility or hypermobility of the affected pelvic joints, both conditions cause pain. The sacroiliac joint connects the sacrum to the ilium; the pubic symphysis joins the two sides of the pelvis. Because of ligamentous laxity in the body of a patient during pregnancy or the postpartum period, one or more pelvic girdle joints become hypermobile, causing pain with movement especially while getting in and out of automobiles, turning over in bed, climbing stairs, and standing or walking. The pain can be reported as sharp or dull, localized to one side of the low back or groin, or radiating to the knee. Often, it worsens when the patient stands on one leg.

A quick test to see if the pelvis is out of alignment can be performed by having the patient lift one leg at a time from the examining table while asking her if she notices a difference between the two legs, referred to as the active straight leg raise test (Fig. 3). The patient with sacroiliac joint dysfunction or pubic symphysis dysfunction will report pain, heaviness, or both when lifting the involved side. It is considered a pain provocation test, and a battery of these tests is best performed by an experienced physical therapist to establish the diagnosis of pelvic girdle pain.
Good practical advice is to recommend that the patient imagine she is wearing a narrow skirt when she is getting in and out of car or standing up from a seated position. She can insert a pillow between her knees and squeeze it when rolling over in bed. In addition, she should avoid walking on uneven surfaces or stairs. She should squeeze her gluteal muscles for support and use the bridge exercise (ie, lie on her back with knees bent and then lift hips) to improve alignment.

Referral to PT can enhance the patient’s care and improve her symptoms. The physical therapist may use manual therapy techniques to correct the asymmetry in the patient’s pelvis, instruct the patient in proper body mechanics, teach her appropriate stretches, and prescribe strengthening exercises to improve lumbopelvic stability. A combination of treatments has been shown to be most helpful (41), and specific stabilizing exercises should be included to address form closure. A pelvic compression belt placed at the level just caudal to the anterior superior iliac spine (42) has been shown to decrease pain and improve functional ability for daily activities (Fig. 4) (43). It is designed to keep the ilia compressed into the sacroiliac joints, and because of decreasing exertion on the hip joint (44) and unloading painful pelvic ligaments (45) it also can be useful for asymptomatic individuals who have difficulty with transitioning from a seating position to a standing position or with prolonged standing.

The onset of pelvic girdle pain is common in pregnancy, but it may not cease immediately after delivery and the postpartum period. More than one out of ten women continue to have pelvic girdle pain that persists up to a decade later (46). Predictors of persistent pelvic girdle pain include back pain that preceded pregnancy and a high number
of positive results of pain provocation tests (46). Thus, the assessment and treatment of pelvic girdle pain during pregnancy has great importance both for the present and future health of the affected pregnant patient.

**UPPER BACK PAIN, NECK PAIN, AND HEADACHE**

Upper back pain, neck pain, and headache can occur in pregnancy as a result of postural changes. As a pregnant woman’s head is thrust forward, she naturally tips her forehead up to level because of the righting reflex and, consequently, develops tight muscles at the base of her skull (suboccipitals). The shoulders round forward and the chest tightens secondary to the added weight of additional breast tissue. In addition, the muscles between the shoulder blades are no longer able to hold the shoulders back and support the weight of the head. It is likely that the pregnant patient with this complication will report worsening pain as the day progresses or with activity and pain improvement with rest or lying on the back with feet elevated.

The physician should obtain the patient’s history regarding daily requirements for sitting, computer and phone use, and wearing high-heeled shoes. The patient should be advised to sit with a cushion behind her lumbar spine or under the back half of her buttocks for alignment and back support. Her elbows should be tucked into her sides.
and wrists flat when she is working on the computer, and she should consider wearing a headset for frequent phone use. She should wear a proper bra for support and seek a bra fitting if she is unsure of proper size or questions the quality of her bras. If the patient reports pain that is interfering with functional activity, she should be referred to PT.

A physical therapist examines the patient’s posture, tests strength of the upper and middle back muscles, observes the shoulder and neck range of motion, and assesses the mobility of the thoracic spine. The physical therapist may use manual techniques, such as mobilizing the thoracic spine, performing suboccipital and pectoralis release maneuvers, and performing the soft tissue massage of the upper trapezius and neck muscles. The physical therapist may recommend stretching exercises to open the patient’s chest and to achieve proper head and neck positions and postural strengthening exercises to build endurance. Furthermore, the physical therapist may instruct the patient about proper body mechanics for holding an infant during breastfeeding or bottle feeding, carrying an infant in a car seat, changing diapers, and placing and lifting an infant in and out of a crib to minimize pain and disability after delivery.

**CASE NO. 3.** A 29-year-old primigravid woman with a prepregnancy body mass index of 32 (calculated as weight in kilograms divided by height in meters squared) came to a prenatal appointment at 28 weeks of gestation and reported worsening upper back pain and neck pain. She reported that her job involves almost constant sitting at a desk and working on a computer and that she had been leaving early several days a week because of the pain. She took acetaminophen for pain but reported no relief. When the obstetrician–gynecologist asked about her desk setup, the patient expressed exasperation and reported that she could not replace her desk chair or change to a standing desk. Because she had no history of neck pain or trauma, the obstetrician–gynecologist referred the patient to PT for evaluation and treatment.

The patient was observed sitting in the PT reception area chair looking down at her phone with her head shifted forward and rounded shoulders. Once in the treatment room, she was unable to sit with good posture for more than a few minutes before she shifted positions. She had normal and pain-free cervical and shoulder range of motion, but palpation produced pain at her cervicothoracic junction and her thoracic spine was stiff. She had grossly normal strength of her upper extremities but poor strength in lower trapezius and rhomboids. She had marks on her shoulders from bra straps.

The physical therapist showed the patient a proper supported sitting posture and counseled the patient regarding desk and chair ergonomics. The patient was advised to go to a specialty shop to purchase a custom-fitted bra to accommodate her breast growth. She was taught how to perform side-lying arm circles and bow-and-arrow exercises for thoracic mobility and standing chest stretches for her pectoralis muscles. She was instructed to squeeze her shoulder blades together when she noticed her shoulders falling forward, and to set an alarm clock to cue her to stand up for a few minutes at least every hour during work day.

The physical therapist saw the patient twice per week for 2 weeks and then once per week for 4 weeks and included manual therapy techniques and exercise in her treatment. The physical therapist
performed manual suboccipital release and manual cervical traction to work on forward head posture and thoracic mobilization and soft tissue massage to the upper trapezius for thoracic mobility and pain relief. Exercises progressed to resistance band rowing and latissimus pull down while seated on an exercise ball, and the patient was encouraged to walk for 30 minutes during her lunch break. After 6 weeks, the patient reported that she had mild discomfort by the end of the work week but that she had developed good habits and enjoyed her walks and home exercises.

Carpal Tunnel Syndrome

Carpal tunnel syndrome develops when the median nerve becomes irritated, compressed, or both as it transits the carpal tunnel on the dorsal side of the wrist. Symptoms of numbness, tingling, and pain in the thumb, index, middle, and radial side of the ring finger ensue. Symptoms range from mild paresthesia, burning, or tingling to numbness in the palm of the hand and fingers. Ultimately, muscular atrophy can develop, which causes the patient to drop things. Although, carpal tunnel syndrome occurs in approximately 4% of the general population and approximately 10% of workers with repetitive job duties, a higher percentage (30–50%) of pregnant women are affected (47).

In a 2015 prospective study of more than 600 pregnant women, 34% of women reported one or more symptoms of carpal tunnel syndrome during pregnancy (47). Of those women, 30% reported unilateral symptoms and 70% had effects in both upper extremities (47). Only 7% of women reported onset of symptoms in the first trimester, whereas 14% reported symptom onset between 12 weeks of gestation and 20 weeks of gestation, 39% reported symptom onset between 21 weeks of gestation and 30 weeks of gestation, and 40% reported symptom onset after 30 weeks of gestation (47). Thus, carpal tunnel syndrome predominantly occurs in the second half of pregnancy. Only 4 of the more than 600 women in the study consulted their obstetrician–gynecologists regarding their symptoms (47). Mostly, the reported symptoms were mild and without functional impairment. The patients did have more difficulty sleeping regardless of symptom severity and likely would have benefited from conservative PT treatment.

The strongest risk factor for developing pregnancy-related carpal-tunnel syndrome is excessive gestational weight gain (48). Pregnancy complications that are systemic in nature and directly result from excessive gestational weight gain with increased interstitial fluid (such as gestational hypertension and gestational diabetes) lead to decreased blood flow to the median nerve and the likely development of symptoms suggestive of pregnancy-related carpal tunnel syndrome (48). As many as 85% of women experience complete resolution of symptoms during the first 2–4 weeks after delivery (49).

Carpal tunnel syndrome is objectively diagnosed using electromyography or nerve conduction velocity tests. Subjective symptoms in a pregnant woman warrant a referral to a physical therapist to refute the involvement of the neck and upper extremities, test grip strength, and evaluate for other impairments. Corticosteroid injections can provide
temporary relief for patients with severe symptoms. Surgery involves the release of the median nerve from the wrist sheath and should be considered only for patients with severe symptoms as a last resort. A wrist splint that stabilizes the wrist in a neutral position can potentially decrease pressure on the median nerve and, thereby, reduce the patient’s discomfort. Because of its low cost and its high rate of success (up to 80% of pregnant women with carpal tunnel syndrome experience symptom relief after the use of a wrist splint [47]), which has become the first-line treatment to recommend for this common condition.

A physical therapist teaches the patient how to apply and remove the splint, adjust the work environment, teaches her exercises to improve her postural strength, and uses manual techniques and compression to decrease swelling in the affecting extremities. The physical therapist may instruct the patient in neural mobilization exercises (also known as nerve gliding or nerve flossing exercises) to decrease edema and adhesion in the carpal tunnel for pain relief (50).

**High-Risk Pregnancy**

Bed rest in its broadest sense has been a longstanding management strategy for patients with a variety of pregnancy complications. However, multiple published reports of complications resulting from prolonged bed rest have shed negative light on its value as a valid intervention even for patients at risk of preterm birth or as a component of care for pregnant women developing gestational hypertension and its sequelae (51). Nevertheless, some physicians continue to prescribe bed rest and activity restrictions that range from strict bed rest in the Trendelenburg position in the hospital to limiting activity for pregnant outpatients. In these circumstances, a physical therapist can collaborate with the attending physician and other health care providers to maintain the safety of woman and the fetus while designing a program of physical activity that is appropriate and effective.

Referring the patient to PT either while hospitalized or while at home helps the patient to combat the negative physiologic (and sometimes psychologic) effects of bed rest. Because randomized controlled trials regarding the usefulness of bed rest as an independently assessed therapy do not exist for most medical and obstetric complications of pregnancy, decisions regarding use often are based only on expert opinion (52). When assessing the patient and developing a plan of care, a physical therapist takes into consideration the following factors:

- The medical interventions the patient is to receive
- The potential negative effect of prolonged inactivity on the woman and the fetus
- The relationship between the physiologic and anatomic changes of pregnancy that may be exacerbated negatively in the woman and the fetus with prolonged inactivity (52)

Physical therapy interventions that are undertaken during a high-risk pregnancy with some change in normal patient activity will focus on education and exercise. The physical
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therapist instructs the patient on safe bed mobility, transfers, and positioning. The physical therapist also shows the patient and family members how to move in bed especially during transfers to avoid abdominal and pelvic floor contractions while emphasizing proper posture, using extremities to assist, and remembering to keep breathing throughout the movement. The physical therapist instructs the patient to use a neutral spine position and to use external support of cushions or pillows so that the patient may position her extremities for activities of daily living, such as eating, grooming, and reading. The physical therapist also explains energy conservation techniques and may recommend the use of durable medical equipment, such as a reacher, shower chair, or elevated toilet seat, to facilitate energy conservation.

Safe exercise techniques may help counteract the physiologic effects of bed rest or activity restrictions. Exercises help to minimize deconditioning, maintain strength and range of motion, and decrease physical discomfort or stiffness (53). Lower extremity exercises stimulate blood circulation to avoid deep vein thrombosis (53). Exercises are categorized as active when the patient performs the movement, passive when the therapist or caregiver performs the movement for the patient, or resistive when the patient performs the exercise against resistance. The patient performs exercise at least two to four times daily and as frequently as hourly while awake for 5–10 minutes in duration. If the patient develops some form of musculoskeletal dysfunction, the physical therapist can examine the patient and adapt her treatment to comply with her activity restrictions.

The Postpartum Period

Even after childbirth that is devoid of complications, patients can experience problems related to their pelvic floor. These problems may include incontinence; pain in the back, groin, hip, tailbone, perineum, and pelvic floor; pain during sex; diminished or absent orgasm; urinary frequency; urinary urgency; urinary retention; or constipation (13). Pregnancy itself (but not delivery) may be the most significant risk factor for the development of pelvic floor dysfunction (54) because of the demands it places on the pelvic floor musculature during the months preceding delivery. This is particularly important if the patient had symptoms of pelvic floor dysfunction before or during pregnancy or had a previous difficult vacuum extraction delivery or a severe perineal injury. In these circumstances, the patient should undergo a thorough pelvic floor assessment (55). Most commonly, patients report SUI and pelvic organ prolapse, but other symptoms, including genitopelvic pain and sexual dysfunction, also can be present. Evaluating for the presence of diastasis recti is quick and simple and should be included in every postpartum visit.

Incontinence, prolapse, scar sensitivity or pain, diastasis recti, or fear of returning to sexual activity indicate the need for a PT referral. Patients who report pregnancy-related musculoskeletal dysfunction that has not completely resolved or patients who indicate a desire to return to exercise after pregnancy also would benefit from PT. A physical therapist performs a comprehensive musculoskeletal examination that includes a pelvic floor
muscle evaluation and examination for diastasis recti and scar mobility. Early intervention is provided if necessary while primary tissue is healing, thus increasing a chance of full recovery. The patient is counseled about appropriate activity and exercise goals to maximize function and strength and avoid injury or the need for future medical intervention.

**Incontinence and Prolapse.** Patients may report difficulty with urinary or fecal incontinence in the postpartum period or have symptoms of pelvic organ prolapse after delivery. Also, they may report leaking urine with lifting their infant, laughing, coughing, or sneezing. They may report an inability to wear a tampon, a feeling of vaginal fullness, or pain with intercourse. For patients with these symptoms, conservative PT is an appropriate management option.

Multiparity is a known risk factor for SUI, and vaginal birth increases that risk (56). Successive vaginal births further increase the risk of SUI. The risk multiplies by 20 for those who undergo forceps-assisted operative vaginal delivery (56). Other risk factors include age, obesity, smoking, constipation, prepregnancy SUI, and gestational diabetes (57). Multiparity also is a known risk factor for symptomatic pelvic organ prolapse, and vaginal delivery increases that risk (56). High fetal birth weight also increases the patient’s risk (58).

A physical therapist evaluates the strength and coordination of the pelvic floor muscles by palpation and assesses the degree of prolapse. Verbal instruction for pelvic floor exercises can help most patients (59). It has been reported that at least one out of five women in the postpartum period erroneously believe that they are performing pelvic floor muscle contractions correctly (59). If the patient is contracting pelvic floor muscles by straining instead of bracing, she likely will aggravate her symptoms. The physical therapist will ensure that the patient is engaging the pelvic floor properly.

**Postpartum Sexual Dysfunction.** Symptoms of female sexual dysfunction occur in 10–30% of the general female population. This rate increases up to 58% 1 year after giving birth in primiparous women (60). The most commonly reported symptoms among these women include insufficient lubrication, abnormal vaginal sensation, vaginal laxity, vaginal tightness, dyspareunia, and coital incontinence (60). Although vaginal delivery is a risk factor for SUI and pelvic organ prolapse, it is not a risk factor for female sexual dysfunction (61). High-degree perineal tears (62) and obstetric anal sphincter injuries (63) independently increase the patient’s risk of female sexual dysfunction. Instructing the patient in proper pelvic floor muscle training (whether to strengthen or to stretch) and manually treating painful pelvic areas within the first 12 months after giving birth reduces the risk of chronic pelvic pain. Specific techniques used during this intervention are similar to those discussed in the section “Pelvic Floor Muscle Pain.”
**Scar Management.** At the patient’s postpartum visit, her scars from either cesarean delivery or vaginal birth should be mobile, visibly healed or healing, and not particularly sensitive to touch. If she is having pain or sensitivity related to healing incisions, a physical therapist can help.

A patient may report sensitivity, itching, or pain in or referred from her scar. It may be painful to lean over, to lift an infant, or to reach overhead. She may have a pulling sensation when she stands up or changes positions. She may avoid touching her incision or choose not to wear tight clothing over it because of discomfort. The scarred tissue underneath the visible scar may pull within the abdominal cavity as it attaches to the uterus and can affect digestion or refer pain to the labia through the round ligament (13).

A patient who gave birth vaginally with or without an episiotomy may report pain or sensitivity in the perineal area. She may report constipation or fear resumption of sex because she is concerned about the scar bleeding, tearing, or causing discomfort. The scar tissue underneath may be pulling the pelvic floor muscles and restrict her ability to contract or to relax.

Although scar tissue is constantly being remodeled, mobilizing it from the outside is most effective if done in the first 6–8 weeks after procedures—it should be initiated within the first 2 months after delivery (13). A physical therapist mobilizes the scar and, in some cases, also teaches the patient to mobilize it herself at home. One technique used by physical therapists is to place the tips of two fingers on one portion of the cesarean scar while pushing the scar parallel to the tissue and up, down, left, and right to assess mobility and to concurrently treat the restriction. That technique is repeated along the entire scar. With greater movement of the scar tissue, the softer it becomes the more it blends with normal tissue around it.

If the patient is unable to tolerate touching the scar, the physical therapist can instruct her in desensitization techniques, such as progressing from touching it with a soft wet material to touching it with a dry towel. Therapeutic ultrasonography is another modality that a physical therapist can use to gently effect scar mobilization with softening of the tissue and improvement of blood flow to the area.

**Diastasis Recti.** The two sides of the rectus abdominis muscles separate laterally during pregnancy as the uterus expands, hormones affect the complex connective tissue of the linea alba, and the abdominal organs are displaced (64, 65). Investigations have revealed that the interrecti separation begins to increase by 14 weeks of gestation and continues to increase until delivery (64). The distance between the rectus bands begins to decrease in the postpartum period mostly during the first 8 weeks, followed by a recovery plateau (66). ⊳

*Diastasis recti,* also known as *diastasis of the rectus abdominis muscle,* is defined as an interrecti distance of greater than 2 cm at one or more assessment points, including the
umbilicus, 4.5 cm above the umbilicus, and 4.5 cm below the umbilicus (67). Because the abdominal muscles contribute to posture, trunk, and pelvic stability; respiration; and trunk motion and also support the abdominal viscera, an increase in the distance between the rectus sheaths can negatively affect any of those factors. A patient with diastasis of the rectus abdominis muscle may report pain in the low back, pelvic girdle, or pelvic floor. She may have noticed a visible separation of the abdominal muscles (invagination) or doming of the midsection with activity, have poor endurance for good posture, or have decreased control of pelvic floor muscles. Commonly, patients are referred to PT because of other problems, such as back pain or incontinence, but diastasis of the rectus abdominis muscle is also an appropriate primary diagnosis for referral (68). Risk factors that increase the likelihood of developing diastasis of the rectus abdominis muscle include maternal age older than 33 years, multiparity, a multiple gestation, a large infant, excessive weight gain during pregnancy, and cesarean delivery (52).

To evaluate for diastasis of the rectus abdominis muscle, the patient should be positioned on her back with knees bent and her arms placed across her chest (69). She should be asked to lift her head and shoulders until her shoulder blades are off the mat (or examination table), while the physician palpates her abdomen at the umbilicus as well as 4.5 cm above the umbilicus and 4.5 cm below the umbilicus (67, 69) (Fig. 5).

Figure 5. Evaluation of diastasis of the rectus abdominis muscle.
The distance between the right-sided and left-sided rectus abdominis muscle should be estimated using finger width as a general guide (70). If this distance exceeds two finger widths, referral to PT is appropriate. A more thorough examination includes a digital examination to ensure proper pelvic floor contraction while the patient is asked to contract her deep abdominals (transverse abdominis) without lifting her head and shoulders (71). If the patient is unable to voluntarily create tension in her linea alba (71) or doming or invagination occurs, a referral to PT is appropriate.

Measures to correct diastasis of the rectus abdominis muscle begin with exercise and patient education. The physical therapist instructs the patient in proper co-contraction of the multifidus, diaphragm, transverse abdominis, and pelvic floor in a neutral position and then progresses to other positions while performing functional tasks (68, 71). The patient may benefit from the use of a towel or bed sheet to approximate the rectus abdominis muscles while she performs partial sit-ups (Fig. 6) (72). The physical therapist teaches the patient how to properly get out of bed, how to sit and stand correctly, and how to lift and carry her infant and heavy objects. The patient is instructed to avoid any activity that does not allow her to maintain continence or maintain integrity through her linea alba (71).

A physical therapist sometimes recommends application of an abdominal binder or therapeutic tape to accompany strenuous activities and may recommend the use of these products during weight-bearing exercise or daily activities (68). If an abdominal binder provides comfort for the patient, it is a sign that the patient has a functional problem secondary to diastasis of the rectus abdominis muscle that must be further addressed (13). It is not meant as replacement for proper rehabilitation. A physical therapist will assist

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**Figure 6.** Diastasis of the rectus abdominis correction exercise with sheet.
the patient in selecting an appropriate product and applying it so that it supports her function rather than potentially contributing to intraabdominal pressure and prolonging her recovery.

Physical therapists also use manual therapy techniques, such as myofascial release, soft tissue massage, muscle energy technique (Fig. 7), and visceral manipulation to treat patients with diastasis of the rectus abdominis muscle (Box 4) (68). Because the patient has a disrupted load transfer system, she is at risk of lumbopelvic instability or muscle tightness that must resolve along with strengthening to achieve the best result.

A patient with diastasis of the rectus abdominis muscle will likely see a physical therapist one to two times per week, most often for 4–6 weeks (68). The wider the gap between rectus muscle sheaths and bigger disruption to the system, the longer it takes for rehabilitation to be fully accomplished. If the patient has not achieved sufficient closure of the interrecti distance or is unable to achieve an optimal strategy for transferring load through the abdomen with a consistent rehabilitation effort over a period of 12 months, surgical repair may be necessary (13, 73).
CASE NO. 4. A 27-year-old woman at 4 months postpartum reported to her obstetrician–gynecologist that she was experiencing central low back pain and SUI. Also, she had noticed a bulge in her abdomen. On examination, the patient exhibited a diastasis of the rectus abdominis muscle (two-finger distance) at her umbilicus and above it. The obstetrician–gynecologist referred her to PT for evaluation and treatment.

On evaluation by a physical therapist, the patient had normal spinal mobility and no pain with any pain provocation tests for sacroiliac joint dysfunction. She had weak pelvic floor muscles but contracted and relaxed correctly with cuing. The patient demonstrated decreased diastasis of the rectus abdominis muscle and increased pelvic floor contraction when she used a sheet to approximate the rectus abdominis muscles. The patient was instructed to perform a curl-up exercise with pelvic floor contraction and use of a sheet to approximate the rectus muscles three times per day for 10 repetitions. She was taught proper body mechanics for child care and breastfeeding.

Over the next four visits, the patient demonstrated good muscle contraction and progressed to activities increasing lower extremity movement and those that required prone and standing positions. After 6 weeks, she reported dramatic improvement in low back pain and SUI, and her diastasis of the rectus abdominis muscle had decreased to less than one-finger distance.

Return to Exercise and Proper Body Mechanics. Exercise routines may be resumed gradually after pregnancy as soon as medically safe, depending on the mode of delivery, vaginal or cesarean, and the presence or absence of medical or surgical complications. Resumption of regular exercise or the initiation of a new exercise program when it is safe supports lifelong healthy behavior (74). This is an ideal time for PT evaluation to determine whether the woman is ready to resume exercise and to prescribe a safe way to return to exercise. Evaluation by the physical therapist is particularly important if the patient had any musculoskeletal problems during pregnancy. Other factors to consider when determining readiness for exercise include the patient’s prior level of exercise before and during pregnancy, the course of delivery, convalescence progress, and breastfeeding status. Because relaxin levels are increased during the postpartum period, patients whose joints are hypermobile must remember to stabilize their joints to avoid injury.

Although the benefits of exercise are well documented, women face substantial barriers to their participation in exercise during the postpartum period. Women often put the pressing priorities of child care, spouse or partner support, and household chores ahead of their need for an exercise program (75). The new mother may have limited access to appropriate or affordable exercise facilities or she may believe that she does not have access to a quality program for women in the postpartum period (75). Partner support and social support through mothers’ groups and postnatal classes encourage participation in exercise. Classes that allow women to bring their infants or provide child care make exercise achievable and accessible (75).

Patients also may appreciate counseling regarding the proper body mechanics for handling infants to avoid aches and injuries. This advice may include instructions on
how to push a stroller, how to lift the infant from a stroller or out of a crib, how to carry the infant, how to bathe the infant, or how to change a diaper. For example, the patient should be advised to put one foot in front of the other and to hinge at the hips as she lowers or lifts the infant to waist level or below (Fig. 8). During feeding, the patient should be instructed to sit with her lower back supported to avoid collapsing into her lower back and rounding her shoulders when bringing the infant to the breast or the bottle. The support cushions or the arm of a couch can be used to help bring the infant up to the breast (76) or the bottle. The woman should be instructed to keep her neck long while looking down during the latch (Fig. 9).

Figure 8. A correct technique for lifting and lowering an infant.
Older Women

Advancing age is an independent risk factor for pelvic floor dysfunction, osteoarthritis, and falls (58). Although more than 20% of women in the United States have some type of pelvic floor dysfunction, this percentage more than doubles for women aged 80 years or older (58). The probability that a woman has undergone a surgical procedure to correct pelvic organ prolapse by age 80 years is 20% (58). As a patient ages, the likelihood of complicated incontinence (ie, overflow, urge, or functional as opposed to SUI) increases. Incontinence more often involves the urinary system but can involve the loss of control of feces or gas (ie, fecal incontinence).

Incontinence

Because some older adults consider incontinence to be a consequence of aging or pregnancy, they fail to raise the subject with their physicians and instead cope with it on their own until it becomes significant (77). The development of urinary incontinence is associated with an increased risk of falling, embarrassment, stigmatization, depression, social isolation, institutionalization, and a burden on caregivers (78, 79). Early PT intervention can help avoid many of those consequences or associated problems. In as little as one PT visit weekly for 12 weeks, patients showed a 75% reduction in leakage episodes and maintained that improvement 1 year later (80).

A physical therapist evaluates the patient with incontinence symptoms. This evaluation typically includes a full assessment of the patient’s mobility and function as well as pelvic floor strength and function. A physical therapist assesses whether the patient
is mobile enough to expect to achieve continence or whether the patient should be instructed to undertake a prompted voiding schedule. Treatment includes improving functional mobility, such as walking, transfers (for example, from sitting to standing), and finger dexterity with clothing. The physical therapist helps the patient modify her environment to improve efficiency and ease of walking and transfers and prescribes exercises for general conditioning, strengthening of specific muscles that improve functional mobility, and pelvic floor strengthening (81). Patients experience empowerment through knowledge and work that helps improve quality of life and self-esteem (82). The physical therapist may use biofeedback or electrical stimulation to assist with strengthening of the pelvic floor and may integrate pelvic floor exercise with activities of daily living. Patient education regarding diet and lifestyle (for example, when to stop fluids before bedtime, how to avoid constipation, and how to use protective wear to maintain or increase social interaction) also may be helpful.

**CASE NO. 5.** A 65-year-old parous woman reported symptoms of mixed urinary incontinence; she underwent no prior treatment or surgery. She sought treatment after an embarrassing episode when she saturated her clothing while climbing out of her car. She preferred to avoid surgery but was “getting desperate to get this under control.” Upon further questioning, she reported that she had gradually stopped her regular walking routine because of worry about having another embarrassing accident. She was not sexually active with her husband by mutual choice after he underwent treatment for prostate cancer. She wore a thin protective pad daily with at least one or more changes required during the day.

During pelvic floor muscle examination, the obstetrician–gynecologist felt a brief squeeze at the patient’s superficial pelvic floor muscles but no lift. The patient was unable to relax when prompted, and she reported pain with pressure to her pubococcygeus on the left side that felt familiar from past sexual activity. The obstetrician–gynecologist referred her to PT for evaluation and treatment.

On examination, the patient demonstrated full and pain-free spinal range of motion. She had decreased hip abductor and hip extensor strength bilaterally and mildly decreased hip internal rotation motion on the left side versus the right side.

During the PT visit, the patient was able to relax the pelvic floor with cueing and imagery, and she reported a 0/10 pain after the physical therapist applied ischemic pressure to the previously reported painful area. The physical therapist instructed the patient how to perform the pelvic floor drop exercise and proper toileting technique. The patient was also instructed to begin a regimen of walking on flat surfaces 5 days per week for 30 minutes. Because the physical therapist had found weakness in both hip abductors and extensors, the patient was also asked to perform home exercises to address those muscles.

On the second visit, the patient reported a great improvement in awareness of her pelvic floor muscles (ie, ability to contract and relax on cue) and confidence that she would not have another accident. She reported that she felt comfortable walking on level surfaces but that she was still worried about car transfers and other advanced activities. The physical therapist showed the patient the proper body mechanics to use for bending, lifting, and transfers. The patient demonstrated a proper pelvic floor contraction of 2 seconds with proper relaxation, and the patient was instructed
to perform 10 repetitions of 2-second holds in a hook-lying position, followed by 10 repetitions of 2-second holds while performing bridge exercise two to five times per day at home. The therapy consisted of six weekly visits during which the patient learned to coordinate pelvic floor relaxation and contraction with breathing. Physical therapy included manual techniques to desensitize active trigger points and to stretch the left pubococcygeus. Exercises progressed from those performed in the supine position to those performed in a sitting position and then to dynamic activities. Six weeks later, the patient reported no accidents. She wore only a pantyliner for a sense of security. She demonstrated the ability to perform her home exercise program correctly and without leakage.

**Osteoarthritis**

More than 30 million Americans have some form of osteoarthritis (83). It is the leading cause of disability in adults in the United States and mostly occurs in the weight-bearing joints of the hip and knee. Aging, past injuries, obesity, and occupations that require repetitive squatting, bending, and twisting are the greatest risk factors for developing osteoarthritis. After age 50 years, women are affected more than men (83). Patients often describe the symptoms as joint stiffness in the morning or after sitting or lying down for long periods, pain during activity that improves with rest, and frequent joint noises, such as cracking, creaking, or crunching. The patient may have a fear of movement that negatively affects overall physical activity (84). Radiography of the joint along with subjective symptoms is appropriate for establishing the diagnosis of osteoarthritis.

A physical therapist examines range of motion of the involved and surrounding joints, assesses the strength of the lower extremities and core, and analyzes the patient’s gait. Treatment includes therapeutic exercise for strengthening, neuromuscular reeducation for balance and proprioceptive training (85), gait training as needed, manual therapy, and modalities for pain management.

**Falls**

Falls affect approximately 30% of community-dwelling adults aged 65 years and older (86), but less than one half of those who fall inform their physicians (87). Physicians who provide care to women older than 65 years should ask direct questions to elicit a patient’s history of falls, near falls, and a fear of falling. Falls occur for a variety of physiologic reasons, such as lower extremity muscle weakness, balance and gait difficulty, vision problems, medical conditions that cause limited mobility, medical conditions that cause confusion, depression, and urinary incontinence (88). Because these risk factors are so diverse, many patients report having at least one. Multiple risk factors increase a patient’s risk or probability of falling. However, many risk factors are modifiable.

Reports of musculoskeletal pain, difficulty with balance, leg muscle weakness, and a history of falls are reasons to refer a patient to a physical therapist (89). A physical
therapist can perform a home safety assessment to minimize external factors, such as the presence of throw rugs, and suggest appropriate footwear. A physical therapist uses standardized tests to determine static and dynamic balance, gait speed and agility, and strength to create a plan of care. Individualized care is necessary for many patients who are fearful of falling or require assistance for mobility. Once the patient meets set goals in the clinical setting, the physical therapist often refers her to appropriate community programs so that the patient continues exercising to maintain strength and balance. Some communities have group classes in yoga, tai chi, or water aerobics, and many have group strengthening classes that are geared toward an elderly population. Effective programs include endurance, balance, and strength exercises and appeal to the patient in frequency, intensity, and type (89).

CASE NO. 6. A 78-year-old woman reports two falls in the past 6 months, one as recently as 3 weeks ago. The falls were associated with mild soft tissue injury to the right hip and outer thigh area. She had a history of hypertension (controlled with lisinopril) and type 2 diabetes mellitus (controlled with metformin). Since the last fall, the patient had limited her activity outside of the home because of her fear of falling. Her obstetrician–gynecologist referred her to PT for evaluation and treatment.

At PT evaluation, the patient walked slowly and carefully into the clinic holding the elbow of her adult son who had driven her to the appointment. She did not have difficulty getting out of the reception room chair, but she hesitated after she stood up to initiate walking. When prompted to walk on her own within parallel bars, she walked with a short stride and with arms held up and elbows out. She performed high level tasks, such as leaning over to pick up something from the ground, turning 360 degrees without help, and standing with a narrow stance and eyes closed for 1 minute.

She stated that she lived alone in a single-story townhouse and that she was comfortable driving for short distances. She liked to cook and owned a small dog. When prompted, she admitted that the dog did get underfoot and that she had multiple throw rugs over the carpet in her living room and in her bathroom. She had a 4/5 strength in quadriceps, 4-/5 in hamstrings and hip flexors, and 3+/5 strength in hip abductors and extensors.

The patient was advised to keep her dog in another room at night, use a night light in her bathroom, and remove the extra rugs from her house. The patient attended PT twice per week for 6 weeks to improve gait and balance and for strengthening exercises. Exercises included walking on uneven surfaces, walking with head turns to mimic grocery shopping, soccer ball stops and kicks to work on single-leg balance, and seated marching to strengthen hip flexors. Once she was discharged from PT, the patient attended twice weekly exercise classes at a local civic center.
Basic knowledge of the common musculoskeletal problems of women at each stage of life, screening for potential functional impact, and the ability to give practical advice enhances the quality of care obstetrician-gynecologists provide to their patients. Furthermore, a referral to a knowledgeable physical therapist creates a collaboration that amplifies the potential for favorable outcomes.

Successful PT treatment includes identifying and treating all the patient’s impairments that contribute to her symptoms, such as muscle, joint, nerve, or connective tissue problems. Thorough treatment includes both external and internal techniques and may involve general body mechanics and posture or focus on pelvic floor coordination and breathing.

Whatever the diagnosis, a physical therapist collaborates with the patient to set goals and create an individualized plan of care. The patient may attend PT one to two times per week, and goals may be set for as few as 6 weeks and as much as 1 year. The duration and severity of the symptoms, comorbidities, finances, and travel distance to therapy all pay a role in setting realistic expectations from treatment. The following list provides the most poignant points regarding the role of PT in the obstetric–gynecologic practice:

- Physical therapy is an evidence-based profession that represents a conservative treatment option for many conditions in women of all ages.
- Physical therapists evaluate and treat patients from the perspective of musculoskeletal dysfunction.
- Women’s health physical therapists have specialized education and experience treating complicated diagnoses, including problems associated with urinary or fecal incontinence, pelvic pain, and pregnancy or the postpartum period.
- Physical therapy is complementary to medical management, and physical therapists should be included in the interdisciplinary team of obstetrician–gynecologists.
- Obstetrician–gynecologists may benefit from learning basic PT examination techniques and treatment strategies.
**Resources</b> 1 5 11

The following list is for information purposes only. Referral to these sources and websites does not imply the endorsement of the American College of Obstetricians and Gynecologists. This list is not meant to be comprehensive. The exclusion of a source or website does not reflect the quality of that source or website. Please note that websites are subject to change without notice.

**Functional Questionnaires**

**Vulvar Pain Functional Questionnaire**
A 10-item questionnaire that asks patients to describe the effect of vulvar pain on different activities, such as sitting, standing, walking, and sex.

**Oswestry Disability Index**
A popular functional outcome tool for low back pain. It includes questions that address the patient’s pain and its effect on activities, such as prolonged sitting, standing, walking, traveling, and social life.

**Books**


**Websites**

**American Physical Therapy Association: Move Forward**
The American Physical Therapy Association (APTA)’s website has a section “Move Forward” about physical therapy, physical therapists, and common conditions that benefit from a physical therapy referral.

**American Physical Therapy Association: The Section of Women’s Health**
Section on Women’s Health—American Physical Therapy Association is an educational and membership organization of approximately 3,000 physical therapists. The website has a resource directory and a “PT locator” as well as patient information.
[www.womenshealthapta.org](http://www.womenshealthapta.org)

**Herman and Wallace Pelvic Rehabilitation Institute**
The Herman and Wallace Pelvic Rehabilitation Institute provides continuing education courses for medical professionals who treat pelvic floor or girdle dysfunction. A practitioner directory, downloadable list of free resources, and a blog on industry-related news are provided on the website.
[www.hermanwallace.com](http://www.hermanwallace.com)

**International Pelvic Pain Society**
The International Pelvic Pain Society’s website has links for patients and professionals to free handouts; resources, such as tools or books; and a geographic directory of health care providers.
[www.pelvicpain.org](http://www.pelvicpain.org)
Complete the answer sheet at www.clinicalupdates.org under “Test Your Clinical Skills” and receive 5 continuing medical education credits. The answers appear on page 44.

**Directions: Select the one best answer or completion.**

1. Currently, all accredited physical therapist programs must provide a degree at what minimum level?
   A. Associate’s
   B. Bachelor’s
   C. Master’s
   D. Doctoral

2. A woman with strong pelvic floor muscles should be able to sustain a squeeze-and-lift contraction for at least how many seconds?
   A. 3
   B. 5
   C. 10
   D. 15

3. Which of the following techniques is not used to treat myofascial trigger point pain?
   A. Dry needling
   B. Ischemic compression
   C. Pelvic floor drop
   D. Transverse friction massage

4. Back pain from shortening of the iliopsoas muscles can be associated with
   A. prolonged standing
   B. sleeping on the side in the fetal position
   C. strong abdominal muscles
   D. wearing flat shoes

5. The iliotibial band syndrome is associated with pain in the
   A. lateral foot
   B. medial foot
   C. lateral knee
   D. medial knee

6. The purpose of complete decongestive therapy is to
   A. move lymph through stagnant areas
   B. open blocked lymph channels
   C. reduce scarring in lymph channels
   D. stimulate new lymphatic circulation

7. Which of the following aids has not been shown to help pregnant patients?
   A. Braces
   B. Maternity support belts
   C. Orthoses
   D. Pelvic compression belts
8. Which of the following maneuvers is not a component of the bridge exercise?
   A. Knees bent
   B. Lying on the back
   C. Lifting hips
   D. Pillow between legs

9. Which of the following recommendations is not believed by the author to relieve upper neck and back pain during pregnancy?
   A. Changing the size of a bra
   B. Changing the size of shoes
   C. Holding elbows close to body
   D. Keeping wrists flat

10. How many times more frequently is carpal tunnel syndrome seen in pregnancy than in the general population?
    A. Two
    B. Four
    C. Six
    D. Eight

11. What percentage of postpartum primiparous patients experience sexual dysfunction 1 year after childbirth?
    A. 10
    B. 20
    C. 30
    D. 60

12. Pathologic diastasis recti is defined as a separation of at least
    A. 1 cm
    B. 2 cm
    C. 4.5 cm
    D. 5 cm

13. Which of the following positions is recommended for a woman to lower or lift the infant?
    A. Bending the knees
    B. Standing with feet together
    C. Standing with feet apart side by side
    D. Hinging the hips

14. What percentage of patients aged 65 years and older who fall inform their physician?
    A. 20
    B. 30
    C. 50
    D. 80


52. Irion JM, Irion GL. Women’s health in physical therapy. Philadelphia (PA): Lippincott Williams & Wilkins; 2010. (Level III)


Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

I Evidence obtained from at least one properly designed randomized controlled trial.

II-1 Evidence obtained from well-designed controlled trials without randomization.

II-2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.

II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.

III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Answers

Forthcoming and Current Titles

Each monograph in *Clinical Updates in Women's Health Care* is an overview of a topic of importance to obstetrician–gynecologists in practice. Upcoming titles include the following:

- Perioperative Pain Management and Enhanced Recovery After Surgery
- Surgical Considerations

If not previously completed, earn CME credits for back issues of *Clinical Updates in Women’s Health Care*. Listed are updates and all current titles by publication date. Online access to the complete title list is available at [www.clinicalupdates.org](http://www.clinicalupdates.org).

**Updates**

Also available at [www.clinicalupdates.org](http://www.clinicalupdates.org) are the following content updates:

- **Anorectal Disorders** (May 2015)
- **Care of Aging Women** (April 2015)
- **Common Dermatologic Conditions** (January 2018)
- **Complementary and Alternative Medicine** (June 2015)
- **Obesity** (August 2017)
- **Occupational Diseases and Injuries** (July 2016)
- **Sleep Disorders** (September 2015)
- **Upper Gastrointestinal Tract, Biliary, and Pancreatic Disorders** (June 2017)

**List of Titles**

**2018**

*Common Dermatologic Conditions* (Vol. XVII, No. 1, January 2018)
*Arthritis* (Vol. XVII, No. 2, March 2018)
*Asthma* (Vol. XVII, No. 3, May 2018)
*Incidental Radiologic Findings* (Vol. XVII, No. 4, July 2018)

**2017**

*Liver Disease: Reproductive Considerations* (Vol. XVI, No. 1, January 2017)
*Structural Heart Disease* (Volume XVI, No. 2, March 2017)
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*Ischemic Heart Disease* (Volume XVI, No. 6, November 2017)

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*Liver Disease: General Pathophysiology, Diagnosis, and Management Supplement* (Vol. XV, No. 6, November 2016)
2015
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Allergies (Vol. XII, No. 4, October 2013)
Thyroid Disorders (Vol. XII, No. 5, November 2013)

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Sleep Disorders (Vol. XI, No. 3, July 2012)
Upper Gastrointestinal Tract, Biliary, and Pancreatic Disorders (Vol. XI, No. 4, October 2012)
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2011
Renal Disease (Vol. X, No. 1, January 2011)
Complementary and Alternative Medicine (Vol. X, No. 4, October 2011)

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Anorectal Disorders (Vol. IX, No. 1, January 2010)
Anorectal Disorders Supplement (Vol. IX, No. 1, January 2010)
Occupational Diseases and Injuries (Vol. IX, No. 3, July 2010)
Perioperative Considerations for Coexisting Medical Conditions (Vol. IX, No. 4, October 2010)

2009
Vulvar Disorders (Vol. VIII, No. 2, April 2009)
Care of Aging Women (Vol. VIII, No. 4, October 2009)

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