

## Original article



## Sexual health and wellbeing and the menopause: An EMAS clinical guide

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## ABSTRACT

**Introduction:** Sexual health and wellbeing are significant aspects of quality of life. However, taking a sexual history is often avoided in medical practice, leaving a void in management and awareness. As the menopause can have a major impact on sexual health, it is imperative that healthcare providers are appropriately trained in sexual health and wellbeing and the aligned disciplines in order to achieve optimal care.

**Aim:** To provide an evidence-based clinical guide for the assessment and management of sexual problems at the menopause and beyond.

**Materials and methods:** Review of the literature and consensus of expert opinion.

**Results and conclusion:** The assessment of sexual problems includes history taking, examination and laboratory investigation (if indicated), and occasionally the use of specific validated questionnaires. Management of sexual problems requires a multidimensional approach using biopsychosocial measures. Medical management and psychosexual counselling include pharmacological and non-pharmacological interventions, and sex therapy and psychoeducation. Furthermore, perimenopausal women should be advised about the need for contraception if they wish to avoid pregnancy. Also, sexually transmitted diseases can be acquired at any age. To conclude, taking a sexual history should be incorporated into medical practice and healthcare providers should be appropriately trained to assess and manage sexual problems at the menopause and beyond.

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## 1. Introduction

The menopause is a natural stage of the life cycle which occurs in all women. The average age of menopause is 51 years. However, it can occur earlier, either naturally or as a consequence of disease, surgery, radiotherapy, or chemotherapy. Increased life expectancy means that women may be sexually active for decades after the menopause [1,2]. Thus, women seeking advice about sexual problems may be in assisted living, nursing homes or other long-term care environments if they are unable to live independently. It is often incorrectly assumed that age and non-independent living environments preclude sexual activity.

Sexual health is defined by the World Health Organization as a state of physical, emotional, mental, and social wellbeing in relation to sexuality [3]. Management of sexual problems after the menopause is challenging. Concerns may not be disclosed by women and reluctantly raised by healthcare professionals [4]. This may lead to difficulty in communication. There may also be institutional barriers such as lack of training, policy development and practice guidance, and wider social barriers in relation to how care services respond to and support women, and how sexual and gender diversity intersect with ethnicity, culture, disability, and ageism [5].

Sexual problems may be chronic, even life-long conditions, but can emerge after previous normal functioning. They may be associated with pain and personal distress. Problems can stem from disorders in one or more phases of the sexual response cycle: desire, arousal, and orgasm [6,7]. Concerns can be situational or generalized. Sexual problems may also be an indicator of underlying illness, a sign of deteriorating relationships, concerns about ageing, or a drug-induced reaction. All can interact with issues of dependency and safeguarding, as well as menopause.

Sexual problems affect wellbeing and quality of life [8]. Menopausal symptoms may compromise sexual health and wellbeing. The genitourinary syndrome of menopause (GSM) is one of the most common causes of sexual dysfunction in postmenopausal women [9]. GSM itself has been associated with depression, anxiety, and reduced quality of life. Several studies have shown a decline in sexual activity and an increase in sexual disorders with ageing [10–12]. Most of them conclude that sexual function worsens with advancing menopause status, even after adjustment for age [13]. The US PRESIDE study, with a sample of 31,581 women, the most extensive study on female sexual dysfunction (FSD), concluded that the most common sexual dysfunctions are low desire (38.7 %), followed by low arousal (26.1 %) and orgasm disorders (20.5 %) [14].

The aim of this EMAS clinical guide is to provide guidance on the assessment, diagnosis, and management of sexual problems at the menopause and during later life for women in both different- and same-sex relationships. Management of sexual problems in trans and gender-nonconforming people is not covered in this clinical guide [15].

## 2. Classification and terminology

Different nomenclatures for and classifications of sexual problems have been produced by various organizations [6,16]:

- the American Psychiatric Association (DSM-5) [17]
- the International Society for the Study of Women's Sexual Health (ISSWSH) [18]
- the World Health Organization (International Classification of Diseases (ICD)) [19]

Although all relate to desire, arousal, orgasm and pain, there are differences between the classifications. Thus, the American Psychiatric Association has three main categories: (a) sexual interest/arousal disorders (hypoactive sexual desire disorder, female sexual arousal disorder), (b) orgasm disorders, and (c) sexual pain disorders. The ISSWSH has four: (a) hypoactive sexual desire disorder (HSDD), (b) female sexual

arousal disorder (FSAD), (c) genito-pelvic dysesthesia (GPD), and (d) female orgasm disorder. In the World Health Organization's ICD-11, there are four main groupings of sexual dysfunctions: sexual desire and arousal dysfunctions; orgasmic dysfunctions; ejaculatory dysfunctions; and other specified sexual dysfunctions. There is a separate grouping of sexual pain disorders [19]. According to DSM-5, the diagnosis of sexual problems requires a 6-month duration of symptoms along with significant personal distress. Disorders may co-exist, and one may cause the other.

## 3. Etiology of sexual dysfunction

The etiology of sexual dysfunction at the menopause is multidimensional and includes the fall in estrogen levels, gynecological disorders, non-gynecological comorbidities, and psychosocial factors, such as childhood and current sexual abuse.

### 3.1. Menopause

Menopause is defined as the permanent end of menstruation due to oocyte depletion and leads to a significant drop in estrogen levels [20]. The mean age at menopause varies worldwide, with a range of 46–52 years. In 10 % of women, it occurs before the age of 45 years and is defined as early menopause, while in 1 % of cases, menopause occurs before the age of 40 years, a condition called premature ovarian insufficiency (POI) [21,22]. Menopause can be either natural or induced (surgical removal of the ovaries or medical ablation of ovarian function with chemotherapy, radiotherapy, etc.) [23]. Several sexual problems can arise, such as reduced sexual desire, vaginal dryness and dyspareunia, and reduced arousal and orgasm [24]. They may be exacerbated by vasomotor symptoms such as hot flushes and night sweats. Although systemic or topical menopausal hormone therapy (MHT) alleviates symptoms, it does not eliminate them in all women.

While androgen levels also decline with age in all women, surgical menopause will lead to an abrupt and more profound fall [25]. Although an association between androgens and sexual function has been reported in several studies, the evidence remains inconsistent [26].

**Genitourinary syndrome of menopause (GSM)** affects 50–70 % of postmenopausal women and has a severe impact on sexual function [27]. Postmenopausal estrogen deficiency leads to urogenital atrophy and symptoms of irritation, burning, itching, and sexual pain during vaginal penetration. Vaginal dryness and dyspareunia are crucial factors that can alter sexual wellbeing [28,29]. Lower urinary tract symptoms may also have adverse effects. They include urinary urgency, frequency, nocturia, incontinence, and a feeling of incomplete emptying or a sensation of a lump in the vagina [30]. The intensity of the other menopausal symptoms (hot flushes, night sweats, sleep disturbances, cognitive dysfunction) is another critical factor that contributes to sexual dysfunction [31]. Unlike hot flushes, which usually improve within ten years, symptoms of GSM are lifelong and often progressive [32].

### 3.2. Gynecological disorders

**Vulvar pain and vulvodynia** are two conditions which can adversely affect sexual function. Terminology and classification was changed in 2015 by the three leading societies in vulvar pain [International Society for the Vulvovaginal Disease (ISSVD), International Society for the Study of Women's Sexual Health (ISSWSH), and International Pelvic Pain Society (IPPS)] to incorporate the complex presentation and pathophysiology of these clinical entities [33]. Vulvar pain is caused by a specific disorder (infectious, inflammatory, neoplastic, neurologic, traumatic, iatrogenic, or hormonal deficiencies), while vulvodynia is defined as vulvar discomfort of at least a three-month duration without an identifiable cause [34]. The potential causes of vulvodynia include other pain syndromes (e.g., fibromyalgia), musculoskeletal factors (e.g., pelvic muscle overactivity), psychosocial factors (e.g., mood disorders,

interpersonal dysfunction), genetic factors, and anatomical defects.

**Gynecological cancer** (i.e., of the ovary, cervix, uterus, vagina) and **breast cancer** may have detrimental effects on sexual activity and intimacy, while the management of sexual dysfunction among the growing number of women with or who have had these cancers is challenging. In women who are taking anti-estrogenic therapies, such as aromatase inhibitors, estrogen-based therapies are contraindicated as first-line treatments [35]. The treatment of gynecological cancers may include hysterectomy with or without salpingo-oophorectomy, radiotherapy, and chemotherapy, and such treatment leads to ovarian impairment and premature or early menopause [36]. A significant decrease in sexual desire and activity has been reported in ovarian cancer survivors [37]. The first-line agents in survivors of estrogen receptor-positive breast cancer are non-hormonal preparations [38]. Surgery for gynecological cancer may reduce sexual desire and arousal through impaired self-image and/or nerve or vascular injury. Breast cancer survivors complain about poor sexual function, pain during vaginal penetration, and low sexual interest [39]. BRCA mutation carriers undergoing risk-reducing bilateral salpingo-oophorectomy (RRBSO) may develop sexual dysfunction; depression and anxiety are primary precipitating factors. Sexuality must be considered by a multidisciplinary team as an integral part of treatment to improve the quality of life of breast cancer survivors. MHT can improve both their physical and their mental symptoms [40].

**Other cancers.** The diagnosis, with the attendant psychological burden, and treatments of other cancers may also affect sexual wellbeing [41]. Chemotherapy and pelvic irradiation may lead to vaginal dryness and dyspareunia. Stomas may affect body image and lead to depression [42]. Women with colorectal cancer may have reduced sexual desire that persists for many years after the completion of treatment [43].

**Pelvic organ prolapse (POP)** is a gynecological condition in which the pelvic organs herniate into the vagina due to ligament or muscular weakness. POP is subcategorized according to the compartment of descent. Cystocele characterizes anterior wall herniation, rectocele refers to posterior vaginal wall descent, and vaginal vault prolapse characterizes descent of the uterus, cervix, or apex of the vagina [44]. The condition is common after the menopause and can lead to discomfort, pelvic pain, dyspareunia, and urinary incontinence or urgency [45]. It can also lead to fecal incontinence and flatulence.

**Vaginal stenosis** is an important cause of sexual dysfunction and is usually caused by either pelvic or vaginal radiation therapy (RT), inflammatory vulvovaginal conditions or surgery for the treatment of an underlying malignancy. It is accompanied by sexual pain during vaginal penetration and vaginal discomfort. Vaginal dilator therapy with or without pelvic floor physical therapy is commonly required [46].

**Endometriosis.** Despite the common belief that endometriosis exclusively affects women of reproductive age, it may persist or develop beyond menopause [47]. Chronic pelvic pain and dyspareunia are the clinical symptoms which most commonly impair sexual wellbeing in women with endometriosis; the severity of symptoms, though, becomes milder in postmenopausal women [48]. Laparoscopic treatment of the lesions may improve sexual function [49].

### 3.3. Non-gynecological comorbidities

Sexual dysfunction at the menopause can be the result of non-gynecological comorbidities, such as type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), cognitive or neurological disorders (e.g. dementia or multiple sclerosis), and non-gynecological cancers [50–52].

**Diabetes.** Sexual problems can be either an early sign of diabetes or a consequence of its vascular complications [53]. Loss of libido as well as problems with orgasm, lubrication, arousal, and pain have been reported in women with type 1 diabetes [54]. Depression and urinary symptoms may play a role [55].

**Cardiovascular disease.** Women with CVD and low risk of cardiovascular complications can resume sexual activity after evaluation by

their healthcare provider [56]. According to the American Heart Association's scientific statement (2012), women with stable CVD can engage in sexual activity with a low risk of adverse cardiovascular events [56]. After a major cardiovascular event, such as an acute myocardial infarction (AMI), women tend to return to their previous sexual activity more reluctantly than men due to reduced desire, impaired vaginal lubrication, or fear of inducing another event, despite the healthcare provider's reassurance [57].

**Arthritis.** Osteoarthritis is a common cause of pain and disability and may limit sexual activity and reduce satisfaction [58]. The American Association of Hip and Knee Surgeons recommends avoiding extreme flexing of the hip joint after total hip replacement, to avoid dislocation [59].

### 3.4. Psychosocial factors

Psychosocial factors leading to sexual dysfunction in menopause include the availability of a partner, relationship difficulties, stress or mood disorders (such as depression and anxiety), low educational level and socioeconomic status, poor health, chronic diseases, and sexually repressive environment (family, religion, culture, etc.). Partner sexual problems such as erectile dysfunction and premature ejaculation in heterosexual relationships should not be overlooked. Moreover, childhood and adulthood sexual abuse are two underestimated risk factors for sexual dysfunction at the menopause. A history of sexual abuse or domestic violence has been associated with reduced sexual satisfaction in later life [60]. All these factors are important contributors to sexual activity.

### 3.5. Institutional/wider factors

Another important aspect of sexual dysfunction concerns discrimination on the basis of gender and age which leads to low awareness or low expectations about the sexuality of women in later life and barriers to their accessing support. In particular, there is a lack of tailoring of menopause services to women beyond the seventh decade and exclusion of those who are dependent on others or living in closed environments, such as care homes and supported housing. What may be appropriate to women in their 50s may not be for women in later life and is dependent on health status. Thus, healthcare training needs to include sexuality and sexual diversity in women; this would be an opportunity to include lesbian and bisexual women.

## 4. Assessment and diagnosis

While a complete medical history is preferred (Fig. 1), a focused or targeted approach is usually sufficient. Starting with open-ended questions and taking the time to listen and respond to the issues, concerns, and fears are paramount. Partners should be involved when appropriate, for example if the woman has a sexual partner, and if she wants her partner to be present at the consultation. Assessment includes taking a sexual, gynecological, obstetric, and medical history. Gynecological assessment should incorporate vulvovaginal conditions. Menopause status and the severity of the related symptoms, both genitourinary and systemic, should be assessed. Clinical and laboratory examinations should be undertaken if indicated, while questionnaires have restricted routine clinical use. Healthcare providers should accept that some women may not wish to be examined. However, if sexual or pelvic pain is part of the symptom complex, an examination to exclude pathology may not be avoidable.

### 4.1. Clinical examination and laboratory investigation

Assessment needs to be individualized. Again, what may be appropriate to women in their 50s may not be for women in later life. The ISSWSH proposes a four-step model for the assessment of sexual

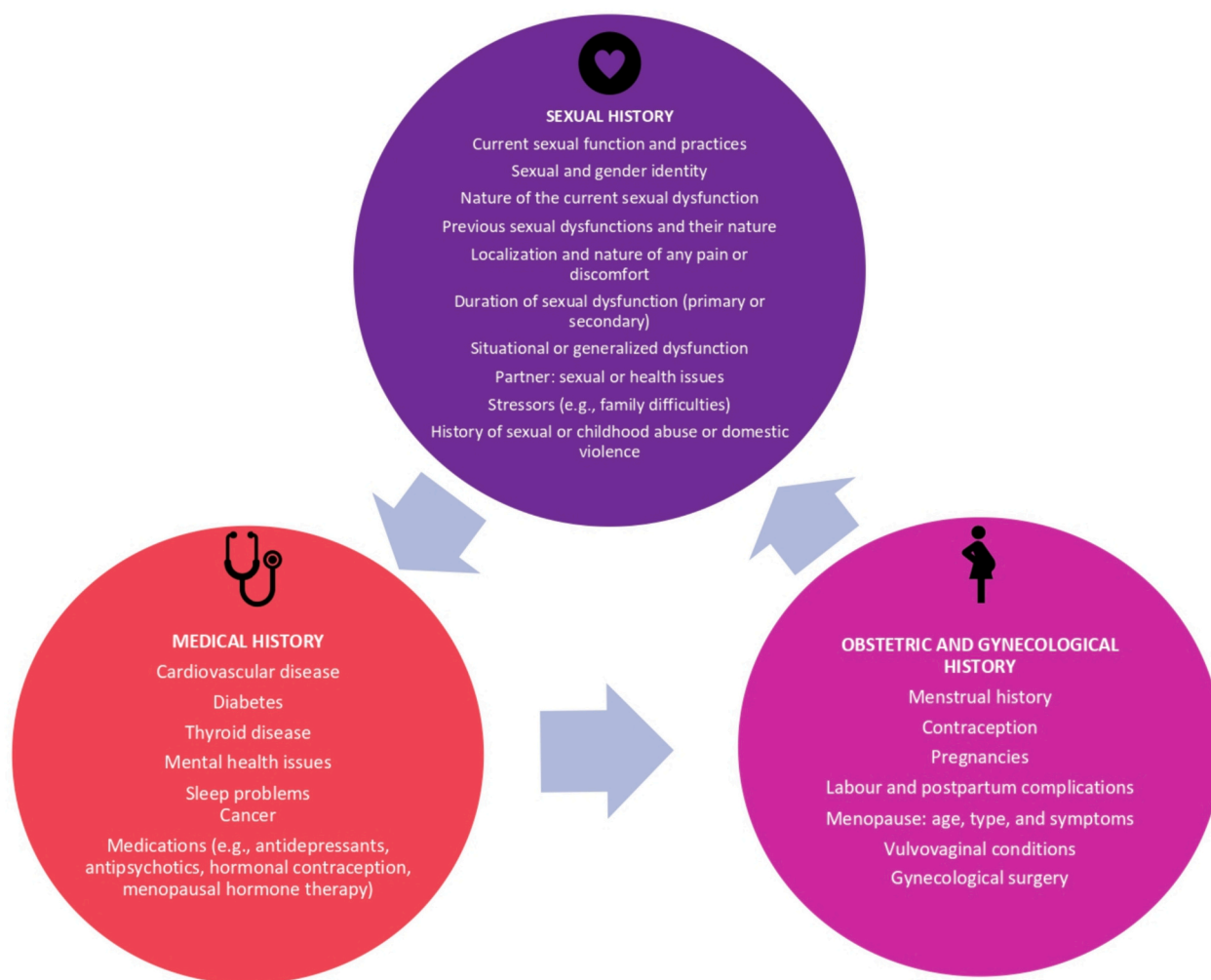


Fig. 1. History-taking in sexual health and wellbeing assessment.

problems and concerns in women: (1) disclosing and sharing the problem themselves in response to open-ended questions, (2) naming and framing the problem by the healthcare provider, (3) active listening with empathy, and (4) assessment and treatment or referral to a specialist [61,62]. Healthcare providers should consider undertaking a gynecological examination but they need to note that menopausal estrogen deficiency may cause pain and discomfort. Thus, it should be performed only if it is essential for the diagnosis or if there is a history or suspicion of malignancy or another lesion. In addition, cervical cancer screening programs worldwide have different recommendations regarding the age at which screening is started, stopped, frequency and type of screening (HPV testing/Pap smears). Laboratory testing is used to diagnose any coexisting medical pathologies, such as sexually transmitted diseases (STDs), CVD or diabetes. FSH and/or estradiol levels should not be measured for the confirmation of menopausal stage in women aged over 45 years. Measurement can be considered in women aged 40–45 years with menopausal symptoms and a change in their menstrual cycle and in women aged under 40 years to assess the presence of POI [63].

Women who complain of sexual dysfunction may request measurement of testosterone levels. In women, however, slightly more than two-thirds of circulating testosterone is bound to steroid hormone-binding globulin (SHBG), and a further one-third is weakly bound to albumin, leaving around 2 % of the total testosterone in the free or unbound state. This is considered to be its active form. In 2019, a Global Consensus Position Statement concluded that measurement of circulating androgen levels was of little value in the diagnosis of female sexual dysfunction

because of issues relating to the sensitivity and specificity of androgen assays, whereas use in the context of assessing treatment and hyperandrogenic states was justified [64,65].

#### 4.2. Questionnaires

A structured approach to sexual history taking could be time-saving for women and healthcare professionals. The use of questionnaires for the assessment of sexual dysfunction is controversial due to the lack of time and expertise in primary care [66]. Their use is more common in research studies. The indexes presented below assess female sexual health and function.

- Female Sexual Function Index (FSFI). A detailed 19-item questionnaire assessing six areas of female sexuality: desire, arousal, lubrication, orgasm, satisfaction, and pain. It is mainly used as a research tool [67].
- PROMIS Sexual Function and Satisfaction (PROMIS SexFS). A diagnostic tool measuring sexual function and satisfaction in patients with cancer, which is a common comorbidity in postmenopausal women [68].
- Decreased Sexual Desire Screener (DSDS). A sensitive and specific questionnaire developed to constitute an HSDD diagnostic tool for clinicians without expertise in sexual health [69].



- Brief Profile of Female Sexual Function (B-PFSF). A 37-item patient-based questionnaire for the measurement of loss of sexual function in menopausal women with low libido [70].

## 5. Management

Management of sexual problems includes education, psychosexual counselling, non-pharmacological (e.g., lubricants or sex aids), pharmacological, and general and lifestyle interventions. A personalized approach should be tailored to what the woman wants, to the type of sexual problem(s) she is experiencing and the biopsychosocial context. Sexual activity does not need to be orgasm- or penetration-focused. Privacy needs to be respected, particularly in the current era of electronic healthcare records. This guide will not consider herbal supplements, botanicals, and alternative complementary therapies as there is a paucity of data regarding safety and efficacy. In addition, some products may contain compounds with estrogenic activity or interact with anticancer and other therapies [71].

### 5.1. Psychosexual counselling

Psychological distress must be addressed to restore sexual function, if appropriate. Psychosexual counselling consists of sex therapy and psychoeducation, including cognitive-behavioral therapy (CBT) or mindfulness-based therapy (MBT). Initially, women may not report sexual problems; however, if a non-judgmental, supportive, and caring environment is provided, this may help expression of concerns [72]. Partner-related problems (erectile dysfunction, premature ejaculation, body image concerns, female partner's own menopause in the case of same-sex relationships, etc.) may be countered with couple/partner(s) therapy. Sexual activity encompasses far more than a narrow focus on coitus or penetration. Thus, there are many ways to maintain wellbeing. When sexuality is not orgasm- or penetration-focused, the act becomes more a reflection of intimacy, connection, and arousal. Mindfulness is based on positive interventions achieved by meditation. It has been associated with a lower incidence of FSD, as it can reduce self-criticism and the effects of negative past experiences and improve the self-image of postmenopausal women. The main goal of mindfulness is mindset change, which can contribute to reduced emotional distress and the achievement of sexual satisfaction [73].

### 5.2. Non-pharmacological interventions

**Lubricants and moisturizers.** These can be used alone or in combination with systemic or topical estrogens. Lubricants are used during sexual activity to reduce vaginal dryness and discomfort. They may be based on water, oil, hyaluronic acid, or silicone. Lubricants provide temporary relief and may need repeated application. On the other hand, moisturizers can be used routinely, even daily, as they usually contain a polycarboxyl-based polymer which retains water and has a long-lasting relieving effect on the vagina. A clinical trial evaluated the safety and efficacy of five water-based lubricants formulated consistently with the World Health Organization criteria in terms of pH and osmolality. The study concluded that they all significantly improved the sexual experience [74]. According to a double-blind daily diary study, sexual pleasure and satisfaction are substantially increased with the use of lubricants during sex that involves penetration [75].

**Dilators.** Vaginal dilators are used to prevent vaginal stenosis in women who have received vaginal or pelvic radiotherapy. Although dilators may delay or prevent the formation of adhesions, the data regarding their impact on sexual function are inconsistent [76]. There are some specifically designed dilators for women with vaginal stenosis or insufficient dilatation due to GSM [77]. Studies are needed to determine efficacy.

**Sexual devices** are commonly used to enhance sexual experience, as well as to contribute to the management of sexual dysfunction.

However, the use of sexual tools may cause discomfort after menopause. In 2000, the Food and Drug Administration (FDA) in the USA approved a clitoral suction device (Eros-Clitoral Therapy Device) to enhance arousal and orgasm in women with FSD. The results and the effectiveness of its use are not encouraging, though, as it remains unclear whether it is superior to other over-the-counter devices, such as vibrators [78]. Healthcare providers may encourage women to use them as they constitute a low-risk measure; however, attention must be drawn to safety precautions (traumatic injury or infection). In a recent pilot study, the use of a therapeutic ultrasound device for vaginal dryness was assessed. The results were promising, offering a new non-pharmacological intervention for women with GSM [79].

**Hyaluronic acid** has skin-moistening effects, as it conserves significant amounts of water. A recent trial that evaluated its use in a cream form for vaginal application concluded that it constitutes an appropriate alternative to hormonal preparations for women who do not consent to their use or have medical contraindications for MHT [80].

**Laser therapy.** Laser therapy has a therapeutic role in various medical conditions and most recently has gained interest as a non-hormonal treatment for GSM and vulvovaginal atrophy. The CO<sub>2</sub> fractional laser treatment and the non-ablative erbium YAG laser are the two main types used. Additionally, the diode vaginal laser has been introduced in GSM treatment. However, randomized trial data are limited, and the studies are small and short term. Mension et al. (2023), in a randomized controlled trial (RCT), reported that while vaginal laser treatment was found to be safe after six months of follow-up, no statistically significant differences in efficacy were observed compared to the sham treatment group [81]. Barba et al. (2023) showed that diode laser treatment was effective and well tolerated [82]. A recent systematic review showed some benefits of laser therapy on vulvodynia [83]. A 2023 review by the European Urogynecological Association (EUGA) working group concluded that both Er:YAG and CO<sub>2</sub> vaginal lasers are safe energy-based therapeutic options for management of GSM and vulvovaginal atrophy in postmenopausal women and breast cancer survivors [84]. In 2018 the FDA warned against the use of energy-based devices for any vaginal "rejuvenation" or cosmetic vaginal procedure, or procedures intended to treat vaginal conditions and symptoms related to menopause, urinary incontinence, or sexual function. The concern was that the safety and effectiveness of energy-based devices to perform vaginal "rejuvenation" or cosmetic vaginal procedures had not been established. More information from large, long-term, sham-controlled randomized studies is required to inform evidence-based practice regarding efficacy and safety [85].

**Pelvic floor muscle training (PFMT)** is a safe and low-cost conservative approach that can improve sexual function in postmenopausal women with GSM. A recent meta-analysis of 21 RCTs showed that PFMT significantly improves FSFI score, arousal, orgasm, satisfaction, and pain [86]. Additionally, a 12-week PFMT program has shown encouraging results in women with GSM and urinary incontinence [87]. The primary mediating mechanisms include increased perfusion and elasticity of vulvovaginal tissues [88].

### 5.3. Pharmacological interventions

#### 5.3.1. Hormonal preparations

**Estrogens.** The use of topical and systemic estrogens may improve sexual wellbeing. There are various preparations, including estradiol-containing tablets, rings, capsules, estriol pessaries, creams, gels, and ovules, as well as conjugated estrogens [89]. Availability of individual preparations varies worldwide. Vaginal administration may be preferred in women with GSM alone, while systemic administration is considered more appropriate in women with vasomotor symptoms as well. Systemic and topical estrogens may be used together [89]. Non-hormonal options are recommended as initial therapy in women with contraindications to estrogens and those taking anti-estrogenic therapies. However, a study published in 2024 found that vaginal estrogen therapy after breast

cancer diagnosis was not associated with increased early breast cancer-specific mortality [90]. Transdermal estrogen therapy has been associated with a favorable effect on sexual function compared with oral estrogens. That difference is attributed to the estrogen-mediated induction of SHBG with oral administration, resulting in a decline in free androgens and, consequently, in poor libido [91]. Low-dose MHT is safer, as tachyphylaxis may occur with high doses [92]. A systematic review in 2023 concluded that there is limited evidence to support the effect of hormonal preparations on sexual function [93]. However, another 2023 systematic review and meta-analysis of RCTs stated that hormone therapy at the menopause may produce a slight improvement in sexual function [94].

**Progestogens.** MHT in postmenopausal women with intact uterus includes progestogens for endometrial protection from the hyperplastic effect of unopposed estrogen. Although there is limited evidence on the independent effect of different progestogens on sexual function, a recent meta-analysis of progestogen-alone contraceptives found a positive or neutral effect of levonorgestrel implants [95]. An RCT in women with FSD associated with the use of combined oral contraceptives found that androgenicity of the progestogens did not affect sexual function [96]. In any case, progestogen selection should be individualized according to the CVD risk, the presence of diabetes mellitus, and the risk of breast cancer. Micronized progesterone has been associated with reduced CVD and breast cancer risk compared with other progestogens [97].

**Testosterone.** According to the Global Consensus Position Statement on the Use of Testosterone Therapy for Women (2019), restoration of testosterone to premenopausal levels leads to an increase in sexual desire and arousal in naturally or surgically postmenopausal women [98]. Evaluation to exclude medical conditions (anemia, thyroid disease, depression) or any relationship issues that may interfere with sexual dysfunction should be undertaken before starting treatment [99]. Testosterone administration is usually transdermal. HSDD is the only evidence-based indication for testosterone administration in women, as this indication formed the basis for most of the research. Testosterone is not approved by the FDA for use in women [100]. Although a testosterone transdermal patch was approved by the European Medicines Agency (EMA) in 2006, it was withdrawn from the market for commercial, not medical, reasons in 2012. Women are commonly prescribed male preparations (topical testosterone) with dose modification in the absence of availability of preparations for female use. Testosterone levels should be measured at baseline and then be carefully monitored at 3–6 weeks and 6-monthly thereafter. Clinical examination is essential to follow up the clinical response to treatment and to detect any signs of androgen excess (hirsutism, acne, androgenic alopecia, etc.) [101].

**Tibolone** is a synthetic steroid hormone which is used as MHT after the menopause to manage vasomotor symptoms, sexual dysfunction, and psychological disorders. It is administered as an oral 2.5 mg tablet [102]. However, tibolone is not available worldwide and is not marketed in the USA. A systematic review in 2023 concluded that tibolone is an effective therapeutic option in treating dyspareunia, vaginal dryness, and reduced sexual desire in postmenopausal women with FSD [103].

**Dehydroepiandrosterone (DHEA)** and DHEA sulfate (DHEA-S) are adrenal androgens which are converted into testosterone, dihydrotestosterone (DHT), and estrogens in peripheral tissues and upon oral administration. Their use in the treatment of FSD has been evaluated in various studies, which have concluded that vaginal administration can improve vaginal atrophy in menopausal women [104,105]. Vaginal DHEA is licensed in both the USA and Europe for the treatment of vulvar and vaginal atrophy in postmenopausal women with moderate to severe symptoms. It is administered as 6.5 mg vaginal pessary, inserted once daily at bedtime [106]. A systematic review and meta-analysis of RCTs published in 2014 suggested that systemic DHEA has no significant impact on sexual function [107]. However, subsequent research has shown benefit [108].

**Ospemifene** is a third-generation selective estrogen receptor modulator (SERM) which is used for the treatment of GSM-related symptoms,

both vaginal dryness and dyspareunia. It is administered orally as a 60 mg tablet. The structure and the pH of the vaginal tissues are significantly improved with ospemifene [109]. In a recent meta-analysis, the efficacy, safety, and non-inferiority of ospemifene to other available treatments for GSM were confirmed [110]. Preliminary evidence suggests it can be used safely for the treatment of GSM in breast cancer survivors [111].

### 5.3.2. Non-hormonal preparations

**Flibanserin** is a postsynaptic 5-hydroxytryptamine 1A (5-HT<sub>1A</sub>) agonist and 2A (5-HT<sub>2A</sub>) antagonist indicated for the treatment of premenopausal women with acquired, generalized HSDD and is not licensed for postmenopausal women in the USA. However, it is licensed by Health Canada and is available for postmenopausal women aged up to 60 years in that country [112]. Flibanserin is administered orally and once daily. A 100 mg dose at bedtime is appropriate for HSDD management [113].

**Bremelanotide**, a melanocortin receptor agonist which non-selectively activates melanocortin 1–5 receptors (MC<sub>1R</sub>, MC<sub>2R</sub>, MC<sub>3R</sub>, MC<sub>4R</sub>, and MC<sub>5R</sub>), is an FDA-approved non-hormonal preparation indicated for the treatment of premenopausal women with acquired, generalized HSDD. It is not licensed for postmenopausal women. However, given its mechanism of action, there is no reason to believe it would not work in them. Bremelanotide is administered by subcutaneous injection 45 min before sexual activity [114].

**Sildenafil** is a phosphodiesterase-5 (PDE5) inhibitor approved for use in erectile dysfunction and pulmonary arterial hypertension. It may improve sexual arousal, but its use in the management of FSD is off-label [115]. A recent RCT evaluated the efficacy and safety of sildenafil as monotherapy or combination therapy with testosterone or bupropion in the treatment of FSD (interest/arousal disorders); the combination of testosterone with sildenafil was promising [116].

**Bupropion** is an antidepressant which, compared with other medications of its category, is less likely to cause sexual dysfunction. Small studies have shown that bupropion administration leads to an improvement in sexual function in women with HSDD or antidepressant-induced sexual dysfunction, measured by higher FSFI scores [117,118]. However, its use in FSD is currently off-label.

**Folic acid, oxytocin, vitamin D.** These have been studied in RCTs. A triple-blind placebo-controlled RCT in 100 postmenopausal women showed a beneficial impact of 5-mg folic acid administration on their sexual function [119]. A double-blind placebo-controlled RCT of oxytocin gel, including 50 postmenopausal women, found improvement in vaginal atrophy [120]. In a three-arm RCT, use of a vitamin D vaginal suppository was associated with improved sexual function in postmenopausal women, as assessed by FSFI scores [121]. More information from large, long-term, randomized studies is required to inform evidence-based practice regarding efficacy and safety and approval by the FDA and EMA.

### 5.4. General and lifestyle interventions

Smoking cessation and reduced alcohol consumption may significantly affect sexual health and wellbeing [122]. Additionally, regular aerobic and resistance physical exercise can improve sexual performance, attenuate climacteric symptoms and enhance fitness. Couple communication and sharing of any new age-related symptoms causing discomfort can restore sexual dynamics and establish a couple-centered management [123].

## 6. Contraception and sexually transmitted diseases after menopause

**Contraception.** The percentage of unintended pregnancies in the perimenopausal period is high due to the common false belief that women in this age group are infertile. Women in heterosexual

relationships should be advised by healthcare professionals to use contraception if they do not wish to become pregnant. The Faculty of Sexual and Reproductive Healthcare (FSRH) guidelines support the use of emergency contraception in heterosexual women over 40 who had unprotected vaginal penetration, as the chance of pregnancy is 10–20 % for women aged 40–44 and 12 % for women aged 45–49 [124].

**Sexually transmitted diseases.** Age does not protect from sexually transmitted diseases. Thus, postmenopausal women who are sexually active are still at risk of STDs, including syphilis, gonorrhoea, HIV, HPV, chlamydia, genital herpes, hepatitis B, genital warts, and trichomoniasis. A UK-based study recently reported a 14 % and 23 % increase in STD diagnoses among patients aged 45–64 and > 65, respectively [125]. Globally >1 million sexually transmitted infections (STIs) are acquired every day. In 2020, the WHO estimated 374 million new infections with one of the following STIs: trichomoniasis (156 million), chlamydia (129 million), gonorrhoea (82 million), and syphilis (7.1 million). An estimated 300 million women have an HPV infection, a primary cause of cervical and anal cancer, while 311,000 women die due to cervical cancer each year [126]. Therefore, condoms should be used for vaginal or anal sex, and dental dams for oral sex [127].

## 7. Sexual intimacy in assisted living, nursing homes, or other long-term care environments

The biological process of menopause and, for some, a woman's reproductive life can lead to women's de-sexualization in society. This can lead to a narrative of loss: of physical strength, emotional stability, and of sexual attractiveness [128] which in later life combines with ageism [129]. Perceiving older people as sexually inactive, in sexual decline or beyond sexual attraction and desire, both as subjects of desire and as experiencing desires, is common. *Ageist erotophobia*, or expressions of "disgust at the thought of ageing body-selves as sexual" [130] can manifest through everyday cultural media, such as the disparaging representation of older people's sexual libido in the media and degrading practices such as the withdrawal of support to vulnerable older adults who express sexual desires and experience arousal. Ageist expressions convey negative, dismissive, or degrading beliefs and attitudes about older people. They may be expressed in covert and subtle ways, including within care environments [131]. This has resulted in older people reporting distress, disappointment, frustration, shock, and fear of failure [132].

**Sexuality and sexual diversity in later life.** There is growing discussion on sexuality and sexual diversity in later life and what constitutes a meaningful life for older people interacting with care services in relation to sexuality and intimacy across different sexual identities. As it is usually health and not age that determines sexual activities in later life, as people become more dependent, they are likely to experience less autonomy in relation to meeting their sexual needs [133]. Professionals and providers need to engage and support older people and recognize opportunities to respond to the complexity of issues arising in care situations. Gewirtz-Meydan et al. (2019) reviewed research that examined sexuality from the perspectives, attitudes, and personal sexual experiences of older people [61]. They found that older people internalized these ageing stigmas and spoke about the tensions and challenges they experienced in their desires to express their sexuality within the constraints of inhibiting social conventions. This may be tailored to people living in supported housing, care homes, hospitals, or nursing homes. Being open will enable information and support on sex and intimacy to be made available and allow both practitioners and patients to engage proactively with the topic. The presumption of heterosexuality by social care workers and professionals precludes recognition of women's non-heterosexual ageing experienced by those with diverse sexual identities. This limits older people's rights to self-define, claim, and express sexual identities outside the heterocentric norm [134]. Hinchcliff et al. (2005), in a study of UK general practitioners, found that almost all reported being uncomfortable in discussing sexuality issues with their

lesbian and gay patients [135]. Less is known about the help-seeking needs of bisexual women [136]. Taylor and Gosney (2011) found that general practitioners recognize that many older people would prefer to discuss sexual issues with a doctor of the same gender and closer to their own age range [137].

**Workforce development** issues should start with embedding sexuality within professional education, in policies and care practices, and in the commissioning of and evaluation of services [5,138]. In institutional care, the accommodation, care practice, and other arrangements should facilitate the operation of sexual rights, and information and guidance should be made available to help postmenopausal older women remain safe and healthy, enjoy pleasurable experiences, and make appropriate decisions for themselves in this area of their lives and with their partners. While cognitive impairment does not erase the need for sexual relationships and activities, the issues can be complex, controversial, and sensitive. They may be guided by the person-centered approach to dementia care [139] and country-specific mental capacity legislation and guidance. Thus, policies should reflect values and principles respecting diversity, equality, and human rights to prevent exclusion.

**Palliative care.** Another area of vulnerability is during end-of-life care or palliative care, where loss and grief can intensify the desire for sex and intimacy [140]. Sexual pleasure can release neurotransmitters, leading to feelings of warmth, muscle relaxation, pain relief, and improved quality of sleep [141]. In relation to other comorbidities, being proactive in giving advice about overcoming obstacles caused by medication and medical equipment (such as indwelling catheters, intravenous lines, oxygen masks, and ostomy pouches) may be beneficial. Also, aids and psychosocial supports may be helpful, as may alternative activities such as tactile massage, medications to improve fatigue, and improved hygiene [142].

## 8. Summary recommendations

- Sexual health and wellbeing and the menopause should not be considered taboo subjects.
- Assessment and management need to be individualized.
- Assessment should include any partner problems, if appropriate.
- Management requires a personalized multidimensional biopsychosocial approach.
- Medical management and psychosexual counselling include pharmacological and non-pharmacological interventions, and sex therapy and psychoeducation.
- Undergraduate and specialist training of healthcare professionals and providers should include sexual problems at the menopause and beyond.

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## References

- [1] J. Steckenrider, Sexual activity of older adults: let's talk about it, *Lancet Heal. Longev.* 4 (2023) e96–e97, [https://doi.org/10.1016/S2666-7568\(23\)00003-X](https://doi.org/10.1016/S2666-7568(23)00003-X).
- [2] N. Beckman, M. Waern, D. Gustafson, I. Skoog, Secular trends in self reported sexual activity and satisfaction in Swedish 70 year olds: cross sectional survey of four populations, 1971–2001, *BMJ* 337 (2008) 151–154, <https://doi.org/10.1136/bmj.a279>.
- [3] WHO, Measuring sexual health: conceptual and practical considerations, *Who/Rhr/10 12* (2010) 1–15. <https://www.who.int/publications/i/item/WHO-RHR-10.12>.
- [4] S.-M. Manninen, P. Polo-Kantola, T. Vahlberg, K. Kero, Patients with chronic diseases: is sexual health brought up by general practitioners during appointments? A web-based study, *Maturitas* 160 (2022) 16–22, <https://doi.org/10.1016/j.maturitas.2022.01.014>.
- [5] T. Hafford-Letchfield, *Intimacy, sex and relationships*, in: *Ageing Well – Care and Support for a New Generation. Practice Guide*, Totness, Research in Practice for Adults, 2020.
- [6] S.J. Parish, C.M. Meston, S.E. Althof, A.H. Clayton, I. Goldstein, S.W. Goldstein, J. R. Heiman, M.P. McCabe, R.T. Segraves, J.A. Simon, Toward a more evidence-based nosology and nomenclature for female sexual dysfunctions—part III, *J. Sex. Med.* 16 (2019) 452–462, <https://doi.org/10.1016/j.jsxm.2019.01.010>.
- [7] American College of Obstetricians and Gynecologists' committee on practice bulletins—gynecology, female sexual dysfunction, *Obstet. Gynecol.* 134 (2019) e1–e18, <https://doi.org/10.1097/AOG.0000000000003324>.
- [8] R.E. Nappi, L. Cucinella, S. Martella, M. Rossi, L. Tiranini, E. Martini, Female sexual dysfunction (FSD): prevalence and impact on quality of life (QoL), *Maturitas* 94 (2016) 87–91, <https://doi.org/10.1016/j.maturitas.2016.09.013>.
- [9] M. Particco, S. Djumaeva, R.E. Nappi, N. Panay, S. Palacios, The European vulvovaginal epidemiological survey (EVES): impact on sexual function of vulvovaginal atrophy of menopause, *Menopause* 27 (2020) 423–429, <https://doi.org/10.1097/GME.0000000000001496>.
- [10] S.E. Jackson, J. Firth, N. Veronese, B. Stubbs, A. Koyanagi, L. Yang, L. Smith, Decline in sexuality and wellbeing in older adults: a population-based study, *J. Affect. Disord.* 245 (2019) 912–917, <https://doi.org/10.1016/j.jad.2018.11.091>.
- [11] G. Gore-Gorszewska, A. Ševčíková, J. Gottfried, Predicting changes to sexual activity in later life: a longitudinal study, *Sex. Res. Soc. Policy* (2023), <https://doi.org/10.1007/s13178-023-00853-9>.
- [12] M. Stentagg, L. Skär, J.S. Berglund, T. Lindberg, Cross-sectional study of sexual activity and satisfaction among older adult's ≥60 years of age, *Sex. Med.* 9 (2021) 100316, <https://doi.org/10.1016/j.esxm.2020.100316>.
- [13] D.M. Lee, J. Nazroo, D.B. O'Connor, M. Blake, N. Pendleton, Sexual health and well-being among older men and women in England: findings from the English longitudinal study of ageing, *Arch. Sex. Behav.* 45 (2016) 133–144, <https://doi.org/10.1007/s10508-014-0465-1>.
- [14] J.L. Shifren, B.U. Monz, P.A. Russo, A. Segreti, C.B. Johannes, Sexual problems and distress in United States women: prevalence and correlates, *Obstet. Gynecol.* 112 (2008) 970–978, <https://doi.org/10.1097/AOG.0b013e3181898c8b>.
- [15] A.S. Cheung, B.J. Nolan, S. Zwickl, Transgender health and the impact of aging and menopause, *Climacteric* 26 (2023) 256–262, <https://doi.org/10.1080/13697137.2023.2176217>.
- [16] S.J. Parish, A.T. Goldstein, S.W. Goldstein, I. Goldstein, J. Pfau, A.H. Clayton, A. Giraldi, J.A. Simon, S.E. Althof, G. Bachmann, B. Komisaruk, R. Levin, S. K. Spadt, S.A. Kingsberg, M.A. Perelman, M.D. Waldinger, B. Whipple, Toward a more evidence-based nosology and nomenclature for female sexual dysfunctions—part II, *J. Sex. Med.* 13 (2016) 1888–1906, <https://doi.org/10.1016/j.jsxm.2016.09.020>.
- [17] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders (DSM-5-TR)*, (n.d.). <https://www.psychiatry.org/psychiatrists/practice/dsm>.
- [18] S.J. Parish, S.R. Hahn, S.W. Goldstein, A. Giraldi, S.A. Kingsberg, L. Larkin, M. J. Minkin, V. Brown, K. Christiansen, R. Hartzell-Cushman, A. Kelly-Jones, J. Rullo, R. Sadovsky, S.S. Faubion, The International Society for the study of women's sexual health process of care for the identification of sexual concerns and problems in women, *Mayo Clin. Proc.* 94 (2019) 842–856, <https://doi.org/10.1016/j.mayocp.2019.01.009>.
- [19] G.M. Reed, J. Drescher, R.B. Krueger, E. Atalla, S.D. Cochran, M.B. First, P. T. Cohen-Kettenis, I. Arango-de Montis, S.J. Parish, S. Cottler, P. Briken, S. Saxena, Disorders related to sexuality and gender identity in the ICD-11: revising the ICD-10 classification based on current scientific evidence, best clinical practices, and human rights considerations, *World Psychiatry* 15 (2016) 205–221, <https://doi.org/10.1002/wps.20354>.
- [20] I. Lambrinoudaki, E. Armeni, D. Goulis, S. Bretz, I. Ceausu, F. Durmusoglu, R. Erkkola, I. Fistonik, M. Gambacciani, M. Geukes, H. Hamoda, C. Hartley, A. L. Hirschberg, B. Meczekalski, N. Mendoza, A. Mueck, A. Smetnik, P. Stute, M. van Trotsenburg, M. Rees, Menopause, wellbeing and health: a care pathway from the European Menopause and Andropause Society, *Maturitas* 163 (2022) 1–14, <https://doi.org/10.1016/j.maturitas.2022.04.008>.
- [21] A. Gosset, J.M. Claeys, E. Huyghe, F. Tremollières, Sexual function and quality of life in women with idiopathic premature ovarian insufficiency, *J. Sex. Med.* 20 (2023) 626–632, <https://doi.org/10.1093/jxmed/qdad006>.
- [22] E.L. Scott, Q. Zhang, R.K. Vadlamudi, D.W. Brann, Premature menopause and risk of neurological disease: basic mechanisms and clinical implications, *Mol. Cell. Endocrinol.* 389 (2014) 2–6, <https://doi.org/10.1016/j.mce.2014.01.013>.
- [23] M. Rees, K. Abernethy, G. Bachmann, S. Bretz, I. Ceausu, F. Durmusoglu, R. Erkkola, I. Fistonik, M. Gambacciani, M. Geukes, D.G. Goulis, A. Griffiths, H. Hamoda, C. Hardy, C. Hartley, A.L. Hirschberg, A. Kydd, S. Marshall, B. Meczekalski, N. Mendoza, A. Mueck, E. Persand, K. Riach, A. Smetnik, P. Stute, M. van Trotsenburg, N. Yuksel, R. Weiss, I. Lambrinoudaki, The essential menopause curriculum for healthcare professionals: a European Menopause and Andropause Society (EMAS) position statement, *Maturitas* 158 (2022) 70–77, <https://doi.org/10.1016/j.maturitas.2021.12.001>.
- [24] D.R. Nebgen, S.M. Domchek, J. Kotsopoulos, J.A. de Hullu, E.J. Crosbie, V. S. Paramanandam, M.M.A. Brood van Zanten, B.M. Norquist, T. Guise, S. Rozenberg, A.W. Kurian, H.J. Pederson, N. Yuksel, R. Michaelson-Cohen, S. L. Bober, A.L. da Silva Filho, N. Johansen, F. Giodozzi, D.G. Evans, U. Menon, S. A. Kingsberg, C.B. Powell, G. Grandi, C. Marchetti, M. Jacobson, D.J. Brennan, M. Hickey, Care after premenopausal risk-reducing salpingo-oophorectomy in high-risk women: scoping review and international consensus recommendations, *BJOG Int. J. Obstet. Gynaecol.* 130 (2023) 1437–1450, <https://doi.org/10.1111/1471-0528.17511>.
- [25] R. Haring, A. Hannemann, U. John, D. Radke, M. Nauck, H. Wallaschofski, L. Owen, J. Adaway, B.G. Keevil, G. Brabant, Age-specific reference ranges for serum testosterone and androstenedione concentrations in women measured by liquid chromatography-tandem mass spectrometry, *J. Clin. Endocrinol. Metab.* 97 (2012) 408–415, <https://doi.org/10.1210/jc.2011-2134>.
- [26] K. Wylie, M. Rees, G. Hackett, R. Anderson, P.M. Bouloux, M. Cust, D. Goldmeier, P. Kell, T. Terry, T. Trinick, F. Wu, Androgens, health and sexuality in women and men, *Maturitas* 67 (2010) 275–289, <https://doi.org/10.1016/j.maturitas.2010.07.011>.
- [27] K. Angelou, T. Grigoriadis, M. Diakosavvas, D. Zacharakis, S. Athanasiou, The genitourinary syndrome of menopause: an overview of the recent data, *Cureus* 12 (2020), <https://doi.org/10.7759/cureus.7586>.



- [28] A. Armeni, E. Armeni, A. Augoulea, S. Stergiotis, G. Kaparos, A. Alexandrou, M. Eleftheriadis, N. Georgopoulos, N. Vlahos, I. Lambrinouadaki, Climacteric symptoms, age, and sense of coherence are associated with sexual function scores in women after menopause, *J. Sex. Med.* 20 (2023) 313–323, <https://doi.org/10.1093/jsxmed/qdac031>.
- [29] R.E. Nappi, L.Å. Mattsson, M. Lachowsky, R. Maamari, A. Giraldi, The CLOSER survey: impact of postmenopausal vaginal discomfort on relationships between women and their partners in northern and southern Europe, *Maturitas* 75 (2013) 373–379, <https://doi.org/10.1016/j.maturitas.2013.05.003>.
- [30] Y. Ozaki, H. Tomoe, M. Shimomura, N. Ninomiya, Y. Sekiguchi, Y. Sato, K. Nagao, Y. Takahashi, S. Takahashi, Female sexual dysfunction and lower urinary tract symptoms associated with vulvovaginal atrophy symptoms: results of the GENJA study, *Int. J. Urol.* 30 (2023) 860–865, <https://doi.org/10.1111/iju.15216>.
- [31] R. Ju, X. Ruan, Y. Yang, X. Xu, J. Cheng, Y. Bai, Y. Shi, X. Yang, R. Li, A.O. Mueck, A multicentre cross-sectional clinical study on female sexual dysfunction in postmenopausal Chinese women, *Maturitas* 172 (2023) 15–22, <https://doi.org/10.1016/j.maturitas.2023.04.002>.
- [32] N. Mili, S.A. Paschou, A. Armeni, N. Georgopoulos, D.G. Goulis, I. Lambrinouadaki, Genitourinary syndrome of menopause: a systematic review on prevalence and treatment, *Menopause* 28 (2021) 706–716, <https://doi.org/10.1097/GME.0000000000001752>.
- [33] J. Bornstein, A.T. Goldstein, C.K. Stockdale, S. Bergeron, C. Pukall, D. Zolnoun, D. Coady, ISSVD, ISSWSH and IPPS consensus terminology and classification of persistent vulvar pain and vulvodynia, *Obstet. Gynecol.* 127 (2016) 745–751, <https://doi.org/10.1097/AOG.0000000000001359>.
- [34] J. Bornstein, A.T. Goldstein, C.K. Stockdale, S. Bergeron, C. Pukall, D. Zolnoun, D. Coady, ISSVD, ISSWSH and IPPS consensus terminology and classification of persistent vulvar pain and vulvodynia, *Obstet. Gynecol.* 127 (2016) 745–751, <https://doi.org/10.1097/AOG.0000000000001359>.
- [35] S. Vegunta, C.L. Kuhle, J.A. Vencil, P.H. Lucas, D.M. Mussallem, Sexual health after a breast cancer diagnosis: addressing a forgotten aspect of survivorship, *J. Clin. Med.* 11 (2022) 6723, <https://doi.org/10.3390/jcm11226723>.
- [36] M. Rees, R. Angioli, R.L. Coleman, R. Glasspool, F. Plotti, T. Simoncini, C. Terranova, European menopause and Andropause society (EMAS) and international gynecologic Cancer society (IGCS) position statement on managing the menopause after gynecological cancer: focus on menopausal symptoms and osteoporosis, *Maturitas* 134 (2020) 56–61, <https://doi.org/10.1016/j.maturitas.2020.01.005>.
- [37] M. Whicker, J. Black, G. Altwerger, G. Menderes, J. Feinberg, E. Ratner, Management of sexuality, intimacy, and menopause symptoms in patients with ovarian cancer, *Am. J. Obstet. Gynecol.* 217 (2017) 395–403, <https://doi.org/10.1016/j.ajog.2017.04.012>.
- [38] S.S. Faubion, L.C. Larkin, C.A. Stuenkel, G.A. Bachmann, L.A. Chism, R. Kagan, A. M. Kaunitz, M.L. Krychman, S.J. Parish, A.H. Partridge, J.V. Pinkerton, T. S. Rowen, M. Shapiro, J.A. Simon, S.B. Goldfarb, S.A. Kingsberg, Management of genitourinary syndrome of menopause in women with or at high risk for breast cancer: consensus recommendations from the North American Menopause Society and the International Society for the Study of Women's sexual health, *Menopause* 25 (2018) 596–608, <https://doi.org/10.1097/GME.0000000000001121>.
- [39] M. Mangiardi-Veltin, J. Mullaert, M. Coeuret-Pellicier, M. Goldberg, M. Zins, R. Rouzier, D. Hequet, C. Bonneau, Prevalence of sexual dysfunction after breast cancer compared to controls, a study from CONSTANCES cohort, *J. Cancer Surviv.* (2023), <https://doi.org/10.1007/s11764-023-01407-z>.
- [40] J.L. Chan, S. Senapati, L.N.C. Johnson, L. DiGiovanni, C. Voong, S.F. Butts, S. M. Domchek, Risk factors for sexual dysfunction in BRCA mutation carriers after risk-reducing salpingo-oophorectomy, *Menopause* 26 (2019) 132–139, <https://doi.org/10.1097/GME.0000000000001176>.
- [41] S.S. Arthur, C.S. Dorfman, L.A. Massa, R.A. Shelby, Managing female sexual dysfunction, *Urol. Oncol. Semin. Orig. Investig.* 40 (2022) 359–365, <https://doi.org/10.1016/j.urolonc.2021.06.006>.
- [42] J.G. Kovoov, J.H.W. Jacobsen, B. Stretton, S. Bacchi, A.K. Gupta, B. Claridge, M. V. Steen, A. Bhanushali, L. Bartholomeusz, S. Edwards, G.P. Asokan, G. Asokan, A. McGee, C.D. Ovenden, J.N. Hewitt, M.I. Trochler, R.T. Padbury, S.W. Perry, M.-L. Wong, J. Licinio, G.J. Maddern, P.J. Hewett, Depression after stoma surgery: a systematic review and meta-analysis, *BMC Psychiatry* 23 (2023) 352, <https://doi.org/10.1186/s12888-023-04871-0>.
- [43] M.B. Savoie, A. Pacionek, K. Van Loon, M. Anwar, C.E. Atreya, P.C. Johnson, S. A. Kenfield, A. Laffan, A.O. Levin, J.F. Smith, D. Stanfield, A. Venook, L. Zhang, E. L. Van Blarigan, T. Rowen, Sexual function remains persistently low in women after treatment for colorectal cancer and anal squamous cell carcinoma, *J. Sex. Med.* 20 (2023) 439–446, <https://doi.org/10.1093/jsxmed/qdac047>.
- [44] C. Abouseif, L. Paul, Pelvic Organ Prolapse, StatPearls [Internet]. <https://www.ncbi.nlm.nih.gov/books/NBK563229/>, 2022.
- [45] American College of Obstetricians and Gynecologists and the American Urogynecologic Society, Pelvic organ prolapse, *Female Pelvic Med. Reconstr. Surg.* 25 (2019) 397–408, <https://doi.org/10.1097/SPV.0000000000000794>.
- [46] R. Tahseen, Y. Ahmed, M. Tariq, S. Abrar, N. Ali, Compliance and clinical efficacy of vaginal dilator after radiotherapy for cervical and endometrial malignancies, *Ecancermedicalscience* 17 (2023), <https://doi.org/10.3332/ecancer.2023.1545>.
- [47] A. Vallée, M. Carbonnel, P.-F. Ceccaldi, A. Feki, J.-M. Ayoubi, Postmenopausal endometriosis: a challenging condition beyond menopause, *Menopause* 31 (2024) 447–456, <https://doi.org/10.1097/GME.0000000000002338>.
- [48] J.M. Kling, S. Ghaith, T. Smith, E. Kapoor, M. Wasson, K. Mara, F.T. Enders, S. Faubion, C. Kuhle, Evaluating the link between self-reported endometriosis and female sexual dysfunction, *J. Sex. Med.* 19 (2022) 1553–1561, <https://doi.org/10.1016/j.jsxm.2022.07.009>.
- [49] A. Lukic, M. Di Properzio, S. De Carlo, F. Nobili, M. Schimberni, P. Bianchi, C. Prestigiacomo, M. Moscarini, D. Caserta, Quality of sex life in endometriosis patients with deep dyspareunia before and after laparoscopic treatment, *Arch. Gynecol. Obstet.* 293 (2016) 583–590, <https://doi.org/10.1007/s00404-015-3832-9>.
- [50] E.S. Spatz, M.E. Canavan, M.M. Desai, H.M. Krumholz, S.T. Lindau, Sexual activity and function among middle-aged and older men and women with hypertension, *J. Hypertens.* 31 (2013) 1096–1105, <https://doi.org/10.1097/HJH.0b013e328335fdefa>.
- [51] M. Brouchet, M. Teng, C. Chesnel, P. Lagnau, G. Amarenco, C. Hentzen, Expectations about the management of sexual dysfunction in women with multiple sclerosis and association with clinical characteristics, *Mult. Scler. Relat. Disord.* 79 (2023) 104950, <https://doi.org/10.1016/j.msard.2023.104950>.
- [52] I. Tsatsou, K. Mystakidou, T. Adamakidou, T. Konstantinidis, I. Kalemikerakis, A. Galanos, O. Govina, Sexual function in women survivors of hematologic malignancy after autologous hematopoietic stem cell transplantation, *Curr. Oncol.* 30 (2023) 2916–2927, <https://doi.org/10.3390/curroncol30030223>.
- [53] A.W. Shindel, T.F. Lue, Sexual Dysfunction in Diabetes, in: K.R. Feingold, B. Anawalt, M.R. Blackman, et al. (Eds.), *Endotext*, MDText.com, Inc, South Dartmouth (MA), 2021. June 8, 2021, <https://www.ncbi.nlm.nih.gov/books/NBK279101/>.
- [54] P. Enzlin, R. Rosen, M. Wiegel, J. Brown, H. Wessells, P. Gattcomb, B. Rutledge, K.-L. Chan, P.A. Cleary, DCCT/EDIC Research Group, Sexual dysfunction in women with type 1 diabetes: long-term findings from the DCCT/EDIC study cohort, *Diabetes Care* 32 (2009) 780–785, <https://doi.org/10.2337/dc08-1164>.
- [55] G. Fernandez Moncaleano, C.M. Gibbons, S. Holt, B. Braffett, R. Pop-Busui, A. Jacobson, H. Wessells, A. Sarma, Urinary symptoms and female sexual dysfunction in women with type 1 diabetes: the role of depression, *J. Sex. Med.* 20 (2023) 1391–1398, <https://doi.org/10.1093/jsxmed/qdad138>.
- [56] G.N. Levine, E.E. Steinke, F.G. Bakaeen, B. Bozkurt, M.D. Cheitlin, J.B. Conti, E. Foster, T. Jaarsma, R.A. Kloner, R.A. Lange, S.T. Lindau, B.J. Maron, D. K. Moser, E.M. Ohman, A.D. Seftel, W.J. Stewart, Sexual activity and cardiovascular disease: a scientific statement from the American Heart Association, *Circulation* 125 (2012) 1058–1072, <https://doi.org/10.1161/CIR.0b013e3182447787>.
- [57] S.T. Lindau, E. Abramsohn, H. Bueno, G. D'Onofrio, J.H. Lichtman, N.P. Lorenze, R.M. Sanghani, E.S. Spatz, J.A. Spertus, K.M. Strait, K. Wroblewski, S. Zhou, H. M. Krumholz, Sexual activity and function in the year after an acute myocardial infarction among younger women and men in the United States and Spain, *JAMA Cardiol.* 1 (2016) 754, <https://doi.org/10.1001/jamacardio.2016.2362>.
- [58] E. Nilsing Strid, M. Ekelius-Hamping, Experiences of sexual health in persons with hip and knee osteoarthritis: a qualitative study, *BMC Musculoskelet. Disord.* 21 (2020) 576, <https://doi.org/10.1186/s12891-020-03596-5>.
- [59] American Association of Hip and Knee Surgeons, Returning to sexual activity following hip or knee replacement surgery, 2018. (n.d.). <https://hipknee.aahks.org/wp-content/uploads/2021/04/A-Guide-to-Returning-to-Sexual-Activity-Following-Hip-or-Knee-Replacement-Surgery.pdf>.
- [60] J. Kong, S.D. Easton, Y. Zhang, Sexual and marital satisfaction in older adulthood: effects of childhood and adulthood violence exposure, *Gerontologist* 63 (2023) 285–296, <https://doi.org/10.1093/geront/gnac126>.
- [61] A. Gewirtz-Meydan, T. Hafford-Letchfield, L. Ayalon, Y. Benyamini, V. Biermann, A. Coffey, J. Jackson, A. Phelan, P. Voß, M. Geiger Zeman, Z. Zeman, How do older people discuss their own sexuality? A systematic review of qualitative research studies, *Cult. Health Sex.* 21 (2019) 293–308, <https://doi.org/10.1080/13691058.2018.1465203>.
- [62] S.J. Parish, S.R. Hahn, S.W. Goldstein, A. Giraldi, S.A. Kingsberg, L. Larkin, M. J. Minkin, V. Brown, K. Christiansen, R. Hartzlett-Cushman, A. Kelly-Jones, J. Rullo, R. Sadovsky, S.S. Faubion, The International Society for the Study of Women's sexual health process of care for the identification of sexual concerns and problems in women, *Mayo Clin. Proc.* 94 (2019) 842–856, <https://doi.org/10.1016/j.mayocp.2019.01.009>.
- [63] National Institute for Health and Care Excellence (NICE), Menopause: diagnosis and management. <https://www.nice.org.uk/guidance/ng23>, 2023.
- [64] S.R. Davis, R. Baber, N. Panay, J. Bitzer, S.C. Perez, R.M. Islam, A.M. Kaunitz, S. A. Kingsberg, I. Lambrinouadaki, J. Liu, S.J. Parish, J. Pinkerton, J. Rymer, J. A. Simon, L. Vignozzi, M.E. Wierman, Global consensus position statement on the use of testosterone therapy for women, *J. Clin. Endocrinol. Metab.* 104 (2019) 4660–4666, <https://doi.org/10.1210/nc.2019-01603>.
- [65] H.W. Vesper, O. Sugahara, Participant Protocol for CDC Hormone Standardization (CDC HoST) Program-Total Testosterone (TT), 2023, pp. 1–5. [https://www.cdc.gov/labstandards/csp/pdf/hs/testosterone\\_protocol-508.pdf](https://www.cdc.gov/labstandards/csp/pdf/hs/testosterone_protocol-508.pdf).
- [66] M. Clegg, A. Towner, K. Wylie, Should questionnaires of female sexual dysfunction be used in routine clinical practice? *Maturitas* 72 (2012) 160–164, <https://doi.org/10.1016/j.maturitas.2012.03.009>.
- [67] M. Wiegel, C. Meston, R. Rosen, The female sexual function index (FSFI): cross-validation and development of clinical cutoff scores, *J. Sex Marital Ther.* 31 (2005) 1–20, <https://doi.org/10.1080/00926230500475206>.
- [68] K.E. Flynn, L. Lin, J.M. Cyranowski, B.B. Reeve, J.B. Reese, D.D. Jeffery, A. W. Smith, L.S. Porter, C.B. Dombeck, D.W. Bruner, F.J. Keefe, K.P. Weinfurt, Development of the NIH PROMIS® sexual function and satisfaction measures in patients with cancer, *J. Sex. Med.* 10 (2013) 43–52, <https://doi.org/10.1111/j.1743-6109.2012.02995.x>.
- [69] A.H. Clayton, E.R. Goldfischer, I. Goldstein, L. DeRogatis, D.J. Lewis-D'Agostino, R. Pyke, Validation of the decreased sexual desire screener (DSDS): a brief diagnostic instrument for generalized acquired female hypoactive sexual desire

- disorder (HSDD), *J. Sex. Med.* 6 (2009) 730–738, <https://doi.org/10.1111/j.1743-6109.2008.01153.x>.
- [70] J. Rust, L. Derogatis, C. Rodenberg, P. Koochaki, S. Schmitt, S. Golombok, Development and validation of a new screening tool for hypoactive sexual desire disorder: the brief profile of female sexual function © (B-PFSF ©), *Gynecol. Endocrinol.* 23 (2007) 638–644, <https://doi.org/10.1080/09513590701592306>.
- [71] Memorial Sloan Kettering Cancer Center, About herbs, botanicals & other products, (n.d.). <https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs>.
- [72] H.N. Thomas, R.C. Thurston, A biopsychosocial approach to women's sexual function and dysfunction at midlife: a narrative review, *Maturitas* 87 (2016) 49–60, <https://doi.org/10.1016/j.maturitas.2016.02.009>.
- [73] R. Sood, C.L. Kuhle, J.M. Thielen, E. Kapoor, J.A. Vencill, K.C. Mara, S.S. Faubion, Association of mindfulness with female sexual dysfunction, *Maturitas* 161 (2022) 27–32, <https://doi.org/10.1016/j.maturitas.2022.02.002>.
- [74] S. Palacios, S. Hood, T. Abakah-Phillips, N. Savania, M. Krychman, A randomized trial on the effectiveness and safety of 5 water-based personal lubricants, *J. Sex. Med.* 20 (2023) 498–506, <https://doi.org/10.1093/jsxmed/qdad005>.
- [75] D. Herbenick, M. Reece, D. Hensel, S. Sanders, K. Jozkowski, J.D. Fortenberry, Association of lubricant use with women's sexual pleasure, sexual satisfaction, and genital symptoms: a prospective daily diary study, *J. Sex. Med.* 8 (2011) 202–212, <https://doi.org/10.1111/j.1743-6109.2010.02067.x>.
- [76] S. Damast, D.D. Jeffery, C.H. Son, Y. Hasan, J. Carter, S.T. Lindau, A. Jhingran, Literature review of vaginal stenosis and dilator use in radiation oncology, *Pract. Radiat. Oncol.* 9 (2019) 479–491, <https://doi.org/10.1016/j.prro.2019.07.001>.
- [77] E.S. Rubin, N.A. Deshpande, P.J. Vasquez, S. Kellogg Spadt, A clinical reference guide on sexual devices for obstetrician-gynecologists, *Obstet. Gynecol.* 133 (2019) 1259–1268, <https://doi.org/10.1097/AOG.00000000000003262>.
- [78] S.K. Wilson, J.R. Delk, K.L. Billups, Treating symptoms of female sexual arousal disorder with the eros-clitoral therapy device, *J. Gen. Specif. Med.* 4 (2001) 54–58. <http://www.ncbi.nlm.nih.gov/pubmed/11480099>.
- [79] M. Hickey, R. Baber, J. Eden, J. Brennan, D. Bateson, M. Goldman, H. Rockweiler, D. Dreon, Safety and effectiveness of a novel home-use therapeutic ultrasound device for the treatment of vaginal dryness in postmenopausal women: a pilot study, *Menopause* 30 (2023) 383–392, <https://doi.org/10.1097/GME.0000000000002157>.
- [80] A. Jokar, T. Davari, N. Asadi, F. Ahmadi, S. Foruhari, Comparison of the hyaluronic acid vaginal cream and conjugated estrogen used in treatment of vaginal atrophy of menopause women: a randomized controlled clinical trial, *Int. J. Community Based Nurs. Midwifery* 4 (2016) 69–78. <http://www.ncbi.nlm.nih.gov/pubmed/26793732>.
- [81] E. Mension, I. Alonso, S. Anglès-Acedo, C. Ros, J. Otero, Á. Villarino, R. Farré, A. Saco, N. Vega, N. Castrejón, J. Ordi, N. Rakislova, M. Tortajada, I. Matas, S. Gómez, L. Ribera, C. Castelo-Branco, Effect of fractional carbon dioxide vs sham laser on sexual function in survivors of breast cancer receiving aromatase inhibitors for genitourinary syndrome of menopause: the LIGHT randomized clinical trial, *JAMA Netw. Open* 6 (2023) e2255697, <https://doi.org/10.1001/jamanetworkopen.2022.55697>.
- [82] M. Barba, A. Cola, D. De Vicari, C. Costa, A.P. Castelli, S. Volontè, R. Fruscio, M. Frigerio, Efficacy of a diode vaginal laser in the treatment of the genitourinary syndrome of menopause, *Bioengineering* 10 (2023) 1158, <https://doi.org/10.3390/bioengineering10101158>.
- [83] M. Starzec-Proserpio, M.G. Bardin, M. Morin, Not all lasers are the same: a scoping review evaluating laser therapy for vulvodynia, *Sex. Med. Rev.* 12 (2023) 14–25, <https://doi.org/10.1093/sxmrev/qead039>.
- [84] S. Salvatore, A.F. Ruffolo, C. Phillips, S. Athanasiou, L. Cardozo, M. Serati, Vaginal laser therapy for GSM/VVA: where we stand now – a review by the EUGA working group on laser, *Climacteric* 26 (2023) 336–352, <https://doi.org/10.1080/13697137.2023.2225766>.
- [85] US Food and Drug Administration, Drug safety communications, (2018). <https://www.fda.gov/drugs/drug-safety-and-availability/2018-drug-safety-communications>, 2018.
- [86] C.H. Jorge, C. Bø, C. Chiazuto Catai, L.G. Oliveira Brito, P. Driusso, M. Kolberg Tennfjord, Pelvic floor muscle training as treatment for female sexual dysfunction: a systematic review and meta-analysis, *Am. J. Obstet. Gynecol.* (2024), <https://doi.org/10.1016/j.ajog.2024.01.001>.
- [87] J. Mercier, M. Morin, D. Zaki, B. Reichetzer, M.-C. Lemieux, S. Khalifé, C. Dumoulin, Pelvic floor muscle training as a treatment for genitourinary syndrome of menopause: a single-arm feasibility study, *Maturitas* 125 (2019) 57–62, <https://doi.org/10.1016/j.maturitas.2019.03.002>.
- [88] J. Mercier, M. Morin, A. Tang, B. Reichetzer, M.-C. Lemieux, K. Samir, D. Zaki, F. Gougeon, C. Dumoulin, Pelvic floor muscle training: mechanisms of action for the improvement of genitourinary syndrome of menopause, *Climacteric* 23 (2020) 468–473, <https://doi.org/10.1080/13697137.2020.1724942>.
- [89] A.L. Hirschberg, J. Bitzer, A. Cano, I. Ceausu, P. Chedraui, F. Durmusoglu, R. Erkkola, D.G. Goullis, L. Kiesel, P. Lopes, A. Pines, M. van Trotsenburg, I. Lambrinoudaki, M. Rees, Topical estrogens and non-hormonal preparations for postmenopausal vulvovaginal atrophy: an EMAS clinical guide, *Maturitas* 148 (2021) 55–61, <https://doi.org/10.1016/j.maturitas.2021.04.005>.
- [90] L. McVicker, A.M. Labeit, C.A.C. Coupland, B. Hicks, C. Hughes, Ú. McMenamin, S.A. McIntosh, P. Murchie, C.R. Cardwell, Vaginal estrogen therapy use and survival in females with breast cancer, *JAMA Oncol.* 10 (2024) 103–108, <https://doi.org/10.1001/jamaoncol.2023.4508>.
- [91] H.S. Taylor, A. Tal, L. Pal, F. Li, D.M. Black, E.A. Brinton, M.J. Budoff, M. I. Cedars, W. Du, H.N. Hodis, R.A. Lobo, J.E. Manson, G.R. Merriam, V.M. Miller, F. Naftolin, G. Neal-Perry, N.F. Santoro, S.M. Harman, Effects of oral vs transdermal estrogen therapy on sexual function in early postmenopause, *JAMA Intern. Med.* 177 (2017) 1471, <https://doi.org/10.1001/jamainternmed.2017.3877>.
- [92] P. Briggs, N. Kersey, Possible tachyphylaxis with transdermal therapy, *Post. Reprod. Heal.* 25 (2019) 111–112, <https://doi.org/10.1177/2053369119853123>.
- [93] L.A. Lara, D. Cartagena-Ramos, J.B. Figueiredo, A.C.J. Rosa-e-Silva, R.A. Ferriani, W.P. Martins, M. Fuentealba-Torres, Hormone therapy for sexual function in perimenopausal and postmenopausal women, *Cochrane Database Syst. Rev.* 2023 (2023), <https://doi.org/10.1002/14651858.CD009672.pub3>.
- [94] N. Meziou, C. Scholfield, C.A. Taylor, H.L. Armstrong, Hormone therapy for sexual function in perimenopausal and postmenopausal women: a systematic review and meta-analysis update, *Menopause* 30 (2023) 659–671, <https://doi.org/10.1097/GME.0000000000002185>.
- [95] M. Ghorbani, A. Ashrafzavah, E. Azmoude, Effects of progestin contraceptive methods on sexual function in reproductive age women: a meta-analysis, *J. Psychosom. Obstet. Gynecol.* 42 (2021) 3–14, <https://doi.org/10.1080/0167482X.2020.1725464>.
- [96] S.R. Davis, J. Bitzer, A. Giraldi, S. Palacios, S. Parke, M. Serrani, U. Mellinger, R. E. Nappi, Change to either a nonandrogenic or androgenic progestin-containing Oral contraceptive preparation is associated with improved sexual function in women with Oral contraceptive-associated sexual dysfunction, *J. Sex. Med.* 10 (2013) 3069–3079, <https://doi.org/10.1111/jsm.12310>.
- [97] M.A. Hipolito Rodrigues, A. Gompel, Micronized progesterone, progestins, and menopause hormone therapy, *Women Health* 61 (2021) 3–14, <https://doi.org/10.1080/03630242.2020.1824956>.
- [98] S.R. Davis, R. Baber, N. Panay, J. Bitzer, S.C. Perez, R.M. Islam, A.M. Kaunitz, S. A. Kingsberg, I. Lambrinoudaki, J. Liu, S.J. Parish, J. Pinkerton, J. Rymer, J. A. Simon, L. Vignozzi, M.E. Wierman, Global consensus position statement on the use of testosterone therapy for women, *J. Clin. Endocrinol. Metab.* 104 (2019) 4660–4666, <https://doi.org/10.1210/je.2019-01603>.
- [99] S.J. Parish, J.A. Simon, S.R. Davis, A. Giraldi, I. Goldstein, S.W. Goldstein, N. N. Kim, S.A. Kingsberg, A. Morgentaler, R.E. Nappi, K. Park, C.A. Stuenkel, A. M. Traish, L. Vignozzi, International Society for the study of women's sexual health clinical practice guideline for the use of systemic testosterone for hypoactive sexual desire disorder in women, *Climacteric* 24 (2021) 533–550, <https://doi.org/10.1080/13697137.2021.1891773>.
- [100] J.A. Simon, M.D. Kapner, The Saga of testosterone for menopausal women at the Food and Drug Administration (FDA), *J. Sex. Med.* 17 (2020) 826–829, <https://doi.org/10.1016/j.jsxm.2020.01.009>.
- [101] S.J. Parish, J.A. Simon, S.R. Davis, A. Giraldi, I. Goldstein, S.W. Goldstein, N. N. Kim, S.A. Kingsberg, A. Morgentaler, R.E. Nappi, K. Park, C.A. Stuenkel, A. M. Traish, L. Vignozzi, International Society for the Study of Women's sexual health clinical practice guideline for the use of systemic testosterone for hypoactive sexual desire disorder in women, *J. Sex. Med.* 18 (2021) 849–867, <https://doi.org/10.1016/j.jsxm.2020.10.009>.
- [102] L. Cucinella, E. Martini, L. Tiranimi, F. Battista, P. Molinaro, A. Casiraghi, S. Cominotti, M. Piccinino, R. Rossini, R.E. Nappi, Menopause and female sexual dysfunctions, *Minerva Obstet. Gynecol.* 74 (2022) 234–248, <https://doi.org/10.23736/S2724-606X.22.05001-1>.
- [103] M. Sánchez-Prieto, N. Mendoza, M. López-Sanclemente, N.A. Domínguez-Osorio, F. Lugo, P.R. Duarte, R. Sánchez-Borrego, The effect of tibolone on female sexual function in postmenopausal women: a systematic review, *Maturitas* 173 (2023) 114, <https://doi.org/10.1016/j.maturitas.2023.04.254>.
- [104] M. Panjari, S.R. Davis, DHEA therapy for women: effect on sexual function and wellbeing, *Hum. Reprod. Update* 13 (2007) 239–248, <https://doi.org/10.1093/humupd/dml055>.
- [105] M. Panjari, S.R. Davis, DHEA for postmenopausal women: a review of the evidence, *Maturitas* 66 (2010) 172–179, <https://doi.org/10.1016/j.maturitas.2009.12.017>.
- [106] F. Labrie, D.F. Archer, W. Koltun, A. Vachon, D. Young, L. Frenette, D. Portman, M. Montesino, I. Côté, J. Parent, L. Lavoie, A. Beauregard, C. Martel, M. Vaillancourt, J. Balsler, É. Moynour, Efficacy of intravaginal dehydroepiandrosterone (DHEA) on moderate to severe dyspareunia and vaginal dryness, symptoms of vulvovaginal atrophy, and of the genitourinary syndrome of menopause, *Menopause* 23 (2016) 243–256, <https://doi.org/10.1097/GME.0000000000000571>.
- [107] T. Elriayah, M.B. Sonbol, Z. Wang, T. Khairalseed, N. Asi, C. Undavalli, M. Nabhan, O. Altayar, L. Prokop, V.M. Montori, M.H. Murad, The benefits and harms of systemic Dehydroepiandrosterone (DHEA) in postmenopausal women with Normal adrenal function: a systematic review and Meta-analysis, *J. Clin. Endocrinol. Metab.* 99 (2014) 3536–3542, <https://doi.org/10.1210/jc.2014-2261>.
- [108] F. Labrie, L. Derogatis, D.F. Archer, W. Koltun, A. Vachon, D. Young, L. Frenette, D. Portman, M. Montesino, I. Côté, J. Parent, L. Lavoie, A. Beauregard, C. Martel, M. Vaillancourt, J. Balsler, É. Moynour, Effect of intravaginal prasterone on sexual dysfunction in postmenopausal women with vulvovaginal atrophy, *J. Sex. Med.* 12 (2015) 2401–2412, <https://doi.org/10.1111/jsm.13045>.
- [109] J.J. Shin, S.K. Kim, J.R. Lee, C.S. Suh, Ospemifene: a novel option for the treatment of vulvovaginal atrophy, *J. Menopausal Med.* 23 (2017) 79, <https://doi.org/10.6118/jmm.2017.23.2.79>.
- [110] J.A. Simon, A. Ferenczy, D. Black, A. Castonguay, C. Royer, R. Marouf, C. Beauchemin, Efficacy, tolerability, and endometrial safety of ospemifene compared with current therapies for the treatment of vulvovaginal atrophy: a systematic literature review and network meta-analysis, *Menopause* 30 (2023) 855–866, <https://doi.org/10.1097/GME.0000000000002211>.

- [111] B. Cai, J. Simon, P. Villa, N. Biglia, N. Panay, S. Djumaeva, M. Particco, H. Kanakamedala, C. Altomare, No increase in incidence or risk of recurrence of breast cancer in ospemifene-treated patients with vulvovaginal atrophy (VVA), *Maturitas* 142 (2020) 38–44, <https://doi.org/10.1016/j.maturitas.2020.06.021>.
- [112] J.A. Simon, A.H. Clayton, N.N. Kim, S. Patel, Clinically meaningful benefit in women with hypoactive sexual desire disorder treated with flibanserin, *Sex. Med.* 10 (2022) 100476, <https://doi.org/10.1016/j.esxm.2021.100476>.
- [113] US Food and Drug Administration, ADDYI (flibanserin) tablets for oral use-initial U.S. Approval: 2015. [https://www.accessdata.fda.gov/drugsatfda\\_docs/lab/2015.www.fda.gov/medwatch](https://www.accessdata.fda.gov/drugsatfda_docs/lab/2015.www.fda.gov/medwatch).
- [114] FDA, Highlights of Prescribing Information - Vyleesi (Bremelanotide Injection), for Subcutaneous Use, 2019, pp. 1–17. [www.fda.gov/medwatch](http://www.fda.gov/medwatch).
- [115] S.P. Benjamin, M. Babos, Sildenafil, *StatPearls*, 2023. <https://www.ncbi.nlm.nih.gov/books/NBK558978/>.
- [116] A. Tuiten, K. van Rooij, J. Bloemers, C. Eisenegger, J. van Honk, R. Kessels, S. Kingsberg, L.R. Derogatis, L. de Leede, J. Gerritsen, H.P.F. Koppeschaar, B. Olivier, W. Everaerd, H.W. Frijlink, D. Höhle, R.P.J. de Lange, K.B.E. Böcker, J. G. Pfaus, Efficacy and safety of on-demand use of 2 treatments designed for different etiologies of female sexual interest/arousal disorder: 3 randomized clinical trials, *J. Sex. Med.* 15 (2018) 201–216, <https://doi.org/10.1016/j.jsxm.2017.11.226>.
- [117] M.J. Taylor, L. Rudkin, P. Bullemor-Day, J. Lubin, C. Chukwujekwu, K. Hawton, Strategies for managing sexual dysfunction induced by antidepressant medication, *Cochrane Database Syst. Rev.* (2013), <https://doi.org/10.1002/14651858.CD003382.pub3>.
- [118] M.R. Safarinejad, Reversal of SSRI-induced female sexual dysfunction by adjunctive bupropion in menstruating women: a double-blind, placebo-controlled and randomized study, *J. Psychopharmacol.* 25 (2011) 370–378, <https://doi.org/10.1177/0269881109351966>.
- [119] M. Asadi, H. Riazzi, M. Abbasnazari, H.A. Majd, A. Montazeri, Effect of folic acid on the sexual function of postmenopausal women: a triple-blind randomized controlled trial, *J. Sex. Med.* 20 (2023) 1180–1187, <https://doi.org/10.1093/jsxmed/qdad086>.
- [120] A. Moussa, K.U. Moberg, E. Elgrahy, M. Elsayied, M. Abdel-Rasheed, M. Farouk, H. Saad, H. Meshaal, Effect of topical oxytocin gel on vaginal mucosa in postmenopausal Egyptian women: a clinical randomized trial, *J. Sex. Med.* 20 (2023) 177–183, <https://doi.org/10.1093/jsxmed/qdac021>.
- [121] Z. Sarebani, V. Chegini, H. Chen, E. Aali, M. Mirzadeh, M. Abbaspour, M. D. Griffiths, Z. Alimoradi, Effect of vitamin D vaginal suppository on sexual functioning among postmenopausal women: a three-arm randomized controlled clinical trial, *Obstet. Gynecol. Sci.* 66 (2023) 208–220, <https://doi.org/10.5468/ogs.22038>.
- [122] A. El Hajj, N. Wardy, S. Haidar, D. Bourgi, M. El Haddad, D. El Chammas, N. El Osta, L. Rabbaa Khabbaz, T. Papazian, Menopausal symptoms, physical activity level and quality of life of women living in the Mediterranean region, *PLoS One* 15 (2020) e0230515, <https://doi.org/10.1371/journal.pone.0230515>.
- [123] A. Giraldi, R.E. Nappi, S. Palacios, Y. Reisman, E.A. Jannini, From couplepause to doublepause: the impact of midlife physical, psychological, and social changes on the sexual life of aging couples, *Sex. Med. Rev.* (2024), <https://doi.org/10.1093/sxmrev/qaee016>.
- [124] Faculty of Sexual & Reproductive Healthcare, FSRH guideline: contraception for women aged over 40 years, *Fac. Sex. Reprod. Healthc.* 2017 (2022). <https://www.fsrh.org/documents/fsrh-guidance-contraception-for-women-aged-over-40-years-2017/>.
- [125] M. Stowell, A. Hall, S. Warwick, C. Richmond, C.H. Eastaugh, B. Hanratty, J. McDermott, D. Craig, G.F. Spiers, Promoting sexual health in older adults: findings from two rapid reviews, *Maturitas* 177 (2023) 107795, <https://doi.org/10.1016/j.maturitas.2023.107795>.
- [126] WHO, Sexually transmitted infections (STIs). [https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-\(stis\)?gclid=EAlaIqobChMlgnXZrbCigQMVitXtCh1ZBAIFEAAYASAAEgLmbvD\\_BwE,2023](https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis)?gclid=EAlaIqobChMlgnXZrbCigQMVitXtCh1ZBAIFEAAYASAAEgLmbvD_BwE,2023) (accessed July 10, 2023).
- [127] A. Hazra, M.W. Collison, A.M. Davis, CDC sexually transmitted infections treatment guidelines, 2021, *JAMA* 327 (2022) 870, <https://doi.org/10.1001/jama.2022.1246>.
- [128] C. Anderson, Menopause and the ‘menoboom’: how older women are desexualised by culture, in: *Desexualisation Later Life*, Policy Press, 2021, pp. 77–94, <https://doi.org/10.1332/policypress/9781447355465.003.0005>.
- [129] T. Hafford-Letchfield, The role of professionals and service providers in supporting sexuality and intimacy in later life: theoretical and practice perspectives, in: P. Simpson, P. Reynolds, T. Hafford-Letchfield (Eds.), *Desexualisation Later Life Limits Sex Intim*, 2021, pp. 191–210, <https://doi.org/10.56687/9781447355489-014>.
- [130] P. Simpson, M. Horne, L.J.E. Brown, C.B. Wilson, T. Dickinson, K. Torkington, Old (er) care home residents and sexual/intimate citizenship, *Ageing Soc.* 37 (2017) 243–265, <https://doi.org/10.1017/S0144686X15001105>.
- [131] T.L. Gendron, E.A. Welleford, J. Inker, J.T. White, The language of ageism: why we need to use words carefully, *Gerontologist* 56 (2016) 997–1006, <https://doi.org/10.1093/geront/gnv066>.
- [132] L. Roney, M.W. Kazer, Geriatric sexual experiences: the seniors tell all, *Appl. Nurs. Res.* 28 (2015) 254–256, <https://doi.org/10.1016/j.apnr.2015.04.005>.
- [133] S.T. Lindau, L.P. Schumm, E.O. Laumann, W. Levinson, C.A. O’Muircheartaigh, L. J. Waite, A study of sexuality and health among older adults in the United States, *N. Engl. J. Med.* 357 (2007) 762–774, <https://doi.org/10.1056/NEJMoa067423>.
- [134] P. Willis, T. Hafford-Letchfield, Sexual wellbeing and rights in later life: developing an affirmative approach to older adult’s sexual agency. *Critical Gerontology for Social Workers*, 2022, pp. 1–22. <https://pureportal.strath.ac.uk/en/publications/sexual-wellbeing-and-rights-in-later-life-developing-an-affirmative-approach-to-older-adults-sexual-agency>.
- [135] S. Hinchliff, M. Gott, E. Galena, “I daresay I might find it embarrassing”: general practitioners’ perspectives on discussing sexual health issues with lesbian and gay patients, *Health Soc. Care Community* 13 (2005) 345–353, <https://doi.org/10.1111/j.1365-2524.2005.00566.x>.
- [136] N. Holmes, L.B. Beach, Bisexual People’s utilization of sexual health services at an LGBTQ Community Center in Chicago, *J. Bisex.* 20 (2020) 342–359, <https://doi.org/10.1080/15299716.2020.1825270>.
- [137] A. Taylor, M.A. Gosney, Sexuality in older age: essential considerations for healthcare professionals, *Age Ageing* 40 (2011) 538–543, <https://doi.org/10.1093/ageing/afr049>.
- [138] Skills for Care, (LGBTQ+) Care in Later Life A learning framework for knowledge, skills, values for working affirmatively with LGBTQ+ people in later life., Leeds. <https://www.skillsforcare.org.uk/resources/documents/Support-for-leaders-and-managers/Supporting-a-diverse-workforce/LGBTQ-framework/LGBTQ-learning-framework.pdf>, 2023.
- [139] National Institute for Health and Care Excellence, Dementia: assessment, management and support for people living with dementia and their carers, *NICE Guidel.* (2018) 2–43. [www.nice.org.uk/guidance/ng97](http://www.nice.org.uk/guidance/ng97).
- [140] A. Higgins, G. Hynes, Sexuality and intimacy, in: *Textb. Palliat. Care*, Springer, Switzerland, 2018, pp. 1–21. [https://link.springer.com/referenceworkentry/10.1007/978-3-319-77740-5\\_40](https://link.springer.com/referenceworkentry/10.1007/978-3-319-77740-5_40).
- [141] M.J. Redelman, Is there a place for sexuality in the holistic care of patients in the palliative care phase of life? *Am. J. Hosp. Palliat. Med.* 25 (2008) 366–371, <https://doi.org/10.1177/1049909108318569>.
- [142] E. Hjalmarsson, M. Lindroth, “To live until you die could actually include being intimate and having sex”: a focus group study on nurses’ experiences of their work with sexuality in palliative care, *J. Clin. Nurs.* 29 (2020) 2979–2990, <https://doi.org/10.1111/jocn.15303>.