ORIGINAL RESEARCH—ONCOLOGY

What Couples Say about Their Recovery of Sexual Intimacy after Prostatectomy: Toward the Development of a Conceptual Model of Couples' Sexual Recovery after Surgery for Prostate Cancer

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DOI: 10.1111/jsm.12732

ABSTRACT

Introduction. Interventions designed to help couples recover sexual intimacy after prostatectomy have not been guided by a comprehensive conceptual model.

Aim. We examined a proposed biopsychosocial conceptual model of couples' sexual recovery that included functional, psychological, and relational aspects of sexuality, surgery-related sexual losses, and grief and mourning as recovery process.

Methods. We interviewed 20 couples preoperatively and 3 months postoperatively. between 2010 and 2012. Interviews were analyzed with Analytic Induction qualitative methodology, using NVivo software. Paired *t*-tests described functional assessment data. Study findings led to a revised conceptual model.

Main Outcome Measures. Couples' experiences were assessed through semi-structured interviews; male participants' sexual function was assessed with the Expanded Prostate Cancer Index Composite and female participants' sexual function with the Female Sexual Function Index.

Results. Preoperatively, 30% of men had erectile dysfunction (ED) and 84% of partners were postmenopausal. All valued sexual recovery, but worried about cancer spread and surgery side effects. Faith in themselves and their surgeons led 90% of couples to overestimate erectile recovery. Postoperatively, most men had ED and lost confidence. Couples' sexual activity decreased. Couples reported feeling loss and grief: cancer diagnosis was the first loss, followed by surgery-related sexual losses. Couples' engagement in intentional sex, patients' acceptance of erectile aids, and partners' interest in sex aided the recovery of couples' sexual intimacy recovery. Unselfconscious sex, not returning to erectile function baseline, was seen as the end point. Survey findings documented participants' sexual function losses, confirming qualitative findings.

Conclusions. Couples' sexual recovery requires addressing sexual function, feelings about losses, and relationship simultaneously. Perioperative education should emphasize the roles of nerve damage in ED and grief and mourning in sexual recovery. **Wittmann D, Carolan M, Given B, Skolarus TA, Crossley H, An L, Palapattu G, Clark P, and Montie JE. What couples say about their recovery of sexual intimacy after prostatectomy: Toward the development of a conceptual model of couples' sexual recovery after surgery for prostate cancer. J Sex Med 2015;12:494–504.**

Key Words. Prostatectomy; Sexual Recovery; Couples; Survivorship

Introduction

Current research recognizes that post-prostatectomy erectile dysfunction (ED) affects the couple, not just the patient [1–5]. The effect on the couple continues long after prostate cancer treatment. However, many studies examine only one time point of this experience [6–8] pre- or postoperatively, rather than the process of recovery. As a result, we lack a full understanding of the process of couples' sexual recovery after prostate cancer surgery. We know that men have found the use of sexual aids after prostatectomy difficult [9]. We also know that we do not fully understand what is helpful for recovering sexual intimacy. Additionally, we do not fully understand the process involved in couples moving toward recovering sexual intimacy.

Interventions aimed at restoring couples' sexual intimacy have shown promise and have increasingly incorporated more sophisticated intervention content as well as study designs. For example, Canada and colleagues evaluated a four-session intervention for men and for couples that included behavioral exercises [10]. It temporarily improved sexual function for both men and partners. Schover and colleagues compared a web-based intervention with a face-to-face intervention in a randomized trial and found that they were equally effective, with positive effects on sexual function for men who completed the intervention, men with female partners with higher sexual function, and female partners with lower baseline sexual function [11].

The accepted definition of sexuality includes biopsychosocial dimensions, sexual function, individual sexuality, and sexual relationships. In both Canada et al. and Schover et al. studies, the intervention sought to improve sexual function. Both interventions also attended to patients' and partners' negative thoughts about sexual aids and taught communication skills for couples. These interventions clearly show that it is important to attend to not only sexual function but also to individuals' psychology and to the relationship. However, while basing the interventions on previous research findings, neither study presented an empirically based theoretical model that would direct the kind of psychosocial content that would help couples move toward recovery. Negative thoughts about erectile aids are, of course, important to address, but perhaps do not fully account for what is psychologically meaningful to men and partners as they approach sexual recovery after prostatectomy.

Manne and Badr have presented a theoretical model that has guided their design of an emotional intimacy-enhancing intervention [12]. The model proposes a paradigm in which greater openness within the couple with each other about cancer-related difficult subjects leads to better adaptation to cancer. They piloted an intimacy-enhancing intervention with prostate cancer survivor couples [13]. While successful, the intervention had modest results, perhaps because the physiologic sexual function, so important to couples' intimacy after prostate cancer treatment, was not included.

Theoretical models of the impact of cancer on the biopsychosocial components of sexuality [14–16] recognize that biopsychosocial sexual losses are an aspect of the experience of coping with post-cancer treatment sexual adaptation. Tierney notes that grief is a response to the sexual losses, while Wittmann et al.'s model considers the grief process as the process of recovery. However, these models have not been tested empirically. As a result, the biopsychosocial model of sexual recovery has not yet been fully understood or incorporated into intervention research studies. Similarly, a biopsychosocial approach to sexual recovery after prostate cancer surgery has not reached clinical care. In usual busy clinical care, urologists treat ED; patients and partners' feelings about sexual losses and requisite adaptation of their sexual interactions go unaddressed.

We developed a model of couples' sexual recovery that builds on previous research and incorporates the biopsychosocial nature of sexuality and the process of grief and mourning as the method through which couples move toward recovering sexual intimacy while incorporating treatment-related sexual changes [17]. Prostatectomy is conceptualized as a "psychosocial transition" [18], a life-altering event that creates biopsychosocial sexual losses, ushering in grief and mourning as the process of change. Our study's aim was to test this model against prostate cancer survivors' and partners' real-time experience of sexual recovery. We hypothesized that couples would use the grief process to reach a meaningful sexual intimacy end point after experiencing prostatectomy-related changes/losses of men's erectile function (bio), sexual confidence (psycho), and familiar sexual interactions (social). We wanted to understand how couples would define this end point.

Method

Participants

This study sample includes men who chose robotic-assisted radical prostatectomy as primary prostate cancer treatment in a Midwestern academic cancer center and their partners, and signed the institutional review board-approved informed consents for a previous prospective mixed methods study on barriers to couples' sexual recovery [19]. Participants were recruited by telephone between January 2010 and June 2012 at the time of surgery scheduling. Of the 108 eligible couples, 28 participated in the original study. Reasons for nonparticipation were not returning the call (31), partner not interested (10), patient not interested (8), the cancer center was too far (9), could not fit it into their schedule (5), opting for different treatment (2), and others (15). Participants were cognitively intact English speakers. Twenty couples returned after surgery: those who did not return cited lack of time due to return to work or retirement activities. One couple rescheduled several times but did not keep the appointment. Preoperative and 3-month postoperative surveys and semi-structured interview transcripts from 19 heterosexual and 1 same-sex couple were available for secondary analysis according to our research questions about the impact of prostatectomy on couples' sexuality and their recovery process. We made the decision to include the same-sex couple in the sample because of the lack of scholarship on gay couples' recovery of sexual intimacy after prostatectomy. In addition, minorities are often excluded from research when their numbers are small. Inclusion allowed the voice of this couple to be presented, particularly should it be different from the heterosexual couples.

Procedure

Couples completed surveys at the cancer center. One-hour couple interviews were followed by brief individual interviews. Interviews were conducted by the first author.

Quantitative Assessments

Patients and the male partner responded to the sexual and urinary incontinence domains of The Expanded Prostate Cancer Index Composite (EPIC) Short Form [20], a validated 26-item questionnaire that assesses urinary, sexual, bowel, and hormonal side effects of prostate cancer treatment. Sexual function cutoff scores of the EPIC are 0–33 (severe ED), 34–45 (moderate ED), 46–60 (mild/moderate ED), 61–75 (mild ED), and above 75 (no ED) [21]. Female partners filled out the Female Sexual Function Index [22], a validated 19-item assessment with desire, arousal, lubrication, orgasm, satisfaction, and pain domains. A summary score below 26.6 (of possible 36) indicates sexual dysfunction.

Qualitative Assessments

Interview guides were based on reviewed literature and the researchers' clinical experience. Interview question examples are displayed below:

> Preoperative: "Are you aware that you will be experiencing side effects that affect urinary control and the ability to have erections? What are your thoughts about those?"
>
> Postoperative: "Can you tell me about your experience of recovering your sexual relationship since the surgery?"

Data Analysis

Demographic, clinical, and functional data were summarized using descriptive statistics. Pre- and postoperative sexual function scores were compared with paired *t*-tests. We used Analytic Induction to analyze interview data and build sexual recovery theory [23,24]. Unlike, for example, Grounded Theory [25], a qualitative method in which data are gathered from a relatively "naïve" standpoint regarding the study's subject matter, this qualitative method begins with an exploratory hypothesis/model, which is then tested by examining interview findings to discover whether the hypothesis holds. Analytic Induction allows recurrent divergent couple experiences to alter the hypothesis and lead to model revisions. We tested our model against couples' statements to discover whether they experienced prostatectomy-related biopsychosocial sexual changes/losses and whether the process of grief and mourning was the path to recovery. After generating open codes (e.g., sexually active, expectation, coping) by identifying representative word groupings from transcripts, we developed themes to categorize these codes into higher level concepts reflective of couples' common experiences. In an iterative process, each case was reexamined in the light of previous findings and newly generated categories led to the reexamination of previous cases. Shared characteristics of the sexual recovery and model modification led to the generation of an explanatory theory. NVivo software (Version 9) [26] aided qualitative analysis. The first author's (D. Wittmann) extensive clinical experience and consultation with a

Table 1 Patients' clinical characteristics (N = 20)

Characteristic	n	%
Gleason sum		
≤6	4	20
7	13	65
≥8	3	14
Clinical stage		
T1c	17	85
T2a	2	10
T2b	1	0.5
Pathological stage		
T2a	5	25
T2b	11	55
T3a	3	14
T3b	1	0.5
Nerve sparing		
Bilateral	18	90
Partial	2	10
None	0	0
Charlson Comorbidity Score (median/range)	0	0–4

qualitative research expert (M. Carolan) as well as with cancer and analytic experts (T.A. Skolarus, B. Given, L. An, H. Crossley, P. Clark, and J.E. Montie) assured data and analysis quality. Consensus governed final data interpretation.

Results

Participants' Demographic and Clinical Characteristics

Patients' and their partners' mean ages were 60.2 and 57.6, respectively. Average length of relationship was reported by patients to be 33.8 (standard deviation [SD] = 13.3) and 33.7 (SD = 14.3) by partners. Most participants (70% patients, 50% partners) were educated beyond high school. Mode family income exceeded 90,000 dollars. One patient was a Chinese American, one partner Hispanic; all others were white. Two patients' more aggressive cancer necessitated a wider resection of the neurovascular bundles and adjuvant radiation treatment, resulting in more nerve damage. Patients' clinical characteristics in Table 1 describe men with localized prostate cancer and good long-term prognosis.

Functional Assessments

Patients' and partners' functional outcomes are displayed in Table 2. On average, patients' preoperative "mild" ED declined postoperatively to "mild/moderate" ED ($P < 0.0001$). Their average urinary incontinence scores declined 25% postoperatively ($P = 0.002$). Female partners' mean total sexual function, largely in the "dysfunction" range prior to patients' surgery, declined after surgery ($P = 0.05$). The male partner rated his sexual function in the non-ED range with the use of phosphodiesterase type 5 inhibitors at both time points.

Interview Findings

After diagnosis and before surgery, couples anticipated sexual recovery with both worry and optimism about outcomes and their ability to cope. After surgery, their worry and coping strategies turned to sexual concerns. Couples' pre- and postoperative experiences, related to our biopsychosocial model of sexuality with grief and mourning as the recovery process, are described below. Selected interview quotes, representative of our findings, are presented in Table 3.

Preoperative Experiences

Couples' preoperative attitudes reflected their life stage. Couples expressed confidence that they would master sexual recovery, having mastered past challenges.

Bio: Already Changed Sexual Function. Most men (70%) reported sexual desire; 30% had declining erectile function. Most female partners (84%) were postmenopausal; 50% reported low interest in sex. The male partner had post-prostatectomy

Table 2 Functional scores (N = 20 patients, 19 heterosexual partners, 1 same-sex partner)

Functional assessment	Preoperative Mean (SD)	Range	3 months postoperative Mean (SD)	Range	*P*
Patients					
EPIC urinary incontinence	94.8 (12.4)	46–100	73.6 (27.3)	14–100	0.002
EPIC sexual function	74.4 (25.1)	25–100	46.5 (25.1)	0–88	<0.0001
Partners					
FSFI total	22.8 (8.5)	6–34	19.3 (10.4)	4–33	0.05
Male partner's EPIC urinary incontinence	73.0		93.8		
Male partner's EPIC sexual function	83.3		83.3		

EPIC = The Expanded Prostate Cancer Index Composite; FSFI = Female Sexual Function Index; SD = standard deviation

Table 3 Direct quotes from prostate cancer couple interviews before and three months after prostate cancer surgery

Preoperative statements		
Theme	Patient	Partner
Bio		
Already changed sexual function and relationship	" I have difficulty maintaining an erection through the full sexual activity."	"Dried up and no urge."
Psycho		
Worry and anticipatory grief	"I think I have some feelings of grief in regard to the sexual aspect because I think we have a good sexual life, I think that it's an important part of our relationship . . ."	"As much as I love or care for my husband, I'd never change his diapers and wipe his butt."
High expectations of erectile function recovery	Patient: "I am just very, very confident that when I walk out of here I'm going to be fine."	"I don't think of it as being a year, I think of it as being less than that cause I think of him as being a vibrant, healthy, normal person . . ."
	Patient: "It won't diminish me, erectile function doesn't define me."	"I know it does affect some men . . . but I don't think (it will), he's never been that way . . ."
Dislike of sexual aids and sexual experimentation	"Yeah, as of now, I'm still of the optimistic thinking that we're not going to need that (sexual aids)."	"It's scary for me (sexual experimentation) . . . I'm very conventional . . ."
Social		
Sex is important to us	"It's still a part of our lives and we still enjoy it and we still agree on it and um, it's, you know, we wouldn't like to lose it if we didn't have to."	Patient: "I'm anticipating, um. . . ." Partner: "Trying new things (chuckle, laugh) . . ."
Couples' self-efficacy in coping	"I think we'll try to come up with other ways of doing it (if intercourse is not available)."	"He's an optimist and I feel like I am, too, and we look at the silver lining and maybe this will bring us closer together . . ."
Postoperative statements		
Theme	Patient	Partner
Bio		
Functional sexual losses	"And plus my orgasms are diminished I can't get an erection and I can't have an orgasm."	"I also feel like reaching an orgasm is just like, oh really hard for me. And it was hard for me before . . . all this paraphernalia, it just doesn't seem worth it to me."
Sexuality now	"There is a response but it's not, probably not what I would say is enough for penetration."	"Well, that seems like another apparatus that it's like so much work, you know . . ."
Psycho		
Ambiguous loss and grief	"It's a part of my being that has changed . . . this is something that is life changing."	"I know. I like threw the vibrator across the bed. I am sick of this. Sick of it. Sick of it."
Social		
Couples' coping—positive	"In that sense the quality is improved. And I think you focus more on your partner than you did in the past."	"I mean it's now there's stages you can't achieve, but it's not diminished our being intimate or being physical . . ."
Couples' coping—negative	"The electric pump device I find sort of alienating it's you know it's mechanical and rigid and kind of aggressive . . ."	"I think the therapy is up to him because it is not something . . . he wants me to participate in."
Partner's role in sexual recovery	"She knows what I need and so she's going to give that and she knows that I need someone to lean on, someone to be strong while I'm having my fearful time . . . I would count on her to do that."	"I am feeling more guilt because I feel that I should be initiating and . . . the motivation isn't there yeah and it should be 'cause he needs it."
Definition of sexual recovery		
	"I wish I could be totally confident that I'd be able not have to worry about anything, just be myself."	"I wouldn't be afraid to say 'would you like to have sex' and not feel like I'm putting pressure on him and getting him all stressed out because like he's thinking about it way too much now."

ED. One-third of couples reported desire discrepancy (patient more interested than partner).

Psycho: Worry/Anticipatory Grief about Potential Losses, High Expectations of Erection Recovery and Coping, and Dislike of Sexual Aids. Couples anticipated surgery with worry that the surgery would not eradicate the cancer (65%), about the danger of surgery (65%), about urinary incontinence (80%), and about ED (60%). Nearly all (95%) identified potential losses. Despite preoperative education about the fact that nerve damage occurs even in nerve-sparing surgeries and that there is a lengthy erection recovery period of up to 2 years,

90% of the couples expected the men to recover preoperative erectile function. They based their expectations on surgeon skill, their healthy living habits, and willingness to work on sexual recovery. Men anticipated that even if they had ED, it would not affect their masculine identity. While eager to work on sexual recovery, 85% of participants expressly disliked one or more of the rehabilitation activities: use of sexual aids, sexual experimentation, or masturbation.

Social: Sex Is Important, "We Are a Team," but Partners Expected to Shoulder the Burden of the Recovery. Nearly all couples (95%) were sexually active, citing sex as important in their relationship (45%). Frequency had decreased with age. Most (90%) wished to engage in sexual recovery or use it to improve their sex lives, even rekindle already abandoned sexual intimacy. Couples acknowledged vulnerabilities, e.g., men's likely impatience and relationship problems, but saw themselves as able to cope. They expressed confidence in their ability to adapt their sex lives, regardless of post-prostatectomy outcome. Yet they did not plan: 80% postponed thinking about the recovery.

All partners (100%) saw themselves as providing support, enforcing men's adherence to rehabilitation, managing men's frustration, and providing requisite sexual stimulation. Men accepted this role, some explicitly expected their partners to know them better than they knew themselves and act as arbiters of decisions about their medical and emotional needs.

Postoperative Experiences

All couples faced changes in their sexual relationships. Three months after the surgery, 60% of couples were sexually active.

Bio: Functional Losses. Ninety-five percent of the men had ED, although 75% had some tumescence. Along with the need for longer stimulation and loss of ejaculate, some men reported loss of desire. Only 50% of the men had satisfactory orgasms. Some pre- and postmenopausal partners continued to have low interest in sex. Urinary incontinence interfered with sex for a third of the couples. Some partners experienced loss of vaginal orgasm due to the man's smaller penis.

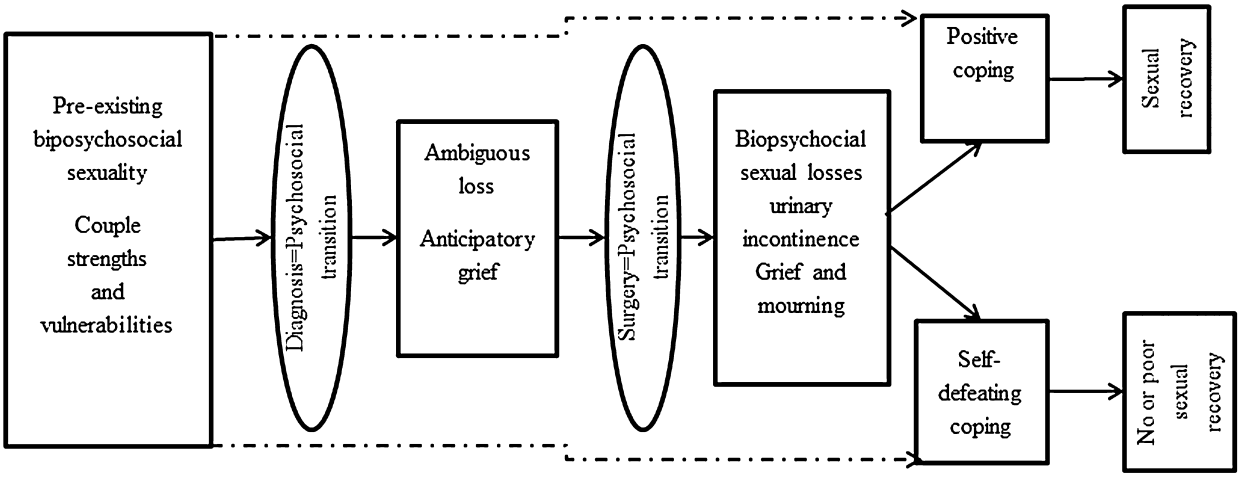
Psycho: Ambiguous Loss and Grief. Feelings associated with grief, e.g., frustration, hopelessness, and hope were reported by 80% of the couples. Against expectations, 75% of the men felt that ED diminished their manhood, 50% rued the loss of sexual performance, and 25% reported loss of sexual confidence. Men and partners worried about the uncertain ultimate erection recovery. The men with more extensive nerve damage had no tumescence or libido: they were particularly upset. Some partners felt disappointed by the arduousness of post-prostatectomy sex. Only one patient did not grieve sexual losses: aging had already taken his athletic ability; ED for him was less significant.

Social: Couples' Coping and the Partner's Role. Many couples (75%) reported feeling unhappy about the loss of spontaneous sex when familiar sexual interactions were ineffective. Worry about satisfying the partner and self-consciousness led to decreased sexual interaction frequency. Even couples reporting that they were coping well noted this hardship. Sexuality was now characterized as "different." Yet some couples reported that work on sexual recovery brought them closer together.

Coping strategies that helped the recovery included being optimistic, using humor, reframing the experience in the larger context of beating cancer, the strength of the relationship, acceptance of low sexual function, affection, patience, communication about sexual losses/changes, the man's participation in sexual rehabilitation activities, the partner's sexual interest, regular sexual activity, and willingness to experiment sexually, using sexual aids. These coping strategies were discussed by both for the heterosexual couples and the gay couple. In contrast to the heterosexual couples, however, the gay partner, because of his own post-prostatectomy ED, had an ability to empathize with the patient's coping and adaptation, which contributed to this couple's emotional intimacy.

Coping strategies that hindered the recovery included feeling hopeless, difficulty grieving and accepting sexual losses, lack of communication or couple emotional intimacy, urinary incontinence, and the partner's disinterest in sex. Dislike of sexual aids led to avoidance of sexual activity. A significant loss of sexual function led to loss of sexual intimacy even in otherwise harmonious couples.

Partners encouraged patients' engagement in rehabilitation activities, scheduled appointments, and offered reassurance for patients' feelings of frustration. They felt they had to be strong for the men and men relied on their partners for strength. Partners had their own complex feelings about their role, including the expectation about



Pre-existing developmental sexual losses: erectile dysfunction, post-menopausal symptoms
Pre-existing strengths: long term relationships, success coping with challenges
Pre-existing vulnerabilities: relationship problems, stressors, dislike of unspontaneous sex
Post diagnosis coping: anticipatory grief, faith in surgeon skill and couple strengths, willingness to work hard on recovery, minimization of nerve damage, belief that using sexual aids will be unnecessary
Biopsychosocial sexual losses: functional, confidence, familiar relationship
Post-surgery positive coping: normal grief and mourning, ongoing sexual activity, acceptance of sexual losses, use of sexual aids, partner's positive interest in sex regardless of menopause
Post-surgery self-defeating coping: inability to grieve sexual losses, no or infrequent sexual activity, relationship problems, stressors, inflexible sexuality, partner's low or no interest sex regardless of menopause

Figure 1 Revised model of couples' sexual recovery after prostate cancer treatment.

initiating sex. This was true for both the female partners and the gay partner.

Couples' Definition of Sexual Recovery

Some couples defined sexual recovery as recovered erection; others simply wished to be sexually engaged. One couple's definition of sexual recovery end point probably represents many couples in this sample: a return to unselfconscious sex, not baseline erectile function. We chose their definition because all the couples in the sample spoke with sadness and frustration about the loss of spontaneity, having to plan, interruption in sexual activity by the use of aids, feeling self-conscious/inadequate, and simply having to "work" at it. They were wistful about the days when sex was easy, spontaneous, and confident. Loss of spontaneity and self-consciousness interfered with couples' sexual pleasure and intimacy.

Revised Model of Couples' Sexual Recovery after Prostate Cancer Treatment

Based on the findings, we modified our preliminary model (Figure 1). We found that couples experienced not one but two psychosocial transitions: cancer diagnosis is the first life-altering event and sexual changes after surgery are the second one. Anticipatory grief was reported prior to surgery, while grief related to actual losses was reported after surgery. We discovered that couples' capacity to recover sexual intimacy was modified by their preexisting strengths and vulnerabilities, their capacity to communicate about grief and mourning together, and their ability to use positive coping strategies.

Discussion

Using mixed methods, our findings supported and extended our exploratory hypothesis that after prostatectomy, couples' sexuality is affected by surgery for prostate cancer physiologically, psychologically, and in the relationship and that the process of grief and mourning begins couples' movement toward recovering sexual intimacy. We therefore believe that in order to optimize sexual recovery outcomes, perioperative interventions should address all the biopsychosocial aspects of

couples' sexuality together as well as the role of the grief process in recovery. A very recently published paper by Pillai-Friedman and Ashline lends support to our model's suggestion that grief is a process variable in the recovery: it proposes that in breast cancer, sexual losses are experienced as a "disenfranchised grief" and suggests that grief and mourning be legitimized and incorporated into clinical care [27].

Couples' preoperative confidence about recovery of erectile function corroborates previous studies' findings about patients' overly optimistic expectations of outcomes [28,29]. In our sample, patients and partners reinforced each other's high expectations. Of concern is couples' tendency to base expectations on factors only somewhat influential on erectile function outcomes: surgeons' expertise, their own healthy living, and willingness to work hard on recovery. They often did not sufficiently account for the physiologic damage, inevitable even when nerve-sparing is attained in the most skilled surgery. Unwittingly, they thus positioned themselves to experience sexual losses, the loss of self-efficacy, and potential decision regret, described in the literature, particularly if their urinary and sexual outcomes did not meet their expectations [30–32]. The explanation for couples' stated willingness to work on sexual recovery yet a dislike of rehabilitation devices and activities may lie in their expectations: if erections returned to baseline, erectile aids would not be necessary. This approach can be described as the first stage of grief when the acknowledgment of losses is resisted, especially when the loss is ambiguous [33].

After surgery, couples reported losses in all three domains of sexuality: erectile and female sexual function (bio), the man's sexual confidence in his masculinity (psycho), and familiar sexual activity (social). Couples successfully recovering sexual relationships worked through grief and engaged in "flexible" sexual coping [34] by discussing losses, not overfocusing on erectile function and using sexual aids. Their intentional regular engagement in sex without reliance on hormonally driven desire is reminiscent of Basson's model of female sexual arousal in which sexual activity is based on a subjective decision rather than on physiologic arousal [35]. The similarity is the lack of connection between physiologic arousal and psychological desire/arousal. For men with post-prostatectomy ED due to nerve damage, the loss of ability to rely on spontaneous physiologic response to desire necessitates that they adopt a conscious, intentional approach by engaging in regular sexual stimulation in order to enjoy sexual expression.

The acceptance of unspontaneous sex and sexual aids by some of the patients in this study sample is a particular sign of resilience, given the fact that the literature has shown that men do not use sexual aids and consider erections necessary to satisfying sexuality [36,37]. Research on couples' resilience suggests that the patient's resilience has a positive effect on the partner and leads to positive coping of the couple [38]; studies on both heterosexual and gay men with prostate cancer corroborate the importance of the patient's attitude in suggesting that some men can respond to the challenge of coping with prostate cancer by feeling empowered to identify what is important in their lives and develop compassion for others [39,40]. Drawing on the family therapy literature, Walsh's systems model of resilience tells us that couples who have had a long history together, value their commitment, and have good communication are more likely to adapt to change and adverse health conditions [41]. Walsh's model seems very applicable to the couples in this sample that coped well with post-prostatectomy ED. Inability to grieve sexual losses, urinary incontinence, relationship problems, avoidance of erectile aids, and external stressors impeded some couples' sexual recovery.

Regardless of female partners' postmenopausal sexuality, couples with sexually interested partners began a more successful recovery. This finding contrasts with previous research [42] in which the female sexual function predicted the man's post-prostatectomy erectile function recovery. It suggests that the female partner's psychological/relationship factors, not function, influence couples' sexual intimacy recovery, which supports the importance of Manne and Badr's research on emotional intimacy [12]. However, we found that emotional intimacy without pursuit of sexual pleasure through sexual activity was insufficient for the recovery of sexual intimacy, which is in line with Beck et al.'s more recent study in which sexual pleasure was the key to maintaining sexual intimacy after prostate cancer treatment [43].

The goal of recovering emotional as well as sexual intimacy despite functional challenges was especially well illustrated by the gay couple in which the partner had sexual desire despite his own prostatectomy-related ED and sought to provide emphatic, meaningful emotional support

for the patient while their new post-prostatectomy sexual relationship had a chance to develop. This couple discussed some of the issues identified in other research on gay men and prostate cancer, such as the need for firmer erections for anal penetrative sex, the meaning of ejaculate, and gay couples' openness to including another partner in their sexual interactions [44,45]. While reporting feelings and concerns about sexual changes, this couple coped in a manner similar to that of the long-term heterosexual couples in this sample by working on sexual recovery within their own relationship.

Grief was a salient feature of the recovery process. Preoperatively, couples coped with anticipatory grief by having high expectations and putting off planning. After surgery, couples endorsed feelings of frustration, sadness, anger, hope, and acceptance.

The study's contribution to the prostate cancer literature is its prospective design with a new, real-time insight into the recovery process. The sample size allowed for repeated confirmation of the concepts of the model in the qualitative data, thus informing in the couples' voice. The model is relevant and can be adapted to couples coping with other cancers. Limitations include a non-diverse sample, biased by participants' interest in sexual recovery and the study end point 3 months after surgery when erectile recovery begins. However, the findings from this postoperative time point suggest that early intervention would help couples wishing to maintain or rekindle sexual intimacy stay sexually engaged as biological function gradually returns and prevent their giving up early in the recovery course.

Because this is an exploratory study with a small sample, its finding can be only transferable. However, the concepts discussed by patients and partners, including the biopsychosocial sexual losses after prostatectomy and grief and mourning as the process through which couples recover sexual intimacy, can expand the conceptualization of providing care for prostate cancer survivors. In order to be generalizable, it will be important to confirm this model of couples' sexual recovery with a larger, more diverse sample in a 2–3-year timeframe.

Based on our findings, we conclude, as did previous studies, that a couple approach to sexual recovery after prostate cancer is critical to the success of interventions and that the inclusion of a multidisciplinary simultaneous treatment of all aspects of sexuality is necessary for the success of couples' sexual recovery after prostatectomy. Attention to the grief process that follows sexual losses facilitates recovery. Urologists routinely address ED; they can best address the role of nerve damage preoperatively and review it postoperatively to help couples tolerate the slow functional recovery despite their best efforts. Collaboration with certified sex therapists can help address sexual losses and guide couples' work through grief and mourning. Couples may need encouragement to communicate with each other about their grief about sexual losses; men may need help accepting their vulnerability [46]. Widening of sexual repertoire, including postmenopausal partners' rediscovery of sexual pleasure, use of sexual aids, non-penetrative sex, and sexual experimentation, can be encouraged [34,47]. For many couples, expert support can be brief. Couples with relationship problems and stressors may need more intensive, longer term sex therapy.

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Conflict of Interest: Daniela Wittmann owns $4,000 in Pfizer stock. James E. Montie is on the Advisory Board of Histosonics, Inc.

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References

1 Couper JW, Bloch S, Love A, Duchesne G, Macvean M, Kissane DW. The psychosocial impact of prostate cancer on patients and their partners. Med J Aust 2006;185:428–32.
2 Beck AM, Robinson JW, Carlson LE. Sexual intimacy in heterosexual couples after prostate cancer treatment: What we know and what we still need to learn. Urol Oncol 2009; 27:137–43.
3 Galbraith ME, Fink R, Wilkins GG. Couples surviving prostate cancer: Challenges in their lives and relationships. Semin Oncol Nurs 2011;27:300–8.
4 Bruun P, Pedersen BD, Osther PJ, Wagner L. The lonely female partner: A central aspect of prostate cancer. Urol Nurs 2011;31:294–9.
5 Sanders S, Pedro LW, Bantum EO, Galbraith ME. Couples surviving prostate cancer: Long-term intimacy needs and concerns following treatment. Clin J Oncol Nurs 2006;10:503–8.
6 Wootten AC, Burney S, Foroudi F, Frydenberg M, Coleman G, Ng KT. Psychological adjustment of survivors of localised prostate cancer: Investigating the role of dyadic adjustment, cognitive appraisal and coping style. Psychooncology 2007; 16:994–1002.
7 Garos S, Kluck A, Aronoff D. Prostate cancer patients and their partners: Differences in satisfaction indices and psychological variables. J Sex Med 2007;4:1394–403.
8 Neese LE, Schover LR, Klein EA, Zippe C, Kupelian PA. Finding help for sexual problems after prostate cancer treatment: A phone survey of men's and women's perspectives. Psychooncology 2003;12:463–73.
9 Ashing-Giwa KT, Padilla G, Tejero J, Kraemer J, Wright K, Coscarelli A, Clayton S, Williams I, Hills D. Understanding the breast cancer experience of women: A qualitative study of African American, Asian American, Latina and Caucasian cancer survivors. Psychooncology 2004;13:408–28.
10 Canada AL, Neese LE, Sui D, Schover LR. Pilot intervention to enhance sexual rehabilitation for couples after treatment for localized prostate carcinoma. Cancer 2005;104:2689–700.
11 Schover LR, Canada AL, Yuan Y, Sui D, Neese L, Jenkins R, Rhodes MM. A randomized trial of internet-based vs. traditional sexual counseling for couples after localized prostate cancer treatment. Cancer 2012;118:500–9.
12 Manne S, Badr H. Intimacy and relationship processes in couples' psychosocial adaptation to cancer. Cancer 2008; 112(11 suppl):2541–55.
13 Manne SL, Kissane DW, Nelson CJ, Mulhall JP, Winkel G, Zaider T. Intimacy-enhancing psychological intervention for men diagnosed with prostate cancer and their partners: A pilot study. J Sex Med 2011;8:1197–209.
14 WHO SHDS. Defining sexual health: A report of a technical consultation on sexual health. 28–31 January, 2002. World Health Organization, Sexual Health Document Series; 2002.
15 Bober SL, Varela VS. Sexuality in adult cancer survivors: Challenges and intervention. J Clin Oncol 2012;30:3712–9.
16 Tierney DK. Sexuality: A quality-of-life issue for cancer survivors. Semin Oncol Nurs 2008;24:71–9.
17 Wittmann D, Foley S, Balon R. A biopsychosocial approach to sexual recovery after prostate cancer surgery: The role of grief and mourning. J Sex Marital Ther 2011;37:130–44.
18 Parkes CM. Psycho-social transitions: A field for study. Soc Sci Med 1971;5:101–15.
19 Wittmann D, Northouse L, Crossley H, Miller D, Dunn R, Nidetz J, Montie J, Moyad M, Lavin K, Montie JE. A pilot study of potential pre-operative barriers to couples' sexual recovery after radical prostatectomy for prostate cancer. J Sex Marital Ther 2013; doi: 10.1080/0092623X.2013.842194.
20 Wei JT, Dunn RL, Litwin MS, Sandler HM, Sanda MG. Development and validation of the expanded prostate cancer index composite (EPIC) for comprehensive assessment of health-related quality of life in men with prostate cancer. Urology 2000;56:899–905.
21 Wheat JC, Hedgepeth RC, He C, Zhang L, Wood DP Jr. Clinical interpretation of the Expanded Prostate Cancer Index Composite-Short Form sexual summary score. J Urol 2009;182:2844–9.
22 Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, Ferguson D, D'Agostino R Jr. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Ther 2000;26:191–208.
23 Znaniecki F. The method of sociology. New York: Farrar & Rinehart; 1934.
24 Robinson WS. The logical structure of analytic induction. Am Sociol Rev 1951;16:812–8.
25 Charmaz K. Construction grounded theory: A practical guide through qualitative analysis. London, Thousand Oaks, New Delhi: Sage Publications; 2006.
26 NVivo 9. QSR International (Americas) Inc.; 2012.
27 Pillai-Friedman T, Ashline JL. Women, breast cancer survivorship, sexual losses, and disenfranchised grief—A treatment model for clinicians. Sex Relation Ther 2014; doi: 10.1080/14681994.2014.934340.
28 Symon Z, Daignault S, Symon R, Dunn RL, Sanda MG, Sandler HM. Measuring patients' expectations regarding health-related quality-of-life outcomes associated with prostate cancer surgery or radiotherapy. Urology 2006;68:1224–9.
29 Wittmann D, He C, Coelho M, Hollenbeck B, Montie JE, Wood DP Jr. Patient preoperative expectations of urinary, bowel, hormonal and sexual functioning do not match actual outcomes 1 year after radical prostatectomy. J Urol 2011; 186:494–9.
30 Chien CH, Chuang CK, Liu KL, Li CL, Liu HE. Changes in decisional conflict and decisional regret in patients with localised prostate cancer. J Clin Nurs 2014;23:1959–69.
31 Davison BJ, Matthew A, Gardner AM. Prospective comparison of the impact of robotic-assisted laparoscopic radical prostatectomy vs. open radical prostatectomy on health-related quality of life and decision regret. Can U Assoc J 2014;8:E68–72.
32 Ratcliff CG, Cohen L, Pettaway CA, Parker PA. Treatment regret and quality of life following radical prostatectomy. Support Care Cancer 2013;21:3337–43.
33 Boss P. Ambiguous loss: Learning to live with unresolved grief. New York: Harvard Press; 1999.
34 Reese JB, Keefe FJ, Somers TJ, Abernethy AP. Coping with sexual concerns after cancer: The use of flexible coping. Support Care Cancer 2010;18:785–800.
35 Basson R. A model of women's sexual arousal. J Sex Marital Ther 2002;28:1–10.
36 Miller DC, Wei JT, Dunn RL, Montie JE, Pimentel H, Sandler HM, McLaughlin PW, Sanda MG. Use of medications or devices for erectile dysfunction among long-term prostate cancer treatment survivors: Potential influence of sexual motivation and/or indifference. Urology 2006;68:166–71.
37 Wittmann D, He C, Mitchell S, Wood DP Jr, Hola V, Thelen-Perry S, Montie JE. A one-day couple group intervention to enhance sexual recovery for surgically treated men with

prostate cancer and their partners: A pilot study. Urol Nurs 2013;33:140–7.
38 Lim JW, Shon EJ, Paek M, Daly B. The dyadic effects of coping and resilience on psychological distress for cancer survivor couples. Support Care Cancer 2014; doi: 10.1007/s00520-014-2334-9.
39 Thomas C, Wootten A, Robinson P. The experiences of gay and bisexual men diagnosed with prostate cancer: Results from an online focus group. Eur J Cancer Care (Engl) 2013; 22:522–9.
40 Morris BA, Wilson B, Chambers SK. Newfound compassion after prostate cancer: A psychometric evaluation of additional items in the Posttraumatic Growth Inventory. Support Care Cancer 2013;21:3371–8.
41 Walsh F. Strengthening family resilience. New York: The Guilford Press; 2006.
42 Shindel A, Quayle S, Yan Y, Husain A, Naughton C. Sexual dysfunction in female partners of men who have undergone radical prostatectomy correlates with sexual dysfunction of the male partner. J Sex Med 2005;2:833–41, discussion 841.
43 Beck AM, Robinson JW, Carlson LE. Sexual values as the key to maintaining satisfying sex after prostate cancer treatment: The physical pleasure-relational intimacy model of sexual motivation. Arch Sex Behav 2013;42:1637–47.
44 Hart TL, Coon DW, Kowalkowski MA, Zhang K, Hersom JI, Goltz HH, Wittmann DA, Latini DM. Changes in sexual roles and quality of life for gay Men after prostate cancer: Challenges for sexual health providers. J Sex Med 2014;2:141–51.
45 Hartman ME, Irvine J, Currie KL, Ritvo P, Trachtenberg L, Louis A, Trachtenberg J, Jamnicky L, Matthew AG. Exploring gay couples' experience with sexual dysfunction after radical prostatectomy: A qualitative study. J Sex Marital Ther 2014; 40:233–53.
46 Wall D, Kristjanson L. Men, culture and hegemonic masculinity: understanding the experience of prostate cancer. Nurs Inq 2005;12:87–97.
47 Alterowitz R, Alterowitz B. Intimacy with impotence: A couple's guide to better sex after prostate disease. Cambridge MA: Perseus Books, De Capo Lifelong Books; 2004.