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Surviving gynecologic cancer and coping with sexual morbidity: an international problem

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Abstract

A review of the international literature reveals that significant sexual morbidity occurs for gynecologic cancer survivors, and that there has been little reduction in either the incidence or the severity of problems over the last 50 years available to research. In fact, prospective data from the last 10 years highlight the discrepancy in sexual activity and sexual responsiveness and the higher frequency of sexual dysfunctions for patients who have been treated for gyneclogic cancer in comparison to age-matched healthy counterparts. We conclude with an international summary and discuss specific research directions for disease sites. We urge international efforts to address quality of life concerns of gynecologic cancer survivors.

Keywords

gynecologic cancer; psychosocial; quality of life; sexual functioning; sexuality; survivor

Sexuality is the major life area most vulnerable to quality of life morbidity for the sexually active gynecologic cancer survivor. Difficulties often begin with the signs/symptoms of the disease and continue, although with different clinical scenarios, as attempts are made to resume intercourse. For some patients, the physical difficulties or the emotional sequelae are so disruptive that all sexual activity with the partner ceases. Far from being a limited source of difficulty, other data suggest that sexual difficulties of this sort have a 'ripple effect', with patients feeling negative about their self-confidence, their sexual self-esteem, and their view of themselves as women. Whether or not patients have sexual relationships with partners, the latter problems are important for all patients and some see them as the most negative sequelae of gynecologic cancer(1). This review documents that problems such as having a negative self-view of one's sexuality, and others such as disruption of intercourse or difficulty becoming sexually aroused, are common following gynecologic cancer, irrespective of the patient's nationality; multiple retrospective surveys provide correlational support and controlled prospective longitudinal studies provide convincing empirical documentation.

The journal of the International Society of Gynecologic Cancer provides a forum for issues which extend beyond national perspectives. In this spirit, we have reviewed the international literature on sexual functioning morbidity. The majority of the studies are single retrospective reports by physicians interested in the quality of life of their own patients, as prospective

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investigator-initiated research programs are rare. Only one collaborative report is available, as regional, national and international study groups have not included sexuality as a quality of life endpoint in clinical trials, although such efforts are now beginning.

While the focus is sexual morbidity, we emphasize that consideration of any *one* psychologic or behavioral variable is limited. Sexuality is affected by other life areas, such as mood and interpersonal adjustment, among others. But it is important to note that when data on major life areas (for example mood, marital adjustment, social adjustment, employment status) have been obtained from patients with gynecologic cancer, sexual functioning is the life area with the most severe and long-lasting morbidity. The importance of sexuality for individual patients may vary, and some who are not sexually active, for example, may be less concerned about permanent disruption, although this is not uniformly the case. If asked about the availability of information on sexual outcomes, the need for assistance in managing sexual difficulties, or related topics, their importance is noted by patients of all nationalities(2–4). In combination, these factors urge special consideration of sexuality for women with gynecologic cancer.

This paper includes three main sections. In the first, we define the types of changes in sexuality which may occur. The second reviews the international literature. We briefly examine studies of pre-invasive and invasive disease which have used retrospective designs, and highlight variations in outcome due to geographic and/or ethnic/cultural factors. We present the data conveniently in tables and display it in the geographic regions familiar to readers of the journal: English-speaking countries, Europe, and the Pacific. The limited data from Africa are noted separately. Studies usually include cervical cancer patients only and compare surgery, radiotherapy and combined treatment; limited data are available for patients treated *in situ* or for invasive vulvar disease. We next provide an extended review of the few single-group and controled prospective longitudinal studies. These studies provide more valid and reliable estimates of sexual morbidity. In the third section, we discuss directions for future research.

Central aspects of female sexuality

In the studies to be reviewed, the typical strategy has been to assess sexuality by asking patients about the frequency of specific sexual activities, such as intercourse, or about specific problems (for example arousal deficits, dyspareunia). This characterized the studies conducted prior to 1980. In the last decade, structured interviews and/or standardized questionnaires are more common, but often the concept of female sexuality remains narrowly defined. Here we emphasize the central aspects which have emerged from basic research in sexuality.

Sexual self-concept (sexual self-schema)

Recent research indicates that there are individual differences among women in their view of themselves as a sexual person. This personal view of one’s sexuality — sexual self-concept or sexual schema — has been defined as a cognitive generalization about sexual aspects of the self(5). A woman’s view of her sexuality is derived from her past experience, manifest in current experiences, is influential in the processing of sexually relevant information, and it gives guidance for sexual behavior. While more than the sum of the parts, a woman’s view of herself as a sexual person includes two positive aspects, an inclination to experience romantic/passionate emotions and a behavioral openness to sexual experience, and a negative aspect, embarrassment or conservatism, which may be a deterrent to sexual/romantic feelings and sexual activity. Women who differ in their views of their own sexuality — positive versus negative self-views — show evidence of very different sexual selves. Women with a positive sexual schema view themselves as emotionally romantic or passionate, and as women who are open to romantic and sexual relationships and experiences. These women tend to be liberal in their sexual attitudes, and are generally free of such social inhibitions such as self-consciousness or embarrassment. Positive-schema women, for example, tend to evaluate various sexual behaviors more positively, report higher levels of arousability across sexual experiences, and are more willing to engage in sexual relations. This characterization is not merely a summary statement of sexual history, but it marks current and future possibilities, as positive-schema women, for example, anticipate more sexual partners in the future than their negative-schema counterparts.

Conversely, women holding negative self-views of their sexuality tend to describe themselves as emotionally cold or unromantic and, by their own admission, they are behaviorally inhibited in their sexual and romantic relationships. These women tend to espouse conservative, and at times negative, attitudes and values about sexual matters and may describe themselves as self-conscious, embarrassed or not confident in social and sexual contexts. Finally, there may be some potential vulnerability for negative women since their self-view can be significantly moderated by external circumstances (for example their sexual self-esteem waivers when a sexual relationship ends), whereas this does not appear to be the case for the positively schematic women.

As will be seen in the review below, a number of investigators have noted that in addition to disruption in sexual activity (usually intercourse), patients often report a decline in feeling attractive(6) or their self-confidence(7). It would appear that women with initially positive views of their sexuality are more resilient to the disruptive effects of gynecologic cancer and/or better able to cope with sexual difficulties than patients whose sexual self-view is negative. Research is underway to examine the importance of this individual difference variable in predicting sexual outcomes(8). Because of the lack of research on this important topic, the review will necessarily focus on the other core aspects of sexuality described below.

Sexual behavior

Studies of patients with gynecologic cancer in the USA have suggested that sexual behavior among heterosexual females falls within the following groupings: preliminary foreplay (for example kissing, embracing, undressing), intimate foreplay (for example manual/oral genital stimulation), intercourse, anal stimulation and masturbation (B. L. Andersen *et al.*, unpublished data). Such a broad view of sexual behavior is rarely assessed; instead, only intercourse is usually documented. Investigators obtain judgments of an ‘increase’, ‘decrease’, or ‘no change’ in intercourse frequency. At a minimum, a more reliable strategy is to obtain an estimate of intercourse frequency (for example times per week or per month), even though validated behavioral inventories are available(8).

Sexual response cycle and sexual dysfunctions

We have attempted to summarize the literature in terms of disruption to phases of the sexual response cycle — including desire, excitement, orgasm and resolution — and the appearance of specific sexual dysfunctions — sexual aversion, vaginismus and dyspareunia. In Table 1 we provide the clinical characteristics of such difficulties and the definitions used in analyzing the studies. This is a clinical framework for understanding normal sexual responses, but presentation of the data in this manner also portrays the broad impact that the disease/treatments may have on sexuality rather than focussing only on disruption of specific activities, such as intercourse.

Retrospective studies of patients treated for *in situ*, localized, or regional disease

In addition to describing the sexual sequelae, reports have often examined outcome as a function of treatment modality. Specifically, many studies provide data on surgery versus radiotherapy, usually in the treatment of cervical cancer. None of the retrospective studies comes from randomized trials, and it is likely that there are systematic differences between the patients who are treated with different modalities. On occasion, ovary or endometrial cancer patients may also be included in the analysis. While this adds to the variability in outcomes, the *variations* in the same modality appear to be less important in predicting sexual outcomes than the effects of *different* treatment modalities (for example surgery versus radiotherapy). For this reason we reviewed the data within treatment regimens, specifically surgery (for example radical hysterectomy), radiotherapy (external beam, with or without intracavitary treatment) and combination surgery and radiotherapy. When the treatment regimen was unclear or data were presented across treatments, we assigned the study to the treatment grouping used for the majority of women. The data for pelvic exenteration surgery and vulva cancer patients are presented separately because of the obvious site and morbidity differences. Since Tables 2 and 4 provide an efficient summary of the findings for each study, below we will highlight the other quality of life findings from the studies and any other notable aspects.

In situ disease: conization

Pre-invasive cervical lesions are common; for example, there are approximately 50 000 new cases annually in the USA. While the diagnostic processes and treatments of cancer can be frightening(9), the lesions can be treated effectively. Kilkku *et al.*(10) reported on the sexual outcomes for 64 Finnish patients who underwent conization of the cervix for diagnosis and treatment. There was no decline in the frequency of sexual intercourse and no increase in sexual dysfunction. In fact, reports of dyspareunia declined significantly at the 6- and 12-month post-treatment assessments. A more recent report by McDonald *et al.*(6) describes the concerns of 20 USA patients surveyed prior to and following treatment. Along with their fear of the disease, sexual functioning or attractiveness usually ranked first or second in a listing of cancer-specific concerns.

Radical hysterectomy and related surgeries

Historically there have been conflicting reports on the sexually disruptive effects of hysterectomy *per se* (see ref. [11] for a methodological discussion). The vaginal shortening with radical hysterectomy may contribute to subjective feelings for the patient that the vagina is ‘too short’ for intercourse. Nerve and vascular disruption to the pelvis (as may occur with lymphadenectomy) may also result in loss of sensitivity and orgasmic disruption. The direct effects of atrophic vaginitis from estrogen deprivation can also result in sexual difficulties.

English speaking—There have been three retrospective investigations from the USA, all with small sample sizes. The most recent report comes from Cochran *et al.*(12), who interviewed 22 endometrial cancer patients. Their findings are consistent with the earlier studies(13,14) on the percentages of patients discontinuing sexual activity or with difficulties. More interesting are the correlation analyses of sexual activity with other psychologic variables. When the effects of pretreatment sexual frequency and medical prognosis were controlled (removed), the frequency of current sexual activity was significantly correlated with greater self-esteem ($r = 0.55$) and lower levels of depression ($r = -0.57$). When the same variables were controlled in the prediction of sexual satisfaction, only a sense of personal control ($r = 0.75$) and less affective disturbance ($r = -0.57$) were related to sexual satisfaction.

A report from Corney *et al.*(7) in the UK interviewed 69 patients treated with a Werthheim hysterectomy. In addition to the changes in sexual behavior provided in Table 2, other data indicated the pervasive impact that gynecologic cancer can have on a patient’s self-concept. For example, approximately 40% of the patients reported that their self-confidence, self-esteem and view of themselves as women had declined significantly. Of the patients remaining sexually active, other data indicated the permanence of their sexual problems, with 76%

reporting problems in the first year post-treatment, and 66% reporting problems at the time of interview (approximately 2 years post-treatment).

Europe—There have been three reports from Austria. Two early ones(15,16) reported high rates of problems. For example, in Heiss(15) 53% mentioned a decrease or complete loss of sexual desire and 86% of the patients mentioned negative body image because of the treatment. Approximately 30 years later the findings remained much the same. Walcher *et al.*(17) reported that of patients attempting to remain sexually active following treatment, 22% reported intercourse occurring less often, and 80% of the patients said they were not informed about the potential changes to their sexual life from the cancer.

The only data from German patients come from 1967. A large sample (*n*=314) of patients treated with ‘vaginal radical’ hysterectomy was studied by Lau(18). Patients at all stages of disease were included. Of the patients sexually active prior to treatment (*n*=250), 32% experienced significant (type unspecified) difficulties during coitus, and for another 22% coitus was no longer possible. It may be important to note that both in the Froewis and Picha(16) and the Lau(18) investigations, the decision of ‘coitus not possible’ and the reason(s) for this difficulty are not specified.

Two reports come from Italy. They are limited by small sample sizes, but again substantial sexual disruption was found. For example, in Carenza *et al.*(19) 95% of the patients reported a decline in the frequency of sexual activity, but in Tamburini *et al.*(20) 36% of the patients reported a decline in the frequency of sexual activity. This considerable discrepancy underscores the questioning of validity and reliability from retrospective estimates.

Pacific—Two reports from the same research group have described the sexual outcomes for Chinese patients(21,22). In these reports, 40 and 28 Chinese patients, respectively, were studied for 6 months or longer following radical hysterectomy for *in situ* or stage I disease. As 75% of the patients had their ovaries preserved, lower rates of sexual morbidity would be expected. Yet in the two reports, 13% and 29%, respectively, noted a minor decrease in coital frequency and an additional 30% and 25%, respectively, noted a significant decrease (greater than a 50% reduction). These papers are notable for the similarity of the estimates of sexual difficulty and behavior change. Since these patients would be the least likely to experience sexual disruption because of the more conservative therapies for early stage disease, these estimates may represent the lower bound of sexual disruption for Chinese women.

Summary—With the exception of the Austrian study by Froewis and Picha(16) and the German study by Lau(18), the data on radical hysterectomy and related surgeries come from small sample reports which are more subject to threats of internal validity, including subject selection (i.e. biased sample), history (i.e. the effects of events prior to and following cancer and cancer treatment) and maturation (i.e. the effects of normal developmental events, such as menopause). While large sample sizes do not solve these research design flaws (i.e. the data have the same problems with validity), they may provide more reliable (stable) estimates of sexual outcomes. It is useful that multiple studies from the same international region are available, and it appears that the data across regions are as similar as the data within the region. This review suggests that approximately 20% of patients reported being sexually inactive at follow-up, and of the patients remaining active approximately 30% reported significant declines in the frequency of intercourse. Considering the rates of dysfunctions, they ranged from 25–40% for the sexually active patients, with dyspareunia being a problem for 30% of patients.

Radiation therapy

Radiation destroys ovarian functioning for the pre-menopausal patient, thereby inducing menopausal symptomatology and causing vaginal atrophy and stenosis. These outcomes are most severe for patients treated with vaginal irradiation (intracavitary radium/cesium implants; see ref. 23 for a discussion of the psychologic aspects of this difficult treatment) when it is used alone or in combination with external beam irradiation. Estrogen therapy following treatment can control menopausal symptoms such as hot flushes and aid in the healing of the vaginal epithelium(24), but dyspareunia may still occur. Further, it has been estimated that radiation-induced tissue changes continue for 36 months following the completion of therapy. Also problematic is the fact that estrogen replacement therapy has not been offered to many endometrial patients, despite the fact that there are no data to support the contention that estrogen replacement is dangerous(25,26).

North American and English speaking—In the USA, there have been five reports on the sexual outcomes for patients following radiotherapy, from the late 1950s to the present. The studies are similar in strategy in that the sample sizes are in the range of 25 patients, individual interviews were usually conducted at least 1 year following treatment, and patients with stage I–III disease were included. The studies span 35 years and are consistent in reporting that 50–70% of radiotherapy patients significantly reduce or end all sexual activity following radiotherapy treatment.

Europe—There have been three reports of sexual outcomes for Austrian patients following radiotherapy. The first report(15) is similar in strategy to the USA reports, but the others(27, 28) are distinguished by their large sample sizes. The reports span 30 years, but the findings remain quite similar. For example, 25–50% of the patients reported decreases in the frequency of intercourse and 25–60% of the patients reported loss of sexual desire. All reports emphasized the effects with induced menopause. For example, in Heiss(15) hormonal failure symptoms (for example, hot flushes, night-sweats, nervousness, depression) were reported by 60% of the patients. Also important were the effects specific to the vagina. In Lasnik and Tatra(27), 84% of the sample attempted to maintain sexual activity, but coital frequency was reduced for more than half (54%) and 50% reported discomfort during coitus. These latter patients all complained of deficient lubrication, in addition to pain from a shortened or narrowed vagina.

Other data from Switzerland(29,30), Germany(18) and Italy(20) are consistent. In the German report by Lau(18) of patients who were sexually active prior to treatment, 36% experienced ‘strong’ difficulties during coitus and for another 35% coitus was no longer possible. The latter outcome may be the end result of the significant dyspareunia that many radiation patients experience which, in turn, results in less frequent intercourse. As intercourse declines, it is likely that vaginal atrophy and stenosis worsen so that across time, intercourse becomes impossible.

The important relationship between vaginal atrophy/stenosis and sexual complaints is found in data from Denmark by Bertelsen(31). These patients had good prognosis, early stage disease, but notably 62% of the sample described their sexual life as ‘radically changed’ after the treatment. Regarding physical disruptors to intercourse, 26% of the patients complained of pain, 16% of bleeding, 58% of dryness, and 28% of tightness of the vagina. Pelvic examinations indicated vaginal agglutination for 62% of the patients. A general relationship between the severity of vaginal fibrosis and sexual function was reported: two-thirds of the patients who stopped coitus or experienced sexual dysfunction had moderate to severe fibrosis. Similar relationships were also found with the severity of vaginal mucosa atrophy and/or pelvic fibrosis and sexual functioning.

Pacific—There have been two reports of sexual outcomes for Chinese patients(21,22). In these reports, 80% of the Chinese patients noted that they did not enjoy sex as much as before treatment, and the majority of the patients attributed their sexual problems to fatigue and physical weakness. While these symptoms may be contributors to sexual difficulties, it is unlikely they were the primary factors as patients were studied at least 2 years post-treatment.

Summary—As with the surgery studies, several data are available and, fortunately, include multiple studies from the same country or region. The percentages of patients discontinuing sexual activity or reporting decreases in frequency are comparable to the surgery studies, with approximately 20% reporting no activity and 40% reporting significant decreases. However, the percentages of patients reporting response cycle distruption are higher, in the range of 40–50%. Approximately one-half of the studies reported on dyspareunia complaints, but, surprisingly, this summary does not suggest a higher rate of this difficulty, with a mean estimate in the range of 25%. There are no apparent regional/national differences in these data trends. Supporting descriptive data on pelvic examinations suggest that radiation effects on the vagina coupled with estrogen deficiency contribute to the occurrence of sexual disruption.

Combined surgery and radiotherapy

There are two comon scenarios in receiving combination therapy. Radiation therapy can follow surgery if the pelvic lymph nodes are positive for malignancy. When radiotherapy precedes surgery, the apex of the vagina, which is exposed to the largest dose of radiation when intracavitary treatment is included, may be removed during surgery. If this is done, the remaining portion of the vagina is less affected and, perhaps, less vulnerable to problems of dyspareunia. In the studies to follow, the authors do not always mention the sequence of the combined treatment, making interpretation difficult and comparison of sequences impossible.

English speaking—Only two studies(14,32) have been reported; both are small samples from the USA. In the later report, Jenkins(32) assessed 27 endometrial patients, 20 of whom were sexually active. Major negative changes were found across all areas of sexual functioning. Notably, patients indicated that these changes occurred within 1 year following treatment and remained essentially unchanged at the time of follow-up (from 6 months to 5 years post-treatment), confirming earlier observations that sexual problems occur early and do not resolve if left untreated(33).

Europe—Several reports are available from Germany(34–36), Switzerland(29), Austria(37), Denmark(31,38) and Italy(20). Those from Germany are notable for their large sample sizes and additional data on marital difficulties. The first report, published in 1967, comes from Erkath and Randow(34). Stage I or II cervical patients indicated that prior to treatment all were married; however, 22% of the sample was divorced following therapy. The second report comes from Henning and Schulz(35). Approximately 80% of patients indicated they had a sexual partner (with 70% also having intercourse) prior to therapy, whereas 77% indicated having a partner at follow-up (with 59% having intercourse). Also notable is the lengthy time that patients waited to resume intercourse; of the 60% of patients who resumed activity, 29% waited longer than 12 months post-treatment to do so. It is likely that this length of time without intercourse only worsened sexual difficulties for the patients. The most recent investigation is that of Lotze(36). Sexual outcomes for this sample should perhaps have been better than those for the previous studies because of the less extensive disease; however the data are not substantially different. In this study, of the patients who became divorced during the follow-up period, two-thirds of them attributed the reason to cancer. Smaller sample reports come from the remaining countries. In the Austrian report(37), of the patients who continued sexual activity, the majority of (59%) resumed intercourse by 3 months following treatment, whereas 29% waited 6 months or longer.

Pacific—There are two small sample size reports on outcomes for Chinese patients treated with combined therapy for early stage disease(21,22). The majority of patients from both reports (65–81%) who were still sexually active post-treatment reported decreases in coital frequency. Other data indicate disruption of all phases of the sexual response cycle(21,22).

Summary—These patients may be at greater risk of sexual morbidity because of the combination therapy. However, with the exception of higher rates of dyspareunia (in the range of 35%), the outcomes appear similar to those for the single modality groups. Summary analyses suggest that approximately 15% reported no sexual activity whereas 40% reported declines in frequency, and 25–50% of the patients reported difficulties with desire, excitement or orgasm. This review reveals no obvious international differences in sexual morbidity. The data from Europe, however, suggest that patients may wait unnecessarily long to resume sexual activity and that marital relationships may become strained.

Radical surgery: pelvic exenteration

This surgery is disfiguring and produces many functional problems along with the obvious sexual sequelae. Clinical reports, not surprisingly, have commonly reported the cessation of sexual activity for the majority of patients (i.e. 80–90% of those surveyed). Available reports only come from North America English-speaking countries, including Canada(39), the UK (7) and the USA(40–44); all reveal a negative scenario for sexual outcomes. For the majority of patients and their partners, the prospect of ending their sexual life (as most partners cease all sexual activity when intercourse becomes impossible) is distressing and may be a source of continuing marital discord and may even lead to divorce (discussed in ref. 45).

Vaginal reconstruction is a possibility for some and enables a patient to maintain sexual activity that includes intercourse, however many sexual difficulties often remain. Some patients have difficulties with the physical characteristics of the new vagina (for example, the cavity is too large or too narrow), others have general problems with arousal or orgasm or specific impediments such as dyspareunia or bleeding with intercourse. Regardless of whether or not patients with pelvic exenteration undergo vaginal reconstruction, they face the greatest disruption to their sexual functioning of any female cancer group. It is surprising that little systematic descriptive or intervention work has been done with these patients in view of the curative intent of this surgery.

Vulvar disease

Despite the morbidity of vulva surgery, attention to the sexual or psychologic outcomes for patients is recent, with the first substantive reports not appearing until 1983. As with pelvic exenteration, vulvar treatments can have a dramatic impact on sexuality as well as other life areas. Following early observations on the benefits of conservative therapy(46), individualized approaches for the treatment of the vulva have been advocated(47). Below we review the data for *in situ* and invasive disease separately because of the considerable difference in the treatment regimens. Also, on average the *in situ* population is younger than those with invasive disease.

In situ—Andersen *et al.*(2) have provided data on the sexual outcomes for patients treated with wide local excision and related treatments for *in situ* disease as seen in Table 3. *In situ* patients are more likely be sexually inactive at follow-up, whether or not they have available sexual partners, than age-matched healthy counterparts. However, if the patients have a sexual relationship, the rates of sexual dysfunction appear only slightly higher than those for healthy patients (Table 3). Additional analyses contrasting treatment methods (for example surgery versus laser versus combined treatment) found no significant differences(48).

Invasive—The outcomes for patients with *in situ* disease contrast markedly with those for patients with invasive disease, many of whom are treated with radical vulvectomy, with or without groin dissection. While all of these reports are limited by their small sample sizes (ranging from 9 to 25) and retrospective evaluations, the trends are consistent: at least 30–50% of patients become sexually inactive and of those remaining active, 60–70% have multiple sexual dysfunctions. For the patients who become sexually inactive, reasons have included negative feelings (by the patient or her partner) about the physical changes to the body and severe dyspareunia, such as may occur with a narrowed introitus. Rather than being resigned to the end of their sexual life, the majority of patients would have preferred to remain sexually active(40).

The data in Table 4 summarize the difficult sexual sequelae from vulvar cancer and reveal the consistency of findings in the international literature. The shift to lesser surgical therapies may improve these outcomes, although confirming data will need to be gathered. Some have suggested outcomes such as these are less problematic because, as a group, patients with vulva cancer are older, often in their 60s, 70s or 80s, and they may have already stopped sexual activity. There is a natural decline in the frequency of sexual behavior with age for women and men alike, but the presence of a healthy and interested partner, rather than one's age, is more important to the maintenance of sexual activity. Thus, the data do not suggest that these patients will be less distressed by their genital distortion, sexual dysfunctions, nor content to have their sexual life end.

Prospective studies

In the prospective designs, patients have been recruited for study participation shortly after diagnosis and assessed longitudinally. These studies usually have detailed assessments of sexual functioning. Some studies have also included patients treated for benign disease to estimate the magnitude of sexual problems with gynecologic disease/treatment, and/or healthy counterparts to estimate the base rate of sexual problems. The latter designs are most powerful when longitudinal assessment is included for all groups.

Sexual disruption with the initial appearance of symptoms/signs of cancer

The sexually disruptive effects of early signs and symptoms have been described by Andersen *et al.*(49). Forty-one patients in the USA with early stage cervical or endometrial cancer were studied within prior to treatment and their responses compared to a matched group (i.e. age, menopausal and sexually active status) of healthy counterparts with no gynecologic distress. The data in Table 5 display the comparability in the frequency of sexual dysfunction between the patients with gynecologic cancer and the gynecologically healthy women prior to the appearance of symptoms (see columns 1 and 2) and the four- to five-fold increase in the frequency of sexual dysfunctions after the appearance of cancer signs/symptoms (see columns 2 and 3). Since 75% of the patients with cancer experienced a substantial change in sexual functioning, it is likely that such obvious and disruptive sexual problems influenced the patients to negatively interpret their gynecologic disease signs/symptoms and seek medical consultation. These controled data replicate and extend the findings of Harris *et al.*(50), also in the USA, who interviewed 63 recently diagnosed patients (stage of disease not specified). Whereas 85% of the patients were satisfied with their sexual life prior to the appearance of symptoms, only 48% felt similarly afterwards. Fifty per cent of the patients stopped having intercourse, and another 30% reduced the frequency. Of those patients remaining sexually active, the percentage of patients able to experience orgasm dropped from 58% to 15%. Finally, patients reported that they initiated the changes in intercourse frequency because of bleeding, pain and anxiety.

Single group longitudinal designs

English speaking—The only experiment to have ever been conducted to test for differential sexual outcomes was reported by Vincent *et al.*(51) in the USA. Fifty patients with early stage cervical disease were randomly assigned to receive either radical hysterectomy or radiotherapy. The groups were matched for such important factors as age, education, socio-economic status, marital status, parity, race and disease stage. Unlike the results from the retrospective studies, the changes in sexual desire and activity from pretreatment to 6 months post-treatment were comparable: estimates of diminished desire were obtained from 24% of the radiation therapy and 20% of the surgical patients. Decreased frequency of intercourse was reported by 29% of the radiation and 33% of the surgical patients. This experiment provides convincing evidence that, in general, the rates of sexual behavior disruption and dysfunction may be comparable for the two major treatment options.

Schover *et al.*(52) reported sexual outcomes for 61 patients treated for stage Ia (8%), Ib (85%) or IIa (7%) cervical cancer. Twenty-six patients received radical hysterectomy and 35 received radiotherapy; however, 19 of the latter also received surgery. There was a 20% refusal rate for study participation. While data were gathered at 6 and 12 months post-therapy, data were only available for 48% and 42% patients, respectively. Surprisingly, the report does not indicate significant sexual disruption. For example, rates of loss of sexual desire were reported as 24% for the initial assessment and 25% at 6 months and 25% at 12 months. Similarly, the rate of excitement problems at 12 months was 20% and 27% for orgasmic dysfunction. Despite these findings, the rates of sexual complaints were high. For example, at 12 months 21% noted that vaginal penetration was painful, 45% indicated deep thrusting was painful, and 24% reported post-coital vaginal pain. Also, 29% reported continued vaginal bleeding at 12 months. It is noteworthy that sexual problems of this type have been reported to be significantly distressing and meriting diagnoses of sexual dysfunction in other studies, whether or not they are due to cancer symptoms/signs(50) or cancer treatment sequelae(53).

Europe—Hansen(55) in Denmark provided sexual outcome data for patients treated with surgery, radiotherapy or combined treatment for stages Ib or IIa cervical cancer. Unfortunately the outcome data are combined and results are only reported for 78 patients who had no sexual difficulties prior to therapy. Of this subset, 73% resumed intercourse and also had no sexual complaints. Of the 27% who stopped intercourse, it appeared that 38% of them reported loss of desire, 17% had orgasmic dysfunction, 24% had dyspareunia and 19% no longer had a sexual partner. Unfortunately the length of the time to follow-up was not reported.

Africa—The only report on psychologic or sexual adjustment of African patients comes from Adelusi(56) who prospectively studied 101 patients treated for stage I–III cerical cancer at the University Hospital in Ibadan, Nigeria. The report is remarkable for its large sample, longitudinal assessment (pretreatment and 12–18 months post-treatment), and specific data on intercourse frequency, causes of difficulty, and marital/relationship status. Despite the modest statistical analyses, important findings indicated significant negative effects: 27% of the patients became separated or divorced after treatment and 75% of the sample became sexually inactive. Reasons noted for sexual difficulty included dyspareunia, vaginal bleeding (36%), and fear of cancer and/or recurrence (18%). This magnitude of problems may be due to cultural and/or other related factors; however, this is difficult to discern due to the absence of other studies from the continent.

Longitudinal studies with comparison groups/data

English speaking—In the USA, research by Andersen *et al.*(53) examined the nature and timing of sexual difficulties for patients with early stage disease and also other quality of life outcomes. Forty-seven patients with stage I or II cervical or endometrial disease were assessed prior to treatment and at 4, 8, and 12 months post-treatment. Data from two matched comparison groups, patients diagnosed and treated for benign disease (for example uterine fibroid treated with simple hysterectomy) and gynecologically healthy counterparts, were also followed longitudinally. The former provides an estimate of sexual disruption due to disease in and treatment to the pelvis, and the latter estimates the base rate of sexual difficulties due to normal life circumstances. There was an 85% participation rate across groups.

Analyses indicated that the primary sexual behavior disrupted by the disease and treatment process for patients with malignant or benign disease was the frequency of intercourse, declining from an average of 9.5 occasions per month to six to seven occasions per month during the post-treatment period. The absence of change in other sexual behavior variables (for example range of current sexual activities) indicated that when partners engaged in intercourse, albeit less often, the patients reported the same sexual activities (for example body caressing, oral–genital stimulation) as having occurred. There were no significant differences between groups in the percentage of patients becoming sexually inactive, with the estimates ranging from 5% to 15% across the assessments. However, half of the sexually inactive cases in the cancer group (i.e. two of four patients) were due to disease-related causes. Specifically, two patients stopped intercourse after two failed attempts. In both cases, the male partners had histories of prior erectile difficulties, and both patients reported dyspareunia with the early intercourse attempts. On the basis of the interviews with the patients, the complaints of intercourse pain probably contributed to the partners loosing erections during intercourse. Longitudinal data such as these underscore the need for the careful interpretation of findings on failure to resume intercourse.

Considering the data on the sexual response cycle, difficulty with sexual excitement for both disease groups was substantial. Following treatment, patients with disease reported awareness of fewer signs of sexual excitement, lower arousability for sexual activities with their partner, and the evaluators and the patients themselves felt that significant arousal problems were experienced. A probable reason for the arousal deficits was the co-occurrence of significant disruptors (for example dyspareunia due to radiation effects and/or induced menopause).

Table 6 summarizes the percentage of sexual dysfunction diagnoses for each group and their duration during the post-treatment year. The ‘continuing dysfunction’ cases (e.g. sexual dysfunction which continued from 4–12 months post-treatment) represent the numbers of patients who had chronic problems and who were at greatest risk for permanently impaired sexual functioning. The ‘new late’ (i.e. no dysfunction reported at 4 months but difficulties at 12 months) column represent cases which could potentially be prevented with therapy during the immediate post-treatment period. The ‘resolved’ cases are heterogeneous. They include cases which resolved (for example cases of dyspareunia which improved with continued recovery) as well as patients who adapted (i.e. reported lower levels of emotional distress) to their changed sexual responsiveness.

To aid in the interpretation of the findings on sexual outcomes, additional data were obtained on other quality of life outcomes: mood, social adjustment, employment, and marital adjustment(54). Regarding mood, there were significant elevations of depression, anxiety and confusion at the time of diagnosis; however, these affects stabilized within normal ranges during the post-treatment year. Similarly, there was no significant disruption of social relationships or activities during recovery, and patients gradually resumed pretreatment levels of time at their occupations across the 4, 8 and 12 months of follow-up. Finally, despite the significant sexual disruption which occurred, marital satisfaction remained unchanged and within the range of scores provided by the two comparison groups. There were divorces and separations within the cancer group, but such events occurred at the same rate for the healthy counterparts and those treated for benign disease. One of the two divorces occurring for the patients with cancer was attributed by the patient to her partner's difficulty in coping with her illness.

Europe—Weijmar Schultz *et al.*(3) studied patients with stage Ia–IIIb cervical cancer. There was a 75% participation rate in the project but follow-up data were only available for 48% of the sample, resulting in 26 patients. Comparison groups included 10 patients treated with simple hysterectomy for benign disease, 21 gynecologically healthy counterparts, and 12 patients treated 1 year previously for cervical cancer. The benign group was followed longitudinally; however, there was only one assessment for the healthy and previously treated cervical patients. Analyses of 12-month post-treatment data indicated that there were no differences between the patients with cancer and healthy counterparts in the areas of current sexual activity or motivation for sexual activity; however, there were significant decreases in sexual arousal, disrupting genital sensations during intercourse, and increases in sexual dissatisfaction. This pattern of difficulties was similar to the sexual disruptions reported by the patients treated for benign disease. These outcomes for the patients treated for disease are consistent with the data of Andersen *et al.*(53). The findings of few differences in sexual activity or desire in the comparison of the cancer and the healthy groups are inconsistent, but they may be due to pretreatment statistical differences between the groups. The validity of the outcomes may also be questioned due to the small sample size, which was further reduced at follow-up. Nevertheless, the data are an important contribution to the prospective data base and in large measure replicate many of the findings from the USA studies.

Another report from the same research group reports outcomes for 10 patients treated for vulvar cancer(57). There was a 77% participation rate; however 2-year follow-up data were only available for 70% (n=7) of the participants. In addition to the pretreatment assessment, follow-ups were conducted 6, 12 and 24 months post-treatment. A comparison group of 24 healthy counterparts was assessed on one occasion. Trends in the data revealed that there were reductions in the frequency of sexual behavior and disruption of sexual desire and arousal at 6 months, but with resolution by 12 and 24 months. Further, the gains remained stable during the next 12 months. All patients remained sexually active despite a 50% increase in negative sensations during sexual arousal. These results are more favorable than the outcomes reported in the retrospective studies of vulvectomy patients and may be due to the selected samples participating in each (i.e. more dysfunctional patients in the retrospective studies and more 'adjusted' patients continuing in this prospective report).

Sexuality and quality of life for the survivor

Despite the emotional trauma of a cancer diagnosis and the ensuing difficult treatments, the majority of individuals cope and resume their life patterns if they remain disease free(61,63). A caveat to this generally positive prognosis for cancer survivors is the occurrence of 'islands' of life disruption. Some of the areas of difficulty have to do with the direct effects of the disease and/or treatments, specifically continuing or late physiologic effects (reviewed in ref. 64) and oncologic events, such as recurrence or second malignancies. These physical sequelae can, in turn, produce disruptive *indirect* effects — psychologic and behavioral sequelae — such as increased psychologic distress or decreases in cognitive functioning. Also, there is some suggestion that even when adverse physiologic effects do not occur, many cancer patients remained worried — and a few traumatically so — about their health. These concerns range from nagging health worries to anxiety about death. In addition to the physiologic effects, scholars have focussed on independent psychologic and behavioral sequelae, including emotional distress (i.e. mood disturbance, traumatic stress), disrupted interpersonal relations (65), and fertility and sexuality concerns(33). Finally, there may be economic or health benefit hardships which may befall the cancer patient, including discriminatory employment practices, occupational difficulties(65,66), or restriction of health insurance coverage in those countries without nationalized health plans(68).

While many of the studies reviewed here did not include other dimensions of quality of life along with the sexuality measures, those that did include a comprehensive assessment usually found that from a psychologic perspective, survival following gynecologic cancer is, in general, positive. This conclusion is tempered by factors which appear to be important moderators of outcome (discussed in ref. 69). For example, the *magnitude of treatment* which patients undergo correlates with adjustment, such that patients who receive conservative therapies will, in general, report better psychologic outcomes (for example see the data in Table 3) than those that undergo radical therapies. Similarly, ‘older’ patients report less distress than ‘younger’ patients(70).

Thus, it is within the context of generally positive adjustment for the ‘average’ gynecologic survivor that sexual disruption will, for the majority, occur. While the positive adjustment in other life areas — mood, social relationships, etc. — may provide a significant buffer for patients in adjusting to any sexual problems that arise, it is clear that they cannot prevent the majority of the significant sexual problems, as 50 years of retrospective data and 10 years of prospective data from around the world demonstrate. Some have suggested that a focus on central aspects of sexuality, such as behavior and response cycle difficulties, as illustrated in Tables 2 and 4, is an emphasis that is unrealistic and/or not ‘emancipated’(1). We agree that focussing on psychologic aspects of sexuality, such as sexual self-concept or self-esteem, is indeed important. These dimensions which have in fact, been included by behavioral scientists in studies of sexual outcomes for patients with gynecologic cancer. However, we would assert that it is *reliable and valid measures* which are most important rather than specific contents and, further, it is the documentation of the incidence and magnitude of significant problems which will probably provide the impetus for gynecologic oncologists to take action to prevent or treat sexual problems for their patients. If the medical community is not moved to action, we would hope that gynecologic cancer survivors would be prompted to advocacy in much the same manner as survivors of breast cancer have been successful in prompting the medical community’s shift to lesser surgical therapy.

Meeting the needs of gynecologic cancer survivors: recommendations for future efforts

Studies of the sexual outcomes for patients treated for gynecologic cancer have been conducted for a half century, but vigorous concern is recent. Within the last 10 years, research has progressed beyond descriptive clinical reports to, in some cases, controlled prospective longitudinal investigations tracing the development of sexual problems. Models for conceptualizing and assessing the sexual difficulties of cancer patients have been proposed (68). Further, reliability and validity data on measures of sexual functioning have been published in North America and parts of Europe and the Pacific and many gynecologic oncology programs could begin a routine program to monitor the sexual functioning. In brief, many of the impediments to assessing and understanding sexual outcomes for gynecologic cancer patients have been addressed in many countries.

The most common strategy for treating psychologic difficulties is to wait until problems develop and people complain about them. However, a variety of longitudinal data suggest that preventive intervention—following cancer diagnosis and during or immediately following the treatment period—rather than rehabilitation efforts (i.e. intervention during recovery or later) would be suited to many of the sexual problems of gynecologic survivors. Many of the direct, permanent, physical effects of the treatment produce immediate disruption or distress. Early difficulties include infertility, sexual problems, premature menopause, body changes or disfigurement, to note a few. Also, reducing the crisis-like distress at diagnosis(54) may prevent late (post-traumatic) stress reactions. Intensive intervention during the immediate post-treatment period would provide patients with a repertoire for appraising and coping with body alterations and sexual problems. In contrast, intervention after the complete recovery process (for example at 12 months post-treatment) might be facilitated by lowered emotional distress and the stabilization of the majority of the treatment side-effects, but by then many sexual difficulties will have stabilized at a severe, chronic level which may be refractory to intervention. The most important point to emphasize is that sufficient data exist to begin intervention trials in many countries(71).

Conclusions for patients treated with surgery, radiotherapy or combined treatment for localized or regional cervix or endometrial disease and localized ovary disease

1. The frequency of patients abandoning sexual activity following cancer treatment is higher than the ‘normal’ base rate for healthy counterparts. This significant decrease in the frequency of intercourse occurs beyond the decline with advancing age. Data suggest that an influential factor for this effect is that the cancer-related sexual difficulties for partners may provide a sufficient, added vulnerability if sexual intercourse is already problematic for other reasons (for example partners where the male has erectile difficulties due to declining health). Frequency of intercourse is an important ‘barometer’ of the sexual health of intimate relationships. Thus, any decline that is noticeable and extends in time will, necessarily, burden a patient and possibly threaten the stability and satisfaction of her intimate sexual relationships.
2. Arousal (excitement) deficits play a central role in influencing the incidence and severity of other responses, such as desire and orgasm.
3. Dyspareunia is an important moderator of arousal. To the extent that medical interventions can directly address the problems of dyspareunia, rates of sexual dysfunction can be significantly lowered. Vigorous medical efforts to treat dyspareunia are needed. For example, the rates of sexual dysfunction and dyspareunia in the Andersen *et al.*(53) investigation occurred in a context of encouragement to use vaginal dialators, lubricants, and estrogen therapy when possible. Thus, these data represent the ‘best case’ scenario. Other medical treatments for dyspareunia must be developed, and investigation of the appropriateness of estrogen replacement therapy may also improve vaginal health post-treatment.
4. Further retrospective study of sexual outcomes in the majority of countries is unnecessary. Prevention efforts are needed, particularly for patients receiving radiotherapy treatments, as the cycle between pain/problems with intercourse only serves to reduce the frequency of intercourse further (and thereby increase the likelihood of additional problems)(71).
5. The data in Table 2 reveal 40-year consistencies across investigators, measurement strategies, nationality, and the important role that cultural factors may play in influencing sexual behavior. Where there have been multiple studies (for example USA, Austria, The Netherlands), sufficient data exist to begin investigations to prevent sexual morbidity. Studies of any sort, including retrospective designs, are needed in those regions not represented, including Central and South America, the Middle East, Africa, India, Russia, and much of the Pacific, to note a few.

Conclusions for patients treated for vulvar cancer

1. Sexual morbidity is directly correlated with the radicality of treatment, such that genital preserving treatments will, necessarily, be more preserving of sexual functioning. Continued efforts to empirically examine the suitability of conservative, vulva-preserving therapies is one important effort that can be taken by gynecologic oncologists to reduce sexual morbidity.
2. The sexual difficulties of patients with vulvar disease will be the most difficult to prevent or treat with psychologic interventions. A realistic goal may be to reduce the incidence and severity of sexual morbidity for them to the range of that for the cervical patients described above (i.e. a reduction of 80–90% morbidity to 40–50%).
3. Retrospective studies would be useful for those countries not represented in Table 4, with beginning prospective or intervention studies where descriptive data are available.

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Table 1

Description of common sexual difficulties and sexual dsyfunctions

Sexual difficulty/dysfunction	Clinical characteristics
Inhibited (hypoactive) sexual desire	Verbal report of being generally uninterested in and unmotivated for sex. Few or no initiations of sex with partner and/or avoidance or refusal's when partner initiates sexual contact (e.g. body touching, intercourse). Patient rarely has sexual thoughts or fantasies.
Sexual aversion	Extreme aversion or avoidance of genital contact (touching) by partner or self. May be accompanied by feelings of extreme anxiety, nervousness or strong negative feelings such as disgust or repulsion.
Inhibited sexual excitement (or arousal disorder)	Few or complete absence of feelings of sexual pleasure or excitement during sexual activity. A woman may feel as if she cannot be aroused. Disruption of physiologic responding, such as vaginal lubrication and genital vasocongestion.
Orgasmic dysfunction	Delayed or absent orgasm (i.e. rhymic vaginal and or pelvic contractions) despite adequate stimulation. Difficulties can be complete or situational, such as inorgasmia during intercourse.
Disrupted resolution response	Following orgasm and/or intense sexual activity, the patient reports either neutral or negative mood or feelings, such as disappointment. May be accompanied by residual sexual tension and an absence of relaxation or feelings of release.
Vaginismus	Recurrent or persistent spasm of the vaginal musculature sufficient to interfere with sexual activity; usually pain occurs with the spasm. Rather than muscular spasm, the vagina or vaginal opening may be constricted due to cancer treatments, such as surgery or radiotherapy.
Dyspareunia	Verbal report of coital pain. If severe, pain often persists following intercourse and is disruptive to resolution.

Table 2

Summary of retrospective studies of sexual outcome (percentage of sample with significant sexual behavior changes or sexual difficulties) following cervical cancer

Treatment and reference	Country	Year	*N*	Sexual behavior		Sexual dysfunction			
				Not active	Decreased frequencies	Desire	Excitement	Orgasm	Dyspareunia
Surgery									
13	USA	1962	32	12%	12%	—	—	—	—
14	USA	1974	32	6%	13%	6%	—	—	6%
12	USA	1987	22	32%	45%	50%	—	—	66%
7	UK	1993	61	8%	52%	44%	—	13%	19%
15	Austria	1954	30	—	—	53%	—	47%	—
16	Austria	1955	333	7%	—	22%	—	29%	33%
17	Austria	1988	87	33%	22%	76%	—	—	20%
18	Germany	1967	314	22%	32%	—	—	—	32%
19	Italy	1982	40	18%	80%	4%	—	60%	10%
20	Italy	1984	22	—	36%	15%	19%	—	—
21	Hong Kong	1985	40	—	30%	41%	28%	23%	30%
22	Hong Kong	1988	28	—	25%	43%	—	—	—
Radiation therapy									
57	USA	1958	16	6%	44%	—	—	—	25%
13	USA	1962	29	31%	24%	—	—	—	—
14	USA	1974	28	25%	53%	43%	—	43%	—
58	USA	1980	22	—	72%	—	45%	—	—
15	Austria	1954	20	—	25%	60%	—	40%	—
28	Austria	1957	156	—	26%	25%	—	21%	—
27	Austria	1986	57	16%	54%	58%	—	—	50%
29	Switzerland	1968	35	29%	—	—	—	—	0%
30	Switzerland	1980	67	34%	40%	—	—	—	29%
18	Germany	1967	43	35%	36%	—	—	—	—
31	Denmark	1983	45	4%	36%	62%	—	—	26%
20	Italy	1984	15	7%	27%	24%	33%	—	—

				Sexual behavior		Sexual dysfunction			
Treatment and reference	**Country**	**Year**	***N***	**Not active**	**Decreased frequencies**	**Desire**	**Excitement**	**Orgasm**	**Dyspareunia**
21	Hong Kong	1985	10	—	40%	50%	80%	60%	—
22	Hong Kong	1988	28	—	25%	36%	—	—	—
Combination therapy									
14	USA	1974	15	—	33%	—	—	—	—
32	USA	1988	27	7%	88%	72%	11%	39%	67%
34	Germany	1967	123	23%	—	39%	—	—	27%
35	Germany	1975	201	37%	—	33%	—	20%	27%
36	Germany	1982	564	6%	30%	41%	41%	—	—
29	Switzerland	1968	109	22%	—	—	—	—	20%
37	Austria	1980	75	10%	—	60%	—	23%	51%
31	Denmark	1983	22	—	16%	50%	—	—	—
38	Denmark	199?	146	32%	—	33%	—	—	40%
20	Italy	1984	61	8%	38%	17%	24%	—	—
21	Hong Kong	1985	53	—	77%	64%	—	58%	—
22	Hong Kong	1988	17	—	10%	55%	—	—	17%

Table 3

Frequency of sexual dysfunctions and across time for patients treated for *in situ* vulvar disease, and comparison with healthy counterparts[*]

		Patients with *in situ* vulvar disease		
Dysfunction	**Healthy counterparts**[†]	**Before treatment**	**1 year post-treatment**	**Follow-up**
Inhibited desire	21%	13%	23%	15%
Inhibited excitement	12%	15%	31%	36%
Inhibited orgasm	10%	18%	36%	28%
Dyspareunia	0%	5%	10%	8%

[*] Adapted from Andersen *et al.*(2)

[†] The sample of healthy counterparts were all sexually active at assessment.

Table 4

Summary of retrospective studies of sexual outcome (percentage of sample with significant sexual behavior changes or sexual difficulties) following *in situ* or invasive vulvar cancer

Extent of disease and reference	**Country**	**Year**	***N***	**Sexual behavior**		**Sexual dysfunction**			
				Not active	**Decreased frequencies**	**Desire**	**Excitement**	**Orgasm**	**Dyspareunia**
In situ									
2	USA	1988	42	33%	—	15	36	28	8
			42*			(21)	(12)	(10)	(0)
48	USA	199	127	46	—	35	14	17	0
			57*			(27)	(12)	(10)	(0)
Invasive									
40	USA	1983	15	60	100				
Stellman	USA	1984	9	100	100	—	—	—	—
7	UK	1993	9	44%	—	—	—	—	—
4	Denmark	1983	15	47	—	70	62	67	70
Andreasson	Denmark	1986	25	40	—	68	63	57	41
59	The Netherlands	1986	10	30	30	—	—	44	—
61	Italy	1986	21	52	76	—	—	—	—

[*] Denotes inclusion of data for age-matched comparison group of healthy counterparts.

Table 5

Frequency of sexual dysfunction diagnoses prior to and following the appearance of early stage cervical or endometrial cancer for 41 patients and comparative data for 41 age-matched gynecologically healthy counterparts[*]

		Women with cancer	
Dysfunction	**Healthy counterparts**	**Prior to symptoms**	**After symptoms**
Inhibited desire	17%	12%	56%
Inhibited excitement	7%	10%	49%
Inhibited orgasm	10%	7%	37%
Dyspareunia	0%	5%	37%

[*] Adapted from Andersen *et al.*(49)

Table 6

Percentage of sexual dysfunction diagnoses by study group at 12 months post-treatment considering diagnoses at 4 months post-treatment[*]

	Status at 12 months post-treatment			
Dysfunction	**No dysfunction**	**Continuing dysfunction**	**New late dysfunction**	**Resolved dysfunction**
Inhibited desire				
Cancer	47%	16%	16%	21%
Benign	60%	0%	13%	27%
Healthy	82%	2%	7%	9%
Inhibited excitement				
Cancer	47%	16%	13%	27%
Benign	67%	0%	20%	13%
Healthy	87%	0%	9%	4%
Inhibited orgasm				
Cancer	58%	18%	11%	13%
Benign	73%	7%	7%	13%
Healthy	91%	2%	4%	2%
Dyspareunia				
Cancer	53%	21%	8%	18%
Benign	67%	7%	7%	20%
Healthy	93%	0%	2%	4%

[*] Adapted from Andersen *et al.*(53)