Table F-14. Quality of life (nonrandomized comparative studies)

| **Study Outcomes** | **Treatment Group 1** | **Treatment Group 2** | **Treatment Group 3** | **Treatment Group 4** | **Analyses; p-Values** |
| --- | --- | --- | --- | --- | --- |
| Alemozaffar et al. 201468 | RALP: 132 patients | RRP: 468 patients | NA | NA | — |
| Expanded Prostate Cancer Index scores (urinary incontinence) | 74.4±23.0 | 74.4±25.3 | NA | NA | p=0.93 |
| Expanded Prostate Cancer Index scores (urinary obstruction) | 94.5±7.5 | 93.9±9.6 | NA | NA | p=0.94 |
| Expanded Prostate Cancer Index scores (sexual) | 36.8±29.5 | 36.3±29.7 | NA | NA | p=0.66 |
| Expanded Prostate Cancer Index scores (bowel) | 96.3±9.2 | 96.3±7.8 | NA | NA | p=0.52 |
| Expanded Prostate Cancer Index scores (hormonal/vitality) | 93.5±10.6 | 92.6±11.4 | NA | NA | p=0.37 |
| Satisfaction scale for cancer care (outcome satisfaction) | 89.3±13.3 | 89.5±13.6 | NA | NA | p=0.41 |
| Ferrer et al. 201391  Same study as Ferrer et al. 200861 | RRP: 134 patients | 3D‑CRT: 205 patients | BT: 275 patients | NA | One-way analysis of variance of Heath related Quality of Life scores (mean and SE) by treatment and risk group at the 5-year followup |
| Irritative obstructive scale  Incontinence scale among men in the BT group compared with RRP and 3D-CRT | Quality of life in men who underwent BT was limited to the urinary domain with Generalized Estimating Equation models showing the following score changes at the 5-year followup compared to RRP and 3D-CRT BT vs. RRP vs. 3D-CRT: mean change -5.3; 95% CI, -7.5 to -3.1  BT vs. RRP vs. 3D-CRT: mean change -12.0; 95% CI, -15.0 to -9.0 | | | | — |
| Irritative obstructive scale and incontinence scale comparing BT to RRP | Favorable irritative obstructive score (mean change 3.3; 95% CI, 0.0 to 6.5) and worse incontinence score (mean change -17.1; 95% CI, -22.7 to -11.5) were reported among men who underwent RRP compared to BT. | | | | — |
| EPIC - sexual function | A worsening in the EPIC score for sexual function was reported among men who underwent RRP (mean change -19.1; 95% CI, -25.1 to -13.1) and men who received 3D-CRT (mean change -7.5; 95% CI -12.5 to -2.5).91 | | | | — |
| Ferrer et al. 200861  Same study as Ferrer et al. 201391 | RRP: 134 patients | 3D‑CRT: 205 patients | BT: 275 patients | NA | One-way analysis of variance of Heath related Quality of Life scores (mean and SE) by treatment and risk group at the 2-year followup |
| SF-36 physical component summary | 50.6 (0.8) | 49.2 (0.6) | 50.9 (0.5) | NA | p>0.05 at the 24 month followup for all dimensions forming the physical component. p=0.094 for component summary. |
| SF-36 mental component summary | 54.9 (0.8) | 56.3 (0.5) | 56.3 (0.4) | NA | p>0.05 at the 24 month followup for all dimensions forming the mental component. p=0.373 for component summary. |
| Functional Assessment of Cancer Therapy General (FACT-G) | 76.6 (1.1) | 77.5 (0.9) | 79.8 (0.6) | NA | One dimension of the FACT-G (physical well-being) showed significant between-group differences for RP vs. BT and BT vs. 3D‑CRT (p<0.05) at the 24 month followup. For entire scale, p=0.008 for RP vs. BT. |
| Functional Assessment of Cancer Therapy Prostate Specific (FACT-P) | 37.2 (0.5) | 37.5 (0.4) | 38.9 (0.3) | NA | For the entire scale, p=0.001 for RP vs. BT and for BT vs. 3D-CRT. |
| American Urologic Association Symptom Index (AUA-7) | 4.9 (0.6) | 6.4 (0.5) | 5.7 (0.4) | NA | p=0.405 |
| EPIC urinary | 88.2 (1.3) | 94.2 (0.8) | 92.4 (0.8) | NA | For the following subscale scores there was a significant (p<0.05) between-group difference at the 24 month follow up for RP vs. BT: irritative obstructive, urinary function, sexual function, incontinence, and sexual bother.  For the following subscale scores there was a significant (p<0.05) between-group difference at the 24 month follow up for BT vs. 3D-CRT: bowel function, sexual function, and bowel bother.  Overall p values for EPIC urinary (p<0.001 RP vs. both other treatments), urinary irritative (p=0.005 for RP vs. BT), urinary incontinence (p<0.001 for RP vs. both other treat­ments), EPIC bowel (p<0.001 3D-CRT vs. both other treatments), EPIC sexual (p<0.001 for all comparisons), EPIC hormonal (p=0.74). |
| Urinary irritative | NR | NR | NR | NA | — |
| Urinary incontinence | NR | NR | NR | NA | — |
| EPIC bowel | 97.9 (0.7) | 94.5 (0.9) | 97.9 (0.3) | NA | — |
| EPIC sexual | 33.1 (2.1) | 43.5 (1.9) | 49.8 (1.6) | NA | — |
| EPIC hormonal | 93.7 (1.0) | 93.7 (0.9) | 95.5 (0.5) | NA | — |
| Resnick et al. 201355 | Prostatectomy | Radiotherapy | NA | NA | OR (95% CI) for prostatectomy vs. radiotherapy, adjusted for registry, baseline function, race or ethnicity, tumor grade, number of coexisting illnesses, education, and propensity score. |
| No control or frequent urinary leakage at the 2‑year followup | 9.6% | 3.2% | NA | NA | 6.22 (1.92‑20.29) |
| No control or frequent urinary leakage at the 5‑year followup | 13.4% | 4.4% | NA | NA | 5.10 (2.29‑11.36) |
| No control or frequent urinary leakage at the 15‑year followup | 18.3% | 9.4% | NA | NA | 2.34 (0.88‑6.23) |
| Bothered by dripping or leaking urine at the 2‑year followup | 10.6% | 2.4% | NA | NA | 5.86 (1.93‑17.64) |
| Bothered by dripping or leaking urine at the 5‑year followup | 12.9% | 2.9% | NA | NA | 7.66 (2.97‑19.89) |
| Bothered by dripping or leaking urine at the 15‑year followup | 17.1% | 18.4% | NA | NA | 0.87 (0.41‑1.80) |
| Erection insufficient for intercourse at the 2‑year followup | 78.8% | 60.8% | NA | NA | 3.46 (1.93‑6.17) |
| Erection insufficient for intercourse at the 5‑year followup | 75.7% | 71.9% | NA | NA | 1.96 (1.05‑3.63) |
| Erection insufficient for intercourse at the 15‑year followup | 87.0% | 93.9% | NA | NA | 0.38 (0.12‑1.22) |
| Bothered by sexual dysfunction at the 2‑year followup | 55.5% | 48.2% | NA | NA | 1.19 (0.77‑1.86) |
| Bothered by sexual dysfunction at the 5‑year followup | 46.7% | 39.7% | NA | NA | 1.48 (0.92‑2.39) |
| Bothered by sexual dysfunction at the 15‑year followup | 43.5% | 35.8% | NA | NA | 1.33 (0.58‑3.03) |
| Bowel urgency at the 2‑year followup | 13.6% | 34.0% | NA | NA | 0.39 (0.22‑0.68) |
| Bowel urgency at the 5‑year followup | 16.3% | 31.3% | NA | NA | 0.47 (0.26‑0.84) |
| Bowel urgency at the 15‑year followup | 21.9% | 35.8% | NA | NA | 0.98 (0.45‑2.14) |
| Bothered by frequent bowel movements, pain, or urgency at the 2‑year followup | 2.9% | 7.9% | NA | NA | 0.37 (0.14‑0.96) |
| Bothered by frequent bowel movements, pain, or urgency at the 5‑year followup | 4.4% | 5.8% | NA | NA | 0.93 (0.27‑3.22) |
| Bothered by frequent bowel movements, pain, or urgency at the 15‑year followup | 5.2% | 16.0% | NA | NA | 0.29 (0.11‑0.78) |
| Barry et al. 201266 | RALRP:406 patients | RRP: 220 patients | NA | NA | — |
| Percentage of patients with incontinence (moderate or big problem) | RALRP: 33.1% (131/393) | RRP: 27.1% (58/214) | NA | NA | Pearson chi-square p‑value=0.113 for the between-group difference in incontinence. A logistic regression model controlling for age and education was performed comparing RALRP to RRP, producing an OR 1.41 (95% CI, 0.97–2.05). A second logistic regression model with mental and overall health factored in in addition to age and education produced an OR of 1.46 (95% CI, 1.00–2.12, p=0.049). Confirmatory ordinal regression models found RALRP to be significantly associated with greater degrees of problems with continence in both the age, education adjusted model (p=0.020) and the four control variable model (p=0.007). |
| Percentage of patients with sexual dysfunction (moderate or big problem) | RALRP: 87.5% (335/383) | RRP: 89.0% (187/210) | NA | NA | Pearson chi-square p-value=0.57 for the between-group difference in incontinence. A logistic regression model controlling for age and education was performed comparing RALRP to RRP, producing an OR 0.87 (95% CI, 0.51–1.49). A second logistic regression model with mental and overall health factored in in addition to age and education produced an OR of 0.93 (95% CI, 0.54–1.61). Confirmatory ordinal regression models found RALRP not to be significantly associated with greater degrees of sexual dysfunction in both the age and education adjusted model (p=0.605) and the four control variable model (p=0.761). |
| Mohammed et al. 201280 | BT: 417 patients | EB-IGRT: 1,039 patients | EBRT plus HDR-BT: 447 patients | — | — |
| Late incontinence ≥Grade 3 | BT: 0.3% | EB-IGRT: 0.4% | EBRT plus HDR: 1% | NA | p-value of difference: 0.13 |
| Ploussard et al. 201262 | LRP: 1377 patients | RALP: 1009 patients | NA | NA | — |
| Rate of continence recovery at 12 months followup for all patients regardless of baseline continence | 68.5% | 75.4% | NA | NA | p=0.177 |
| Rate of continence recovery at 24 months followup for all patients regardless of baseline continence | 78.8% | 83.6% | NA | NA | p=0.024 |
| Predictors of continence at 12 month followup (variable = age) | — | — | NA | NA | Multivariate regression for predictors of urinary continence, OR not calculated, p=0.002. |
| Predictors of continence at 12 month followup (variable = PSA) | — | — | NA | NA | Multivariate regression for predictors of urinary continence, OR not calculated p=0.746. |
| Predictors of continence at 12 month followup (variable = prostate volume) | — | — | NA | NA | Multivariate regression for predictors of urinary continence, OR not calculated=0.524. |
| Predictors of continence at 12 month followup (variable = pT2 disease) | — | — | NA | NA | Multivariate regression for predictors of urinary continence, OR 0.78 (95% CI 0.44 to 1.37), p=0.393. |
| Predictors of continence at 12 month followup (variable = Gleason score) | — | — | NA | NA | Multivariate regression for predictors of urinary continence using Gleason score 6 as the reference.  7: OR 0.915 (0.53 to 1.60), p=0.751  8 to 10: OR 1.24 (0.42 to 3.68), p=0.70 |
| Predictors of potency at 12 month followup (variable = procedure) | — | — | NA | NA | Multivariate regression for predictors of potency using procedure with LRP as the reference.  RALP: OR 5.93 (1.04 to 33.82), p=0.045 |
| Rate of potency recovery following bilateral NS surgery at 12 months followup for all patients regardless of baseline potency | 31.6% | 57.7% | NA | NA | p<0.001 |
| Rate of potency recovery following bilateral NS surgery at 24 months followup for all patients regardless of baseline potency | 55.0% | 69.0% | NA | NA | p<0.001 |
| Predictors of potency at 12 month followup (variable = age) | — | — | NA | NA | Multivariate regression for predictors of potency, OR not calculated, p=0.001 |
| Predictors of potency at 12 month followup (variable = PSA) | — | — | NA | NA | Multivariate regression for predictors of potency, OR not calculated, p=0.085 |
| Predictors of potency at 12 month followup (variable = prostate volume) | — | — | NA | NA | Multivariate regression for predictors of potency, OR not calculated, p=0.943 |
| Predictors of potency at 12 month followup (variable = pT2 disease) | — | — | NA | NA | Multivariate regression for predictors of potency OR 8.02 (0.33 to 1.97), p=0.630 |
| Predictors of potency at 12 month followup (variable = Gleason score) | — | — | NA | NA | Multivariate regression for predictors of potency using Gleason score 6 as the reference.  7: OR 1.36 (0.57 to 3.24), p=0.49  8 to 10: OR 1.25 (0.19 to 7.98), p=0.82 |
| Sheets et al. 201258 | Urinary incontinence diagnoses | IMRT: 6,438 patients  3D-CRT: 6,478 patients  IMRT: 684 (for the propensity score matched comparison to proton therapy)  Proton therapy: 684 patients | Adjusted for baseline- and clinical- characteristics. Outcomes are per 100 person-years and are presented as rate ratio (95% CI) for IMRT vs. 3D-CRT:  IMRT total events 858, rate 3.5  3D-CRT total events 917, rate 3.7  Rate ratio: 0.94 (0.86 to 1.04)  Propensity score matched rates adjusted for baseline- and clinical- characteristics. Outcomes are per 100 person-years and are presented as rate ratio (95% CI) for IMRT vs. Proton therapy:  IMRT total events 75, rate 3.1  Proton total events 82, rate 3.3  Rate ratio: 0.96 (0.70 to 1.32) | — | — |
| Sheets et al. 201258 (continued) | Erectile dysfunction diagnoses | IMRT: 6,438 patients  3D-CRT: 6,478 patients  IMRT: 684 (for the propensity score matched comparison to Proton therapy)  Proton therapy: 684 patients | Adjusted for baseline- and clinical- characteristics. Outcomes are per 100 person-years and are presented as rate ratio (95% CI) for IMRT vs. 3D-CRT:  IMRT total events 1,342, rate 5.9  3D-CRT total events 1,239, rate 5.3  Rate ratio: 1.12 (1.03–1.20)  Propensity score matched rates adjusted for baseline- and clinical- characteristics. Outcomes are per 100 person-years and are presented as rate ratio (95% CI) for IMRT vs. Proton therapy:  IMRT total events 145, rate 6.6  Proton total events 164, rate 7.4  Rate ratio: 0.89 (0.70 to 1.12) | — | — |
| Williams et al. 201157 | BT: 9,985 patients | Cryotherapy: 943 patients | NA | NA | Propensity-weighted incidence of complications expressed as percentages. |
| Incontinence | 18.2% | 11.3% | — | — | p<0.001 |
| Bowel | 12.1% | 19.0% | — | — | p<0.001 |
| Erectile dysfunction | 34.7% | 21.0% | — | — | p<0.001 |
| Malcolm et al. 201071 | RRP | RALRP | BT | Cryotherapy | Cox proportional hazards ratio adjusted for age, race, Gleason score and baseline functioning on this outcome. Results are presented as hazard ratio (95% CI) for returning to 90% of the baseline score. Scores are presented as average (PBS) |
| Urinary function | PBS at 1 year followup: 79  PBS at 2 year followup: 84  PBS at 3 year followup: 83 | PBS at 1 year followup: 74  PBS at 2 year followup: 76  PBS at 3 year followup: 78 | PBS at 1 year followup: 94  PBS at 2 year followup: 90  PBS at 3 year followup: 88 | PBS at 1 year followup: 106  PBS at 2 year followup: 102  PBS at 3 year followup: 113 | RRP plus RALRP: 1.0, BT plus Cryotherapy 2.98 (2.33‑3.82) |
| Urinary bother | PBS at 1 year followup: 84  PBS at 2 year followup: 87  PBS at 3 year followup: 88 | PBS at 1 year followup: 81  PBS at 2 year followup: 83  PBS at 3 year followup: 86 | PBS at 1 year followup: 88  PBS at 2 year followup: 94  PBS at 3 year followup: 90 | PBS at 1 year followup: 97  PBS at 2 year followup: 98  PBS at 3 year followup: 103 | RRP plus RALRP 1.0, BT plus Cryotherapy 1.48 (1.17‑1.88) |
| Sexual function | PBS at 1 year followup: 43  PBS at 2 year followup: 46  PBS at 3 year followup: 48 | PBS at 1 year followup: 40  PBS at 2 year followup: 45  PBS at 3 year followup: 46 | PBS at 1 year followup: 71  PBS at 2 year followup: 74  PBS at 3 year followup: 73 | PBS at 1 year followup: 30  PBS at 2 year followup: 36  PBS at 3 year followup: 27 | RRP, RALRP, plus cryotherapy 1, BT 5.71 (3.71‑8.77) |
| Sexual bother | PBS at 1 year followup: 40  PBS at 2 year followup: 52  PBS at 3 year followup: 58 | PBS at 1 year followup: 47  PBS at 2 year followup: 48  PBS at 3 year followup: 45 | PBS at 1 year followup: 63  PBS at 2 year followup: 78  PBS at 3 year followup: 85 | PBS at 1 year followup: 59  PBS at 2 year followup: 61  PBS at 3 year followup: 50 | RRP plus RALRP 1, BT plus cryotherapy 1.99 (1.49‑2.67) |
| Bowel function | PBS at 1 year followup: 102  PBS at 2 year followup: 104  PBS at 3 year followup: 101 | PBS at 1 year followup: 103  PBS at 2 year followup: 101  PBS at 3 year followup: 102 | PBS at 1 year followup: 103  PBS at 2 year followup: 110  PBS at 3 year followup: 107 | PBS at 1 year followup: 110  PBS at 2 year followup: 108  PBS at 3 year followup: 108 | BT 1, RRP, RALRP, plus cryotherapy 1.24 (0.99 to 1.55) |
| Bowel bother | PBS at 1 year followup: 99  PBS at 2 year followup: 102  PBS at 3 year followup: 99 | PBS at 1 year followup: 100  PBS at 2 year followup: 97  PBS at 3 year followup: 94 | PBS at 1 year followup: 99  PBS at 2 year followup: 101  PBS at 3 year followup: 99 | PBS at 1 year followup: 106  PBS at 2 year followup: 107  PBS at 3 year followup: 92 | RRP, BT plus cryotherapy 1, RALRP 1.28 (1.08 to 1.51) |
| Krambeck et al. 200865 | RRP: 496 patients with one year data for continence and potency | RALRP: 252 patients with one year data for continence and potency | NA | NA | p=0.344 |
| With continence | 446 (93.7%) | 224 (91.8%) | NA | NA | NA |
| Continence=No pads | 419 (88.0%) | 199 (81.6%) | NA | NA | NA |
| Continence=security pad only | 27 (5.7%) | 25 (10.3%) | NA | NA | NA |
| Without continence | 30 (6.3%) | 20 (8.2%) | NA | NA | NA |
| Continence=1 to 2 pads per day | 23 (4.8%) | 17 (7.0%) | NA | NA | NA |
| Continence=3 pads per day | 7 (1.5%) | 3 (1.2%) | NA | NA | NA |
| Previous incontinence | 6 | 1 | NA | NA | NA |
| Continence=unknown | 14 | 7 | NA | NA | NA |
| — | RRP: 496 patients with potency data at one year followup | RALRP: 252 patients with potency data at the one year followup | NA | NA | p=0.081 |
| Impotent | 155 (37.2) | 61 (30%) | NA | NA | NA |
| Potent | 262 (62.8%) | 142 (70%) | NA | NA | NA |
| Previously impotent | 49 | 32 | NA | NA | NA |
| Potency=unknown | 31 | 17 | NA | NA | NA |
| Sanda et al. 200885 | RP (RRP or LRP or RALRP): 603 patients | EBRT (IMRT or 3D‑CRT): 292 patients | BT: 306 patients | NA | — |
| Overall urinary problem at 24 months followup, (%) | 7 | 11 | 16 | NA | RP vs. BT: OR 0.21 (0.09 to 0.52), p=0.00  RP vs. EBRT  OR: 0.30 (0.12 to 0.78), p=0.01  EBRT vs. BT  OR: 0.71 (0.32 to 1.56), p=0.39 |
| Overall bowel problem at 24 months followup, (%) | 1 | 11 | 8 | NA | RP vs. BT: OR 0.06 (0.01 to 0.50), p=0.01  RP vs. EBRT  OR: 0.04 (0.01 to 0.33), p=0.00  EBRT vs. BT: OR 1.45 (0.58 to 3.68), p=0.42 |
| Overall sexual problem at 24 months followup, (%) | 43 | 37 | 30 | NA | RP vs. BT: OR 0.71 (0.43 to 1.15), p=0.0.16  RP vs. EBRT: OR 0.53 (0.33 to 0.84), p=0.00  EBRT vs. BT: OR 1.34 (0.80 to 2.23), p=0.27 |
| Sexuality | RP, independent variable Age, p=0.001  RP, independent variable PSA score, p=0.01  EBRT, independent variable Age, p=0.009  BT, independent variable Age, p=0.01  BT, independent variable PSA score, p≤0.001 | | | NA | — |
| Urinary incontinence | RP, independent variable PSA score, p=0.005  RP, independent variable Black race, p=0.03  BT, independent variable PSA score, p=0.02 | | | NA | — |
| Urinary irritation or obstruction | BT, independent variable PSA score, p=0.03  BT, independent variable Clinical stage T1c, p=0.05 | | | NA | — |
| Bowel or rectal function | RP, independent variable >2 Coexisting illnesses, p=0.02  BT, independent variable Gleason score >7, p=0.03 | | | NA | — |
| Vitality or hormonal function | EBRT, independent variable Coexisting illness, p=0.03  BT, independent variable Age, p=0.03 | | | NA | — |
| Sumitomo et al. 200863 | High-Intensity Focused Ultrasound (HIFU): 260 patients | | | HIFU plus ADT: 270 patients | — |
| Transient grade 1 and 2 incontinence | 6 patients (2.3%) | | | 3 patients (1.1%) | p=0.11 |

**Abbreviations:** 3D-CRT=Three-dimensional conformal radiotherapy; BT=brachytherapy; CI=confidence interval; EB-IGRT=external beam image-guided radiation therapy; EBRT=external beam radiation therapy; EPIC=Expanded Prostate Cancer Index Composite; HDR=high dose rate; IMRT=intensity-modulated radiation therapy; LRP=laparoscopic radical prostatectomy; NA=not available; NR=not reported; NS=nerve sparing; OR=odds ratio; PBS=percent baseline scores; PSA=prostate-specific antigen; RALP=robotic-assisted laparoscopic prostatectomy; RALRP=robotic-assisted laparoscopic radical prostatectomy; RP=radical prostatectomy; RRP=radical retropubic prostatectomy; SF=Short Form (instrument).