Concise Review for Clinicians

Understanding Women’s Sexual Health: A Case-Based Approach

Mary L. Marnach, MD, and Petra M. Casey, MD

On completion of this article, you should be able to: (1) describe the cyclic model of female sexual response, (2) define female sexual dysfunction, and (3) describe the multidisciplinary approach to the evaluation and management of patients with sexual concerns.

Female sexual dysfunction is complex and its management challenging. In this review, we discuss female sexual response and the definitions of female sexual disorders. Evidence-based strategies for the evaluation and multidisciplinary treatment of female sexual dysfunction are presented in a case-oriented manner applicable to everyday clinical practice.


BSO = bilateral salpingo-oophorectomy; FDA = Food and Drug Administration

Sexual dysfunction in women, as in men, is more common than one would expect. Laumann et al. reported that 31% of men and 43% of women in the United States aged 18 to 59 years had sexual concerns. For women, these included lack of sexual interest and/or pleasure, inability to achieve orgasm, and pain with sexual activity. Similarly, a global study of sexual attitudes and behaviors in 27,000 men and women showed sexual difficulties to be common in mature adults worldwide. Further, Dennerstein et al. showed that 42% of women in early menopause report sexual issues. By the time women are a decade into menopause, this figure increases to 80%. Sexual frequency decreases with aging in both sexes but remains important to the well-being of many men and women.

Discussing sexual issues with patients is challenging because of time constraints and limited formal training in human sexuality and sexual dysfunction. As women become more comfortable in seeking help for their sexual concerns, clinicians need to develop the skills necessary to discuss this important aspect of human well-being and to offer comprehensive evaluation and management strategies. This review discusses the scope of the female sexual response, systematically defines areas of dysfunction, and offers evidence-based strategies for the evaluation and treatment of female sexual dysfunction in a case-oriented manner applicable to clinical practice.

Female Sexual Response Models

Beginning in the 1950s, through extensive study of the physiology and psychology of human sexuality, Masters and Johnson, along with Kaplan, defined the human sexual response. They developed the linear sexual response model for men and women with sequential stages of desire, arousal, orgasm, and resolution. More recently, Basson, together with her colleagues, developed the cyclic biopsychosocial model of female sexual response, which allows for physical, emotional, and cognitive feedback and applies to women in established relationships. As they age, women often report that emotional closeness with a partner may be their primary reason for sexual intimacy. This response begins from a sexually neutral state, progresses to sexual arousal, and is followed by sexual desire. If the outcome is positive, both emotionally and physically, subsequent sexual motivation may be increased.

Scope of Female Sexual Dysfunction

Women’s sexual dysfunction is complex and multifactorial and encompasses physical and emotional well-being across the lifespan. As young women form relationships, experience childbirth, and raise children, their sexuality evolves. With aging, chronic medical conditions, cancer, surgery, physical disability, medications, and hormonal fluctuations need to be considered in relation to sexual function. Anxiety, depression, and a history of sexual, physical, or emotional abuse, as well as the medical therapies used for these problems, can profoundly affect a woman’s sexuality. For example, 30% to 60% of men and women have 1 or more sexual symptoms while using selective serotonin reuptake inhibitor antidepressants. Health issues in partners can lead to intimacy concerns for the couple. Separation, divorce, or death can leave people without sexual partners. Sociocultural influences, conflict with religious beliefs or family values, and quality of sexual education shape our
attitudes toward sexuality. Further, early sexual experiences and relationships, whether positive or negative, define our sexuality in adulthood.

**FEMALE SEXUAL DYSFUNCTION DEFINED**

The 2000 American Foundation of Urologic Disease International Committee reviewed and expanded the definitions of female sexual disorders to include 4 major domains. In the most common domain, feelings of sexual interest or desire are absent or diminished beyond the normal lessening seen with increasing age and relationship duration. The second domain is a subjective and/or genital arousal disorder. Women report absent or diminished feelings of sexual excitement or pleasure from any type of sexual stimulation. Genital arousal may be absent or impaired, and vulvovaginal sensation and/or vaginal lubrication may be minimal. The third domain includes a diminished intensity of orgasmic sensation, a marked delay of orgasm from any kind of stimulation, or complete absence of orgasm. The final domain includes sexual pain encompassing dyspareunia, vaginismus, and/or noncoital sexual pain. Of note, most women who present with sexual concerns have more than 1 disorder at a given time. Further, unless a woman experiences personal distress related to 1 or more sexual disorders, she is not considered to have sexual dysfunction. Her partner, however, may experience distress related to difficulty with the couple’s sexual intimacy; sexual dysfunction would then exist between them.

**A MULTIDISCIPLINARY APPROACH TO MANAGEMENT**

The complexity of sexual dysfunction in women lends itself to a multidisciplinary approach, one that draws on the expertise of specialists in both physical and mental health. The medical aspects of sexual disorders can be evaluated and treated by appropriately trained clinicians. Concurrently, the psychological components deserve attention from a psychologist and/or licensed sex therapist who can address previous sexual education and experiences; relationship issues; psychological comorbidities, such as anxiety and depression; and a patient’s current coping mechanisms. The 3 cases that follow exemplify the medical and psychological aspects of female sexual dysfunction and highlight this collaborative approach.

**CASE 1**

**Description.** A 64-year-old woman (gravida 1, para 1) who had undergone a total abdominal hysterectomy/bilateral salpingo-oophorectomy (BSO) at age 52 years for menorrhagia presented with a 1-year history of worsening vaginal dryness and inability to have intercourse. She had stopped systemic hormonal therapy 1 year before presentation. She reported decreased sexual desire due to vaginal dryness and a sensation of “tearing” at the introitus with attempted vaginal penetration. She denied vaginal discharge, bleeding, or odor. The patient described her 43-year marriage as excellent and hoped to regain sexual intimacy with her husband. The patient had a history of hypertension and hyperlipidemia, both stable with medication. She had been successfully losing weight through an exercise and diet regimen to improve her glucose intolerance.

On examination, the patient had moderate vaginismus, defined as involuntary tightening of the muscles of the pelvic floor or distal one-third of the vagina. She could tolerate a narrow speculum and was able to insert a small number 4 acrylic vaginal dilator without difficulty. Her introitus and vaginal mucosa were dry, thin, and mildly erythematous with smooth vaginal walls typical of vaginal atrophy (physiological changes seen with menopause).

After a discussion of her dyspareunia, vaginismus, atrophic vaginitis, and sexual intimacy issues, the patient began localized estrogen (17-B estradiol tablets intravaginally and 17-B estradiol cream to the introitus) to improve vaginal elasticity. She also used progressively larger vaginal dilators. When seen 3 months later, she had moved from the number 4 to number 10 dilator without difficulty. She used each size dilator for 1 to 2 weeks (10-15 minutes daily) before advancing to the next size. She and her partner have resumed intercourse, and both are pleased with having regained sexual intimacy. Her sexual desire, arousal, and orgasmic function have improved.

**Discussion.** Symptoms of atrophic vaginitis affect 10% to 40% of postmenopausal women and include vaginal dryness, vulvovaginal irritation, itching, and dyspareunia. Treatment for atrophic vaginitis may include hormone-free vaginal moisturizers. These polycarbofilm-based bioadhesive polymers bind to the vaginal epithelium, release purified water, and produce a moist film over the vaginal tissues. Vaginal moisturizers may be used every few days. Personal lubricants can be used concurrently for intercourse. Most lubricants are water-based and contain glycerin; glycerin-free or silicone-based lubricants are also available. For some women, vaginal moisturizers and personal lubricants alone may control symptoms.

Many women with moderate to severe symptoms of atrophic vaginitis benefit from low-dose systemic estrogen or vaginal estrogen. Vaginal estrogen is available in formulations approved by the Food and Drug Administration (FDA) and is associated with fewer adverse effects than systemic estrogen. Vaginal estrogen may be administered...
by a silastic ring (Estring; Pharmacia/Pfizer, New York, NY) that delivers 6 to 9 µg of 17-B estradiol to the vagina daily.

The ring is replaced every 3 months and should not be confused with a vaginal ring that releases systemic doses of estradiol (50-100 µg daily) for genital atrophy and other vasomotor symptoms (Femring; Warner Chilcott, Rockaway, NJ). The latter should be used with progesterone in women who have not undergone hysterectomy. A low-dose tablet containing 25 µg of 17-B estradiol is available and is generally inserted nightly for 2 weeks and then on 2 nonconsecutive nights per week (Vagifem; NovoNordisk, Brogardsvej, Denmark). Vaginal creams include conjugated estrogen cream (Premarin; Wyeth/Ayerst, Madison, NJ), which can be given at 0.5 g or 0.3 mg (one-fourth of an applicator) nightly for 2 to 3 weeks followed by twice weekly administration. Another 17-B estradiol cream (Estrace; Warner Chilcott, Rockaway, NJ) can also be given by vaginal applicator at a low dose of 50 µg or 0.5 g (one-eighth of an applicator). Long-term low-dose intravaginal estrogen improves vaginal cytology and symptoms without significantly altering serum estradiol or estrone levels or stimulating endometrial proliferation. Thus, progesterone is generally not indicated for women with an intact uterus who use low-dose vaginal estrogen alone. Systemic estrogen via patch, gel, or tablet may be used in conjunction with vaginal estrogen for vasomotor symptoms or other indications.

Survivors of breast cancer pose a unique challenge in management of symptomatic atrophic vaginitis. Systemic estrogen is generally not recommended, and minimal data exist about low-dose vaginal estrogen use. Therapy should be individualized, balancing a patient’s quality of life against her recurrence risk. If a woman has a history of breast cancer, her oncologist should be consulted regarding the use of any estrogen. Vaginismus may be alleviated by the use of graduated dilators, often in conjunction with pelvic floor and vaginal relaxation exercises taught by a physical therapist.

**Case 2**

**Description.** A 26-year-old woman (gravida 1, para 1) presented with a 2-year history of insertional dyspareunia and decreased libido. The symptoms had begun after a normal spontaneous vaginal delivery over a second-degree midline perineal laceration. Her obstetrician/gynecologist surgically revised her episiotomy 6 months after childbirth. She had undergone corticosteroid/lidocaine injections to the vulvar vestibule, had applied topical xylocaine to the area, and had taken 50 mg of amitriptyline at bedtime orally for 2 months—all without success. Her 3-year marriage had been affected by her reluctance to engage in intercourse.

On examination, the patient had marked erythema and tenderness on cotton-swab mapping of the posterior vestibule, consistent with vestibulodynia or vestibulitis. She tolerated insertion of a narrow speculum. Her vaginal mucosa appeared normal. She had marked tenderness over the pelvic floor bilaterally, consistent with pelvic floor tension myalgia.

Given the patient’s previous therapies, vestibulectomy was offered and performed by an experienced gynecological surgeon. The patient noted a 90% improvement in her pain. Postoperatively, a physical therapist taught her pelvic floor relaxation and retraining exercises. She met with a sex therapist to discuss resumption of sexual intimacy with her husband.

**Discussion.** Vestibulodynia, formerly known as vulvar vestibitis, refers to localized, severe pain on vestibular touch or attempted vaginal entry. Its hallmark, focal pain in the vestibule for at least 3 to 6 months, differentiates it from vulvodynia, which is characterized by diffuse vulvar pain. Vestibulodynia is defined as tenderness to light touch with a cotton swab. Physical findings are often limited to vestibular erythema.

Primary vestibulodynia begins with sexual activity or insertion of a tampon or vaginal speculum. A patient with secondary vestibulodynia develops symptoms after comfortable sexual relations, tampon use, or speculum examinations. Patients may also experience urinary frequency and/or urethral or bladder burning and report frequent urinary tract infections with negative findings on cultures. Irritable bowel syndrome, fibromyalgia, migraines, depression, chronic fatigue syndrome, temporomandibular joint syndrome, and endometriosis are frequently associated with vestibulodynia. The diagnosis is based on history and physical examination findings. Medical therapy is focused on the elimination of triggers, such as vulvovaginal candidiasis, underlying dermatosis, or vulvar irritants. Patients should avoid scented products, dyes, chemicals, and daily minipad use. They should wear loose, breathable cotton clothing. Nonirritating lubricants for intercourse, along with warm baths or ice to the vulva, may be helpful. Topical 5% xylocaine to the vestibule may provide temporary relief before intercourse. Oral tricyclic antidepressants, serial injections of methylprednisolone and lidocaine, and vulvar injections of interferon and botulinum toxin have been explored, with mixed results. Vestibulectomy, the excision of a full-thickness, horseshoe-shaped area involving the vestibule, has shown a success rate of 60% to 90% in experienced hands. Postoperative sex therapy combined with vestibulectomy improves outcome compared with surgery alone.

Pelvic floor tension myalgia occurs in 50% of women with vestibulodynia. This condition, now also called hyper-
active pelvic floor syndrome, was initially described as myofascial pain or myalgia involving the levator ani muscles.\textsuperscript{21,22} Progressively increasing hypertonicity of the pelvic floor musculature may be related to anxiety, vulvar dermatoses, and infection. Patients often present with low back and leg pain, a “heavy feeling in the pelvis,” painful bowel movements, constipation, coccygeal pain, and dyspareunia. Aggravating factors include sitting or standing for long periods, tension, physical activity, and intercourse. Analgesics, muscle relaxants, and tricyclic antidepressants may be helpful, as may rest in the supine position, relaxation, and warm/hot baths. Physical therapists play a key role in teaching patients relaxation, retraining exercises for the pelvic floor, biofeedback, dilator therapy, and myofascial release of the levator ani muscles.

Because this couple had once enjoyed a mutually satisfying sexual relationship, the patient’s current pain and consequent avoidance of intercourse were problematic. Fortunately, the patient’s previous positive experiences and continued sexual desire provided an excellent sexual self-image. After surgery, the patient found relaxation and pelvic floor retraining exercises helpful. She also saw a sex therapist, who discussed nondemand sexual pleasuring and reinitiation of intercourse after physical therapy.

**CASE 3**

**Description.** A 49-year-old woman (gravida 5, para 3) presented with a 3-year history of decreased sexual desire, arousal, and orgasmic function. She had undergone a hysterectomy with BSO for endometrial hyperplasia 5 years previously. For 2 years after surgery, the patient had taken combination oral esterified estrogen and testosterone to control vasomotor symptoms. She then switched to her current therapy of conjugated estrogen alone. Her husband of 23 years was experiencing erectile dysfunction. The patient’s overall health was excellent, and findings on physical examination were unremarkable other than mild vaginal atrophy.

The patient met with a sex therapist/psychologist to review her psychosexual history, explore the couple’s adaptations to changes in their sexual and physical function, and focus on her avoidance of intimacy. At the same time, her husband was encouraged to consider treatment for erectile dysfunction. Sexual flexibility and exploration were encouraged as a means to enhance the couple’s intimacy. The patient’s hormonal therapy was changed from oral to replacement and laboratory monitoring.

**Discussion.** The patient’s prior BSO may be a factor in her sexual issues. Women’s serum testosterone levels decrease by half from their 20s to their 40s with a slow but steady decline thereafter to the end of life.\textsuperscript{23} When a woman, whether premenopausal or postmenopausal, undergoes BSO, her serum testosterone level further decreases by half.\textsuperscript{24}

Several studies have examined the use of testosterone patches in women. The patches release 300 µg daily and are well tolerated. They have been shown to increase sexual frequency and well-being and decrease distress regarding sexual function. The patches have been used in women receiving estrogen replacement therapy with goal serum testosterone levels at the upper limit of or slightly above the normal range.\textsuperscript{25-27} In a review of 176 studies, short-term use (up to 2 years) of exogenous testosterone in women was reported to be safe.\textsuperscript{28} The major adverse effects are hirsutism and acne. Cardiovascular risk does not appear to increase, with the exception of a lowering of high-density lipoprotein cholesterol noted with oral testosterone therapy. Data on endometrial safety are limited, and most of the experimental data support a neutral or beneficial effect in regard to breast cancer. No increased risk of hepatotoxicity, neurobehavioral abnormalities, or sleep apnea with physiological treatment doses of testosterone has been reported.

Experts disagree about when to make the diagnosis of androgen insufficiency and whether to use testosterone in women. The 2002 Princeton consensus guidelines on androgen insufficiency concluded that androgens positively affect cognition, mood, energy, sexual function, bone density, muscle mass/strength, and general well-being.\textsuperscript{29} The diagnosis of androgen insufficiency may be made after ovarian or adrenal failure, with hypopituitarism, or with medications that suppress ovarian or adrenal function. In contrast, The Endocrine Society cautioned against the generalized use of testosterone in women until long-term safety data can be established.\textsuperscript{30} The North American Menopause Society acknowledges that testosterone supplementation may have a positive effect on sexual desire, arousal, and orgasm after spontaneous or surgical menopause.\textsuperscript{31} Data are inconclusive regarding the use of testosterone to increase bone density, reduce vasomotor symptoms, increase lean body mass, or improve well-being. Testosterone use is contraindicated in women with a history of estrogen-dependent malignancies or with cardiac or liver disease. To prevent supraphysiologic testosterone levels, transdermal routes are preferred along with estrogen replacement and laboratory monitoring.

This patient is an appropriate candidate for a 6-month trial of transdermal testosterone, available as a compounded cream or as a prescription testosterone gel or cream, using one-tenth the dosage of that prescribed for a man. The testosterone patch designed for women (Intrinsa; Proctor & Gamble; available in Europe) has not been ap-
proved by the FDA for use in the United States. The patient should be counseled that testosterone supplementation in women has not been approved by the FDA for sexual dysfunction. Serum total and free testosterone levels, liver function tests, and lipid measurements should be obtained 3 months after therapy initiation, 3 months after any dosage adjustments, and then at least yearly. After a 6-month trial with serum levels in the upper range of normal for a woman, therapy effectiveness should be reassessed and discontinued if sexual symptoms have not substantially improved. Transdermal estrogen should be used with testosterone supplementation. Oral estrogens increase levels of sex hormone–binding globulins, which bind free testosteron, making testosterone less available to the tissues. Transdermal estrogens increase levels of sex hormone–binding globulins to a lesser degree.

Testosterone is a pregnancy category X drug and should not be used during pregnancy or in a woman who may become pregnant.

CONCLUSION

These cases show various challenges in the multidisciplinary evaluation and treatment of women with sexual concerns. The evidence-based approach includes the use of the Basson cyclic model for review of normal female sexual response. The 4 domains of sexual dysfunction, involving desire, arousal, orgasm, and pain, can be used as an overall classification, if one acknowledges that many women have several coexisting issues. A disorder does not exist in the absence of considerable distress on the part of the patient or her partner.

REFERENCES

CME Questions About Women’s Sexual Health

1. Which **one** of the following is the **best** definition of female sexual dysfunction?
   a. Decreased libido
   b. Decreased genital arousal
   c. Inability to achieve orgasm with previous ability to do so
   d. New-onset dyspareunia and vaginismus
   e. Personal distress related to the presence of 1 or more of the 4 major sexual domains

2. Which **one** of the following statements about the Basson model of sexual response in women is **false**?
   a. It allows for physical, emotional, and cognitive feedback
   b. It is a linear model of female sexual response
   c. It acknowledges that emotional closeness with a partner may be a woman’s primary reason for sexual intimacy
   d. It posits that sexual response often begins from a sexually neutral state for women in long-term relationships
   e. It suggests that a positive sexual experience may increase a woman’s subsequent sexual motivation

3. Which **one** of the following tests is the **most helpful** for the diagnosis of vestibulodynia?
   a. Papanicolaou smear
   b. Colposcopy of the vestibule
   c. Culture of the introitus
   d. Cotton swab mapping of the vestibule
   e. Biopsy of the vestibule

4. In which **one** of the following groups of women does The North American Menopause Society suggest that a trial of transdermal testosterone may be **appropriate**?
   a. Women in surgical or natural menopause with sexual dysfunction
   b. Young women taking oral birth control pills and experiencing decreased libido
   c. Women taking selective serotonin reuptake inhibitors who cannot achieve orgasm
   d. Premenopausal women with sexual dysfunction
   e. Women whose partners are taking agents for erectile dysfunction

5. In women, which **one** of the following is **not** positively affected by androgen therapy?
   a. Cognition
   b. Mood and energy
   c. Weight loss
   d. Bone density
   e. Sexual function

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