Knowledge about the sexual functioning of women with pelvic organ prolapse or urinary incontinence is limited. Recently, leaders in the field of urogynecology and pelvic surgery called for the development, validation, and standardization of scales to evaluate function thought to be related to urinary incontinence and pelvic organ prolapse.1 Four functional groups were identified as follows: (1) urinary symptoms, (2) bowel symptoms, (3) sexual symptoms, and (4) other local symptoms. Although scales assessing urinary symptoms have been developed and validated, no condition-specific, self-administered, valid, and reliable scale evaluating sexual function in patients with incontinence or uterovaginal prolapse is available.2, 3

The importance of accurate measures of symptom severity to assess the impact of treatments on the well-being of patients, as well as the relief of incontinence or the correction of pelvic relaxation, has been delineated elsewhere.4, 5 An emphasis on the development of condition-specific rather than generalized survey instruments has evolved. Generalized instruments may not have the sensitivity to detect subtle differences that exist within a defined population, whereas population-specific questionnaires may be more accurate in their differentiation.4, 6 We present a reliable, validated self-administered instrument to evaluate sexual function in women with urinary incontinence or pelvic organ prolapse.

**Material and methods**

After institutional review board approval, items for the initial questionnaire were developed through consultation with clinicians and experts in the field of sexual function and through review of the literature and of previously validated instruments evaluating sexual function.5.
In addition, items were constructed from guidelines outlined in “The Standardization of Terminology of Female Pelvic Organ Prolapse and Pelvic Floor Dysfunction.” This article outlines questions regarding function that should be addressed by pelvic surgeons.

An initial list of 41 questions was identified and screened to ensure that the questions met the standard for an eighth-grade reading level. Women participating in the study were recruited from the gynecology clinic at the University of New Mexico Health Sciences Center and from a database of patients who have been involved in gynecologic research from the research division of the University of New Mexico Hospital. The institutional review board waived the need for signed consent, because the questionnaire was anonymous. Inclusion criteria included women who were nonpregnant, who were older than 21 years, who were in a heterosexual relationship, and who could read English. The study was designed to be completed in 2 phases. In both phases women completed a screening questionnaire, which included self-reporting of sexual activity. Those who stated that they were sexually active then completed additional questionnaires.

Phase 1, which served as a pilot study for item selection, included women with and without symptoms of urinary incontinence or pelvic organ prolapse. In this phase we included both women with and those without urinary incontinence or pelvic organ prolapse to ensure the generalizability of the instrument. Incontinence was self-reported, as were symptoms of prolapse. Women asked to participate were screened with the question, “Do you have any symptoms of urine leaking, pressure in your vagina, or the feeling that ‘things are falling out’?” Women in phase 1 completed 2 questionnaires—the 41 questions identified as described here and the Incontinence Impact Questionnaire-7 (IIQ-7), which measures the impact of incontinence on the patient’s social functioning. In phase 1 factor analysis identified 3 impact domains. The impact domains were labeled Behavioral/Emotive, Physical, and Partner-Related. Item-total correlations, relating how each item correlates with a sum of the items, as well as the multicollinearity, or redundancy, of the items in the initial instrument, were calculated. The Cronbach α statistic, which represents the internal consistency-reliability coefficient, was calculated for each factor and for the questionnaire as a whole to determine whether the scale’s reliability was higher with or without a particular item. For construct validity, item, factor, and total scores from our questionnaire were correlated with both the IIQ-7 scores and the woman’s age. Increasing age has been associated with poorer sexual functioning in previous studies, and age served as a way to measure the responsiveness of the instrument to differences in sexual functioning. A subset of 20 of the initial 83 women repeated the questionnaire within a 2-week period for reliability testing. Test-retest reliability was calculated by weighted κ statistics with a cutoff score of 0.5, and bias was evaluated by paired t tests. Questions were scored in a matrix evaluation according to correlations with age, IIQ-7 scores, and satisfaction, as well as κ scores, P values evaluating test-retest bias, and Cronbach α values. Questions that scored poorly in this matrix were eliminated from the questionnaire.

In phase 2 study participants included only women who had urinary incontinence or pelvic organ prolapse (or both of these). Patients in phase 2 completed the 31 questions remaining after the matrix evaluation in phase 1 and the questions in IIQ-7. Additionally, Sexual History Form-12 (SHF-12), a nonspecific but validated questionnaire that evaluates sexual functioning and served as a criterion standard with which to compare our questionnaire, and the Symptom Questionnaire, which evaluates the patient’s well-being, including scales on depression, somatization, anxiety, and hostility, were completed.

Using the Behavioral/Emotive, Physical, and Partner-Related domains defined in phase 1, we repeated validity and reliability testing in phase 2. In addition to the correlations evaluated in phase 1, scores from the questionnaire were also correlated with the SHF-12 scores. Questions were again scored in a matrix evaluation according to correlations with age, IIQ-7 scores, satisfaction, and SHF-12 scores, as well as κ scores, P values evaluating bias, and Cronbach α values. For additional construct validity, scores for the total questionnaire and factors were correlated with scores on depression from the Symptom Questionnaire, because up to 90% of patients with depression also have sexual dysfunction. The resulting validated questionnaire was named the Pelvic Organ Prolapse–Urinary Incontinence Sexual Function Questionnaire (PISQ; see Appendix).

A power analysis for phase 2 calculated that a sample size of 80 patients was adequate to distinguish an effect size of 0.65 because of age with 80% power and α = .05 for validity testing. The sample size of 20 for κ statistics in the

<table>
<thead>
<tr>
<th>Table I. Phase 1 and phase 2 demographics</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Age (y, mean ± SD)</td>
</tr>
<tr>
<td>Gravidity (mean ± SD)</td>
</tr>
<tr>
<td>Parity (mean ± SD)</td>
</tr>
<tr>
<td>Ethnicity (%)</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Native American</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Urinary incontinence or pelvic organ prolapse (%)</td>
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<tr>
<td>Hysterectomy (%)</td>
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</table>
Correlations are therefore expected. The magnitude of the correlation, not the sign of the correlation, is indicative of agreement.

### Table II. Correlation of SHF-12 and IIQ-7 scores with PISQ factors and total score* in phase 2

<table>
<thead>
<tr>
<th>PISQ domain (factor)</th>
<th>SHF-12 (n = 96)</th>
<th>IIQ (n = 99)</th>
<th>SHF-12 NS</th>
<th>IIQ NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral/Emotive</td>
<td>-0.79</td>
<td>-0.14</td>
<td>-0.50</td>
<td>-0.26</td>
</tr>
<tr>
<td>Physical</td>
<td>-0.23</td>
<td>-0.63</td>
<td>-0.74</td>
<td>-0.36</td>
</tr>
<tr>
<td>Partner-Related</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PISQ score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistical significance*</td>
<td></td>
<td></td>
<td></td>
<td>P &lt; .001</td>
</tr>
</tbody>
</table>

*Higher PISQ scores indicate better sexual function, and lower SHF-12 and IIQ scores represent better sociosexual function; negative correlations are therefore expected. The magnitude of the correlation, not the sign of the correlation, is indicative of agreement.

### Table III. Comparison of SHF-12 scores and PISQ scores by age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Study subjects (No.)</th>
<th>Questionnaire scores</th>
<th>Statistical significance*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Range</td>
<td></td>
</tr>
<tr>
<td>SHF-12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;46 y</td>
<td>19</td>
<td>95 ± 18</td>
<td>38-112</td>
</tr>
<tr>
<td>46-64 y</td>
<td>68</td>
<td>92 ± 12</td>
<td>55-114</td>
</tr>
<tr>
<td>&gt;64 y</td>
<td>11</td>
<td>91 ± 19</td>
<td>75-106</td>
</tr>
<tr>
<td>PISQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;46 y</td>
<td>18</td>
<td>0.43 ± 0.14</td>
<td>0.29-0.86</td>
</tr>
<tr>
<td>46-64 y</td>
<td>67</td>
<td>0.45 ± 0.12</td>
<td>0.25-0.75</td>
</tr>
<tr>
<td>&gt;64 y</td>
<td>11</td>
<td>0.46 ± 0.18</td>
<td>0.19-0.70</td>
</tr>
</tbody>
</table>

NS. Not significant.

*Comparison of scores between age groups (analysis of variance).

test-retest data was adequate to distinguish an effect size of 0.66. With a moderate correlation of 0.7 for the repeated measures in a paired t test a difference in means equal to 50% of the common SD was detectable with 80% power and \( \alpha = .05 \).

**Results**

A total of 378 patients were screened between September 1997 and March 1999 for 263 women who met the inclusion criteria, of whom 182 (69%) agreed to complete questionnaires in either phase 2 or phase 1. The demographic data are outlined in Table I. The ethnicity of the population reflects the ethnic diversity of the University of New Mexico Hospital, which serves a largely indigent patient population.

In phase 1 we eliminated 10 items that scored poorly in the matrix evaluation. The items eliminated had poor test-retest reliability, with weighted \( \kappa \) scores < 0.5, low item–total correlations, or Cronbach \( \alpha \) scores < .6, or otherwise provided redundant information compared with another item in the questionnaire. The remaining 31 questions composed the final questionnaire.

Reliability testing was performed in both phase 1 and phase 2 of the study. Testing was repeated in phase 2 because 6 of the questions in phase 1 were rewritten for the second phase of the study. Final test-retest evaluation had weighted \( \kappa \) values ranging from 0.56 to 0.95, indicating moderate to high reliability, and all paired t test \( P \) values were > .15, indicating a lack of bias.

In phase 2 the internal consistency on the questionnaire as a whole and on the Behavioral/Emotive and Physical factors was high, with the Cronbach \( \alpha \) value at .85, .86, and .77, respectively. The Partner-Related factor was much lower, at \( \alpha = .43 \). Initial testing in phase 1 resulted in higher scores for the Partner-Related factor (Cronbach \( \alpha = .60 \)), which did not persist in phase 2 of the study. Because of this and the fact that the Partner-Related factor in phase 1 explained 25% of the variability in the factor analysis with 3 factors, the Partner-Related factor was considered experimental and was retained for further evaluation in different populations and settings.

Scoring for the questionnaire was as follows. Questions were transformed into Likert-type scales (0, always; 4, never), with the exception of question 5, which was scored from 0 to 5 (0, do not masturbate; 5, always). Scores were calculated by totaling the score for each question. Reverse scoring was used for some questions to consistently reflect that higher scores reflected better sexual functioning (see Appendix). Individual factor scores were calculated by adding the scores for the individual items in each factor. Higher PISQ scores indicate better sexual function. Because higher SHF-12 scores indicate decreased sexual function, negative correlations indicate agreement between the 2 questionnaires. When PISQ scores were compared with SHF-12 scores, a significant negative correlation indicated agreement in the patient’s sexual functioning. The total PISQ scores were highly negatively correlated with SHF-12 scores, indicating excellent correlation between the PISQ and the SHF-12 (Table II). Scores for the Behavioral/Emotive and Partner-Related domains were also highly negatively correlated with SHF-12 scores (Table II). The Physical factor was not correlated with SHF-12 but did correlate highly with IIQ-7 (Table II); this factor represents new content evaluating sexual function in women with pelvic organ prolapse or urinary incontinence.

Creti et al. in an article on female sexual functioning that discussed a global score for Nowinski and Lopiccolo’s “Sexual History Form,” defined dysfunctional scores as >0.57. When a cut score of 0.56 on the SHF-12 was used to define good versus poor sexual functioning, high and low scores on the PISQ gave sensitivities of 86% and a specificity of 75% in distinguishing these 2 SHF-12
subgroups. When age was divided into 3 groups previously used to distinguish poor from better sexual functioning with the use of SHF-12 scores, no differences were noted (Table III).

Scores from the PISQ were then compared between women with high and women with low depression scores on the Symptom Questionnaire depression scale. One of the criteria for depression is a lack of libido and the presence of sexual dysfunction. Eighteen patients scored high in depression, and scores on the PISQ were significantly lower for this group than for the patients who scored normally on the Symptom Questionnaire’s depression scale (Table IV). The PISQ had a sensitivity of 78% and a specificity of 72% for distinguishing the difference between depressed women and those not depressed.

**Comment**

Published studies on sexual dysfunction in patients with urinary incontinence or pelvic organ prolapse fall into 2 groups—studies that concentrate on vaginal anatomy and those that analyze sexual satisfaction. Many authors have chosen to evaluate the anatomic outcomes of surgical repairs rather than discuss functional outcomes in women. Reports focus on vaginal length and caliber and the ability of the vagina to support sexual intercourse rather than on the sexual satisfaction of women after surgical repair.7,13

One instrument used for evaluating sexual functioning of women in this population has been a validated and reliable shortened version of Lopiccolo’s Sexual History Form-36, originally published in 1982 to evaluate sexual function.5 Norms for this form were derived from 90 couples in New York who responded to a newspaper advertisement requesting couples in a stable relationship to participate in sexual research. Catholic and Jewish couples were overrepresented in this sample, as were young couples in the middle class.15 This demographic sampling may not be pertinent to the patient population of many academic centers in the United States and may not accurately reflect the sexual function of a more varied population, including women with urinary incontinence or pelvic organ prolapse.1, 4, 6 Although nonspecific questionnaires such as the SHF-12 can be used to evaluate other than the target population, they run the risk of not being able to distinguish differences in a given population as well as more specific questionnaires can.6, 16, 17 For investigators evaluating the impact of interventions to treat pelvic organ prolapse and urinary incontinence, there is a need for a specific, validated, and reliable questionnaire.6

Reports vary on the numbers of women with incontinence or pelvic organ prolapse who are sexually active,15, 18-22 although many authors report a decrease in sexual activity with aging, others report continued sexual activity and desire in women well into the menopause,21-24 and this may partially explain the lack of differences noted in our population by age group. In addition, women with urinary incontinence or pelvic organ prolapse may be different from previously studied populations, in that differences attributable to age may be obscured by the confounding condition of prolapse or incontinence. We did not find the differences in sexual function according to age group, by using both the PISQ and the SHF-12, that other authors have reported in our population.2, 5 We did, however, find that the PISQ correlated highly with the SHF-12, which served as a criterion standard, and that it was also able to distinguish between women who scored high on depression scores and those who did not. Although normative values for sexual functioning have yet to be determined by the PISQ, evaluation of mean scores or median splits allows comparison of study subjects. Future study will be needed to determine the sensitivity of this instrument to changes in sexual function in women after treatment for incontinence or prolapse.

Symptoms of urinary incontinence and prolapse were self-reported by the women completing the questionnaires. Although we were able to use a reliable and validated questionnaire, the IIQ-7, to confirm the patient’s report of the severity of incontinence, no such measure exists to evaluate prolapse. Because of the sensitive nature of the questions that we were asking patients, we believed it essential to preserve patient anonymity and ensure candid answers. Further studies relating questionnaire results to physical examination and objective evaluation of incontinence are needed to confirm our findings and to evaluate whether severity of incontinence or prolapse is reflected in poorer sexual function.

The patient population in New Mexico, although ethnically diverse, has a higher Hispanic and a lower African

| Table IV. Comparison of PISQ scores divided into Symptom Questionnaire high and low depression scores |
|---------------------------------------------|---------------------------------------------|
| **PISQ domain** | **Symptom Questionnaire depression score** | **Statistical significance** |
| | **Mean high score (≥10) (n = 18)** | **Mean low score (<10) (n = 79)** | |
| Behavioral/Emotive score | 25 | 27 | \(P = .03\) |
| Physical score | 30 | 35 | \(P < .001\) |
| Partner-Related score | 30 | 32 | \(P < .22\) |
| Total score | 83 | 94 | \(P < .001\) |
American population than many of the United States. Sexual function, in addition to being influenced by prolapse and incontinence, is also influenced by race and culture. Therefore, this questionnaire needs to be further validated by use in other diverse populations.

This questionnaire was administered to women who self-reported urinary incontinence or pelvic organ prolapse and who stated that they were currently sexually active. We found that approximately 30% of our study population reported that they were sexually inactive. This questionnaire was designed to evaluate sexual activity in women who were currently sexually active. However, to report accurately, authors who use this questionnaire to study pelvic floor disorders need to report whether patients are sexually active and if not, why not.

The domains identified in phase 1 of the study were retained and validated in phase 2. Although the Cronbach α value was low for the Partner-Related domain, the score for the questionnaire as a whole was high with the inclusion of those questions, which indicates that they continued to contribute to the questionnaire as a whole. The fact that the Partner-Related domain scored high in phase 1 and lower in phase 2 indicates that it might need further testing to evaluate its value as an independent factor and its contribution of new content to the questionnaire.

Gynecologists operate on women and treat diseases of the sexual organs daily. Measurements of length and caliber are not adequate to evaluate the impact of therapies on the sexual functioning of women. The lack of a condition-specific, reliable, and validated instrument to measure sexual function limits an investigator’s ability to evaluate the impact of medical or surgical therapies on urinary incontinence or pelvic organ prolapse.


Appendix

Pelvic Organ Prolapse–Urinary Incontinence Sexual Function Questionnaire (PISQ)

Instructions. Following is a list of questions about you and your partner’s sex life. All information is strictly confidential. Your confidential answers will be used only to help doctors understand what is important to patients about their sex lives. Please check the box that best answers the question for you. While answering the questions, consider your sexuality during the past 6 months. Thank you for your help.

1. How frequently do you and your partner have sexual intercourse or activity?
   - Every day
   - 1 to 3 times a week
   - 1 to 3 times a month
   - Less than once a month
   - Never

REFERENCES

2. How frequently would you like to have sexual intercourse or activity?
- Every day
- 1 to 3 times a week
- 1 to 3 times a month
- Less than once a month
- Never

3. Does your partner have a problem with erections that affects your sexual activity?
- Always
- Usually
- Sometimes
- Seldom
- Never

4. Does your partner have a problem with premature ejaculation that affects your sexual activity?
- Always
- Usually
- Sometimes
- Seldom
- Never

5. Do you climax (have an orgasm) when masturbating?
- Always
- Usually
- Sometimes
- Seldom
- Never

6. Do you climax (have an orgasm) when having sexual intercourse with your partner?
- Always
- Usually
- Sometimes
- Seldom
- Never

7. Do you climax (have an orgasm) when you are caressed by your partner?
- Always
- Usually
- Sometimes
- Seldom
- Never

8. Do you notice any of the following when having sex with your partner: your breathing and pulse speed up; you have wetness in your vagina; you have pleasurable sensations in your breast and genital area?
- Always
- Usually
- Sometimes
- Seldom
- Never

9. Do you feel sexually excited (turned on) when having sexual activity with your partner?
- Always
- Usually
- Sometimes
- Seldom
- Never

10. How frequently do you feel sexual desire? This feeling may include wanting to have sex, planning to have sex, feeling frustrated because of lack of sex, and so forth.
- Daily
- Weekly
- Monthly
- Less than once a month
- Never

11. Do you feel pain during sexual intercourse?
- Always
- Usually
- Sometimes
- Seldom
- Never

12. Do you feel that your vagina is so “dry” that sexual intercourse cannot occur?
- Extremely dry
- Pretty dry
- Somewhat dry
- Not very dry
- Not dry at all

13. Is your vaginal opening so “tight” that sexual intercourse cannot occur?
- Extremely tight
- Pretty tight
- Somewhat tight
- Not very tight
- Not tight at all

14. Does your partner complain that your vagina is too tight?
- Always
- Usually
- Sometimes
- Seldom
- Never

15. Do you avoid sexual activity because of the length of the vagina?
- Always
- Usually
- Sometimes
- Seldom
- Never

16. Do you avoid sexual intercourse because of bulging in the vagina (either the bladder, rectum, or vagina falling out)?
- Always
- Usually
- Sometimes
- Seldom
- Never

17. Do you engage in anal or oral sex because vaginal sexual activity is uncomfortable for any reason?
- Always
- Usually
- Sometimes
- Seldom
- Never

18. Are you incontinent of urine with sexual activity?
- Always
- Usually
- Sometimes
Seldom
Never

19. Are you incontinent of stool with sexual activity?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

20. Does fear of incontinence (either stool or urine) restrict your sexual activity?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

21. Does fear of embarrassment because of incontinence restrict your sexual activity?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

22. Overall, how satisfied are you with your sexual relationship with your partner?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

23. Overall, how satisfied do you think your partner is with your sexual relationship?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

24. How satisfied are you with the variety of sexual activities in your current sex life?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

25. When you have sex with your partner, do you have negative emotional reactions such as fear, disgust, shame, or guilt?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

26. How often do you feel satisfied after sexual activity?
☐ Always
☐ Usually

27. How often are you able to achieve orgasm (climax)?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

28. Compared with orgasms you have had in the past, how intense are the orgasms you have had in the past 6 months?
☐ Much less intense
☐ Less intense
☐ Same intensity
☐ More intense
☐ Much more intense

29. Please complete the following sentence: In my relationship, I start activity leading to sexual intercourse...
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

30. Do you avoid sexual intercourse because of embarrassment?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

31. Do you think that your partner avoids sexual intercourse with you because of your problems with incontinence or bulging (either the bladder, rectum, or vagina falling out)?
☐ Always
☐ Usually
☐ Sometimes
☐ Seldom
☐ Never

Scoring. Scores were calculated by totaling the scores for each question, from 0 (always) to 4 (never), with the exception of question 5, which was scaled from 0 (always) to 5 (do not masturbate). Individual factor scores were calculated by adding the scores for the individual items in each factor. Reverse scoring was used for items 1, 2, 5, 6, 7, 8, 9, 10, 22, 23, 24, 26, 27, and 29. Factor 1 contained questions 1, 2, 5, 6, 7, 8, 9, 10, 12, 22, 23, 24, 26, 27, and 29; factor 2 contained questions 11, 13, 16, 17, 18, 19, 20, 21, 25, and 30; factor 3 contained questions 3, 4, 14, 15, 28, and 31. To handle missing values, the researcher calculated the sum by multiplying the number of items by the mean of the answered items.