We have invited select authorities to present background information on challenging clinical problems and practical information on diagnosis and treatment for use by practitioners.

Chronic Pelvic Pain

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Chronic pelvic pain is a common and significant disorder of women. It is estimated to have a prevalence of 3.8% in women. Often the etiology of chronic pelvic pain is not clear, as there are many disorders of the reproductive tract, gastrointestinal system, urological organs, musculoskeletal system, and psychoneurological system that may be associated with chronic pelvic pain. The history and physical examination are crucial in evaluating a woman with chronic pelvic pain and must address all of the possible systems potentially involved in chronic pelvic pain, not just the reproductive system. Laboratory and imaging studies should be selectively utilized, as should laparoscopy. Conscious laparoscopic pain mapping has been proposed as a way to improve information derived from laparoscopic evaluations. Treatment of chronic pelvic pain may consist of two approaches. One is to treat chronic pain itself as a diagnosis, and the other is to treat diseases or disorders that might be a cause of or a contributor to chronic pelvic pain. These two approaches are not mutually exclusive, and in many patients effective therapy is best achieved by using both approaches. Treatment of chronic pain as well as treatment of four of the more common disorders associated with chronic pelvic pain (endometriosis, adhesions, irritable bowel syndrome, and interstitial cystitis) are discussed in this review. (Obstet Gynecol 2003;101:594–611.

Chronic pelvic pain is nonmenstrual pelvic pain of 6 or more months duration that is severe enough to cause functional disability or require medical or surgical treatment.[1] It is a common and significant disorder of women. Chronic pelvic pain is estimated to have a prevalence of 3.8% in women aged 15–73, which is higher than the prevalence of migraine (2.1%) and is similar to that of asthma (3.7%) or back pain (4.1%).[2] In primary care practices, 39% of women complain of pelvic pain,[3] and a recent Gallup poll found that 16% of all women have pelvic pain.[4] Chronic pelvic pain is estimated to account for 10% of all referrals to gynecologists. It is the indication for 12% of all hysterectomies and over 40% of gynecologic diagnostic laparoscopies.[1] Direct costs of health care for chronic pelvic pain in the United States are estimated at $880 million per year, and direct and indirect costs may total over 2 billion dollars per year.[4] At an individual level, chronic pelvic pain leads to years of disability and suffering, with loss of employment, marital discord and divorce, and numerous untoward and unsuccessful medical misadventures. Clearly, pelvic pain is an important issue in the health care of women.

Often the etiology of chronic pelvic pain is not discernible. There are many disorders of the reproductive tract, gastrointestinal system, urological organs, musculoskeletal system, and psychoneurological system that may be associated with chronic pelvic pain in women (Table 1). Occasionally only one of these disorders is present and treatment is curative. More often the pain is associated with several diagnoses and a number of contributing factors need evaluation and treatment. For example, endometriosis, irritable bowel syndrome, poor posture, and emotional stresses may all be contributing factors in a single patient. Frequently treatment is not curative in such cases. Why such disorders lead to a syndrome of chronic pain in some women, yet are cured with initial treatment in others, or even fail to cause any symptoms at all, is not known, yet. It may be that such different responses are due to changes in the visceral nerves or to altered central nociceptive processing. These are areas of intensive, ongoing research.

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Table 1. Some of the Diseases That May Be Associated With Chronic Pelvic Pain in Women

- Gynecologic
  - Extrauterine
    - Adhesions
    - Adnexal cysts
    - Chronic ectopic pregnancy
    - Chlamydial endometritis or salpingitis
    - Endometriosis
    - Endosalpingiosis
    - Neoplasia of the genital tract
    - Ovarian retention syndrome (residual ovary syndrome)
    - Ovarian remnant syndrome
    - Ovarian dystrophy or ovulatory pain
    - Pelvic congestion syndrome
    - Postoperative peritoneal cysts
    - Residual accessory ovary
    - Subacute salpingo-oophoritis (chronic PID)
    - Tuberculous salpingitis
  - Uterine
    - Adenomyosis
    - Atypical dysmenorrhea or ovulatory pain
    - Cervical stenosis
    - Chronic endometritis
    - Endometrial or cervical polyps
    - Intrauterine contraceptive device
    - Leiomyomata
    - Symptomatic pelvic relaxation (genital prolapse)
- Urological
  - Bladder neoplasm
  - Chronic urinary tract infection
  - Interstitial cystitis
  - Radiation cystitis
  - Recurrent, acute cystitis
  - Recurrent, acute urethritis
  - Stone/urolithiasis
  - Uninhibited bladder contractions (detrusor dyssynergia)
  - Urethral diverticulum
  - Urethral syndrome
  - Urethral caruncle
- Gastrointestinal
  - Carcinoma of the colon
  - Chronic intermittent bowel obstruction
  - Colitis
  - Constipation
  - Diverticular disease
  - Hernias
  - Inflammatory bowel disease
  - Irritable bowel syndrome
- Musculoskeletal
  - Abdominal wall myofascial pain (trigger points)
  - Chronic coccygeal pain
  - Compression of lumbar vertebrae
  - Degenerative joint disease
  - Disk herniation or rupture
  - Faulty or poor posture
  - Fibromyositis
  - Hernias: ventral, inguinal, femoral, Spigelian
  - Low back pain
  - Muscular strains and sprains
  - Neoplasia of spinal cord or sacral nerve
  - Neuralgia of iliohypogastric, ilioinguinal, and/or genitofemoral nerves
  - Pelvic floor myalgia (levator ani spasm)
  - Piriformis syndrome
  - Rectus tendon strain
  - Spondylosis
- Other
  - Abdominal cutaneous nerve entrapment in surgical scar
  - Abdominal epilepsy
  - Abdominal migraine
  - Bipolar personality disorders
  - Depression
  - Familial Mediterranean fever
  - Neurologic dysfunction
  - Porphyria
  - Shingles
  - Sleep disturbances
  - Somatic referral

PID = pelvic inflammatory disease.

DIAGNOSTIC APPROACH

The history and physical examination are crucial. They are not only vital to accurate diagnoses, but also powerful therapeutic tools. When the history is taken caringly, with the patient talking and the clinician listening, it establishes rapport. Furthermore, there is great therapeutic benefit from the telling of one's story. Intake pain questionnaires are essential in evaluating women with chronic pelvic pain, but they should be used to supplement, not replace, allowing the patient to tell her story. The physical examination, when gently and meticulously performed, establishes trust that the physician is caring and competent. Because the examination is often painful for the woman with chronic pelvic pain, it is important that the physician go slowly enough to allow her to recover and relax between various portions of the examination. It is important to remember that even a "routine" pelvic examination is very emotionally stressful for many patients with chronic pelvic pain. Additionally, during the physical examination it is not uncommon for the patient to remember aspects of her history that she previously omitted, and time must be allowed for her to relate these additions to the history.

History

A pelvic pain intake questionnaire facilitates obtaining details of the history. A useful form is available from The International Pelvic Pain Society[5] and may be downloaded free of charge. If a form is not used, some of the particularly important questions to remember to ask are summarized in Table 2. Only a few of the areas of the history that may not be as familiar to most gynecologists are covered in this review, but this is not meant to

Table 2. Particularly Important Questions to Ask of Women With Chronic Pelvic Pain

1. How old are you?
2. How many pregnancies have you had?
3. Where does it hurt?
4. How much does it hurt?
5. What is the quality or character of your pain?
6. Do you have pain with your periods?
7. Does your pain worsen with menses or just before menses?
8. Is there any cyclic pattern to your pain? Is it the same 24 hours a day, 7 days a week?
9. Is your pain constant or intermittent?
10. When and how did your pain start and how has it changed?
11. Did pain start initially as menstrual cramps (dysmenorrhea)?
12. What makes your pain better?
13. What makes your pain worse?
14. Do you have pain with deep penetration during intercourse? If so, does it continue afterwards?
15. Have you ever been diagnosed with or treated for a sexually transmitted disease or pelvic inflammatory disease?
16. What form of birth control do you use or have you used in the past?
17. Have you ever had any kind of surgery?
18. What prior evaluations or treatments have you had for your pain? Have any of the previous treatments helped?
19. How has the pain affected your quality of life?
20. Are you depressed or anxious?
21. Are you taking any drugs?
22. Have you been or are you now being abused physically or sexually? Are you safe?
23. What other symptoms or health problems do you have?
24. What do you believe or fear is the cause of your pain?

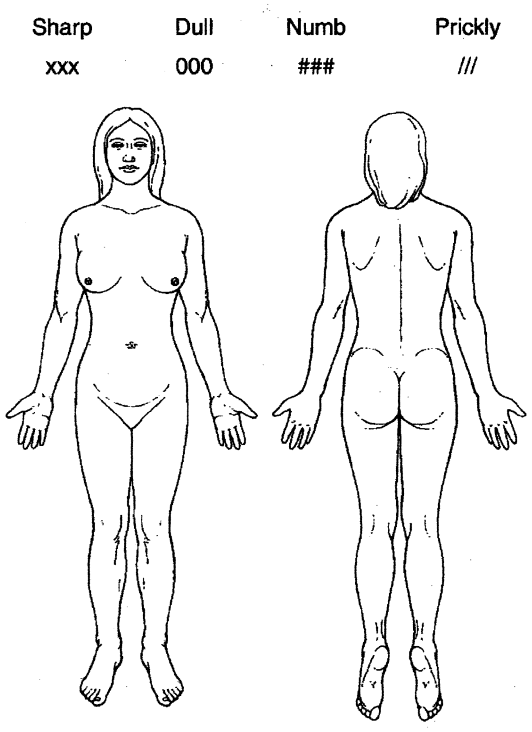

Figure 1. Pain map that may be used in women with chronic pelvic pain. Instruction to patient: "Please mark the areas where you feel pain. Put E if external, or I if internal, near the areas which you mark. Put EI if both external and internal."

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minimize the importance of the detailed history that is needed in clinical practice to formulate a thorough differential diagnosis.

Obstetric History. Pregnancy and childbirth are traumatic events to the musculoskeletal system, especially the pelvis and back, and may lead to chronic pelvic pain. Historical risk factors associated with pregnancy and pain include lumbar lordosis, delivery of a large infant, muscle weakness and poor physical conditioning, a difficult delivery, vacuum or forceps delivery, and use of gynecologic stirrups for delivery.[6] Women with a history of no pregnancies may have disorders that cause infertility and chronic pelvic pain, such as endometriosis, chronic pelvic inflammatory disease, or pelvic adhesive disease.

Location of Pain. It is useful to have the patient mark the location of her pain on a pain map (Figure 1).[7] Pain maps frequently reveal that the patient has other areas of pain. For example, up to 60% of women with chronic pelvic pain also have headaches, and up to 90% have backaches. Sometimes the pain map may show a distribution of pain suggesting a nonvisceral source, such as a dermatomal distribution or a myotomal pattern. Pain of visceral origin, however, is not well localized, so patients have difficulty differentiating if visceral abdominopelvic pain is of gynecologic, urological, or intestinal origin. Pain both ventrally and dorsally often suggests intrapelvic pathology, whereas only dorsal lower back pain suggests an orthopedic or musculoskeletal origin.

Pain Severity and Quality. In clinical practice, a simple rating system of "no pain, mild pain, moderate pain, severe pain" is often used, but this is not very sensitive to smaller changes in pain severity and may not be very useful in following patients' responses during treatment. Several of the more useful instruments that may be used to assess pain severity are shown in Figure 2.[7] It may be useful to ask how long the pain lasts when it occurs and how much it affects the patient's daily life and activities. It is also helpful to ask how the patient's pain has changed over time.

Timing of Pain. Finding out if there is any temporal pattern of pain may be helpful. Cyclicity related to menses particularly suggests gynecologic pain, but this is

A. McGill Present Pain Index.

People agree that the following 5 words represent pain of increasing intensity.

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

To answer the questions below, write the number of the most appropriate word in the space beside the question.

1. Which word describes your pain right now? _____
2. Which word describes it at its worst? _____
3. Which word describes it when it is least? _____
4. Which word describes the worst toothache you ever had? _____
5. Which word describes the worst headache you ever had? _____
6. Which word describes the worst stomachache you ever had? _____

B. Visual Analog Scale

Please place a mark on the line at the location that most appropriately rates your pain severity:

No Pain — Worst Possible Pain

(Line is 10 cm long)

C. Visual Analog Scale (modified)

Please circle the number that most appropriately rates your pain severity:

0	1	2	3	4	5	6	7	8	9	10
No Pain										Worst Possible Pain

Figure 2. Three of the instruments that may be used to assess pain severity.
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not pathognomonic of gynecologic disease. The same pattern may occur with pain of intestinal, urological, or musculoskeletal origin also. For example, symptoms of irritable bowel syndrome frequently increase premenstrually.

Past Surgery. Obviously a history of surgery for pain is pertinent, but surgical history also may be pertinent other than for the specific diagnosis for which the surgery was performed. For example, spillage of gallstones at the time of laparoscopic and open cholecystectomy has been reported as a cause of chronic pelvic pain in at least two cases.[8,9] The Marshall–Marchietti–Kranz procedure for urinary incontinence has also been reported as a cause of chronic pelvic pain with localization to the pubic symphysis due to osteitis pubis or osteomyelitis in several cases.[10] Prior cervical surgery for dysplasia may cause cervical stenosis with resultant hematometra and chronic pelvic pain. A high association of cervical stenosis and endometriosis has also been reported.[11]

Psychosocial History. A complete psychosocial history involves extensive evaluation that usually requires a psychologist, or similarly educated professional, and cannot always be done–nor is it always necessary. However, some psychosocial history is always an important part of the history, especially asking about depression. Depression is one of several predictors of pain severity in women with chronic pelvic pain, and it is also a significant indicator of responsiveness to treatment. Many of

Table 3. Components of the Standing Physical Examination of the Woman With Chronic Pelvic Pain and Some of the General Problems or Diagnoses That May Be Suggested Based on These Components of the Examination

Standing examination	Possible problems diagnosed
Gait	Short leg syndrome; herniated disk; general musculosketal problems
Posture with and without forward bending	Typical pelvic pain posture; scoliosis; one-leg standing
Standing on one leg with and without hip flexion	Laxity of the pubic symphysis; laxity of pelvic girdle; weakness of the hip and pelvis
Iliac crest symmetry	Short leg syndrome; one-leg standing
Groin evaluation with and without Valsalva	Inguinal hernia; femoral hernia
Pubic symphysis evaluation, including trigger points	Peripartum pelvic pain syndrome; trigger points; osteitis pubis; osteomyelitis pubis
Hip and sacroiliac evaluation, including trigger points	Arthritis of hip; trigger points
Buttocks (gluteus and piriformis) evaluation, including trigger points	Piriformis syndrome; pelvic floor pain syndrome; gluteal trigger points
Fibromyalgia tender point evaluation	Fibromyalgia

Table 4. Components of the Sitting Physical Examination of the Woman With Chronic Pelvic Pain and General Problems or Diagnoses That May Be Suggested Based on These Components of the Examination

Sitting examination	Possible problems diagnosed
Posture	Levator ani spasm; pelvic floor pain syndrome
Palpation of the upper and lower back	Trigger points; myalgia; arthritis
Palpation of sacrum	Trigger points; sacroiliitis
Palpation of gluteal and piriformis muscles	Trigger points; myalgia
Palpation of the posterior superior iliac crests	Peripartum pelvic pain syndrome
Basic sensory testing to sharpness, dullness, and light touch	Herniated disk
Muscle strength testing and deep tendon	Herniated disk

the pain questionnaires include a section that screens for depression, but if not, it is helpful to use a screening tool like the Zung or Beck depression inventories.

History of Abuse. There is a significant association of physical and sexual abuse and the development of chronic pelvic pain.[12] With the correlation of abuse and chronic pain, and with the high prevalence of domestic violence, it is important to ask women with chronic pelvic pain if they are in a safe environment. This question should be asked in a private setting without the spouse or significant other present. Satisfaction or dissatisfaction with marital or family relationships and support may be explored at this time also.

Physical Examination

A major goal of the examination is to detect, inasmuch as possible, the exact anatomic locations of tenderness and correlate these with areas of pain. This requires a systematic and methodical attempt to duplicate the pain by palpation or positioning. At each tender or painful area, the patient should be asked whether the pain produced is the pain for which she is being evaluated. The examination should evaluate the musculoskeletal, gastrointestinal, urinary, and psychoneurological systems, not just the reproductive tract. For simplicity, I divide the examination into 1) standing, 2) sitting, 3) supine, and 4) lithotomy components. Tables 3–6 summarize the evaluations that may be done during each of these components of the examination, as well as some of the potential diagnoses that may be suggested.[13] Because of space limitations only the supine and lithotomy examinations will be discussed in this review.

Supine Examination. Inability to lower the legs completely without arching the lower back suggests abdominal weakness and stiffness of the lumbar spine. Active leg flexion, knee to chest, can be done to elicit lower back dysfunction, lower back pain, and abdominal muscle weakness. Obturator and psoas signs are also often useful to look for shortening, dysfunction, or spasm of the obturator or iliopsoas muscles or fascia.[14]

The patient should be asked to point to the area of pain and then to demonstrate how hard one must press at the area of maximal pain to elicit tenderness. Abdominal palpation by the physician then starts and should initially be superficial, noting hyperesthesias or hypersensitivity (hyperalgesia) of the skin and checking superficial abdominal reflexes. Next, single-digit palpation for myofascial or trigger point pain is carefully and systematically done, including the inguinal areas. At any points of tenderness the patient should be asked if this palpation

Table 5. Components of the Supine Physical Examination of the Woman With Chronic Pelvic Pain and General Problems or Diagnoses That May Be Suggested Based on These Components of the Examination

Supine examination	Possible problems diagnosed
Active leg flexion, knee to chest	Low back dysfunction; low back pain; abdominal muscle weakness; deconditioning
Obturator and psoas sign testing	Shortening, dysfunction, or spasm of the obturator or iliopsoas muscles or fascia
Head raise and leg raise	Herniated disk; abdominal muscle weakness; deconditioning
Light abdominal palpation	Referred visceral pain; nerve entrapment; neuropathy
Gentle pinching	Referred visceral pain; nerve entrapment; neuropathy
Head maneuver	Referred visceral pain; nerve entrapment; neuropathy
Dermographism evaluation	Referred visceral pain; nerve entrapment; neuropathy
Single-digit palpation	Trigger points; myofascial pain; hernias; nerve entrapments
Abdominal wall tenderness test	Abdominal wall pain; visceral pain
Groin and abdominal evaluation with and without Valsalva	Inguinal hernia; Spigelian hernia; epigastric hernia; diastasis recti
(Incisional evaluation with and without Valsalva)	Incisional hernia
Pubic symphysis evaluation	Trigger points; osteitis pubis; osteomyelitis pubis
Traditional abdominal examination for distention, masses, ascites, bowel sounds, shifting dullness, vascular bruits, deep tenderness, guarding, or rigidity	Acute disease

Examination components in parentheses are not always a necessary part of the examination.

Table 6. Components of the Lithotomy Physical Examination of the Woman With Chronic Pelvic Pain and General Problems or Diagnoses That May Be Suggested Based on These Components of the Examination

Lithotomy examination	Possible problems diagnosed
Visual inspection of the external genitalia	Inflammatory and infectious diseases; vulvar abscess; trauma; fustula; ulcerative disease; pigmented lesions (neoplasias); condylomata; atrophic changes; fissure
Basic sensory testing to sharpness, dullness, and light touch	Nerve entrapment; neuropathy; spinal cord lesion
Cotton-tipped swab evaluation of the vestibule	Vulvar vestibulitis
Single-digit palpation of vulva and pubic arch	Trigger points
(Colposcopic evaluation of the vulva and vestibule)	Neoplasia
Sims retractor or single-blade speculum examination of vagina and pelvic muscles	Enterocele; cystocele; rectocele; uterine descensus
Cotton-tipped swab evaluation of cervical os and paracervical and cervical tissues	Trigger points
(Cotton-tipped swab evaluation of vaginal cuff)	Trigger points; neuroma
Single-digit pelvic examination of introitus	Vulvar vestibulitis; vaginismus; trigger points
Single-digit pelvic examination of levator ani	Pelvic floor pain syndrome; trigger points
Single-digit pelvic examination of coccygeus	Pelvic floor pain syndrome; trigger points
Single-digit pelvic examination of piriformis with and without abduction	Piriformis syndrome
Single-digit pelvic examination of anterior vaginal urethral and trigonal evaluation	Chronic urethral syndrome; urethritis; cystitis; interstitial cystitis; trigonitis; urethral diverticulum; vaginal wall cyst
Single-digit pelvic examination of cervix, paracervical areas, and vaginal fornices	Trigger points; endometriosis; cervicitis; repeated cervical trauma; pelvic infection; ureteral pain
Single-digit pelvic examination of uterus	Adenomyosis; pelvic congestion syndrome; pelvic infection; premenstrual syndrome; adhesions
Single-digit pelvic examination of coccyx	Coccydynia
Single-digit pelvic examination of adnexa	Pelvic congestion syndrome; endometriosis
Bimanual pelvic examination	See text
Rectovaginal examination	See text

Examination components in parentheses are not always a necessary part of the examination.

duplicates or is similar to her pain. The abdominal wall tenderness test may then be used to distinguish abdominal wall (myofascial) tenderness or trigger points from visceral tenderness (the abdominal wall tenderness test is also known by the eponym Carnett test).[15] In this test, while the area of abdominal tenderness is palpated, the patient voluntarily tenses the abdominal muscles, which is readily accomplished by having her raise her head or legs. If the pain is increased, it suggests that the pain is of myofascial origin. If the pain is decreased or unchanged, it suggests that the pain is not of myofascial origin. Myofascial pain suggested by the abdominal wall tenderness test may be due to muscular strain, nerve entrapment, viral myositis, trauma, epigastric artery rupture, or an abdominal wall hernia, as well as myofascial trigger points. It may be worth blocking any trigger points of the abdominal wall before performing the pelvic examination.[16]

Surgical scars should be noted and palpated for hernial defects. Palpation for Spigelian hernias should be done just lateral to the lateral margin of the rectus sheath. Spigelian hernias are small, spontaneous, lateral ventral hernias that protrude through the transversus abdominis aponeurosis lateral to the edge of the rectus muscle, but medial to the "Spigelian line," which is the point of transition of the transversus abdominis muscle to its aponeurotic tendon. Spigelian hernias are most likely just below the level of the umbilicus, but they are difficult to palpate.

The pubic symphysis should be palpated for tenderness, suggesting symptomatic pelvic girdle relaxation, rectus muscle inflammation or injury at its fascial insertion, osteitis pubis, or osteomyelitis. The usual components of the abdominal examination, looking for distention, abdominal masses, ascites, bowel sounds, shifting dullness, vascular bruits, and palpation for deep tenderness, guarding, or rigidity, should not be neglected.

Lithotomy. Visual inspection of the external genitalia should be performed, noting redness, discharge, abscess formation, excoriation, fistulas, fissures, ulcerations, pigment changes, condylomata, atrophic changes, or signs of trauma. Basic sensory testing to sharpness, dullness, and light touch as well as bulbocarvenosus and anal wink reflexes should be done. A cotton-tipped swab may be used to evaluate the vestibule for localized tenderness of vulvar vestibulitis. Patients with vulvar vestibulitis demonstrate exquisite tenderness in localized areas at the minor vestibular glands just external to the hymen, with normal sensation in adjacent vulvar areas. This technique or single-digit palpation should also be used to evaluate the vulva and pubic arch for trigger points, or for skin or mucosal lesions that reproduce the patient's symptoms. Areas of previous vulvar or vaginal trauma or scars from surgeries or deliveries should be given particular attention.

The traditional speculum examination is done for full visual inspection and to obtain requisite cytologic and bacteriological specimens. Also, a cotton-tipped swab should be used to evaluate the cervical os and the paracervical and cervical tissues for tenderness. In posthysterectomy patients the full vaginal cuff should be similarly palpated for tenderness with a cotton-tipped applicator.

The manual portion of the pelvic examination should always be initiated with a single index finger, first noting any introital tenderness or spasm suggesting vaginismus. Next the levator ani muscles are directly palpated for tone and tenderness. Normally this palpation causes only a pressure sensation, but in patients with pelvic floor pain it may cause pain consistent with at least part of the patient's clinical pain symptoms. "Pelvic floor myalgia," "piriformis syndrome," "levator ani spasm syndrome," "diaphragma pelvis spastica," and "coccydynia" are terms used for syndromes that appear to be similar to pelvic floor pain.[17–20] Pelvic floor pain may also result from trigger points of one or more of the muscles of the pelvis. Pelvic floor pain may be a primary problem or it may be secondary to other diseases such as interstitial cystitis or endometriosis.

The piriformis, coccygeus, and obturator internus muscles should be gently palpated bilaterally, seeking tenderness that reproduces the patient's pain. The piriformis muscles are somewhat more difficult to palpate than the levators. Rectal examination may allow an easier evaluation than vaginal examination. Transvaginally or transrectally the examining finger is pressed posteriolaterally just superior to the ischial spine. In the lithotomy position, if the patient is asked to abduct the thigh against resistance (hold the patient's knee laterally on the same side being examined) as the piriformis is palpated, the muscle may be more easily palpated, and there is exquisite tenderness of the muscle if there is spasm or tension myalgia involving the piriformis (piriformis syndrome).

The anterior vaginal, urethral, and trigonal areas should be gently palpated to elicit any areas of tenderness, induration, discharge or thickening suggestive of chronic urethritis, chronic urethral syndrome, urethral diverticulum, vaginal wall cyst, trigonitis, or interstitial cystitis. With deeper palpation the cervix, paracervical areas, and vaginal fornices should be palpated with the single digit for tenderness or trigger points suggestive of problems such as repeated cervical trauma (usually from intercourse), pelvic infection, endometriosis, ureteral pain, or trigger points.

Table 7. Some of the Diagnostic Tests That May Be Useful in the Diagnostic Evaluation of Women With Chronic Pelvic Pain

Symptom, finding, or suspected diagnosis	Potentially useful tests
Adenomyosis	Ultrasonography; hysterosalpingography; magnetic resonance imaging
Chronic urethral syndrome	Urodynamic testing
Compression or entrapment neuropathy	Nerve conducting velocities; needle electromyographic studies
Constipation	Anorectal balloon manometry; colonic transit time
Depression	Thyroid-stimulating hormone; thyroxine; triiodothyronine levels; antithyroid antibody; complete blood count; renal function tests; hepatic function tests; electrolytes; rapid plasma reagin
Diarrhea	Stool specimens for ova and parasites; stool polymorphonuclear leukocytes and red blood cells; stool cultures; stool for *Clostridium difficile* toxin; stool guiaic testing; barium enema radiography; colonoscopy; upper gastrointestinal series with fol1ow-through; computerized tomography
Diverticular disease	Barium enema radiography
Dyspareunia	Urethral and cervical gonorrhea and chlamydia cultures; chlamydial PCR testing; vaginal cultures; urine cultures; vaginal wet preparations; vaginal pH
Endometriosis	CA 125; ultrasonography; barium enema radiography; hysterosalpingography; computed tomography; magnetic resonance imaging
Hernias	Abdominal wall ultrasonography; computed tomography; herniography
Interstitial cystitis	Cystourethroscopy; KCl bladder challenge test; urine culture; urine cytologies; urodynamic testing; bladder biopsy
Ovarian remnant syndrome	Follicle-stimulating hormone; estradiol; gonadotropin-releasing hormone agonist stimulation test; ultrasonography ± clomiphene stimulation; barium enema radiography; computed tomography
Ovarian retention syndrome	Ultrasonography; computed tomography
Pelvic congestion syndrome	Pelvic venography; ultrasonography ± Doppler
Pelvic tuberculosis	Chest x-ray; PPD skin test
Porphyria	Urine porphobilinogen
Urethral diverticulum	Vaginal sonography; voiding cystourethrography; double-balloon cystourethrography; magnetic resonance imaging

PCR = polymerase chain reaction; KCl = potassium chloride; PPD = purified protein derivative.

The uterus should be compressed against the sacrum to evaluate uterine tenderness, which may be consistent with diseases such as adenomyosis, pelvic congestion syndrome, pelvic infection, or premenstrual syndrome. A uterus that is immobile and fixed in position, especially a retroflexed one, may suggest endometriosis or adhesions. The coccyx should also be palpated with the single digit, and an attempt should be made to move it 30° or less. This may be easier to evaluate during the rectovaginal examination. Normally the coccyx moves 30° without eliciting pain, but in patients with coccydynia this movement elicits pain. The ureteral and the adnexal areas should be palpated next, still using a single digit without the use of the abdominal hand.

All of the above are "monomanual–monodigital" evaluations–that is, only one finger of one hand is used. No abdominal palpation with the other hand is involved. The traditional bimanual examination is best performed after completing the monomanual–monodigital examination. The bimanual examination may be a less sensitive portion of the evaluation as it involves stimulation of all layers of the abdominal wall, the parietal peritoneum, and the palpated organ or organs. Rectal or rectovaginal examination should be performed last. Marked discomfort with digital rectal examination often accompanies irritable bowel syndrome or chronic constipation, as may hard feces in the rectum. The rectovaginal septum should be carefully examined for nodularity and tenderness, suggesting endometriosis, especially if done while the patient is menstruating.

Diagnostic Tests

Routinely having every woman with chronic pelvic pain have a barium enema and upper gastrointestinal series to "rule out" gastrointestinal disease, an intravenous pyelo-

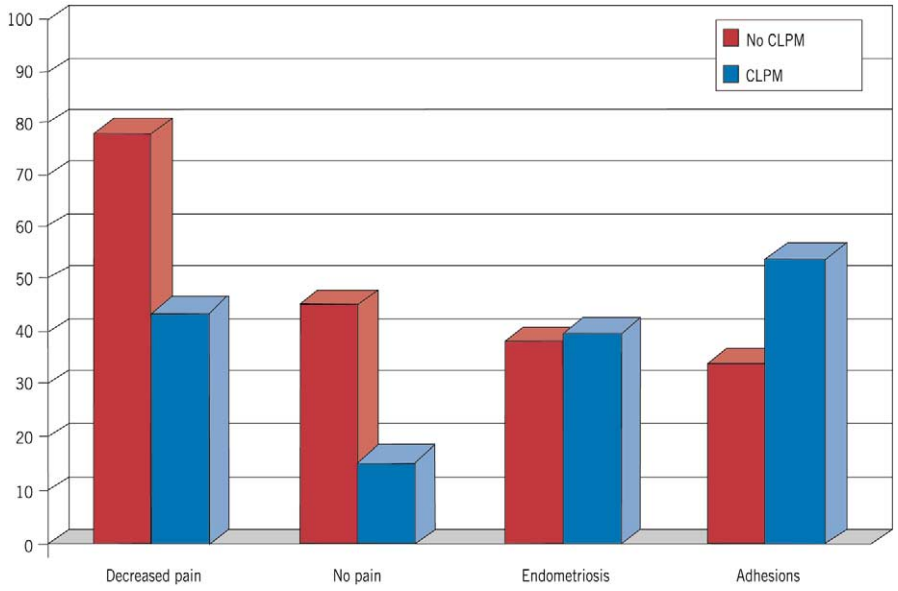

Figure 3. Comparison of the results of two different series of women with chronic pelvic pain, one before the introduction of conscious laparoscopic pain mapping (No CLPM) and one after (CLPM). Data are percentages of complete pain relief and decrease of pain after laparoscopic evaluation and treatment, and percentages with the visual diagnoses of endometriosis and adhesions at the time of laparoscopy.

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gram to rule out urinary tract disease, a pelvic ultrasound to rule out gynecologic disease, a complete blood count and sedimentation rate to rule out infection, and so on is neither efficient nor effective. It seems more appropriate to perform diagnostic tests that are indicated by the history and physical examination, and when the results will change the diagnoses, the further evaluation, or the treatment. Table 7 lists some of the diagnostic tests that may be helpful in evaluation of women with chronic pelvic pain. A full discussion of these tests is beyond the scope of this article.

Laparoscopy is an important diagnostic study in the evaluation of pelvic pain—over 40% of gynecologic diagnostic laparoscopies are done for chronic pelvic pain. Endometriosis and adhesions account for at least 85% of all laparoscopic diagnoses. It is important to remember that a negative laparoscopy is not synonymous with no diagnosis or no disease and does not mean that a woman has no physical basis for her pain. More discriminative use of laparoscopy, carefully based on the patient's history, physical examination, laboratory, and imaging findings, might decrease the rate of negative laparoscopies from 39% to 4%.[21]

A new approach to diagnostic laparoscopy, "conscious laparoscopic pain mapping," has been suggested as a way to improve the diagnostic capability of laparoscopy. Conscious laparoscopic pain mapping is a diagnostic laparoscopy under local anesthesia, with or without conscious sedation, directed at the identification of sources of pain.[22,23]

The technique used with conscious laparoscopic pain mapping is a gentle probing or tractioning of tissues, lesions, and organs with a blunt probe or forceps passed through a secondary trocar site. Diagnosis of an etiological lesion or organ is based on the severity of pain elicited and on replication of the pain that is the patient's presenting symptom. Chronic pelvic pain, however, is a multifaceted and complicated problem, and it is premature to assume that the findings with mechanically elicited tenderness at conscious pain mapping directly translate into cause and cure. For example, data from our center evaluating laparoscopic diagnosis and treatment, comparing a historical cohort of 65 patients treated before the introduction of conscious pain mapping with 50 patients treated after introduction of conscious laparoscopic pain mapping, failed to show any improvement in outcome (Figure 3). A significant difference between the populations in these two groups is that only half of the patients in the traditional laparoscopy group had undergone prior evaluations and treatments for chronic pelvic pain, whereas all of the patients in the conscious laparoscopic pain mapping group had. Other published series of conscious laparoscopic pain mapping procedures do not clearly report data on outcomes 6–12 months afterwards. Whether conscious laparoscopic pain mapping

improves outcomes in women with chronic pelvic pain, either by decreasing unnecessary surgical interventions or improving pain relief via more specific medical and surgical treatments, needs more study and probably will require a prospective, randomized trial.

THERAPEUTIC APPROACH

In clinical practice there are two approaches to the treatment of chronic pelvic pain. One is to treat chronic pain itself as a diagnosis, and the other is to treat diseases or disorders that might be a cause of or a contributor to chronic pelvic pain. These two approaches are not mutually exclusive, and in many patients effective therapy is best achieved by using both.

Treatment of Chronic Pelvic Pain

Although it is not known how, after 4–6 months duration pain itself can become an illness. In other words, in such patients chronic pain is a disease, not a symptom. In such cases, the treatment of chronic pain needs to be consistent with the current biologic understanding of pain. In general terms, the current treatments of chronic pain as a diagnosis may be classified as 1) pharmacological, 2) psychologic, and 3) neuroablative. Treatment of chronic pain, different from that of acute pain, generally requires acceptance of the concept of managing rather than curing pain.

Pharmacological treatment of pain is based on the knowledge that pain reception, transmission, and perception involve a series of neural links and several neurotransmitters. This mosaic of neural elements and chemical mediators makes it possible for drugs with different pharmacological profiles and mechanisms to interrupt or decrease the transmission of pain information and thereby decrease pain.

Analgesics are the mainstay of pharmacological treatment. Peripherally acting analgesics include aspirin, nonsteroidal antiinflammatory medications, and acetaminophen. Clinical experience suggests these first-step analgesics are effective. There appear to be wide individual variations in response to different nonsteroidal antiinflammatory medications, so it seems reasonable before abandoning or adding to nonsteroidal antiinflammatory medication therapy that at least three different nonsteroidal antiinflammatory medications be tried.[24] The potential of side effects with nonsteroidal antiinflammatory medications, aspirin, and acetaminophen, especially with chronic use, are significant, and careful observation is important.

Opioids are the major category of analgesics with central activity used for pain. Although the role of opioid analgesics is well recognized in acute pain management, their use in the treatment of chronic pain is controversial. However, clinical experience in pain centers suggests that chronic opioid therapy may allow the return of normal function without significant adverse side effects in those who have failed other treatments.[25] Some of the bias against opioid treatment may stem from a lack of understanding of the difference between tolerance, dependence, and addiction. Tolerance is the diminution of effectiveness over time of the same dose of a drug. Physical dependence is the appearance of an abstinence syndrome if the drug is withdrawn. Addiction refers to a set of aberrant behaviors consisting of drug craving, efforts to secure its supply, interference with physical health or psychologic function, and recidivism after detoxification. Although tolerance and dependence are significant problems, addiction is the only complication that leads to unacceptable and illegal behavior by the patient. Estimates are that only 3–16% of chronic pain patients experience addiction to opioids, whereas surveys show that 55–71% of patients referred to chronic pain centers are taking opioids regularly.[26] Recognizing that patients with a history of addiction to legal or illegal substances are not good candidates for opioid treatment may diminish cases of iatrogenic addiction.

Opioid maintenance therapy for chronic pelvic pain should be considered only after all other reasonable attempts at pain control have failed and when persistent pain is the major impediment to improved function. If opioid maintenance is instituted, a detailed notation in the chart that documents that the patient has failed nonnarcotic treatment and has been counseled on potential risks is advisable. There should be a written contract or agreement with the patient that includes at least the following particulars: 1) The treating doctor is the sole provider of opioids; 2) the patient is seen by this physician before having her opioid prescription refilled; 3) multiple prescriptions, each with small amounts, will be provided if the patient demonstrates she cannot responsibly take her medication as prescribed; 4) lost medications or prescriptions will not be refilled; and 5) the patient agrees she will actively participate in strategies to develop alternative pain therapies.

Opioids are best given on a scheduled basis. A scheduled regimen improves effectiveness by having the patient take analgesics before severe pain symptoms and avoidance of the increased focus on pain symptoms that may actually increase pain severity with "as occasion requires" dosing–it avoids a pain-contingent approach that has the tendency to use medication as a reinforcer of pain behaviors. After gradual titration of the selected opioid the extent of pain relief, restoration of function, and improvement of quality of life should be assessed. Close and regular follow-up are essential, and most

patients should be seen monthly. If inappropriate use occurs, such as for treating depression or anxiety, drug diversion, or hoarding, it should be pursued and managed firmly. Use of the medication for symptoms other than its prescribed indication (eg, use for headaches in addition to pelvic pain) may lead to increased tolerance and dose escalation, and should be discouraged. If control cannot be maintained, then treatment with opioids should be discontinued.

Antidepressants, particularly tricyclic ones, have been used to treat a number of chronic pain syndromes. They are generally thought to improve pain tolerance, restore sleep patterns, and reduce depressive symptoms.[27] In the only published study of tricyclic antidepressant (nortriptyline) treatment of chronic pelvic pain in women (all had negative laparoscopies, pain of 6 or more months duration, and no specific diagnosis), some women reported a decreased intensity and duration of pain.[28] However, this was a study of only 14 women, seven of whom dropped out of the study because of side effects of the nortriptyline. Doses were increased to 100 mg per day, and six of the seven women remaining in the trial were pain free at 1 year. The only other study of antidepressants for chronic pelvic pain was of sertraline (not a tricyclic antidepressant). This double-blinded, crossover study of 50 mg twice daily versus a placebo showed no improvement in pain scores in women taking sertraline versus those taking the placebo.[29] This was a small study with a short duration of treatment and as such should be regarded as preliminary. Also, it should be stated that antidepressants are often indicated in women with chronic pelvic pain, as depression occurs with increased frequency with chronic pelvic pain.

Combination drug therapy that uses medications with different sites or mechanisms of action may improve treatment.[30,31] For example, combining centrally acting and peripherally acting analgesics may improve the response because of the action at two different sites. Such a combination might consist of a nonsteroidal antiinflammatory medication and an opioid, especially if significant inflammation were part of the pain syndrome. Caution is advised with the use of commercially available formulations of opioids with acetaminophen, aspirin, or ibuprofen, as they can lead to overdosage of the nonopioid drug. Combining two medications that are centrally acting, but with different mechanisms, may also be appropriate, such as an antidepressant and an opioid. If muscle spasm or tension is a contributor to pain, then combining a tranquilizer or muscle relaxant with an opioid or nonsteroidal antiinflammatory medication may enhance efficacy.

Psychologic Treatment. Ideally, psychologic evaluation by a professional specializing in pain psychology would be part of the initial evaluation and treatment of every patient with chronic pelvic pain.[32] Even when there is no suspicion of a psychologic diagnosis, it helps provide the physician with specific information about the patient that may be related to therapeutic responsiveness and prognosis, and can be used in treatment planning. Psychologic evaluation and treatment, though, is not always possible. Many women are unable to afford or are reluctant to accept referral to a psychologist or psychiatrist for evaluation and treatment.

Although pain is usually the patient's chief concern, the majority of women with chronic pelvic pain have serious psychosocial problems that also need attention of their own accord. These psychosocial factors often appear to determine the extent of suffering and disability experienced. It is postulated that women with psychosocial problems, such as sexual abuse, marital discord, mild personality disorder, difficulty maintaining relationships, or distressed family of origin, may be more vulnerable to nociceptive signals and are ill equipped to cope with uncomfortable somatic sensations accompanying any disease process. Psychologic treatment and support may decrease suffering and disability in chronic pelvic pain patients, which are worthwhile goals even if the severity of pain is not affected.

Neuroablative Treatment. Neurolytic therapies may be done by surgical transection or excision of nerves, injection of neurotoxic chemicals, or use of energy sufficient to destroy neural tissue (heat, cold, or laser). Although these therapies are most often used specifically to treat a particular nerve dysfunction, such as an entrapped iliohypogastric nerve, they may also be used more centrally to try to decrease pain even if there is no specific diagnosis or specific nerve dysfunction.

Presacral neurectomy consists of excision of the superior hypogastric plexus ("presacral nerve"). This procedure has been performed most often for severe dysmenorrhea or for endometriosis-associated pelvic pain. There are few reports of its use for chronic pelvic pain without associated pathology—that is, as treatment for chronic pelvic pain as a diagnosis.[33] A retrospective study of experience with 6 years of laparoscopic presacral neurectomies in 655 patients, of whom 392 had dysmenorrhea and 135 had chronic pelvic pain, shows that pain was significantly decreased in 72% with dysmenorrhea, as compared with 62% with chronic pelvic pain.[34] It has been suggested that performing superior hypogastric nerve blocks before considering a presacral neurectomy might be predictive of surgical success. In a report by Bourke et al,[35] ten of 11 patients with pain relief after superior hypogastric plexus nerve blocks had greater than 50% pain relief with subsequent presacral neurectomies. Superior hypogastric plexus nerve block at the time of conscious pain mapping has also been

suggested as possibly predictive of success of presacral neurectomy.[36]

Paracervical denervation techniques, usually performed by transecting the uterosacral ligaments, have also been performed primarily for relief of dysmenorrhea, not for chronic pelvic pain per se. In a randomized trial of laparoscopic uterosacral nerve ablation for the treatment of central dysmenorrhea, five (45%) of 11 women in the laparoscopic uterosacral nerve ablation–treated group showed improvement, as compared with zero of ten in the control group.[37]

Uterovaginal ganglion excision involves excision of the inferior hypogastric plexus, a coalescence of parasympathetic and sympathetic nerves bilaterally at the base of the broad ligament lateral to the cervix, known by the eponym Frankenhauser plexus. In an uncontrolled study by Perry, 17 (81%) of 21 patients with chronic pelvic pain experienced improvement after uterovaginal ganglion excision.[38] Although these results are promising, more data are needed.

There are case reports of treatment of incapacitating pelvic pain via surgically created lesions of the central nervous system.[39] Clearly this represents a dramatic and potentially hazardous approach to treatment that requires extraordinary circumstances and a highly skilled neurosurgical team. It is not possible to speculate at this time as to the generalizability of this approach.

Nonsurgical neurolytic treatment can be done with cryoablation, thermocoagulation, or injection of chemical agents such as alcohol, phenol, and hypertonic. Superior hypogastric plexus ablation with 10% phenol has been performed for intractable pelvic pain associated with cancer, with a 69% (18 of 26 patients) success rate at 6 months.[40] Inferior hypogastric plexus or paracervical denervation by chemical ablation using alcohol injections has been reported only for treatment of dysmenorrhea.[41] Neurolytic block of the ganglion impar (ganglion of Walther or sacrococcygeal ganglion) has been performed in cancer patients for intractable perineal and rectal pain.

Multidisciplinary Pain Centers. Generally pain centers do not set "cure" as a goal, but rather the achievement of reduced pain levels that allow return of normal activities. This goal is often incongruent with the goals of the woman with chronic pelvic pain, who remains focused on diagnosis and cure and so seeks new physicians who will pay attention to her perception of a missed diagnosis and curable disease.

Little has been reported about multidisciplinary clinics specifically for chronic pelvic pain. A randomized clinical trial by Peters et al[42] suggests that multidisciplinary treatment is better than a traditional approach by a gynecologist alone, at least in women with a history of negative evaluations by a gynecologist (ie, negative findings at the time of a prior laparoscopy or laparotomy).

Treatment of Specific Disorders

Although the number of disorders that may be associated with chronic pelvic pain is large, in clinical practice endometriosis, adhesions, irritable bowel syndrome, and interstitial cystitis are the diagnoses made most frequently. There are reasonably good randomized clinical trials of treatments for each of these common diagnoses.

Endometriosis. Endometriosis-associated pelvic pain can be treated medically or surgically. Laparoscopic surgical treatment is particularly popular, as it can be done at the time of the diagnostic laparoscopy. Laparoscopic treatment has been shown to be effective in a blinded, randomized clinical trial of 63 women with stage I, II, or III endometriosis.[43] At 6 months there was a clinically and statistically significant difference in pain relief between the control group (seven [23%] of 31 improved) and the treated group (20 [63%] of 32 improved). This means that 40% of the women were better directly because of the treatment, and the number needed to treat was 2.5.

This study, the only published, double-blind, randomized clinical trial of surgical treatment, excluded women with stage IV endometriosis and included only six women with stage III disease. Surgery for advanced-stage endometriosis can be challenging, tedious, and frustrating, and in many cases cannot be performed laparoscopically. Thus, it may not automatically follow that these data are applicable to surgeries for patients with stage IV disease.

Both presacral neurectomy and uterosacral neurectomy (uterine nerve resection or transection of the uterosacral ligament) have been recommended for relief of chronic pelvic pain associated with endometriosis, based mostly on data from observational studies. Presacral neurectomy has been evaluated, however, in at least two randomized clinical trials.[44,45] Taken together, these two trials suggest that presacral neurectomy has a role in conservative surgery for endometriosis, but is most effective for the treatment specifically of midline dysmenorrhea. There appears to be a small effect, if any, on nonmenstrual pelvic pain or dyspareunia. Uterosacral neurectomy, also called laparoscopic uterosacral nerve ablation or laparoscopic uterosacral nerve ablation, in a randomized clinical trial has been shown to offer no additional benefit to laparoscopic surgery for treatment of endometriosis-associated pelvic pain.[46]

Gonadotropin-releasing hormone (GnRH) agonists are currently the most often used medical treatment. The recent randomized clinical trial by Ling[47] is particularly worth reviewing. This was a study of leuprolide versus a

placebo for chronic pelvic pain with suspected but undocumented endometriosis. Laparoscopies were performed after 3 months of treatment with leuprolide or placebo. Endometriosis was confirmed in 78% (38 of 49) of the leuprolide-treated group and 87% (40 of 46) of the placebo-treated group. Pain relief was observed in 81% of those with endometriosis treated with leuprolide and 39% of those treated with the placebo, giving an absolute benefit increase of 42% and a number needed to treat of 2.3. Comparing this study of medical treatment with GnRH with the study of surgical treatment by Sutton et al[43] suggests that there is no difference in efficacy between medical and surgical treatment (numbers needed to treat 2.3 versus 2.5, respectively). This is the best comparison currently available, as no studies directly comparing medical and surgical treatments have yet been published.

When patients have a recurrence of pain within 1 year after treatment with GnRH analogues, retreatment appears to be reasonably effective, with about two thirds of patients showing a significant reduction of pain levels during retreatment.[48] However, retreatment with GnRH analogues results in further loss of bone density.

Loss of bone density with GnRH agonists is a serious problem. One approach to decreasing bone density loss has been to use GnRH agonists for a shorter duration. Hornstein et al[49] showed in a randomized clinical trial that 3 months of nafarelin gave decreases in combined pain levels that were comparable to 6 months of nafarelin.

Another approach to decreasing loss of bone density has been add-back treatment with estrogen or progestagen. A randomized clinical trial of add-back therapy with conjugated equine estrogen and/or norethindrone acetate suggests that bone loss is significantly decreased.[50] All of the add-back regimens significantly decreased hot flushes, but they also increased the likelihood of breakthrough bleeding (30–60%) and pain symptoms.

Danazol, a 17-ethinyl-testosterone derivative, has been used as the gold standard for the evaluation of most other medical treatments, but has been evaluated in only one placebo-controlled, double-blind, randomized clinical trial for the treatment of endometriosis-associated pelvic pain in women with stage I or II disease.[51] This small study had several significant flaws, but it showed that 83% of danazol-treated patients improved, versus 25% of placebo-treated patients, giving an absolute benefit increase of 58% and the number needed to treat of 2.[52]

Medroxyprogesterone acetate has been a recommended medical treatment for many years. In the only placebo-controlled trial of medroxyprogesterone acetate (this was another part of the study of danazol cited previously),[51] the dose studied was 100 mg per day for 6 months. The number needed to treat for severe pain symptoms at this high dose of medroxyprogesterone acetate was equal to that of danazol–2.

Despite their widespread use in clinical practice, there appears to be only one randomized clinical study of low-dose oral contraceptives used as a solitary treatment for endometriosis-associated pain.[53] This study of low-dose contraceptive pills (0.02 mg of ethinyl estradiol with 0.15 mg of desogestrel daily taken cyclically) versus monthly subcutaneous injections of goserelin (3.6 mg) showed no significant differences in relief of nonmenstrual pelvic pain. Six months after discontinuation of treatment, there were no differences between the two treatments. However, symptoms had recurred in all patients.

Adhesions. Adhesions are diagnosed in about 25% of women with chronic pelvic pain, but their role as a cause of chronic pelvic pain is controversial. Conscious laparoscopic pain mapping has the potential of helping to clarify the association of adhesions and chronic pelvic pain. For example, in our study of conscious laparoscopic pain mapping and chronic pelvic pain, adhesions were present in 27 of 50 patients (54%).[23] In six patients, adhesions were the direct cause of failed conscious pain mapping. Of the remaining 21 cases, 15 were mapped successfully, and one or more adhesions were mapped as painful in seven (47%) of these cases. This suggests adhesions may be a cause of pelvic pain in some but not all women with adhesions and chronic pelvic pain.

The only randomized trial of adhesiolysis failed to show any significant improvement in pain symptoms after lysis of adhesions by laparotomy, relative to a control group that did not undergo adhesiolysis.[54] Only a subgroup analysis of 15 women with severe, stage IV adhesions showed any detectable improvement in pain that could be attributed to adhesiolysis.

Irritable Bowel Syndrome. Symptoms suggestive of irritable bowel syndrome are present in 50–80% of women with chronic pelvic pain. Dietary treatment is the mainstay of therapy, but most dietary interventions have not been experimentally validated. Elimination of dietary lactose, sorbitol, and fructose is advised. Lactose intolerance can mimic irritable bowel syndrome and contribute to irritable bowel syndrome symptoms, and about 40% of patients with irritable bowel syndrome also have lactose intolerance. Sorbitol, which is a common sweetening agent used in "sugar free" and other dietetic foods, may also contribute to symptoms. Fructose, a major sugar component of fruit and an additive to a variety of processed foods, also can cause significant abdominal distress. Caffeinated products, including coffee, tea, and cola; carbonated products; and gas-produc-

ing foods may contribute to bloating. Smoking and chewing gum lead to more swallowed air and may increase gas and bloating. Excessive alcohol consumption may lead to increased rectal urgency.

Medical treatment of irritable bowel syndrome is directed to relief of symptoms. Patients sometimes can be put into one of the three following major subclassifications, depending on which symptom(s) are dominant: 1) abdominal pain, gas, and bloating; 2) constipation predominant; and 3) diarrhea predominant. Unfortunately, many patients do not fall clearly into one of these three groups, but have overlapping symptoms.

In patients with predominately abdominal pain, gas, and bloating symptoms, an antispasmodic may be tried. The commonly used antispasmodics are dicyclomine (Bentyl; Aventis Pharmaceuticals Inc., Bridgewater, NJ), hyoscyamine (Levsin; Schwarz Pharma Inc., Milwaukee, WI), atropine–hyoscyamine–phenobarbital–scopolamine formulation (Donnatal), and chlordiazepoxide with clidinium (Librax; ICN Pharmaceuticals, Costa Mesa, CA). In patients with predominately gas and bloating symptoms, Beano (a D-galactosidase) (GlaxoSmithKline Consumer Healthcare, Pittsburgh, PA) or a simethicone preparation (Gas X [Novartis Consumer Health Inc., Summit, NJ], Phazyme [Block Drug Co. Inc., Jersey City, NJ]) also can be tried.

If the patient's symptomatology is predominately constipation, then a trial of increased roughage and psyllium is prescribed. Many patients have increased gas with increased fiber, and about 15% cannot tolerate fiber therapy. If necessary, a stool softener or osmotic laxative also can be used temporarily. Chronic use of stimulant laxatives should be discouraged. There may be a role for prokinetic agents. Cisapride* (Propulsid; Janssen Pharmaceutica Products) has been shown to increase small-bowel transit and may be helpful, but two randomized clinical trials showed differing results,[55,56] and more evidence is needed.

In irritable bowel syndrome patients with diarrhea-predominant symptomatology, loperamide (Imodium; McNeil Consumer & Specialty Pharmaceuticals, Fort Washington, PA) is the most commonly used agent.[57] In a double-blind, placebo-controlled trial of loperamide in patients with diarrhea-predominant irritable bowel syndrome, loperamide was found to significantly improve stool consistency, pain, and urgency.[58] One particular advantage of loperamide is that it does not cross the blood–brain barrier, as do other antidiarrheal agents.

Peppermint oil, a major constituent of several over-the-counter remedies for irritable bowel syndrome, appears to an effective treatment based on several randomized clinical trials.[59,60] Peppermint oil decreased abdominal distension, reduced stool frequency, decreased borborygmi, and reduced flatulence.

Combining psychologic treatment with medical therapies improves the clinical response over that with the medical treatment only.[61,62] Factors that predict a good response to psychotherapy include predominately diarrhea and pain symptoms, the association of overt psychiatric symptoms, intermittent pain exacerbated by stress, short durations of bowel complaints, and few sites of abdominal pain.[63] Patients with constant abdominal pain do poorly with psychotherapy or hypnotherapy. A recent review of controlled trials of psychologic treatments for irritable bowel syndrome found that eight of 14 studies reported that psychologic therapy was significantly superior to control treatment in reducing the primary symptoms of irritable bowel syndrome.[64]

Of women with irritable bowel syndrome, 21% aged 18–40 years have undergone hysterectomies. This is significantly higher than the national average of about 6%.[65] Whether this represents inaccurate diagnoses by gynecologists, the presence of multiple disorders in women with irritable bowel syndrome, or an etiological link between hysterectomy and irritable bowel syndrome is not clear.

Interstitial Cystitis. Interstitial cystitis is a chronic inflammatory condition of the bladder that may cause chronic pelvic pain. The definition and diagnostic criteria of interstitial cystitis are imprecise, but most commonly it is defined clinically by the following triad: 1) irritative voiding symptoms, 2) absence of objective evidence of another disease that could cause the symptoms, and 3) a characteristic cystoscopic appearance of the bladder (glomerulations).[66] Recently it has been suggested that increased intravesical sensitivity to potassium chloride is sufficient for the diagnosis in women with urological symptoms,[67] but further work is needed to substantiate this.

Dimethylsulfoxide (Rimso-50; Ben Venue Laboratories Inc., Bedford, OH), the first drug with a Food and Drug Administration–approved indication for interstitial cystitis, is administered intravesically. Treatments are usually repeated four to eight times at 1–2-week intervals.[68] Dimethylsulfoxide treatments result only in remission of disease, not cure.

Other intravesical therapies for interstitial cystitis have been less extensively studied. Intravesical capsaicin therapy, in a trial of 36 patients randomized to 10 μg of capsaicin versus a placebo, showed significant improvements in frequency and nocturia, but no improvement in

**Access in the United States is restricted, and cisapride is not available for general use.*

pain levels.[69] Intravesical bacillus Calmette–Guerin, in a prospective, double-blind, placebo-controlled trial, showed a response rate of 60%, relative to a response rate of 27% in the placebo group (number needed to treat 3).[70] In responders, the mean decrease of pelvic pain was 81%.

Sodium pentosan polysulfate, sold under the brand name Elmiron (ALZA Pharmaceuticals, Palo Alto, CA) and the only Food and Drug Administration–approved oral medication for interstitial cystitis, is a polyanionic analogue of heparin. Reported results of its effectiveness have been mixed, but at least one placebo-controlled, double-blinded study of pentosan polysulfate (100 mg orally three times a day) showed a 50% response rate, relative to the placebo response of 23%.[71] Decreased pelvic pain, in particular, occurred in 45% patients, versus 18% with the placebo (number needed to treat 3.7).

Other nonsurgical treatments for interstitial cystitis have been reported, but evidence of their effectiveness is scant. Cyclosporine, an immunosuppressive drug, in an uncontrolled, nonblinded study of 2.5–5 mg/kg daily for 3–6 months followed by maintenance doses of 1.5–3 mg/kg daily, resulted in improvement in ten of 11 patients.[72] Symptoms recurred when cyclosporine was discontinued. L-arginine, 1.5 g daily for 6 months, resulted in improvement in urinary frequency and pain in an uncontrolled, nonblinded study of ten women with interstitial cystitis.[73] Nifedipine, in an open trial of ten women with interstitial cystitis, resulted in improvement in eight, with complete resolution of symptoms in three.[74] Antihistamines, such as hydroxyzine, have been used with anecdotal success. In an uncontrolled, nonblinded study of hydroxyzine, 37 of 40 women had improvement in symptoms, with an average decrease of about 35% in urinary frequency and pain scores.[75] Tricyclic antidepressants, particularly amitriptyline, are frequently used to treat interstitial cystitis. Uncontrolled, nonblinded studies suggest improvement in 65–90% of those able to tolerate amitriptyline at doses of 25–75 mg daily at bedtime.[76]

Based on clinical observations, the mainstay of urological treatment of interstitial cystitis for more than 50 years has been hydrodistension of the bladder.[77] This procedure can be performed at the time of diagnostic cystoscopy if general or spinal anesthesia is used. It is too painful to be done without anesthesia.

Neurolytic surgery via laser destruction of the vesicoureteric plexus has been reported, with some degree of success,[78] but these have been uncontrolled studies with limited follow-up and require further confirmation before this procedure is widely used. Presacral neurectomy has a limited role, if any, in surgical treatment. Up to a third of patients have improvement with presacral neurectomy, but in those with relief it appears to be temporary.[79]

CONCLUSION

Chronic pelvic pain is a serious problem. Women who suffer from chronic pelvic pain are a heterogeneous group, and the possible diagnoses and contributing factors are varied and numerous. Diagnosis and treatment can be complex, and the goals of treatment must be realistic. Sometimes these consist only of treatment of one or more specific diseases, such as endometriosis and irritable bowel syndrome, but often must include treatment of pain itself as a diagnosis. Although chronic pain may be difficult for the clinician and her patient to accept as a diagnosis, it is an important concept in the care of chronic pelvic pain. It allows the use of pain-directed therapies that, albeit not curative, permit the patient to progress toward a more normal life that is not dominated by pain. It also breaks the traditional hold of the Cartesian model of pain, so that if no organic lesion is found that leads to a cure, the patient is not led to believe that her pain is not real. Finally, it offers hope that with future research the psychoneurological dysfunctions responsible for chronic pelvic pain may be identified, leading to definitive, curative treatments.

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