ARTICLE TITLE: Physical Examination of the Female Cancer Patient With Sexual Concerns: What Oncologists and Patients Should Expect From Consultation With a Specialist

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After reading the article “Physical Examination of the Female Cancer Patient With Sexual Concerns: What Oncologists and Patients Should Expect From Consultation With a Specialist,” the learner should be able to:
1. Review aspects of the physical examination of the female cancer patient with sexual concerns
2. Describe the specialist expertise needed when referring patients for treatment of female patients with cancer and sexual function concerns
3. Interpret specialist findings and recommendations when communicating with female cancer patients

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Examination of Women With CA and Sexual Concerns

Physical Examination of the Female Cancer Patient With Sexual Concerns: What Oncologists and Patients Should Expect From Consultation With a Specialist

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Sexual concerns are prevalent in women with cancer or cancer history and are a factor in patient decision making about cancer treatment and risk-reduction options. Physical examination of the female cancer patient with sexual concerns, regardless of the type or site of her cancer, is an essential and early component of a comprehensive evaluation and effective treatment plan. Specialized practices are emerging that focus specifically on evaluation and treatment of women with cancer and sexual function problems. As part of a specialized evaluation, oncologists and their patients should expect a thorough physical examination to identify or rule out physical causes of sexual problems or dysfunction. This review provides oncology professionals with a description of the physical examination of the female cancer patient with sexual function concerns. This description aims to inform anticipatory guidance for the patient and to assist in interpreting specialists’ findings and recommendations. In centers or regions where specialized care is not yet available, this review can also be used by oncology practices to educate and support health care providers interested in expanding their practices to treat women with cancer and sexual function concerns. CA Cancer J Clin 2016;66:241-263. © 2016 American Cancer Society.

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Introduction

Sexual function concerns are prevalent in women with cancer or cancer history and are a factor in patient decision making about cancer treatment and risk-reduction options. Several cancer programs in the United States, Canada, Europe, and Australia have opened specialized clinical practices that focus specifically on evaluation and treatment of females with cancer and sexual concerns. With the emergence of new treatment options for female sexual dysfunction, patients are likely to ask their oncology providers about this aspect of their health. As part of a referral for specialized evaluation, oncologists and their patients should expect a thorough physical examination to identify or rule out physical causes of sexual problems or dysfunction.

Female sexual function concerns commonly present with physical, psychological, and interpersonal components. While the majority of women presenting for sexual concerns after cancer have breast or gynecologic cancer types, reflecting overall cancer prevalence and survival rates, sexual concerns are common among patients with other cancer types as well. Common sexual concerns seen among these patients include those associated with iatrogenic menopause and estrogen-deprivation therapy: severe vaginal dryness, painful intercourse, difficulty with arousal and orgasm, and diminished or low libido. Body image changes and loss of breast or genital erogenous sensation or sexual pleasure are also common, including among women without, but at elevated risk of, cancer who elect to undergo prophylactic mastectomy with immediate reconstruction. Genital radiation changes, ostomy, diarrhea, and stool or flatus incontinence can impair sexual function in women with colorectal cancer. Pain with kissing, dry mouth, and loss of smell and taste can interfere with sexual function in women with head and neck cancer. Graft-versus-host disease (GVHD) can manifest genitally in women who undergo bone marrow or peripheral blood stem cell transplantation for hematologic cancers and cause severe, chronic discomfort in addition to painful intercourse. Fatigue, disordered sleep, anxiety, depression, relationship strain, and partner sexual problems are also common cofactors in women with cancer.

Systematic physical examination of the female cancer patient with sexual concerns, regardless of the type or site of her cancer, is an essential and early component of a comprehensive evaluation and effective treatment plan. Evaluation without physical examination can result in misdiagnosis and failed treatment of sexual function problems. This review provides oncology professionals with a description of the physical examination of the female cancer patient with sexual function concerns. This description aims to inform anticipatory guidance for the patient and to assist in interpreting specialists’ findings and recommendations. In centers or regions where specialized care is not yet available, this review can be used by oncology practices to educate and support health care providers interested in expanding their practices to treat women with cancer and sexual function concerns.

Building the Evidence Base for the Systematic Physical Examination of Females With Cancer and Sexual Function Concerns

Although it is essential to patient care, no standard practice for physical examination of the female with cancer and sexual function concerns has been established, and the literature is sparse on this specific topic. The Scientific Network on Female Sexual Health and Cancer (the Network) was created as an interdisciplinary cooperative group in 2009 that includes behavioral and mental health professionals, educators, nurses, patients, physical therapists, physicians and surgeons (including medical, surgical, gynecologic, and radiation oncologists), and allied professionals working in the field to accelerate the evidence base and improve the consistency and quality of care for this patient population. The Network complements the important work of other groups, with which many Network members are also affiliated (Table 1). Oncologists who refer to or seek to support the development of a specialized practice for cancer and female sexuality can find assistance and education from these organizations and should expect specialists in the field to be affiliated with one or more of these or similar professional groups.

This review by an interdisciplinary subgroup of Network members draws on the best available literature about physical examination of females with cancer and women with sexual function concerns. Review elements, adapted from the Cochrane review framework, were operationally defined to guide the literature search by content experts in each area of the physical examination (Table 2). Given the dearth of literature specifically on this topic, expert opinion was solicited from Network members via a brief Web-based survey (administered and received in advance of the Network’s September 2013 meeting) and a plenary session at the 2013 annual Network meeting. The survey elicited information about physical examination practices across a diversity of providers (N = 34) and practices and, to our knowledge, is the only such survey to be fielded on this topic (Fig. 1). A plenary session was held to share the Web survey results and gain additional input on two key questions: 1) Should a physical examination be performed on all patients with cancer or cancer history who present with sexual concerns; and 2) what are the essential examination elements? Characteristics of respondents generally reflected the disciplinary and geographic diversity of the Network membership at the time of the survey. Data collected from the Web-based survey and feedback from the Network...
conference were used to complement findings from the review of literature. The survey was administered by the Lindau Laboratory at the University of Chicago and was deemed exempt by the University of Chicago Institutional Review Board.

What Referring Oncologists and Patients Should Expect From Physical Evaluation for Sexual Function Concerns

Who Should Have a Physical Examination?

Attendees of the 2013 Network meeting unanimously agreed that a directed and age-appropriate, systematic physical examination is necessary to establish virtually every patient’s treatment plan. No literature was found to counter this opinion. The general exception identified was the rare case in which, in the specialist’s judgment, the risks of examination clearly outweigh the benefits. It is also appropriate for the specialist to forgo or delay the internal gynecologic component of the examination of an adolescent patient (as described in further detail below) or in cases where the patient makes informed refusal, cannot tolerate the examination, or is near the end of life.

Who Should Perform a Physical Examination?

Patient-centered oncology practice includes brief assessment in the domain of sexual function. When these issues arise, oncology providers will typically refer to a collaborating provider rather than perform comprehensive evaluation and treatment. In some oncology settings (e.g., the MD Anderson radiation oncology practice and the University of Wisconsin Carbone Cancer Center), the physical examination component of specialized care for sexual concerns is performed by advanced practice nurses or physician assistants on the oncology team.

Thorough evaluation of the female patient with cancer and sexual function concerns should include a comprehensive physical examination by a provider with expertise in genitopelvic examination skills, knowledge of cancer pathophysiology, and ability to collaborate with the patient’s treating oncologist. Although cancer surveillance is not the primary focus of most sexual medicine specialists, providers performing physical examination in this patient population should be competent to identify and refer for findings suggestive of malignancy. Female patients with cancer and sexual concerns often times self-refer for specialized care rather than raise the issue with the oncology team. Depending in part on the availability of local services and the timing and nature of her concerns, the patient may present to a physician, advanced practice nurse, or other provider from among a wide diversity of disciplines, such as gynecology, physical

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therapy, primary or survivorship care, psychology or social work, or dermatology. By proactively screening for sexual function concerns, oncologists can direct their patients in need of specialized care and maintain a high standard of coordination with this aspect of the patient’s care.

Coordinating the Specialized Evaluation for Sexual Function Concerns With Other Aspects of Cancer or Survivorship Care

Across the continuum of cancer and survivorship care, chronic medical conditions and routine health maintenance should be addressed before initiating specialized care for female sexual concerns. In some settings, the same provider may be responsible for both aspects of the patient’s care. Ideally, the patient and specialist will work collaboratively with both primary care and oncology to affect a treatment plan to align with the patient’s other health needs. Specialists are best positioned to efficiently evaluate and treat this patient population when the following care coordination elements are in place.

Patients in Active Cancer Care

1. Female patients with cancer should be informed by the oncology care team about potential short-term and long-term side effects of cancer treatment, including the possibility of sexual function problems. 53,59,60

2. Female patients with cancer should be in the care of a treating oncology provider, including a hospice or palliative care provider, who is available to the specialist for consultation and care coordination.

3. Patients undergoing pelvic radiation should be educated by the radiation oncology team before initiating treatment about the possible effects of radiation on vaginal capacity for penetration (eg, for vaginal speculum or digital examination or for transvaginal ultrasound) and sexual function. A rationale and plan for vaginal dilation should be discussed. 60-63 Baseline vaginal capacity and sexual function should be objectively assessed (discussed below) and communicated to the patient before initiating treatment. If it is not addressed before treatment, then patients should be seen after the acute vulvar/perineal/perianal inflammatory phase resolves to initiate a vaginal dilation plan and address other sexual function and vaginal capacity concerns.

Patients in Survivorship Care

After cancer treatment is complete, a female with a history of cancer should be in the care of a clinical provider who is attuned to cancer survivorship guidelines and available to the specialist for consultation and care coordination.

1. Untreated, chronic medical conditions and late effects of cancer treatment may be the cause of sexual concerns and should be addressed before specialized evaluation for such concerns.
2. Gynecologic conditions, such as abnormal uterine bleeding or a pelvic mass, may be the cause of, and should be addressed before specialized evaluation for, sexual concerns.

**General Health Screenings**

The patient should be current on appropriate health screenings (eg, mammogram, pelvic examination, cervical cancer screening, colonoscopy, bone mineral density test) as abnormalities in these areas could influence the management of sexual function concerns, especially the use of hormone therapies.

**Overview of the Specialized Clinical Encounter for Evaluating Female Sexual Concerns in the Context of Cancer or Cancer History**

Thorough assessment of the female with cancer and sexual concerns typically begins with a clinical intake survey that the patient self-completes. To our knowledge, no standard intake survey has been published; in our own practices, the intake survey for this patient population covers: 1) past medical, reproductive, and surgical history, including cancer and treatment history, injuries, menstrual/ menopause status, mental health, status of screening, and routine health maintenance; 2) medications and allergies; 3) review of systems, including sexual concerns and function; 4) partner status and partner health and sexual function; 5) family medical history; 6) history of abuse (physical, emotional, psychological, sexual); 7) nutrition, exercise, sleep, substance use, and other health behaviors; 8) screening for anxiety and depression; and 9) referring, primary, and oncology provider contact information.

**Patient Self-Report of Symptoms**

Patient-reported symptoms, such as altered mood, disrupted sleep, and disturbed thought content, are included in review of systems and a comprehensive psychosocial history. Depression and anxiety are prevalent and often go untreated in this patient population. Mood and anxiety can be further assessed using standardized self-report measures, such as the Hospital Anxiety and Depression Scale (HADS), a brief, 14-item self-report questionnaire used with cancer patients as a screening tool.

**Baseline Assessment of Sexual Function**

Baseline assessments of partnership, gender, identity/orientation, sexual activity, sexual behavior, sexual function and related distress, relationship quality, and sexual abuse and trauma are imperative. The literature offers several self-report tools that are variably used by clinicians for baseline and serial assessment of sexual function in women with cancer. Although they were beyond the scope of this review, these tools have been very capably reviewed by Jeffrey et al and Flynn and colleagues in the development of the National Cancer Institute Patient-Reported Outcomes Measurement Information System (PROMIS) Sexual Function and Satisfaction Measures. Findings from the systematic physical examination should be combined with information elicited from history-taking and patient self-report to provide a full assessment of sexual functioning and concerns.

**The Comprehensive Physical Examination**

**Purpose of the Physical Examination**

The routine gynecologic examination performed in the general gynecology or the gynecology oncology setting typically does not include all of the elements needed to thoroughly assess a patient with sexual function concerns. The purpose of physical examination in female patients with cancer or cancer history and sexual function concerns is to identify and inform the patient of normal and abnormal findings and to determine the salience of these findings to the patient’s presenting symptoms. Patients commonly present with little or no information about sexual side effects of treatment and with ideas or fears about post-cancer changes to their internal and external genital anatomy. In our practices, many female patients report that they have never “looked down there,” or that they have tried, but encountered physical or emotional difficulty.

**Elements of the Physical Examination**

The following core elements are performed as part of the routine, age-appropriate, systematic physical examination of female patients with cancer or cancer history who are seeking care for sexual function concerns. An expanded examination may be necessary, depending on the patient’s presentation, cancer type, and clinician judgment. While findings may differ across the cancer care and survivorship continuum, the examination elements are the same. In our experiences, the specialized physical examination for a new patient, using the steps described below, typically takes 10 to 12 minutes to complete. The order of steps in the physical examination may vary by provider. For example, the physical therapist commonly begins with the general musculoskeletal examination, because this information can be used to inform the specialized assessment of the pelvic floor. With the adult patient, the gynecologist typically begins with the genitopelvic examination. There is no evidence to suggest general benefit of one examination order or another. Table 3 presents detailed, descriptive terms for documenting physical examination findings pertinent to female sexual function by anatomic location.

To ensure patient safety and comfort, in general, a medical chaperone is present if requested by either the adult patient or the clinician and should be routine for
| ANATOMIC SITE | FINDINGS AND DESCRIPTORS* | INSPECTION | PALPATION | SPECIALIZED TESTING |
|---------------|--------------------------|------------|-----------|-------------------|
| Vulvovaginal examination | | | | |
| Inguinal canal | Mass | Small, mobile, nontender lymph nodes, symmetrical | Firm, enlarged, tender lymph nodes; edema; hernia; lymphocyst | |
| Mons pubis | Presence of pubic hair covering mons, labia majora; adolescents, note Tanner stage | Decreased, sparse, or absent pubic hair due to treatment or personal alteration; radiation changes such as edema (pitting/nonpitting, location); tattoos and/or genital piercing; pigmented lesions, rash, or other skin changes | No lesions, tenderness or masses | Presence of lesions, tenderness, or masses |
| Labia majora | Note abnormal size or symmetry of structures; presence of agglutination, atrophy, edema, erosions, erythema, fissures, granulation, excoriation, laceration, fissures, inflammation, lesions, reticulated leukokeratosis, scars, ulceration, or nodules; urethral caruncle, prolapse, pallor; | No lesions, tenderness, or masses | Presence of lesions, tenderness, or masses; urethral or periurethral glandular discharge | Culture any discharge exuded from palpation of paravaginal glands, periurethral glands, urethra |
| Labia minora, interlabial sulcus folds | Normal size, symmetry | | | |
| Bartholin glands | Presence and size of Bartholin gland cyst | No discharge, erythema, swelling, or tenderness | Presence of discharge, erythema, swelling, or tenderness | |
| Clitoris | Size typically 1.5-2 cm long by <0.5 cm wide; pink color | Agglutination or phimosis, clitoromegaly, pigmented, or other lesions | Sensation to pressure | Absence of sensation; tenderness | Hormonal and radiologic testing for clitoromegaly (Horejsi 1997<sup>88</sup>) |
| Perineum | Note abnormal size or symmetry of structures; presence of agglutination, atrophy, edema, granulation, excoriation, laceration, fissures, inflammation, lesions, scars, ulceration, or nodules; urethral caruncle, prolapse, pallor | No lesions, tenderness, or masses | Presence of lesions, tenderness, or masses; urethral or periurethral glandular discharge | Culture any discharge exuded from palpation of paravaginal glands, periurethral glands, urethra |
| Vestibuule | Pink, glistening | Erythema, pallor, fissures, lesions | No lesions, tenderness or masses | Presence of lesions, tenderness, or masses | Cotton swab test— vulvar pain mapping (Kort 2014<sup>89</sup>, Vardi 2000<sup>90</sup>) |
| Vaginal opening (introitus) | Normal size, nonmalodorous physiologic discharge, rugae visible | Presence of agglutination, atrophy,<sup>6</sup> bleeding, contraction, dehiscence, discharge, dryness, erythema,<sup>4</sup> pallor, scarring, stenosis, or telangiectasia; note relaxed introitus or bulge from rectocele, cystocele, or vaginal vault prolapse | Easily insert one or two fingers without pain | Adhesions, atrophy, dryness, fibrosis, inelasticity, scarring, or stenosis | Graduated vaginal dilator examination as described in text |
| Urethral meatus | Normal size, symmetry | Note abnormal size or symmetry of structures; presence of agglutination, atrophy, edema, granulation, excoriation, laceration, fissures, inflammation, lesions, scars, ulceration, or nodules; urethral caruncle, prolapse, pallor | No lesions, tenderness, or masses | Presence of lesions, tenderness, or masses; urethral or periurethral glandular discharge | Culture any discharge exuded from palpation of paravaginal glands, periurethral glands, urethra |
**TABLE 3. Continued**

| **ANATOMIC SITE** | **FINDINGS AND DESCRIPTORS** | **NORMAL** | **CHANGES** | **NORMAL** | **CHANGES** | **SPECIALIZED TESTING** |
|-------------------|-----------------------------|------------|-------------|------------|-------------|------------------------|
| **Skene glands**  | SMALL, ~1 mm, pink orifice inferior and lateral to urethral meatus | Presence and size of Skene gland cyst (rare) | No discharge, erythema, swelling, or tenderness | Presence of discharge, erythema, swelling or tenderness |  |
| **Urethra**       | Normal size, symmetry | Note abnormal size or symmetry of structures; presence of agglutination, atrophy, edema, granulation, excoriation, laceration, fissures, inflammation, lesions, scars, ulceration, or nodules; urethral caruncle, prolapse, pallor | No lesions, tenderness or masses | Presence of lesions, tenderness, or masses; urethral or periurethral glandular discharge | Culture any discharge exuded from palpation of paravaginal glands, periurethral glands, urethra |
| **Bladder**       | Nontender | | | | |
| **Vagina**        | Pink, rugae, physiologic discharge; nonmalodorous; 6-7 cm vaginal length; if hysterectomy, cuff intact | Agglutination, ecchymoses, abnormal discharge, decreased or absent rugae, fibrosis, granulation tissue, hematocolpos, laxity, masses, pallor, scarring, stenosis | Elastic, nontender, lubricated, rugated | Dry, hematocolpos, inelastic, nodular, tender | Vaginal pH test; KOH and saline wet prep test for BV, yeast, trichomonas; can also use wet prep to visualize superficial epithelial cells, which will be rare to absent in atrophic vaginitis; Pelvic Organ Prolapse Quantification (POP-Q) to assess pelvic organ prolapse (Bump 1996[a]) |
| **Vaginal mucosa**| Present or absent; ectropion size; nabothian cyst size, location | Bleeding, discharge, masses, nodules, scarring, ulceration | No cervical motion, tenderness; uniform, "cartilaginous" feel | Cervical motion tenderness, fibrosis, firmness, tenderness, nodularity | Screening for gonorrhea/Chlamydia; screening Pap/HPV if indicated and in sync with primary care |
| **Vaginal walls** | 6-wk size or smaller, mobile, well supported | Small, may not be palpable; mobile |  |
| **Cervix**        | | | | | |
| **Uterus**        | 6-wk size or smaller, mobile, well supported | Hematometra, mass, nodule(s), uterine prolapse, uterine or adnexal tenderness, fixed or firm adnexae |  |
| **Adnexa**        | | | | | |
| **Pelvic floor examination** | Ability to contract muscles and/or relax after contraction; able to bear down, observed as a slight bulging of the perineum | Vulva drawing in, gaping of the perineum | Presence of muscle tension or laxity at rest; inability to contract muscles and/or relax after contraction; inability to bear down | | Modified Oxford scale used to assess pelvic muscle strength and endurance and assign degree of muscle contraction around practitioner’s finger (Laycock & Jerwood 2001[b]) |
| **Perineum, vulva**| Bilateral muscle strength, length, tone, coordination, and symmetry | Hypertonicity, tenderness (note quality of pain, e.g. burning, stinging, sharp, etc.) or tension |  | | |

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| ANATOMIC SITE | NORMAL | CHANGES | NORMAL | CHANGES | SPECIALIZED TESTING |
|---------------|--------|---------|--------|---------|---------------------|
| Pelvic floor (levator) muscles | | | | | |
| Obturator internus muscles | | | | | |
| Urogenital diaphragm | | | | | |
| Rectovaginal examination | | | | | |
| Anus/rectum | Healthy appearing perianal skin | | Patulous anus, anal fissure, anal scarring/fibrosis, external/internal hemorrhoid, excoriation, incontinent stool, perianal abscess; radiation changes to the skin, such as edema (pitting/nonpitting), erythema, hypo- or hyperpigmentation or texture (thick/thin, rough/smooth, dry) | Normal anorectal tone; anal wink reflex; grossly heme-negative stool | Induration, irregularities, or nodules, especially along uterosacral ligaments; abnormal anorectal/resting and/or squeeze pressure, palpable lesion, anorectal stenosis, tenderness, changes to skin texture (thick/thin, rough/smooth, dry) | Anoscopy |
| Rectovaginal septum | | | No evidence of masses, nodules, swelling, tenderness | Presence of masses, nodules, swelling, tenderness, or thickness | |
| Abdominal examination | | | | | |
| Abdomen | Presence of hernias, obesity, ostomies, scars or skin changes; radiation changes to the skin such as edema (pitting/nonpitting), erythema, hypo- or hyperpigmentation or texture (thick/thin, rough/smooth, dry) | Soft, nontender | Edema (pitting/nonpitting), changes to skin texture (thick/thin, rough/smooth, dry); hepatomegaly, splenomegaly, scars, tenderness, rebound, guarding; suprapubic tenderness or scarring | |
| Functional breast examination | | | | | |
| Breast | Normal size and symmetry; no dimpling, flattening, masses, changes to the skin, such as in color or thickening of the skin or pores; Adolescents, note Tanner stage | Presence of breast asymmetry,\(^a\) capsular contracture (around expander or implant), discoloration (of skin or donor flap), dry/moist desquamation, edema, erythema, fibrosis, hyperpigmentation, induration, lesions, masses, scarring (including hypertrophic or keloid scars), or telangiectasia | Appropriate fullness, nontender | Disproportionate or asymmetrical fullness, fibrosis, hyperesthesia, induration, lesions, masses, seroma, or tenderness | |
| Nipples | Normal size and shape | Absence of native nipple,\(^1\) presence of asymmetry, contraction, flattening or retraction in reconstructed nipple, any discharge, ulceration | | Presence of discharge, loss of elasticity | |
| Axilla | Smooth, no scarring or dimpling | Mass, scarring, cording, dimpling; radiation changes to the skin such as edema (pitting/nonpitting), erythema, hypopigmentation or hyperpigmentation, or texture (thick/thin, rough/smooth, dry) | No palpable lymph nodes, no masses, nontender | Palpable lymph nodes, masses, tender | |
TABLE 3. Continued

| ANATOMIC SITE                          | FINDINGS AND DESCRIPTORS* |
|----------------------------------------|---------------------------|
| **Lymph nodes (axillary, supraclavicular)** |                           |
| Normal size and shape                   | Full range of motion      |
| Enlarged, tender, fixed, firm lymph node(s) | Lymphedema can be quantified by measuring the circumference of arm at midpoint, cubital fossa, and midforearm |

BV, bacterial vaginosis; KOH and saline prep, potassium hydroxide and saline preparation; HPV, human papillomavirus; Pap, Papanicolaou. *Darkly shaded cells indicate where an element is not applicable or specialized testing for sexual function is not needed or available. These structures may be surgically absent; the clitoris may be diminished in size, and the glans may not be visible, even with retraction of the clitoral hood, in women on aromatase inhibitors. See Figure 4a. See Figure 4b. See Figure 4c. Auscultation of the abdomen is also recommended to assess for normal bowel sounds. This includes mastectomy, mastectomy with implant reconstruction, and mastectomy with autologous tissue reconstruction with or without a flap. See Figure 4d. See Figure 4e.

The examination of the adolescent. The patient may request that her partner be present during the physical examination; her preference should be accommodated, if possible. As a routine practice, the adolescent or adult patient is given the opportunity for private consultation with the clinician during each encounter. In addition, if the examiner and the patient do not speak the same language, a medical interpreter must be engaged to ensure patient consent, bidirectional communication, and therapeutic benefit of the encounter. In some settings, with appropriate planning, medical interpretation can be provided by phone. The benefits of having an interpreter present during the physical examination, including an ad hoc interpreter such as a partner or bilingual staff member, must outweigh the risks, including patient discomfort and the potential for miscommunication. Referring oncologists can help streamline care by ensuring the specialist is aware in advance of translation or other communication needs.

The following examination elements are performed always with patient consent and in a private setting. During and after the physical examination, the patient is educated about normal and abnormal findings. These findings should also be communicated back to the referring oncology care provider with the patient’s permission.

Vital signs

Physical examination of the female patient with cancer and sexuality concerns should include focused constitutional assessment and vital signs to identify the risk for or the presence of common chronic conditions that can affect overall health and interfere with sexual function. Vital signs are taken at the beginning of the medical visit and are briefly reviewed with the patient through the lens of her sexual function concerns. Because these findings sometimes trigger the need for acute medical care or care coordination by the oncology team, we briefly describe common findings and the relevance of these to care for sexual function concerns in females with cancer.

Heart rate and blood pressure. Cardiovascular disease is a leading preventable cause of morbidity and premature mortality in women and can affect sexual function. Some chemotherapeutic regimens can cause transient or persistent elevation in blood pressure, and cardiovascular changes resulting from menopause (natural or iatrogenic) can cause chronic blood pressure elevation. Situational, or “white-coat hypertension” is common in this patient population, especially when presenting for sexual concerns for the first time, and will present as mild to moderate elevation in systolic blood pressure with elevated pulse rate, typically in the range of 85 to 100 beats per minute. Repeating the pulse and blood pressure measurement after establishing rapport with the patient will often times show normalization. A higher pulse rate (>100 beats per minute) that persists over the course of the visit may indicate dehydration, hyperthyroidism, cardiac arrhythmia, or other conditions and warrants further evaluation. Patients with systolic blood pressure higher than 180 mm Hg and/or diastolic blood pressure higher than 110 mm Hg that persists during the visit should be referred for immediate treatment to prevent stroke. Evidence about the effect of antihypertensive medication on female sexual function is mixed. However, several classes of antihypertensive medication have been associated with vulvar lichen planus, which is a treatable cause of dyspareunia.

Weight. Weight and body mass index (BMI) complement information about patient-reported nutrition and weight changes in relation to cancer or side effects of treatment.
TABLE 4. Key Mental Status Factors to Observe During the Physical Examination of Women With Cancer and Sexual Concerns

| MENTAL STATUS DOMAINS | COMPONENTS OF EXAMINATION | EXAMPLES OF MENTAL STATUS CONCERNS |
|-----------------------|---------------------------|----------------------------------|
| Behavior              | Observable assessment of psychomotor activity, gestures, mannerisms, expression, eye contact, and ability to follow commands | Slowed physical and emotional reactions; difficulty sitting still, fidgeting |
| Affect                | Observable assessment of patient’s emotional state, including documenting appropriateness of affect, range (broad or restricted), intensity (blunted, flat, normal), fluctuations (labile or even), and quality (ie, sad, angry, hostile, detached) | Sadness, tearfulness, hopelessness, worry, or fearfulness; reluctance to view own genital anatomy with hand mirror; use of deflecting humor or honing in with worry about one specific finding while examining their genitals with a hand mirror |
| Speech                | Observable assessment of patient’s speech (quantity, rate, volume/tone, fluency/rhythm, and coherence) | Slowed speech with flat tone; short responses; delayed response time when answering questions or following instructions; pressured or nonstop talking, often about unrelated things, rumination, or long/tangential responses |
| Memory                | Observable assessment of memory changes or complaints | Difficulty recalling information related to diagnosis, treatment, physical symptoms, and other related information discussed during the examination; frequent forgetting; word-finding difficulty |
| Thought process        | Observable assessment of patient thought processes by noting their coherence of thought, logic, relevance, and flow of ideas | Circumstantial, incoherent, evasive, or perseverative thinking |

*See Goldberg RJ, Faust D, Novack D. Integrating the cognitive mental status examination into the medical interview. South Med J. 1992;85:491–497; and Snyderman D, Rovner BW. Mental status examination in primary care: a review. Am Fam Physician. 2009;80:809–814.*

Low BMI may indicate poor overall nutrition, decreased appetite, depression, or frailty, all of which can be associated with low libido. Low or high BMI may be associated with impaired body image, which is a known risk factor for sexual problems in women. Women with central obesity produce more endogenous estrogen and typically experience less vaginal dryness than thinner women.107-109

**Mental status**

Anxiety and depression in women with cancer44,69,110-112 and the positive correlation between mental health status and sexual problems44,69,70,113 are well documented. A standardized mental status examination has been previously described for the oncology and posttreatment settings.114-118 In addition to mood and other mental status information obtained by patient report and history, key elements of the mental status examination are elicited during physical examination to inform diagnosis and management (Table 4).

The examiner should be sensitive to behaviors that could be signs of situational or underlying anxiety or depression. Signs of anxiety during the physical examination may include: pressured or nonstop talking, often about unrelated things, which makes communication about the physical examination difficult; long/tangential responses to questions during the examination (eg, rather than providing a number during the cotton swab test, the patient will qualitatively describe the pain in detail); using deflecting humor; or honing in with worry about one specific finding. Tearfulness during the examination, reluctance when asked if she would like to use a mirror to see her genital anatomy, and unusually long response time to questions or instructions, combined with other indicators, may indicate grief or depression.117 Memory changes are common complaints related to cancer treatment (eg, chemotherapy) or side effects of treatment (eg, menopause).119 Repeated uncertainty or confusion in response to questions or instructions during the examination may indicate compromised memory or other cognitive changes.

Evidence of significant mental health concerns suggests the need for further evaluation and treatment by a mental health specialist. Practitioners specializing in the care of women with cancer and sexual concerns should have a competent referral source for psychotherapy, sex and couples therapy, treatment for sexual assault and abuse, and medical management of psychiatric conditions, including suicidality.

**External genital examination**

At the least, the physical examination includes the steps of comprehensive internal and external genital examination used in adult and adolescent/pediatric gynecologic practice120-122; therefore, it requires an examiner skilled in genitopelvic examination and procedures. Based on our clinical experience and supporting literature from noncancer populations, the patient is offered a diagram of the genital anatomy,120,123 (Fig. 2) and is positioned in a slightly upright position with a hand mirror so she can see examination findings and help locate areas of pain.124 In our experience, most patients participate and ask questions during this part of the examination.

The examination begins with palpation of the inguinal lymph nodes. Close visual inspection of the external genitalia includes the mons pubis, labia majora and minora, clitoris, perineum, vestibule, vaginal introitus, urethral meatus,
and urethra, noting any new or atypical findings (Table 3). Bilateral oophorectomy and the gonadotoxic effects of chemotherapy and radiation can induce hypoestrogenism, a condition that can cause significant changes in the anatomy and physiology of the genitalia (including atrophy and irritation of the vulva and vagina) and in sexual physiology more generally. Vulvar edema and lymphedema are documented. Serial photography, with patient or guardian consent, can be used to track benign-appearing lesions of the vulva (such as a well-circumscribed, flat, pigmented lesion or a rash) and to help the patient better visualize vulvar findings.

A practical protocol is needed for systematic neurologic examination of the vulvar structures to objectively evaluate genital, including clitoral, sensation. Testing starts with gentle application of a moistened, standard-tip cotton swab, beginning laterally on the thighs (mainly to accustom the patient to the sensation) and moving medially to the vestibule. The cotton swab is then applied to standard points A through H on the vulva in alphabetical order (rather than in an expected, such as clockwise, order) (Fig. 3a). The patient, using a 0 to 10 visual analog pain scale (Fig. 3b) is instructed to describe the sensation as ranging between “0,” meaning just touch but no pain, and “10,” or excruciating pain. Using the visual analog scale and a standard approach on serial examinations is useful to objectively quantify, for the provider and patient, change over time and also facilitates research. In this patient population, common causes of vulvar pain are contact irritant dermatitis (Fig. 4a) in the setting of extreme vulvar atrophy (Fig. 4b), vestibulodynia, vulvar dysphorie, and extreme pelvic floor muscle hypertonicity or vaginismus. If vulvar dermatoses are suspected, particularly lichen planus, the oral cavity is examined for apthous ulcers, plaques, and erosions. A general examination documents rash, hives, eczema, or more generalized skin conditions that may also affect the vulva. Chronic GVHD (Fig. 4c) should be considered in women with a history of allogeneic bone marrow or peripheral stem cell transplantation. Physical findings in chronic GVHD are graded as minimal (grade 1), moderate (grade 2), or severe (grade 3) and can involve vulvar, vaginal, and musculoskeletal structures. The physical appearance, especially in grade 1 or 2 cases, can mimic the appearance of vulvar dystrophies.

**Vaginal speculum examination**

As described in Table 3, the speculum examination is used in the adult patient (and, in some cases, the adolescent) to assess for vaginal lesions, injury, discharge, atrophy, or bleeding. Inspection with a speculum may be facilitated by first inserting a finger into the vagina to assess length and orientation (eg, midline, deviated right or left/ante-rior or posterior). The speculum should be no larger than necessary to fully visualize the vagina; standard speculum blades vary from 2.22 cm to 3.18 cm in width and from 7.62 cm to 12.7 cm in length. In most cases, a narrow, well-lubricated speculum is sufficient for visualizing the vaginal canal, especially in women who have stenosis and/or severe atrophy with or without a cervix.

Women and adolescents who are sexually active with a new or nonmonogamous partner are counseled (before or after the physical examination) about human immunodeficiency virus (HIV) testing and are offered screening for sexually transmitted infections (STIs) during the physical examination. Although the overall incidence of STIs and HIV is substantially lower among menopausal women, vulvovaginal atrophy, radiation changes, and immune compromise increase susceptibility to infection. Disclosure of cancer history to a new partner is stigmatizing for some women, and condoms can be very uncomfortable with severe vaginal dryness. Such factors present a barrier to open communication between partners about safe sex, and few women with cancer, especially women without a current partner, are counseled about STI and HIV prevention. Most women with cancer and sexual function concerns are menopausal and have vaginal atrophy. Candida typically does not grow in a low-estrogen environment. Wet preparations, vaginal pH testing, and/or vaginal cytology sampling to quantify a maturation value are rarely needed but may be useful modalities to diagnose and treat sexual problems in this patient population.

**Vaginal manual examination**

A careful bimanual pelvic examination is performed with a single intravaginal examining finger when possible. The purpose of the pelvic examination in this clinical
scenario is to assess specifically for conditions that may be contributing to the patient’s sexual function concerns. Thin adhesions caused by radiation changes may be appreciated and gently separated or lysed with the examining finger. The patient should be informed (and the referring oncologist should be aware) that she may, as a result, experience some bleeding and pinkish or watery discharge and that these symptoms can also occur during or after sexual vaginal penetration.

Pain with deep palpation in patients who have undergone vaginal radiation and/or hysterectomy is not uncommon. Tenderness with palpation or contact to the vaginal cuff after hysterectomy, especially if granulation tissue is present, can be avoided during intercourse by sexual positioning that allows the patient to control the depth of penetration. The literature offers very limited insight into the histopathology of vaginal granulation tissue, but there is evidence that macrophages may have a role in recruiting sensory nerves. An infectious component could also contribute to sensitivity. Further work is needed to understand the variability in and treatment of deep dyspareunia in women with apical vaginal granulation tissue, but biopsy and culture could be useful modalities for evaluation. A vesicovaginal fistula should be considered with persistent granulation tissue and in patients with copious, continuous watery or serosanguinous vaginal discharge.

A nonmalodorous yellow or green vaginal discharge or exudate is common after vaginal radiation and/or reconstruction, as fecal pathogens can infect the vaginal tissues. Odorous or fecal-like discharge could be a sign of rectovaginal fistula, particularly in women who have had prior irradiation or pelvic surgery. Signs of STI in a woman at risk, such as cervical mucopurulent discharge and motion tenderness, should prompt culture at the time of the examination. Cervical motion tenderness is not a common radiation effect.

Pelvic floor function examination

Many patients with cancer and sexual function concerns present initially to a physical therapist for specialized care. Some oncology care providers will be very familiar with the practice of pelvic physical therapy and will have experience referring to these specialists. In other settings, including among general gynecologists, familiarity with the pelvic floor musculoskeletal examination is very limited. Given the high prevalence of remediable pelvic and related musculoskeletal disorders among women with dyspareunia and other types of sexual dysfunction, all specialists caring for women with cancer and sexual concerns should apply a systematic approach to pelvic floor examination that harmonizes with pelvic physical therapy practice, as described below.

Pelvic muscle examination begins with visual inspection of the perineum and vulva to grossly assess the range of motion of the muscles. In a lithotomy position, the patient is instructed to first contract and then bear down on the pelvic floor. Inability to release contraction or to affect a bulge with bearing down suggests pelvic floor hypertonicity. Applying a lubricant to the examiner’s gloved index finger, the labia are separated by the thumb and forefinger, and the index finger is inserted into the vaginal introitus. Initial depth of insertion is fairly shallow to assess the first layer of muscle, the urogenital triangle (bulbospongiosus, ischiocavernosus, and transverse...
perineal muscles), which can be accessed using gentle pincher (between the index finger and thumb) palpation. If taut bands are palpated and found to be painful, this may indicate the presence of a trigger point, referring an ache to the vaginal or perineal areas. The urogenital triangle, pelvic floor (levator muscles), obturator internus, urogenital diaphragm, bladder, and urethra should be palpated and assessed. Trigger points are discrete, focal, hyperirritable areas within a taut band of skeletal muscle. \(^{157,158}\) Advancing the examining finger farther, the pelvic floor muscles (levator ani) are accessed and palpated for tender or trigger points. Gentle, even pressure is used for palpation of the muscles initially. If well tolerated, this maneuver is repeated with firm pressure. \(^{159}\)
Table 3 details descriptors for inspection and palpation of the pelvic floor.

Pelvic muscle strength and endurance should be assessed by asking the patient to contract (“squeeze and lift”) the pelvic floor muscles around the examiner’s finger. A grade (0–5, 0 being “nil” muscle contraction response and 5 being a “strong” muscle response) should be assigned according to a modified Oxford scale.2,160 Laxity is associated with low-tone pelvic floor weakness and, often times, prolapse.161 High-tone pelvic floor weakness is prevalent, especially among younger and nulliparous women with postcancer dyspareunia; muscle tone will feel strong to palpation, but the patient will be unable to generate or release a contraction on command. Palpation of the coccyx and the sacrococcygeal joint can elicit tenderness that contributes to deep dyspareunia and can be addressed with physical therapy and/or sexual positioning. If the vaginal approach is not possible because of conditions such as pain or stenosis, then many of these examination elements can be assessed using a rectal approach.162,163 Decreased sensation in the vulva and/or the medial thigh may indicate compression or traction injuries affecting the genitofemoral, ilioguinal, and/or iliohypogastric nerves.164

Many patients, particularly those with the following common conditions, benefit from consultation and treatment by a pelvic physical therapist: untreated pelvic or related musculoskeletal injury or inflammation (eg, arthritis), vaginismus or vaginal stenosis requiring assisted dilation,154 pelvic floor weakness requiring muscle training, pelvic floor trigger points requiring manual therapy,131 comorbid urinary or fecal incontinence requiring exercise for muscle strengthening or control,165 and chronic constipation requiring behavioral interventions and neuromuscular reeducation.153,156,166 The pelvic physical therapist specializing in care of this patient population additionally performs an expanded neuromusculoskeletal examination, which typically begins by observing posture and alignment in the standing position.168 In some patients, biofeedback using external sensors may be used to assess muscle tone when digital examination is intolerable. Inspection of posture, habitual sitting and standing positions, and gait pattern provide clues to sources of pain originating outside the genital region.169 External examination includes neuromusculoskeletal, spine, pelvis, and hip joints and soft tissues (connective tissue, muscle, and ligaments). Scoliosis and hip joint dysfunction often refer pain to the pelvic muscles. Scoliosis and pelvic asymmetry, such as unlevel iliac crests or leg length discrepancy, may create muscle imbalances in the pelvic floor muscles that may manifest as painful, tender trigger points that contribute to dyspareunia. Thorough evaluation and examination are vital for the development, with the patient’s input, of a specific, goal-directed physical therapy treatment plan.

Vaginal capacity assessment

Well-lubricated vaginal dilators or sounds are used to objectively establish the patient’s baseline (ideally, before treatment), current, and desired vaginal capacity (desired capacity may be the size of a male partner’s erect penis, the size of a preferred vibrator or dildo, or the size needed for pain-free internal genital examination) and to track change over time. Medical-grade, sterilizable, graduated vaginal dilators for clinical assessment are most widely available in flexible silicone or rigid plastic, white or pink in color, with a variety of head types (eg, flat, barrel-shaped, conical, or ovoid). Although vaginal dilators are widely used in practice, and new outcomes research is emerging,60,170 prospective, experimental studies to inform recommendations about the timing and technique for vaginal dilator use are limited.63 Based on our experience, for patients seeking to resume vaginal-penile intercourse, we prefer the flexible silicone model, because it more closely mimics the friction and rigidity of the penis; patients are given a choice of head types for the physical examination. In one center where vaginal capacity is routinely assessed with vaginal dilators in this population, patients typically underestimated their vaginal capacity.171 Insertion (by the patient or the clinician, according to patient preference) of graded vaginal dilators, beginning with a dilator size the patient feels she can easily accommodate without pain, provides the patient and the examiner an objective measure of vaginal capacity helps identify a suitable dilator type and size for self-dilation,172-174 and can be useful for locating pain with penetration (eg, introital, deep).

The dilator examination also assists in detecting vaginismus. When present, a vaginismus response will typically be elicited when the dilator (or examining finger) is inserted between 0 and 3 cm into the vaginal introitus. The patient will express discomfort; she and/or the examiner may feel that the dilator has “hit a wall.” This reflex can often be overcome by instructing the patient to “bear down” or to “push the dilator out of the vagina” while the dilator is being gently advanced. Some patients can learn this technique during the physical examination and effectively translate it to improved vaginal penetration for intercourse, other sexual activities, and future internal genital examinations. Although the use of vaginal dilators to prevent vaginal stenosis and dyspareunia, particularly after pelvic radiotherapy,175-178 is widely cited in the literature, dilator assessment as part of routine evaluation of women with cancer and sexual concerns has only been reported by one center.171

Findings from the dilator examination can be used to assist the patient in acquiring an appropriately sized set of medical-grade (typically $150 US for a graded set of four) or direct-to-consumer (typically $50-$100 US for a graded set of four or $40-$55 US for one) dilator devices (the US
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2012 Current Procedural Terminology [CPT] code for vaginal dilation is 57400). An appropriately sized vibrator or dildo can accomplish the same goal at significantly lower cost ($10-$25 US for one device) and is a more appealing alternative for some women.

A 3-dimensional model of the internal and external genital and the reproductive, musculoskeletal, and neurovascular pelvic anatomy is used (eg, the American 3B Scientific Female Pelvis, 3B Scientific, Atlanta, GA) for explaining physical examination findings to the adult, adolescent, or pediatric patient after the physical examination. A printed genital diagram (Fig. 2) is useful for explaining examination findings and giving instructions about hygiene techniques and/or the application of topical or intravaginal therapies.

**Anal and rectovaginal examination**

Inspection of the anus and perianal skin is important for identifying signs of stool incontinence (patients with diminished perineal sensation and/or chronic vaginal discharge may be unaware of symptoms), hemorrhoids, scar- ring, and skin conditions that may contribute to dyspareunia or otherwise interfere with sexual activity (Table 3). Inconti- nence (or concern for incontinence) of stool and flatus can prompt a woman to avoid sex and inhibit her sexual response. A rectovaginal examination, using a single, well- lubricated examining finger, assesses: 1) anal tone, scarring, and capacity for penetration; 2) constipation; 3) the posterior vaginal wall and cul-de-sac and; 4) if intact, the uterosacral ligaments. Patients with anal fibrosis or stenosis after radiotherapy and/or the application of topical or intravaginal therapies.

**Abdominal examination**

The abdomen is visually assessed for skin changes, osto- mies, or scars from surgery and/or radiation therapy. These conditions can affect body image and/or can cause changes in sensation or pain that interfere with sexual function. Pal- pation and percussion of the abdomen should evaluate for masses (recurrent disease, hematomas, hernias, or lymph- cysts), tenderness, and hepatosplenomegaly. Suprapubic palpation can elicit tenderness related to bladder conditions and surgical scarring. In some patients, based on expert opinion but not on published experimental evidence, physical- therapy and acupuncture may be effective modalities for the alleviation of pain related to abdominal wall scarring (Fig. 4d). Research is needed to validate these modalities.

**Breast examination**

Breast or chest wall examination is performed for women who present with sexual function concerns after treatment for breast cancer, breast cancer risk reduction, and any breast or chest symptoms that interfere with sexual func- tion. The primary purpose of the breast examination in this context is to document any changes to the breast and to give the patient an opportunity to describe how these changes relate to her sexual function.

Body image, appearance, and esthetics play an important role in sexual function for many women. Research and practice focus heavily on preservation of breast cosme- sis and function of the ipsilateral lymph nodes and arm. Much less is known about preservation or systemic assessment of breast function, including sensation, erectile capacity of the nipple, feel of the breast to the patient and her partner during intimate and sexual activity, range of motion of the breast and arm, and psychological perception of the breast as an erogenous zone.

Although dyspareunia, decreased libido, and arousal diff- iculties are the most common symptoms among women with a breast cancer history who present with sexual function concerns, the sexual function history and breast examination may also elicit patient report of breast symptoms interfering with sexual function. Common symptoms include avoidance of breast contact because of the patient’s or partner’s discomfort with the appearance of the breast, loss of erotic breast and/or nipple sensa- tion, breast or chest wall pain, or unpleasant hypersensi- tivity, especially in radiated or scarred areas. Arm pain, discomfort around a chest wall port site and swelling due to lymphedema can also interfere. A thoracotomy inci- sion, commonly seen in lung cancer patients, can result in decreased or lost sensation to the breast and nipple; women are rarely counseled to expect this change after surgery.

In the specialized female sexual function practice, exami- nation of the breast (Table 3) after surgery with or without radiation therapy for cancer includes visual inspection and palpation of the breast, axilla, and lymph nodes, with the patient in both a supine and upright position. Palpation of the reconstructed breast especially could reveal masses, nod- ularity, and tenderness related to normal healing that, in the routine breast examination, would raise concern. Pain, ten- derness, erythema, and edema, especially in the acute recovery phase, may be caused by normal healing or may be the result of serious complications, such as infection, necrosis (fat or skin), or tumor recurrence. Specialized providers caring for this patient population benefit from training with a breast surgeon to learn how to interpret postoperative breast changes found in physical examination.

Patients who have undergone mastectomy with either auto- logous tissue reconstruction or implant reconstruction are examined for the presence or absence (Fig. 4e) of the native nipple or a reconstructed (Fig. 4d) or tattooed nipple. In patients who undergo autologous tissue reconstruction,
common donor sites include the abdomen (Fig. 4d), back, thigh, and buttock; and pain or scarring in these sites may also interfere with sexual function.208,209 If the donor tissue was from the abdomen, then the abdominal wall is evaluated for evidence of hernia, bulge, and scar-related discomfort.210-212 If the donor tissue was from the back, then any evidence of seroma after latissimus flap reconstruction is noted.213

Breast examination is not necessary in the evaluation of sexual function concerns in patients who have neither breast complaints nor a history of treatment involving the breasts or thorax. Surveillance for breast disease and/or recurrent cancer occurs in the primary and/or oncology care settings according to established guidelines.53,214 In adolescents, inspection of the breasts is necessary for Tanner staging.215

Elements of the Physical Examination of the Pediatric and Adolescent Girl With Concerns About Current or Future Sexual Function in the Context of Cancer or Cancer History

Oncology care for girls and adolescents with cancer includes counseling and interventions to preserve future fertility and optimize normal sexual development.216 Although age-specific guidelines for sexual education can be used to inform counseling,217 far less is known about how best to address the topic of future sexual function in the context of cancer care, especially for girls.218 We find no published evidence specific to the physical examination of this patient population in the context of specialized care for current or future sexual function concerns. This section reviews the physical examination components to expect from specialized evaluation for sexual concerns of an adolescent patient with cancer or cancer history.

For adolescents, the presence of a family member, in addition to a medical chaperone,93 during the examination and subsequent discussions is at the discretion of the patient.219 A systematic external genital gynecologic examination in an adolescent should include those elements listed above for the adult patient with cancer (Table 3). Adolescents usually do not need any instrumentation of the vagina by speculum or bimanual examination. If necessary, although rarely indicated for assessment of sexual concerns in this population, examination may be done with sedation or under anesthesia.220

Adolescent cancer survivors may have normal or incomplete genital development because of pubertal failure as a result of ovarian surgery, chemotherapy, or radiation treatment or as a result of low endogenous estradiol levels because of malnutrition or chronic illness.216,223 Assessment of the breast and external genitalia is performed to determine whether normal pubertal changes have occurred or if they are delayed. Inspection of the breasts and genitals using Tanner staging (Table 3) should lead to reassurance if the findings are normal or to hormonal testing and discussion of treatment options if there is incomplete maturation.219,222 Physiologic estradiol levels in girls are accompanied by findings of estrogen stimulation like breast maturation and external genital changes, such as growth and fullness of labia minora, color change of the vaginal and hymenal mucosa from a dull red to pink, and increased physiologic discharge.223 Before puberty, the uterus is a small, tubular structure, and the ovaries measure about 1 cm3.223 With maturation, ovarian stroma increases in size, and ovulatory changes (follicles) can be visualized on ultrasound. Uterine growth can be monitored by the change in the uterus-to-fundus ratio from 1:1 to 3:1 and an increase in endometrial thickness.

In a healthy adolescent who has a normal hormonal milieu, normal vaginal discharge is clear to white, odorless, and of high viscosity. The normal bacterial flora is dominated by lactobacilli, but a variety of other organisms, including some potential pathogens, are also present at lower levels. Lactobacilli convert glycogen to lactic acid. Lactic acid helps to maintain a normal acidic vaginal pH of 3.8 to 4.2. Menstrual abnormalities are common in adolescents, yet the risk of pregnancy and STIs in a sexually active teen should always be considered and, if necessary, evaluated. Preventive measures should be discussed.224 Adolescents who are amenorrheic are counseled that, if sexually active, they should use contraception to prevent unwanted pregnancy, because pregnancy can occur in an amenorrheic adolescent.219

Special Considerations for Interpretation of and Counseling About Physical Examination Findings in Female Childhood Cancer Survivors and Adolescents With Cancer

Physical examination findings in adolescents seeking care for current or future sexual function concerns are interpreted with knowledge of common endocrine changes that can affect growth and sexual development.

Endocrine disorders affect up to 60% of childhood cancer survivors after chemotherapy and radiotherapy225-227 and can have implications for female sexual development and function.216 Cranial radiation has been associated with central precocious puberty (CPP) at lower doses (18-35 grays) and with brain tumor treatment at higher doses (>35 grays). The mechanism of CPP after irradiation is hypothesized to involve dysregulation of cortical influences on the hypothalamus and a release of the inhibitory γ-aminobutyric acidergic (GABAergic) tone. Risk factors associated with the development of CPP after hypothalamic irradiation include younger age at treatment, female sex, and increased BMI. Standard treatment of CPP consists of injections of depot parental preparations of gonadotropin-releasing hormone (GnRH) agonists or annual subdermal histrelin acetate implants. The goal of treatment, typically managed by an expert in
endocrinology, is to minimize the effect that pubertal levels of estradiol have on advancing skeletal maturation and secondary sexual development. Little is known about the impact of this treatment on sexual function.

Hormone treatment with oral, transdermal, or topical estradiol are options for young women with ovarian insufficiency and have been shown to improve current and future sexual function.229 Discussions of current or future sexual concerns, the ability to have sexual intimacy, the possibility of future fertility, the need for contraception, and prevention of STIs should be initiated by the oncologist and can be addressed in more depth with a specialized and knowledgeable provider.54,230

Conclusion

As part of a referral for specialized care for sexual function concerns, oncologists and their patients should expect a thorough physical examination as an essential component of evaluation, diagnosis, and treatment. This review, complemented by multidisciplinary expert opinion where the literature is sparse, describes the elements of a systematic approach to physical examination of this patient population. This information can be used by oncology care providers to help patients understand what to expect from specialized evaluation, to aid in the interpretation of specialists’ findings and recommendations, and to recruit and support new professionals to fill gaps in this important but often overlooked area of female cancer care. In addition, adoption by specialists across sites of a systematic approach to physical examination contributes to overall harmonization efforts needed to advance science in the field.59

The elements of the comprehensive physical examination of this patient population will be iterated and refined over time as new evidence is generated and as the field grows to a broader range of practice settings and patient populations. The field needs low-tech, patient-centered protocols for neurological assessment of vulvar and clitoral sensation and serial assessment of vaginal capacity over time. Additional evidence and infrastructure are needed to establish formal practice guidelines like those produced and vetted by and on behalf of professional organizations (eg, the International Consensus Recommendations for Female Sexual Dysfunction231 or the American Heart Association Scientific Statement on Sexual Activity and Cardiovascular Disease232). As the Network matures from a cooperative group to an independent nonprofit organization and deepens its interactions with other professional societies in the field, we expect it will develop an infrastructure and consensus process for formalized practice guidelines.

The evidence is particularly sparse for clinical evaluation of sexual function and outcomes in girls and adolescents with cancer, and surprisingly little is known about how to evaluate breast sexual function.233 Research and practice expertise is also needed to better serve particularly marginalized groups, including women with cancer and sexual concerns who are older or widowed, those who identify with a sexual or gender minority group, women with physical and/or cognitive disability, and women receiving palliative or hospice care. Some women do wish to remain sexually active until the end of life; as a matter of compassion and human rights, institutional hospice care settings should ensure patient privacy and support symptom alleviation for comfortable and safe sexual activity. This review and related publications59,234 can be used by oncology care teams to advocate for humane and holistic care for their patients.

The cost to build and sustain an effective female sexual medicine program for women with cancer presents a challenge for patient access to services and limits growth of the field. We advocate special concern for females with cancer and sexual function difficulties who live in poverty or other resource-constrained conditions. A woman’s ability to function sexually, even in the context of cancer, can materially affect her ability to marry, to sustain a marriage or long-term relationship, and to maintain economic security for herself and her children.59,235,236 Many of the physical examination elements we recommend are feasible even in low-resource settings. In our experience, communication of findings from the physical examination helps the patient understand her symptoms and can itself be therapeutic, even if more expensive treatment modalities, such as sex and couples and physical therapy, are not an option. Female sexual medicine providers should learn from and cooperate with international cancer and women’s health aid organizations such as the World Health Organization Department of Reproductive Health and Research237 to broaden access to care that would prevent loss of sexual function and improve sexual outcomes in all females with cancer. We recommend that all specialists in the field contribute in some manner, through direct patient care, education of other providers, and education of the public, to improving access to knowledge and care that preserves sexual function in all females with cancer.

The comprehensive physical examination, described in detail here to facilitate a systematic approach across practices, achieves both evaluative and therapeutic goals. Adoption of evidence-based, standard practice for physical examination is needed by specialists across related disciplines to improve sexual outcomes after cancer for patients of all ages and to accelerate patient-centered, multisite collaborative research.
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