

Sexual Dysfunction, Part II: Diagnosis, Management, And Prognosis

John G. Halvorsen, M.D., M.S., and Michael E. Metz, Ph.D.

Abstract: *Background:* Sexual problems are common but infrequently diagnosed. They are classified into four major categories: (1) sexual desire disorders, (2) sexual arousal disorders, (3) orgasmic disorders, and (4) sexual pain disorders.

Methods: MEDLINE files from 1966 to the present were searched using the specific sexual dysfunctions as key words along with the general key word "sexual dysfunction" to review the published literature.

Additional articles came from the reference lists of dysfunction-specific reviews.

Results and Conclusions: The key to diagnosis often rests on the physician's willingness to raise the issue with patients. A rational protocol can be followed to identify causative organic and psychogenic factors using the psychosexual and medical history, a comprehensive physical examination, psychological assessment instruments, laboratory tests, and special procedures.

Current psychological treatment includes one or more of the following components: sensate focus exercises, cognitive-behavioral therapy, relaxation training, hypnosis and guided imagery, and group therapies. Specific techniques, such as directed self-stimulation, the stop-start and squeeze techniques, the sexological examination, systematic desensitization, and Kegel exercises, are added therapy when appropriate. Marital therapy to improve communication and resolve conflict is also part of standard therapy.

Medical management can include pharmacologic agents to correct endocrine dysfunctions or to alter the progression of the sexual response. Surgical management can involve arterial revascularization, venous ligation, and penile implants. A noninvasive vacuum constriction device is also used to treat erectile disorders.

The long-term prognosis of the sexual dysfunctions varies with the type of disorder and its causes. Generally good results (80 to 95 percent satisfaction) are obtained when treating vaginismus, dyspareunia, male erectile disorders, and female orgasmic dysfunctions. Long-term results are modestly successful (40 to 80 percent) when treating inhibited male orgasm and premature ejaculation. Long-term success is poorest at present for treating sexual desire disorders. (J Am Board Fam Pract 1992; 5:177-92.)

Sexual problems are common. According to the literature summarized in Part I of this review,¹ 75 percent of all women and 50 percent of all men will experience sexual difficulties. Sexual dysfunctions are present in one-half of all marriages and in 75 percent of couples who seek marital therapy. Yet, although common, sexual dysfunctions are infrequently recorded by primary care physicians when diagnostic encounter lists or patient charts are reviewed. Many sexual problems remain hidden; therefore, primary care physicians need to search for them in their patients. Once dis-

covered, physicians must know how to approach these problems diagnostically, evaluating them thoroughly by history, physical examination, and laboratory testing. Furthermore, physicians must know how to initiate management for those problems they can treat and how to request timely and appropriate consultation and referral from other professionals for those problems that are beyond their expertise or interest.

Part II of this review focuses on diagnosis and management. It provides information that can increase both the physician's comfort and competence in addressing patient's sexual concerns and in helping them to enjoy sexual health.

Diagnosis

General Sexual History

Physicians do not regularly ask about sexual concerns.² Patients also do not often initiate discus-

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From the Department of Family Practice and Community Health, University of Minnesota, Minneapolis. Address reprint requests to John G. Halvorsen, M.D., M.S., University of Minnesota, 3-100 Phillips-Wangensteen Building, 516 Delaware Street S.E., Box 381 UMHC, Minneapolis, MN 55455.

sions about their sexual problems.³ Only 23 percent of men and 56 percent of women report that they themselves will raise sexual concerns with their physicians. Both men and women, however, are grateful when their physicians do initiate the discussion, and they are willing to discuss their sexual problems.^{4,5} In primary care many sexual concerns are masked as psychosomatic complaints, and only 10 percent of men and women with chronic illness will initiate requests for help from their physicians for a sexual problem.⁶ It is apparent, therefore, that an important step in treating sexual problems is the physician-initiated discussion.

Once a problem is identified, the diagnostic process for evaluating sexual complaints begins by taking a thorough medical history, carefully pursuing symptoms with questions to distinguish, develop, and clarify diagnostic hypotheses.

Talking about their personal sexual concerns is a new experience for most adults. Many talk "about sex" in the third person, but few discuss their own sexuality and behavior; therefore, nesting specific sexual topics within the patient's other relationship or personal medical concerns offers a comfortable context within which to talk specifically about sex.

Physicians can pursue five levels of questioning as they collect the sexual history. These levels of

inquiry turn the patient's attention specifically to sexual issues. Every patient can be asked a general sexual history question, such as, "What concerns do you have about sexual matters?" or "How has your illness affected your sex life?" The basic sex history incorporates specific sex questions during health maintenance evaluations as part of the routine database, often inserting these questions into the urogenital or gynecologic system review. The brief history focuses upon patient-specific sexual concerns and evaluates each as a chief complaint with appropriate symptom pursuit (onset, chronicity, severity, what the patient believes is causing the problem, and whether the problem is primary or secondary, absolute or situational, total or partial). The detailed sex history focuses upon a thorough understanding of the sexual problem, exploring those areas illustrated in Table 1. Providing sexual education also can be an important method of sexual inquiry. Some physicians regularly offer patients brief sexual information appropriate to routine clinic problems (e.g., health maintenance examination, birth control, genitourinary problems) as opportunities present themselves. For example, a request for birth control can lead to a discussion about safer sex practice; a urologic evaluation can lead to discussions about normal male sexual physiology.

Table 1. Detailed Sexual History Outline.

History of the present problem

Date and mode of onset, duration, situational context, exacerbations and remissions, effect of any attempted management, presence of any associated symptoms in other body systems

Current sexual interaction

Frequency of intercourse or sex play, frequency both partners would prefer, time of day of lovemaking, presence of fatigue during lovemaking, difficulties with privacy, verbal and nonverbal communication of desires, types and pleurability of sex play that precedes intercourse, level of arousal during intercourse, frequency of orgasm, cognitive activities that occur during sex (thoughts, visualizations, fantasies), pain during intercourse, type of contraception, paraphilias

Sexual history

Early experiences, response to puberty, emotional reactions, attitudes toward sexuality, level of sexual knowledge, frequency and types of past sexual practices, acceptance of cultural myths, development of current sexual relationships, masturbatory practices and fantasies, homosexual experiences, history of negative sexual experiences (e.g., multiple relationship rejections, incest, sexual assault), body image, physical sexual development

Family history

Family attitudes toward sexuality, parental modeling, religious influences, relationships with parents and siblings, family violence, level of family function in the couple's families of origin

Marital history

Development and stability of current relationship, changes in feelings toward partner, presence of unresolved conflict, loss of trust or fidelity, problems with communication (e.g., failure to listen and understand, hidden agendas, use of sex for power in the relationship)

Current stressors

Intrafamilial stresses (e.g., death, illness, problems with children), extrafamilial stresses (e.g., financial, occupational, legal), stresses and strains normally associated with family life cycle stages

Medical history

Acute or chronic illness, injuries, surgery, medications, habits, drug or alcohol use, complete review of systems

When a problem is identified, sensitive discussion about treatment is important and should usually involve the sexual partner, because all sexual concerns are ultimately relationship concerns. Inviting the patient to include the partner when a sexual problem is identified helps to gain the partner's perspective and begins the initial therapeutic process of reframing the problem. Helping to reframe the problem by reassuring the couple that sexual concerns are common and treatable immediately begins to unburden the couple and orients them toward the future and relief.

A more specific psychosexual history for each dysfunction focuses on identifying those causative factors discussed in Part I as dysfunction-specific.

General Medical History

The general medical history begins by comprehensively pursuing the patient's sexual concerns with detailed questioning. Then the patient's sexual, developmental, family, marital, and psychological histories are evaluated. Finally, a comprehensive evaluation includes a complete medical history and comprehensive systems review to identify any acute or chronic illnesses, injuries, surgery, pharmacologic agents (Table 1, Part I), or chemical abuse that could affect sexual functioning, considering the organic factors discussed as pathophysiologic (Part I) for each specific sexual dysfunction.

Psychological Measures and Questionnaires

For physicians, the most important assessment tool is the semistructured interview. Impressions of the patient from first-hand interviewing are essential. Psychological measures can support the interview by helping to confirm diagnostic impressions and to monitor therapy. Most can be administered and scored in the office by trained clinic staff, reimbursed by third-party payors, and interpreted easily. Four types of instruments are commonly used: those that assess individual factors (e.g., personality type, psychopathology, anxiety, and depression),⁷⁻¹⁴ couple relationship factors,¹⁵⁻¹⁷ sexuality dimensions,¹⁸⁻²² and family functioning.²³⁻²⁵

General Physical Examination

A comprehensive general physical examination helps to diagnose any acute or chronic illness that

might cause a sexual dysfunction and to identify associated physical conditions that might affect sexual functioning or influence treatment for a diagnosed dysfunction. Certain physical findings that are associated with previously discussed organic conditions underlying each dysfunction deserve special diagnostic attention.

Dysfunction-Specific Physical Examination

Sexual Desire Disorder

The physician should examine both men and women for physical signs of chronic systemic illness, the presence of visible disfiguring problems, and endocrine dysfunction (e.g., diabetes mellitus or thyroid, adrenal, or pituitary disease). The presence of secondary sex characteristics should be sought in both sexes, including the presence or absence of pubic and axillary hair. Men should be evaluated for testicular atrophy, castration, structural penile lesions, and gynecomastia. Galactorrhea should be sought in women, as well as physical findings consistent with early pregnancy.

Sexual Arousal Disorder

Physical findings associated with cardiovascular and neurologic disease should be sought in both men and women. These findings can be associated with generalized disease as well as disease affecting only the genital system. Cardiovascular findings include bruits (especially femoral), decreased peripheral pulses, evidence of venous stasis or arterial insufficiency in the lower extremities, and a pulsatile abdominal mass. General neurologic findings include abnormalities in gait, coordination, motor strength, and deep tendon reflexes, as well as the presence of pathologic reflexes. The physician should also search for physical findings associated with pituitary, adrenal, and thyroid disease.

For men who have arousal disorders, additional specific evaluation is necessary. The genital system needs to be thoroughly evaluated for testicular size and consistency; penile size; structural abnormalities or lesions (such as the plaques of Peyronie disease); signs of infection in the urethra, prostate, or epididymis; and surgical scars that relate to previous surgery on the nervous system, the vascular system (e.g., aortic aneurysm, aortofemoral bypass), or genital and pelvic structures (e.g., prostate or bladder surgery).

The neurologic examination in men should focus on the sacral dermatomes. The integrity of the sacral reflex arc (S-2 through S-4) is assessed by evaluating perineal sensation, anal sphincter tone, and the bulbocavernosus reflex.

Penile blood pressure as a special test for any man with erectile dysfunction deserves special mention.²⁶⁻²⁸ The measurement is obtained by placing a 3-cm pediatric blood pressure cuff around the base of the penis and auscultating the central artery of the corpora cavernosa with a 9.5-MHz Doppler stethoscope. The cuff is inflated past the point at which the pulse can no longer be heard before it is slowly deflated. The pressure at which the arterial pulse is first heard is the penile systolic pressure. The ratio between the penile systolic pressure and the brachial systolic pressure (the penile-brachial index or PBI) should be > 0.75 . If it is < 0.6 , significant penile vascular insufficiency likely exists.

Orgasm Disorders

No common organic causes of inhibited orgasm other than pharmacologic agents have been identified in men or women. Premature ejaculation is rarely associated with an organic disorder. The physical examination should focus on identifying signs of localized genitourinary infection or inflammation and signs of either generalized neurologic disease or localized sensory deficits.

Sexual Pain Disorders

The physical examination in men with dyspareunia should focus on signs of genitourinary infections (e.g., urethritis, prostatitis, seminal vesiculitis, cystitis, tuberculosis, elephantiasis, orchitis), penile lesions (e.g., Peyronie disease, condylomata, priapism, urethral stricture), and prior genitourinary trauma (e.g., pelvic fracture, urethral rupture, penile surgery).

A detailed pelvic examination is important in women. During the external genital examination the physician should search for adduction of the thighs when vaginal examination is attempted, evidence of genital tract infection (e.g., herpetic lesions, condylomata, discharge), episiotomy or other scars, signs of vulvar inflammation, clitoral inflammation or adhesions, and dermatitis. The introitus is specifically examined for spasm of the vaginal sphincter, fourchette irritation, hymenal abnormalities, urethral carbuncle, and Bartholin

gland inflammation. On vaginal examination, the physician looks for atrophy, discharge, inflammation, stenosis, specific lesions on the vagina or cervix, relaxation of supporting ligaments, tenderness along the vaginal urethra or posterior bladder wall, and inadequate lubrication. The uterus is evaluated for signs of endometriosis, adnexal mass, and pelvic inflammatory disease, as well as uterine position, size, mobility, and tenderness. Rectal disease should also be considered, with the physician specifically looking for signs of hemorrhoids, proctitis, constipation, or fissure.

Laboratory Screening for Systemic Disease

The laboratory and procedural evaluation for sexual dysfunction falls into two categories: (1) those tests used to diagnose a systemic disease that can produce sexual dysfunction as a complication, and (2) those tests and procedures specific for diagnosing the dysfunction itself. The laboratory evaluation is most helpful in evaluating sexual desire disorders, male erectile dysfunction, and dyspareunia.

Baseline studies used to diagnose a systemic disease that can produce sexual dysfunction as a complication include a complete blood count, fasting blood glucose, urinalysis, tests for sexually transmitted disease, and profiles to evaluate lipids and thyroid, liver, and renal functions.

Dysfunction-Specific Laboratory Tests and Special Procedures

Sexual Desire Disorders

Determining serum testosterone levels is recommended for men presenting with sexual desire disorders. If levels are low or borderline, or if the symptoms of chronic or low libido are associated with little or no history of masturbation, follicle-stimulating hormone (FSH), leutinizing hormone (LH), and serum prolactin determinations are recommended to help differentiate between primary and secondary (pituitary-hypothalamic) testicular failure.²⁹⁻³² When hypogonadotropic hypogonadism is found, the sella turcica is evaluated for a pituitary tumor with computed tomography or magnetic resonance imaging.

Sexual Arousal Disorders

Better techniques for measuring nocturnal vaginal blood flow have been used to show that vaginal engorgement cycles in women take place dur-

ing rapid eye movement (REM) sleep with the same frequency that erectile cycles occur in men.^{33,34} To date, the only clearly successful clinical use of monitoring nocturnal vaginal blood flow has been to show that postmenopausal women presenting with vaginal atrophy, sexual inhibition, and dyspareunia lack basal levels of vaginal capillary blood flow and oxygen and that these women do not reach the level of engorgement that control women do during arousal.³⁵ Estrogen replacement therapy reverses all these findings.

Male erectile dysfunction has been extensively studied, and many tests and procedures are available for evaluation. Serum testosterone levels should be measured to screen for hypogonadism, and if the level is low, the same protocol should be followed that is discussed above for men with sexual desire disorders.

In normal men, three or four erections occur each night during REM sleep. These can be measured using nocturnal penile tumescence monitors.^{26-30,36,37} The diagnostic usefulness of nocturnal penile tumescence monitoring is based on the assumption that sleep eliminates the psychological factors that impede erectile function during wakefulness, allowing one to gauge the integrity of a man's physiologic capability. Organic interference should persist during sleep and therefore inhibit the number and duration of erections. Nocturnal penile tumescence monitors use mercury strain gauges attached to the penis and connected to a plethysmograph. They measure only circumferential change in the penis. Because rigidity is also important, some investigators also use a specially designed tonometer to measure the amount of force that is required to "buckle" the erect penis.

The snap gauge,^{28-30,38,39} a band that is placed around the base of the penis before sleep, is another device designed to evaluate erections. Breaking the band during sleep purportedly indicates normal nocturnal penile tumescence and thus psychogenic impotence. The gauge is simpler and less costly than nocturnal penile tumescence monitoring, but if the man has only one brief nocturnal erection (an abnormal pattern), the torn gauge will lead to a false-negative diagnosis. Furthermore, in the absence of recording REM sleep, during which nocturnal penile tu-

mescence occurs, failure to break the ring is not interpretable.

Studies of the penile arteries with a real-time 10-MHz duplex scanner and pulsed 4.5-MHz range-gated Doppler subsystems permit simultaneous imaging and flow measurements of the cavernous arteries.^{26,29,40} The diameter of the cavernous artery in the flaccid penis is compared with measurements obtained 1, 3, and 5 minutes after injecting papaverine, a vasodilator. Normal arteries should double in diameter after injection. An abnormal response indicates the need for further study to confirm whether atherosclerosis is the cause of erectile failure.

Men who have clinical and noninvasive findings that suggest vascular impotence and who are potential candidates for vascular surgery may benefit from selective internal pudendal arteriograms to determine whether the vascular block could be corrected by penile revascularization.^{26,27,41-43} With manometric and angiographic evaluation following intracavernosal injection of a papaverine-phentolamine mixture, defects in the venoocclusive cavernosal mechanism can be recognized.^{26,44,45} If the internal valve mechanism in the vein fails, egress of blood will limit the maximal internal pressure, and it will be impossible to obtain or maintain a rigid penis.

Objective neurologic information is obtained with a bulbocavernosus reflex latency test.^{27,46,47} In this evaluation, the glans penis is stimulated by a pinch or squeeze, and electromyographic needles in the bulbocavernosus muscle record muscle contraction. The length of time from stimulation to muscle contraction is calculated. Longer latency times suggest a neurologic cause for the impotence. Somatosensory-evoked-potential testing is another objective assessment of the complete pudendal nerve pathway.⁴⁸ This procedure documents the wave forms that are recorded over the sacrum and the cerebral cortex in response to dorsal penile nerve stimulation. Neurologic lesions can then be localized to peripheral, sacral, or suprasacral locations.

Both papaverine and phentolamine are vasodilators that cause an erection when they are injected into the corpora cavernosa.⁴⁹⁻⁵² These agents can be used to measure vessel dilation, maximum rigidity, volume changes, and duration of full rigidity. The injection can help to differentiate between purely arterial and mixed arteriove-

nous impotence and to grade severity. If a man develops an erection within 10 minutes after an injection of 30 mg of papaverine and if his erection is sustained for more than 30 minutes, a major vasculogenic cause for the impotence is unlikely.

After the history and physical examination are completed, the first step in staging the impotence evaluation is usually a nocturnal penile tumescence study. If nocturnal penile tumescence monitoring shows no erections, then the organic evaluation proceeds along one of several pathways, depending on the likely underlying condition(s) discovered during the initial evaluation. If the man has signs and symptoms of vascular disease and his PBI is < 0.6 , then an intracavernosal injection study is appropriate. If he has an inadequate response to the injection, then referral for additional vascular study (e.g., duplex ultrasonography, cavernosmetry, cavernosgraphy, or selective pudendal arteriography) is warranted. If signs or symptoms of neurologic disease are found, somatosensory-evoked potentials and sacral latency testing are indicated. When signs and symptoms of endocrine disease are suspected, a serum testosterone level is obtained, and if the level is low, the prolactin levels and serum gonadotropin levels (FSH, LH) are evaluated.

Sexual Pain Disorders

The laboratory evaluation for dyspareunia is guided by the data collected during clinical evaluation and is directed at confirming associated organic factors. The evaluation can include a saline and potassium hydroxide "wet mount" of vaginal secretions to diagnose vaginitis; a urinalysis and urine culture to diagnose associated urinary tract infection; tests to diagnose chlamydial, herpes simplex, and gonococcal infections; pelvic ultrasonography to assess adnexal, uterine, or cul-de-sac abnormalities; laparoscopy to identify, and in some cases treat, adnexal or intraperitoneal conditions; and anoscopy or sigmoidoscopy to identify associated colorectal problems.

Management

PLISSIT⁵³ is an easily recalled acronym that reminds physicians of their different therapeutic roles with patients. Permission giving (P) is a general level of attention to patient care around sexual issues. It entails asking about sexual con-

cerns, conducting the sexual history, and offering basic sexual information. All physicians, even those not specifically skilled in sexual medicine, can encourage patients to discuss sex, accept patients' sexual concerns, and make appropriate referral. At the limited information (LI) level, physicians give normalizing information to reassure patients regarding a specific concern. Specific suggestion (SS) means offering options for managing a specific concern. Intensive therapy (IT) refers to providing professional sexual, marital, and psychological therapy. Few primary care physicians are prepared to provide intensive psychotherapy, but referring for this type of treatment is an important physician skill. Table 2 outlines the therapeutic tasks and corresponding therapeutic roles that Leif⁵⁴ has suggested physicians can play according to this model.

Another model that family physicians can use to define their role with patients who experience sexual dysfunctions is an adaptation of the Levels of Involvement model that Doherty and Baird⁵⁵ originally proposed for physician involvement with families. Physicians can relate at one of five levels to patients who have a sexual dysfunction.

Level 1 is a baseline level. It focuses only on case finding. Physicians functioning at this level ask the initial sexual history question, but then refer to another professional for further evaluation and treatment. All physicians can provide level 1 involvement.

At level 2, physicians go beyond the initial question to collect the basic sexual history during routine health maintenance examinations. They also provide basic education to patients about normal anatomy, physiology, and sexual functioning. When sexual concerns are brought to their attention, they obtain a brief history of the problem, which includes the chief complaint with appropriate symptom pursuit. In addition, they perform a directed physical examination. If treatment involves more than simple reassurance or basic sex education, they refer the patient to another professional.

Level 3 involvement commits physicians to more comprehensive evaluation. At this level, physicians obtain a detailed sexual history (Table 1), which includes both the psychosocial and the medical history. Physicians also perform a comprehensive physical examination and conduct the

Table 2. Managing Sexual Problems Following the PLISSIT Model.*

Sex Problem	Patient Need	Therapeutic Tasks	Therapeutic Physician Role
Unknown	Understanding	Offer personal acceptance, empathy, listening (permission)	Evaluator and listener
Sexual ignorance	Sexual knowledge	Provide accurate information, follow-up (limited information)	Sex educator
Sexual discomfort or dysfunction	Comfortable sexual functioning	Treat organic factors, reduce discomfort or dysfunction, make direct treatment suggestions (specific suggestions)	Sex counselor
Sex problem with relationship conflict	Assistance managing conflict that leads to sexual dysfunction	Review, restore bonding; suggest specific marital, sexual behaviors; follow-up (specific suggestions)	Marital therapist
Sex problem with psychological conflict	Explore psychological conflicts and related interpersonal conflicts	Correlate psychological conflict with sex problem for perspective and resolution (intensive therapy)	Psychotherapist
All of the above	Comfortable use of newly learned sex knowledge, attitudes, and skills	Recognize hierarchy of patient needs (intensive therapy)	Sex therapist

*Adapted from Leif HI. Sexual problems in clinical practice. Monroe, WI: American Medical Association, 1981.

organic evaluation with appropriate laboratory tests and procedures.

Levels 4 and 5 move beyond evaluation into treatment for a defined dysfunction. At level 4, physicians treat any organic problem that is identified or coordinate care with another physician if a special procedure, such as a penile implant, is required. The family physician can continue to provide psychological support, but refers the psychosexual therapy to another professional. Physicians who function at level 5 are capable of comprehensively managing both organic and psychosexual treatment.

Most family physicians operate at levels 2 and 3. Some who have a special interest in the sexual dysfunctions operate at level 4, and a few who have had advanced training in sexual medicine or family therapy function at level 5.

General Medical Treatment

General medical treatment is directed toward managing those organic conditions that could contribute to almost all sexual dysfunctions. Any existing chronic systemic disease must be comprehensively managed. Diabetes should be meticulously controlled, thyroid dysfunctions corrected, pharmacologic therapies altered, and bad habits involving chemical abuse, poor nutrition, and inadequate rest and exercise eliminated.

General Psychosexual Treatment

Psychological sex therapy is warranted in all but the most simple sex problems. In the medical

management of organic sexual problems, sex therapy can help patients adjust to any adverse impact on their normal sexuality caused by physical limitations, as well as develop alternative ways to achieve sexual satisfaction (e.g., manual pleasuring when intercourse is precluded). For psychogenic sexual dysfunction, psychosexual therapy offers reasonably effective treatment.

All legitimate contemporary sexual therapies are influenced by certain basic treatment principles and approaches. The central principle undergirding most current sex therapy is the principle of "responsibility for self." Partners are commonly enlisted to provide therapeutic support and to deal with relationship issues, but each patient is encouraged to claim actively his or her own sexuality. Another basic principle is that sex therapy at some point must incorporate behavioral change so that growth in sexual attitudes, performance, or feelings can occur. The principle of positive sexual attitudes acknowledges every patient's right to sexual health. It incorporates such basic tenets as the body and sexuality are good, patients have a right to know about their sexuality, and sexuality is a natural physiological and psychological process. Training in physiological relaxation is a primary goal of treatment. Adequate and satisfying sexual performance depends on physical relaxation as the foundation for more natural physiological and psychological sexual excitement. A final principle is that the boundaries between sexual and nonsexual aspects of the dysfunction need clarification. This principle es-

establishes that sex warrants its own focus. Sex will not automatically improve when other problems are resolved, even though such nonsexual factors as career stress or marital problems must also be addressed.

Classic sex therapy is rooted in a physiological model of sexual responsivity that is founded on the Masters and Johnson sexual response model (Figure 1, Part I).¹ Psychological therapies attempt to remove individual and interpersonal impediments to the natural physiological response. Standard sex therapy interventions slow down the physiological response, isolate specific phases or stages of the cycle, remove impediments that block responsivity, and teach comfort with natural physical responses. Major components of current sex therapy include the following:

Sensate focus and relaxation training. The original behavioral tasks developed by Masters and Johnson are called "sensate focus."⁵⁶ These tasks invite patients to focus on their own bodily sensations as a technique to induce relaxation, increase pleasure, and overcome whatever barriers may impede the natural physiological response of healthy sexual functioning. Relaxation training that focuses on deep muscle relaxation, biofeedback, hypnotic relaxation, and relaxation through medication is also a part of standard sex therapy. Relaxation training occurs automatically during the sensate focus exercises and other homework assignments that teach patients consciously to relax by focusing upon their bodies.

Dual-sex therapy. Masters and Johnson's original treatment model was distinguished by mandating that a male-female cotherapy team work with couples. This model is effective, but similar results are also obtained with other methods.^{57,58} The dual-sex model acknowledges that men and women differ in their experiences and roles and establishes the importance of fairness and balance. Few centers currently utilize dual treatment teams, however, except in specialized treatment, such as group therapy, or in specific situations, such as the failure of earlier treatment.

Cognitive-behavioral therapy. The treatment of choice for managing most sexual problems is cognitive-behavioral therapy.^{56,59} Graduated sexual exercises are performed in privacy and then discussed in treatment sessions. Developing brief cognitive interventions, such as "positive relabeling" or "cognitive restructuring," enhances treat-

ment and recognizes the important role that negative conditioning and self-defeating thoughts serve to cause or maintain sexual dysfunction.

Hypnosis and guided imagery. Hypnosis has been used successfully to treat premature ejaculation,⁶⁰ erectile dysfunction,^{61,62} hypoactive sexual desire,⁶³ and orgasmic dysfunction.^{60,61,64} Treatment can involve direct suggestion, regressive hypnosis to alleviate sexual inhibition or trauma, guided imagery of successful performance, or basic relaxation imagery.⁶³

Group therapies. Group formats for treating specific male or female sexual dysfunctions⁶⁵⁻⁶⁷ or for managing conjoint sexual dysfunctions^{68,69} encompass the standard cognitive-behavioral interventions and add the powerful process of "normalization" by the group. Couples realize that they are not alone and find support from others to complete treatment. The sexual anxiety and shame so common in those with sexual dysfunction are readily ameliorated in a group format. Group treatment is often the treatment of choice for managing paraphilic behavior, sexual compulsivity, abuse recovery, and sex-identity dysphoria.

Communications training. Communications training that focuses on the direct discussion of specific sexual feelings and desires is another standard feature of sex therapy. Direct discussion decreases feelings of shame, guilt, or embarrassment about sex, helps patients clarify their own feelings and those of their partners, and establishes a communication process for discussing sexual problems in the future. Because sexual intimacy and marital intimacy are inextricably united, brief marital therapy is also an essential component of competent sex therapy. It can alleviate nonsexual contributing factors and relieve the detrimental side effects that the sexual problem might produce for the marriage.

Adjunctive therapies. Sexual attitude reassessment workshops,⁷⁰ college-level sex education courses, body-image workshops, massage training, and even physical exercise classes (e.g., aerobics) are useful educational resources. Bibliotherapy, utilizing self-help sexual treatment books, such as Friday's *My Secret Garden*, Zilbergeld's *Male Sexuality*, or Heiman's *Becoming Orgasmic*, is another common adjunct to sex therapy. Because of continuing misinformation among many adults, even books on basic anatomy and physiology are helpful.

Integrated therapies. Comprehensive sex therapy integrates individual, group, conjoint, pharmacologic, and medical therapies. For example, a man with erectile dysfunction secondary to venous incompetence might deal with the organic dysfunction and its emotional sequelae during individual sessions to identify his feelings about the dysfunction and to consider medical management or a surgical procedure. Conjoint sessions or a couples' group can help the couple adapt to sex relationship changes.

In ideal settings, the physician manages the sexual problem in association with a competent sex therapist to ensure that all the dimensions of the sexual problem are comprehensively addressed. If physicians do not know of a sex therapist with whom they can consult, they can contact the Society of the Scientific Study of Sex (SSSS); the American Association for Sex Education, Counseling, and Therapy (ASSET); or the Society for Sex Therapy and Research (SSTAR). These are professional organizations that credential sex therapists.

Dysfunction-Specific Treatment

Sexual Desire Disorders and Sexual Arousal Disorders

Testosterone does not benefit men with normal serum levels. In fact, in impotent men with normal serum levels, testosterone can compound the problem by increasing sexual desire without increasing performance. Testosterone therapy is indicated in hypogonadal men whose testosterone values are < 3.5 nmol/L (1 ng/mL). Oral doses of 5 to 20 mg daily of methyltestosterone or fluoxymesterone have been used, although intramuscular injections of 100 mg of testosterone cypionate every 7 to 14 days appear to be more effective. Double-blind studies have also shown that androgens profoundly influence sexual behavior in women,^{71,72} and they have been used to treat women with inadequate sexual desire. The benefit of using androgens in women, however, must be weighed against their virilizing side effects. Oral doses of 2.5 mg daily or 5.0 mg Monday through Friday of methyltestosterone or fluoxymesterone or parenteral doses of 50 to 100 mg of testosterone enanthate monthly have been used.

Bromocriptine mesylate (Parlodel™) is used to treat hyperprolactinemia.²⁸ Doses start with 1.25 mg daily and increase by 1.25 mg every 3 to 7 days

until the serum prolactin level is normal. The usual treatment dose is between 5.0 and 7.5 mg daily.

Yohimbine is an A₂ adrenoceptor antagonist that theoretically enhances penile erections by restricting penile venous outflow and increasing libido through a central nervous system effect.⁷³⁻⁷⁶ It is used in doses of 6 mg orally three times daily. To date there are few double-blind placebo-controlled studies that document its efficacy.

Self-injection of papaverine and phentolamine, alone or in combination, into the corpora is used both to diagnose erectile dysfunctions and to treat them.^{27-29,52,76-79} Although not officially approved indications for these drugs, neurogenic impotence, mild vasculogenic disease, and combined neurogenic and vascular disorders, such as diabetes, have been treated, and selected patients with psychogenic impotence who have failed conventional psychological treatment have been managed particularly successfully by injecting these drugs intracavernosally.

Papaverine is used in doses of 10 to 30 mg and phentolamine in doses of 0.5 to 1.0 mg. A mixture of 25 mg of papaverine and 0.8 mg of phentolamine per milliliter in doses of 0.1 to 1.5 mL is also effective. Patients with neurogenic impotence usually require smaller doses than those with vasculogenic or psychogenic disorders. An initial therapeutic dose of 5 to 10 mg of papaverine or 0.1 to 0.2 mL of the mixture is increased in increments of 2.5 mg of papaverine or 0.2 mL of the mixture until the patient experiences an adequate erection that lasts from 1 to 2 hours.

Complications to date are primarily local (hematoma, cavernositis, fibrosis, and priapism) except for a small number of patients who report orthostatic hypotension. Erections that last more than 4 hours should be reversed by irrigating the corpora cavernosa with diluted phenylephrine.

Several versions of a penile suction pump have also been designed to aid erections. By applying negative external pressure to the penis, the suction pump allows blood to enter the corpora and produce an erection that is maintained by an elastic band around the base of the penis.^{26,80,81} Reported short-term complications include skin petechiae, ecchymoses, and swelling. The results of long-term follow-up have not yet been reported.

Arterial revascularization procedures are appropriate for some men with impotence caused by vascular occlusive disease.⁸²⁻⁹⁰ Successful surgery for proximal arterial occlusion (endarterectomy, transluminal balloon angioplasty, and graft placement) reportedly improves blood flow through the hypogastric vessels. Success depends on whether the distal vessels are free of disease and can accept the increased flow and whether the surgery results in damage to the autonomic nerves that course over the vessels. Many methods have been devised to revascularize the corpora when distal vessels (internal pudendal and penile arteries) are occluded. These methods include end-to-side anastomosis of artery to the corpora, direct anastomosis to the dorsal or deep cavernous artery, and anastomosis of the epigastric artery to the dorsal vein with ligation of the vein's distal end, thus forming a direct retrograde connection to the corporal spaces.

Abnormal venous drainage that causes erectile dysfunction has also been approached surgically.⁹⁰⁻⁹³ Procedures vary depending on where the venous incompetence occurs. If a shunt is found from the corpus to the deep dorsal vein, treatment consists of ligating the vein, any accessory veins, and all the circumflex and emissary veins that join the dorsal vein, thus providing added resistance to venous outflow.

The penile prosthesis currently remains the most reliable surgical option for treating organic impotence.^{76,94,95} Three types of prosthesis are available: semirigid, intermediate-type, and inflatable. Semirigid devices consist of paired, semiflexible silicone rods that occupy the entire length of the corpora cavernosa. They are available in two diameters and in several lengths. Implantation is simple, and the incidence of mechanical failure is low. The rods, however, do not increase in length or girth, and concealment can be a problem. Intermediate-type devices have two hydraulically powered self-contained inflatable cylinders that can be inflated to rigidity and then deflated. Implantation is again simple, and the incidence of mechanical failure is low. The cylinders also do not increase in girth, and detumescence is incomplete. Inflatable prostheses consist of inflatable cylinders that fit into the corpora, a reservoir that is implanted near the bladder, and an inflation-deflation pump that is placed into the scrotum. Implantation is more demanding, and

the rate of surgical and device-related complications has been higher than with the semirigid devices. These prostheses provide a more natural flaccid appearance, however, and they also allow the penis to increase in girth during erection.

The choice among available treatment modalities for a man with erectile dysfunction is influenced by the nature of the problem. For psychological impotence that is not responding to psychological therapy, either a trial of yohimbine or the suction device should precede intracavernosal injections or considerations for a penile implant. For mild arterial insufficiency, the same protocol would follow, with the exception that in some men vascular surgery will be chosen to bypass an isolated lesion before an implant is inserted. Severe vascular insufficiency is best managed with a penile implant. A trial with the suction device or intracavernosal injections is warranted before considering venous surgery or an implant in managing venous incompetence. Neurogenic impotence responds quite favorably to intracavernosal injections and the suction device. These methods should be attempted before resorting to a prosthesis. Finally, endocrine abnormalities should be corrected with appropriate doses of testosterone and bromocriptine before other treatment modalities are considered.

The most effective treatment to date for primary arousal and orgasmic dysfunction in women is sex therapy coupled with a process of directed self-stimulation.^{30,65,96-98} Treatment incorporates a progressive series of steps that starts with sexual attitude assessment and education in basic sexual anatomy and physiology. Then the woman progresses in sequence to visual and tactile self-exploration, manual or vibrator self-stimulation, fantasy development when orgasm is experienced, sensate focus exercises alone and then with a partner, and finally sharing effective stimulation techniques with her partner. Directed self-stimulation is used in individual therapy, as well as in women's and couples' groups.

The vaginal sexological examination⁹⁹ conducted by the physician is a special technique that helps treat women with arousal and orgasmic dysfunction by assisting them and their partners to identify specific areas of the external genitalia and vagina that are erotically sensitive. The examination is performed with the sexual partner present and with the patient's signed consent. It begins

with a standard pelvic examination, after which the physician systematically explores the vagina from the posterior vaginal wall toward the lateral and anterior aspects of the vaginal canal with light pressure applied to all vaginal surfaces. The woman concentrates on her sensations and verbalizes her sensory feelings during stimulation of various areas of the vagina. Once the woman identifies an erotically sensitive area, stimulation is continued long enough to allow her to experience the sensations but only long enough to reach the early arousal phase. When the physician's examination is completed, the partner then explores the woman's vagina, and under her instruction proceeds with similar stimulation so that he can also identify her erotically sensitive areas and experience success with helping her become aroused.

Incidental to treating women for urinary stress incontinence, Kegel¹⁰⁰ found a correlation between perivaginal muscular development and the presence or absence of sexual satisfaction. This finding led him to suspect that sexual feeling in the vagina is closely related to muscle tone and, therefore, to create exercises to strengthen the pubococcygeal muscles. Conditioning these muscles has enhanced female sexual arousal and facilitated orgasmic release.¹⁰¹ Kegel exercises are often used in therapy for preorgasmic women and more recently have been adapted to help men overcome premature ejaculation and psychogenic erectile dysfunction.

Orgasm Disorders

Inhibited male and female orgasm is treated with psychosexual measures. The vaginal sexual examination, a program of directed self-stimulation, and the Kegel exercises just discussed have all been useful in helping women with orgasmic disorders.

Some pharmacologic agents can be helpful in treating men with premature ejaculation. Tricyclic antidepressants can be effective in treating premature ejaculation,¹⁰²⁻¹⁰⁴ presumably by inhibiting the cholinergic component of ejaculation. A low initial dose (e.g., 25 mg of amitriptyline) is taken 3 to 5 hours prior to sexual activity and then progressively increased until the man achieves ejaculatory control, experiences side effects, or reaches maximal doses. Thioridazine has also been advocated for treating premature ejacu-

lation.¹⁰³⁻¹⁰⁵ It is the most potent anticholinergic and α -adrenergic blocking agent in its class and presumably delays ejaculation through these effects. Doses again start at 10 to 25 mg and increase until either control, side effects, or maximal doses are reached. Phenoxybenzamine is an α -adrenergic blocking agent that delays erection and ejaculation with minimal side effects.^{105,106} It is recommended for temporary use in men who experience premature ejaculation but who do not wish to procreate (phenoxybenzamine also impairs fertility by abolishing the peristalsis of the vas deferens, the seminal vesicles, and the ejaculatory ducts that discharge semen into the urethra). Daily dosages of 20 to 30 mg are usually employed.

The stop-start technique of Semans¹⁰⁷ and the squeeze technique modification of Masters and Johnson are special therapeutic techniques used to treat premature ejaculation. The squeeze technique is frequently used in individual therapy to verify for the man that he has the capacity for ejaculatory control. During self-pleasuring homework exercises, as the man approaches orgasm, he squeezes his penis firmly under the corona of the glans between the thumb and fingers to inhibit the ejaculatory reflex. This technique has fallen out of use in couples' therapy in which the woman administers the squeeze because it commonly fails to control the problem long term. Failure is attributed to the fact that by teaching the woman to apply the squeeze, it paradoxically suggests that the control is hers rather than the man's. The stop-start technique requires the couple to stimulate and stop arousal through a progressive series of exercises that teach the man to focus on his own arousal sensations, learning to recognize those that are premonitory to orgasm. By learning to recognize these sensations, he learns to control his ejaculatory response.

Sessions begin with the couple embracing and caressing until the man's penis is erect. Then he lies on his back and the woman stimulates his penis as he concentrates on the arousal sensations he is experiencing. Just before he feels the urge to ejaculate he tells his partner to stop stimulation. When arousal sensations wane, the process of stimulation and stopping starts again and is repeated several times before ejaculation is permitted.

A variation on the Kegel technique in which the man is taught to relax the pubococcygeal mus-

cles while experiencing sexual arousal is very effective when used in conjunction with the stop-start technique. This technique capitalizes on the natural ejaculatory inhibiting effect of relaxing these muscles that are involved in ejaculation.

After four or five successful external stimulation sessions, the couple tries the start-stop process with the penis in the vagina. The woman assumes the superior position and the man relaxes the pubococcygeal muscles, gliding her slowly up and down the shaft of his penis. When he feels that ejaculation is imminent, he stops moving his partner, still focusing on relaxing the pubococcygeal muscles, until the need subsides. This process is also repeated several times before ejaculation is permitted. When control is achieved with this level of stimulation, the couple repeats the process first with vaginal thrusting and then with penile thrusting. The couple is then encouraged to complete a stop-start sequence at least weekly, trying different positions, until they are able to use it automatically during intercourse.

Sexual Pain Disorders

If any of the organic problems previously discussed have been identified in the course of evaluation as a cause of pain, they should be treated before proceeding with sexual therapy techniques. These techniques can then be used to help the woman experience sexual relationships as pleasurable once causes of pain have been removed.

Both psychologically based dyspareunia and vaginismus can be treated by systematic desensitization.^{108,109} The process starts with basic education in anatomy and psychosomatic physiology. Then under the woman's control, using a "bear down and pull in" technique while doing the Kegel exercises, she progressively learns to accept the examiner's finger, her own finger, her partner's finger, and finally her partner's penis. Systematic desensitization techniques, alone or in conjunction with other modalities, such as relaxation training, have also been used successfully to treat premature ejaculation,^{110,111} inhibited orgasm,^{110,112-114} inhibited excitement,^{110,113,115,116} hypoactive sexual desire, and sexual aversion.^{114,117}

Prognosis

The few published outcome studies available indicate that sexual desire disorders for both men

and women resist sustained behavioral change.¹¹⁸

The prognosis is better if the problem is secondary rather than primary, the symptoms are less than 1 year in duration, the marital relationship is stable, the partners are emotionally calm, both partners see each other as loving and attractive, both partners find pleasure in sexual behavior, and the couple properly complies with homework assignments during therapy.¹¹⁹

The natural history of untreated orgasmic disorders in women is unknown. Women with primary orgasmic dysfunction respond rapidly to treatment with a high success rate when therapy is focused specifically on sexual matters. Women with secondary dysfunction do better when traditional marital therapy is combined with sexual therapy. Masters and Johnson have reported success rates of 83 percent for primary dysfunction and 77 percent for secondary dysfunction using dual-sex therapy.⁵⁶ Reported success rates for directed self-stimulation as treatment for primary dysfunction range from 80 to 100 percent.³⁰ The natural history and prognosis of male erectile disorders depend on many variables, with the underlying problem most significant. In men who have a psychogenic problem treated with standard sex therapy techniques, improvement is generally estimated at 50 to 90 percent. The prognosis for surgical methods depends on the extent of the underlying disease and patient selection. With any of the prostheses, patient-partner satisfaction rates range from 85 to 95 percent.⁴⁵ The level of satisfaction is influenced by the amount of care taken in arriving at the decision for implantation and how well the partner accepts the prosthesis. Success rates for intracavernosal injections are similar to those of the prostheses.⁷⁹

Outcome studies on treatment for inhibited male orgasm are limited because this problem was previously considered relatively rare. Recent evidence suggests that it is more common than previously thought.⁴ Treatment success rates of 46 to 82 percent are reported.¹²⁰

Masters and Johnson have reported immediate post-treatment success rates of 95 percent¹²¹ for premature ejaculation. Others have reported more modest rates around 60 percent.¹²²⁻¹²⁴ Long-term success rates, however, are disappointing. DeAmicus and colleagues¹¹⁸ found that by 3 years post-treatment in one group of pa-

tients, frequency and desire for sexual contact had regressed and duration of intercourse and marital satisfaction had dropped to pretreatment levels. More systemic, conjoint treatment could offer better long-term results.

The prognosis for dyspareunia varies considerably, depending on the nature of any associated organic problems and the success of medical or surgical management. In those cases with a purely psychogenic cause, success rates range around 95 percent.¹²⁵ Vaginismus is also very amenable to treatment. In one group of patients studied for 4 years, sexual functioning was achieved and maintained in 95 percent.¹²⁶ Successful outcomes were associated with a desire for childbearing, a husband-initiated consultation, and a couple's perception that the problem was psychogenic. Unsuccessful outcomes were associated with a perception that the problem was organic, previous experience with an anatomic problem, abundant sexual misinformation, extensive sexual knowledge deficiency, a negative attitude toward genitalia, fear of sexually transmitted disease, and negative parental attitudes toward sex.¹²⁶

Summary

Sexual problems are common in primary care and definitely within the scope of the family physician's practice. Following the standard process of physical diagnosis that is the family physician's stock-in-trade, a diagnostic and therapeutic approach for each sexual dysfunction can be tailored to meet each family physician's level of interest and expertise. As family physicians incorporate sexual medicine into their practices, matter-of-factly discussing sexual concerns and offering help with management, they will be surprised at their patients' gratitude for caring for their whole person. Patients need to be reassured that they have a right to sexual health, as well as a right to physical, emotional, and spiritual health.

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