APPENDIXES

Appendix A: Search Strategy

Question 3. How do provider/hospital characteristics affect outcomes overall and differentially (e.g., geographic region and volume)?

Search Strings	Studies Identified
"Outcome assessment (health care)"[MeSH] AND "prostatic neoplasms"[MeSH] AND hospital volume	29
"Outcome assessment (health vare)"[MeSH] AND "prostatic neoplasms"[MeSH] AND surgeon volume	11
"Cryotherapy"[MeSH] AND "prostatic neoplasms"[MeSH] AND "outcome and process assessment (health care)"[MeSH]	7
"Brachytherapy"[MeSH] AND "prostatic neoplasms"[MeSH] AND "outcome and process assessment (health care)"[MeSH]	249
"Radiotherapy"[MeSH] "prostatic neoplasms"[MeSH] AND "outcome and process assessment (health care)"[MeSH]	624
"Radiotherapy"[MeSH] "Prostatic Neoplasms"[MeSH] AND "outcome and process assessment (health care)"[MeSH] AND hospital volume	9
"Prostatic neoplasms"[MeSH] AND "outcome and process assessment (health care)"[MeSH] AND "prostatectomy"[MeSH], Limits: humans, English, published from 01/01/1993 to 01/12/2005	702
"Health care quality, access, and evaluation"[MeSH] AND "prostatic neoplasms"[MeSH] AND hospital volume	100
"Health care quality, access, and evaluation"[MeSH] AND "prostatic neoplasms"[MeSH] AND "clinical competence"[MeSH]	6
"Prostatic neoplasms"[MeSH] AND "clinical competence"[MeSH]	47
Physician's practice patterns"[MeSH] AND "prostatic neoplasms"[MeSH] Limit: human, English	142
"Health services research/organization and administration"[MeSH] OR "health Services research/standards"[MeSH] OR "health services research/statistics and numerical data"[MeSH] OR "health services research/trends"[MeSH]) AND "prostatic neoplasms"[MeSH]	20
"United States/epidemiology"[MeSH] AND "prostatic neoplasms"[MeSH] NOT review, English, human	608
"Physicians"[MeSH] AND "prostatic neoplasms"[MeSH]	20
"Hospitals"[MeSH] AND "prostatic neoplasms"[MeSH] NOT review NOT letter NOT editorials	75
"Prostatic neoplasms"[MeSH] AND "malpractice"[MeSH]	17
Hospital volume AND prostate cancer	132
"Prostatic neoplasms"[MeSH] AND "learning curve" Limits: English, humans	67
"Physicians"[MeSH] AND "prostatic neoplasms"[MeSH] AND "learning curve" Limits: English, humans	0
"Prostatic neoplasms"[MeSH] AND "learning curve" Limits: English, randomized controlled trial, humans	0
"Prostatic neoplasms"[MeSH] AND "learning curve"	84

Quality of Life. The literature search was done on MEDLINE (via OVID) using the following combination of MeSH headings, keywords, and publication types (search results were limited to: human studies; English-language articles; year of publication = 2000 to 2006; not comments, letters or reviews; and clinical trials, clinical trials phase I, clinical trials phase II, clinical trials phase III, clinical trials phase IV, controlled clinical trials, meta analyses, or randomized controlled trials):

((((quality of life or qol or hrqol).mp. OR exp "quality of life"/ OR health status.mp. OR exp health status/) AND exp prostatic neoplasms/) NOT (metastat$ or advanced).mp.)

HIFU. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

"Prostatic Neoplasms"[MeSH] AND "Ultrasound, High-Intensity Focused, Transrectal" [MeSH] Limits: English, Clinical Trial, Randomized Controlled Trial, Male, Humans

IMRT. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

"Prostatic Neoplasms"[MeSH] AND "Radiotherapy, Intensity-Modulated"[MeSH] NOT review NOT case-reports NOT letter NOT editorial Limits: Entrez Date from 2004/01/01 to 2007/04/31, English, Clinical Trial, Randomized Controlled Trial, Male, Humans

PBRT. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

("Prostatic Neoplasms/radiotherapy"[MeSH] OR "Prostatic Neoplasms/therapy"[MeSH]) AND proton NOT Review NOT Comment NOT letter NOT editorial NOT Case-reports Limits: English, Clinical Trial, Randomized Controlled Trial, "Clinical Trial, Phase II", "Clinical Trial, Phase III", "Clinical Trial, Phase IV", Comparative Study, Male, Humans

Cryosurgery. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

"Prostatic Neoplasms"[MeSH] AND "Cryosurgery"[MeSH] NOT Review NOT Comment NOT letter NOT editorial NOT Case-reports Limits: English, Clinical Trial, Randomized Controlled Trial, Male, Humans

Laparoscopic Surgery. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

"Prostatic Neoplasms"[MeSH] AND "Laparoscopy"[MeSH] AND "Prostatectomy" [MeSH] NOT Review NOT Comment NOT letter NOT editorial NOT Case-reports Limits: English, Clinical Trial, Randomized Controlled Trial, Male, Humans

Robotic Surgery. The literature search was done on PubMed using the following combination of MeSH headings, keywords and limits:

"Prostatic Neoplasms"[MeSH] AND "Robotics"[MeSH] AND "Prostatectomy"[MeSH] NOT Review NOT Comment NOT letter NOT editorial NOT Case-reports Limits: English, Clinical Trial, Randomized Controlled Trial, Male, Humans

Appendix B: Peer Reviewers

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Appendix C: Evidence Tables and Figures

Figure C1. Flow of articles reviewed

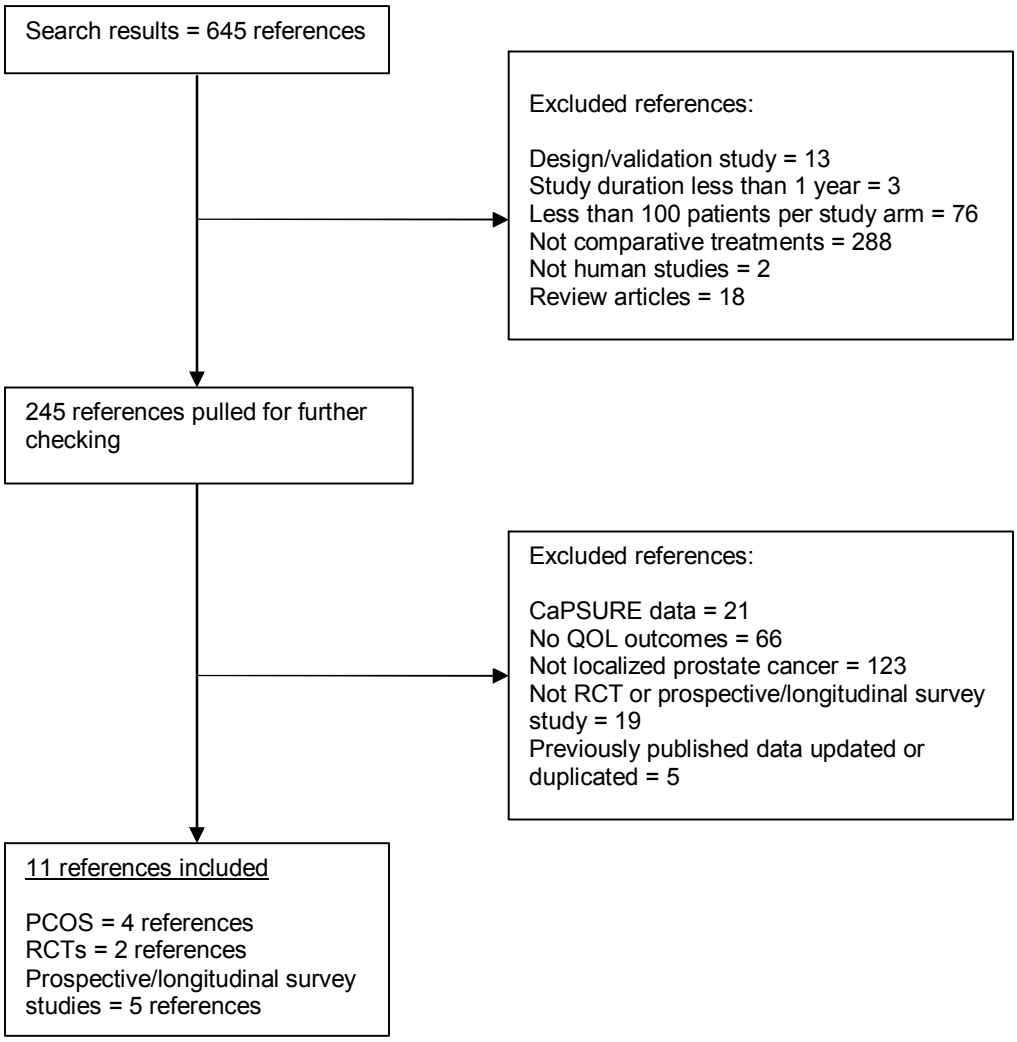


Table C1. Disease specific mortality or survival for randomized controlled trials

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
RP compared to WW			
Bill-Axelson, 2005[1]	RP (n=347)	Watchful waiting (n=348)	p value Absolute risk reduction (ARR) [95% CI] Relative risk (RR) [95% CI]
Total number of PC deaths	30	50	0.01
Cumulative Incidence of death	2.3% [1.2 to 4.6]* at 5 years 9.6% [6.5 to 14.2] at 10 years	4.3% [2.6 to 7.1] at 5 years 14.9% [11.2 to 19.8] at 10 years	ARR: 2.0 [-0.6 to 4.7] at 5 years ARR: 5.3 [-0.3 to 11.0] at 10 years
Median followup: 8.2 years			RR: 0.56 [0.36 to 0.88] at 10 years
RP compared to RP combined with neoadjuvant ADT			
Klotz, 2003[2]	RP (n=101)	RP + neoadjuvant ADT (n=112)	
Total number of PC deaths	0	1	
Median followup: 6 years (0.6 to 9.8)			
EBRT, comparison of different regimens			
Yeoh,2006[3]	Hypofractionated (55 Gy) EBRT group (n=108)	Conventional (64 Gy) EBRT (n=109)	
Total number of PC deaths	1	3	
Median followup: 4 years (0.5 to 9)			
Lukka, 2005[4]	Long arm (66 Gy) EBRT (n=470)	Short arm (52.5 Gy) EBRT (n=466)	
Total number of PC deaths	3 (<1%)	0	
Median followup: 5.7 years (4.5 to 8.3)			
Yeoh, 2003[5]	Conventional (64 Gy) EBRT (n=61)	Hypofractionated (55 Gy) EBRT (n=59)	
Total number of PC deaths	1 (1.6%)	0	
Median followup: 3.6 years (1.9 to 5.2)			
Zietman, 2005[6]	Conventional dose (70 Gy) EBRT (n=197)	High dose (79.2 Gy) EBRT (n=196)	
Total number of PC deaths	2	0	
Median followup: 5.5 years (1.2 to 8.2)			

Table C1. Disease specific mortality or survival for randomized controlled trials (continued)

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
EBRT combined with ADT compared to EBRT alone			
Denham, 2005[7]	EBRT (66 Gy) (n=164, T2 only)	EBRT (66 Gy) Group + 6 months ADT (n=162, T2 only)	HR [95% CI]
Total number of PC deaths: T2b	5	1	0.22 [0.03 to 1.88]
Total number of PC deaths: T2c	12	7	0.57 [0.22 to 1.44]
Median followup: 5.9 years (0.1 to 8.5)			
D'Amico, 2004[8]	Conformal EBRT (70 Gy) (n=103)	Conformal EBRT (70 Gy) + adjuvant ADT (n=98)	p value
Total number of PC deaths	6	0	0.02
Median followup: 4.5 years			
Vaccine compared to nilutamide			
Arlen, 2005[9]	Vaccine Group (n=21)	Nilutamide Group (n=21)	
Total number of deaths	1**	4**	

* 95% Confidence intervals
** Includes crossover deaths

Table C2. Biochemical progression/reoccurrence or bNED for randomized controlled trials

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
RPwith or without ADT compared to RP combined with neoadjuvant ADT			
Homma, 2004[10]	Definition of biochemical progression/reoccurrence or bNED: PSA above the normal level, local reoccurrence, or distant metastases.		
	RP + adjuvant ADT (n=63, stage A and B)	RP + neoadjuvant and adjuvant ADT (n=69, stage A and B)	p value
Clinical relapse events at 5 years	9 1/12 stage A 8/51 stage B	11 0/9 stage A 11/60 stage B	<0.05 relapse vs. no relapse
Klotz, 2003[2]	Definition of biochemical progression/reoccurrence or bNED: Two consecutive detectable PSAs (>2.0 ng/ml) at least 4 weeks apart, re-treatment or death from prostate cancer.		
	RP (n=101)	RP + neoadjuvant ADT (n=112)	Hazard ratio [95% CI*]
Biochemical reoccurrence events at 6 years	34 (33.7%)	42 (37.5%)	0.98 [0.61; 1.56]
Gleason score at biopsy: 2-6			1.00
7			1.29 [0.72; 2.31]
8-10			2.82 [1.52; 5.22]
			p value
No evidence of bNED at 5 years	68.2% [58.5; 77.8]	60.2% [50.4 to 70.0]	0.73
Estimated bNED survival at 7 years:			
Gleason: 2-6 (n=142)	0.90	0.89	0.81
7 (n=36)	0.75	0.90	0.91
8-10 (n=22)	0.63	0.79	0.80
Median followup: 6 years (0.6 to 9.8)			
Schulman, 2000[11]	Definition of biochemical progression/reoccurrence or bNED: Increase in PSA on 2 consecutive occasions of >1.0 ng/ml		
	RP (n=115, T2 only)	RP + neoadjuvant ADT (n=105, T2 only)	p Value
PSA progression >1 ng/ml events at 4 years	26/114 (22.8%) T2 and PSA <20 ng/ml 16/94 (17.0%)	18/102 (17.6%) T2 and PSA <20 ng/ml 13/84 (15.4%)	0.35 0.78
Soloway, 2002[12]	Definition of biochemical progression/reoccurrence or bNED: PSA >0.4 ng/ml		
	RP (n=154)	RP + neoadjuvant ADT (n=149)	p value
Biochemical reoccurrence at 5 years			
Gleason, biopsy: 2-6 (n=159)	22/80 (27.1%)	18/79 (22.6%)	0.62
7 (n=56)	10/25 (41.3%)	15/31 (47.7%)	0.72
8-10 (n=29)	8/14 (57.4%)	13/15 (89.6%)	0.173
Gleason, specimen: 2-6 (n=105)	18/66 (27.1%)	10/39 (26.0%)	1.0
7 (n=96)	17/48 (38.9%)	15/48 (30.5%)	0.54
8-10 (n=38)	4/12 (33.7%)	17/26 (64.6%)	0.13
bNED at 5 years	67.6%	64.8%	0.66

Table C2. Biochemical progression/reoccurrence or bNED for randomized controlled trials (continued)

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
RP compared to EBRT			
Paulson, 1982[13]	Definition of biochemical progression/reoccurrence or bNED: Serum prostatic acid phosphatase elevation on 2 consecutive followups or by appearance of bony or parenchymal disease with or without concomitant acid phosphatase elevation.		
	RP (n=47)	EBRT (n=59)	p value
K-M estimate of failure at 5 years	14% *(estimated from graph)*	39% *(estimated from graph)*	0.037
EBRT, comparison of different regimens			
Peeters, 2006[14]	Definition of biochemical progression/reoccurrence or bNED: Defined according to ASTRO -3 consecutive increases in PSA level after nadir or clinical evidence of failure (palpable and/or biopsy proven local relapse, regional relapse, metastases, or initiation of salvage		
	Conventional dose (68 Gy) EBRT group (n=56 Low risk T1/2; Gleason ≤6; PSA ≤10)	High dose (78 Gy) EBRT group (n=64 Low risk T1/2; Gleason ≤ 6; PSA ≤ 10)	HR [95% CI]
Biochemical reoccurrence/clinical failure events			
Median followup: 4.2 years (0.8 to 7.6)	7/56 (12.5%)	10/64 (15.6%)	1.25 [0.5; >2.0] (*estimated from figure)*
Yeoh, 2003[5]	Definition of biochemical progression/reoccurrence or bNED: 3 consecutive increases in PSA after nadir		
	Hypofractionated (55 Gy) EBRT group (n=108)	Conventional (64 Gy) EBRT (n=109)	p value HR [95% CI]
PSA relapse events	37	39	Not significant
K-M estimate of biochemical relapse-free survival at 5 years	57.4%	55.5%	HR: 0.92 [0.58; 1.45]
Lukka, 2005[4]	Definition of biochemical progression/reoccurrence or bNED: 3 consecutive increases in PSA, clinical evidence of failure (local and distant), initiation of hormonal therapy		
	Short arm (52.5 Gy) EBRT (n=466)	Long arm (66 Gy) EBRT (n=470)	ARR [95% CI], HR [95% CI]
Biochemical or clinical failure (BCF) events	263 (56.4%)	236 (50.2%)	
K-M estimate of BCF at 5 years	59.95%	52.95%	ARR: -7.0 [-12.6; -1.4]
Median followup: 5.7 years (4.5 to 8.3)			HR: 1.18 [0.99; 1.41]
Sathya, 2005[15]	Definition of biochemical progression/reoccurrence or bNED: PSA failure, clinical failure, or death from prostate cancer		
	Iridium implant + EBRT (n=31, T2 only)	EBRT (n=32, T2 only)	HR [95% CI]
BCF events	8	18	0.37 [0.16; 0.85]
K-M estimate of BCF at 5 years			
Median followup: 8.2 years	25.8%	57.3%	
Zietman, 2005[6]	Definition of biochemical progression/reoccurrence or bNED: 3 consecutive increases in PSA level, with the failure backdated to a point halfway between the first increase and the last nonincreasing value		
	Conventional dose (70 Gy) EBRT (n=197)	High dose (79.2 Gy) EBRT (n=196)	p value
Freedom from biochemical failure at 5 years	61.4% [54.6 to 68.3]	80.4% [74.7; 86.1]	<0.001
Median followup: 5.5 years (1.2 to 8.2)			
EBRT combined with ADT compared to EBRT alone			
Denham, 2005[7]	Definition of biochemical progression/reoccurrence or bNED: Based on Houston method. Time to failure is time from end		

Table C2. Biochemical progression/reoccurrence or bNED for randomized controlled trials (continued)

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
	of treatment to an increase of PSA ≥2 ng/ml above the post-treatment nadir level.		
	EBRT (66 Gy) (n=164, T2 only)	EBRT (66 Gy) + 6 months ADT (n=162, T2 only)	HR [95% CI]
Failure events: T2b	48	34	0.68 [0.44; 1.06]
Failure events: T2c	66	40	0.47 [0.32; 0.69]
Median followup: 5.9 years (0.1 to 8.5)			
Crook, 2004[16]	Definition of biochemical progression/reoccurrence or bNED: Biochemical (PSA) disease-free survival according to ASTRO definition.		
	3 month group (n=51, Low risk T1c-T2a; PSA <10 ng/ml; Gleason ≤6)	8 month group (n=41, Low risk T1c-T2a; PSA<10 ng/ml; Gleason ≤ 6)	
K-M estimate of freedom from biochemical failure at 5 years	61% *(estimated from graph)*	72% *(estimated from graph)*	p-value not noted
Median followup: 3.7 years (10 months-7 years)			
D'Amico, 2004[8]	Definition of biochemical progression/reoccurrence or bNED: PSA >1.0 ng/ml and increasing >0.2 ng/ml on 2 consecutive visits.		
	Conformal EBRT (70 Gy) group (n=103)	Conformal EBRT (70 Gy) + adjuvant ADT (n=98)	p value HR [95% CI]
PSA failure events	46	21	<0.001 2.86 [1.69; 4.86]
Survival free of salvage ADT events	43	21	0.002
K-M estimated salvage therapy free survival at 5 years	57% [46; 69]	82% [73; 90]	2.30 [1.36; 3.89]
Median followup: 4.5 years			
Brachytherapy			
Wallner, 2003[17]	Definition of biochemical progression/reoccurrence or bNED: PSA ≤ 0.5 ng/ml at last followup		
	^{125}I (144 Gy) (n=57)	^{103}Pd (125 Gy) (n=58)	p value
Biochemical failure events	6	5	
KM estimated biochemical freedom from failure at 3 years	89%	91%	0.76

Table C2. Biochemical progression/reoccurrence or bNED for randomized controlled trials (continued)

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
Adjuvant EBRT combined with brachytherapy			
Wallner, 2005[18]	Definition of biochemical progression/reoccurrence or bNED: PSA ≤ 0.5 ng/ml at last followup		
	^{103}Pd + EBRT (20 Gy) (n=83)	^{103}Pd + EBRT (44 Gy) (n=76)	p value
Biochemical failure events	12	9	
K-M estimated biochemical freedom from failure at 3 years	83%	88%	0.64
Subjects with pretreatment PSA <10 ng/ml (n=112)			
K-M estimated biochemical freedom from failure at 3 years	84%	94%	0.16
Subjects with pretreatment PSA >10 ng/ml (n=47)			
K-M estimated biochemical freedom from failure at 3 years	82%	72%	0.38
Bicalutamide versus placebo; both treatment arms combined with standard care (adjuvant RP/EBRT or WW)			
Wirth, 2004[19] Localized disease population (T1/T2)	Definition of biochemical progression/reoccurrence or bNED: Progression-free survival defined as the time from randomization to the earliest occurrence of objective progression (confirmed by bone scan, computerized tomography/ultrasound/MRI or histological evidence of distant metastases) or death from any cause.		
	Bicalutamide and radical prostatectomy *(estimated n=1365)*	Placebo and radical prostatectomy *(estimated n=1,369)*	p value HR [95% CI] Event-to-time ratio (ETR) [95% CI]
Progression events	115 (8.4%)	121 (8.8%)	0.57 HR: 0.93 [0.72 to 1.20]
Median followup: 5.4 years			ETR: 1.06 [0.87 to 1.28]
	Bicalutamide and radiation therapy *(estimated n=538)*	Placebo and radiation therapy *(estimated n=527)*	
Progression events	114 (21.2%)	128 (24.3%)	0.09 HR: 0.80 [0.62; 1.03]
Median followup: 5.4 years			ETR: 1.16 [0.98; 1.37]
Vaccine compared to nilutamide			
Arlen, 2005[9]	Definition of biochemical progression/reoccurrence or bNED: PSA progression, the development of secondary malignancies or toxicity, and were either removed from study or crossed over to the other arm if time it was an appropriate time to do so		
	Vaccine Group (n=21)	Nilutamide Group (n=21)	p value
Median time to treatment failure, in months	9.9	7.6	0.28
	Crossover: 12 subjects had added nilutamide 13.9 after crossover, 25.9 from initiation of therapy	Crossover: 8 subjects had added vaccine 5.2 after crossover, 15.5 from initiation of therapy	

* Confidence intervals

Table C3. Definitions of biochemical progression/reoccurrence or bNED for randomized controlled trials

Study	Definition
Paulson, 1982[13]	Acid phosphatase elevation on 2 consecutive followups or by appearance of bony or parenchymal disease with or without concomitant acid phosphatase elevation
Homma, 2004[10]	Clinical relapse defined as PSA above the normal level, local reoccurrence, or distant metastases
Klotz, 2003[2]	Biochemical reoccurrence defined as 2 consecutive detectable PSAs (>2.0 ng/ml) at least 4 weeks apart, re-treatment or death from prostate cancer
Schulman, 2000[11]	PSA progression defined as an increase in PSA on 2 consecutive occasions of >1.0 ng/ml
Soloway, 2002[12]	Biochemical reoccurrence defined as PSA >0.4 ng/ml
Lukka, 2005[4]	Biochemical or clinical failure was defined as 3 consecutive increases in PSA, clinical evidence of failure (local and distant), initiation of hormonal therapy, or death from prostate cancer
Sathya, 2005[15]	Biochemical or clinical failure was defined as PSA failure, clinical failure, or death from prostate cancer
Yeoh, 2003[5]	PSA relapse defined as 3 consecutive increases in PSA after nadir
Zietman, 2005[6]	American Society for Therapeutic Radiology and Oncology (ASTRO) definition of 3 consecutive increases in PSA level, with the failure backdated to a point halfway between the first increase and the last nonincreasing value
Crook, 2004[16]	Freedom from failure was biochemical (PSA) disease-free survival according to ASTRO definition
D'Amico, 2004[8]	PSA failure defined as PSA >1.0 ng/ml and increasing >0.2 ng/ml on 2 consecutive visits
Wallner, 2003[17]	Freedom from biochemical failure was defined as PSA ≤0.5 ng/ml at last followup
Wallner, 2005[18]	Freedom from biochemical failure was defined as PSA ≤0.5 ng/ml at last followup
Wirth, 2004[19]	Progression free survival defined as the time from randomization to the earliest occurrence of objective progression (confirmed by bone scan, computerized tomography/ultrasound/MRI or histological evidence of distant metastases) or death from any cause
Arlen, 2005[9]	Treatment failure defined as PSA progression, the development of secondary malignancies or toxicity, and were either removed from study or crossed over to the other arm if time it was an appropriate time to do so

Table C4. Incidence of distant metastatic disease for randomized controlled trials

Study Outcomes	Treatment Group	Control Group	Analyses; p-values
WW versus RP			
Bill-Axelson, 2005[1]	RP (n=347)	WW (n=348)	p value ARR [95% CI] RR [95% CI]
Total number of events	50	79	0.004
Cumulative incidence of metastases	8.1% [5.7; 11.6]* at 5 years	9.8% [7.1; 13.5] at 5 years	ARR: 1.7 [-2.5; 6.0] at 5 years
Median followup: 8.2 years	15.2% [11.4; 20.3] at 10 years	25.4% [20.4; 31.5] at 10 years	ARR: 10.2 [3.1; 17.2] at 10 years RR: 0.60 [0.42; 0.86] at 10 years
RP versus radiation therapy			
Paulson, 1982[13]	RP (n=47)	Radiation therapy (n=59)	
Total number of events at followup (time unclear)	2 (positive bone scan)	14 (positive bone scan (11); pulmonary metastases (1); lymph node metastases (1); parenchymal metastases (1)	
RP with or without neoadjuvant therapy			
Klotz, 2003[2]	RP (n=101)	Neoadjuvant androgen ablation + RP (n=112)	p value
Total number of events Median followup: 6 years (0.6 to 9.8)	1	5	0.21
Schulman, 2000[11]	RP (n=115, T2 only)	Neoadjuvant androgen ablation + RP (n=105, T2 only)	p value
Total number of events at 4 years	6/114 (5%)	6/102 (6%)	0.84
Soloway, 2002[12]	RP (*estimated n=135*)	Neoadjuvant androgen ablation + RP (*estimated n=133*)	p value
Events at 5 years			
urethral margin involvement	23 (17%)	8 (6%)	<0.01
seminal vesicle involvement	30 (22%)	20 (15%)	Not significant
positive lymph nodes	9 (6%)	8 (6%)	Not significant
EBRT			
Lukka, 2005[4]	Long arm (66 Gy in 33 fractions) EBRT (n=470)	Short arm (52.5 Gy in 20 fractions) EBRT (n=466)	
Distant failure events Median followup: 5.7 years (4.5 to 8.3)	4 (1%)	10 (2%)	
Vaccine versus nilutamide			
Arlen, 2005[9]	Vaccine Group (n=21)	Nilutamide Group (n=21)	
Progressive disease (metastasis on scans)	14 (5 events after crossover addition of nilutamide)	7 (1 event after crossover addition of nilutamide)	p value not provided

* 95% Confidence intervals

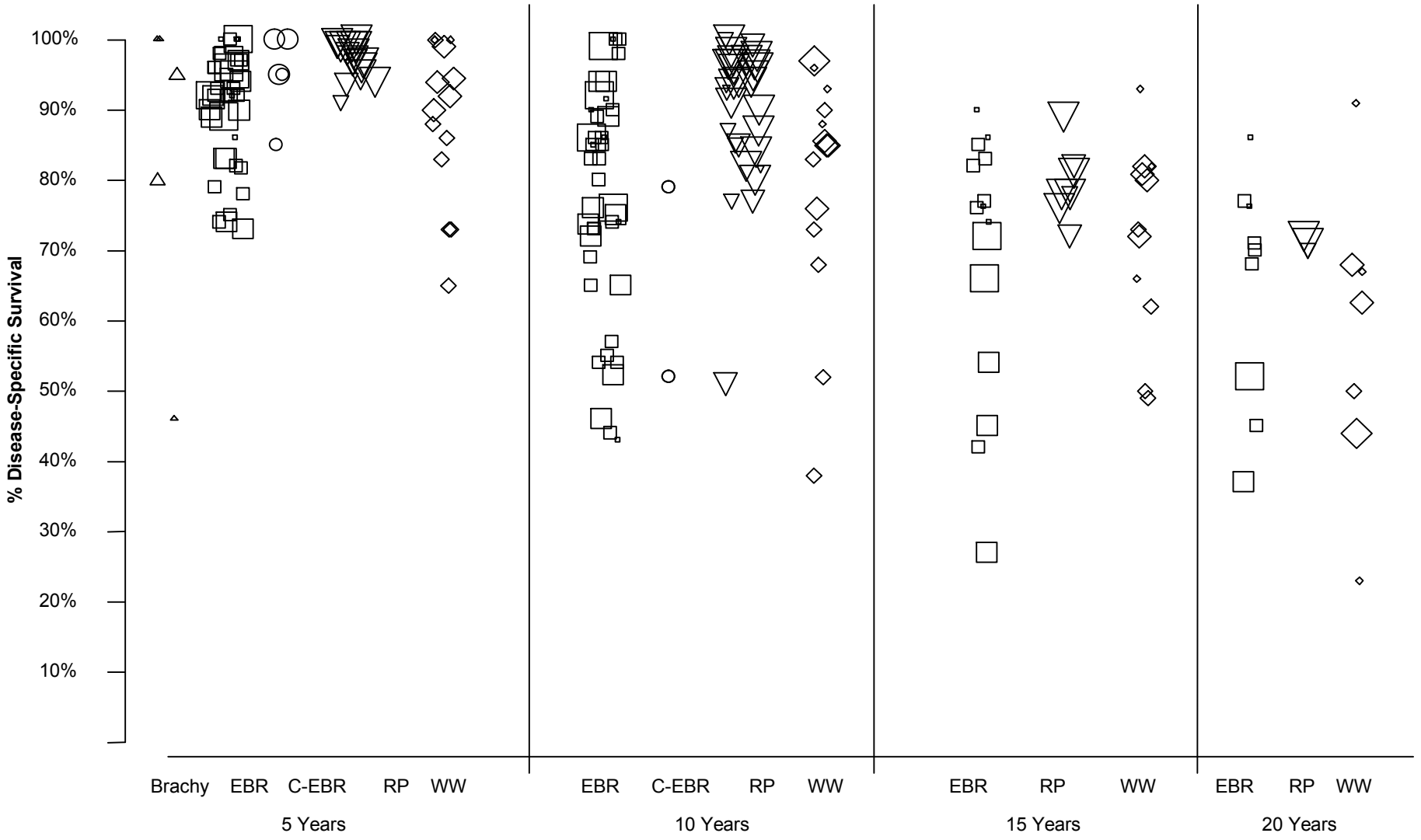
Table C5. Definitions of toxicity for randomized controlled trials

Study	Definition
Lukka, 2005[4]	Toxicity was assessed using National Cancer Institute of Canada toxicity scale, grading according to specific criteria for each symptom on a 5-point scale ranging from 0 (nontoxic) to 5 (severe toxicity). Gastrointestinal (GI) system included anorexia, diarrhea, GI bleeding, nausea, pain/cramping, proctitis, and vomiting. Genitourinary (GU) system included bladder changes, cystitis, fistula formation, frequency, hematuria, ureteral obstruction, and genitourinary pain.
Yeoh, 2003[5]	GI symptoms were assessed by questionnaire: stool frequency, stool consistency, rectal pain, rectal mucus discharge, urgency of defecation, and rectal bleeding. Each symptom was graded on a on a 5-point scale ranging from 0 (nontoxic) to 4 (severe). The following GU symptoms were evaluated: urinary frequency by day, urinary frequency by night, hematuria, urgency of urination, and dysuria. Each symptom was graded on the same basis as the GI symptoms.
Zietman, 2005[6]	Acute GU and GI morbidity were scored using the Radiation Therapy Oncology Group (RTOG) criteria, a 0 to 5 scale in which lower scores indicate fewer symptoms.
D'Amico, 2004[8]	Toxicity grades are defined as Grade 1- mild, Grade 2 - moderate, Grade 3 - severe, Grade 4 – life threatening. From Trotti et al, Common toxicity criteria: version 2.0: an improved reference for grading the acute effects of cancer treatment: impact on radiotherapy. *Int J Radiat Oncol Biol Phys*. 2000;47:13-47.
Herstein, 2005[20] Wallner, 2003[17]	RTOG criteria. Persistent bleeding was defined as lasting more than one month and was noted as a Grade 2 morbidity.

Table C6. Intra-operative outcomes and positive margins after laparoscopic vs. open retropubic radical prostatectomy

Outcomes	LRP, %	RRP, %	OR LRP vs. RRP (95% CI)
Pelvic lymphadenectomy	40	45	0.82 (0.47; 1.43)
Bilateral nerve sparing	41.6	51.6	0.67 (0.38; 1.17)
Monolateral nerve sparing	18.3	13.3	1.46 (0.68; 3.15)
Autologous transfusion (no)	13.3	45	0.19 (0.09; 0.38)
First flatus (%)	35	18	2.45 (1.27; 4.72)
Mobilization (%)	92	82	2.52 (1.04; 6.11)
Free ambulation (%)	23	10	2.69 (1.21; 6.00)
5-day catheterization	86.6	66.6	3.24 (1.59; 6.59)
Discharged on postoperative day 6 (with or without catheter)	90	86.6	1.39 (0.58; 3.33)
Positive margins, T2	24.4	18.25	1.45 (0.73; 2.86)

Figure C2. Disease-specific survival at time points by treatment



Brachy = Brachytherapy; EBR = External Beam Radiotherapy; C-EBR = Conformal External Beam Radiotherapy; RP = Radical Prostatectomy; WW = Watchful Waiting
Point size indicates N, <50 (smallest), 50-150 (next smallest) 150-300 (next largest) and >300 (largest)

Table C7. Complication counts

Type of Complication	Time Period[a]	Used in Graphs[c]		Entire Database[d]	
		Number of Reports	Number of Descriptions	Number of Reports	Number of Descriptions
Bowel	≤6 months	6	3	17	30
Bladder	≤6 months	4	2	30	72
Erectile dysfunction	≤6 months	3	2	15	16
Bowel	6-24 months	2	3	12	23
Bladder	6-24 months	3	2	21	52
Erectile dysfunction	6-24 months	6	2	17	26
Bowel	>24 months	0	0	11	19
Bladder	>24 months	3	4	14	21
Erectile dysfunction	>24 months	5	2	12	9
Other	>24 months	0	0	3	8
Bowel	999	3	2	34	53
Bladder	999	14	3	51	109
Erectile dysfunction	999	5	1	24	46
Bowel	Any[b]	5	3	57	87
Bladder	Any[b]	19	6	79	203
Erectile dysfunction	Any[b]	13	2	44	79
Other	Any[b]			47	129

[a] The latest month reported was selected for each report/group combination, or each report
[b] Maximum of 4 per report/group combination or report
[c] Definitions selected had 3 or more reports associated with them, needed to have percent with complication data, and were selected by treatment. Graphs include report/group combinations.
[d] All treatments and combinations of treatments are included in these numbers, report/group combinations were not used.

Table C8. Outcomes after cryosurgical prostatectomy in patients with localized prostate cancer

Reference Design	Population Followup Definition of Outcome	Treatment	Outcome	Occurrence
Aus, 2002[21] Prospective phase noncontrolled II trial	54 patients without metastases, mean age 68 years, mean PSA 26 ng/ml 40.7% with T >2, 37.04% with Gleason scores >7, median followup 58.5 months. Treatment failure: positive biopsy or a serum PSA of >1 ng/ml	Liquid nitrogen system CMS AccuProbe 450 (CryoMedical Science Inc., Rockville, MD). The total operation time 90-180 minutes, mean 148 minutes, freezing time 33 minutes, length of stay 1.2 days	Progression free survival Tissue sloughing TURP resection of sloughed tissue Stricture Stone formation in prostatic urethra Urinary tract infection Perennial fistula/prostatic abscess Self reported impotence Self reported potency Not reported potency Incontinence Severe (>2 pads per day) Mild (1-2 pads per day)	19 (38.9%) 14.81% 14.81% 16.67% 9.26% 33.33% 1.85% 72.22% 7.41% 20.37% 1.85% 16.67%
Lee, 1994[22] Case series	210 patients with localized or locally advanced prostate cancer	3.4 mm diameter cryoprobes (Endocare, Inc., Irvine, CA) inserted transperineally into the prostate under the transrectal ultrasound control	Urethrorectal fistula Bladder outlet obstruction Incontinence Impotence Total complications	2.4% 3% 9% 40% 14%
Bahn, 2002[23] Case series	590 consecutive patients with localized or locally advanced prostate cancer, mean age 70.76 years, 1.8% - T1, 78.1% - T2, 52.5% with Gleason score of 7, and 6% >7, mean followup 5.43 years, Treatment failure: PSA level >1 and >0.5 ng/ml	3.4 mm diameter cryoprobes (Endocare, Inc., Irvine, CA) inserted transperineally into the prostate under the transrectal ultrasound control. Androgen ablation therapy 91.5% before treatment 3 months to 1 year before cryoablation	Biochemical disease free survival PSA <0.5 12 months 24 months 36 months 48 months 60 months 72 months 84 months Impotency of 373 potent before surgery 16.4 months after surgery Incontinence TURP Fistula	89-100% Low risk group (T1-2) 19.49% 16.53% 15.47% 14.62% 12.92% 9.53% 6.78% 354 (94.9%) 19 (5.1%) 4.3% 5.5% <0.1%

Table C8. Outcomes after cryosurgical prostatectomy in patients with localized prostate cancer (continued)

Reference Design	Population Followup Definition of Outcome	Treatment	Outcome	Occurrence
Cohen, 1996[24] Non controlled clinical trial	383 patients with localized or locally advanced prostate cancer 28% with T >2, 7.9 Mean PSA 10 ng/ml 53% with Gleason ≥7, 7 (>8)	Cryoprobes (3 mm in diameter) were placed percutaneously with a transperineal approach. Cryoprobe placement and freezing were monitored using the transrectal ultrasound	% positive biopsy Initial PSA ng/ml in A stage Post treatment Mean PSA ng/ml Urethrorectal fistula Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Perineal pain Urinary tract infection Epididymitis Sepsis Urethral obstruction	16% 9.7 0.73-1.7 0.4% 9.8% 2.2% 3% 4% 0.4% 2.2% 1.6% 0.7% 2%
Coogan, 1995[25] Non controlled clinical trial	95 percutaneous cryoablations of the prostate on 87 patients with prostate cancer, mean age 65.4, mean PSA 12.60 ng/ml, mean Gleason score 6.03, median followup 12 months	Cryoprobes (3 mm in diameter) were placed percutaneously with a transperineal approach. Cryoprobe placement and freezing were monitored using the transrectal ultrasound. Mean operative time was 129 minutes, mean length of stay 16 days	% positive biopsy Mean PSA ng/ml T1 T2 Urethrorectal fistula Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Impotence Perineal pain Urinary tract infection Urethral obstruction	16-38% 1.58-3.22 3.55 1.9 1% 10% 1% 6% 3.5% 47% 1% 4% 2%
Cox, 1995[26] Case series	Retrospective review of the charts of 63 patients (69 procedures) performed in a single center	Cryoprobes (3 mm in diameter) were placed percutaneously with a transperineal approach. Cryoprobe placement and freezing were monitored using the transrectal ultrasound	Urethrorectal fistula Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Perineal pain Sepsis Urethral obstruction Total complications Number of operations Transient ischemic attack Cerebrovascular accident	3% 19% 3% 29% 27% 11% 3% 13% 59% 43% 2% 2%

Table C8. Outcomes after cryosurgical prostatectomy in patients with localized prostate cancer (continued)

Reference Design	Population Followup Definition of Outcome	Treatment	Outcome	Occurrence
Donnelly, 2002[27] Prospective pilot noncontrolled clinical trial	76 consecutive patients with adenocarcinoma of prostate mean age 65 years, 12% with T >2, mean PSA ng/ml 13, 56% Gleason ≥7, followup 50 months. Treatment failure: PSA > 1 ng/ml	Multiple percutaneous cryoprobes (5) were placed under TRUS guidance percutaneously and transperineally into the prostate	Progression free survival % positive biopsy Mean PSA ng/ml Sloughing Incontinence Testicular abscess	60-75% 1.4% 0.3-0.9 3 (3.9%) 1 (1.3%) 1 (1.3%)
Ellis, 2002[28] Case series	75 patients with localized prostate cancer, 21% with T >2, mean PSA ng/ml 8.5, 55% Gleason ≥7	Multiple percutaneous cryoprobes (6) were placed with Cryocare System, (Endocare, Inc., Irvine, CA), a cryosurgical device with 8 cryoprobe ports and an integrated temperature monitoring system	Progression free survival Mean PSA ng/ml Tissue sloughing Incontinence Impotence	84% 0-0.23 6.7% 5.5% 82.4%
Koppie, 1999[29] Case series	176 patients with clinically localized (stages T1 to T4) prostate cancer, 35.8% with T >2, mean PSA ng/ml 18.4, 20% Gleason ≥7; 57% received neoadjuvant androgen deprivation; Treatment failure: PSA >0.5 ng/ml and increased by more than 0.2 ng/ml on 2 consecutive occasions. Mean followup 30.8 months	The prostate was frozen with a multiprobe cryosurgical device. 5 probes were placed with ultrasound monitoring	Progression free survival in T1-2 At 1 year At 3 years	 82% 60%

Table C8. Outcomes after cryosurgical prostatectomy in patients with localized prostate cancer (continued)

Reference Design	Population Followup Definition of Outcome	Treatment	Outcome	Occurrence
Long, 1998[30] Prospective pilot noncontrolled trial	145 consecutive patients with nonmetastatic prostate adenocarcinoma; Androgen deprivation was used for 3 to 8 months before the procedure in 30% of patients. 28% with T >2, mean PSA ng/ml 10, 53% Gleason ≥7, followup 60 months. Treatment failure: PSA >0.3	Multiple percutaneous cryoprobes (5-8) were placed to ablate the entire prostate with real-time transrectal ultrasound monitoring	Progression free survival Positive biopsy Urethrorectal fistula Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Impotence Perineal pain Urinary tract infection Epididymitis Sepsis Urethral obstruction Total complications Number of operations Any treatment	56% 21% 1.3% 8.9% 3.4% 17.2% 2% 88% 2.3% 2.3% 1.5% <1% 4.8% 17% 17% 21%
Shinohara, 1996[31] Case series	102 patients underwent cryosurgery as definitive therapy for localized prostate cancer, 57% with T >2, mean PSA ng/ml 21.8, 54% Gleason ≥7, followup 12 months	Multiple percutaneous cryoprobes were placed to ablate the entire prostate with real-time transrectal ultrasound monitoring	Progression free survival Urethrorectal fistula Tissue sloughing Bladder outlet obstruction Incontinence Impotence Perineal pain Urinary tract infection Epididymitis Sepsis Urethral obstruction	74% 1% 23% 23% 15% 86% 3% 3% 3% 3% 4%
Shinohara, 1997[32] Case series	134 patients underwent 147 cryosurgical ablation procedures for localized prostate cancer. 35.1% with T >2, mean PSA ng/ml 19, 46.4% Gleason ≥7 biochemical failure: PSA nadir ≥0.5 ng/ml or PSA increase ≥0.2 g, followup 6 months	Multiple percutaneous cryoprobes were placed to ablate the entire prostate with real-time transrectal ultrasound monitoring	Progression free survival Positive biopsy	89% 11%

Table C8. Outcomes after cryosurgical prostatectomy in patients with localized prostate cancer (continued)

Reference Design	Population Followup Definition of Outcome	Treatment	Outcome	Occurrence
Sosa, 1996[33] Multicenter case series	1,467 patients with prostate cancer, 5% with Gleason score >8	Multiple percutaneous cryoprobes were placed to ablate the entire prostate with real-time transrectal ultrasound monitoring	Urethrorectal fistula Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Impotence Perineal pain Urinary tract infection Sepsis	1.4% 9.9% 5% 6.8% 11% 100% 9.4% 9.1% 2.3%
Wake, 1996[34] Noncontrolled clinical trial	104 patients with localized adenocarcinoma of the prostate, 46% with T >2, mean PSA ng/ml 11.3, 14% Gleason ≥7, followup 6 months, treatment failure: PSA >4 ng/ml positive biopsy	Multiple percutaneous cryoprobes (5) were placed under ultrasound guidance. Average hospital stay 36.6 hours	Progression free survival Positive biopsy Mean PSA ng/ml Tissue sloughing Urethral stricture Bladder outlet obstruction Incontinence Perineal pain	96% 25% 1.15 1% 1.9% 21.2% 7.7% 9.6%
Wieder, 1995[35] Case series	83 patients with prostate cancer, mean age 67 years, 22.9% with T >2, mean PSA ng/ml 6.5-9.6	Transrectal ultrasound-guided transperineal percutaneous cryoablation with an Accuprobe System cryosurgery instrument (3 to 6 probes)	Progression free survival Positive biopsy Mean PSA ng/ml Urethrorectal fistula Tissue sloughing Urethral stricture BOO Incontinence Perineal pain Urinary tract infection Epididymitis Sepsis Urethral obstruction	92.6% 19.3% 3.5 0% 3.8% 2.2% 3% 4% 0.4% 2.2% 1.6% 0.7% 2%
Robinson, 1999, 2002[36,37] Phase 2 of noncontrolled clinical trial	75 patients with localized prostate cancer, 11-12% with T 1-2, the Functional Assessment of Cancer Treatment–Prostate	Transrectal ultrasound-guided percutaneous radical cryosurgical ablation with multiple probes and transrectal ultrasound guidance	 Physical well-being Social/family well-being Emotional well-being Functional well-being Relationship with doctor	Scores (SE) (max 28) 26.01 (2.93) 23.46 (4.62) 17.92 (2.87) 24.34 (3.95) 7.40 (1.54) max 8

Table C9. Patient outcomes after cryosurgical treatment of localized prostate cancer (evidence from nonrandomized clinical trials and case series)

Author	Bahn [38]	Coogan [25]	Wieder [35]	Cox [26]	Cohen [24]	Sosa [33]	Shinohara [31]	Wake [34]	Shinohara [32]	Long [30]	Koppie [29]	Bahn [23]	Donnelly [27]	Ellis [28]	Aus [21]
Year	1994	1995	1995	1995	1996	1996	1996	1996	1997	1998	1999	2002	2002	2002	2002
Followup, months	NR	12	3	12	24	NR	12	6	6	60	30.8	68.6	50	3	58.5
Number of patients	210	95	83	63	239	1467	102	104	134*	145	176	590	76	75	54
% with T >2	NR	7.4	22.9	NR	7.9	NR	57	46	35.1	28	35.8	17.6	12	21	40.7
Mean PSA ng/ml	NR	12.6	6.5-9.6	NR	9.7		21.8	11.3	19	10	18.4	NR	13	8.5	26
% Gleason ≥7	NR	NR	NR	NR	7 (>8)	5(>8)	54	14	46.4	53	20	58.5	56	55	37.04
Outcomes in patients with localized PC															
Progression free survival, %	NR	NR	92.6	NR	NR	NR	74	96	89	56	60	89-100	60-75	84	38.9
% positive biopsy	NR	16-38	19.3	NR	16	NR	NR	25	11	21	NR	13	1.4	NR	NR
Mean PSA ng/ml	NR	1.58-3.22	3.5	NR	0.73-1.7	NR	NR	1.15	NR	NR	NR	NR	0.3-0.9	0-0.23	NR
% Complications															
Urethrorectal fistula	2.4	1	0	3	0.4	1.4	1	0	NR	1.3	NR	<0.1	NR	0	1.9
Tissue sloughing	NR	10	3.8	19	9.8	9.9	23	1	NR	8.9	NR	NR	NR	6.7	14.8
Urethral stricture	NR	1	2.2	3	2.2	5	NR	1.9	NR	3.4	NR	NR	NR		11.1
BOO	3	6	3	29	3	6.8	23	21.2	NR	17.2	NR	NR	NR	NR	NR
Incontinence	9	3.5	4	27	4	11	15	7.7	NR	2	NR	4.3	NR	5.5	18.5
Impotence	40	47	NR	NR	NR	100	86	NR	NR	88	NR	94.9	NR	82.4	72.2
Perineal pain	NR	1	0.4	11	0.4	9.4	3	9.6	NR	2.3	NR	NR	NR	NR	NR
Urinary tract infection	NR	4	2.2	NR	2.2	9.1	3	NR	NR	2.3	NR	NR	NR	NR	33.3
Epididymitis	NR	0	1.6	NR	1.6	NR	3	NR	NR	1.5	NR	NR	NR	NR	NR
Sepsis	NR	0	0.7	3	0.7	2.3	3	NR	NR	<1	NR	NR	NR	NR	NR
Urethral obstruction	NR	2	2	13	2	NR	4	NR	NR	4.8	NR	NR	NR	NR	NR
Total complications	14	NR	NR	59	NR	NR	NR	NR	NR	17	NR	NR	NR	NR	NR
Number of operations	NR	NR	NR	43	NR	NR	NR	NR	NR	17	NR	NR	NR	NR	NR
Any treatment (n)	NR	NR	NR	NR	NR	NR	NR	NR	NR	21	NR	NR	NR	NR	NR

* Probably same patients
NR = not reported
BOO = Bladder outlet obstruction

Table C10. Comparative effectiveness of extraperitoneal versus transperitoneal laparoscopic prostatectomy in patients with localized prostate cancer (adapted from the systematic review by Rassweiler et al)

Author	Population			Treatment	N	OR-Time (Minutes)	Complication (%)	Reintervention (%)	Transfusion (%)	Catheter Time (d)	Positive Margins (%)
Hoznek, 2003[39]		A	B	Total	40						
Case series	Age (years)	63	67	A-transperiton	20	224	Not reported	5	15	5.3	15
Historical controls	Mean PSA (ng/ml)	9.5	11.7	B-extraperiton	20	170	7.3		10	4.2	25
	Gleason score	5.5	6.3								
	T1a	1	0								
	T1b	0	0								
	T1c	15	14								
	T2a	3	4								
	T2b	1	2								
Cathelineau, 2004[40]		A	B	Total	200						
Case series	Age	63	61	A-transperiton	100	173	23.8		4	6.2	26.2
Historical controls	PSA	8.9	10	B-extraperiton	100	163	16.7		3	6	15.9
	T1	68	72								
	T2	32	27								
	T3	0	1								
Ruiz, 2004[41]		A	B	Total	330						
Case series	Age	64.1	63	A-transperiton	165	248	Not reported	Not reported	1.2	5.1	23
Historical controls	T1a–b	8	5	B-extraperiton	165	220	Not reported	Not reported	5.4	6.6	Not reported
	T1c	110	106								
	T2a	42	50								
	T2b	5	4								
	Mean PSA (ng/ml)	10.8	9.9								
	Gleason score	5.7	6.2								
	2–4	33	17								
	5–6	95	84								
	7	28	53								
	8–9	9	11								
Erdogru, 2004[42]		B	A	Total	106						
Case series	Age	63	62.9	A-transperiton	53	187	24.6	1.8	13	7	20.7
Match-paired controls	PSA	7	7.6	B-extraperiton	53	191	11.8	–	16	7	22.6
	T stage										
	2a	12	13								
	2b	21	20								
	2c	7	8								
	3a	11	10								
	3b	2	2								
	Gleason score	6	6.1								

Table C10. Comparative effectiveness of extraperitoneal versus transperitoneal laparoscopic prostatectomy in patients with localized prostate cancer (adapted from the systematic review by Rassweiler et al) (continued)

Author	Population			Treatment	N	OR-Time (Minutes)	Complication (%)	Reintervention (%)	Transfusion (%)	Catheter Time (d)	Positive Margins (%)
Brown, 2005[43]		A	B	Total	156						
Case series	Age (years)	58	56	A-transperiton	122	197	10.7	Not reported	3	Not reported	24
Historical controls	T1c	103	23	B-extraperiton	34	191	11.8	Not reported	–	Not reported	21
	T2	19	11								
	Gleason score 6	104	25								
	Gleason score >7	18	9								
	Gleason score (mean)	15	14.9								
Remzi, 2005[44]		B	A	Total	80						
Case series	Age (years)	59	61	A-transperiton	39	279	20	7.7	Not reported	Not reported	25.6
	PSA (ng/ml)	8.1	5.5	B-extraperiton	41	217	37	2.4	Not reported	Not reported	19.5
	Gleason score	5.5	5.1								

Table C11. Comparative effectiveness of laparoscopic versus retropubic radical prostatectomy (adapted from the systematic review by Rassweiler et al)

Author	Population				Treatment	Sample Size	OR-Time (minutes)	Complication (%)	Reintervention (%)	Analgesics (mg)	Blood Loss (cc)	Transfusion (%)
Guilloneau, 2000[45]			LRP	RRP	Total	220						
	PSA ng/ml		11.2	11	RRP	100	135	Not reported	Not reported	Not reported	850	31
Case series	Gleason score		6	6	LRP	120	239	7.3	2.5	Not reported	402	10
	Stage											
	pT2		85	107								
	pT3a		8	7								
	pT3b		7	6								
Salomon, 2002[46]		RRP	PRP	LRP	Total	401						
Case series	Age	65	64.6	64.1	RRP	219	197	23.8	Not reported	Not reported	Not reported	26.2
	PSA	21	13.2	11.6	PRP	219	178	16.7	Not reported	Not reported	Not reported	15.9
	Gleason Score	5.7	5.7	5.7	LRP	219	285	18.1	Not reported	Not reported	Not reported	2.9
Rassweiler, 2003[47]		RRP	LRP	LRP	Total	657						
			Early	Later	RRP	219	196	19.1	6.8	50.8a	1,550	55.7
Case series	Age	65	64	64	LRP early	219	288	13.9	4.2	33.8	1,100	30.1
	pT1	5	5	1	LRP late	219	218	6.1	2	30.1	800	9.6
	pT2a	55	43	39								
	pT2b	40	73	103								
	pT3a	72	53	49								
	pT3b	21	35	22								
	pT4	24	10	5								
	Gleason score	7	6	6								
	PSA (ng./ml)	12	14.6	10.6								
Bhayani, 2003[48]			RRP	LRP	Total	60						
Case series	Age (years)		60.5	57.4	RRP	24	168	20.8	12.5	45	1,473	Not reported
	PSA (ng/ml)		8.6	6.74	LRP	36	348	21.2	6	53c	533	Not reported
	Gleason score		6.13	6.06								
	T1a		1	0								
	T1c		14	21								
	T2a		8	11								
	T2b		1	1								
Roumeguere, 2003[49]			RRP	LRP	Total	162						
	Age		64	62.5	RRP	77	168	24.6	7.8	Not reported	1514	Not reported
Nonrandomized	PSA (ng/ml)		11	8.6	ELRP	85	288	11.8	3.5	Not reported	522	Not reported
clinical trial	Gleason score		5.4	5.4								
Artibani, 2003[50]			RRP	LRP	Total	121						
Case series	Age		64.3	63	RRP	50	105	20	4	Not reported	Not reported	34
	PSA (ng/ml)		11	16	LRP	71	180	37	4.2	Not reported	Not reported	63
	T1b		4	1								
	T1c		26	20								

Table C11. Comparative effectiveness of laparoscopic versus retropubic radical prostatectomy (adapted from the systematic review by Rassweiler et al) (continued)

Author	Population			Treatment	Sample Size	OR-Time (minutes)	Complication (%)	Reintervention (%)	Analgesics (mg)	Blood Loss (cc)	Transfusion (%)
	T2a	15	34								
	T2b	4	10								
	T3	1	6								
	Gleason score	5.7	5.8								
Brown, 2004[51]		LRP	RRP	Total	120						
Case series	Age	59	59	RRP	60	Not reported	18.3	3.3	Not reported	1355	52
	PSA (ng/ml)	6.4	5.6	LRP	60	330	25	3.3	Not reported	317	1.7
	T1a/b	0	1								
	T1c	47	45								
	T2a	13	11								
	T2b	0	3								
Fornara, 2004[52]				Total	64						
Nonrandomized clinical trial				RRP	32	140	9.3	Not reported	35	550	17
				ELRP	32	220	3.1	Not reported	33	200	6
Remzi, 2005[44]		LRP	RRP	Total	121						
Case series	Age (years)	59	60	RRP	41	195	Not reported	7.3	300	385	Not reported
	PSA (ng/ml)	8.1	6.9	LRP	39	279	Not reported	7.7	290	290	Not reported
	Gleason score	5.5	4.7	ELRP	41	217	Not reported	2.4	189	189	Not reported
Keller, 2005[53,54]	PSA >10 ng/ml			Total	150						
Nonrandomized clinical trial	Gleason score >5			RRP	50	150	Not reported	Not reported	Not reported	739	4
				PRP	50	86	Not reported	Not reported	Not reported	269	0
				LRP	50	249	Not reported	Not reported	Not reported	322	16

Table C12. Comparative effectiveness of laparoscopic, retropubic, and perineal radical prostatectomy (adapted from the systematic review by Rassweiler et al)

Author	Population				Treatment	N	Continence (1 year) (%)	Potency Bilat Ns. (%)	Positive Margins (%)	PSA Relapse (%)	Overall Survival (%)
Salomon, 2002[46]		RRP	PRP	LRP	Total	401					
Case series	Age	65	64.6	64.1	RRP	219	Not reported	Not reported	31.7	Not reported	75
	PSA	21	13.2	11.6	PRP	219	Not reported	Not reported	18.5	Not reported	85.2
	Gleason Score	5.7	5.7	5.7	LRP	219	Not reported	Not reported	28.5	Not reported	84.1
Rassweiler, 2003[47]		RRP	LRP	LRP	Total	657					
			Early	Later	RRP	219	89.9	Not reported	28.7	17.4	96.6
Case series	Age	65	64	64	LRP early	219	90.3	Not reported	21	13.2	98.6
	pT1	5	5	1	LRP late	219	91.7	Not reported	23.7	Not reported	Not reported
	pT2a	55	43	39							
	pT2b	40	73	103							
	pT3a	72	53	49							
	pT3b	21	35	22							
	pT4	24	10	5							
	Gleason score	7	6	6							
	PSA (ng/ml)	12	14.6	10.6							
Anastasidis, 2003[55]			RRP	LRP	Total	300					
	Age		65	64.1	RRP	70	66.7	44%	Not reported	Not reported	Not reported
	PSA (ng/mL)		11	10.7	LRP	230	71.6	53%	Not reported	Not reported	Not reported
	Gleason score		6	5.8							
	T1a-b		2	10							
	T1c		50	156							
	T2a		17	58							
	T2b		1	6							
	Gleason score		7	6.7							
Roumeguere, 2003[49]			RRP	LRP	Total	162					
	Age		64	62.5	RRP	77	83.9	54.5	40.2	6.9	Not reported
Nonrandomized	PSA (ng/ml)		11	8.6	ELRP	85	80.7	65.3	25.8	8.6	Not reported
clinical trial	Gleason score		5.4	5.4							
Artibani, 2003[50]			RRP	LRP	Total	121					
Case series	Age		64.3	63	RRP	50	78.5	10	24	11	Not reported
	PSA (ng/ml)		11	16	LRP	71	60	8	30	19	Not reported
	T1b		4	1							
	T1c		26	20							
	T2a		15	34							
	T2b		4	10							
	T3		1	6							
	Gleason score		5.7	5.8							

Table C12. Comparative effectiveness of laparoscopic, retropubic, and perineal radical prostatectomy (adapted from the systematic review by Rassweiler et al) (continued)

Author	Population			Treatment	N	Continence (1 year) (%)	Potency Bilat Ns. (%)	Positive Margins (%)	PSA Relapse (%)	Overall Survival (%)
Remzi, 2005[44]		LRP	RRP	Total	121					
Case series	Age (years)	59	60	RRP	41	Not reported	Not reported	19.5	Not reported	Not reported
	PSA (ng/m)	8.1	6.9	LRP	39	Not reported	Not reported	25.6	Not reported	Not reported
	Gleason score	5.5	4.7	ELRP	41	Not reported	Not reported	19.5	Not reported	Not reported
Keller, 2005[53,54]	PSA >10 ng/ml			Total	150					
Nonrandomized clinical trial	Gleason score > 5			RRP	50	88	Not reported	20	Not reported	Not reported
				PRP	50	90	Not reported	11.7	Not reported	Not reported
				LRP	50	50	Not reported	16	Not reported	Not reported

Table C13. Perioperative and pathological parameters and complication rates after three surgical treatments of prostate cancer: robotic assisted, laparoscopic, and open radical retropubic prostatectomy, pooled estimated from 24 observations

Outcomes	Robotic Assisted RP	LRP	Open RP
Installation time (minutes)	32		
Operative time (minutes)	222	225	182
Mean EBL (ml)	231	505	727
Blood transfusion (%)	3.9	8.4	24
Conversion/abortion (%)	1.1	1.4	
Catheter time (days)	8.1	6.1	7-21
Positive margins T2 (%)	77.5	72.4	64
Positive margins T3 (%)	21.6	26.5	32.2
Total positive surgical margins (%)	15	19.9	24.1
Pathological stage 2/positive surgical margins (%)	8.5	13.8	17.5
Overall complications (%)	8.3	16.8	10.3
Minor complications (%)	4.6	13	6.3
Major complications (%)	3.8	4.9	4

Figure C3. Comparative studies of LRP vs. RRP; operative data (from the systematic review of nonrandomized clinical trials and case series by Rassweiler et al)

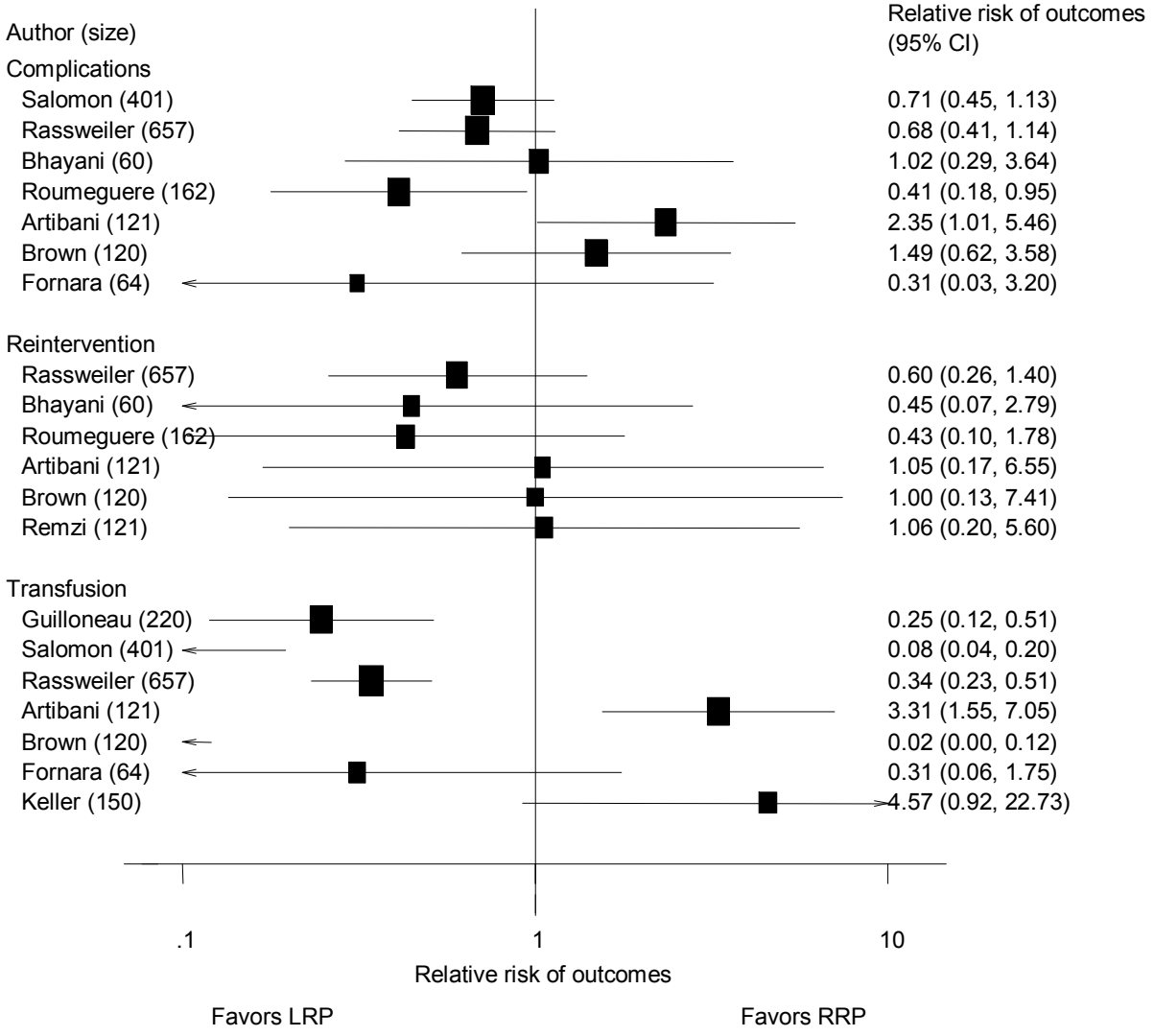


Figure C4. Comparative studies of transperitoneal vs. extraperitoneal radical prostatectomy; operative data (from the systematic review of nonrandomized clinical trials and case series by Rassweiler et al)

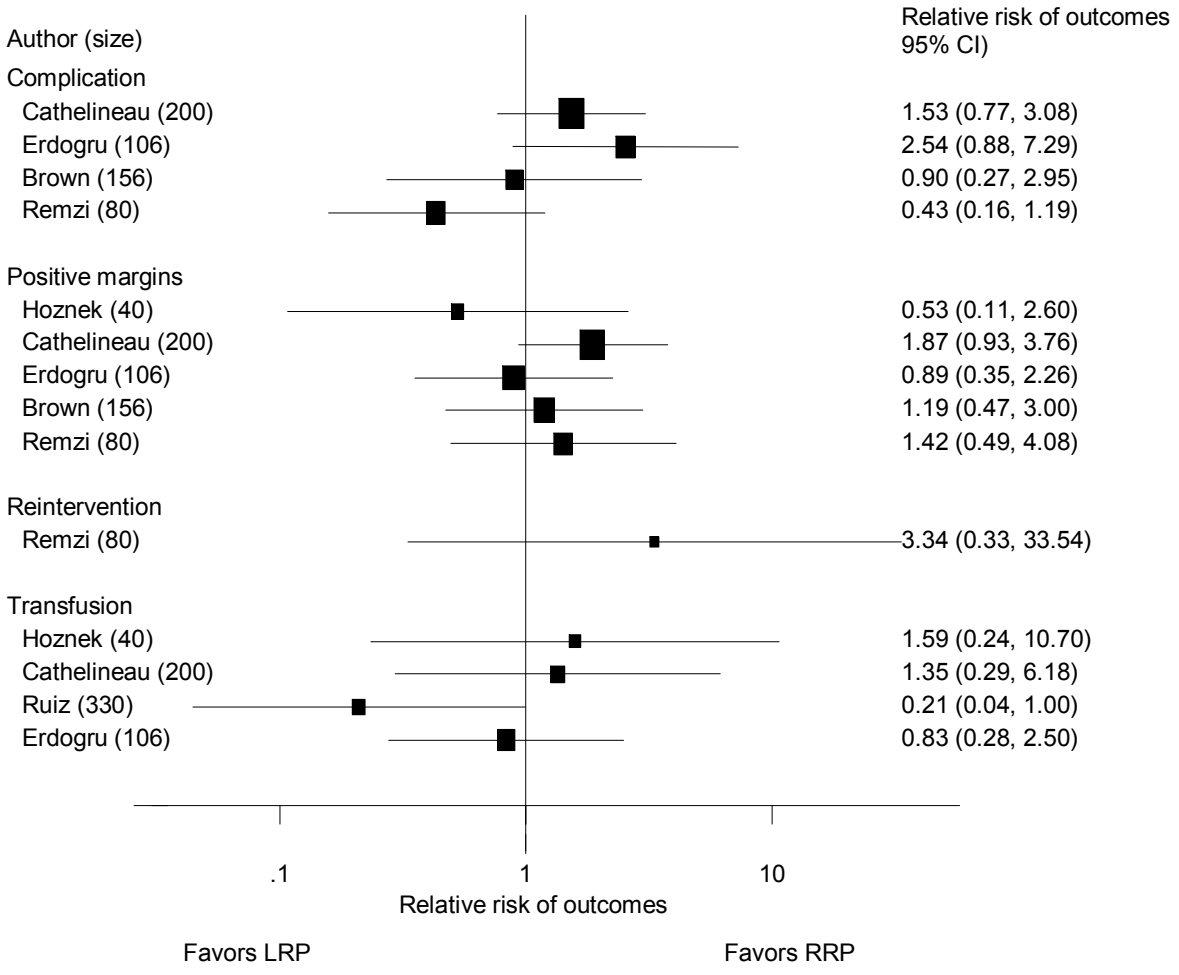


Table C14. Outcomes after laparoscopic extraperitoneal, transperitoneal, robot assisted, and radical retropubic prostatectomy (from systematic review by Tooher et al)[56]

Outcome (Number of Studies)	Effect Size
% Conversions to open procedure (12)	0–14 (median 2)
% Total complications	
Transperitoneal LRP vs. RRP (6)	0–25 (median 17) vs. 8–25 (median 19)
Extraperitoneal endoscopic RP vs. RRP (3)	11–37 (median 14) vs. 8–30 (median 20)
Robot assisted RP vs. RRP (2)	5 + 7 vs. 20 + 10
Blood loss (ml)	
Transperitoneal LRP vs. RRP (5)	317–1,100 (median of means 800) vs. 1,325–1,550 (median of means 1,400)
Extraperitoneal endoscopic RP vs. RRP (2)	795 vs. 829, 522 vs. 1,514
Robot assisted RP vs. RRP (3)	103–382 (median of means 153), 418–1,330 (median of means 910)
% Transfusions	
Transperitoneal LRP vs. RRP (5)	0–18 (median 2) vs. 10–56 (median 26)
Extraperitoneal endoscopic RP vs. RRP (1)	34 vs. 64
Robot assisted RP vs. RRP (3)	0–28 (median 0) vs. 2–67 (median 38)
Operative time (minutes)	
Transperitoneal LRP or extraperitoneal endoscopic RP vs. RRP (10)	180–400 (median of means 288) vs. 105–235 (median of means 168)
Robot assisted RP vs. RRP (4)	160–368 (median of means 231) vs. 163–242 (median of means 214)
Length of stay (days)	
Transperitoneal LRP vs. RRP (8)	2–12 (median of means 5) vs. 3–16 (median of means 7)
Extraperitoneal endoscopic RP vs. RRP (1)	7.2 vs. 10.1
Robot assisted RP vs. RRP (3)	1.1–2.0 (median of means 1.2) vs. 2.2–3.5 (median of means 2.7)
Catheterization (days)	
Transperitoneal LRP vs. RRP (5)	6.5–14 (median of means 7) vs. 12–19 (median of means 15)
Extraperitoneal endoscopic RP vs. RRP (2)	6–11.8 (median of means 8) vs. 8.4–15 (median of means 14)
Robot assisted RP vs. RRP (3)	6.3–7 (median of means 7) vs. 9–15.8 (median of means 13)
% Positive margins	
Transperitoneal LRP vs. RRP (8)	11–50 (median 23) vs. 20–34 (median 29)
Extraperitoneal endoscopic RP vs. RRP (3)	16–30 (median 26) vs. 15–40 (median 24)
Robot assisted RP vs. RRP (4)	6–26 (median 16) vs. 4–29 (median 20)
% Recurrence-free survival	
Transperitoneal LRP vs. RRP (2)	84 + 99 vs. 75 + 97
Extraperitoneal endoscopic RP vs. RRP (2)	91 + 81 vs. 93 + 89
Robot assisted RP vs. RRP (2)	92 + 95 vs. 85 + 95
Continence (% pad free)	
Transperitoneal LRP vs. RRP (3)	60–90 (median 80) vs. 67–90 (median 89)
Extraperitoneal endoscopic RP vs. RRP (3)	79–90 (median 81) vs. 60–88 (median 83.9)
Robot assisted RP vs. RRP (3)	76–90 (median 78) vs. 68–83 (median 75)
% Potency	
Transperitoneal LRP vs. RRP (1)	41 vs. 30
Extraperitoneal endoscopic RP vs. RRP (2)	9 + 65 vs. 10 + 55
Robot assisted RP vs. RRP (2)	71 + 90 vs. 59 + 40

* PSA 0.2 m/l or greater on more than 1 occasion
LRP= laparoscopic radical prostatectomy
RRP= retropubic radical prostatectomy

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
Ahlering, 2004[57] The first 140 consecutive robot-assisted radical prostatectomies, pT2a - T2b 59 men <66 years of age with Sexual Health Inventory in Men (SHIM) score of 22 to 25 were treated with cautery-free technique (CFT) to preserve the neurovascular bundles (NVB) during robotic laparoscopic radical prostatectomy	Cases 51–140, define the prostatic apex precisely vs. cases 1–50	Positive margins	3	9	**0.003**
Ahlering, 2005[58] 59 men <66 years of age with Sexual Health Inventory in Men (SHIM) score of 22 to 25 were treated with cautery-free technique (CFT) to preserve the neurovascular bundles (NVB) during robotic laparoscopic radical prostatectomy	Preservation of the NVB with CFT vs. traditional dissection using bipolar cautery	Erection adequate for vaginal penetration at 3 months	10	3	**0.003**
		Zero penile fullness at 3 months	2	15	
Ahlering, 2004[59] 60 standard RPs and 60 robot-assisted laparoscopic RPs performed by one surgeon	Robotic assisted laparoscopic RP vs. RP	Positive margins	2	4	
Badani, 2005[60] Twenty-eight anastomotic drills performed randomly in a blinded fashion	Three-dimensional (3D) suturing frills vs. two-dimensional (2D) suturing frills	Operative time per drill	8.5 minutes (range 4.7-12.8 minutes)	13.1 minutes (6.9-21.9)	**<0.001**
		Major errors in performances	2	5	
Farnham, 2006[61] 279 patients with localized PC made the decision which surgical approach to use	Robotic assisted laparoscopic RP vs. RP	Intraoperative blood loss	191	664	**< 0.001**
		Transfusion of blood products	1	3	
Hu, 2006[62] 358 patients, 4 with T3 after LRP and 322 after RAP	Robotic assisted laparoscopic RP vs. laparoscopic RP	Estimated blood loss	250 (50–1,600)	200 (0–1,500)	
		Operative time	3.1 (1.9–8.8)	4.1 (2.5–12.8)	
		Urological complications	40	77	
		Bowel complications	11	34	
		Vascular complications	4	7	
		Postop blood transfusion	5	8	
Menon, 2002[63] 48 laparoscopic radical prostatectomies and 50 robot assisted prostatectomies	Robotic assisted laparoscopic RP vs. laparoscopic RP	Mean mins. operating time (SE)	274	258	0.4
		Mean ml. estimated blood loss (SE)	256	391	**0.013**

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
		Mean gm/dl hemoglobin decrease (SE)	2.6	3	0.17
		Mean % hematocrit decrease (SE)	17.2	20.1	0.11
		No. intraop. blood transfusion (%)	0	1	>0.99
		No. conversion to open surgery (%)	0	1	>0.99
		No. discharge home less than 24 hours (%)	32	26	0.13
		No. pos. margins	5	5	
Menon, 2002[64] Prospective nonrandomized comparison of RRP and RAP in 60 patients with clinically localized prostate cancer who elected s surgical treatment.	Robotic assisted laparoscopic RP vs. RP	Operative time (hr)	4.8 (4–7)	2.3 (1.5–5)	
		EBL (mL)	329 (75–1050)	970 (400–2200)	
		Blood transfusion (%)	7	30	
		Mean postoperative pain score (range)	4 (1–9)	7 (4–10)	**<0.05**
		Hemoglobin drop (g/dL)	1.2 (0.1–2)	4.4 (0.5–4.8)	**<0.05**
		Mean hospital stay (hr)	36 (23–96)	56 (48–96)	NS
		Discharged within 24 hr (%)	63	0	<0.001
		Mean duration of catheterization (days)	10.7 (6–18)	13.7 (7–18)	NS
		Gleason score	6.9 (2–9)	6.6 (2–9)	NS
		Node status (%)	0	0	NS
		Margin positivity (%)	26	29	NS
		Focal	12	14	NS
		Extensive	14	15	NS
		Seminal vesicle positivity (%)	10	10	NS
		Intraoperative bleeding (>1,000 mL)	1	5	**<0.05**
		Conversion	1		NS
		Rectal injuries	0	1	NS
		Postoperative urinary retention	1	1	NS
		Postoperative ileus	3	3	NS
		Exaggeration of arthritis	1	0	NS
		Wound dehiscence	1	1	NS
Tewari, 2003[65] 100 patients undergoing RRP and 200	Robotic assisted laparoscopic RP vs. RP	Catheterization, days	7 (1–18)	15.8 (7–28)	**< 0.05**
		Collow-up, days	236	556	**< 0.05**

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
undergoing VIP, 5.5% with T3A		Undetectable PSA, %	92	85	NS
		% cancer in specimen	19 (1–80)	18.3 (5–90)	NS
		Complications	5	20	**< 0.05**
		Time of 50% return of erection	180 days	440 days	
		Using sildenafil	42%	65%	
Menon, 2004[66] 1,100 cases of robotic radical prostatectomy in patients with localized prostate cancer and a life expectancy of over 10 year	Robotic assisted laparoscopic RP vs. RP	Operating room time	Crude odds ratio 0.91	163 min	
		Estimated blood loss	0.1	910 mL	**<0.05**
		Positive margins	1	23%	
		Complications	0.33	15%	**<0.05**
		Catheterization time	0.44	15.8 d	**<0.05**
		Hospital stay > 24 hours	0.07	100%	**<0.05**
		Postoperative pain score (0–10)	0.45	7	**<0.05**
		Median time to continence (days)	0.28	160	**<0.05**
		Median time to erection (days)	0.4	440	**<0.05**
		Median time to intercourse(days)	0.5	>700	**<0.05**
		Detectable prostate specific	0.5	15%	
Rozet, 2007[67] 133 consecutive patients who underwent extraperitoneal robot assisted radical prostatectomy compared to 133 match-paired patients treated with a pure extraperitoneal laparoscopic approach, 0.8% with T3	Extraperitoneal robotic assisted laparoscopic RP vs. extraperitoneal laparoscopic RP	Mean ml blood loss	609 (100-3,000)	512 (70-1,800)	0.07
		Mean operative mins	166 (90-300)	160 (90-270)	0.09
		% transfusion rate	3	9.8	**0.02**
		Hospital stay (days)	5.4 (3-26)	4.9 (3-20)	0.21
		Bladder catheter (days)	9.2 (6-29)	9.0 (7-31)	0.56
		Pos surgical margins	19.5	15.8	0.42
		Complications	19.4	9.1	**0.01**
		Anastomotic leakage	0.8	0.8	
		Wound abscess	0.8	0	
		Infected pelvic hematoma	2.2	1.5	
		Urinary infection	4.4	0.8	
		Postop bleeding	4.4	0.8	
		Retention	0.8	2.2	
		Anastomotic leakage	0.8	0.8	
		Postop bleeding	2.2	0	
		Urinary sepsis	1.5	1.5	

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
		Pulmonary embolism	0	0.8	
		Renal insufficiency	1.5	0	
Patel, 2007[68] 500 robotically assisted laparoscopic radical prostatectomies , 22% with >T2	Robotic assisted laparoscopic RP	Pos surgical margins	9.4		
		Mean Operative duration, min	130		
		Mean EBL, mL	50		
		Conversion rate, %	0.6		
		% blood transfusion	0		
		No. complications during RALP	2		
		Mean haematocrit change, %	3.1		
		% of patients requiring no narcotics	85		
		Mean catheter duration, days	6.9		
		% discharged home on day 1	97		
		Complete continence, %, at 3 months	89		
		Complete continence, %, at 6 months	95		
		% undetectable PSA level at 9.7month	95		
Zorn, 2007[69] 300 consecutive cases of robotic-assisted laparoscopic radical prostatectomy with selective use of interfascial nerve preservation, all with T1-2	Robotic assisted laparoscopic RP with selective use of interfascial nerve preservation	Operative time (min)	282 (143–540)		
		Estimated blood loss (ml)	273 (25–1500)		
		Transfused (%)	5 (1.7)		
		Hospital stay (days)	1.4 (1–6)		
		Length of foley catheter	5.9 (4–26)		
		Myocardial infarction	0.6		
		Thromboembolic event	0.6		
		Hemorrhage	1		
		Rectal injury			
		Ureteral injury			
		Lymphocele	0.6		
		Anastamotic leak	1.4		
		Bladder neck contracture	1.4		
		Wound infection/hernia	2		
		Femoral nerve palsy	1.4		
		Positive surgical margins	20.9		

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
		Intra-operative complication	2.3		
		Subjective continence at 12 months	90.20		
		Subjective potency at 12 months	80.4		
		Pathologic-T3 Positive surgical margins with ipsilateral interfascial nerve preservation	73		
		Pathologic-T3 Positive surgical margins without ipsilateral interfascial nerve preservation	33		
Mikhail, 2006[70] nonrandomized prospective trial of initial 100 patients who underwent robotic-assisted laparoscopic radical prostatectomy, all with T1-2 Rand 36-item health survey	Robotic assisted laparoscopic RP	Operative time	200-520		
		Estimated blood loss (mL)	25-1500		
		Length of hospitalization (days)	1-6		
		Length of foley catheterization	4-26		
		Positive margin rate	16		
		Postoperative bleed	1		
		Postoperative hematuria	1		
		Bladder neck contracture	2		
		Anastomotic leak	3		
		Lymphocele	2		
		Wound infection	2		
		Pulmonary embolus	1		
		Transient mild CHF	1		
		Wound dehiscence (after altercation)	1		
		Hand numbness	1		
		Postoperative ileus	1		
		Incisional hernia	1		
		Total complications	13		
		Subjective continence at 12 months	89		
		Subjective potency, unilateral at 12 months	68		

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
		Subjective potency, bilateral at 12 months	79		
		Subjective potency, overall at 12 months	75		
		Urinary function at 12 months	74.8 ± 24.9		NS compared to baseline
		Urinary bother at 12 months	82.7 ± 27.3		NS compared to baseline
		Sexual function, unilateral at 12 months	52.9 ± 290		NS compared to baseline
		Sexual function, bilateral at 12 months	60.1 ± 23.6		NS compared to baseline
		Sexual function, overall at 12 months	57.3 ± 25.8		NS compared to baseline
Tseng, 2006[71] Case series of 90 patients undergoing robot-assisted laparoscopic prostatectomy, 8.9% with >T2 median followup 9.5 months Expanded Prostate Cancer Index Composite questionnaire	Robotic assisted laparoscopic RP	Urinary, function at 9.5 months	80.8 ± 19.6		
		Urinary, bother at 9.5 months	78.6 ± 21.2		
		Urinary, incontinence at 9.5 months	68.8 ± 31.9		
		Urinary, Irritative/ obstructive at 9.5 months	87.0 ± 13.6		
		Urinary, summary score at 9.5 months	79.5 ± 19.6		
		Sexual, function at 9.5 months	20.5 ± 17.2		
		Sexual, bother at 9.5 months r	32.2 ± 27.7		
		Sexual, summary score at 9.5 months	24.1 ± 19.1		
		Bowel, function at 9.5 months	94.5 ± 7.1		
		Bowel, bother at 9.5 months	94.6 ± 10.0		
		Bowel, summary score at 9.5 months	94.5 ± 8.0		

Table C15. Comparative effectiveness of robotic assisted laparoscopic radical prostatectomy (continued)

Author, Sample	Active vs. Control Treatment	Outcome	Outcome Rate After Active Treatment	Outcome Rate After Active Control Treatment	p
		Hormonal, function at 9.5 months	86.5 ± 12.5		
		Hormonal, bother at 9.5 months	89.9 ± 12.0		
		Hormonal, summary score at 9.5 months	88.4 ± 11.7		
		SF-12 component score, physical at 9.5 months	50.5 ± 10.1		
		SF-12 component score, mental at 9.5 months	53.0 ± 9.1		
		Recover to baseline urinary summary score at 12 months	76.8		
		Recover to baseline sexual summary score at 12 months	19.2		

Bold - significant at 95% confidence level difference

Table C16. Comparison of task performance of AESOP (N=10) and EndoAssist (N=10) during operative steps of laparoscopic radical prostatectomy

Outcomes	AESOP Mean ± STD	EndoAssist Mean ± STD	Difference (95% CI)	P Value
Robot setup and assembly to laparoscope	2 ± 0.8	5.3 ± 2.4	-1.85 (-2.91; -0.78)	0.001
Identification and dissection of vas deferens and seminal vesicles	33.3 ± 13.4	22.7 ± 7	0.99 (0.06; 1.93)	0.04
Development of space between Denonvilliers' fascia and rectum	9.9 ±2.73	7.8 ± 2.6	0.79 (-0.13; 1.70)	0.09
Development of prevesical space of Retzius	8.7 ± 3.8	8.8 ±3.6	-0.03 (-0.90; 0.85)	0.95
Dissection of prostatic apex	16.7 ± 10.3	11.4 ± 2.3	0.71 (-0.20; 1.62)	0.13
Ligation of deep dorsal vein	5.9 ± 1.8	5.8 ± 1.9	0.05 (-0.82; 0.93)	0.91
Development of lateral neurovascular bundle groove	18.7 ± 3.5	14.9 ± 7	0.69 (-0.22; 1.59)	0.21
Bladder neck transection	13.2 0 ±3.6	12 ± 3.3	0.35 (-0.54; 1.23)	0.45
Antegrade preservation of neurovascular bundles	24 0±7.5	23.1 ± 8.7	0.11 (-0.77; 0.99)	0.81
Apical transection of prostate	13.1 0 ±5	12.7 ± 6.2	0.07 (-0.81; 0.95)	0.88
Urethrovesical anastomosis	48.9 ± 12.8	40.3 ± 13	0.67 (-0.24; 1.57)	0.15
Pelvic lymph node dissection	11.6 ± 5.6	11 ± 3.4	0.13 (-0.75; 1.01)	0.78
Specimen procurement and trocar site closure	20.9 ± 7.6	19.5 ± 5.4	0.21 (-0.67; 1.09)	0.64

AESOP = Automated Endoscope System for Optimal Positioning

Table C17. Clinical outcomes after IMRT in patients with localized prostate cancer

Author, Design	Outcomes	Rate Active, %	Rate Control, %
Kupelian, 2002[72] Case series of 166 patients treated with IMRT 70 Gy in 28 fractions and 116 with 3D-CRT 78 Gy in 39 fractions % of >T2: 7% Followup: 25-32 months	Freedom of biochemical relapse: 3 consecutive rising PSA after reaching a nadir	91	88
	Freedom of biochemical relapse: reaching and maintaining PSA of ≤0.5 ng/ml	84	70
Kupelian, 2005[73] Case series of 100 patients treated with IMRT 70.0 Gy at 2.5 Gy per fraction and 310 with 3D-CRT 78 Gy at 2 Gy per fraction % of >T2: 62% Followup: 66 months	Freedom of biochemical relapse: ASTRO definition (the first documented rise in PSA)	85	78
	Freedom of biochemical relapse: nadir PSA >2 ng/ml	88	93
Zelefsky, 2006[74] Case series of 561 patients treated with IMRT 81.0 Gy % of >T2: 6% Followup: 84 months	Freedom of biochemical relapse: absolute nadir plus 2 ng/ml dated at the call).	85	
	Freedom of biochemical relapse in low risk patients	89	
	Distant metastases	3	
	Distant metastases in low risk patients	1	
	Cause specific survival in low risk	100	
De Meerleer, 2007[75] Case-series of 133 patients treated with IMRT 76 -74 Gy % of >T2: 33% Followup: 36 months	Overall survival at 5 years	96	
	Biochemical relapse-free survival as three consecutive PSA rises at 3 years	88	
	At 5 years	83	
	5 years biochemical relapse-free survival for patients:		
	low-risk	100	
	intermediate-risk	94	
	high-risk group	74	
	5 years clinical relapse-free survival	85	
	5 years clinical relapse-free survival In high-risk group, AD–naive patients	44	
	Hazard ratio of biochemical relapse free survival in high risk	6.21 (0.96; 40.07)	
	Hazard ratio of biochemical relapse		
	Total Gleason score	1.07 (0.75; 1.53)	
	Pretreatment PSA	1.02 (0.99; 1.04)	
	Risk group	3.07 (0.92; 10.3)	
	Prescription dose	**0.34 (0.11; 0.98)**	
	Use of AD	**0.28 (0.10; 0.79)**	
	Segment outline weight adapting tool	0.41 (0.13; 1.36)	

Bold - significant at 95% confidence level difference

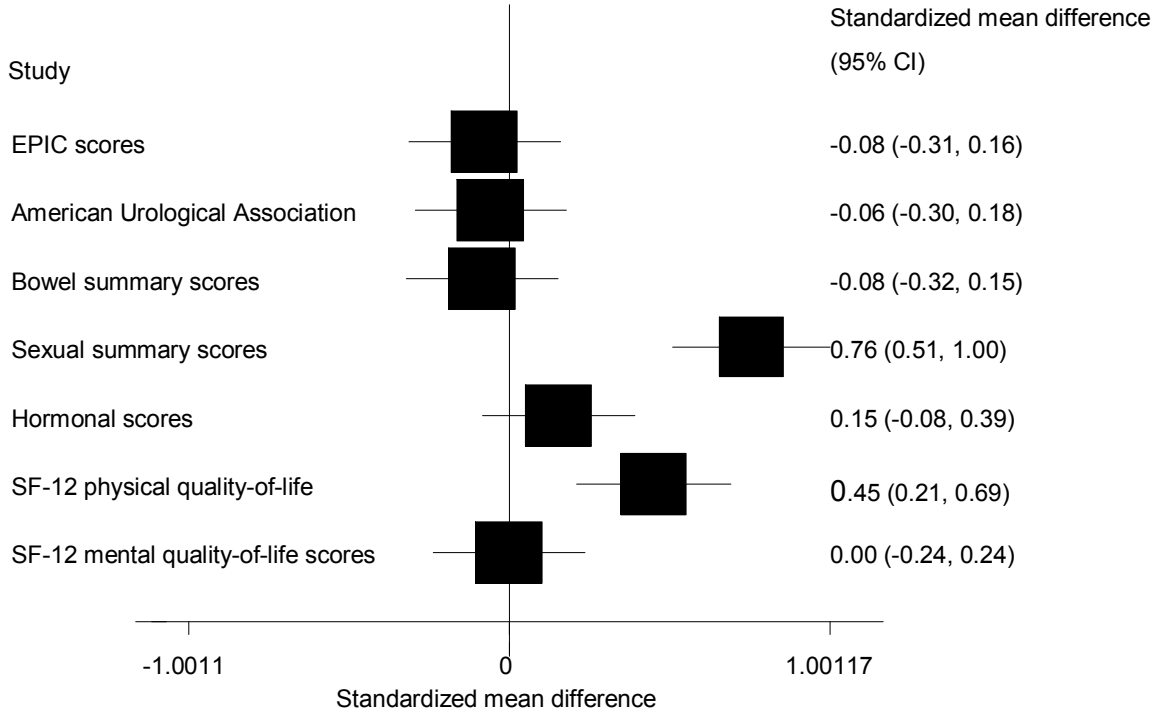
Table C18. Acute toxicity outcomes after intensity modulated radiotherapy for prostate cancer

Author, Design	Acute Toxicity Outcomes	Rate in Active Group, %	Rate in Control Group, %
Zelefsky, 2006[74] Case series of 561 patients treated with IMRT 81.0 Gy % of >T2: 6% Followup: 84 months	Grade 2 rectal bleeding	1.6	
	Grade 3 rectal toxicity	0.1	
D'Amico, 2006[76] Phase II clinical trial 100 patients treated with IMRT 75.6Gy+flutamide 250 mg 3 times/day % of >T2: 8% Followup: 12 months	Rectal bleeding	10	
Zelefsky 2002[77] Case series of 698 patients treated with IMRT 81.0 Gy and 74 with IMRT 86.4 Gy % of >T2: 28% Followup: 29 months	Acute genitourinary toxicity Grade 1	37	46
	Acute genitourinary toxicity Grade 2	28	31
	Acute genitourinary toxicity Grade 3	0.5	0

Table C19. Late toxicity outcomes after intensity modulated radiotherapy for prostate cancer

Author, Design	Chronic Toxicity Outcomes	Rate Active, %	Rate Control, %
Kupelian, 2002[72] Case series of 166 patients treated with IMRT 70 Gy in 28 fractions and 116 patients treated with 3D-CRT 78 Gy in 39 fractions. % of >T2: 7% Followup: 25-32 months	Grade 2-3 late rectal toxicity Actuarial Grade 3 late rectal toxicity	5 2	12 8
Kupelian, 2005[73] Case series of 100 patients treated with IMRT 70.0 Gy at 2.5 Gy per fraction and 310 patients treated with 3D-CRT 78 Gy at 2 Gy per fraction % of >T2: 62% Followup: 66 months	Actuarial Grade2 and 3 late rectal toxicity Actuarial Grade 3 late urinary toxicity	11 1	
Zelefsky 2002[77] Case series of 698 patients treated with IMRT 81.0 Gy and 74 with IMRT 86.4 Gy % of >T2: 28% Followup: 29 months	Late Gastrointestinal toxicity grade 2 Late Gastrointestinal toxicity grade 3	1.5 0.5	
Kupelian, 2002[72] Case series of 166 patients treated with IMRT 70 Gy in 28 fractions and 116 patients treated with 3D-CRT 78 Gy in 39 fractions. % of >T2: 7% Followup: 25-32 months	Late urinary toxicity	2.4	1.7
Kupelian, 2005[73] Case series of 100 patients treated with IMRT 70.0 Gy at 2.5 Gy per fraction and 310 patients treated with 3D-CRT 78 Gy at 2 Gy per fraction % of >T2: 62% Followup: 6 months	Actuarial Grade 2 and 3 late urinary toxicity	8	
Zelefsky 2002[77] Case series of 698 patients treated with IMRT 81.0 Gy and 74 with IMRT 86.4 Gy % of >T2: 28% Followup: 29 months	Late Genitourinary toxicity grade 1 Late Genitourinary toxicity grade 2 Late Genitourinary toxicity grade 3	22 9 0.5	24 12 0
Zelefsky 2006[74] Case series of 561 patients treated with IMRT 81.0 Gy % of >T2: 6% Followup: 84 months	Late grade 2 urinary toxicities Late grade 3 urinary toxicities Erectile dysfunction	9 3 49	
De Meerleer, 2007[75] Case-series of 133 patients treated with IMRT 76 -74 Gy % of >T2: 33% Followup: 36 months	Late gastrointestinal morbidity grade 1 Late gastrointestinal morbidity grade 2 Late gastrointestinal morbidity grade 3 Late genitourinary morbidity grade 1 Late genitourinary morbidity grade 2 Late genitourinary morbidity grade 3	47 17 1 43 19 3	

Figure C5. Quality of life measures after IMRT vs. 3D-CRT} (Kupelian, 2002)[72]



C-40

Table C20. Patient outcomes after high-intensity focused ultrasound therapy for localized prostate cancer

Author, Year	Gelet, 2000[78]	Gelet, 2001[79]	Thuroff, 2003[80]	Chaussy, 2003[81]	Chaussy, 2003[81]	Blana, 2004[82]	Uchida, 2005[83]	Blana, 2006[84]	Uchida/ Illig, 2006[85]	Uchida/ Illig, 2006[85]	Uchida/ Ohkusa, 2006[86]	Poissonnier, 2007[87]
Design	CS	CT	CT	CS	CS (HIFU + TURP)	CS	CT		CS (AS before HIFU)	CS	CS	CS
Followup, months	17.6	19	13.6	18.7	10.9	22.5	14	13	6	6	23.3	12-121
Number of patients	82	102	402	96	175	146	72	223	154	96	63	227
Mean age	71	70.8	69.3	65.8	68.4	66.9	72	68.2	67.9	69.2	70.5	68.8
% with T1-2	100	100	100	100	100	100	100		100	100	100	100
Mean PSA	8.11	8.38	10.9	8.6	8	7.6	8.1	11.3	10.5	8.9	11.2	6.99
% Gleason ≥7		46	9.3 (with 8-10)	30	25.7		8 (with 8-10)				6 (with 8-10)	33
Prostate volume, cm3	34.9	33.3	28	21.7	20.5	23	22.1	23.5	22	25.7	28.5	23.9
HIFU device	Ablatherm	Ablatherm	Ablatherm	Ablatherm	Ablatherm	Ablatherm	Sonablate	Ablatherm	Sonablate	Sonablate	Sonablate	Ablatherm
HIFU treatments	1.92	1.7	1.4	1.25	1.04	1.17	1.2					1.4
PSA nadir			0.6	0.48	0.48	0.07					1.38	0.33
Progression free survival,* %	68-83	66		84.2	80	87	76				75	66 Initial PSA PSA PSA <4 - 90% 4.1-10-57% 10.1-15-61%
Biopsy, % negative	78	75	87.2	87.7	81.6	93.4	68	22 needed second HIFU	69	66	87	nadir PSA<0.5 - 89% 0.51 -1 - 76% PSA >1.1 68%
Adverse events												
Mild to moderate incontinence	15.8	18.6	13.1	15.4`	6.9	10.2	1.4	7.6			2	12
Severe incontinence	4.8	4	1.5	0	0	0	0	0			0	1
Impotence	23	24.5	8.7	40	31.8	52.7	39	49.8			23.5	No erection-31%
Rectourethral	1.2	0.98	1.2			0.7	1.4	0			2	

Table C20. Patient outcomes after high-intensity focused ultrasound therapy for localized prostate cancer (continued)

Author, Year	Gelet, 2000[78]	Gelet, 2001[79]	Thuroff, 2003[80]	Chaussy, 2003[81]	Chaussy, 2003[81]	Blana, 2004[82]	Uchida, 2005[83]	Blana, 2006[84]	Uchida/ Illig, 2006[85]	Uchida/ Illig, 2006[85]	Uchida/ Ohkusa, 2006[86]	Poissonnier, 2007[87]
fistula												
Urethral stenosis	20.7	16.7	3.6	27.1	8	11.7	18	19.7			24	12
Length of stay							5					
Quality of life (IPSS)				2.36	1.86	No change	No change	No change				>16-31% 7-15-38%

* progression free survival definitions:
CT - clinical trial, CS - case series, HIFU - High-intensity focused ultrasound, TURP - transurethral resection of the prostate, AS - androgen suppression therapy, IPSS - International prostate symptom score

Author, Year	Definition of biochemical failure
Gelet, 2000[78]	3 successive increases of PSA with PSA velocity >0.75ng/ml/year
Gelet, 2001[79]	3 successive increases of PSA with PSA velocity >0.75ng/ml/year
Chaussy, 2003[81]	Constant PSA level (ASTRO)
Chaussy, 2003[81]	Constant PSA level (ASTRO)
Blana, 2004[82]	Constant PSA <1ng/ml
Uchida, 2005[83]	3 consecutive increases in PSA >1ng/ml
Blana, 2006[84]	increase of PSA >0.2 ng/ml after the last control
Uchida, 2006[86]	3 consecutive increases in PSA >1.38ng/ml
Poissonnier,2007[87]	Any positive biopsy or a PSA >1 ng/ml with three consecutive rises

Table C21. Proton radiation for localized prostate cancer

Author	Yonemoto, 1997[88] Phase I/II Clinical Trial	Slater, 1999[89] Case Series	Slater, 2004[90] Case Series	Rossi, 2004[91] Case Series	Nihei, 2005[92] Phase I/II Clinical Trial
Treatment	45 Gy photon-beam irradiation to the pelvis and 30 CGE to the prostate with 250-MeV protons, total dose 75 CGE in 40 fractions	Conformal radiation doses of 74 to 75 CGE with protons alone or combined with photons in 40 fractions	Conformal proton boost of 30 CGE with 225–250 MeV in 15 fractions to the prostate and seminal vesicles, followed by 45 Gy of photon radiation	Conformal proton radiation with 74-75 CGE followed by 45 Gy of 3D pelvic photon radiation	50 Gy/25 fractions photon irradiation to the prostate and the bilateral seminal vesicles followed by proton boost therapy of 26 GyE/13 fractions to the prostate alone. Phase II clinical trial
Follow up, months	20.2	43	63	62	30
No. of patients	106	319	1,255	1,000	30
% with T>2	18	0	4	0	23
% Gleason >7	12	6	7	7	10
Definitions of outcomes	Disease free survival; negative DRE and normalized PSA (<4.0 rig/ml). Local failure - increasing size of the tumor or nodule, or a continued abnormal prostate with rising PSA. Distant failure; any evidence of metastasis outside the primary site and regional lymph nodes.	Disease free survival; no symptoms Negative DRE and radionuclide scans. Biochemical disease-free survival; 3 consecutive PSA rises >10% or initiation of androgen therapy (American College of Radiology)	Biochemical disease-free survival; 3 consecutive rises in PSA, date of failure –midway between the nadir and first rise (ASTRO)	Biochemical disease-free survival; 3 consecutive rises in PSA, date of failure – midway between the nadir and first rise (ASTRO)	Biochemical disease-free survival; 3 consecutive rises in PSA, date of failure midway between the nadir and first rise (ASTRO)
Total survival	96	100	100	100	100
Disease-free survival, %	86	97			
Biochemical disease-free survival		88	73	In patients <60 years -75 In patients >60 years -74	77
Local survival, % negative biopsy	97.2				
Distant failure	7.5	2.5			
% complications					
Urinary, Grade 1	0				13.3
Urinary, Grade 2	3.8	5			20
Urinary, Grade 3	0	0	1		0
Urinary, Grade 4	0	0	0		0
GI, Grade 1	4.8				60
GI, Grade 2	3.8	6			20
GI, Grade 3	0	0	1		0
GI, Grade 4	0	0	0		0
Hematuria	3.8				
Rectal bleeding	8.7		0.2		

CGE = cobalt-gray equivalent

Table C22. PCOS: Reason for condition specific bother for responders reporting bother on urinary, bowel, and sexual questions* (Potosky, 2004)[93]

Domain	RP† (n = 901)	EBR† (n = 286)	Odds Ratio (95% CI)
Urinary bother‡			
Too far from the bathroom	22.1 (24.0)	30.1 (24.9)	1.32 (0.83; 2.13)
Embarrassment about going too often	14.7 (15.2)	13.3 (11.9)	1.32 (0.83; 2.13)
Frequent urination	30.6 (31.6)	34.3 (31.3)	1.01 (0.68; 1.51)
Urination at night	41.6 (43.2)	51.9 (47.2)	0.84 (0.58; 1.22)
Urgency in urination	32.7 (34.2)	44.6 (39.9)	0.84 (0.58; 1.22)
Slow or difficult urination	32.7 (34.2)	44.6 (39.9)	0.78 (0.53; 1.12)
Bowel bother‡			
Diarrhea	11.2 (11.5)	16.6 (15.3)	0.70 (0.4; 1.22)
Tenderness during bowel movements	6.8 (7.3)	9.7 (8.4)	0.85 (0.46; 1.56)
Bleeding with bowel movements	7.5 (8.0)	14.7 (13.0)	0.58 (0.31; 1.06)
Passing mucus from rectum	5.1 (5.4)	14.4 (13.1)	0.36 (0.20; 0.66)
Sexual bother§			
Lack of sexual interest	42.7 (41.7)	40.6 (43.8)	0.92 (0.63; 1.32)
Lack of sexual enjoyment	53.1 (52.2)	45.5 (48.9)	1.14 (0.80; 1.64)
Inability to satisfy spouse or partner	57.5 (56.4)	46.1 (50.3)	1.28 (0.88; 1.86)
Orgasm difficult	47.8 (47.2)	43.4 (46.0)	1.05 (0.73; 1.51)
Orgasm satisfying	43.4 (42.4)	38.2 (41.4)	1.04 (0.72; 1.51)
Erectile difficulties	63.4 (62.0)	56.5 (61.2)	1.03 (0.71; 1.49)

* EBR is the referent group. Adjusted percentages are from separate logistic regression models, each adjusted for treatment propensity score, age, baseline function, race, comorbidity, and educational level.

† RP = radical prostatectomy, EBR = external beam radiation. Values in columns are unadjusted percentages, in parentheses, adjusted percentages.

‡ Percentages and OR for bother are somewhat/a lot versus not at all.

§ For bother items, percentages refer to patients reporting bother of a lot versus somewhat/not at all.

Table C23. Adjusted percentage distributions for satisfaction by characteristics at 24 months* (Hoffman, 2003)[94]

Variable	Percent Satisfied (95% CI)	Wald Chi-Square Test p Value
Treatment		<0.01
No treatment	50.5 (42.5; 58.8)	
AD	66.3 (58.0; 74.6)	
Radiation	69.4 (64.6; 74.2)	
Free of PC		<0.01
No	49.1 (42.0; 56.3)	
Don't know	53.7 (48.7; 58.7)	
Yes	66.4 (63.2; 69.6)	
Bowel urgency		0.03
Almost every day	38.4 (22.0; 54.8)	
Some days	62.1 (56.6; 67.7)	
Rarely or not at all	60.5 (57.7; 63.3)	
Urinary leakage		<0.02
At least once a day	53.7 (48.6; 58.8)	
Once a week or less	59.7 (55.0; 64.4)	
Not at all	64.2 (60.8; 67.7)	
Erectile dysfunction		0.04
Cannot get any erections	58.1 (54.6; 61.5)	
Some or a lot of difficulty	61.7 (57.2; 66.1)	
No or little difficulty	65.9 (60.8; 71.1)	
General health (24 month followup)		<0.01
Excellent	71.3 (65.6; 77.0)	
Very good	65.2 (61.3; 69.2)	
Good	54.8 (50.5; 59.2)	
Fair	52.0 (45.3; 58.6)	
Cancer or treatment limits activities		<0.01
A lot or some	41.7 (33.2; 50.2)	
Only a little	52.9 (47.1; 58.8)	
Not at all	65.5 (62.4; 68.5)	
Cancer treatment affects relationships with spouse/friends		<0.01
A lot or some	43.9 (37.8; 50.0)	
A little	54.6 (49.5; 59.6)	
Not at all	68.1 (64.8; 71.3)	

* Weighted to reflect all eligible PC patients in the study area

Table C24. Association of bowel, urinary, and sexual function with patients' perception of the problem and satisfaction at 24 months post diagnosis*

Function at 24 Months	No Problem % Satisfied	Small/Very Small % Satisfied	Moderate/Big % Satisfied
Urgent bowel movements			
Rarely or not at all	64.3	57.7	35.2
Some days	65.5	55.1	29.7
Almost everyday	45.8	26.1	19.2
Leak or drip urine			
Not at all	69.9	59.9	--
Once a week or less	67.6	54.0	47.0
Daily or more often	73.3	48.8	31.6
Difficulty keeping an erection			
None or little	84.3	73.6	42.8
Some or a lot	77.3	74.4	52.1
No erections	62.8	63.5	48.2

*Weighted to reflect all eligible PC patients in the study area

Table C25. QOL studies of treatments for localized prostate cancer in nonRCTs

Study	Study Type/Patients/Interventions	Quality of Life Outcomes
Lee, 2001[95]	Prospective cohort study N = 98 T1/T2 patients enrolled Interstitial brachytherapy (IB): n = 44 [I-125, 144 Gy; 11 patients received androgen deprivation therapy before IB, to reduce size of prostate gland] Electron beam radiotherapy (EBRT): n = 23 [median dose = 70.2 Gy; 2 patients received androgen deprivation therapy before EBRT] Radical prostatectomy (RP): n = 23 [3 patients received androgen deprivation therapy before RP] Age [median (range)] IB = 67.1 (49 – 79) EBRT = 68.8 (51 – 79) RP = 61.0 (42 – 68) Response rate All patients = 91% (90 patients)	**HRQOL scores** FACT-P = Functional Assessment of Cancer Therapy – Prostate; FACT-G = FACT – general; PWB = physical well-being; FWB = functional well-being; IPSS = International Prostate Symptom Score
Schapira, 2001[96]	Prospective observational study N = 122 T1/T2 patients Radical prostatectomy (RP): n = 42 [during the course of the study, 6 patients received hormonal therapy and 2 had radiation therapy] Radiation therapy (RT): n = 51 [during the course of the study, 12 patients received hormonal therapy] Expectant management (EM): n = 29 [during the course of the study, 7 patients received hormonal therapy and 4 had radiation therapy]	**UCLA-PCI scores**

Measure/ Treatment	Mean (SD) - Baseline	Mean (SD) – 1 Month	Mean (SD) – 12 Months	p-Value Overall Within Treatment Group	p-Value B vs. 12 Months
FACT-P					
IB	138.4 (17.0)	120.5 (21.7)	138.5 (14.2)	0.0001<0.01	0.88
EBRT	137.1 (12.1)	129.5 (21.0)	136.9 (15.6)	0.08	0.94
RP	138.3 (14.7)	117.7 (18.3)	140.4 (14.9)	<0.01	0.39
FACT-G					
IB	100.7 (11.8)	92.5 (14.7)	102.2 (9.1)	<0.01	0.29
EBRT	99.9 (7.9)	96.1 (12.5)	101.0 (10.1)	0.17	0.56
RP	99.8 (9.6)	88.9 (13.2)	101.9 (11.3)	<0.01	0.28
PWB					
IB	25.9 (2.8)	21.6 (4.7)	25.3 (2.6)	<0.01	0.23
EBRT	25.2 (2.2)	22.6 (4.7)	25.1 (4.1)	<0.01	0.91
RP	26.3 (2.3)	20.9 (5.0)	26.3 (2.5)	<0.01	0.92
FWB					
IB	23.3 (4.4)	18.9 (6.4)	24.1 (3.7)	<0.01	0.18
EBRT	22.9 (3.2)	21.7 (5.0)	23.2 (4.8)	0.25	0.65
RP	23.6 (4.3)	16.5 (5.1)	23.3 (4.1)	<0.01	0.72
IPSS					
IB	8.3 (6.0)	20.8 (7.7)	10.4 (7.3)	<0.01	0.10
EBRT	11.9 (6.4)	13.8 (7.5)	8.5 (5.4)	<0.01	0.01
RP	12.5 (9.3)	17.2 (10.3)	5.5 (3.7)	<0.01	<0.01

Domain/treatment	Mean Score - Baseline	Mean Score – 3 Months	Mean Score – 12 Months
Urinary bother			
RP	82	57	67
RT	80	77	81
EM	86	86	84
p-values (across treatment groups)	NS	NS	NS
Sexual bother			
RP	64	28	29
RT	55	55	60
EM	56	67	62
p-values (across treatment groups)	NS	0.02*	NS
Bowel bother			
RP	91	90	86
RT	86	76	77

Table C25. QOL studies of treatments for localized prostate cancer in nonRCTs (continued)

Study	Study Type/Patients/Interventions	Quality of Life Outcomes
	Age [median (range)] RP = 64 (58-68) RT = 73 (68-75) EM = 73 (70-78)	EM 86 85 81 p-values (across treatment groups) NS 0.05** NS * RP vs. RT and RP vs. EM ** RP vs. RT **Incontinence and impotence rates (based on UCLA-PCI responses)** **Side-effect/treatment / Baseline – n (%) / 3 months – n (%) / 12 months – n (%)** ***Incontinence*** RP 1 (2) 31 (76) 16 (44) RT 2 (4) 4 (9) 3 (8) EM 0 (0) 0 (0) 1 (4) ***Impotence*** RP 14 (35) 42 (100) 33 (89) RT 30 (61) 33 (77) 30 (75) EM 16 (55) 17 (63) 17 (68) **SF-36 scores** **Domain/treatment / Mean score - baseline / Mean score – 3 months / Mean score - 12 months** ***General health perceptions*** RP 74 71 71 RT 60 62 59 EM 64 67 68 *p-values (across treatment groups)* *NS* *NS* *NS*
Soderdahl, 2005[97]	Prospective longitudinal comparative study N = 452 T1c/T2 patients recruited [334 responded to baseline questionnaire; 250 completed all surveys] Open radical prostatectomy (ORP): n = 86 Laparoscopic radical prostatectomy (LRP): n = 93 Brachytherapy (Brachy): n = 71 [Pd-103, 115 Gy mean dose] Age [median]: ORP = 59 LRP = 61 Brachy = 68	**UCLA-PCI scores** **Domain / Mean score - baseline / Mean 1 month / Mean 6 months / Mean 12 months * / P-values** ***Sexual bother*** ORP 68 19 22 26 LRP 61 23 25 26 Brachy 57 37 45 44 P <0.001 [brachy were significantly less bothered by sexual problems than surgery] ***Urine bother*** ORP 87 31 65 74 LRP 83 24 65 69 Brachy 81 44 70 78 P <0.001 [RP more bother than brachy] ***Bowel bother*** ORP 89 76 90 87 LRP 85 68 85 87 Brachy 84 63 76 83 P = 0.07 [brachy had marginally lower scores (more bother) than surgery] Scale range = 0-100

Table C25. QOL studies of treatments for localized prostate cancer in nonRCTs (continued)

<table>
<tr><th>Study</th><th>Study Type/Patients/Interventions</th><th>Quality of Life Outcomes</th></tr>
<tr><td></td><td></td><td><u>SF-36 scores</u>
“After each treatment, there was an initial drop-off of general domain scores, which returned to baseline over time.”
Profiles of changes were not different between groups for these scales
Physical functioning (P = 0.26); Limitations secondary to emotional problems (P = 0.57)
Vitality (P = 0.46); Mental health (P = 0.35); Bodily pain (P = 0.46); General health (P = 0.92); Health transition (P = 0.55).

Scale change profile was marginally significantly different between groups for:
Limitations attributable to physical problems (P = 0.052)
Social functioning (P = 0.06)
“At 12 months, there were no significant differences among groups.”</td></tr>
<tr><td></td><td></td><td>Potency (sexual function)
<table>
<tr><th>Treatment</th><th>Mean Score - Baseline</th><th>Mean Score – 1 Month</th><th>Mean Score – 6 Months</th><th>Mean Score – 12 Months</th><th>P-Values</th></tr>
<tr><td>ORP</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Bilateral NS</td><td>65</td><td>9</td><td>20</td><td>30</td><td></td></tr>
<tr><td>Unilateral NS</td><td>62</td><td>8</td><td>20</td><td>29</td><td></td></tr>
<tr><td>Non NS</td><td>56</td><td>15</td><td>20</td><td>26</td><td>No statistical difference by ORP</td></tr>
<tr><td>LRP</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Bilateral NS</td><td>75</td><td>7</td><td>12</td><td>15</td><td></td></tr>
<tr><td>Unilateral</td><td>75</td><td>7</td><td>13</td><td>20</td><td></td></tr>
<tr><td>Non NS</td><td>53</td><td>6</td><td>12</td><td>19</td><td>P <0.001 [baseline sexual function was worse in non-NS LRP]</td></tr>
</table></td></tr>
<tr><td>Fulmer, 2001[98]</td><td>Prospective cohort study

N = 127 T1/T2 patients

Hormonobrachytherapy with external beam radiotherapy (HBTC): n = 40 [high-risk patients]
[received 40-45 Gy of EBRT followed by brachytherapy + antiandrogen + LHRH agonist]

Hormonobrachytherapy (HBT): n = 45 [low-risk patients]
[received brachytherapy + antiandrogen + flutamide]

Radical retropubic prostatectomy (RP): n = 42</td><td>Voiding and sexual function scores
<table>
<tr><th>Domain/ Treatment</th><th>Baseline - Mean Score (SE)</th><th>3 Months - Fold Change (95% CI)*</th><th>6 Months - Fold Change (95% CI)*</th><th>12 Months - Fold Change (95% CI)*</th></tr>
<tr><td>AUASS</td><td></td><td></td><td></td><td></td></tr>
<tr><td>RP</td><td>7.17 (0.98)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>HBTC</td><td>7.57 (1.06)</td><td>1.66 (1.15; 2.40)</td><td>1.55 (1.11; 2.17)</td><td>1.36 (0.93; 1.98)</td></tr>
<tr><td>HBT</td><td>6.69 (0.93)</td><td>1.40 (0.99; 1.98)</td><td>1.38 (1.01; 1.87)</td><td>1.32 (0.94; 1.88)</td></tr>
<tr><td>IAUA</td><td></td><td></td><td></td><td></td></tr>
<tr><td>RP</td><td>3.87 (0.42)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>HBTC</td><td>4.63 (0.61)</td><td>1.26 (0.95; 1.66)</td><td>1.26 (0.97; 1.63)</td><td>1.27 (0.95; 1.68)</td></tr>
<tr><td>HBT</td><td>4.10 (0.48)</td><td>1.02 (0.78; 1.32)</td><td>1.04 (0.82; 1.33)</td><td>1.10 (0.84; 1.43)</td></tr>
<tr><td>OAUA</td><td></td><td></td><td></td><td></td></tr>
<tr><td>RP</td><td>3.32 (0.62)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>HBTC</td><td>3.25 (0.70)</td><td>2.48 (1.63; 3.77)</td><td>2.18 (1.50; 3.16)</td><td>1.68 (1.10; 2.57)</td></tr>
<tr><td>HBT</td><td>2.64 (0.55)</td><td>2.28 (1.55; 3.38)</td><td>2.17 (1.53; 3.06)</td><td>1.95 (1.31; 2.89)</td></tr>
</table></td></tr>
</table>

Table C25. QOL studies of treatments for localized prostate cancer in nonRCTs (continued)

Study	Study Type/Patients/Interventions	Quality of Life Outcomes			
	Age [median] HBTC = 68 HBT = 66 RP = 59 Median followup (time since surgery) 8.2 months (range 0.2 – 37.0 months)	***VB***			
		RP	3.58 (0.55)	-	-	-
		HBTC	4.03 (0.58)	0.76 (0.47; 1.22)	0.85 (0.56 – 1.30)	1.08 (0.67; 1.73)
		HBT	3.30 (0.48)	0.71 (0.46; 1.09)	0.78 (0.53 – 1.16)	0.96 (0.62; 1.49)
		SF				
		RP	4.24 (0.73)	-	-	-
		HBTC (n = 36)	9.75 (1.21)	-	-	0.70 (0.52; 0.93)
		HBT (n = 43)	7.69 (0.96)	-	-	0.54 (0.42; 0.69)
		SFB				
		RP	3.42 (0.60)	-	-	-
		HBTC (n = 36)	6.36 (0.76)	-	-	0.76 (0.58; 0.99)
		HBT (n = 43)	4.90 (0.70)	-	-	0.59 (0.47; 0.75)
		AUASS = AUA symptom score; IAUA = AUA Irritative subscale; OAUA = AUA Obstructive subscale; VB = Voiding Bother; SF = Sexual function; SFB = Sexual Function Bother score *Relative change or fold change of given BT group compared to RP (BT/RP). Numbers lower than one indicate lower scores in BT than in RP.				
Galbraith, 2001[99]	Longitudinal survey study N = 185 localized prostate cancer patients Watchful waiting (WW): n = 30 Surgery (S): n = 59 Conventional radiation (CR): n = 25 Proton beam therapy (PB): n = 24 Mixed-beam radiation (MB): n = 47 Age [mean] WW = 73 S = 65 CR = 71 PB = 68 MB = 69	**Health-related quality of life score**			
		Treatment	**Baseline**	**6 Months**	**18 Months**
		Watchful waiting	60.4	58.1	59.0
		Surgery	60.3	56.6	57.0
		Conventional radiation	59.6	59.5	57.2
		Mixed-beam radiation	61.7	59.5	60.5
		Proton-beam radiation	60.7	59.0	60.7
		p value			
		Higher score = higher QOL (range = 0-100)			
		Physical functioning			
		Treatment	**Baseline**	**6 Months**	**18 Months**
		Watchful waiting	74	65	75
		Surgery	80	78	81
		Conventional radiation	79	71	70
		Mixed-beam radiation	83	80	78
		Proton-beam radiation	84	84	78
		p value		<0.05 (PB vs. WW)	
		Higher score = higher functioning (range = 0-100)			
		General health			
		Treatment	**Baseline**	**6 Months**	**18 Months**
		Watchful waiting	48	50	54
		Surgery	57	61	58
		Conventional radiation	58	59	56
		Mixed-beam radiation	60	58	59
		Proton-beam radiation	53	58	60
		p value	<0.001 (MB vs. WW)	<0.01 (S vs. WW)	
		Higher score = better health (range = 0-100)			

Table C26. QOL studies of treatments for localized prostate cancer in RCTs

Study	Study Type/Patients/Interventions	Quality of Life Outcomes
Fransson, 2001[100]	Randomized controlled trial N = 166 T1/T2 patients enrolled [30 patients died by date of questionnaire submission; 11patients were excluded due to followup <6 months or progressed disease with progressive treatment before questionnaire] Radiation therapy (EBRT): n = 59 Deferred therapy (DT): n = 49 Age [mean (range)] RT = 71.3 (49.1 – 83.0) DT = 72.8 (58.9 – 81.9) Median followup (from randomization date to time of questionnaire) RT = 40.6 months DT = 30.4 months [p = 0.055] Response rate RT = 90% DT = 85%	**EORTC QLQ-C30 (+3) Questionnaire** **Domain** / **EBRT Mean Scores** / **DT Mean Scores** / **p Value** Global health/QOL: 68 / 70 Scores were linearly transformed to a 0 to 100 scale according to EORTC recommendations Increasing score = higher level of functioning **QUFW94 Questionnaire** **Variable** / **RT Mean Score (95% CI)** / **DT Mean Score (95% CI)** / **p Value** ***General function*** Limitation to daily activity caused by prostate carcinoma: 1.8 (1.29; 2.39) / 0.7 (0.19; 1.26) / 0.001 ***Urinary symptoms*** Incontinence: 1.5 (0.55; 2.18) / 0.6 (0.13; 1.00) / 0.008 Limitation in daily activity caused by urinary problems: 1.1 (0.63; 1.62) / 0.9 (0.27; 1.47) / 0.06 Urinary problems in general: 1.8 (1.15; 2.42) / 1.2 (0.60; 1.86) / 0.227 ***Intestinal symptoms*** Limitation in daily activity caused by intestinal problems: 1.3 (0.73; 1.85) / 0.3 (0.04; 0.48) / 0.001 Planning of daily activity caused by intestinal problems: 1.9 (1.19; 2.54) / 1.0 (0.22; 1.72) / 0.004 QUFW94 scores range from 0 (no problem/very good function) to 10 (many problems/very bad function)

Table C26. QOL studies of treatments for localized prostate cancer in RCTs (continued)

Study	Study Type/Patients/Interventions	Quality of Life Outcomes
Steineck, 2002[101]	Randomized controlled trial: SPCG-4 N = 376 T0/T1/T2 patients enrolled Age [mean (range)]: RP = 64.1 (48.0 - 74.0) WW = 64.8 (51.0 - 74.0) Median followup (from randomization date to time of questionnaire) RP = 50.0 months WW = 48.0 months	**Sexual Dysfunction** **Function - Outcome** / **RP [n / N Responding (%)]** / **WW [n / N Responding (%)]** / **Unadjusted Relative Risk (95% CI)** ***Desire*** Importance of sexual function – no or little importance: 79 / 159 (50) / 64 / 154 (42) / 1.2 (0.9; 1.5) ***Penile stiffness*** Erectile function - seldom or never sufficient for intercourse: 129 / 161 (80) / 71 / 158 (45) / 1.8 (1.5; 2.2) Distress from erectile dysfunction – moderate or great distress: 90 / 155 (58) / 65 / 152 (43) / 1.4 (1.0; 1.7) Distress from erectile dysfunction – great distress: 46 / 155 (30) / 26 / 152 (17) / 1.7 (1.1; 2.7) ***Intercourse*** Distress from decreased frequency – moderate or great distress: 94 / 160 (59) / 66 / 153 (43) / 1.4 (1.1; 1.7) ***Orgasm*** Distress from decreased frequency – moderate or great distress: 88 / 158 (56) / 65 / 152 (43) / 1.3 (1.0; 1.6) ***Distress from compromised sexuality*** Distress (if sexual function has declined) – moderate or great distress: 87 / 156 (56) / 62 / 154 (40) / 1.4 (1.1; 1.8) For each question, some men did not respond. A number above unity indicates better function in the watchful waiting group. **Urinary Tract Dysfunction** **Function - outcome** / **RP [n / N Responding (%)]** / **WW [n / N Responding (%)]** / **Unadjusted Relative Risk (95% CI)** ***Global features*** Distress from obstructed voiding – moderate or great distress: 34 / 164 (21) / 34 / 157 (22) / 1.0 (0.6; 1.5)

Table C26. QOL studies of treatments for localized prostate cancer in RCTs (continued)

Study	Study Type/Patients/Interventions	Quality of Life Outcomes		
		Urinary leakage		
		Subjective estimation of the degree of leakage – moderate or severe leakage	30 / 163 (18)	3 / 152 (2)	9.3 (2.9; 29.9)
		Distress from urinary leakage – moderate or great distress	47 / 164 (29)	15 / 158 (9)	3.0 (1.8; 5.2)
		Regular dependence on some form of protective aid - yes	71 / 165 (43)	16 / 154 (10)	4.1 (2.5; 6.8)
		Regular dependence on diaper or urine bag - yes	23 / 165 (14)	1 / 154 (1)	21.5 (2.9; 157.0)
		Overall distress from all urinary symptoms – moderate or great distress	44 / 163 (27)	28 / 157 (18)	1.5 (1.0; 2.3)
		For each question, some men did not respond. A number above unity indicates better function in the watchful waiting group.			
		Psychological Symptoms			
		Function - outcome	**RP [n / N Responding (%)]**	**WW [n / N Responding (%)]**	**Unadjusted Relative Risk (95% CI)**
		Physical function			
		Decreased general physical capacity – the lowest five of seven possible categories	89 / 164 (54)	89 / 157 (57)	1.0 (0.8; 1.2)
		Low or moderate physical well-being – the lowest five of seven possible categories	68 / 164 (41)	78 / 157 (50)	0.8 (0.7; 1.1)
		Psychological function			
		Worry (moderate or high) - the highest five of seven possible categories	64 / 164 (39)	71 / 157 (45)	0.9 (0.7; 1.1)
		Low or moderate psychological well-being – the lowest five of seven possible categories	57 / 164 (35)	57 / 158 (36)	1.0 (0.7; 1.3)

Table C26. QOL studies of treatments for localized prostate cancer in RCTs (continued)

Study	Study Type/Patients/Interventions	Quality of Life Outcomes		
		Low or moderate subjective quality of life – the lowest five of seven possible categories	64 / 159 (40)	68 / 151 (45)	0.9 (0.7; 1.2)
		For each question, some men did not respond. CI denotes confidence interval.			
		Bowel Function			
		Function - Outcome	**RP [n / N Responding (%)]**	**WW [n / N Responding (%)]**	**Unadjusted Relative Risk (95% CI)**
		Fecal leakage – once a week or more	1 / 164 (1)	9 / 157 (6)	-
		Distress from fecal leakage – moderate to great	3 / 164 (2)	7 / 155 (5)	-
		Distress from all bowel symptoms	5 / 159 (3)	10 / 156 (6)	-

Figure C6. Search strategy

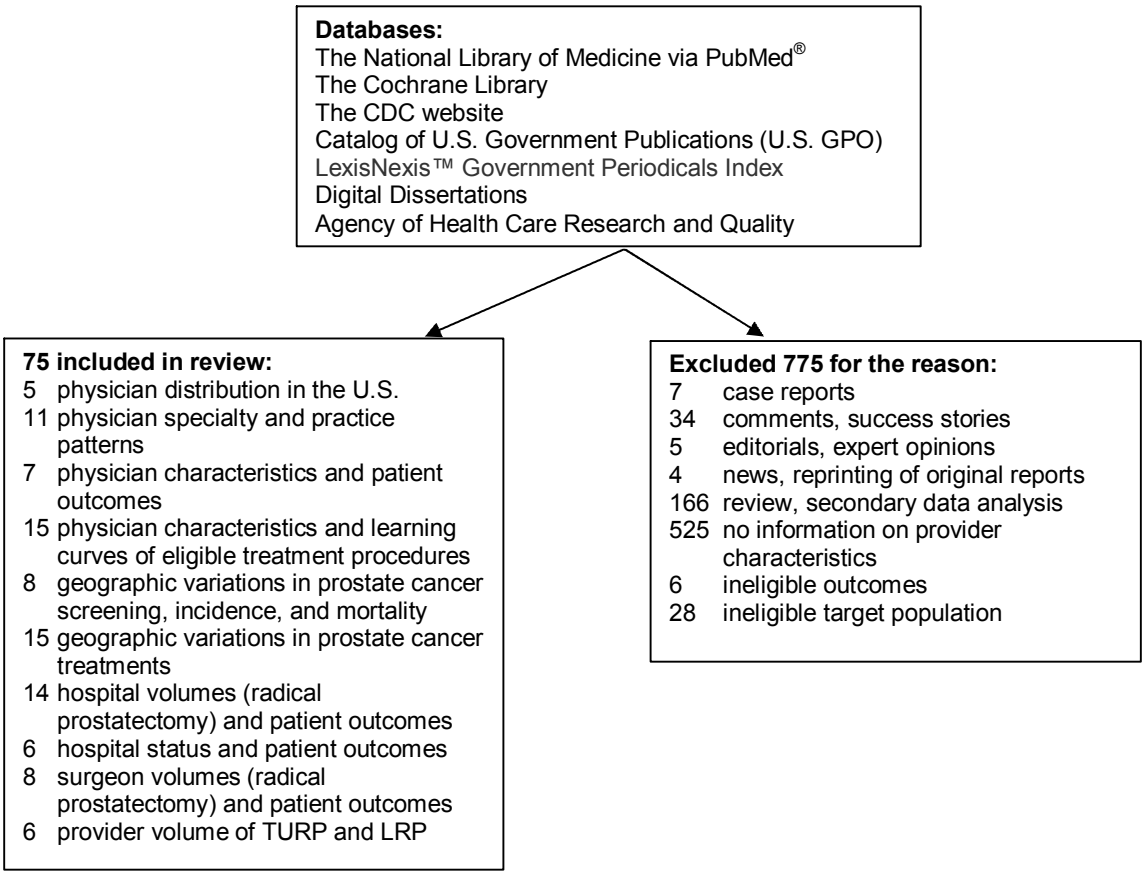


Table C27. Quality (% of maximum possible) of studies that assessed the association between patient outcomes and provider volumes

Outcomes (Means ± Standard Deviation)	All Studies	Mortality	Morbidity	Urinary Complications	Incontinence	Length of Stay	Cost	Readmission	Positive Margins
Criteria to score quality of the studies									
Quality, % of maximal	65.2±10.8	68.3±5.9	73.3±11.4	75.0±14.6	64.9±0.2	66.7±16.7	54±11.8	69.3	69.5±0.7
Study question clearly focused and appropriate	4.0±0.7	4.3±0.5	4.2±0.5	4.4±0.6	4.0±0.01	4.0±0.9	3.4±0.8	4	4
The objectives and primary hypothesis of the study clearly stated	2.1±1.4	1.9±1.1	2.1±1.8	2.8±2.0	1±0.01	2.6±1.7	2.1±1.0	1	3.9±0.3
Description of the target population	3.7±0.5	4.0±0.0	3.7±0.5	3.9±0.2	4±0.01	3.4±0.6	3.2±0.4	4	4
Description and clear definition of the exposure	4.3±0.7	4.3±0.9	4.7±0.5	4.9±0.5	5±0.01	4.6±0.7	3.4±0.8	5	3.9±0.3
Description and clear definition of primary outcomes	4.4±0.7	4.4±0.5	4.5±0.5	4.9±0.3	4.9±0.3	4.2±0.9	4.5±0.5	4	5±0.0
Description and clear definition of secondary outcomes	3.8±1.6	4.4±0.9	3.7±0.9	4.0±1.0	3.1±0.3	4.0±0.9	3.7±0.8	4	0.3±1.3
Validation of the measurements of the exposure	4.2±0.8	3.8±0.7	4.4±0.7	4.4±0.8	4.1±0.3	4.2±0.8	2.9±0.7	5	3.9±0.5
Validation of the measurements of the outcomes	4.5±0.5	4.1±0.3	4.3±0.4	4.4±0.5	4±0.01	4.7±0.5	4±0.0	4	4.1±0.3
The process of the subjects selection	3.4±0.6	3.3±0.5	3.4±0.6	3.4±0.6	3±0.01	3.3±0.6	2.9±0.7	4	3±0.0
The adequacy of the sampling (random selection or not) and selection bias	2.9±0.8	2.3±0.5	2.6±0.9	2.9±1.0	2±0.01	2.8±0.8	3±0.0	2	2.9±0.3
Was the sample size justified	2.0±0.1	2.0±0.0	2.0±0.2	1.9±0.2	2±0.01	2.0±0.2	1.7±0.5	2	2.0±0.0
Assessment of possible confounding factors	3.2±0.9	3.6±0.5	3.9±0.5	3.8±0.7	4±0.01	2.9±1.3	1.1±1.6	4	4.0±0.0
Validity of the measurements of confounding factors	4.0±1.3	4.2±0.4	4.4±0.8	4.3±1.0	4±0.01	3.8±1.9	1.3±2.0	4	5.0±0.0
Adjustment for confounding factors	2.8±2.4	4.8±0.4	4.9±0.7	4.8±0.9	5±0.01	2.5±2.4	1.1±1.6	5	5.0±0.0
Reporting of the statistical analysis	4.1±1.0	5±0.0	4.7±0.5	4.9±0.5	5±0.01	3.9±1.1	2.9±1.2	5	4.9±0.5
Precision of the reported estimates of the association	3.7±1.5	2.4±1.9	2.4±1.3	2.2±2.0	0.4±1.3	3.5±0.7	3.7±0.8	2	5±0.0
Use of multivariate models to assess crude and adjusted estimation	2.6±2.2	4.0±0.4	4.4±0.8	4.2±0.9	3.8±0.7	2.3±2.2	1.3±1.6	4	5±0.0

Table C27. Quality (% of maximum possible) of studies that assessed the association between patient outcomes and provider volumes (continued)

Outcomes (Means ± Standard Deviation)	All Studies	Mortality	Morbidity	Urinary Complications	Incontinence	Length of Stay	Cost	Readmission	Positive Margins
Justification for statistical methods used to test hypothesis	3.2±2.1	4.8±0.4	4.9±0.7	4.8±0.9	5±0.01	3.1±1.9	1.1±1.6	5	5±0.0
Justification for subgroup analysis	1.9±1.9	1.9±1.7	2.7±2.5	2.2±2.6		2.8±1.8	2.2±1.4		0.3±1.3
Assessment of the limitations of the study	3.6±0.8	3.3±1.0	4.2±0.6	4.3±0.8	4±0.01	3.7±1.0	2.9±0.7	4	4±0.0
Results presentation	3.9±0.8	3.8±0.7	4.0±0.9	4.3±0.8	3.8±0.7	3.8±0.9	3.2±0.4	5	4.9±0.3
Justification for the results of the study	4.4±0.5	4.5±0.5	4.7±0.5	4.9±0.3	4.9±0.3	4.4±0.5	4±0.0	5	4.9±0.3
The appropriate conclusions of the study	3.4±0.8	3.4±1.0	4.2±0.5	4.4±0.6	4±0.01	3.9±0.8	3.7±0.5	4	2.9±0.3
Justification for conclusions in relation to tested hypotheses	3.7±0.9	3.8±1.3	4.6±0.6	4.8±0.5	4.9±0.3	4.0±0.9	3.7±0.5	5	2.9±0.3
Applicability of the studies findings	3.5±0.7	3.0±0.9	3.7±0.5	3.4±0.5	3±0.01	3.5±0.5	3.2±0.4	4	4±0.0

Table C28. Quality of the studies (% of maximum possible) by sponsorship, journal of publication, data sources, and country of publication (means ± standard deviations)

	Studies	Selection of Patients	Adjustment for Confounding Factors	Quality	Applicability
Sponsorship					
Grant	7	3.0 ± 0.6	3.6 ± 2.1	64.0 ± 11.9	3.3 ± 0.8
Unknown	8	3.3 ± 0.7	3.1 ± 2.4	65.0 ± 10.5	3.6 ± 0.5
Industry	2	3.5 ± 0.7	5.0±0.0	76.4 ± 19.2	3.0 ± 1.4
Journal of Publication					
General medicine	2	3.0 ± 0.01	5.0 ± 0.01	68.2 ± 4.5	2.5 ± 0.7*
Oncology	2	4.0 ± 0.01*	5.0 ± 0.01	79.6 ± 14.6	4.0 ± 0.01
Other	2	3.5 ± 0.7	2.5 ± 3.5	65.4 ± 9.6	4.0 ± 0.01*
Urology	7	2.9 ± 0.7*	3.0 ± 2.2	59.5±11.8	3.1 ± 0.7
Data used					
Administrative	10	3.2 ± 0.6	4.0 ± 1.9	67.4 ± 12.5	3.2 ± 0.8
Medical Records	7	3.1 ± 0.7	2.9 ± 2.4	63.9 ± 11.5	3.7 ± 0.5
Country where Study was Conducted					
Austria	1	3.0	0.0	54.3	3.0
Canada	1	3.0	5.0	62.9	2.0*
USA	15	3.2	3.7	66.9	3.5*

* significant differences at 95% confidence interval

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
Lu-Yao, 1994[102] 1983-1989 Retrospective cohort; ecologic analysis. Evidence II2B Quality: 0.7	White men 50-70 years old from 9 areas in SEER program(~10% of the USA population) The National Center of Health Statistics	Time trends and geographical variations in the detection and treatment of prostate cancer	Age-standardized Incidence; annual % change (EAPC) in rates by calendar year	Regression analysis. Pearson correlation between the average rates of incidence and mortality for each SEER area *Unit*: Patient *Risk adjustment*: Age	*Area* Atlanta Connecticut Detroit Hawaii Iowa New Mexico San Francisco Seattle Utah Atlanta Connecticut Detroit Hawaii Iowa New Mexico San Francisco Seattle Utah Atlanta Connecticut Detroit Hawaii Iowa New Mexico San Francisco Seattle Utah	*Incidence/100,000* *1983* 279.4 235.0 284.6 281.3 251.0 284.6 249.3 348.9 326.7 *1989* 384.5 267.9 361.7 502.3 332.3 351.9 368.2 606.8 374.1 Annual % change in rate 7.7 (4.1-11.3) 2.7 (0.6-4.8) 5.2 (3.2-73) 10.0 (4.3-15.9) 5.0 (3.6-83) 3.0 (0 8-5.3) 6.6 (5.0-8.3) 12.0 (8.8-15.2) 3.0 (0.3-5.7)
Kafadar, 1997[103] 1953-1987 Ecologic analysis Evidence II2B	The U.S. Census population from 1953-1987 The state Cancer Control Maps; The National Center of Health Statistics	Time trends and geographic location by U.S. counties. The proportion of African-Americans	Age-standardized mortality among whites and nonwhites	Bivariate smoothing using calculation of age-specific rates; United States *Risk adjustment*: age, proportion of	*Area* Midwest Northeast South West Midwest	*Mortality/100,000* *1953-1972, Whites* 18.9-23.57 18.93-24.17 17.16-22.02 18.45-23 *1953-1972, Not Whites* 16.34-39.12

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate		
Quality: 0.9				African Americans	Northeast	0-45.98		
					South	28.29-44.33		
					West	6.31-30.69		
						1973-1987, Whites		
					Midwest	20.01-24.01		
					Northeast	20.5-25.59		
					South	18.73-23.32		
					West	20.06-26.86		
						1973-1987, Not Whites		
					Midwest	12.18-45.97		
					Northeast	9.14-42.47		
					South	29.92-51		
					West	17.96-32.8		
Jemal, 2002[104]	Population estimates in the U.S. for the years 1970-1989 by 5-year age groups	Geographic locations, race	indirectly age-adjusted mortality	Spatial scan statistic; Poisson distribution	*Areas*	*Age adjusted mortality/100,000 person years*		
					White males	*Rate*	*Rate ratio*	*P value*
1970-1989					(United States)	20.2	1	-
Ecologic analysis	U.S. Bureau of Census; The National Center for Health Statistics			*Unit:* Counties	Northwest quadrant	21.5	1.064	0.0001
				Risk adjustment: education and agricultural employment	New England	21.3	1.055	0.0001
Evidence II2B					Maryland, Virginia, Pennsylvania	21.7	1.074	0.0001
Quality: 0.85					Michigan, Ohio, Indiana, Illinois	20.8	1.028	0.0001
					South Carolina, North Carolina	22	1.09	0.0027
					Montana, North Dakota, Wyoming	23.2	1.147	0.0001
					Minnesota, Iowa, Wisconsin	22.8	1.126	0.0001
					California, Oregon	21.9	1.084	0.0001
					Washington, Oregon	21.6	1.068	0.0005
					Utah, Nevada, Colorado, Arizona	22.4	1.107	0.017
					Iowa, Missouri	25.3	1.249	0.0235
					Vermont, New	22.8	1.126	0.0001

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories		Outcome Rate	
					Hampshire, Maine			
					Massachusetts, Rhode Island	23	1.139	0.0001
					Massachusetts, Connecticut	21.6	1.07	0.0194
					Maryland, Delaware	22.6	1.116	0.0001
					Kentucky, Ohio, Indiana	23	1.135	0.0001
					Wisconsin	21.5		0.0033
					Black Males			
					(United States)	28.6	1	-
					South Atlantic	31.9	1.114	0.0001
					Alabama	33.3	1.161	0.005
					Ohio, Indiana, Michigan, Kentucky	30.8	1.077	0.0561
					North Carolina, South Carolina	33.7	1.177	0.0001
					Florida, Georgia	33.7	1.177	0.0001
					Maryland, Virginia, Delaware	33.2	1.16	0.0001
					Georgia, North Carolina	32.7	1.142	0.0001
					Georgia	37.8	1.319	0.02
Jemal, 2005[105] 1995-2000 Retrospective cohort, ecologic analysis Evidence II2B Quality: 0.85	40% of the U.S. male population ages 40 years for 1995 to 2000 The National Center for Health Statistics and the North American Association of Central Cancer Registries (SEER)	Geographic locations; race, degree of urbanization as a proxy for access to medical care	Average age adjusted to the year 2000 U.S. population standard incidence and mortality rates/ 100,000 men	Poisson distribution *Unit:* States *Risk adjustment:* age and race	*Location*	*Age adjusted mortality/100,000*		
					White men			
					Alaska	258.2		
					Arizona	215.9		
					Colorado	274.4		
					Connecticut	332.4		
					District of Columbia	320.5		
					Atlanta	311.4		
					Hawaii	315.3		
					Idaho	283.9		
					Illinois	278.7		
					Iowa	297.1		

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories		Outcome Rate
					Kentucky	220.0	
					Louisiana	302.0	
					Maine	296.2	
					Massachusetts	353.8	
					Michigan	320.1	
					Montana	278.1	
					Nebraska	308.7	
					New Hampshire	287.3	
					New Jersey	330.1	
					North Carolina	271.2	
					North Dakota	357.4	
					Oregon	298.9	
					Pennsylvania	296.6	
					Rhode Island	266.8	
					South Carolina	286.9	
					Utah	385.8	
					Washington	298.8	
					West Virginia	250.7	
					Wisconsin	318.2	
					Wyoming	279.0	
					Black men		
					Arizona	154.8	
					Colorado	172.6	
					Connecticut	167.6	
					District of Columbia	164.2	
					Atlanta	169.9	
					Illinois	167.4	
					Iowa	180.3	
					Kentucky	155.2	
					Louisiana	164.4	
					Massachusetts	142.9	
					Michigan	153.7	
					Nebraska	142.5	
					New Jersey	167.2	
					North Carolina	196.7	
					Oregon	177.3	
					Pennsylvania	172.7	
					Rhode Island	129.2	
					South Carolina	195.9	

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
					Washington	146.6
					West Virginia	170.1
					Wisconsin	145.1
					White men	*Incidence of localized PC*
					Alaska	258.2
					Arizona	215.9
					Colorado	274.4
					Connecticut	332.4
					District of Columbia	320.5
					Atlanta	311.4
					Hawaii	315.3
					Idaho	283.9
					Illinois	278.7
					Iowa	297.1
					Kentucky	220.0
					Louisiana	302.0
					Maine	296.2
					Massachusetts	353.8
					Michigan	320.1
					Montana	278.1
					Nebraska	308.7
					New Hampshire	287.3
					New Jersey	330.1
					North Carolina	271.2
					North Dakota	357.4
					Oregon	298.9
					Pennsylvania	296.6
					Rhode Island	266.8
					South Carolina	286.9
					Utah	385.8
					Washington	298.8
					West Virginia	250.7
					Wisconsin	318.2
					Wyoming	279.0
					Black men	
					Alaska	457.7
					Arizona	255.9
					Colorado	363.4

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
					Connecticut	500.5	
					District of Columbia	516.2	
					Atlanta	481.5	
					Hawaii	351.8	
					Illinois	386.5	
					Iowa	485.2	
					Kentucky	317.4	
					Louisiana	381.8	
					Massachusetts	487.6	
					Michigan	561.9	
					Nebraska	389.7	
					New Jersey	494.8	
					North Carolina	380.7	
					Oregon	384.6	
					Pennsylvania	483.1	
					Rhode Island	309.3	
					South Carolina	454.6	
					Utah	475.8	
					Washington	421.2	
					West Virginia	400.8	
					Wisconsin	511.6	
Escobedo, 2004[106] 1979-1998 Retrospective cohort Evidence II2B Quality: 0.75	3,274 African American men in Connecticut, Iowa, and New Mexico diagnosed with localized or regional prostate cancer in 1979-1998 The National Center for Health Statistics (NCHS), SEER database	Time trends in periods before (1979-1986), during (1987-1990) and after introduction of the PSA test (1991–1998); geographic locations	Age-adjusted to the 1970 U.S. standard incidence and mortality	Poisson distribution. *Unit*: patients *Risk adjustment*:: age; direct method of standardization to 1970 U.S. population	*Time and regions*		
					Connecticut	*Incidence*	*Rate*
					1973–1988	*Rate*	*Ratio*
					<54	3.8	
					55–64	210.3	
					65–74	721.5	
					>75	1157.3	
					1989–1998		
					<54	13.7	3.61
					55–64	567.2	2.7
					65–74	1450	2.01
					>75	1495.2	1.29
					1973–1988		
					By stage		
					Local/regional	63	
					Distant	36	
					Unstaged	10.9	
					1989–1998		
					Local/regional	158.1	2.51

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
					Distant	26.1	0.73
					Unstaged	23.5	2.16
					Overall		
					Before PSA	109.9	
					During PSA	207.8	1.89
					Iowa		
					1973–1988		
					<54	4	
					55–64	211.7	
					65–74	654.2	
					>75	1275.1	
					1989–1998		
					<54	13	3.25
					55–64	512.1	2.42
					65–74	1253.6	1.92
					>75	1589.9	1.25
					1973–1988		
					By stage		
					Local/regional	66.3	
					Distant	36.7	
					Unstaged	7.5	
					1989–1998		
					Local/regional	141.1	2.13
					Distant	28.6	0.78
					Unstaged	24.1	3.21
					Overall		
					Before PSA	110.6	
					During PSA	193.8	1.75
					New Mexico		
					1973–1988		
					<54	3.5	
					55–64	257.7	
					65–74	475.5	
					>75	1195.4	
					1989–1998		
					<54	6.7	1.91
					55–64	295	1.14
					65–74	1093.7	2.3
					>75	978.3	0.82

Table C29. Geographic variations in prostate cancer screening, incidence, and mortality (continued)

Reference Period Design	Population Data Source	Exposure Definitions	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
					1973–1988		
					By stage		
					Local/regional	69.4	
					Distant	22.6	
					Unstaged	8.4	
					1989–1998		
					Local/regional	115.9	1.67
					Distant	15.2	0.67
					Unstaged	5	0.6
					Overall		
					Before PSA	100.4	
					During PSA	136.1	1.36
					Connecticut	*Age adjusted mortality*	
					1979–1986	78.2 (65.9–90.6)	
					1987–1990	81.2 (65.1–97.3)	1.04
					1991–1998	93.1 (82.3–103.8)	1.19
					Iowa		
					1979–1986	79.5 (55.1–103.9)	
					1987–1990	111.1 (71.9–150.3)	1.4
					1991–1998	93.5 (69.1–117.9)	1.18
					New Mexico		
					1979–1986	104.7 (69.4–140.0)	
					1987–1990	62.1 (26.9–97.4)	0.59
					1991–1998	47.6 (29.6–65.5)	0.45
Lu-Yao, 2002[107] 1987-1997 Retrospective cohort Evidence II2B Quality: 0.78	215,521 males Medicare beneficiaries from the Seattle (94 900) and Connecticut (120,621) identified in the SEER database	Geographical variations in the detection and treatment of prostate cancer	Prostate cancer mortality, incidence, and screening intensity(prostate biopsies and PSA)	Poisson distribution *Unit*: patients *Risk adjustment*: age; race, area of residence, study year, and an age-race interaction		*PSA rate ratio*	
					Seattle	5.39 (4.76-6.11)	
					Connecticut	1 (reference)	
						Biopsy rate ratio	
					Seattle	*2.2 (1.81-2.68)*	
					Connecticut	1 (reference)	
						Age adjusted mortality rate ratio	
					Seattle	1.03 (0.95-1.11)	
					Connecticut	1 (reference)	

Table C30. Geographic variations in prostate cancer treatments

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
Lu-Yao, 1994[102]	White men 50-70 years old from 9 areas in SEER program(~10% of the U.S. population) The National Center of Health Statistics	Age adjusted rate of radical prostatectomy; proportions of cases receiving radical prostatectomy or radiation as initial treatment	Regression analysis. Pearson correlation between the average rates of incidence and mortality for each SEER area; *Unit*: Patient *Risk adjustmen*t: Age		Radical Prostatectomy (rate per 100,000)	
1983-1989					1983	1989
Retrospective cohort				Atlanta	11.9	118.2
				Connecticut	7.3	43.4
Ecologic analysis				Detroit	16	61.2
				Hawaii	17.9	83.6
Evidence II2B				Iowa	32	68.5
				Now Mexico	32.7	93.6
Quality: 0.73				San Francisco	13.6	94.4
				Seattle	54.6	224.4
				Utah	52.6	118.8
					% of prostate cancer cases receiving radical prostatectomy as initial treatment	
					1983	1989
				Atlanta	5	32.3
				Connecticut	3.3	15.7
				Detroit	6.1	17.4
				Hawaii	7.3	16.8
				Iowa	12.3	19.6
				Now Mexico	11.8	25.7
				San Francisco	4.8	25.9
				Seattle	16	36.8
				Utah	16.6	31.6
				All areas	9.4	25.6
					% of prostate cancer cases receiving Radiation as initial treatment	
					1983	1989
				Atlanta	35.3	23.7
				Connecticut	29.4	28.1
				Detroit	28.2	36.7
				Hawaii	24.6	31.6
				Iowa	19.3	29.2
				Now Mexico	25.2	30
				San Francisco	32.8	32.6
				Seattle	32.1	31.4
				Utah	30.2	19.9
				All areas	28.5	30.4

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
Lu-Yao, 1993[108]	A 20% national sample of male	Age adjusted radical prostatectomy	Poisson regression		Utilization rate ratio and 95% CI	
				New England	0.51	0.44-0.59
1984-1990	Medicare beneficiaries	rates/100,000 males to 1990 Medicare	*Unit*: Patient	Mid Atlantic	0.5	0.44-0.56
				South Atlantic	1.12	1.01-1.23
Retrospective cohort		population; age and	*Risk adjustment:*	East North Central	0.84	0.75-0.92
	The Prostate Patient	race adjusted	age, race, temporal	East North Central	0.99	0.88-1.12
Evidence II2B	Outcomes Research	utilization rate ratios	trends	West North Central	1.15	1.03-1.28
	Team	compared with U.S.		West North Central	0.99	0.89-1.1
Quality: 0.85		rate of		Mountain	1.49	1.33-1.67
	10,598 radical	prostatectomy		Pacific	1.76	1.6-1.95
	prostatectomies			USA	1 (reference)	
Mushinski, 1994[109]	Claims data from Metropolitan Life	The total average hospital and	ANOVA test		Cost $	Length of stay in days
			Unit: Patient	USA	18,680	5.56
1994	Insurance Company,	physician charges;	*Risk adjustment:* NR	New England	18,500	5.3
	Corporate Health	average length of		Mid-Atlantic	20,610	6.71
Cross-sectional	Strategies, Inc.	stay in hospitals		East North Central	18,100	5.63
	Analyses			West North Central	17,700	5.17
Evidence III				South Atlantic	18,940	5.75
	1,004 radical			East South Central	12,910	5.62
Quality: 0.78	prostatectomies			West South Central	18,900	5.52
				Mountain	16,220	4.92
				Pacific	20,790	4.93
Mettlin et al, 1998[110]	The National Cancer Data Base Data	Proportion of patients treated by	Logistic regression		% of patients treated by radical prostatectomy	
					1992	1995
1994	from 1,114 hospitals	radical	*Unit Patient*	Northeast	22.4	27.5
	on 103,979 patients	prostatectomy and		Southeast	30.6	32.8
Retrospective cohort	diagnosed with	external beam	*Risk adjustmen*t:	Midwest	31.3	34.9
	prostate carcinoma	radiation	age, race, American	South	33.7	38.9
Evidence II2B	in 1992 and from		Joint Committee on	Mountain	37.3	40.4
	1,144 hospitals on		Cancer stage, and	Pacific	39.4	39.7
Quality: 0.83	72,337 patients		tumor histologic		% of patients treated by external beam radiation	
	diagnosed in 1995		grade		1992	1995
				Northeast	37.5	31.1
				Southeast	33.8	28.4
				Midwest	29.1	23.8
				South	25.5	25.4
				Mountain	23.4	20.6
				Pacific	26.2	21.8

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
Krupski et al, 2005[111]	104,316 men with localized/regional prostate cancer;	Proportion of patients who	Logistic regression		% of patients treated by adjuvant therapy	
		received adjuvant	*Unit Patient*	Connecticut	9.5	
1995-1999	34,763 underwent surgical resection,	radiation therapy after surgical	*Risk adjustment:*	Hawaii	3.9	
				Iowa	10	
Retrospective cohort	1,549 received postprostatectomy	resection of the prostate gland	patient age, race, grade of cancer	New Mexico	3	
				Utah	3.5	
Evidence II2B	radiotherapy			Detroit	6.2	
			2000 Census	San Francisco	10.2	
Quality: 0.63	The National Cancer Institute's Surveillance Epidemiology and End Results (SEER)		median education and income level in the county of residence and ethnicity	Atlanta	5.8	
				Seattle	15.3	
				Los Angeles	25.2	
				San Jose-Monterey	7.4	
					Adjusted odds ratio of adjuvant therapy	
				Connecticut	1.21	0.98-1.4
				Hawaii	1.69	1.2-2.3
				Iowa	1.14	0.91-1.4
				New Mexico	0.64	0.45- 0.89
				Utah	0.57	0.42- 0.76
				Detroit	0.46	0.36-0.59
				San Francisco	1.04	0.83-1.3
				Atlanta	0.9	0.7-1.1
				Seattle	1.38	1.1-1.6
				Los Angeles	1 reference	
				San Jose-Monterey	1.21	0.95-1.5

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
Cooperberg et al, 2003[112]	3,439 of patients diagnosed with prostate cancer	proportion of patients treated by radical	Logistic regression		% of patients treated by watchful waiting
			Unit Patient	West	15.5
1989-2001	since 1989 treated with radical	prostatectomy, external beam		East	8.85
			Risk adjustment:	Midwest	12.5
Retrospective cohort	prostatectomy, radiation therapy, or	radiation, brachytherapy,	patient age, ethnicity, location,	South	7.9
					% of patients treated by radical
Evidence II2B	primary androgen deprivation therapy;	watchful waiting, primary androgen	type of insurance, educational level,	West	prostatectomy 38.6
Quality: 0.88	CaPSURE database	deprivation therapy, and neoadjuvant androgen deprivation therapy	and income	East	50.9
				Midwest	44.6
				South	43.4
					% of patients treated by external beam radiation
				West	13.7
				East	22.04
				Midwest	17.8
				South	14.54
					% of patients treated by Brachytherapy
				West	5.3
				East	2.83
				Midwest	6.93
				South	7.99
					Adjusted odds ratio of primary androgen deprivation
				West	1.0 (reference)
				East	0.4 (0.3-0.5)
				Midwest	0.5 (0.3-0.7)
				South	0.8 (0.6-1.2)
					Adjusted odds ratio of neoadjuvant androgen deprivation
				West	1.0 (reference)
				East	0.6 (0.4-.)
				Midwest	1.1 (0.7-.6)
				South	0.7 (0.5-.0)

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
Lai et al., 2001[113] 1983-1992 Retrospective cohort Evidence II2B Quality: 0.85	66,293 patients with localized prostate cancer who underwent radical prostatectomy from 1983 through 1992; the Surveillance, Epidemiology, and End Results Program (SEER)	Overall and disease-specific survival	A proportional hazards model *Unit Patient* *Risk adjustment:* age at diagnosis, year of diagnosis, marital status, tumor grade, and race/ethnicity	 San Francisco Connecticut Detroit Hawaii Iowa New Mexico Seattle Utah Atlanta San Francisco Connecticut Detroit Hawaii Iowa New Mexico Utah Atlanta San Francisco Connecticut Detroit Hawaii Iowa New Mexico Utah Atlanta	% of patients treated by radical prostatectomy 18.3 10 14.1 14.6 12.9 17.6 24.2 31.4 16.7 *Overall survival in patients treated with prostatectomy* 1.02 (0.89–1.16) 0.85 (0.70–1.04) 1.11 (0.98–1.26) 0.85 (0.65–1.26) 0.99 (0.86–1.15) 1.01 (0.85–1.20) 1.11 (0.97–1.27) 0.97 (0.79–1.19) *Disease-specific survival in patients treated with prostatectomy* 1.17 (0.86–1.60) 0.86 (0.52–1.41) 1.25 (0.93–1.70) 1.18 (0.65–2.14) 1.16 (0.83–1.63) 0.99 (0.64–1.52) 0.84 (0.57–1.23) 0.78 (0.44–1.38)
Bubolz et al, 2001[114] 1984 to 1997 Retrospective cohort Evidence II2B Quality: 0.8	49,978 men treated with radical prostatectomy; 20% of the national sample Medicare beneficiaries; Medicare's Medicare Provider Analysis and Review file	Case rates of radical prostatectomy (among total discharges); population-based rates of radical prostatectomy (among all eligible men in Medicare beneficiaries regardless of	Logistic regression *Unit Patient* *Risk adjustment:* patient co morbidity; standardized to age distribution of the Medicare male beneficiaries in 1997	 USA New England Middle Atlantic East North Central West North Central South Atlantic East South Central West South Central	Rates of radical prostatectomy as a % of U.S. rate 1984-1989 1 0.65 0.5 0.825 1.19 1.2 0.96 1

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
		whether they received treatment)		Pacific	1.68
					1990-1993
				USA	1
				New England	0.6
				Middle Atlantic	0.62
				East North Central	0.9
				West North Central	1.22
				South Atlantic	1.11
				East South Central	0.96
				West South Central	1
				Pacific	1.45
					1994-1997
				USA	1
				New England	0.79
				Middle Atlantic	0.78
				East North Central	0.999
				West North Central	1.275
				South Atlantic	1.04
				East South Central	0.96
				West South Central	1.19
				Pacific	1.1
Cooperberg et al, 2004[115]	2,078 men diagnosed with low risk prostate cancer	Proportion of patients receiving primary treatment alternatives: radical prostatectomy , external-beam radiotherapy, interstitial radiotherapy (brachytherapy), primary androgen deprivation therapy , watchful waiting, and neoadjuvant androgen deprivation therapy	Logistic regression		% of patient by primary treatment
					RP Brachyth.
1989 to 2001			*Unit Patient*	West	48.2 10.3
	The Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE)			Northeast	59 8.8
			*Risk adjustment: p*atient age, ethnicity, income, education, insurance type	Midwest	57.4 19
Retrospective cohort				South	48.8 17.9
					EBRT PADT
Evidence II2B				West	8.3 10.6
				Northeast	13.4 7
Quality: 0.85				Midwest	6.2 9.6
				South	7.5 15
					Watchful waiting
				West	22.6
				Northeast	11.8
				Midwest	7.9
				South	10.8

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
Saigal et al, 2002[116]	17,586 Medicare beneficiaries newly diagnosed with clinically localized prostate cancer Health Care Financing Administration database Random sample of 5% of all Medicare beneficiaries	Proportion of patients received combination of radical prostatectomy and radiation therapy with tomography (CT), magnetic resonance imaging (MRI), or bone scans	Multivariate logistical regression *Unit Patient* *Risk adjustment:* Charlson index score, age group, race, geographic region, and year of diagnosis		% of patients received RP with CT scan
1991 to 1996				Midwest	52.9
Retrospective cohort				Northeast	56.5
Evidence II2B				South	46.5
Quality: 0.9				West	42.1
					% of patients received RP with CT scan
				Midwest	1.5
				Northeast	3
				South	2.9
				West	2.7
					% of patients received RP with bone scan
				Midwest	57.4
				Northeast	61
				South	57.7
				West	54.4
					% of patients received radiation therapy with CT
				Midwest	29.3
				Northeast	33.1
				South	20.2
				West	15.2
					% of patients received radiation therapy with MRI
				Midwest	1.1
				Northeast	2.6
				South	2
				West	1.8
					% of patients received radiation therapy with bone scan
				Midwest	54.7
				Northeast	57.7
				South	51.4
				West	48.1

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
Wilt et al., 1999[117]	13,398 men ages 45 to 84 years who underwent RP at a VAMC; the Department of Veterans Affairs Patient Treatment File and Outpatient Clinic File	RP utilization per 100,000 veteran users	Logistic regression		Adjusted odds ratio of RP (95% CI)	
1986-1996			*Unit Patient*	Northeast	0.784	0.755; 0.814
				New England	0.725	0.67; 0.784
Retrospective cohort			*Risk adjustment: p*atient age and years of diagnosis	Middle Atlantic	0.803	0.763; 0.846
				Midwest	1.117	1.085; 1.15
Evidence II2B				East North Central	0.76	0.725; 0.797
				West North Central	1.7	1.63; 1.774
Quality: 0.9				South	1.028	1.001; 1.056
				South Atlantic	0.968	0.93; 1.008
				East South Central	1.012	0.952; 1.076
				West South Central	1.097	1.053; 1.148
				West	1.11	1.075; 1.146
				Mountain	1.141	1.079; 1.206
				Pacific	1.081	1.032; 1.132
				USA	1 (reference)	
					RP rate/100,000	
				Northeast	46.8	
				New England	43.7	
				Middle Atlantic	48.1	
				Midwest	67.1	
				East North Central	46.1	
				West North Central	102.1	
				South	60.8	
				South Atlantic	57.4	
				East South Central	60.2	
				West South Central	65.7	
				West	64.3	
				Mountain	68	
				Pacific	62	
				USA	60.5	
					Odds ratio of 30 days mortality after RP	
				West	1	1-1
				Northeast	1.18	0.76; 1.81
				South	1.23	0.9; 1.69
				Midwest	1.06	0.74; 1.51

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories		Outcome Rate
Hu, 2003[118]	2,292Medicare beneficiaries after radical prostatectomy Medicare claims data	In-hospital complications; Means length of stay	Multiple regression *Unit:* Patient *Risk adjustmen*t: patient age, race, co morbidities, hospital type			Adjusted odds ratio of in hospital complications after RP
1997-1998				Northeast		1 1-1
				South		1.05 0.76; 1.46
Retrospective cohort				West		0.58 0.38; 0.88
				Midwest		0.86 0.62; 1.2
Evidence: II-2C						Adjusted odds ratio of anastomatic stricture after RP
Quality: 0.86				Northeast		1 1 1
				South		1.18 0.82 1.7
				West		1.04 0.68 1.58
				Midwest		0.94 0.65 1.35
						Mean length of stay
				Northeast		Reference
				South		-0.93 (-1.36; 0.5)
				West		-1.63 (-2.19; 1.07)
				Midwest		-1.19 (-1.66; 0.72)
Litwin et al, 1998[119]	688,000 men Medicare beneficiaries treated with radical prostatectomy ; national 5% simple random sample from the Health Care Financing Administration	Radical prostatectomy rates per 100,000 male Medicare beneficiaries	Descriptive statistics and chi-square t *Unit Patient* *Risk adjustmen*t: stratification by patient age and race			Radical prostatectomy rates/100,000
1991-1993				USA	1991	216
				USA	1992	284
Retrospective cohort				USA	1993	235
				Northeast	1991	136
Evidence: II-2C				Northeast	1992	206
				Northeast	1993	151
Quality: 0.78				South	1991	223
				South	1992	305
				South	1993	250
				Midwest	1991	233
				Midwest	1992	290
				Midwest	1993	241
				West	1991	295
				West	1992	346
				West	1993	313

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate	
Escobedo, 2004[106] 1979-1998 Retrospective cohort Evidence II2B Quality: 0.75	3,274 African American men in Connecticut, Iowa, and New Mexico diagnosed with localized or regional prostate cancer in 1979-1998 The National Center for Health Statistics (NCHS), SEER database	Prostate cancer treatment strategies: prostatectomy, transurethral resection of the prostate, radiation only, prostatectomy plus radiation, observation, and all other (diagnostic categories, non-cancer directed surgery, subtotal/simple prostatectomy, pelvic surgery, node surgery, radioactive implants, radioisotopes)	Poisson distribution. *Unit*: patients *Risk adjustment*: age; direct method of standardization to 1970 U.S. population	*Connecticut 1983–1988*	% of patients who received therapy	
				Prostatectomy	6.6	
				Transurethral resection of the prostate	54.1	
				Radiation only	0	
				Prostatectomy plus radiation	0.8	
				Observation	1.7	
				All other	36.8	
				Connecticut 1989–1994		
				Prostatectomy	21.3	
				Transurethral resection of the prostate	19.4	
				Radiation only	0.6	
				Prostatectomy plus radiation	2.7	
				Observation	1.3	
				All other	54.7	
				Iowa	1983–1988	1989–1994
				Prostatectomy	11.1	25
				Transurethral resection of the prostate	72.2	15.6
				Radiation only	0	0
				Prostatectomy plus radiation	0	9.4
				Observation	1.9	1
				All other	14.8	49
				New Mexico	1983–1988	1989–1994
				Prostatectomy	5.9	28.8
				Transurethral resection of the prostate	55.9	15
				Radiation only	0	0
				Prostatectomy plus radiation	2.9	7.5
				Observation	0	1.3
				All other	35.3	47.5

Table C30. Geographic variations in prostate cancer treatments (continued)

Reference Period Design	Population Data Source	Outcomes	Analysis/Unit	Exposure Categories	Outcome Rate
Brandeis, 2000[120]	10,107 Medicare beneficiaries treated for early stage prostate carcinoma from inpatient, outpatient, and part B claims	Proportion of patients treated with Brachytherapy, external beam radiation therapy, radical prostatectomy, and its combinations	Descriptive statistic, chi-square test		*% of patients treated by Brachytherpay*
1991-1993			*Unit*: patients	Midwest	2.3
Retrospective cohort				Northeast	4.8
			Risk adjustment: comorbidity	South	5.7
Evidence: II-2C				West	3.3
				Other	1.8
Quality: 0.78	The Health Care Financing Administration				*% of patients treated by Brachytherpay + external beam radiation therapy*
				Midwest	1
				Northeast	2.8
				South	3.1
				West	3.5
				Other	0
					% of patients treated by radical prostatectomy
				Midwest	33.2
				Northeast	23.1
				South	32.8
				West	44.2
				Other	38.2
					% of patients treated by radical prostatectomy +external beam radiation therapy
				Midwest	3.9
				Northeast	2.1
				South	3.5
				West	4
				Other	1.8
					% of patients treated by external beam radiation therapy
				Midwest	59.7
				Northeast	67.2
				South	54.9
				West	45.1
				Other	58.2

Table C31. Association between hospital volumes (radical prostatectomy) and surgery related mortality

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis/Units	Risk Adjustment	Volume Categories	Outcome Rate (%)	Adjusted Volume Effect
Ellison, 2000[121] 1989-1996 Retrospective cohort Evidence: II-2C Quality: 0.75	66,693 patients after prostatectomy; 1,334 hospitals	Nationwide Inpatient Sample database Average number of procedures/year	In-hospital death after radical prostatectomy	Multiple logistic regression Unit :patient Goodness-of-fit: Yes Discrimination: Not reported	Patient age and comorbidity	*Annual Hospital Volume (% hospitals)* <25 (76) 25-54 (17) >54 (7) *Subgroups by patient age* *>65 years* Volume <25 25-54 >54 *<65 years* Volume <25 25-54 >54	 0.3 0.28 0.17 0.4 0.38 0.25 0.15 0.15 0.5	Odds ratio 1.78 (1.2; 2.7) 1.71 (1.2; 2.6) 1 (reference)
Begg,2002[122] 1992-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	11,522 Medicare beneficiaries (Parts A and B) after radical prostatectomy 6,421 with localized PC 403 hospitals	SEER data base linked to Medicare claims. Average number of procedures/year	Postoperative death within 30-60 days after radical prostatectomy	GEE-logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, stage of cancer, comorbidities Hospital - surgeon correlations	*Annual Hospital Volume (% hospitals)* <16 (69) 17-28 (17) 29-50 (9) 51-120 (5) <16 17-28 29-50 51-120	30 days mortality 0.5 0.5 0.5 0.5 60 days mortality 0.6 0.6 0.6 0.5	

Table C31. Association between hospital volumes (radical prostatectomy) and surgery related mortality (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis/Units	Risk Adjustment	Volume Categories	Outcome Rate (%)	Adjusted Volume Effect
Yao, 1999[123] 1991-1994 Retrospective cohort Evidence: II-2C Quality: 0.677	101,604 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	Postoperative death within 30-90 days after radical prostatectomy	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, comorbidities; surgeon specialty, hospital teaching status	*Hospital Volume* <38 (9/year) 39- 74 (14/year) 75-140 (27/year) >141 (36/year)	 0.63 0.59 0.56 0.39	 1.51 (1.25; 1.77) 1.43 (1.17; 1.69) 1.42 (1.16; 1.68) 1 (reference)
Wennberg, 1987[124] 1974-1977 Retrospective cohort Evidence: II-2C Quality: 0.655	4,570 Medicare beneficiaries after prostatectomy	Medicare claims data: 16 hospitals Number of procedures/ time of the study	Postoperative death within 90 days after prostatectomy	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, comorbidities Hospital size and teaching status	*Annual Hospital Volume* <40 40-90 >91	 	 1 (reference) 1.26 (0.69; 2.32) 1.66 (0.95; 2.89)

Table C32. Association between hospital volumes (radical prostatectomy) and complications (cardiac, respiratory or vascular events, the need for reoperation, bleeding, renal failure, and shock)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis/Units	Risk Adjustment	Volume Categories	Outcome Rate (%)	Adjusted Volume Effect
Yao, 1999[123] 1991-1994 Retrospective cohort Evidence: II-2C Quality: 0.677	101,604 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	In-hospital complications	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, comorbidities; surgeon specialty, hospital teaching status	*Hospital Volume* <38 (9/year) 39-4 (14/year) 75-140 (27/year) >141 (36/year) <38 (9/year) 39- 4 (14/year) 75- 140 (27/year) >141 (36/year)	 Any complications 31.3(30.8-31.9) 28.7(28.2-29.3) 27.8(27.2-28.3) 26.3(25.8-26.9)	Serious complications 1.4 3(1.37; 1.48) 1.25 (1.19; 1.31) 1.09 (1.03; 1.15) 1(reference) 1.28 (1.24; 1.32) 1.13 (1.08; 1.17) 1.08 (1.04; 1.12) 1 (reference)
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data. Number of procedures/time of the study	In-hospital complications	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Yes	Patient age, race, comorbidities, hospital type, region	*Hospital volume (% of procedures)* Low (85.2) (<60/year) High (14.8) (>60 /year)	Postoperative complications 21.6 16.8	 1 (reference) 0.84(0.59; 1.19)
Begg, 2002[122] 1992-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	11,522 Medicare beneficiaries (Parts A and B) after radical prostatectomy, 6,421 with localized PC; 403 hospitals	SEER data base linked to Medicare claims Average number of procedures/year	Postoperative complications during 30 days after surgery	GEE-logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, stage of cancer, co morbidities; hospital - surgeon correlations	*Annual Hospital Volume (% hospitals)* <16 (69) 17-28 (17) 29-50 (9) 51-120 (5)	 32 31 30 27	

Table C33. Association between hospital volumes (radical prostatectomy) and quality measures (cancer control, late urinary complications, or long term incontinence, operative quality)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis/Units	Risk Adjustment	Volume Categories	Outcome Rate (%)	Adjusted Volume Effect
Ellison, 2000[125] 1990-1999 Retrospective cohort Evidence: II-2C Quality: 0.745	12,635 Medicare beneficiaries after radical prostatectomy 5,837 with localized PC 348 hospitals	SEER database Number of procedures/time of the study	Style of cancer control: use of adjuvant therapy more than 6 months after radical prostatectomy	Cox model; Kaplan-Meier Unit: Patient Goodness-of-fit: Yes Discrimination: Not reported	Patient age histological grade, pathological stage, and comorbidity	*Annual Hospital Volume (% hospitals)* <16 (64) 17-28 (17) 29-50 (11) 51-120 (8) <16 17-28 29-50 51-120	Cancer control (Adjuvant therapy) 31.9 26.9 27.7 26.9	*Adjusted for tumor stage and grades* 1.24 (1.13; 1.37) 1.09 (0.99; .19) 1.02 (0.94; .12) 1 reference) Adjusted for tumor stage and grades and patients co morbidities 1.25 (1.14; .38) 1.11 (1.01; .21) 1.03 (0.94; .12) 1 (reference)
Begg, 2002[122] 1992-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	11,522 Medicare beneficiaries (Parts A and B) after radical prostatectomy 6,421 with localized PC; 403 hospitals	SEER data base linked to Medicare claims Average number of procedures/year	Late urinary complications from 30 to 365 days after radical prostatectomy Long term incontinence	GEE-logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, stage of cancer, comorbidities Hospital - surgeon correlations	*Annual Hospital Volume (% hospitals)* <16 (69) 17-28 (17) 29-50 (9) 51-120 (5) <16 17-28 29-50 51-120 <16 17-28 29-50	Late urinary complications (events) 18 19 16 13 Late urinary complications (symptoms) 28 29 23 20 Long term incontinence (events) 6.5 6.4 7	

Table C33. Association between hospital volumes (radical prostatectomy) and quality measures (cancer control, late urinary complications, or long term incontinence, operative quality) (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis/Units	Risk Adjustment	Volume Categories	Outcome Rate (%)	Adjusted Volume Effect
						51-120	7.6	
							Long term incontinence (symptoms)	
						<16	19	
						17-28	19	
						29-50	18	
						51-120	18	
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	Late urinary complications 12 months after radical prostatectomy	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Yes	Patient age, race, comorbidities, hospital type, region	*Hospital volume(% of procedures)* Low (85.2) (<60/year) High (14.8) (>60/year)	Late urinary complications (events) 26.8 19.8	 1 (reference) 0.72 (0.49; 1.04)
Imperato, 2000[126] 1996 Cross-sectional Evidence: III Quality:0.52	583 Medicare beneficiaries living in New York State after radical prostatectomy 113 hospitals	Medicare claims data Number of procedures/time of the study	Operative quality indicators	Chi square – test Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Not applicale	*Hospital volume* (% hospitals) 1-4 (67) 5-9 (22) >10 (10)	Scores of Operative quality indicators 49.1 47.6 58.4	

Table C34. Association between hospital volumes (radical prostatectomy) and length of stay in the hospital

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	LOS (Days)	Adjusted Volume Effect
Ellison, 2000[125] 1989-1996 Retrospective cohort Evidence: II-2C Quality: 0.75	66,693 patients after prostatectomy	Nationwide Inpatient sample database Average number of procedures/year	Length of stay	Multiple logistic regression Unit :patient Goodness-of-fit: Yes Discrimination: Not reported	Patient age and comorbidity	*Annual hospital volume* <25 25-54 >54 *Annual hospital volume* <25 25-54 >54	Mean (median) 5.4 (5) 4.8 (4) 4.2 (4) Hospital charges $15,600 $15,100 $13,500	Odds ratio
Yao, 1999[123] 1991-1994 Retrospective cohort Evidence: II-2C Quality: 0.677	101,604 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	Length of stay Changes in length of stay from 1991 to 1994 Readmission in 30 days	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, comorbidities; surgeon specialty, hospital teaching status	*Hospital volume (annual median)* Low <38(9) Medium-low 39-4 (14) Medium-high 75- 140 (27) High 141(36) *Increase in volume (1991-1994)* Low Medium-low Medium-High High *Unchanged volume* Low Medium-low Medium-high High	Mean (95% CI) 8.51 (8.47; 8.56) 8.18 (8.14; 8.22) 7.7 (7.66; 7.74) 7.81 (7.77; 7.85) *Decrease in LOS in days* 1.62 (1.33; 1.91) 1.42 1.18; 1.67) 1.5 (1.29; 1.72) 1.49 (1.27; 1.7) 1.34 (1.12; 1.57) 1.38 (1.21; 1.55) 1.29 (1.12; 1.47) 1.37	

Table C34. Association between hospital volumes (radical prostatectomy) and length of stay in the hospital (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	LOS (Days)	Adjusted Volume Effect
							(1.17; 1.57)	
						Decreased Volume		
						Low	0.9 (0.63; 1.17)	
						Medium-low	1.07 (0.89; 1.24)	
						Medium-high	1.19 (1.02; 1.36)	
						High	1.2 4 (0.93; 1.55)	
						Hospital volume		*Readmission*
						Low		1.3 (1.21; 1.39)
						Medium-low		1.16 (1.07; 1.25)
						Medium-high		1.08 (0.99; 1.17)
						High		1 (Reference)
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	Length of stay	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, comorbidities, hospital type, region	*Hospital volume* Low (<60/year) High (>60 /year)	*LOS* Mean (SD) 5.2 (3.8) 4.4 (2.1)	*Regression coefficient for mean LOS* 1 -0.42 (-0.89; 0.05)

Table C35. Association between hospital status and outcomes

Reference Period Design	Population	Data Source Status Definition	Outcome	Analysis Units	Risk Adjustment	Status Categories	Crude Outcomes Rates	Adjusted Status Effect
Wennberg, 1987[124] 1974-1977 Retrospective cohort Evidence: II-2C Quality: 0.655	4,570 Medicare beneficiaries after prostatectomy	Medicare claims data 16 hospitals Presence of the teaching programs	Postoperative death within 90 days after prostatectomy	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, comorbidities hospital size and teaching status	Hospital status No teaching programs Teaching hospitals		Surgery related mortality 1.10 (0.69; 1.76) 1
Karakiewicz, 1998[127] 1988-1996 Retrospective cohort Evidence: II-2C Quality: 0.6	4,997 beneficiaries of the Quebec Healthcare Plan after radical retropubic prostatectomy, assumed all with localized PC 104 urologists	Quebec Healthcare Plan database (insurance plane in the province of Quebec. Affiliation with academic center	Postoperative death within 30 days after radical prostatectomy Cumulative survival (31 months)	Cox proportional hazards regression model Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, physician age and volume, hospital type	Hospital affiliated with academic centers Nonacademic institutions	30 days mortality 0.45 0.72	
Gheiler, 1999[128] 1990-1996 Descriptive baseline analysis of planned implementation of clinical pathway Evidence: III Quality: 0.46	1,129 patients after radical prostatectomy Single hospital study 24 urologists	Records of all patients admitted to the hospital in 1990-1996 before and after implementation of clinical care pathway Urologists affiliated with academic center Private urologists	Average hospital stay	ANOVA test, Chi square test Goodness-of-fit: Not reported Discrimination: Not reported	NR	Urologists affiliated with academic center Private urologists	LOS in days 9 13	

Table C35. Association between hospital status and outcomes (continued)

Reference Period Design	Population	Data Source Status Definition	Outcome	Analysis Units	Risk Adjustment	Status Categories	Crude Outcomes Rates	Adjusted Status Effect
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data. Academic affiliation Government hospitals vs. nonprofit institutions	Late urinary complications 12 months after radical prostatectomy Anastomotic stricture Length of stay	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Yes	Patient age, race, comorbidities, hospital type, region	Hospital status Academic affiliation Nonacademic Academic affiliation Nonacademic Academic affiliation Government Hospitals vs. Nonprofit Government Hospitals vs. Nonprofit Government Hospitals vs. nonprofit		In hospital complications 1.0 (0.8; 1.37) 1 Anastomotic stricture 1.1 (0.83; 1.46) 1 Reduction in LOS 0.03 (0.39; 0.34) In hospital complications 1.32 (0.96; 1.82) Anastomotic stricture 1.45 (1.03; 2.04) Increase in LOS 0.51 (0.04; 0.98)

Table C35. Association between hospital status and outcomes (continued)

Reference Period Design	Population	Data Source Status Definition	Outcome	Analysis Units	Risk Adjustment	Status Categories	Crude Outcomes Rates	Adjusted Status Effect
Gaylis, 1998[129] 1990-1996 Case-series Evidence: III Quality: 0.41	116 patients after radical retropubic prostatectomy; two hospitals study	Records of all patients admitted to hospitals in 1990-1996 Hospitals ownership: profit and not-for-profit	Length of stay Hospital charges	T-test Unit patient Goodness-of-fit: Not reported Discrimination: Not reported	Not reported	Hospital status Not for profit For profit	Cost *1990-1995* $17,743 $24,481 *1996* $13,233 $25,979	
Yuan, 2000[130] 1984-1993 Retrospective cohort Evidence: II-2C Quality: 0.7	17,260 Medicare beneficiaries after prostatectomy	The Health Care Financing Administration (HCFA) database Teaching hospitals by a membership in the Council of Teaching Hospitals of the Association of American Medical Colleges Types of hospitals (American Hospital Association File): for-profit, not-for-profit, non teaching public, teaching not-for-profit, and teaching public hospitals	30-day mortality 6-month mortality	Multiple regression Unit patient Goodness-of-fit: Yes Discrimination: Yes	Year of admission, patient age and race, and major comorbidities	Hospital status For profit Not for profit Public Teaching not for profit Teaching public For profit vs. Teaching not for profit Not for profit vs. Teaching not for profit Public vs. Teaching not Teaching public vs. Teaching not for profit LOS For profit Not for profit Public Teaching not for profit	30 day mortality 1.1 1 1.2 0.9 0.9 LOS 6.6 6.9 6.4 7.9	30 day mortality 1.18 (1.1; 1.22) 1.1 (1.05; 1.15) 1.2 (1.15; 1.23) 1 (0.9; 1.2) LOS

Table C35. Association between hospital status and outcomes (continued)

Reference Period Design	Population	Data Source Status Definition	Outcome	Analysis Units	Risk Adjustment	Status Categories	Crude Outcomes Rates	Adjusted Status Effect
						Teaching public	8.2	
						For profit vs. teaching not for profit		0.875
						Not for profit vs. teaching not for profit		0.9
						Public vs. teaching not for profit		0.85
						Teaching public vs. teaching not for profit		1

Table C36. Association between surgeon volumes (radical prostatectomy) and surgery related mortality

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Begg, 2002[122] 1992-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	11,522 Medicare beneficiaries (Parts A and B) after radical prostatectomy 6,421 with localized PC 999 surgeons	SEER data base linked to Medicare claims 403 hospitals Average number of procedures/year	Postoperative death within 30-60 days after radical prostatectomy	GEE logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, stage of cancer, comorbidities; hospital-surgeon correlations	*Annual surgeon volume (% surgeons)* 1-4 (64) 5-9 (20) 10-15 (10) 16-58 (6) *Annual surgeon volume* 1-4 (64) 5-9 (20) 10-15 (10) 16-58 (6)	*30 days Mortality* 0.4 0.5 0.5 0.5 *60 days Mortality* *0.5* *0.5* *0.6* *0.6*	
Karakiewicz, 1998[127] 1988-1996 Retrospective cohort Evidence: II-2C Quality: 0.6	4,997 beneficiaries of the Quebec Healthcare Plan after radical retropubic prostatectomy, assumed all with localized PC 104 urologists	Quebec Healthcare Plan database (insurance plans in the province of Quebec Number of procedures during the study	Postoperative death within 30 days after radical prostatectomy Cumulative survival (31 months)	Cox proportional hazards regression model Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, physician age and volume, hospital type	*Surgeon age/volume* 28-37/4 38-47/8 48-57/5 58-67/6 68-77/0.5 *Surgeon age/volume* 28-37/4 38-47/8 48-57/5 58-67/6 68-77/0.5	Adjusted 30 days mortality 0.28 0.45 0.57 0.99 0 Cumulative survival, % 97.2 92.2 91.7 87.3 0	

Table C36. Association between surgeon volumes (radical prostatectomy) and surgery related mortality (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Bianco, 1999[131] 1993-1996 Retrospective cohort Evidence: II-2C Quality:0.63	5,238 Medicare beneficiaries (Parts A and B) after radical prostatectomy 159 surgeons	SEER data base linked to Medicare claims Number of procedures during the study	Postoperative death within 30-60 days after prostatectomy	Logistic regression Unit Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, cancer stage, comorbidities, hospital volume	*Surgeon volume 20-121* *Annual average volume 17*	60 days mortality 0.5	

Table C37. Association between surgeon volumes (radical prostatectomy) and complications (cardiac, respiratory or vascular events, the need for reoperation, bleeding, renal failure, and shock)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Begg, 2002[122] 1992-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	11,522 Medicare beneficiaries (Parts A and B) after radical prostatectomy 6,421 with localized PC 999 surgeons	SEER data base linked to Medicare claims 403 hospitals Average number of procedures/ year	Postoperative complications during 30 days after surgery	GEE logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, stage of cancer, comorbidities Hospital - surgeon correlations	*Annual surgeon volume (% surgeons)* 1-4 (64) 5-9 (20) 10-15 (10) 16-58 (6)	Postoperative complications *32* *31* *30* *26*	
Hu, 2002[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/ time of the study	Postoperative in hospital complications	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Yes	Patient age, race, comorbidities, hospital type, region	*Surgeon volume (% of procedures)* Low (92.2) (<40/year) High (7.8) (>40 /year) *Subgroups by hospital/surgeon volume* Low-low High-low Low-high High-high	Postoperative complications 21.9 11.8 22.4 18.6 13.6 10.5	1 (reference) 0.53 (0.32; 0.89)

Table C37. Association between surgeon volumes (radical prostatectomy) and complications (cardiac, respiratory or vascular events, the need for reoperation, bleeding, renal failure, and shock) (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Bianco, 1999[131] 1993-1996 Retrospective cohort Evidence: II-2C Quality:0.63	5,238 Medicare beneficiaries (Parts A and B) after radical prostatectomy 159 surgeons	SEER data base linked to Medicare claims Number of procedures/ time of the study	Postoperative in-hospital complications Variability in outcome among high volume surgeons	Logistic regression Unit Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, cancer stage, comorbidities, hospital volume	Surgeon volume 20-121 Annual average volume = 17 4 surgeons 12 surgeons Annual average volume = 17 Annual average volume = 17	Postoperative complications 28.6 <15 >50 Late urinary complication 25.2 Long term urinary complications 6.7	
Dash, 2004[132] 1994-2000 Prospective cohort Evidence: II -2B Quality: 0.69	1,123 patients after radical retropubic prostatectomy Single academic center; 9 surgeons	Consecutive cases prospectively enrolled in the IRB approved study Average number of procedures/ year	Surgery related blood transfusion	Logistic regression Unit Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, hormone therapy use, clinical stage and grade, and prostate size; type of anesthesia	Annual surgeon Volume (% of patients) >15/year (94) <15/year (6)	Homologous transfusion rate 3 18.2 (range 0-20.6)	1 8.63 (3.95; 18.86)
Litwiller, 1995[133] 1984-1994 Design: Retrospective analysis of cases Evidence: III Quality: 0.47	428 patients after radical retropubic prostatectomy Single academic center; 18 surgeons	Records of all patients admitted to the hospital from 1984-1994; number of procedures performed by surgeon / study period	Surgery related blood loss and transfusion	Linear regression Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, stage of cancer, comorbidities	Average surgeon volume 3 procedures (rank 1-9) Correlation with blood loss Correlation with transfusion	Average blood loss 1,327 ml -0.31 (Not significant) Average blood transfusions 1.57U -0.37 (Not significant)	

Table C38. Association between surgeon volumes (radical prostatectomy) and quality measures (late urinary complications or long term incontinence and operative quality)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Begg, 2002[122]	11,522 Medicare	SEER data base linked to	Late urinary complications	GEE logistic regression	Patient age, race, stage of	*Annual surgeon volume*	Late urinary complications	
1992-1996	beneficiaries (Parts A and	Medicare claims	from 30 to 365 days after	Unit: Patient	cancer, comorbidities	*(% surgeons)*	(events)	
Retrospective cohort	B) after radical prostatectomy	403 hospitals	radical prostatectomy	Goodness-of-fit: Not reported	Hospital - surgeon correlations	1-4 (64)	19	
Evidence: II-2C		Average number of procedures/ year	Long term incontinence	Discrimination: Not reported		5-9 (20)	18	
Quality: 0.63	6,421 with localized PC					10-15 (10)	17	
	999 surgeons					16-58 (6)	14	
							Late urinary complications (symptoms)	
						1-4 (64)	28	
						5-9 (20)	26	
						10-15 (10)	27	
						16-58 (6)	20	
							Long term incontinence (events)	
						1-4 (64)	7.3	
						5-9 (20)	7.2	
						10-15 (10)	6.7	
						16-58 (6)	6.6	
							Long term incontinence (symptoms)	
						1-4 (64)	20	
						5-9 (20)	20	
						10-15 (10)	19	
						16-58 (6)	16	

Table C38. Association between surgeon volumes (radical prostatectomy) and quality measures (late urinary complications or long term incontinence and operative quality) (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/ time of the study	Late urinary complications (anastomotic strictures) 12 months after surgery	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Yes	Patient age, race, comorbidities, hospital type, region	*Surgeon volume (% of procedures)* <40/year (92.2) >40/years (7.8) *Subgroups by hospital/ surgeon volume* Low-low High-low Low-high High-high	Anastomotic stricture 27.7 22 28.4 22.7 29.6 17.7	
Bianco, 1999[131] 1993-1996 Retrospective cohort Evidence: II-2C Quality: 0.63	5,238 Medicare beneficiaries (Parts A and B) after radical prostatectomy 159 surgeons	SEER data base linked to Medicare claims Number of procedures/ time of the study	Late urinary complications within 30 days-1 year after surgery Long term incontinence Variability in outcomes among high volume surgeons	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, cancer stage, comorbidities, hospital volume	*Surgeon volume* *20-121 (17/year)* *19 surgeons* *11 surgeons* *38 surgeons* *11 surgeons*	Late urinary complications 25.2 Long term incontinence 6.7 Late urinary complications <5 >55 Long-term incontinence <10 >40	
Eastham, 2003[134] 1983-2002 Retrospective analysis of cases Evidence: III Quality: 0.68	4,629 patients after radical prostatectomy Two large urban centers; 44 surgeons	Records of all patients admitted to hospitals from 1983-2002 Number of procedures performed by surgeon/study period	Positive surgical margins	Logistic regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Cancer clinical stage and grade; surgeon and institution	*Surgeon volume* *<8* *10-16* *20-23* *>50* *Increment* *1 procedure*	Positive surgical margins rate 14 10-48 12-48 12	Regression coefficient for positive surgical margins -0.0007 (SE0.0002) RR 0.99 (0.9996; 0.998)

Table C38. Association between surgeon volumes (radical prostatectomy) and quality measures (late urinary complications or long term incontinence and operative quality) (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Crude Rate (%)	Adjusted Volume Effect
Hernandez, 2005[135]	204 patients after radical retropubic	Records of all patients admitted to the	Positive surgical margins	Chi square test	Not reported	Surgeon volume (per year)	Positive surgical margins rate	
				Unit: Patient		101 (16.83)	5.9	
1996-2002	prostatectomy	hospital from 1996-2002	Bundle spring			10,317.17)	5.8	
				Goodness-of-fit:			Bundle nerve sparing	
Retrospective analysis of cases	Single hospital study; 2 surgeons	Number of procedures/ time of study		Not reported			Bilateral	
				Discrimination:		101	84.2	
				Not reported		103	36.9	
Evidence: III							Unilateral	
						101	15.8	
Quality :0.69						103	54.4	
							Both bundles excised	
						101	0	
						103	8.7	

Table C39. Association between surgeon volumes (radical prostatectomy) and length of stay in the hospital

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Length of Stay (%)	Adjusted Volume Effect
Hu, 2003[118] 1997-1998 Retrospective cohort Evidence: II-2C Quality: 0.86	2,292 Medicare beneficiaries after radical prostatectomy	Medicare claims data Number of procedures/time of the study	Average hospital stay	Multiple regression Unit: Patient Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, race, comorbidities, hospital type, region	*Surgeon volume (% of procedures)* <40/year (92.2) >40/years (7.8) *Subgroups by hospital/surgeon volume* Low-low High-low Low-high High-high	*LOS* Mean (SD) 5.2 (3.7) 4.1 (2.6) 5.2 (3.8) 4.7 (3.5) 4.8 (3.7) 3.7 (1.1)	*Regression coefficient for mean LOS* -0.66 (-0.06; 1.26)
Litwiller, 1995[133] 1984-1994 Retrospective analysis of cases Evidence: III Quality: 0.47	428 patients after radical retropubic prostatectomy Single academic center; 18 surgeons	Records of all patients admitted to the hospital from 1984-1994 Number of procedures performed by surgeon/study period	Average hospital stay	Linear regression Goodness-of-fit: Not reported Discrimination: Not reported	Patient age, stage of cancer, comorbidities	Average surgeon volume 3 procedures (rank 1-9) Correlation LOS	Average hospital stay 7.71 (rank 3-24) -0.51	
Gheiler, 1999[128] 1990-1996 Descriptive baseline analysis of planned implementation of clinical pathway Evidence: III Quality: 0.46	1,129 patients after radical prostatectomy Single hospital study 24 urologists	Records of all patients admitted to the hospital from 1990-1996 before and after implementation of clinical care pathway; an average numbers of procedures performed annually by surgeons	Average hospital stay	ANOVA test, Chi square test Goodness-of-fit: Not reported Discrimination: Not reported	Not reported	Surgeon volume (% procedures) High (41) – 53/year Low (59) – 7/year	Average hospital stay (nights) 7.2 8.2	

Table C39. Association between surgeon volumes (radical prostatectomy) and length of stay in the hospital (continued)

Reference Period Design	Population	Data Source Volume Definition	Outcome	Analysis Units	Risk Adjustment	Volume Categories	Length of Stay (%)	Adjusted Volume Effect
Leibman, 1998[136] 1994-1997 Descriptive baseline analysis of planned implementation of clinical pathway Evidence: III Quality: 0.46	856 patients after radical retropubic prostatectomy Single hospital study; 24 surgeons	Records of all patients admitted to the hospital from 1990-1996 before and after implementation of clinical care pathway; an average number of procedures performed annually by surgeons	Average hospital length of stay Average hospital charges	T-test to compare outcomes between groups Goodness-of-fit: No Discrimination: No	Not reported	Annual surgeon volume (% procedures) <12/year (21) >12/year (79) <12/year (21) >12/year (79) < 12/year (21) >12/year (79)	LOS in days, Median 5.8 5.3 Charges in 1994 $11,798 $11,113 Charges from 1994-1997 $10,208 $9,388	

Table C40. Sampling sources of studies that evaluated associations between providers' volumes (radical prostatectomy) and patients' outcomes

Source	Author	Time	Size	Hospital Volume	Surgeon Volume	Mortality	Morbidity	Urinary Complications	Long term Incontinence	LOS	Operational Quality
Single hospital	Hernandez[135]	1996-2002	506		X						X
Single hospital	Dash[132]	1994-2000	1,123	X	X		X				
Single hospital	Litwiller[133]	1984-1994	428	X	X					X	
Single hospital	Leibman[136]	1994-1998	856		X					X	
Single hospital	Gheiler[128]	1990-1994	1,129		X					X	
SEER-Medicare	Bianco[131]	1992-1996	5,238		X	X	X	X	X		
SEER-Medicare*	Ellison[125]	1990-2005	12,635	X			X				
SEER-Medicare*	Begg[122]	1992-1996	11,522	X	X	X	X	X	X		
Quebec Healthcare Plan	Karakiewicz[127]	1988-1996	4,997		X	X					
Nationwide inpatient sample	Ellison[121]	1989-1995	66,693	X		X				X	
Multihospital study	Imperato[126]	1996	583	X							X
Multihospital study	Gaylis[129]	1990-1996	116	Type		X	X	X		X	
Multihospital study	Eastham[134]	1983-2002	6,542		X						X
Medicare	Yao[123]	1991-1997	10,1604	X		X	X			X	
Medicare	Wennberg[124]	1974-1977	4,570	X		X					
Medicare	Yuan[130]	1984-1993	17,260	Type		X				X	
Medicare	Hu[118]	1997-1998	2,292	X	X		X	X		X	

LOS = length of stay
* Studies used the same data base at the same period of time but followup was different

Table C41. Sampling sources of studies that evaluated associations between provider's locations and patient outcomes

Author	Source	Time	Incidence	Incidence of Localized Cancer	Mortality	Cancer Specific Mortality	Standardized Rate of Treatments	Probability of Treatments	Probability of PSA	Complications	LOS
Cooperberg[112]	CaPSURE*	1989-2001						X			
Cooperberg[115]	CaPSURE*	1989-2001						X			
Lu-Yao[108]	Medicare	1990					X	X			
Bubolz [114]	Medicare	1984-1989						X			
Saigal[116]	Medicare	1991-1996						X			
Hu[118]	Medicare	1997-1998								X	X
Litwin[119]	Medicare	1991					X				
Brandeis[120]	Medicare	1993-1996						X			
Mushinski[109]	MetLife	1994									X
Mettlin[110]	National Cancer Database	1992						X			
Jemal[105]	NCHS	1995-2000	X	X	X	X					
Jemal[104]	NCHS	1970-1989				X					
Lu-Yao[102]	SEER	1983	X				X	X			
Krupski[111]	SEER	1995-1999						X			
Lai[113]	SEER	1983-1992			X	X		X			
Escobedo[106]	SEER	1989-1998	X	X		X		X			
Shaw[137]	SEER	1991-1998						X			
Kafadar[103]	State Cancer Control Map	1953-1972				X					
Wilt[117]	VAMC	1986-1994			X		X	X			
CDC[138]	CDC	1999-2004	X			X			X		

LOS = length of stay
* Studies used the same database at the same period of time, the second study evaluated the association between provider's location in interaction with patient's health insurance

Table C42. Studies that evaluated association between other provider's factors (specialty, facility structure, awareness) and patient outcomes (no overlapping in samples detected)

Author	Source	Year	Provider's Factors	Screening	Treatment	Cost	Survival	Complication	Operation Quality	Satisfaction
Kim[139]	Survey	2002	Specialty	X						
McNight[140]	Survey	1996	Specialty	X						
Fowler[141]	Survey	1998	Specialty	X	X					
Shay[142]	Survey	2002	Specialty		X					
Plawker[143]	Survey	1997	Specialty	X						
Gee[144]	Survey	1995	Specialty		X					
Hanna[145]	Survey	2002	Specialty		X					
Salminen[146]	Survey	2004	Specialty		X					
McNaughton Collins[147]	Survey	2002	Specialty/location	X	X					
Fowler[148]	Survey	2000	Specialty		X					
Kramolowsky[149]	Multi hospital	1995	Education			X				
Kramolowsky[150]	Single hospital	1995	Education			X				
Diamond[151]	The patterns of care study	1990	Facility structure				X	X		
Cazzaniga[152]	Survey	1998	Inter physician variability						X	
Van Poppel[153]	Survey	2001	Inter physician variability					X	X	
Votron[154]	Survey	2004	Inter physician variability		X					
Maliski[155]	Single hospital	2005	Facility structure					X		
Maliski[156]	IMPACT study	2004	Physician communication					X		X

Table C43. Association between physician specialty and patient outcomes

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
Kim, 2002[139]	Members of the Academy of Family Physicians	Chi-square test		Recommended *PC* screening for patient >50 years old	
Internet-based survey	381 primary care physicians in 3 states: 113 family physicians 238 general internists 11.76 years of practice	Logistic regression Not reported		DRE	
			Family physician	87%	<0.01
			General internist	69%	
				PSA screening	
			Family physician	67%	<0.01
			General internist	40%	
				Not PC screening for patient >60 years old	
			Family physician	10%	0.01
			General internist	20%	
				Do not use age as a criteria	
			Family physician	51%	<0.01
			General internist	33%	
				Recommendations for patients with PSA 4.1-10 ng/ml	
				Repeat PSA at 4-6 weeks	
			Family physician	40	0.06
			General internist	29	
				Repeat PSA at 6-12 months	
			Family physician	13	0.93
			General internist	14	
				Prostate ultrasound	
			Family physician	5	0.48
			General internist	7	
				Referral to urologist	
			Family physician	42	0.15
			General internist	50	
				Referral to radiation oncologist	
				Yes (all patients)	
			Family physician	10	
			General internist	14	
				Yes, poor surgical candidates	
			Family physician	9	
			General internist	10	
				By patient's request	
			Family physician	17	
			General internist	21	
				By urologist's request	
			Family physician	88	
			General internist	78	

Table C43. Association between physician specialty and patient outcomes (continued)

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
				Use of alternative therapies for prevention and management of PC	
			Family physician	15	
			General internist	7	
McNight, 1996[140]	Board certified physicians in three states	Chi-square test		*Screening practices*	
				DRE	
	231 urologists and 205 family	Not reported	Urologist	99%	0.14
Survey	physicians		Primary care physicians	98%	
				Age at initial DRE (mean)	
	Urologists: 99% males;		Urologist	45	<0.01
	mean age 50 years		Primary care physicians	43	
	city of practice >100,000 - 55%			Median Interval for DRE (months)	
			Urologist	12	
	Primary care physicians: 89% males;		Primary care physicians	12	
				PSA	
	mean age 46 years;		Urologist	98%	<0.01
	city of practice >100,000 - 28%		Primary care physicians	87%	
				Age at initial PSA	
			Urologist	49	
			Primary care physicians	49	
				Median Interval for PSA (months)	
			Urologist	12	
			Primary care physicians	12	
				Single best screening tool	
			Urologist	69% PSA	
			Primary care physicians	59% DRE	
				Screening for asymptomatic patients <age 50 with negative family history	
			Urologist	14%	<0.01
			Primary care physicians	29%	
				Screening for patients age <40 with a positive family history	
			Urologist	2%	<0.01
			Primary care physicians	19%	
				Strategy in positive tests	
			Urologist	66% biopsy	
			Primary care physicians	55% referral	
				Screening cessation	
			Urologist	61%	<0.01
			Primary care physicians	14%	
				Age for screening cessation	
			Urologist	79	
			Primary care physicians	79	

Table C43. Association between physician specialty and patient outcomes (continued)

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
Fowler, 1998[141]	Random sample of the American Medical Association Registry of Physicians	Chi-square test		*Use of PSA almost always for patients at age*	
		Not reported		40-49 years	
			Urologists	33%	
Survey			Primary care physicians	19%	Not significant
	444 primary care physicians			50-59 years	
	394 urologists		Urologists	97%	
	Urologists: 99% males		Primary care physicians	55%	<0.05
	More than 90% if time devoted to clinical practice - 88%			60-69 years	
			Urologists	98%	
	Solo practice - 31%;		Primary care physicians	66%	Not significant
	Single specialty group - 53%;			70-74 years	
	Multi specialty group - 16%		Urologists	88%	
	Primary care physicians: 84% males		Primary care physicians	65%	Not significant
				75-79 years	
	More than 90% if time devoted to clinical practice - 88%		Urologists	50%	
			Primary care physicians	58%	Not significant
	Solo practice - 35%;			80+ years	
	Single specialty group - 42%;		Urologists	25%	
	Multi specialty group - 23%		Primary care physicians	53%	Not significant
				Referral to urologists for a biopsy if PSA 4-10ng/ml	
				50-59 years	
			Urologists	81%	
			Primary care physicians	69%	
				60-69 years	
			Urologists	66%	
			Primary care physicians	67%	
				70-74 years	
			Urologists	33%	
			Primary care physicians	58%	
				75-79 years	
			Urologists	13%	
			Primary care physicians	52%	
				80+ years	
			Urologists	3%	
			Primary care physicians	45%	
				Perception which therapy is better	
				Patients life expectancy >10 years	
				Radical PE	
			Urologist	98%	
			Primary care physicians	73%	
				External bean radiotherapy	
			Urologist	53%	

Table C43. Association between physician specialty and patient outcomes (continued)

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
			Primary care physicians	67%	
				Patients life expectancy <10 years	
				Radical PE	
			Urologist	13%	
			Primary care physicians	13%	
				External beam radiotherapy	
			Urologist	36%	
			Primary care physicians	48%	
				Watchful waiting	
				Patients life expectancy <10 years	
			Urologist	Definitely 13%; probably 55%	
			Primary care physicians	Definitely 17%; probably 52%	
				Patients life expectancy >10 years	
			Urologist	Definitely 1%; probably 2%	
			Primary care physicians	Definitely 2%; probably 11%	
Shay, 2000[142]	61 urologists after residency in single medical center	Descriptive statistic	Training in RPP	*Use of RPP*	
			Yes (86%)	41%	
	Urologists practice:		No	13%	0.12
Survey	Private group 66%	Chi-square test	Intensity of training		
	Solo 20%	Not reported	>10 RPP in residency	53%	
	Academic 7%		<10 RPP	21%	0.03
				Reasons of not using RPP	
			Training in RPP	Length of operation	
			Yes (86%)	4%	
			No	25%	0.03
				Difficulty of operation	
			Yes (86%)	20%	
			No	25%	0.75
				Partner preference	
			Yes (86%)	28%	
			No	12.50%	0.35
				Concerns to preserve potency	
			Yes (86%)	12	
			No	0	0.3
				Inability to obtain lymph nodes	
			Yes (86%)	12%	
			No	0%	0.3
				Use of RPP	
			Practice		
			Private group 66%	29%	
			Solo 20%	50%	
			Academic 7%	100%	0.11

Table C43. Association between physician specialty and patient outcomes (continued)

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
Fowler, 2000[148]	Random sample of physicians in the United States listed as urologists and radiation	Chi-square test Not reported		*Recommending routine PSA for men in average risk of prostate cancer* Patient age 40-49 years	
Survey	oncologists in the American Medical Association Registry of Physicians and practicing at least 20 hours per week 504 urologists (response rate 64) 559 radiation oncologists (response rate 76)		Radiation oncologists Urologists	24% 25%	0.93
				50-59 years	
			Radiation oncologists Urologists	90% 96%	<0.01
				60-69 years	
			Radiation oncologists Urologists	98 98	0.92
				70-74 years	
			Radiation oncologists Urologists	95% 89%	<0.01
				75-79 years	
			Radiation oncologists Urologists	77% 51%	<0.01
				>80 years	
			Radiation oncologists Urologists	43% 16%	<0.01
				Survival benefits of different treatments Brachytherapy Baseline life expectancy <10 years	
			Urologists Radiation oncologists	38% 35%	
				Baseline life expectancy >10 years	
			Urologists Radiation oncologists	66% 82%	
				External beam radiation Baseline life expectancy <10 years	
			Urologists Radiation oncologists	46% 39%	
				Baseline life expectancy >10 years	
			Urologists Radiation oncologists	67% 86%	
				Radical prostatectomy Baseline life expectancy <10 years	
			Urologists Radiation oncologists	14% 22%	
				Baseline life expectancy >10 years	
			Urologists Radiation oncologists	98% 79%	

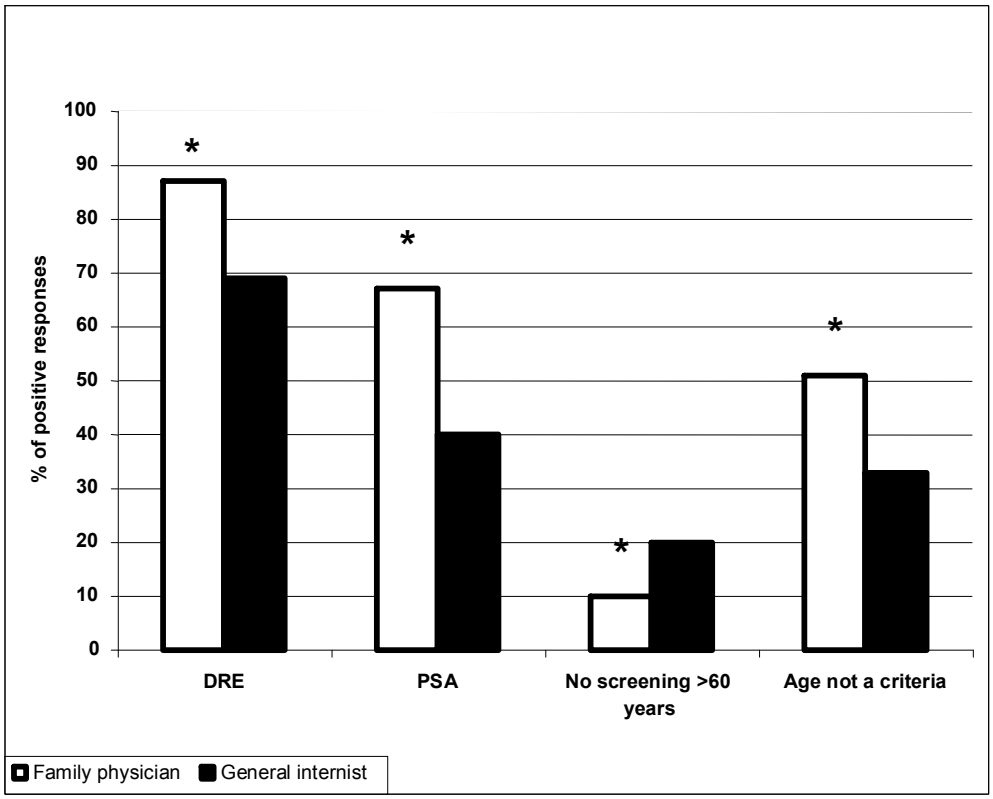
Table C43. Association between physician specialty and patient outcomes (continued)

Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
				Comparison of treatments benefits in patients with clinically localized PC and life expectancy <10 years	
				Radiation is better compared with prostatectomy	
			Radiation oncologists	10%	
			Urologists	9%	<0.01
				Both therapy are the same	
			Radiation oncologists	68%	
			Urologists	40%	<0.01
				Prostatectomy better	
			Radiation oncologists	2%	
			Urologists	17%	<0.01
				Neither offer survival benefit	
			Radiation oncologists	19%	
			Urologists	32%	<0.01
				External beam radiation is better than radical prostatectomy	
			Radiation oncologists	3%	
			Urologists	0%	<0.01
				Both therapy are the same	
			Radiation oncologists	72%	
			Urologists	6%	<0.01
				Prostatectomy better	
			Radiation oncologists	20%	
			Urologists	93%	<0.01
				Neither offer survival benefit	
			Radiation oncologists	3%	
			Urologists	0%	<0.01
				Brachytherapy is better than External beam radiation	
			Radiation oncologists	21%	
			Urologists	30%	<0.01
				Both the same	
			Radiation oncologists	53%	
			Urologists	33%	<0.01
				Neither offer survival benefit	
			Radiation oncologists	2%	
			Urologists	4%	<0.01
				Perceived rates of use the treatments for PC	
				Radical prostatectomy overused	
			Radiation oncologists	82%	
			Urologists	34%	<0.01

Table C43. Association between physician specialty and patient outcomes (continued)

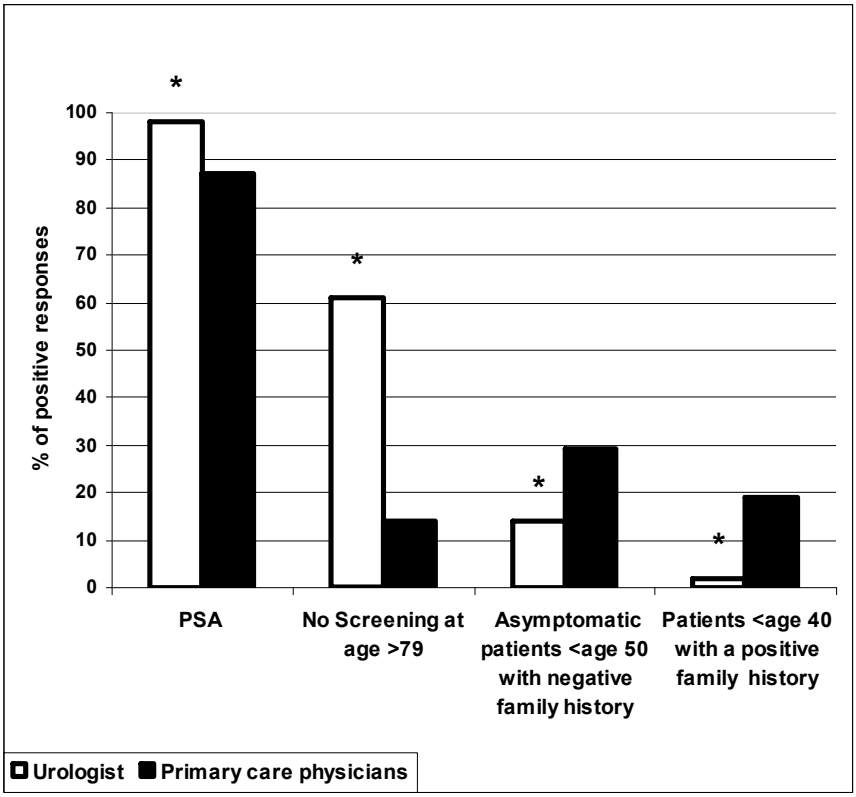
Reference Design	Data Source Population	Analysis Risk Adjustment	Specialty	Outcomes	P Values
				Radical prostatectomy underused	
			Radiation oncologists	16%	
			Urologists	51%	<0.01
				Use at about the right rate	
			Radiation oncologists	16%	
			Urologists	51%	<0.01
				External beam radiation overused	
			Radiation oncologists	13%	
			Urologists	37%	<0.01
				External beam radiation underused	
			Radiation oncologists	50%	
			Urologists	5%	<0.01
				Use at about the right rate	
			Radiation oncologists	35%	
			Urologists	51%	<0.01
				Brachytherapy overused	
			Radiation oncologists	26%	
			Urologists	30%	<0.01
				Brachytherapy underused	
			Radiation oncologists	44%	
			Urologists	27%	<0.01
				Use at about the right rate	
			Radiation oncologists	20%	
			Urologists	21%	<0.01
Vorton, 2004[154]	676 participating in national meetings general practitioners	Logistic regression		*Referring elderly patient with PC to a specialist*	
			Physician sex		
			Males	Odds ratio 0.44	0.03
Survey	546 completed questionnaire	Patient age, sex, comorbidity, physician characteristics	Females	1	
				Non curative approach (hormone therapy and watchful waiting)	
			Ages physicians vs. young	Odds ratio 1.1 (1.02-1.09)	<0.01
			Physician sex	Not significant	
			Physician place to work	Not significant	
				Treatments of prostate cancer in elderly patients	
				Surgical treatment vs. Hormone therapy	
			Physician age	Not significant	
			Physician sex	Not significant	
			Physician place to work	Not significant	

Figure C7. Percentage of responses by family physicians and general internists to the question: "Do you recommend the following for prostate cancer screening for patients 50 years old and older?" (Kim, 2002)[139]



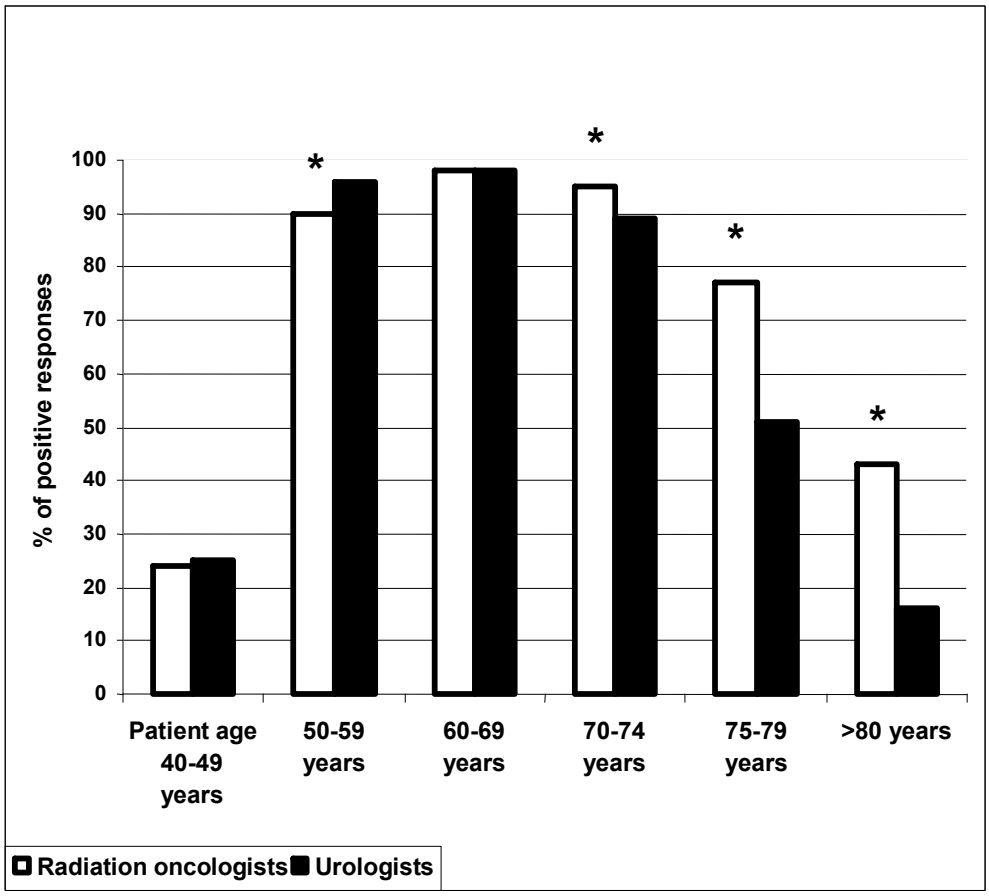
DRE = digital rectal examination; PSA = prostate specific antigen
* significant differences at 95% CI

Figure C8. Percentage of responses by urologists and primary care physicians to the question "Which test do you believe is the single best screening tool? Do you screen for prostate cancer patients older than 79 years? Do you screen young asymptomatic patients?" (McKnight, 1996)[140]



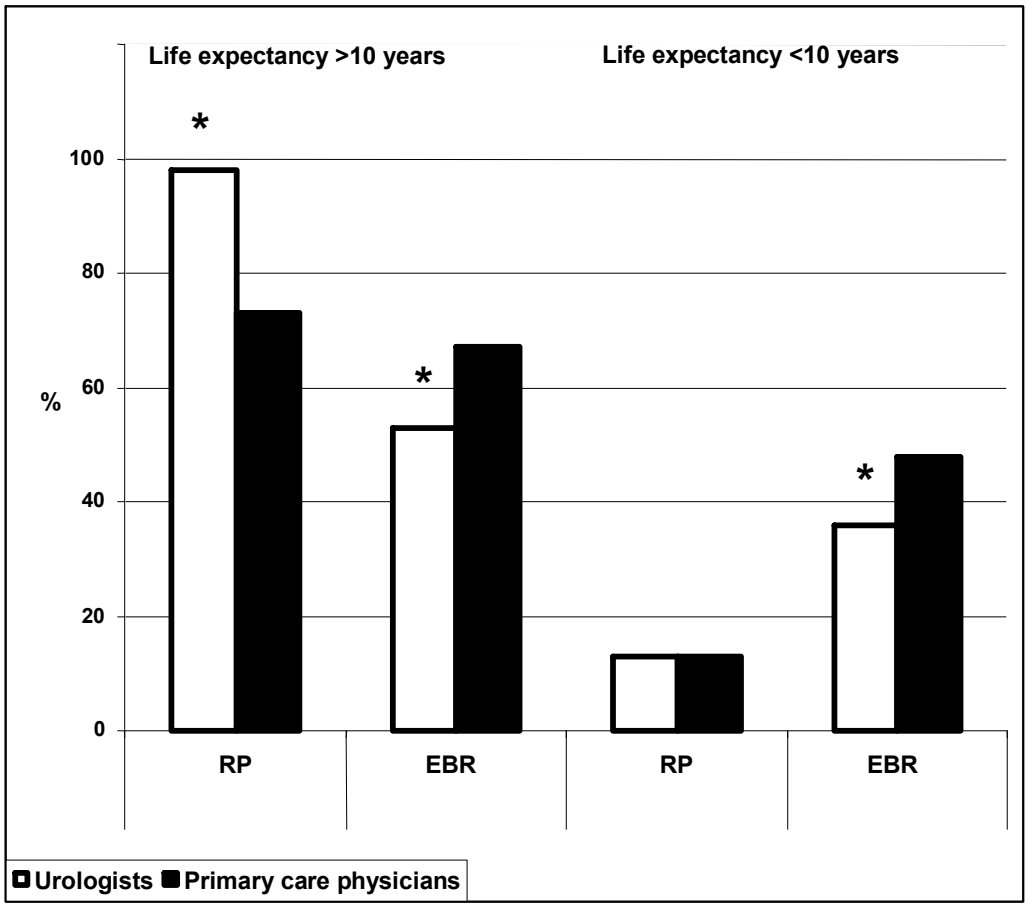
* significant differences at 95% CI

Figure C9. Percentage of responses by urologists and radiation oncologists to the question: "Do you recommend that primary care physicians include PSA testing as a part of the routine physician examinations for men who are at average risk of prostate cancer in each age category?" (Fowler, 2000)[148]



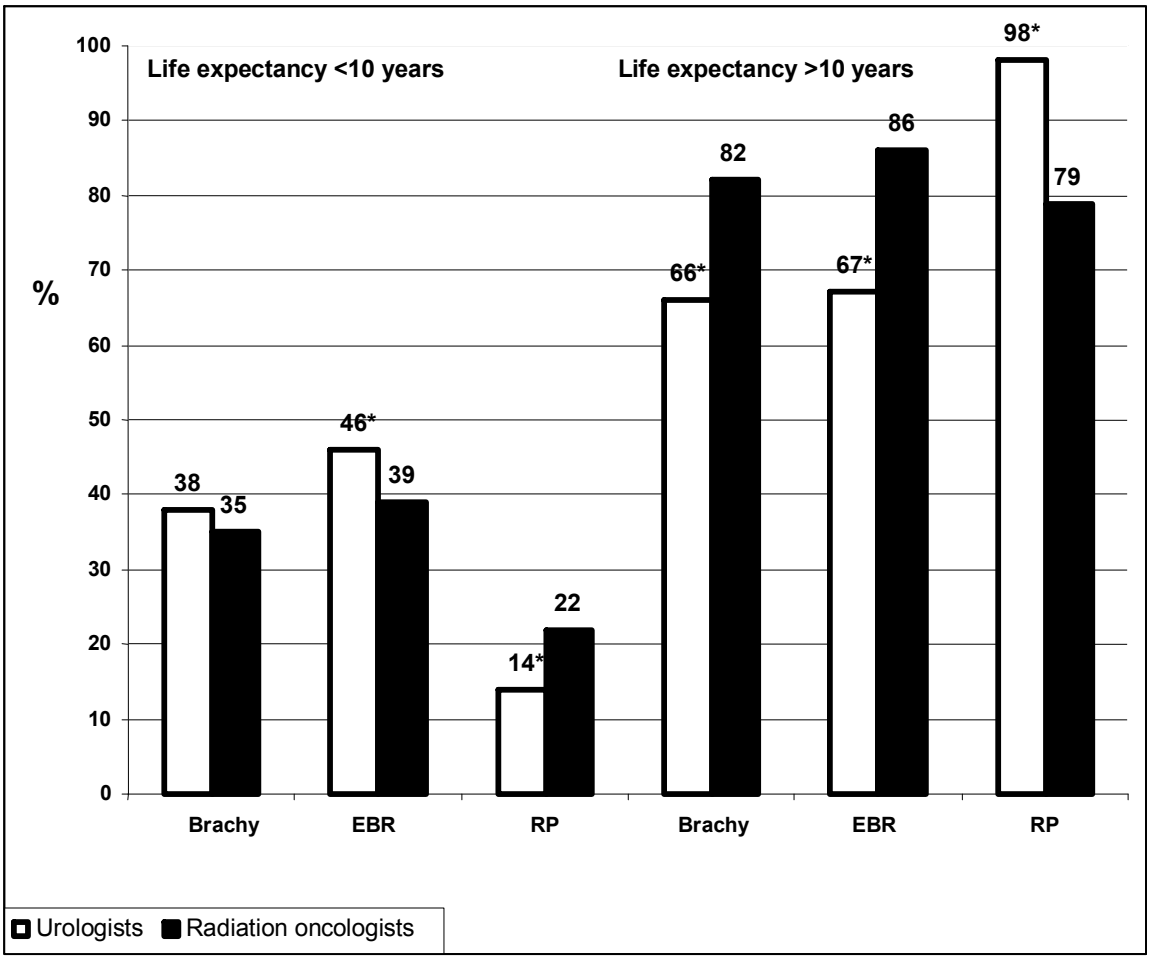
* significant differences at 95% confidence level

Figure C10. Percentage of responses by urologists and primary care physicians to the question whether radical prostatectomy or external beam radiation "probably" or "definitely" offers survival benefit for patients with clinically localized prostate cancer (Fowler, 1998)[141]



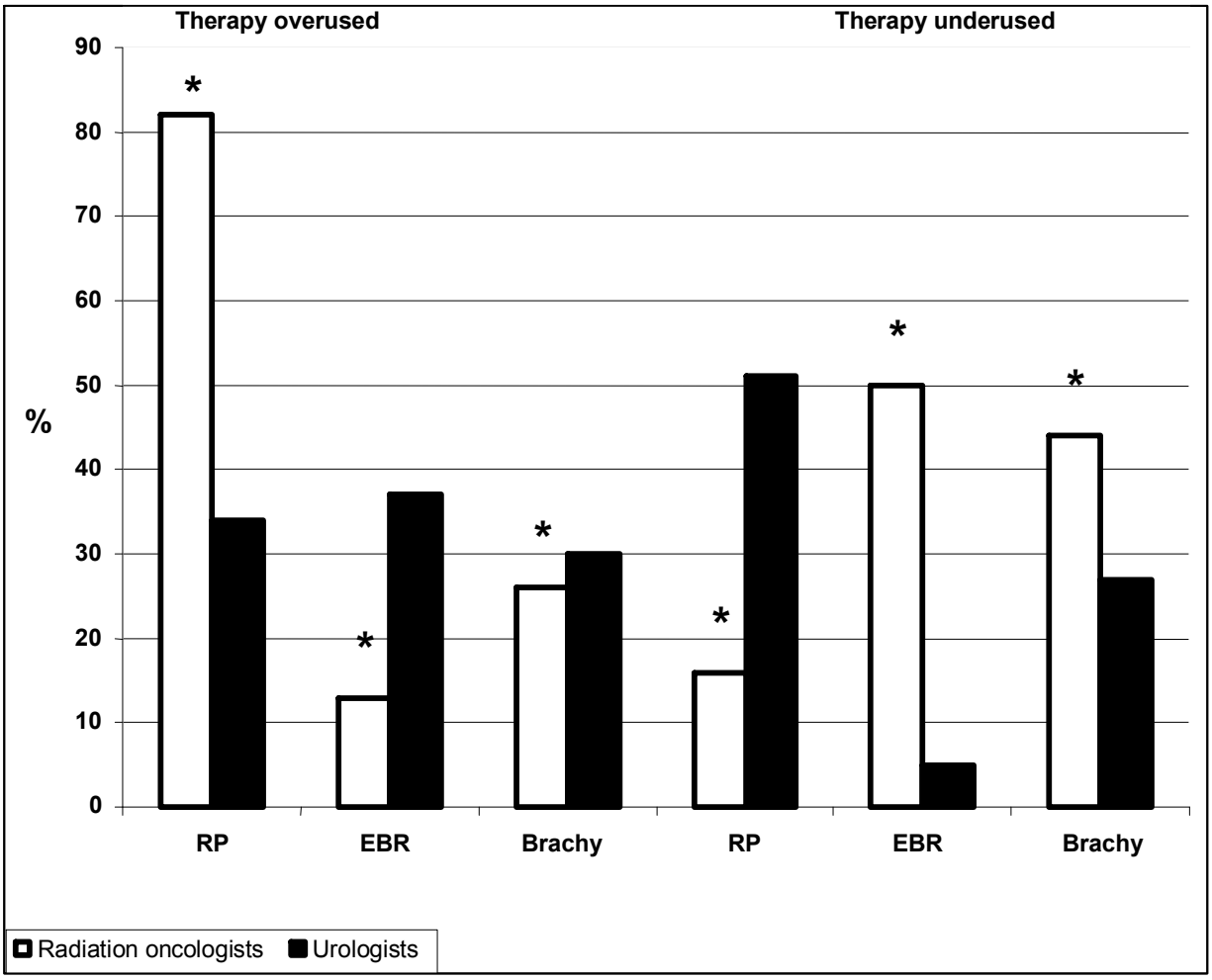
* significant differences at 95% confidence level

Figure C11. Which therapy offers the best survival to patients with clinically localized prostate cancer? Treatment recommendations by urologists and radiation oncologists (Fowler, 2000)[148]



* significant differences at 95% confidence level

Figure C12. Percentage of responses by urologists and radiation oncologists to the question whether they believed that three main potentially curative prostate cancer therapies are overused or underused in the United States (Fowler, 2000)[148]



* significant differences at 95% confidence level

Table C44. Variability in management of prostate cancer (compared with recommended guidelines)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Management Options	Frequency of Practice		P Values
Hanna, 2002[145] Survey	Oncology departments treated urological malignancy 169 clinical oncologists	Not reported	Treatment of localized RP External beam radiotherapy Brachy therapy Hormone therapy Medical Surgical Surveillance only Surveillance + hormone Bladder outlet obstruction RP External beam radiotherapy Poorly differentiated local tumor RP External beam radiotherapy Brachytherapy Hormone therapy medical	Local PC, patient age 55 52% 19% 7% 0% 0% 5% 0% 15% 68% 9% 77% 1 3		
McNaughton Collins, 2002[147] Survey	The American Medical Association Master List of Physicians A random sample of radiation oncologists (559) and urologists (504) working in clinical practice for at least 20 hours weekly	Chi-square test Not reported	 Radiation oncologists Urologists Radiation oncologists Brachytherapy for 20% of patients last year Brachytherapy offers a survival benefit for patients with >10 year life expectancy Brachytherapy has survival value for patients with <10 year life expectancy	PSA screening for men 75-79 years 92% 68-81% Northeast 35% 87% 29%	 Midwest 28% 2% 28%	 <0.01 <0.01 0.6 0.05

Table C44. Variability in management of prostate cancer (compared with recommended guidelines) (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Management Options	Frequency of Practice		P Values
			Urologists			
			Brachytherapy for 20% of patients last year	40%	17%	<0.01
			Brachytherapy offers a survival benefit for patients with >10 year life expectancy	71%	0%	0.4
			Brachytherapy has survival value for patients with <10 year life expectancy	40%	36%	<0.01
				West	South	
			Brachytherapy for 20% of patients last year	28%	26%	
			Brachytherapy offers a survival benefit for patients with >10 year life expectancy	0%	79%	
			Brachytherapy has survival value for patients with <10 year life expectancy	38%	35%	
			Urologists			
			Brachytherapy for 20% of patients last year	24%	28%	
			Brachytherapy offers a survival benefit for patients with >10 year life expectancy	63%	69%	
			Brachytherapy has survival value for patients with <10 year life expectancy	23%	43%	

Table C44. Variability in management of prostate cancer (compared with recommended guidelines) (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Management Options	Frequency of Practice	P Values
Plawker, 1997[143]	The American Urological Association (AUA) data	Chi-square	Ultrasound use for all biopsy	95.8%	
Survey	1,500 randomly selected urologists	Not reported	Sextant biopsy	79.5%	
			Biopsy of transition zone	46.7%	
			Use of age specific PSA in patients with normal exams	69.7%	
			Use PSA density when PSA >4 ngg/dL/dl	40.3%	
			Radiological staging	CT MRI Bone scan	
			All patients regardless of PSA	28.6 3.5 52.4	
			PSA >10 ng/dL	12.6 1.7 29.5	
			PSA >20 ng/dL	12.4 4.2 11.9	
			PSA >30 ng/dL	4.9 0.9 0.3	
			PSA >50 ng/dL	2.5 1.3 0.2	
Gee, 1995[144]	The American Urological Association data	Not reported	Radiological staging In patients >70 years with PC and PSA <10 ng/dL		
Survey	A random sample of 514 urologists who had completed a urological residency, practiced urology at least 20 hours a week in 1994, and practiced urology in 1993		Bone scan	72%	
			CT	40%	
			Cystoscopy	33%	
			IVP	25%	
			Laparoscopic lymph node dissection	6%	
			Pelvic MRI	5%	
			Rectal coil MRI	4%	
				Treatment of PC in patients <70 years	
			Radical prostatectomy	95%	
			External beam radiation	36%	
			Observation	10%	
			Hormone therapy	7%	
			Brachytherapy	5%	
			Cryosurgery	2%	
				Treatment of PC in patients >70 years	
			Radical prostatectomy	48%	
			External beam radiation	74%	
			Observation	38%	
			Hormone therapy	17%	
			Brachy therapy	10%	
			Cryosurgery	4%	

Table C44. Variability in management of prostate cancer (compared with recommended guidelines) (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Management Options	Frequency of Practice	P Values
Shahinian, 2006[157] Retrospective cohort	61,717 men with incident prostate cancer (1/1992-12/1999) identified in the SEER-Medicare database. 1,802 urologists providing care within 1 year of cancer diagnosis identified by the Unique Physician Identifier numbers on Medicare physician claims. Rate of ADT in evidence-based group: Mean – 71.3% 4.6% of urologists >71.3% 11.8% of urologists <71.3% Rate of ADT in uncertain-benefit group: Mean – 36.% 15.2% of urologists >36% 8.4% of urologists <36%	Chi-square statistics and logistic regression models adjusted for patient age, comorbidity, ethnicity, socioeconomic status, SEER region, and year of diagnosis and tumor stage and grade.	The evidence-based group: radiation therapy for T3 tumors (regardless of grade) or T2 tumors with high-grade histology (Gleason score of 8–10) Uncertain benefit group All patients 1992-1999 1992-1996 1997-1999 Evidence-based group Uncertain benefit group All patients 1992-1999 1992-1996 1997-1999 Evidence-based group Uncertain benefit group All patients 1992-1999 1992-1996 1997-1999	The % of the total variance in the use of androgen deprivation therapy attributable to the urologist 25.38 22.68 16 15.6 22.56 % of variance in the use of ADT attributable to stage and grade: 6.63 5.34 13.06 15.4 9.71 To patient characteristics 7.27 4.99 8.99 6.58 4.29	

Table C45. Association between provider characteristics and patient outcomes

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Outcomes	Provider Characteristics		P Values
Kramolowsky, 1995[150]	14 board certified urologists 34 to	Student's t test and chi-square test		Time 1 (baseline)	Time 2 (after intervention)	
			Total charge	$17134 ± 653	$13,826 ± 260	<0.01
			Length of stay (days)	7.8 ± 0.3	5.8 ± 0.2	<0.01
Nonrandomized intervention: physician education on factors that may decrease charges	62 years old performed 256 consecutive radical retropubic prostatectomies at a 401-bed, community, not for profit hospital	Not reported	Charges/day	$2229 ± 54	$2,622 ± 70	<0.01
			Operation time (minutes)	193 ± 5	154 ± 4	
			Estimated blood loss	1053 ± 67	915 ± 50	
			Units transfused	2.5 ± 0.2	1.7 ± 0.1	
			Central arterial lines	43%	21%	
			ICU used	51%	19%	
			Epidural used	68%	91%	
Kramolowsky, 1995[149]	625 males diagnosed with carcinoma of	Student's t test and chi-square test		Time 1 (baseline)	Time 2 (after intervention)	
			Total charge	$17,201 ± 943	$15,931 ± 420	<0.01
				$16,798 ± 683	$15,286 ± 506	
Nonrandomized intervention: physician education on factors that may decrease charges	the prostate gland undergoing radical prostatectomy by one of 20 urologists at 5 community hospitals in VA 1991-1993	Not reported		$18,601 ± 694	$14,084 ± 621	<0.01
			Length of stay (days)	7.7 ± 0.2	5.6 ± 0.1	
			Charges/day	$2,314 ± 37	$2,846 ± 40	<0.01
Maliski, 2004[156]	286 California patients with biopsy-proven prostate cancer, uninsured, with household income less than 200% of the Federal Poverty Level. 233 (81%) consented and completed the	Multivariate logistic regression	Patient outcomes: SF-12	High self-efficacy	Low self efficacy	
			Physical function	64.7 ± 32.9	53.8 ± 35.8	0.03
			Role-physical	62.4 ± 33.0	57.0 ± 33.1	0.30
			Mental health	47.5 ± 12.6	44.3 ± 13.6	0.12
			Role-emotional	73.3 ± 27.2	63.0 ± 27.8	0.02
			Social function	72.7 ± 31.7	52.9 ± 35.2	<0.01
			Vitality	53.1 ± 28.2	45.8 ± 28.1	0.10
			Bodily pain	69.9 ± 30.2	62.0 ± 29.1	0.10
			General health	51.6 ± 29.7	44.6 ± 24.5	0.12
			UCLA PCI			
			Urinary function	74.5 ± 28.0	61.9 ± 32.5	0.01
			Urinary bother	73.0 ± 34.0	56.6 ± 34.4	<0.01
			Bowel function	77.4 ± 24.7	65.4 ± 24.2	<0.01
		Patient age and treatment				
		Scales: Perceived Efficacy in Patient-Physician Interactions (PEPPI) to				

Table C45. Association between provider characteristics and patient outcomes (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Outcomes	Provider Characteristics		P Values
	surveys. All were participants in the Improving Access, Counseling, and Treatment for Californians with Prostate Cancer (IMPACT), a state-funded program providing free prostate cancer treatment to indigent men	assess a person's confidence in his ability to communicate with his physician; prostate-specific HRQOL; the Medical Outcomes Study five-item Mental Health Index (MHI-5)	Bowel bother	75.4 ± 31.7	63.0 ± 27.3	0.01
			Sexual function	34.5 ± 31.5	23.4 ± 26.8	0.02
			Sexual bother	35.6 ± 38.9	23.0 ± 31.6	0.04
			Symptom distress scale	19.2 ± 6 .6	24.7 ± 7.9	<0.01
			Satisfaction with care			
			Satisfaction with healthcare received	1.2 ± 0.7	2.1 ± 1.5	<0.01
			Some things could have been better	3.1 ± 2.1	3.6 ± 1.9	0.10
			Have not had as much contact as should have	3.3 ± 2.2	3.8 ± 1.8	0.11
			Amount of time adequate	4.2 ± 2.1	3.6 ± 1.9	0.09
			Could have listened more carefully	5.4 ± 1.2	4.6 ± 1.7	<0.01
			Have explained completely	1.2 ± 0.9	1.9 ± 1.4	<0.01
			Have treated me with respect	4.3 ± 2.2	4.1 ± 1.8	0.41
			Could have been kinder	5.7 ± 0.8	4.1 ± 1.8	<0.01
			Have extraordinary confidence in provider	1.6 ± 1.2	2.7 ± 1.6	<0.00
Diamond, 1991[151]	The Patterns of Care Study (PCS) of all facilities in the U.S. where 770 males were treated for PC in 1978	Logistic regression		Facility structure per physician	Annual number of new patients per physician	
			In hospital mortality	Not significant	Positive	<0.01
Facility survey		Not reported	Major complication	Positive	Not significant	<0.01
			Local Recurrence	Not significant	Not significant	
			Any recurrence	Not significant	Not significant	
Maliski, 2005[155]	149 males with a biopsy positive for prostate cancer in a large tertiary medical center, an urban Veterans Affairs medical center, and an urban public hospital. Subjects were followed for 6 and 12 months to complete the UCLA Prostate	Multivariate logistic regression	Patient fatigue	Facility		
				Public	Private	
Secondary analysis of prospective cohort the utilities study			Fatigued	67.83%	32.14%	
			Not fatigued	35.29%	64.71%	<0.01
		Patient age and treatment	Progression of fatigue	53.49%	46.51%	0.06
				Odds ratio		
Survey			Progression >10 points in fatigue from baseline	5.82 (1.78-19.07)	1 (reference)	<0.01

Table C45. Association between provider characteristics and patient outcomes (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Outcomes	Provider Characteristics			P Values
	Cancer Index (PCI) questionnaire to measure prostate-specific HRQOL						
Greenwald, 1992[158] Prospective cohort with two overlapping samples	264 males diagnosed with PC from 1980-1982, identified in the Cancer Surveillance System (CSS), a part of the SEER Program 1,000 consecutive cases of newly diagnosed prostatic cancer from the CSS	Cox regression Patient age, income, education, treatment, cancer stage, HMO membership	Sample 1 Treatment received Surgery Radiation Mortality Sample 2 Treatment received Surgery Radiation Mortality	HMO members vs. fee for service Relative risk 95% CI 0.26 0.11 0.58 2.99 1.26 7.09 0.334 0.196 0.734 0.45 0.28 0.71 4.08 2.49 6.69 0.736 0.547 0.991			
Potosky, 1999[159] Prospective cohort	21,741 men age 65 and over diagnosed with prostate cancer between 1985 and the end of 1992 and followed through 1994 in 5 county San Francisco-Oakland metropolitan area, and 13-county Seattle-Puget Sound area	Logistic regression to estimate the odds ratios of receiving one of two treatments for men with nonmetastatic prostate cancer (local and regional stage) Patient age, race, education level, and clinical	Treatment received Prostatectomy Radiation Conservative management Prostatectomy Radiation Conservative management All cause mortality PC mortality	California HMO Medicare 13.6% 28.3% 53.7% 25.2% 31.3% 41.3% Seattle HMO Medicare 17.3% 36.3% 53.3% 31.3% 27% 29.3% Relative risk HMO vs. Medicare 1.01 (0.94-1.08) 1.25 (1.13-1.39)			<0.01 <0.01

Table C45. Association between provider characteristics and patient outcomes (continued)

Reference/ Design	Data Source Population	Analysis Risk Adjustment	Outcomes	Provider Characteristics	P Values
	participating in SEER Program	characteristics. The Cox proportional hazards regression model was used to estimate the relative risk of overall and cause-specific 10-year mortality among HMO cases relative to those in the Medicare FFS setting. Patient age at diagnosis, race, stage, grade, comorbidity, and group educational status			

Table C46. Association between physician characteristics and learning curves for treatment of prostate cancer

Reference Procedure	Physician Experience, Training	Cases/ Curves	Operative Time (hours)	% Open Surgery	% Complica-tions	Blood Loss (ml)	% Transfu-sions	LOS (days)	% Positive Margins	Catheteri-zation (Days)	% Continence	% Potency
Ahlering, 2003[160] Robot assisted LRP (June 2002-March 2003)	1 fellowship trained urological oncologist; 1-day da Vinci LRP course + 2 cadaveric robotic LRP	45/12	3.45	0	13.3	145	2.2	1.6	35.5	2.2% in 1 week	1 week-33% pad free	Not reported
Arai, 2003[161] LRP (December 1999 and September 2001)	6 centers Several surgeons with no previois experience on LRP	148	6.7	10.8	37.2	856	6	Not reported	Not reported	Removed in 1 week in 49.3% of cases	Not reported	Not reported
Baumert, 2004[162] LRP (December 2000-April 2002)	1 surgeon 30 laparoscopic procedures, assisting in 20 LRP	50 50 Total 100/50	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported	62.5* 11.1* 12.8-T2 31.8-T3	Not reported	Not reported	Not reported
Cathelineau, 2004[40] A. Transperitoneal and B. extraperitoneal LRP (2002)	1surgeon with >400 Transperitoneal LRP 1 surgeon with >80 Transperitoneal LRP	200 A. 100 B. 100	 2.8 2.7		10 9	360 375	4 3	5.8 6.1	15 21			
Dahl, 2003[163] LRP (May 2000 to May 2001)	No previous experience	70 1-10 11-70	4.6 6.4 4.6	1.4	20	449 811 295	5.7	2.5	11.4		At 3 months, 85% used 0-1 pad/day	

Table C46. Association between physician characteristics and learning curves for treatment of prostate cancer (continued)

Reference Procedure	Physician Experience, Training	Cases/ Curves	Operative Time (hours)	% Open Surgery	% Complica-tions	Blood Loss (ml)	% Transfu-sions	LOS (days)	% Positive Margins	Catheteri-zation (Days)	% Continence	% Potency
Eden, 2004[164]	1 surgeon, unknown	200								Days	Pad free (3m)	Erection (3m)
Transperitoneal laparoscopic radical prostatectomy (TLRP) and extraperitoneal approach (ELRP)	experience	TLRP	4.0*	0.5	4	310	1	3.8*	16	11.3	60	10
		ELRP	3.2*	0	2	201.5	0	2.6*	16	10.1	70	60
		1-100										
		TLRP		0	2	320	0	3.5	14	10		
		ELRP		0		246.2	0	2.5	10	10		
		150-200										
		TLRP	3.6								56	20
		ELRP	3.1								80	70
El-Feel, 2003[165,166]	A. 2 surgeons (>100 cases)	100 randomly assigned										
LRP (November 2001 to May 2002)	B. 2 junior surgeons (<30 cases)	among 4 surgeons										
		LRP	3.6									
		LRP with robot	4.9									
			3									
		A. LRP	4.9									
		LRP/robot										
		B. LRP	4.8									
		LRP+ nerve sparing										
		A.	3*									
		B.	4.1*									
		LPR+ pelvic lymphadenectomy										
		A.	3.7*									
		B.	5.4*									
		LPR+ sural nerve grafting										
		A.	4.6*									
		B.	7.7*									

Table C46. Association between physician characteristics and learning curves for treatment of prostate cancer (continued)

Reference Procedure	Physician Experience, Training	Cases/ Curves	Operative Time (hours)	% Open Surgery	% Complica-tions	Blood Loss (ml)	% Transfu-sions	LOS (days)	% Positive Margins	Catheteri-zation (Days)	% Continence	% Potency
El-Feel, 2003[165] (November 2001 to May 2002)	A. 2 surgeons (>100 cases) B. 2 junior surgeons (<30 cases)	100 randomly assigned among 4 surgeons A. B.	 3.6* 5.8*						 19* 34* Adjusted OR 2 (Not significant)			
Fabrizio, 2003[167] Transperitoneal LPR (March 2001 - September 2001)	A. 12 cases - the mentor (>200 LRP) with assisting trainee B. 18 cases - the trainee with assisting mentor C. 30 cases – the trainee alone with assisting urological residents	30 A. B. C.	 4.1 4.3 5.2			 150 250 250	 5.6	 3 3 3	 16 22 39	 13 11 9		
Freder, 2005[168] LPR	A. 1 surgeon (600 cases open retropubic RP and laparoscopy) B. 1 surgeon (150 cases open retropubic RP and laparoscopy) C.1 surgeon (150 cases in laparoscopis). D. fellows in laparoscopic program	1,000 A. 1-50 51-100 101-150 B. 1-50 51-100 101-150 C. 1-50 51-100 101-150 D. 1-50 51-100 101-150	 5.5* 5.0* 3.3* 4.8* 3.9* 3.5) 4.5* 3.9* 3.9* 4.1		 16 8 12 12 16 4 20 36 0 4 4 0				 4.3 0 10.3 0 12.5 8.5 9.3 0 6.3 15.3 NA	<14 days 66* 92* 88* 70* 66* 68* 70* 64* 84* 40*		

Table C46. Association between physician characteristics and learning curves for treatment of prostate cancer (continued)

Reference Procedure	Physician Experience, Training	Cases/ Curves	Operative Time (hours)	% Open Surgery	% Complica-tions	Blood Loss (ml)	% Transfu-sions	LOS (days)	% Positive Margins	Catheteri-zation (Days)	% Continence	% Potency
Ghavamian, 2004[169] LPR transperitoneal LRP and extraperitoneal LRP (May 2001-Spetember 2002)	1 surgeon with fellowship in urologic oncology with laparoscopic experience	60 1-10 11-20 21-30 31-40 41-60	 6.9* 4.7 4.1 3.7 3.3		 80 40 30 30 5	 316 398 252 291 277						
Hoznek, 2001[170] LPR (May 1998-December 2000)	1 surgeon with unknown experience	134 1-10 11-20 21-40 41-60 61-80 81-100 101-120 121-134	 8.1 7.8 5.1 4.2 3.9 4.0 4.8 4.5					 9.1 5.5 7.3 4.8 6.5 6.8 5.8 5.6				
Keyes, 2006[171] Prostate brachytherapy (July 1998-Novemebr 2002)	Seven oncologists with >20 procedures experience	805 1-200 cases 201-400 401-600 601-805 1-200 cases 201-400 401-600 601-805			Acute urinary retention 1 1.2 (0.7-1.9) 0.5 (0.3-0.9) 0.3 (0.2-0.7) Prolonged AUR 1 0.9 (0.4-1.9) 0.4 (0.2-1) 0.4 (0.1-0.9)							
Rassweiler, 2003[47] LPR vs. radical prostatectomy (March 1999-September 2002)	2 surgeons performed both operations	1-219 220-439	4.8 3.6*	3.7 0.5	6.4 4.1*	1,100 800*	30.1 9.6*	12 11		12.8% (7) 13.2% (7)	9.7 8.3	

Table C46. Association between physician characteristics and learning curves for treatment of prostate cancer (continued)

Reference Procedure	Physician Experience, Training	Cases/ Curves	Operative Time (hours)	% Open Surgery	% Complica-tions	Blood Loss (ml)	% Transfu-sions	LOS (days)	% Positive Margins	Catheteri-zation (Days)	% Continence	% Potency
Stolzenburg, 2005[172]	4 trainees in mentor-initiated program	Camera holders/ assist										
Endoscopic extraperitoneal radical prostatectomy		4/140			4		4		14	7.6 (4; 20)		
		62/15			0		0		12	None		
		20/45			0		0		15	5.9 (5; 10)		
		5/18			0		0		7	5.4 (5; 7)		
		Mentor			0		0		12	6.2 (4; 14)		

*** S**ignificant difference at 95% confidence interval

Table C47. Distribution of urologists and radiation oncologists in the United States*

	Total Number of Urologists		Total Number of Radiation Oncologists	
	Mean	Standard Error	Mean	Standard Error
East North	465	39	207	16
East South	207	50	68	20
Middle Atlantic	878	48	336	19
Mountain	295	31	118	12
New England	351	34	177	14
Pacific	460	39	199	16
South Atlantic	492	31	177	12
West North	154	35	64	14
West South	396	43	139	17
Midwest	298	28	3,903	39
Northeast	534	30	233	12
South	418	24	148	10
West	364	26	151	10
USA	10,026	102	3,903	41

* An average of absolute number of physicians identified themselves as urologists in the U.S. were obtained from the surveys conducted by the American Medical Association from 1999-2005[173-176]

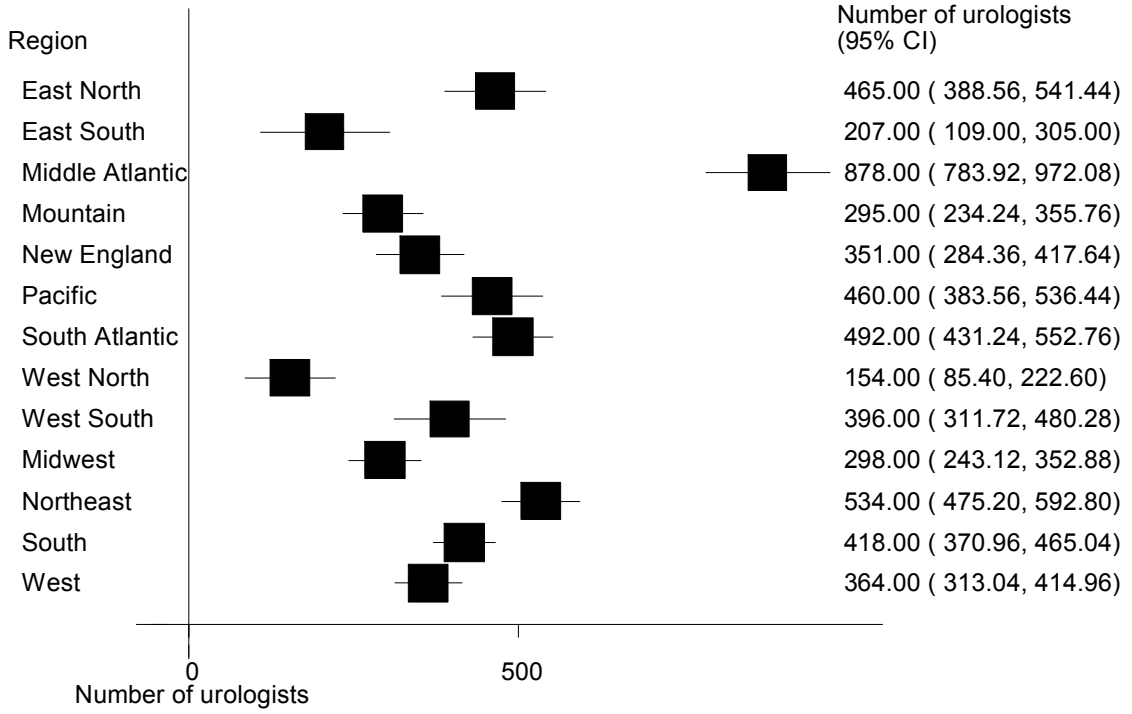
Table C48. Significant geographic differences in total numbers of urologists

Regions		Mean Differences in Total Number	Standard Error	p
East North	East South	258	64	<0.01
East North	Middle Atlantic	-414	62	<0.01
East North	Mountain	169	50	<0.01
East North	New England	114	52	0.03
East North	West North	311	52	<0.01
East South	Middle Atlantic	-671	70	<0.01
East South	New England	-144	61	0.02
East South	Pacific	-253	64	<0.01
East South	South Atlantic	-285	59	<0.01
East South	West South	-189	66	<0.01
Middle Atlantic	Mountain	583	57	<0.01
Middle Atlantic	New England	527	59	<0.01
Middle Atlantic	Pacific	418	62	<0.01
Middle Atlantic	South Atlantic	387	57	<0.01
Middle Atlantic	West North	725	60	<0.01
Middle Atlantic	West South	482	64	<0.01
Mountain	Pacific	-165	50	<0.01
Mountain	South Atlantic	-196	44	<0.01
Mountain	West North	142	47	<0.01
New England	Pacific	-109	52	0.04
New England	South Atlantic	-141	46	<0.01
New England	West North	197	49	<0.01
Pacific	West North	306	52	<0.01
South Atlantic	West North	338	47	<0.01
West North	West South	-242	55	<0.01
Midwest-Northeast	Northeast	-236	41	<0.01
Midwest-South	South	-120	37	<0.01
Northeast-South	South	116	38	<0.01
Northeast-West	West	169	39	<0.01

Table C49. Significant geographic differences in total numbers of radiation oncologists

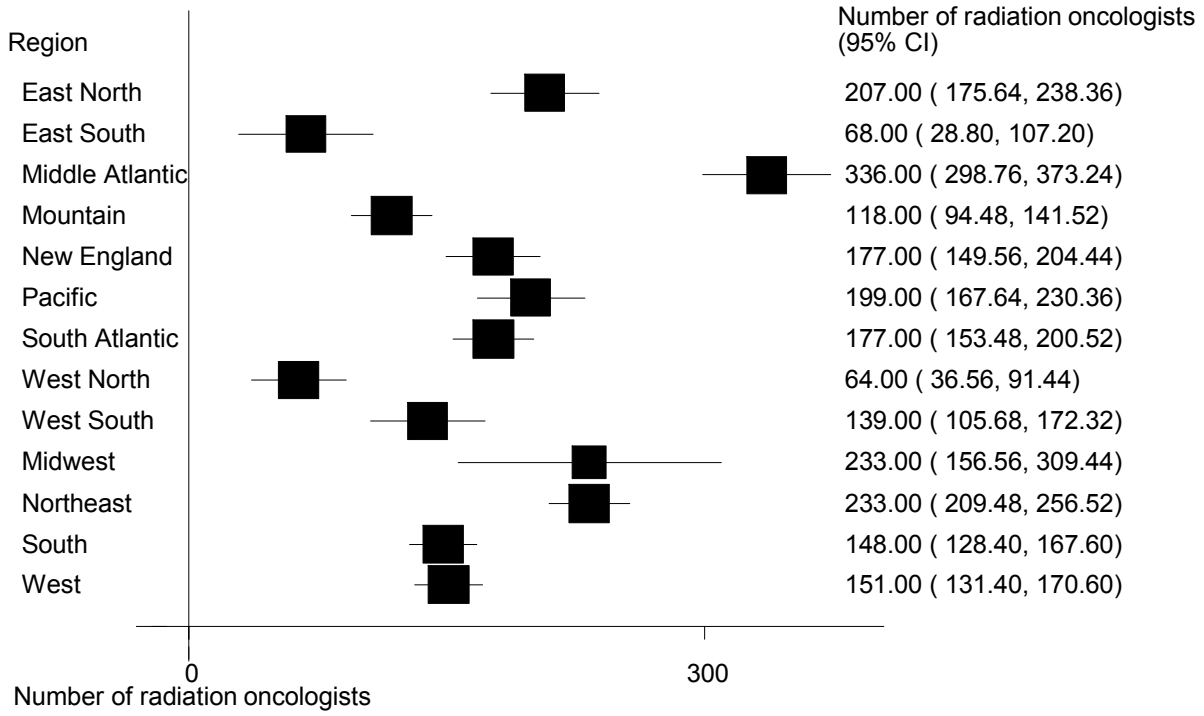
Regions	Mean Differences in Total Number	Standard Error	p
East North - East South	139	25	<0.01
East North - Middle Atlantic	-129	25	<0.01
East North - Mountain	89	20	<0.01
East North - West North	143	21	<0.01
East North - West South	68	23	<0.01
East South - Middle Atlantic	-268	28	<0.01
East South - Mountain	-50	24	0.04
East South - New England	-109	24	<0.01
East South - Pacific	-130	25	<0.01
East South - South Atlantic	-108	24	<0.01
East South - West South	-71	26	0.01
Middle Atlantic - Mountain	218	23	<0.01
Middle Atlantic - New England	159	24	<0.01
Middle Atlantic - Pacific	137	25	<0.01
Middle Atlantic - South Atlantic	160	23	<0.01
Middle Atlantic - West North	272	24	<0.01
Middle Atlantic - West South	197	26	<0.01
Mountain - New England	-59	18	<0.01
Mountain - Pacific	-81	20	<0.01
Mountain - South Atlantic	-59	18	<0.01
Mountain - West North	54	19	<0.01
New England - West North	113	20	<0.01
Pacific - West North	134	21	<0.01
Pacific - West South	60	23	0.01
South Atlantic - West North	112	19	<0.01
West North - West South	-75	22	<0.01
Midwest - Northeast	-103	16	<0.01
Northeast - South	85	15	<0.01
Northeast - West	81	16	<0.01

Figure C13. Distribution of urologists* in the U.S. regions (pooled analysis from 1999-2004)



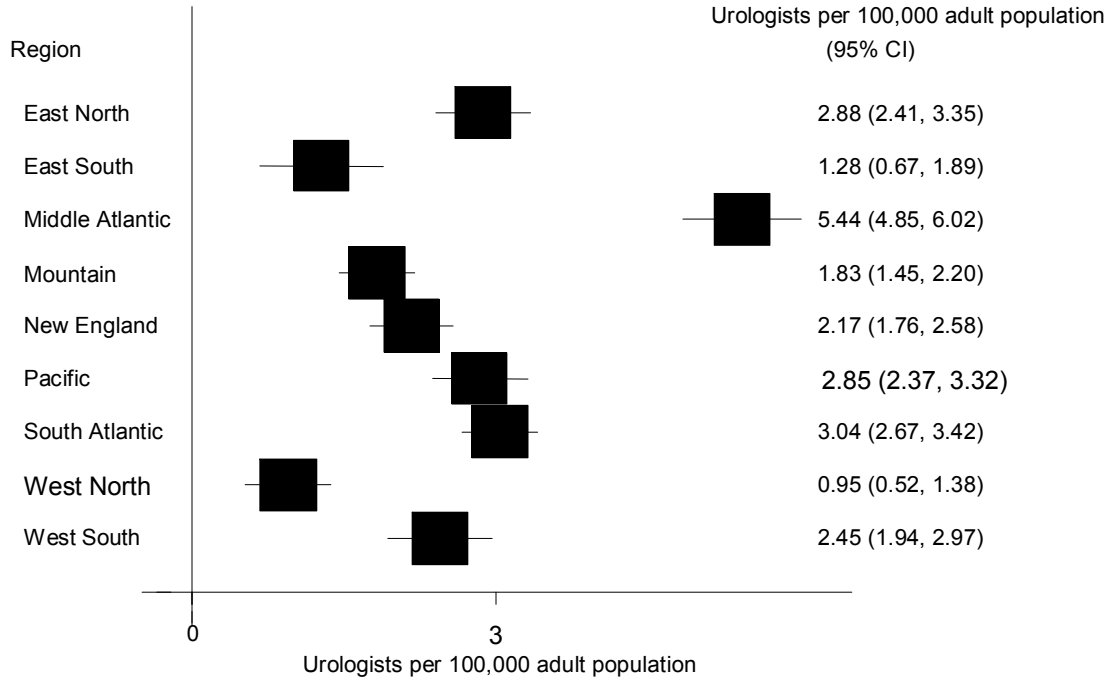
* An average of absolute number of physicians identified themselves as urologists in the U.S. were obtained from the surveys conducted by the American Medical Association from 1999-2005[173-177]

Figure C14. Distribution of radiation oncologists* in U.S. regions



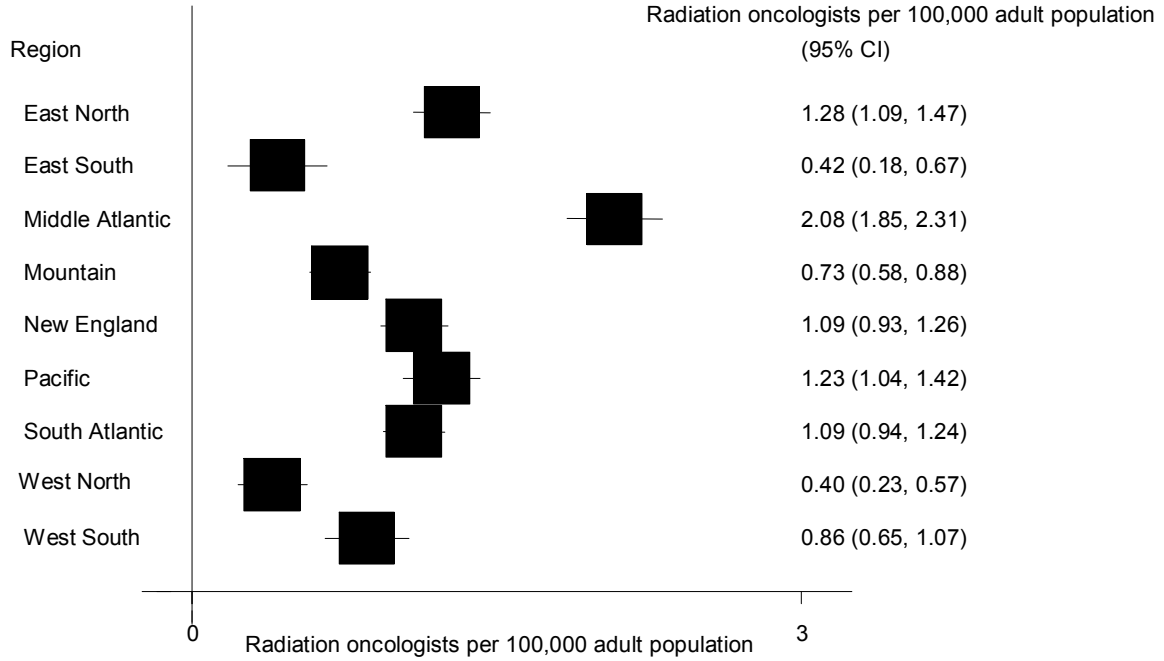
* An average of absolute number of physicians identified themselves as radiation oncologists in the U.S. were obtained from the surveys conducted by the American Medical Association from 1999-2005.[173-177]

Figure C15. Ratio* of urologists (1999-2004) per 100,000 adult population (2002) in U.S. regions



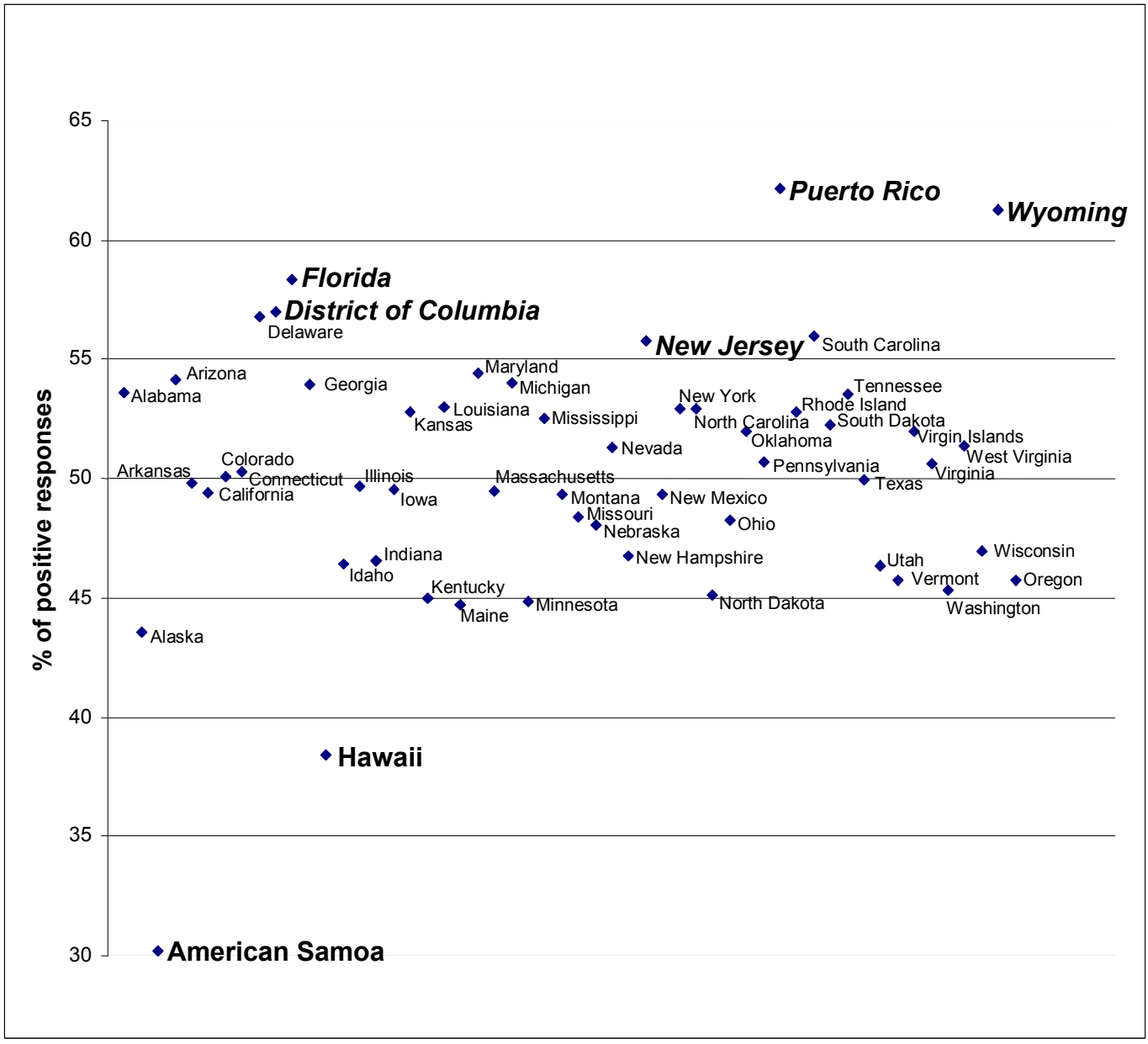
* The ratio was calculated with an average of number of urologists in each state from 1999-2004 in numerator and the Census 2002 adult population in each state in denominator.

Figure C16. Ratio* of radiation oncologists (1999-2004) per 100,000 adult population (2002) in U.S. regions



* The ratio was calculated with an average number of radiation oncologists in each state from 1999-2004 in numerator and the Census 2002 adult population in each state in denominator.

Figure C17. Geographic variations in PSA testing*



* Average responses in U.S. regions to the BRFSS questionnaire[138] having PSA test during last 2 years in males older than 40 years

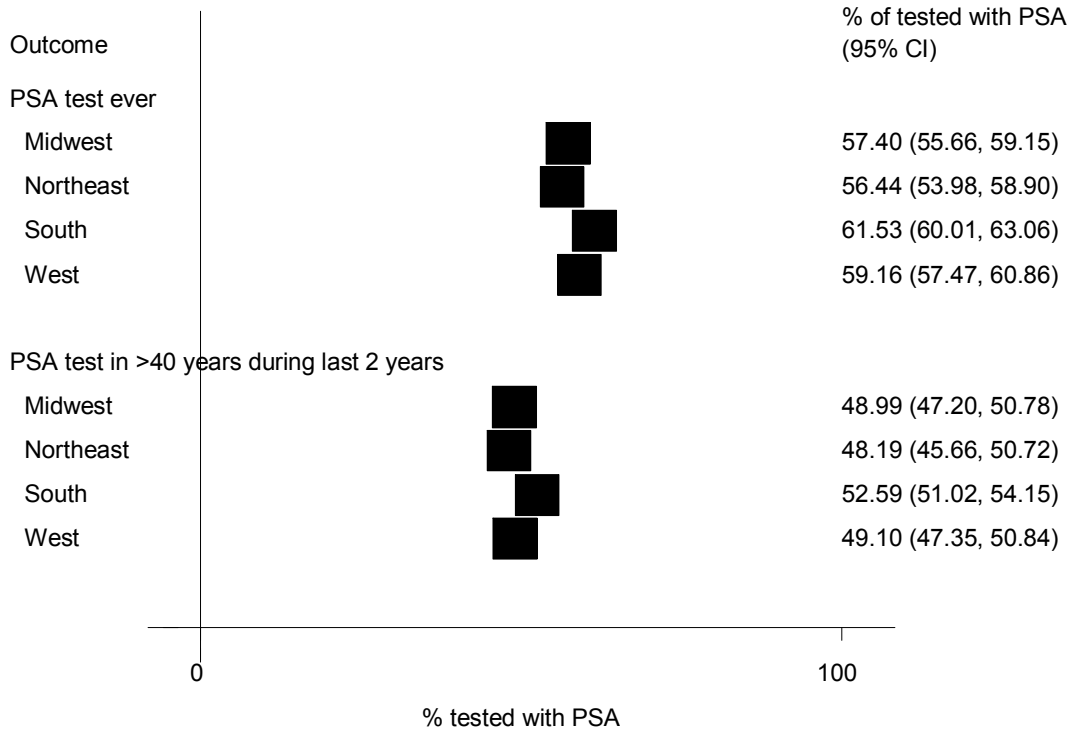
Table C50. Significant geographic differences in % of males >40 years of age who had PSA test during last 2 years

Regions		Differences in % of PSA Testing			
		Mean %	Lower 95% CI	Upper 95% CI	P Value
East North	Pacific	4.07	0.49	7.65	0.03
East North	South Atlantic	-5.77	-9.02	-2.52	<0.01
East South	Pacific	6.16	2.40	9.92	<0.01
East South	South Atlantic	-3.67	-7.12	-0.23	0.04
Mountain	New England	3.57	0.36	6.79	0.03
Mountain	Pacific	6.14	2.77	9.50	<0.01
Mountain	South Atlantic	-3.70	-6.71	-0.69	0.02
New England	South Atlantic	-7.27	-10.72	-3.83	<0.01
Pacific	South Atlantic	-9.84	-13.42	-6.26	<0.01
Pacific	West North	-3.90	-7.48	-0.33	0.03
Pacific	West South	-6.18	-9.94	-2.42	<0.01
South Atlantic	West North	5.93	2.69	9.18	<0.01
South Atlantic	West South	3.66	0.21	7.10	0.04
Midwest	South	-3.60	-5.97	-1.22	<0.01
Northeast	South	-4.39	-7.37	-1.42	<0.01
South	West	3.49	1.14	5.84	<0.01

Table C51. Significant geographic differences in % of males who ever had PSA test

Regions		Differences in % of PSA Testing			
		Mean %	Lower 95% CI	Upper 95% CI	P Value
East North	Mountain	-3.49	-6.37	-0.62	0.02
East North	South Atlantic	-5.65	-8.76	-2.55	<0.01
East North	West South	-3.58	-6.88	-0.29	0.03
East South	New England	4.26	0.78	7.73	0.02
East South	Pacific	4.41	0.81	8.00	0.02
East South	South Atlantic	-3.79	-7.09	-0.50	0.02
Middle Atlantic	New England	5.77	0.28	11.26	0.04
Middle Atlantic	Pacific	5.92	0.36	11.49	0.04
Mountain	New England	5.89	2.81	8.97	<0.01
Mountain	Pacific	6.04	2.83	9.26	<0.01
Mountain	West North	4.05	1.18	6.93	0.01
New England	South Atlantic	-8.05	-11.35	-4.76	<0.01
New England	West South	-5.98	-9.45	-2.51	<0.01
Pacific	South Atlantic	-8.20	-11.63	-4.78	<0.01
Pacific	West South	-6.13	-9.73	-2.54	<0.01
South Atlantic	West North	6.21	3.11	9.32	<0.01
West North	West South	-4.14	-7.44	-0.85	0.01
Midwest	South	-4.13	-6.44	-1.81	<0.01

Figure C18. Geographic differences in PSA testing in U.S. regions*



* Average responses in U.S. regions to the BRFSS questionnaire[138] having PSA test ever and during last 2 years in males older than 40 years

Figure C19. Geographic variations in age adjusted incidence of prostate cancer per 100,000 male population (pooled analysis from 4 studies and CDC data)

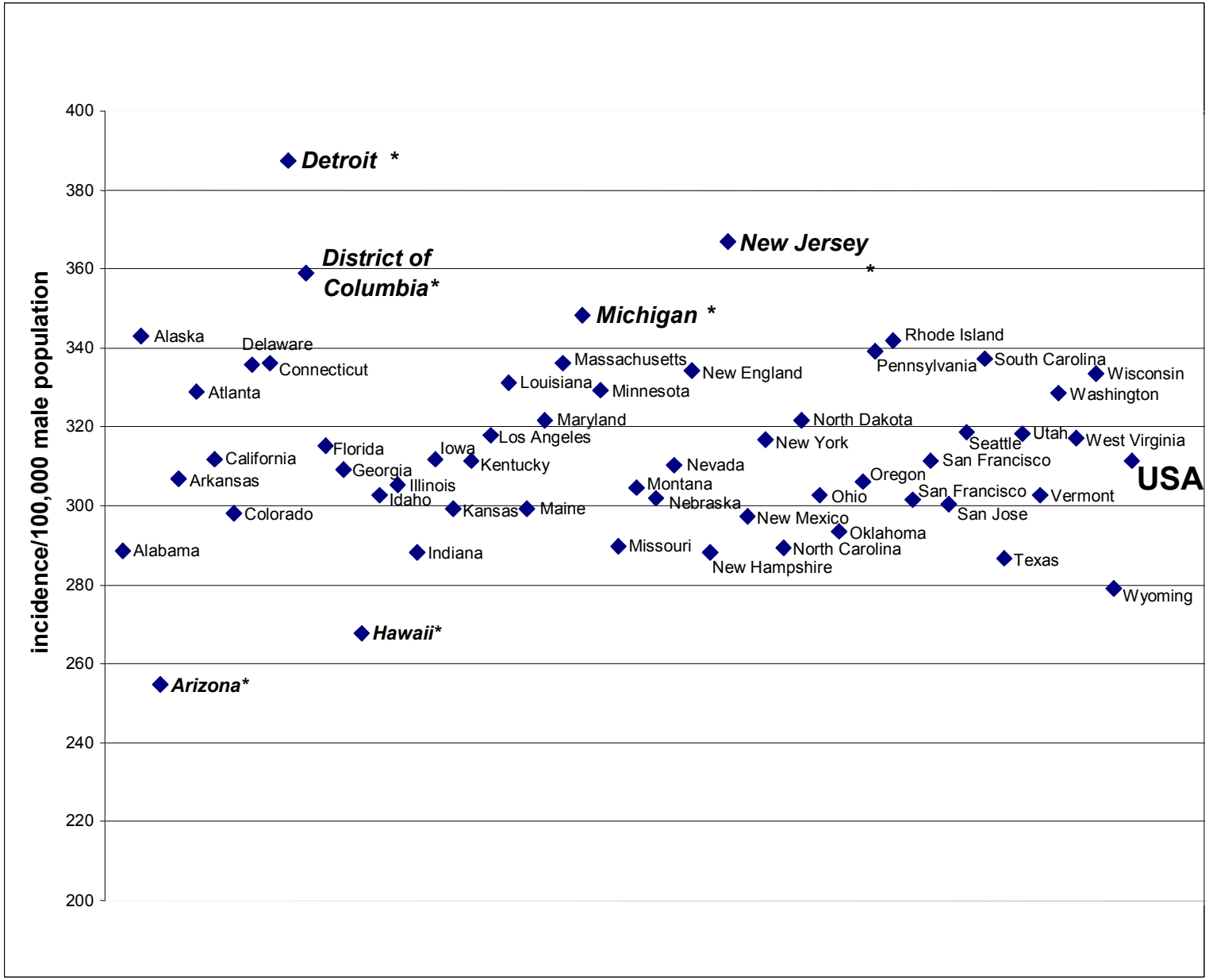


Table C52. Incidence of prostate cancer in the U.S. regions reported in individual studies

Region	Incidence	Lower 95% CI	Upper 95% CI
East North			
Lu-Yao, 1994[102]	323.2	192.3	454.0
Jemal, 2005[105]	487.3	396.1	578.4
CDC, 1999-2004[178]	183.2	175.4	191.0
East South			
Jemal, 2005[105]	383.0	225.1	540.8
CDC, 1999-2004[178]	167.8	150.8	184.9
Middle Atlantic			
Jemal, 2005[105]	514.5	402.9	626.1
CDC, 1999-2004[178]	199.4	188.5	210.4
Mountain			
Lu-Yao, 1994[102]	334.3	241.8	426.8
Jemal, 2005[105]	401.5	327.1	475.9
Escobedo, 2004[106]	118.3	42.8	193.7
CDC, 1999-2004[178]	161.8	154.0	169.7
New England			
Lu-Yao, 1994[102]	251.5	120.6	382.3
Jemal, 2005[105]	434.6	355.7	513.6
Escobedo, 2004[106]	158.9	83.4	234.3
CDC, 1999-2004[178]	192.0	183.7	200.4
Pacific			
Lu-Yao, 1994[102]	392.8	317.3	468.3
Jemal, 2005[105]	447.6	368.7	526.5
CDC, 1999-2004[178]	177.9	169.8	185.9
South Atlantic			
Lu-Yao, 1994[102]	332.0	201.1	462.8
Jemal, 2005[105]	467.7	397.1	538.2
CDC, 1999-2004[178]	186.0	178.2	193.7
USA			
Lu-Yao, 1994[102]	329.5	198.7	460.3
CDC, 1999-2004[178]	175.1	153.9	196.4
West North			
Lu-Yao, 1994[102]	291.7	160.8	422.5
Jemal, 2005[105]	444.6	344.8	544.4
Escobedo, 2004[106]	152.2	76.8	227.6
CDC, 1999-2004[178]	169.0	160.2	177.7
West South			
Jemal, 2005[105]	438.1	280.2	595.9
CDC, 1999-2004[178]	166.9	156.7	177.2

Figure C20. Incidence of prostate cancer (per 100,000 male population) in U.S. regions (CDC data, 1999-2004) (U.S. Cancer Statistics Working Group, 2005)

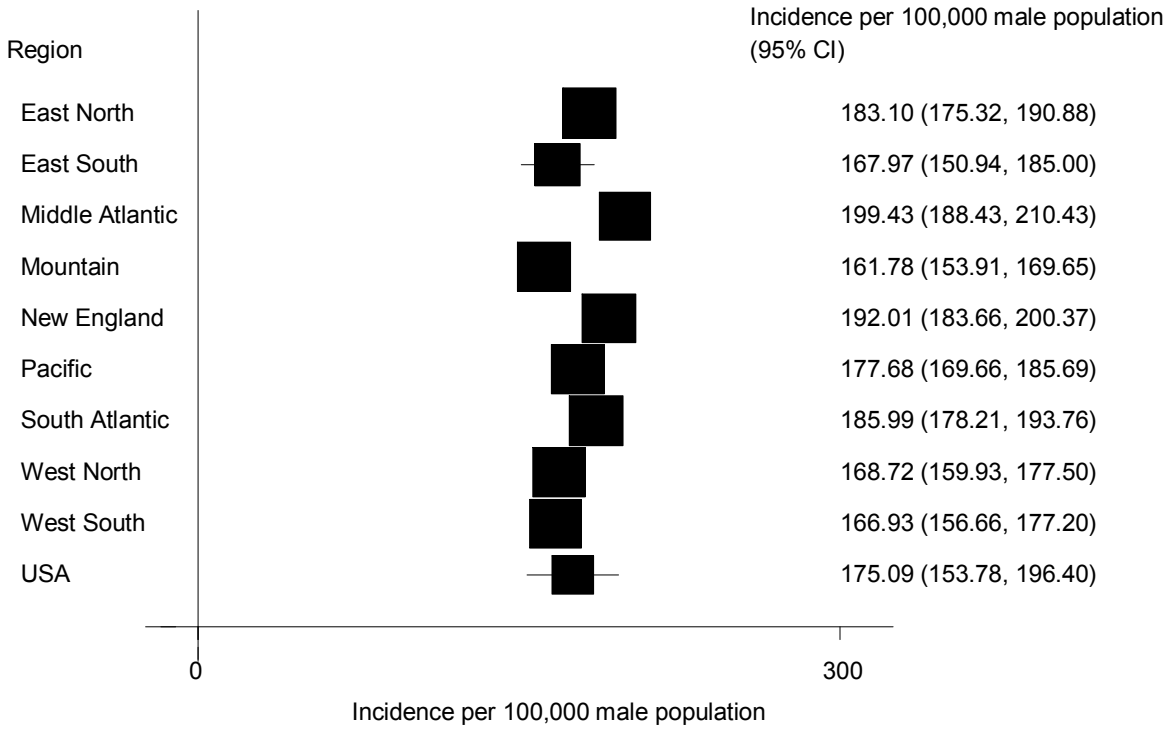


Table C53. Regional variations in age-standardized prostate cancer incidence/100,000 male population (CDC data, 1999-2004) (pair-wise comparisons between U.S. Census regions)

Regions		Difference	Standard Error	P Value
East North	East South	15.13	9.54	0.11
East North	Middle Atlantic	-16.33	6.86	0.02
East North	Mountain	21.32	5.64	0.00
East North	New England	-8.91	5.82	0.13
East North	Pacific	5.42	5.69	0.34
East North	South Atlantic	-2.89	5.60	0.61
East North	West North	14.38	5.98	0.02
East North	West South	16.17	6.56	0.01
East North	USA	8.01	11.56	0.49
East South	Middle Atlantic	-31.46	10.33	0.00
East South	Mountain	6.19	9.56	0.52
East South	New England	-24.04	9.67	0.01
East South	Pacific	-9.71	9.59	0.31
East South	South Atlantic	-18.02	9.54	0.06
East South	West North	-0.75	9.76	0.94
East South	West South	1.04	10.13	0.92
East South	USA	-7.12	13.90	0.61
Middle Atlantic	Mountain	37.65	6.89	<.01
Middle Atlantic	New England	7.42	7.04	0.29
Middle Atlantic	Pacific	21.75	6.93	0.00
Middle Atlantic	South Atlantic	13.44	6.86	0.05
Middle Atlantic	West North	30.71	7.17	<.01
Middle Atlantic	West South	32.50	7.67	<.01
Middle Atlantic	USA	24.34	12.22	0.05
Mountain	New England	-30.23	5.85	<.01
Mountain	Pacific	-15.90	5.72	0.01
Mountain	South Atlantic	-24.21	5.64	<.01
Mountain	West North	-6.94	6.01	0.25
Mountain	West South	-5.15	6.59	0.43
Mountain	USA	-13.31	11.57	0.25
New England	Pacific	14.34	5.90	0.02
New England	South Atlantic	6.02	5.81	0.30
New England	West North	23.30	6.18	0.00
New England	West South	25.08	6.74	0.00
New England	USA	16.92	11.66	0.15
Pacific	South Atlantic	-8.31	5.69	0.14
Pacific	West North	8.96	6.06	0.14
Pacific	West South	10.74	6.64	0.11
Pacific	USA	2.59	11.60	0.82
South Atlantic	West North	17.27	5.98	0.00
South Atlantic	West South	19.06	6.56	0.00
South Atlantic	USA	10.90	11.55	0.35
West North	West South	1.78	6.89	0.80
West North	USA	-6.37	11.74	0.59
West South	USA	-8.16	12.05	0.50

Table C54. Significant geographic differences in incidence of prostate cancer among differences races (CDC data, 1999-2004) (pair-wise comparisons between the US Census regions)

Region		Difference	Standard Error	P Value
African American				
East North	East South	25.93	9.50	0.01
East North	Mountain	52.58	6.65	<.01
East North	West North	42.25	6.49	<.01
East North	West South	31.80	7.09	<.01
East South	Middle Atlantic	-38.44	10.40	0.00
East South	Mountain	26.66	9.92	0.01
East South	New England	-20.86	10.05	0.04
East South	Pacific	-24.19	9.76	0.01
East South	Atlantic tic	-29.25	9.41	0.00
Middle Atlantic	Mountain	65.09	7.89	<.01
Middle Atlantic	New England	17.57	8.06	0.03
Middle Atlantic	West North	54.76	7.75	<0.01
Middle Atlantic	West South	44.31	8.26	<0.01
Mountain	New England	-47.52	7.42	<0.01
Mountain	Pacific	-50.85	7.02	<0.01
Mountain	Atlantic tic	-55.90	6.53	<0.01
Mountain	West South	-20.78	7.64	0.01
Mountain	USA	-43.42	13.06	0.00
New England	West North	37.19	7.27	<0.01
New England	West South	26.74	7.81	0.00
Pacific	West North	40.51	6.87	<0.01
Pacific	West South	30.06	7.43	<0.01
South Atlantic	West North	45.57	6.37	<0.01
South Atlantic	West South	35.12	6.97	<0.01
West North	USA	-33.09	12.97	0.01
Hispanic				
East North	Middle Atlantic	-41.19	8.49	<0.01
East North	New England	-61.49	7.27	<0.01
East South	New England	-56.60	24.43	0.02
Middle Atlantic	Mountain	37.78	8.33	<0.01
Middle Atlantic	New England	-20.30	8.77	0.02
Middle Atlantic	Pacific	37.81	8.49	<0.01
Middle Atlantic	South Atlantic	55.78	9.30	<0.01
Middle Atlantic	West North	47.96	9.17	<0.01
Middle Atlantic	West South	28.93	9.31	0.00
Middle Atlantic	USA	36.08	13.87	0.01
Mountain	New England	-58.08	7.08	<0.01
Mountain	South Atlantic	18.00	7.73	0.02
New England	Pacific	58.11	7.27	0.01
New England	South Atlantic	76.08	8.20	<0.01
New England	West North	68.25	8.05	<0.01
New England	West South	49.23	8.21	<0.01
New England	USA	56.38	13.16	<0.01
Pacific	South Atlantic	17.97	7.90	0.02
South Atlantic	West South	-26.85	8.77	0.00
West North	West South	-19.03	8.63	0.03
Whites				
East North	East South	27.68	9.50	0.00
East North	West South	16.42	7.09	0.02
East South	Middle Atlantic	-37.33	10.40	0.00
East South	Mountain	-25.03	9.44	0.01
East South	New England	-38.43	9.50	<0.01
East South	Pacific	-31.19	9.50	0.00
East South	South Atlantic	-21.13	9.41	0.03
East South	West North	-27.00	9.67	0.01
Middle Atlantic	South Atlantic	16.20	7.25	0.03
Middle Atlantic	West South	26.07	8.26	0.00

Table C54. Significant geographic differences in incidence of prostate cancer among differences races (CDC data, 1999-2004) (continued)

Region		Difference	Standard Error	P Value
Mountain	New England	-13.40	5.91	0.02
Mountain	West South	13.77	7.01	0.05
New England	South Atlantic	17.30	5.88	0.00
New England	West South	27.17	7.09	0.00
Pacific	West South	19.92	7.09	0.01
West North	West South	15.74	7.32	0.03

Table C55. Incidence of localized prostate cancer reported in individual studies

Region	Incidence	Lower 95% CI	Upper 95% CI
East North			
Jemal, 2005[105]	396.2	325.7	466.7
East South			
Jemal, 2005[105]	268.7	146.6	390.8
Middle Atlantic			
Jemal, 2005[105]	401.2	314.8	487.5
Mountain			
Jemal, 2005[105]	312.5	254.9	370.0
Escobedo, 2004[106]	92.7	19.3	166.0
New England			
Jemal, 2005[105]	354.2	293.2	415.3
Escobedo, 2004[106]	110.6	37.2	183.9
Pacific			
Jemal, 2005[105]	348.3	287.3	409.4
South Atlantic			
Jemal, 2005[105]	367.5	312.9	422.0
West North			
Jemal, 2005[105]	367.6	290.4	444.8
Escobedo, 2004[106]	103.7	30.4	177.0

Table C56. Correlation between incidence, mortality, and physicians' distribution in geographic regions (state level)

Race	Outcome		Number of Urologists	Number of Radiation Oncologists
Whites	Incidence	Correlation coefficient	-0.04	-0.03
		p value	0.57	0.66
	Mortality	Correlation coefficient	-0.16	-0.15
		p value	0.01	0.02
Blacks	Incidence	Correlation coefficient	0.08	0.09
		p value	0.26	0.20
	Mortality	Correlation coefficient	-0.04	-0.06
		p value	0.63	0.44
Combined	Incidence	Correlation coefficient	-0.02	-0.02
		p value	0.74	0.82
	Mortality	Correlation coefficient	-0.07	-0.09
		p value	0.23	0.17
	PSA testing	Correlation coefficient	0.14	0.09
		p value	0.16	0.36

Table C57. Correlation between incidence and mortality in different races in geographic regions (state level) (CDC data)

Race	Outcome		Mortality
Whites	Incidence	Correlation coefficient	0.5
		p value	0.0002
Blacks	Incidence	Correlation coefficient	-0.14
		p value	0.41

Table C58. Correlation between incidence, mortality, and screening in geographic regions (state level) (CDC data)

		Incidence	Mortality	PSA Test Last 2 Years	PSA Test Ever
Incidence	Correlation coefficient	1			
	p value				
Mortality	Correlation coefficient	0.2	1		
	p value	0.13			
PSA test last 2 years	Correlation coefficient	0.27	0.43	1	
	p value	0.06	0.0018		
PSA test ever	Correlation coefficient	0.18	0.44	0.94	1
	p value	0.23	0.0012	<0.01	

Table C59. Proportion of patients treated with external beam therapy, brachytherapy, primary androgen deprivation therapy, radiation, and watchful waiting (%) pooled analysis

	External Beam Therapy	Brachytherapy	Primary Androgen Deprivation Therapy	Radiation Therapy	Watchful Waiting
Midwest	25.92	10.02	15.70	27.38	7.24
Northeast	33.72	4.86	17.14	27.72	6.57
South	27.42	10.69	13.39	28.58	5.34
West	22.74	6.36	14.11	28.10	14.00
East North	25.97	9.55	17.64	30.69	7.04
East South	24.14	10.83	18.68		5.34
Middle Atlantic	33.72	4.18	8.50		6.22
Mountain	21.54	6.43	11.81	24.51	13.77
New England	33.76	5.11	17.34	26.88	6.69
Pacific	24.21	6.27	15.70	29.09	14.45
South Atlantic	29.85	10.63	13.11	27.74	5.34
West North	25.94	10.58	13.80	22.40	7.38
West South	24.14	10.83	18.68		5.34

Table C60. Correlation between proportion of patients with different primary treatments and total number of urologists and radiation oncologists in geographic regions (state level)

		Radical Prostatectomy	External Beam Radiotherapy	Brachytherapy	Primary Androgen Deprivation	Watchful Waiting
Urologists	Correlation coefficient	-0.57065	0.58002	-0.54	-0.56	-0.10
	p value	0.1086	0.1016	0.13	0.11	0.79
Radiation Oncologists	Correlation coefficient	-0.66288	0.63121	-0.65	-0.50	-0.02
	p value	0.0517	0.0683	0.06	0.17	0.95

Figure C21. Percentage of patients with prostate cancer treated with external beam radiation as an initial therapy in the U.S. regions (pooled analysis)

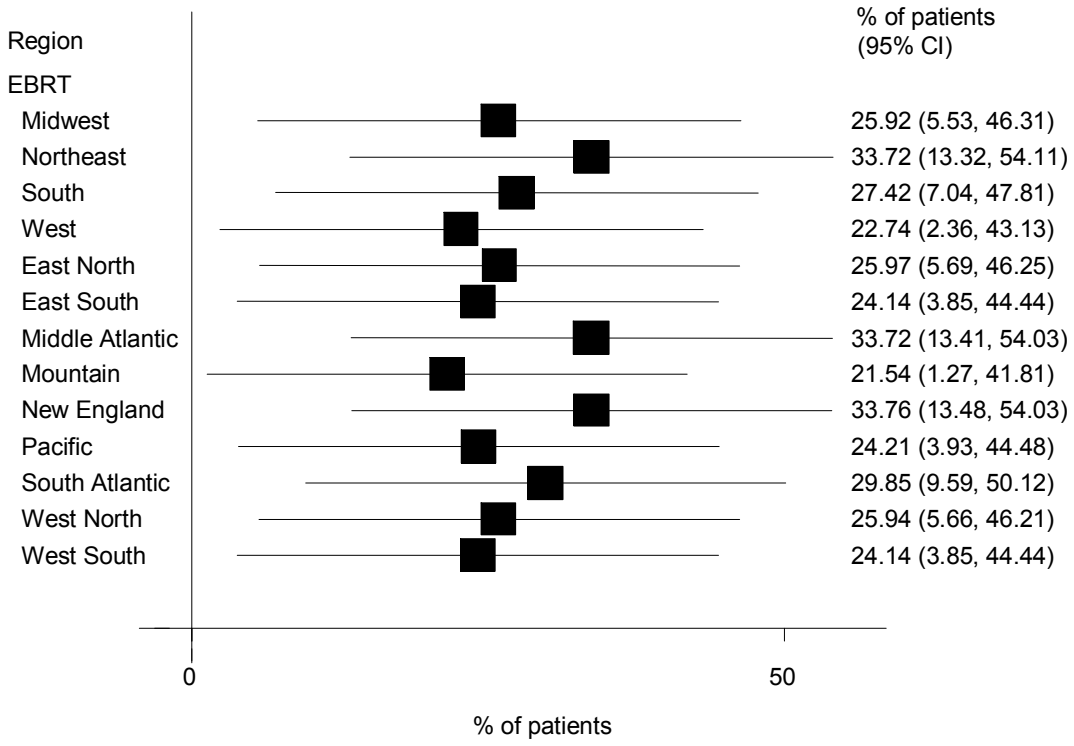


Table C61. Significant variations in proportion of patients treated with external beam therapy

Region		Mean Differences	Lower 95% CI	Upper 95% CI	P Value
East North	East South	1.83	0.06	3.59	0.04
East North	Middle Atlantic	-7.75	-9.68	-5.82	<0.01
East North	Mountain	4.43	2.96	5.90	<0.01
East North	New England	-7.79	-9.30	-6.27	<0.01
East North	Pacific	1.76	0.24	3.29	0.02
East North	South Atlantic	-3.88	-5.27	-2.50	<0.01
East North	West South	1.83	0.06	3.59	0.04
East South	Middle Atlantic	-9.58	-11.67	-7.49	<0.01
East South	Mountain	2.60	0.93	4.28	<0.01
East South	New England	-9.61	-11.33	-7.90	<0.01
East South	South Atlantic	-5.71	-7.31	-4.11	<0.01
East South	West North	-1.79	-3.51	-0.08	0.04
Middle Atlantic	Mountain	12.18	10.33	14.03	<0.01
Middle Atlantic	Pacific	9.52	7.63	11.40	<0.01
Middle Atlantic	South Atlantic	3.87	2.09	5.65	<0.01
Middle Atlantic	West North	7.79	5.90	9.67	<0.01
Middle Atlantic	West South	9.58	7.49	11.67	<0.01
Mountain	New England	-12.22	-13.63	-10.81	<0.01
Mountain	Pacific	-2.67	-4.08	-1.25	<0.01
Mountain	South Atlantic	-8.31	-9.58	-7.05	<0.01
Mountain	West North	-4.40	-5.81	-2.98	<0.01
Mountain	West South	-2.60	-4.28	-0.93	<0.01
New England	Pacific	9.55	8.09	11.01	<0.01
New England	South Atlantic	3.91	2.59	5.22	<0.01
New England	West North	7.82	6.36	9.28	<0.01
New England	West South	9.61	7.90	11.33	<0.01
Pacific	South Atlantic	-5.65	-6.97	-4.32	<0.01
Pacific	West North	-1.73	-3.19	-0.27	0.02
South Atlantic	West North	3.92	2.59	5.24	<0.01
South Atlantic	West South	5.71	4.11	7.31	<0.01
West North	West South	1.79	0.08	3.51	0.04
Midwest	Northeast	-7.79	-9.15	-6.44	<0.01
Midwest	South	-1.50	-2.66	-0.34	0.01
Midwest	West	3.18	1.96	4.40	<0.01
Northeast	South	6.30	5.04	7.56	<0.01
Northeast	West	10.97	9.66	12.29	<0.01
South	West	4.68	3.56	5.79	<0.01

Figure C22. Percentage of patients with prostate cancer treated with radiation as an initial therapy in U.S. regions (pooled analysis)

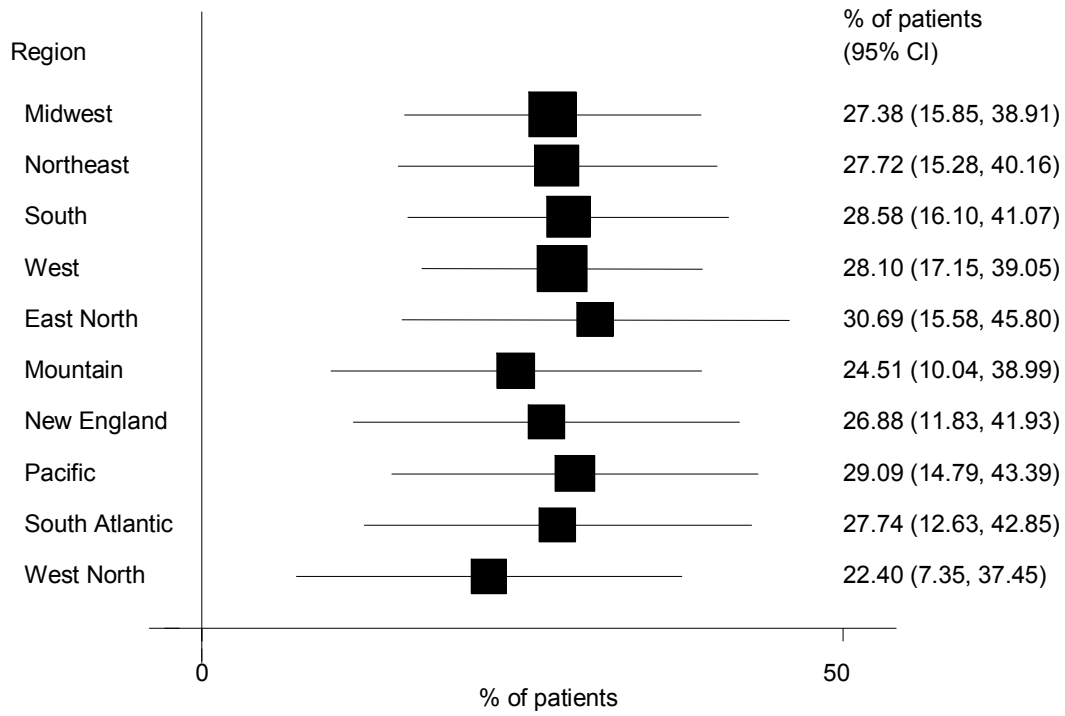


Figure C23. Percentage of patients with localized prostate cancer treated with watchful waiting as an initial therapy in U.S. regions (pooled analysis)

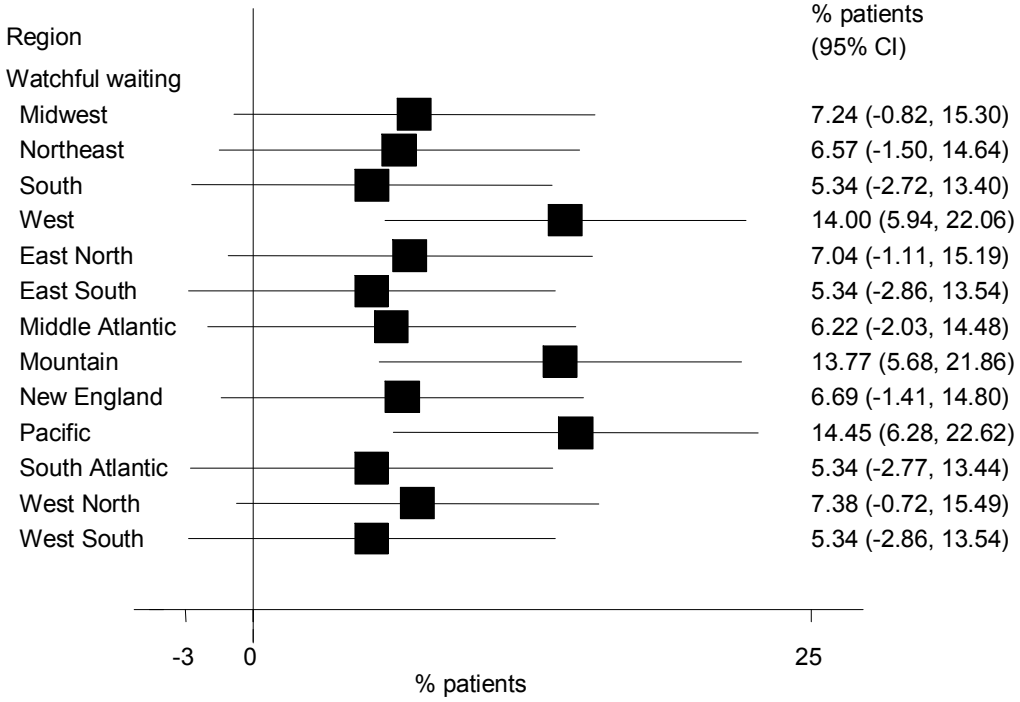


Table C62. Significant variations in proportion of patients treated with watchful waiting

Region		Mean Differences	Lower 95% CI	Upper 95% CI	p Value
East North	Mountain	-6.73	-8.40	-5.07	<0.01
East North	Pacific	-7.41	-9.36	-5.47	<0.01
East North	South Atlantic	1.70	0.04	3.36	0.04
East South	Mountain	-8.43	-10.34	-6.53	<0.01
East South	Pacific	-9.11	-11.27	-6.96	<0.01
East South	West North	-2.04	-4.02	-0.07	0.04
Middle Atlantic	Mountain	-7.55	-9.67	-5.43	<0.01
Middle Atlantic	Pacific	-8.23	-10.58	-5.89	<0.01
Mountain	New England	7.08	5.57	8.59	<0.01
Mountain	South Atlantic	8.43	6.99	9.88	<0.01
Mountain	West North	6.39	4.88	7.90	<0.01
Mountain	West South	8.43	6.53	10.34	<0.01
New England	Pacific	-7.76	-9.60	-5.92	<0.01
Pacific	South Atlantic	9.11	7.36	10.87	<0.01
Pacific	West North	7.07	5.23	8.91	<0.01
Pacific	West South	9.11	6.96	11.27	<0.01
South Atlantic	West North	-2.04	-3.58	-0.51	0.01
West North	West South	2.04	0.07	4.02	0.04
Midwest	South	1.90	0.77	3.03	<0.01
Midwest	West	-6.76	-7.92	-5.60	<0.01
Northeast	South	1.23	0.01	2.44	0.05
Northeast	West	-7.43	-8.67	-6.19	<0.01
South	West	-8.66	-9.76	-7.55	<0.01

Figure C24. Percentage of patients with prostate cancer treated with brachytherapy as an initial therapy in U.S. regions (pooled analysis)

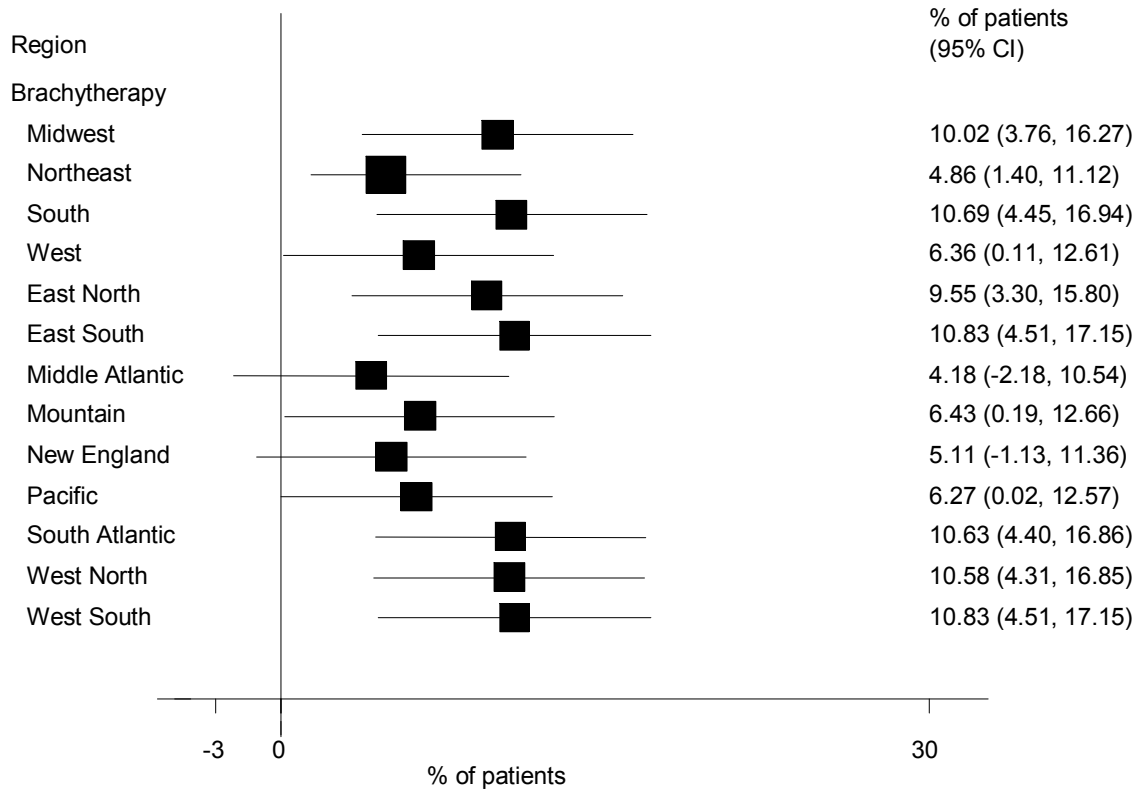


Table C63. Significant variations in proportion of patients treated with brachytherapy

Region		Mean Differences	Lower 95% CI	Upper 95% CI	P Value
East North	Middle Atlantic	5.37	3.66	7.08	<0.01
East North	Mountain	3.12	1.95	4.29	<0.01
East North	New England	4.44	3.21	5.66	<0.01
East North	Pacific	3.27	1.83	4.72	<0.01
East South	Middle Atlantic	6.65	4.74	8.55	<0.01
East South	Mountain	4.40	2.93	5.87	<0.01
East South	New England	5.71	4.20	7.23	<0.01
East South	Pacific	4.55	2.88	6.22	<0.01
Middle Atlantic	Mountain	-2.25	-3.88	-0.61	0.01
Middle Atlantic	Pacific	-2.10	-3.91	-0.28	0.02
Middle Atlantic	South Atlantic	-6.45	-8.07	-4.84	<0.01
Middle Atlantic	West North	-6.40	-8.12	-4.68	<0.01
Middle Atlantic	West South	-6.65	-8.55	-4.74	<0.01
Mountain	New England	1.31	0.19	2.44	0.02
Mountain	South Atlantic	-4.21	-5.25	-3.16	<0.01
Mountain	West North	-4.15	-5.37	-2.93	<0.01
Mountain	West South	-4.40	-5.87	-2.93	<0.01
New England	South Atlantic	-5.52	-6.63	-4.41	<0.01
New England	West North	-5.47	-6.74	-4.19	<0.01
New England	West South	-5.71	-7.23	-4.20	<0.01
Pacific	South Atlantic	-4.36	-5.70	-3.02	<0.01
Pacific	West North	-4.30	-5.76	-2.85	<0.01
Pacific	West South	-4.55	-6.22	-2.88	<0.01
Midwest	Northeast	5.16	4.19	6.12	<0.01
Midwest	West	3.66	2.76	4.55	<0.01
Northeast	South	-5.83	-6.74	-4.92	<0.01
Northeast	West	-1.50	-2.45	-0.55	<0.01
South	West	4.33	3.50	5.16	<0.01

Figure C25. Percentage of patients with prostate cancer treated with primary androgen deprivation as an initial therapy in U.S. regions (pooled analysis)

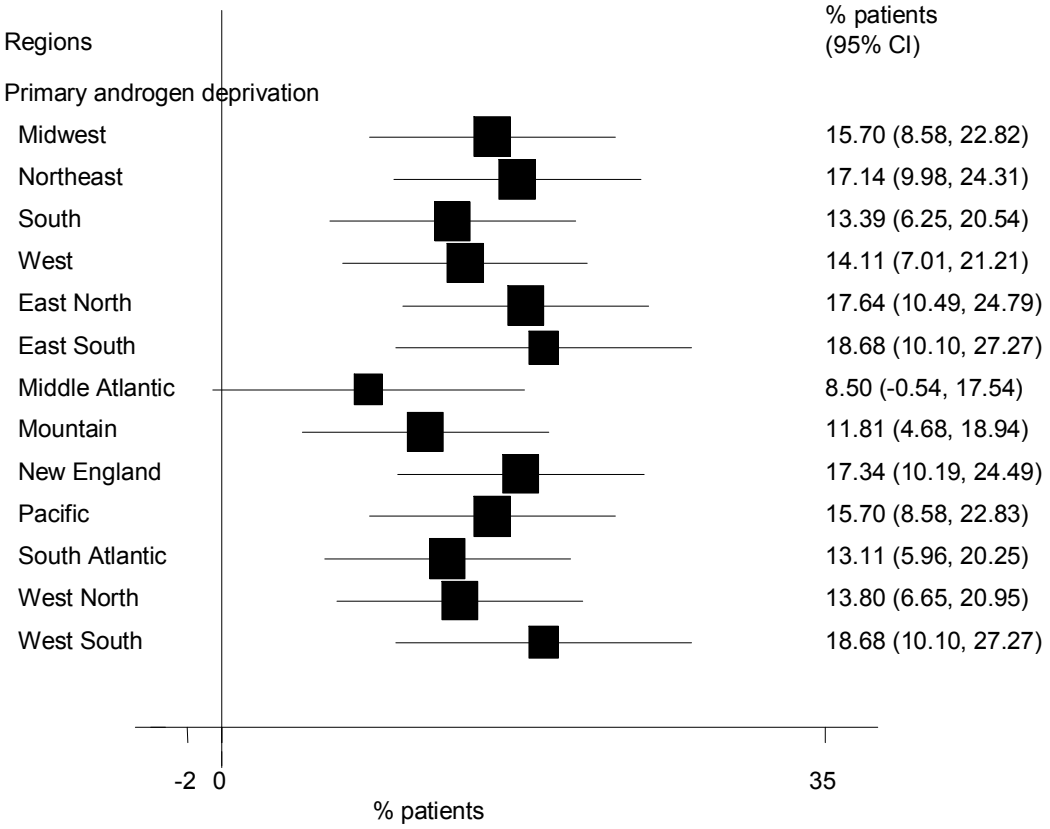


Table C64. Significant variations in proportion of patients treated with primary androgen deprivation

Region		Mean Differences	Lower 95% CI	Upper 95% CI	P Value
East North	Middle Atlantic	9.14	3.26	15.02	<0.01
East North	Mountain	5.83	4.81	6.85	<0.01
East North	Pacific	1.94	0.97	2.90	<0.01
East North	South Atlantic	4.53	3.37	5.70	<0.01
East North	West North	3.84	2.67	5.01	<0.01
East South	Middle Atlantic	10.18	2.72	17.65	<0.01
East South	Mountain	6.87	1.74	12.01	0.01
East South	South Atlantic	5.57	0.43	10.72	0.03
Middle Atlantic	New England	-8.84	-14.72	-2.96	<0.01
Middle Atlantic	Pacific	-7.20	-13.06	-1.35	0.02
Middle Atlantic	West South	-10.18	-17.65	-2.72	<0.01
Mountain	New England	-5.53	-6.55	-4.52	<0.01
Mountain	Pacific	-3.89	-4.66	-3.13	<0.01
Mountain	South Atlantic	-1.30	-2.31	-0.29	0.01
Mountain	West North	-1.99	-3.01	-0.97	<0.01
Mountain	West South	-6.87	-12.01	-1.74	<0.01
New England	Pacific	1.64	0.68	2.60	<0.01
New England	South Atlantic	4.23	3.07	5.40	<0.01
New England	West North	3.54	2.38	4.71	<0.01
Pacific	South Atlantic	2.59	1.64	3.55	<0.01
Pacific	West North	1.90	0.94	2.86	<0.01
South Atlantic	West South	-5.57	-10.72	-0.43	0.03
West North	West South	-4.88	-10.04	0.27	0.06
Midwest	South	2.30	0.77	3.84	<0.01
Midwest	West	1.59	0.51	2.67	<0.01
Northeast	South	3.75	1.98	5.52	<0.01
Northeast	West	3.03	1.64	4.43	<0.01

Figure C26. Relative risk of primary androgen deprivation as an initial therapy (polled analysis)

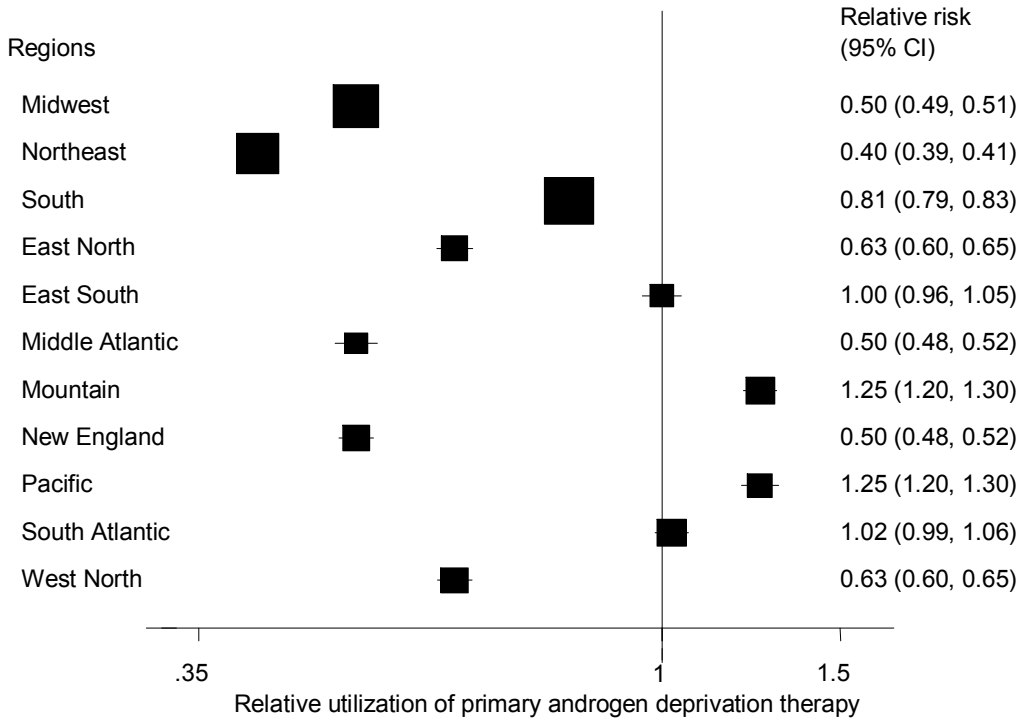


Figure C27. Percentage of patients with localized prostate cancer treated with radical prostatectomy as an initial therapy in the U.S. regions (pooled analysis)

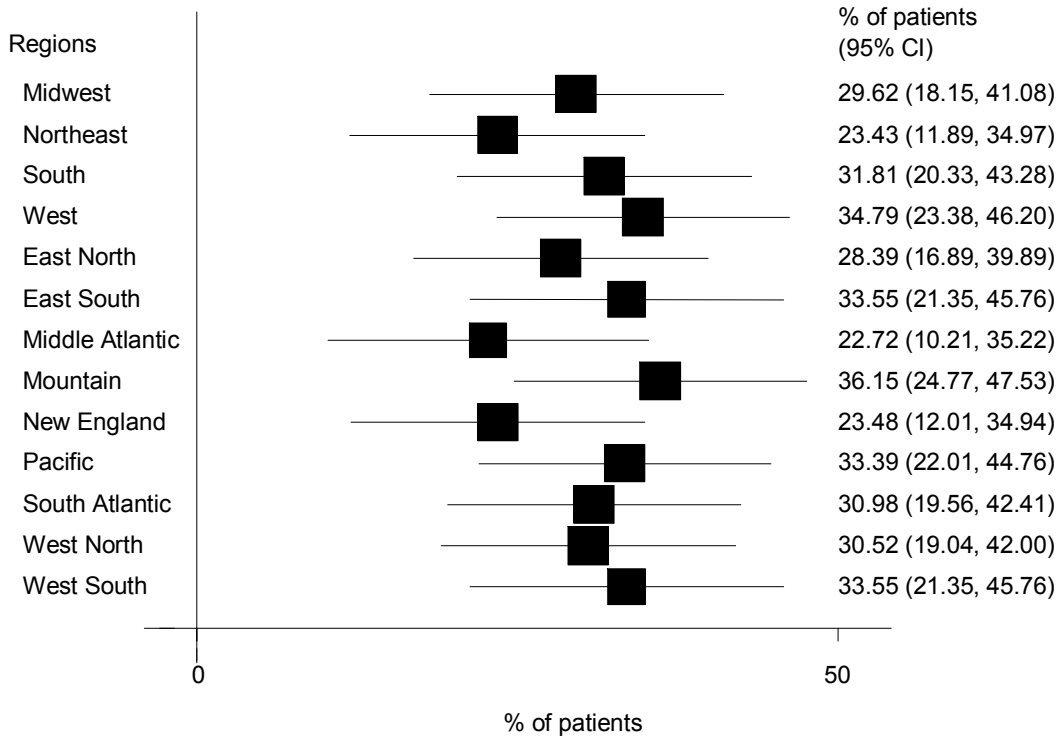


Table C65. Significant variations in proportion of patients treated with radical prostatectomy

Region		Mean	Lower 95% CI	Upper 95% CI	P Value
Midwest	Northeast	6.19	3.26	9.12	<0.01
Midwest	West	-5.17	-7.45	-2.90	<0.01
Northeast	South	-8.38	-11.34	-5.41	<0.01
Northeast	West	-11.36	-14.06	-8.66	<0.01
South	West	-2.99	-5.41	-0.57	0.02
East North	Mountain	-7.76	-11.05	-4.47	<0.01
East North	New England	4.91	1.29	8.54	0.01
East North	Pacific	-5.00	-8.18	-1.82	<0.01
East South	Middle Atlantic	10.84	3.59	18.08	<0.01
East South	New England	10.08	4.63	15.53	<0.01
Middle Atlantic	Mountain	-13.43	-19.39	-7.48	<0.01
Middle Atlantic	Pacific	-10.67	-16.60	-4.74	<0.01
Middle Atlantic	South Atlantic	-8.27	-14.22	-2.31	0.01
Middle Atlantic	West North	-7.80	-13.90	-1.70	0.01
Middle Atlantic	West South	-10.84	-18.08	-3.59	<0.01
Mountain	New England	12.68	9.46	15.90	<0.01
Mountain	Pacific	2.76	0.08	5.45	0.04
Mountain	South Atlantic	5.17	2.14	8.19	<0.01
Mountain	West North	5.63	2.41	8.85	<0.01
New England	Pacific	-9.91	-13.03	-6.80	<0.01
New England	South Atlantic	-7.51	-10.87	-4.15	<0.01
New England	West North	-7.05	-10.60	-3.49	<0.01
New England	West South	-10.08	-15.53	-4.63	<0.01

Table C66. Geographic variations in radical prostatectomy. Age adjusted Rate/100,000 male population (pooled analysis)

Region	Mean	Lower 95% CI	Upper 95% CI
New England	63.63	29.41	156.68
Northeast	67	25.46	159.45
Middle Atlantic	102.02	3.02	207.07
East North	117	23.95	210.05
East South	118.84	14.8	222.88
Midwest	120.78	28.56	213.01
West North	125.95	31.83	220.07
West South	127.9	23.86	231.94
South	129.25	36.96	221.54
South Atlantic	129.5	36.52	222.48
Pacific	150.24	57.18	243.3
West	156.43	64.4	248.45
Mountain	159.57	66.79	252.34
USA	121.79	28.5	215.09

Table C67. Significant differences in age adjusted rate/100,000 male population (pooled analysis)

Region		Mean	Lower 95% CI	Upper 95% CI	P Value
Midwest	Northeast	53.79	36.61	70.97	<0.01
Midwest	West	-35.64	-49.74	-21.55	<0.01
Northeast	South	-62.25	-80.24	-44.27	<0.01
Northeast	West	-89.43	-105.38	-73.49	<0.01
Northeast	USA	-55.98	-75.36	-36.61	<0.01
South	West	-27.18	-42.76	-11.59	<0.01
West	USA	33.45	16.50	50.40	<0.01
East North	Mountain	-42.57	-60.36	-24.77	<0.01
East North	New England	53.37	34.30	72.44	<0.01
East North	Pacific	-33.24	-52.67	-13.81	<0.01
East South	New England	55.21	2.78	107.64	0.04
Middle Atlantic	Mountain	-57.54	-111.42	-3.67	0.04
Mountain	New England	95.93	78.16	113.71	<0.01
Mountain	South Atlantic	30.07	12.39	47.74	<0.01
Mountain	West North	33.62	10.36	56.88	<0.01
Mountain	USA	37.78	19.38	56.17	<0.01
New England	Pacific	-86.61	-106.02	-67.20	<0.01
New England	South Atlantic	-65.87	-84.82	-46.91	<0.01
New England	West North	-62.32	-87.00	-37.64	<0.01
New England	West South	-64.27	-116.70	-11.83	0.02
New England	USA	-58.16	-77.80	-38.52	<0.01
Pacific	South Atlantic	20.74	1.43	40.06	0.04
Pacific	West North	24.29	0.90	47.68	0.04
Pacific	USA	28.45	8.44	48.46	0.01

Figure C28. Age adjusted rate of radical prostatectomy per 100,000 male population (results from individual studies)

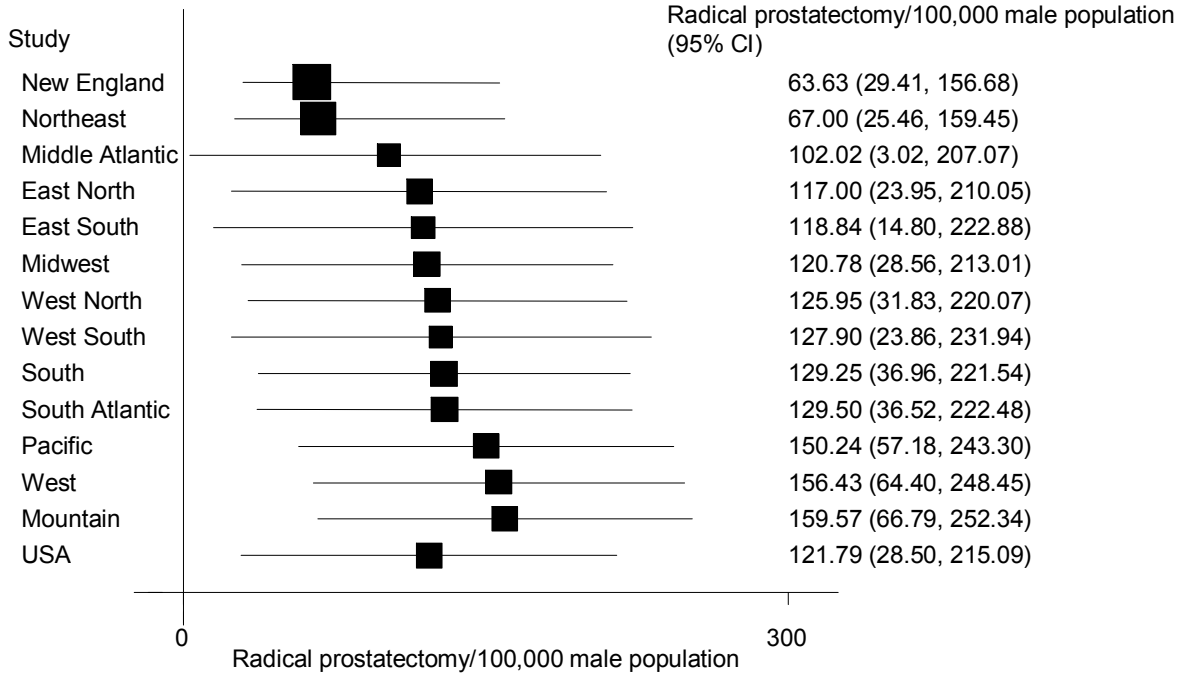


Table C68. Differences in utilization of radical prostatectomy compared with the national average (pooled analysis)

Region	Relative Risk	Lower 95% CI	Upper 95% CI	P Value
Midwest	1.08	0.93	1.25	0.33
Northeast	0.65	0.56	0.75	<0.01
South	1.05	0.91	1.21	0.53
West	1.38	1.19	1.60	<0.01
USA	1.00			

Table C69. Length of hospital stay after radical prostatectomy

Region	Mean	Lower 95% CI	Upper 95% CI	
West	3.7	1.6	5.8	A
Midwest	4.6	2.6	6.7	B
South	4.7	2.7	6.8	B
Northeast	5.2	3.1	7.3	B
USA	4.6	2.1	7	AB

Different letters assigned for statistically significant differences at 95% confidence level

Figure C29. Length of stay in hospital after radical prostatectomy in U.S. regions (pooled analysis)

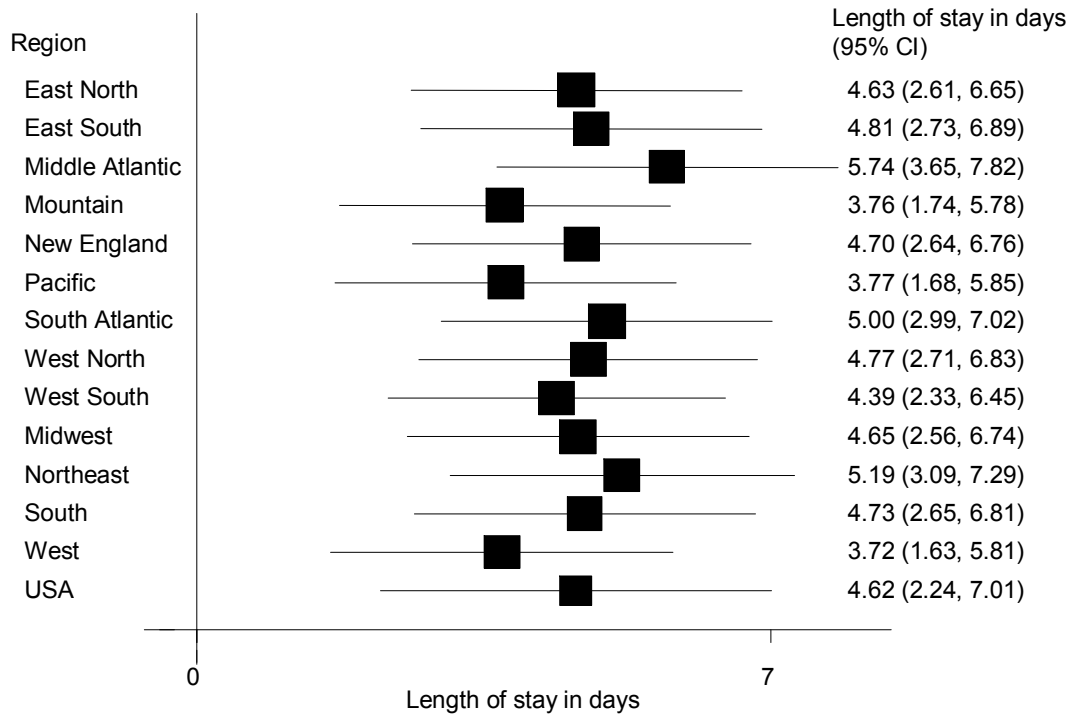


Table C70. Cost of radical prostatectomy in $ U.S.

Region	Mean	Lower 95% CI	Upper 95% CI
West*	16,043	13,767	18,319
South	16,672	14,872	18,472
Midwest	17,718	15,548	19,888
Northeast*	20,003	17,284	22,722
USA	18,680	11,488	25,872

*statistically significant differences at 95% confidence level

Table C71. Differences in hospital charges for radical prostatectomy in U.S, regions

Region		Differences	Lower 95% CI	Upper 95% CI
Midwest	Northeast	-2,285	-5,762	1,192
Midwest	South	1,046	-1,770	3,863
Midwest	West	1,675	-1,467	4,817
Midwest	USA	-962	-8,473	6,549
Northeast*	South	3,331	72	6,590
Northeast*	West	3,960	416	7,504
Northeast	USA	1,323	-6,365	9,011
South	West	629	-2,270	3,528
South	USA	-2,008	-9,421	5,404
West	USA	-2,637	-10,179	4,905
East North	East South	3,333	-1,314	7,979
East North	Middle Atlantic	-3,480	-8,126	1,166
East North	Mountain	2,595	-1,561	6,751
East North	New England	-1,352	-6,442	3,738
East North	Pacific	-413	-5,059	4,234
East North	South Atlantic	-288	-4,293	3,717
East North	West North	-623	-4,982	3,736
East North	West South	179	-4,180	4,538
East North	USA	-1245	-9,020	6,530
East South*	Middle Atlantic	-6,813	-11,902	-1,723
East South	Mountain	-738	-5,384	3,909
East South	New England	-4,684	-10,182	814
East South	Pacific	-3,745	-8,835	1,345
East South	South Atlantic	-3,620	-8,132	891
East South	West North	-3,956	-8,784	873
East South	West South	-3,154	-7,982	1,675
East South	USA	-4,578	-12,625	3,470
Middle Atlantic*	Mountain	6,075	1,429	10,721
Middle Atlantic	New England	2,128	-3,369	7,626
Middle Atlantic	Pacific	3,068	-2,022	8,157
Middle Atlantic	South Atlantic	3,192	-1,320	7,704
Middle Atlantic	West North	2,857	-1,972	7,686
Middle Atlantic	West South	3,659	-1,170	8,488
Middle Atlantic	USA	2,235	-5,813	10,283
Mountain	New England	-3,947	-9,037	1,143
Mountain	Pacific	-3,008	-7,654	1,639
Mountain	South Atlantic	-2,883	-6,888	1,122
Mountain	West North	-3,218	-7,577	1,141
Mountain	West South	-2,416	-6,775	1,943
Mountain	USA	-3,840	-11,615	3,935
New England	Pacific	939	-4,559	6,437
New England	South Atlantic	1,064	-3,903	6,031
New England	West North	729	-4,528	5,986
New England	West South	1,531	-3,726	6,788
New England	USA	107	-8,205	8,418
Pacific	South Atlantic	125	-4,387	4,636
Pacific	West North	-211	-5,039	4,618
Pacific	West South	592	-4,237	5,420
Pacific	USA	-833	-8,880	7,215
South Atlantic	West North	-335	-4,550	3,880
South Atlantic	West South	467	-3,748	4,682
South Atlantic	USA	-957	-8,652	6,738
West North	West South	802	-3,751	5,355
West North	USA	-622	-8,507	7,263
West South	USA	-1,424	-9,309	6,461

Figure C30. Hospital charges for radical prostatectomy in U.S. regions (results from one study)

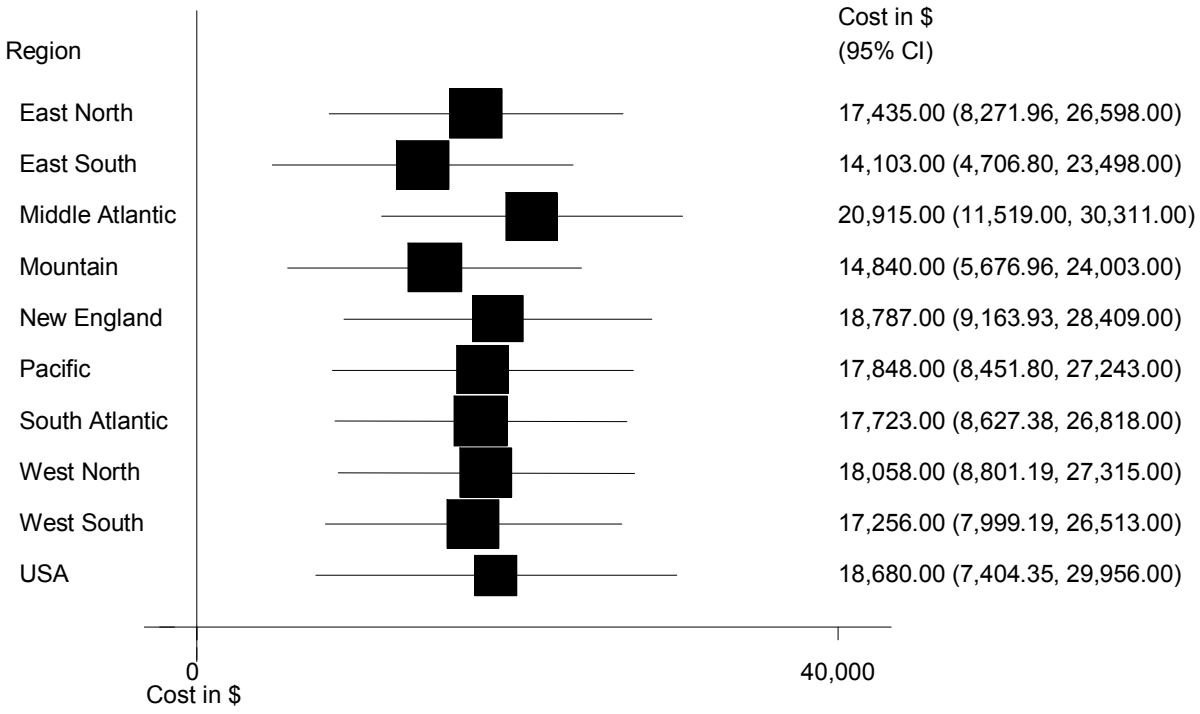


Table C72. Age adjusted mortality from prostate cancer per 100,000 male population in U.S. regions reported in individual studies

Region	Mortality	Lower 95% CI	Upper 95% CI
East North			
Kafadar, 1997[103]	29.6	25.7	33.4
CDC, 1999-2004[178]	38.1	34.7	41.4
Jemal, 2005[105]	115.6	76.7	154.6
Jemal, 2002[104]	24.2	21.7	26.6
East South			
Kafadar, 1997[103]	27.7	23.5	32.0
CDC, 1999-2004[178]	45.9	41.7	50.1
Jemal, 2005[105]	116.2	48.6	183.7
Jemal, 2002[104]	29.0	24.4	33.7
Middle Atlantic			
Kafadar, 1997[103]	29.4	24.4	34.3
CDC, 1999-2004[178]	36.2	32.0	40.4
Jemal, 2005[105]	121.5	73.8	169.3
Jemal, 2002[104]	21.7	13.6	29.8
Mountain			
Kafadar, 1997[103]	20.7	17.7	23.7
CDC, 1999-2004[178]	33.1	30.0	36.2
Jemal, 2002[104]	100.0	66.2	133.7
Escobedo, 2004[106]	71.5	48.9	94.0
Jemal, 2005[105]	22.7	19.4	26.0
New England			
Kafadar, 1997[103]	24.9	21.4	28.4
CDC, 1999-2004[178]	33.3	29.8	36.7
Jemal, 2005[105]	101.5	67.8	135.3
Escobedo, 2004[106]	84.2	61.6	106.7
Jemal, 2002[104]	22.4	19.5	25.2
Pacific			
Kafadar, 1997[103]	20.7	15.8	25.7
CDC, 1999-2004[178]	32.6	28.6	36.6
Jemal, 2005[105]	101.9	62.9	140.9
Jemal, 2002[104]	21.8	17.7	25.8
South Atlantic			
Kafadar, 1997[103]	30.9	28.1	33.7
CDC, 1999-2004[178]	41.9	39.1	44.6
Jemal, 2005[105]	125.4	95.2	155.6
Jemal, 2002[104]	29.5	27.6	31.5
West North			
Kafadar, 1997[103]	24.6	21.4	27.8
CDC, 1999-2004[178]	34.5	30.8	38.3
Jemal, 2005[105]	109.5	66.8	152.2
Escobedo, 2004[106]	94.7	72.1	117.3
Jemal, 2002[104]	23.5	20.2	26.8
West South			
Kafadar, 1997[103]	26.3	22.0	30.6
CDC, 1999-2004[138,178]	39.6	35.6	43.5
Jemal, 2005[105]	118.7	51.2	186.2
USA			
CDC, 1999-2004[178]	36.7	28.5	44.8
Jemal, 2005[105]	24.4	18.7	30.1

Table C73. Geographic differences in prostate cancer age adjusted mortality per100,000 male population (CDC data, 1999-2004)

Region		Difference	Standard Error	P Value
East North	East South	-7.86	2.74	0.00
East North	Middle Atlantic	1.83	2.74	0.51
East North	Mountain	4.92	2.31	0.03
East North	New England	4.79	2.46	0.05
East North	Pacific	5.43	2.66	0.04
East North	South Atlantic	-3.81	2.22	0.09
East North	West North	3.50	2.56	0.17
East North	West South	-1.51	2.64	0.57
East North	USA	1.36	4.49	0.76
East South	Middle Atlantic	9.69	3.04	0.00
East South	Mountain	12.78	2.65	<0.01
East South	New England	12.65	2.78	<0.01
East South	Pacific	13.30	2.96	<0.01
East South	South Atlantic	4.05	2.57	0.12
East South	West North	11.36	2.87	<0.01
East South	West South	6.35	2.95	0.03
East South	USA	9.22	4.68	0.05
Middle Atlantic	Mountain	3.09	2.65	0.24
Middle Atlantic	New England	2.97	2.78	0.29
Middle Atlantic	Pacific	3.61	2.96	0.22
Middle Atlantic	South Atlantic	-5.63	2.57	0.03
Middle Atlantic	West North	1.67	2.87	0.56
Middle Atlantic	West South	-3.34	2.95	0.26
Middle Atlantic	USA	-0.47	4.68	0.92
Mountain	New England	-0.13	2.36	0.96
Mountain	Pacific	0.51	2.57	0.84
Mountain	South Atlantic	-8.73	2.10	<0.01
Mountain	West North	-1.42	2.46	0.56
Mountain	West South	-6.43	2.55	0.01
Mountain	USA	-3.56	4.44	0.42
New England	Pacific	0.64	2.71	0.81
New England	South Atlantic	-8.60	2.27	0.00
New England	West North	-1.29	2.60	0.62
New England	West South	-6.30	2.68	0.02
New England	USA	-3.43	4.52	0.45
Pacific	South Atlantic	-9.24	2.49	0.00
Pacific	West North	-1.93	2.80	0.49
Pacific	West South	-6.95	2.87	0.02
Pacific	USA	-4.08	4.63	0.38
South Atlantic	West North	7.31	2.38	0.00
South Atlantic	West South	2.30	2.46	0.35
South Atlantic	USA	5.17	4.39	0.24
West North	West South	-5.01	2.78	0.07
West North	USA	-2.14	4.57	0.64
West South	USA	2.87	4.62	0.53

Table C74. Significant geographic differences in prostate cancer age adjusted mortality/100,000 among different races (CDC data, 1999-2004)

Region		Difference	Standard Error	p Value
African American				
East North	East South	-9.11	1.50	<0.01
East North	New England	9.37	1.60	<0.01
East North	Pacific	5.90	1.82	0.00
East North	South Atlantic	-8.27	1.27	<0.01
East North	West South	-3.01	1.50	0.05
East South	Middle Atlantic	11.24	1.71	<0.01
East South	Mountain	10.70	1.77	<0.01
East South	New England	18.48	1.71	<0.01
East South	Pacific	15.02	1.91	<0.01
East South	West North	8.94	1.86	<0.01
East South	West South	6.11	1.61	0.00
East South	USA	6.39	2.79	0.02
Middle Atlantic	New England	7.25	1.80	<0.01
Middle Atlantic	South Atlantic	-10.39	1.50	<0.01<.0001
Middle Atlantic	West South	-5.13	1.71	0.00
Mountain	New England	7.78	1.86	<0.01
Mountain	Pacific	4.31	2.05	0.04
Mountain	South Atlantic	-9.86	1.58	<0.01
Mountain	West South	-4.60	1.77	0.01
New England	South Atlantic	-17.64	1.50	<0.01
New England	West North	-9.54	1.94	<0.01
New England	West South	-12.37	1.71	<0.01
New England	USA	-12.09	2.84	<0.01
Pacific	South Atlantic	-14.17	1.73	<0.01
Pacific	West North	-6.08	2.12	0.00
Pacific	West South	-8.91	1.91	<0.01
Pacific	USA	-8.63	2.97	0.00
South Atlantic	West North	8.09	1.67	<0.01
South Atlantic	West South	5.26	1.39	0.00
South Atlantic	USA	5.55	2.67	0.04
Hispanic				
East North	Middle Atlantic	-5.34	2.08	0.01
East North	Mountain	-9.27	1.85	<0.01
East North	New England	-5.74	2.32	0.01
East North	South Atlantic	-5.14	2.08	0.01
East North	West South	-4.77	2.32	0.04
Middle Atlantic	Mountain	-3.93	1.85	0.03
Mountain	Pacific	5.49	2.12	0.01
Mountain	South Atlantic	4.13	1.85	0.03
Mountain	West South	4.50	2.12	0.03
Whites				
Mountain	South Atlantic	2.97	1.12	0.01
New England	South Atlantic	2.39	1.19	0.05
Pacific	South Atlantic	3.37	1.32	0.01

Figure C31. Mortality from prostate cancer (per 100,000 male population) among different races in U.S. regions (CDC data, 1999-2004)

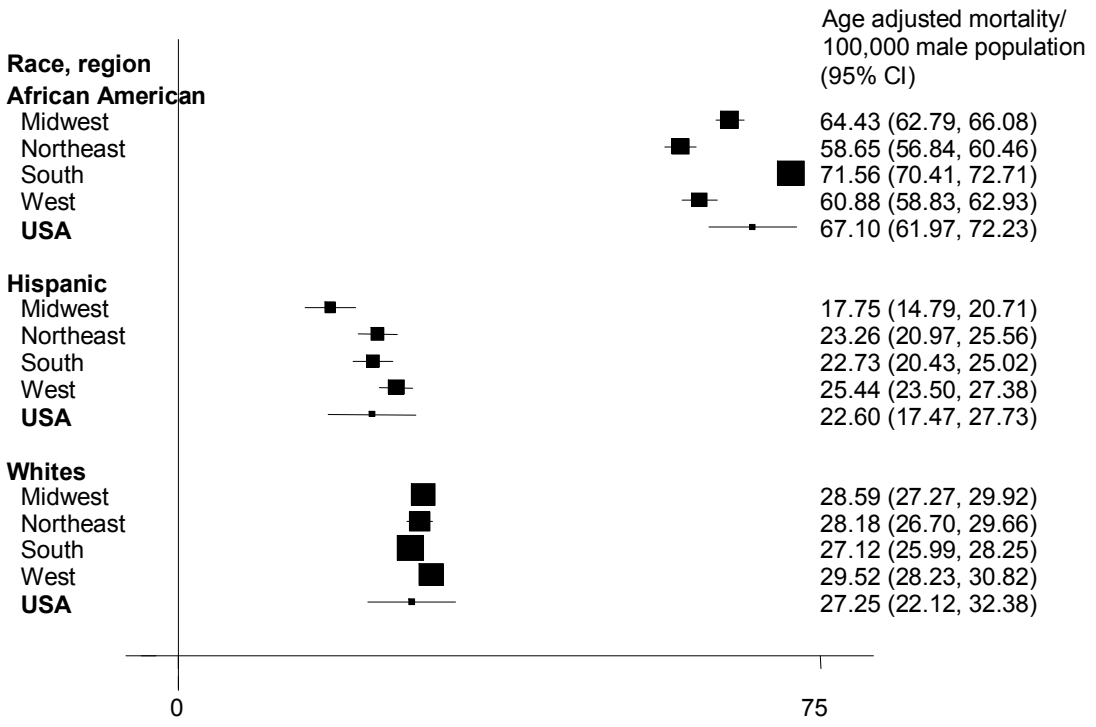


Figure C32. Positive correlation between PSA testing among males older than 40 years and adjusted prostate cancer mortality in the USA. Ecologic analysis

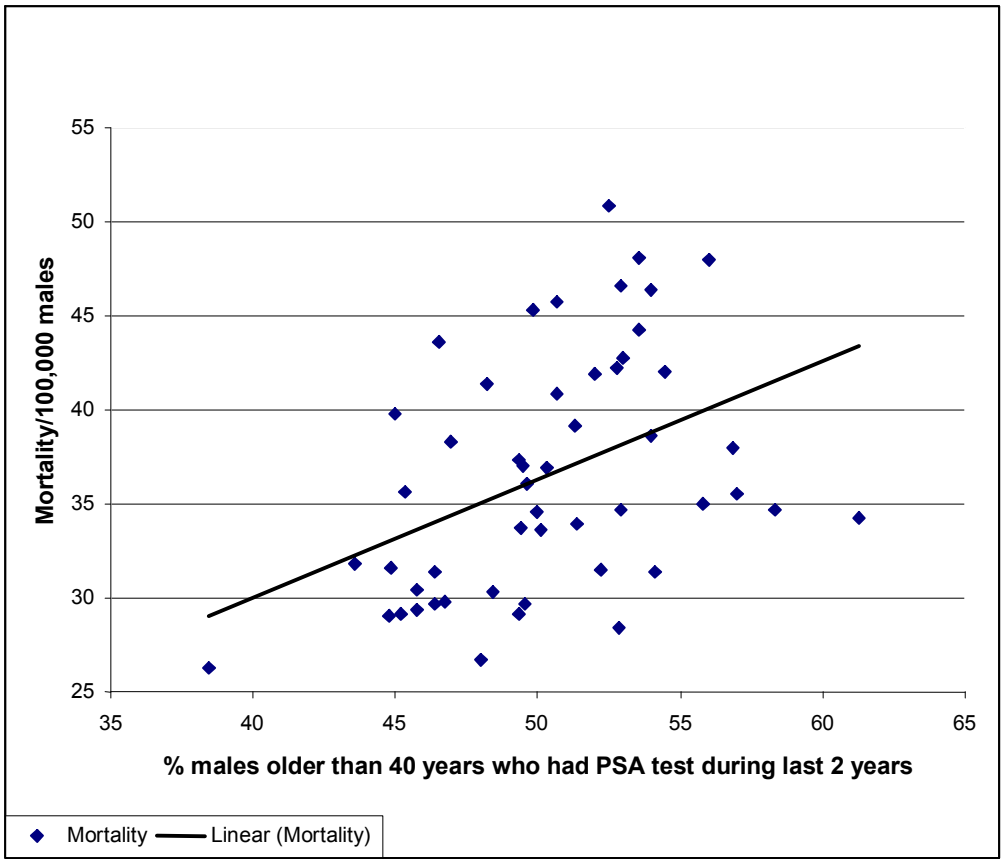


Table C75. Distribution of hospital and surgeon annual volumes of radical prostatectomy

	Hospital Volume	Surgeon Volume
Mean	43.6	12.2
Standard deviation	37.0	13.5
Median	40.0	10.0
Quartile 1	8-22	0.1-3.3
Quartile 2	23-39	3.5-8.75
Quartile 3	40-43	10-14
Quartile 4	>85	15-75.6

Figure C33. Difference in surgery-related death rate corresponding to an increase by 10 radical prostatectomies performed in hospital

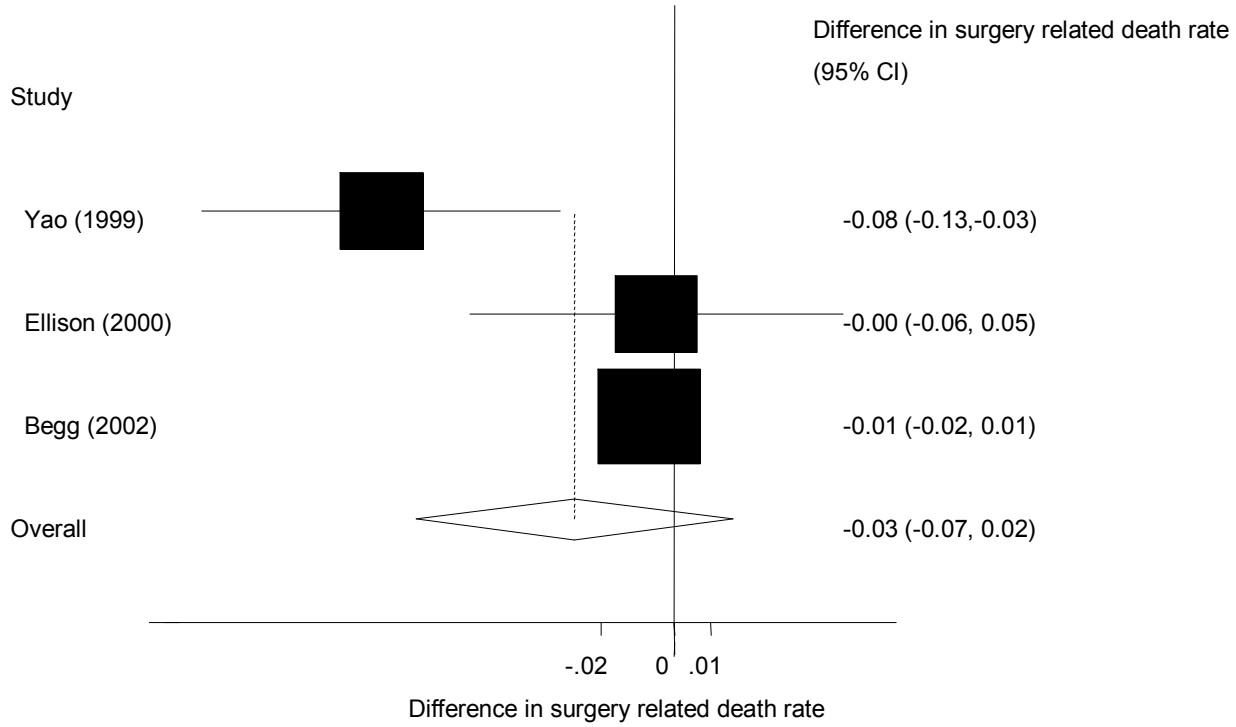


Figure C34. Relative risk of surgery related death corresponding to an increase by 10 radical prostatectomies performed in hospital

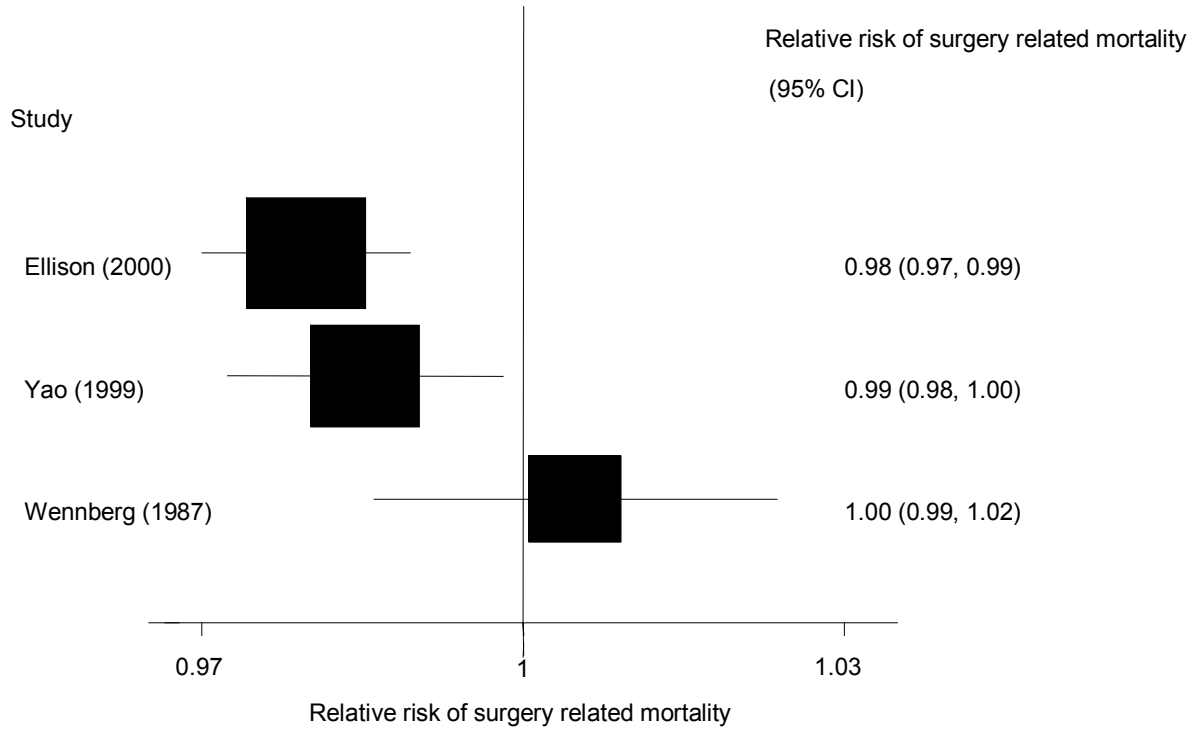


Figure C35. Relative risk of surgery related death in quartile and above and below mean of annual hospital volume (pooled analysis)

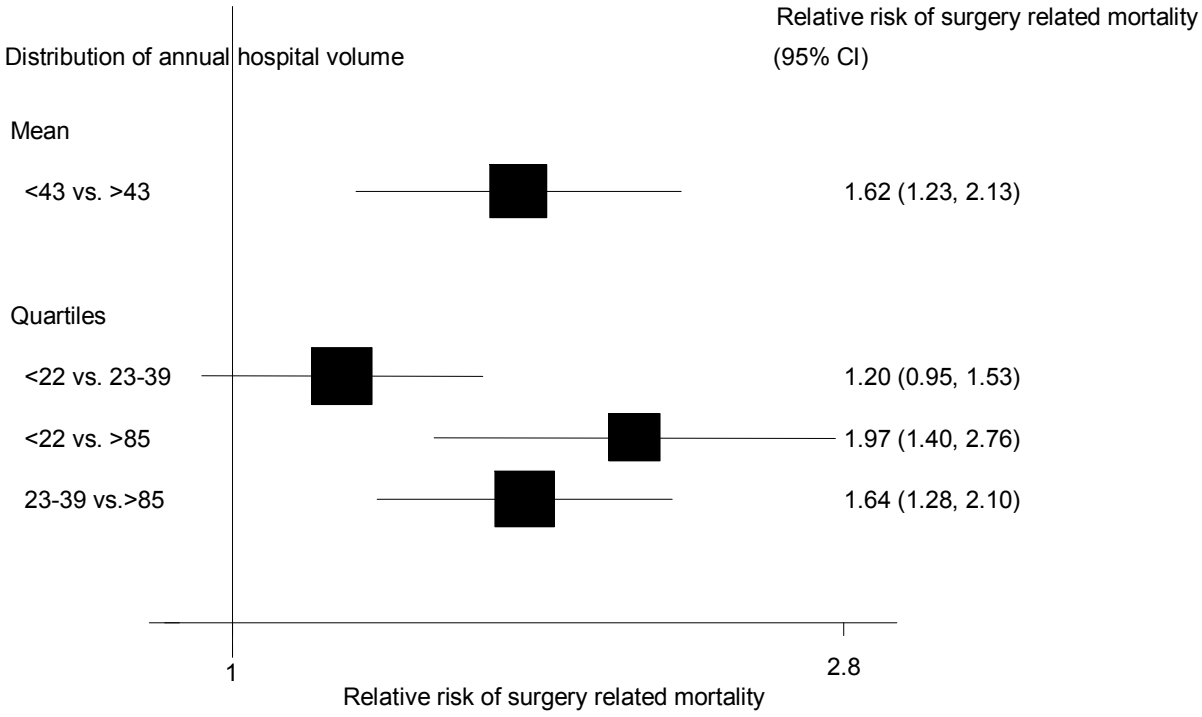


Figure C36. Number of avoided and excessive deaths in quartiles and above and below mean of annual hospital volume (pooled analysis)

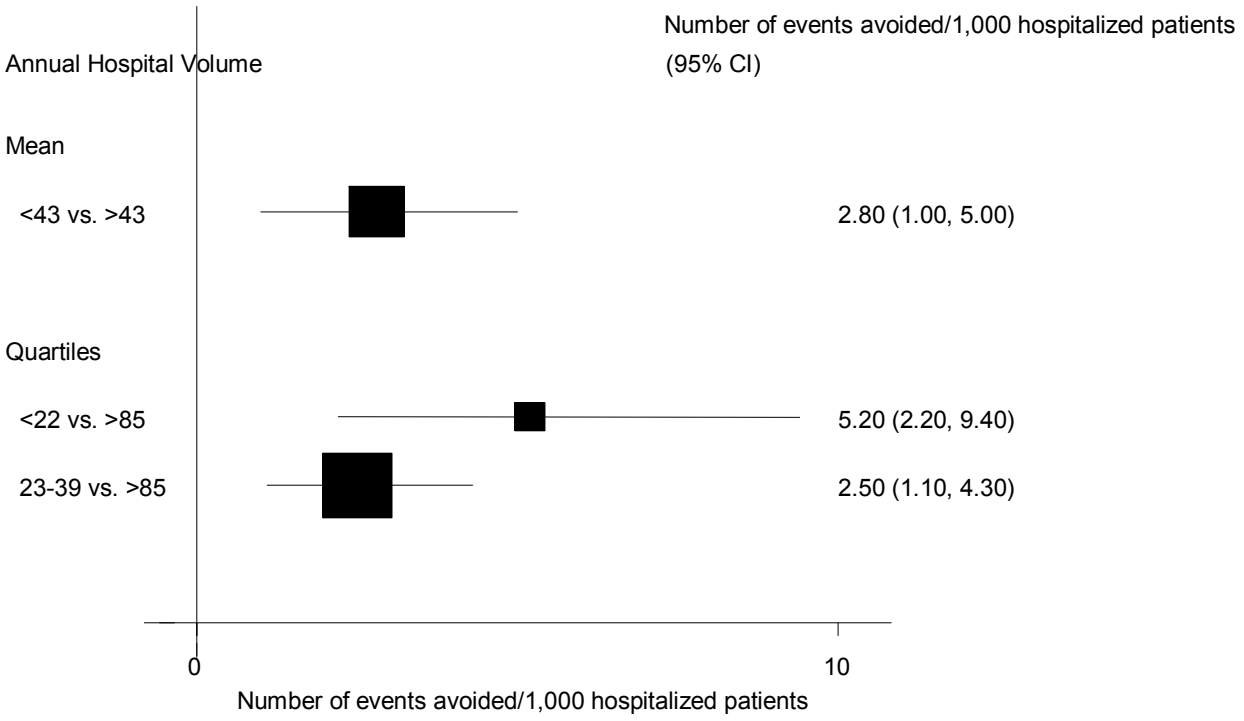


Figure C37. Difference in surgery related complications rate corresponding to an increase by 10 radical prostatectomies performed in hospital

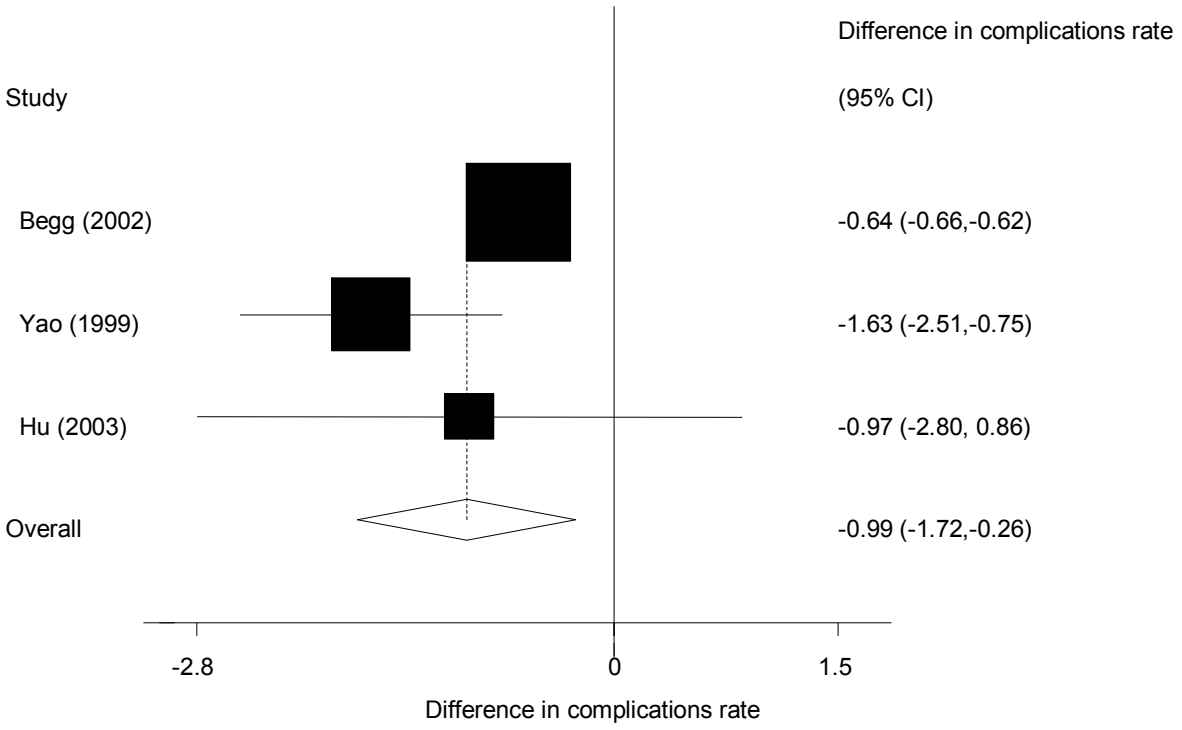


Figure C38. Relative risk of adjuvant therapy 6 months after radical prostatectomy in relation to hospital volume (results from one cohort study)

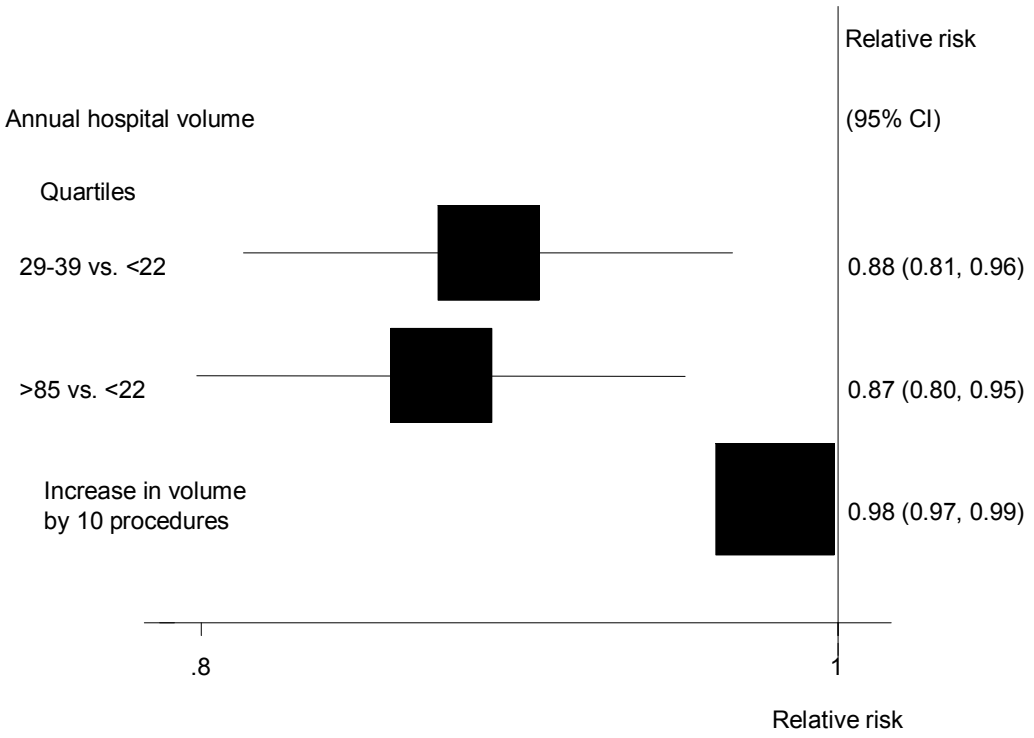


Figure C39. Difference in surgery related complication rates corresponding to an increase by 10 radical prostatectomies performed in hospital

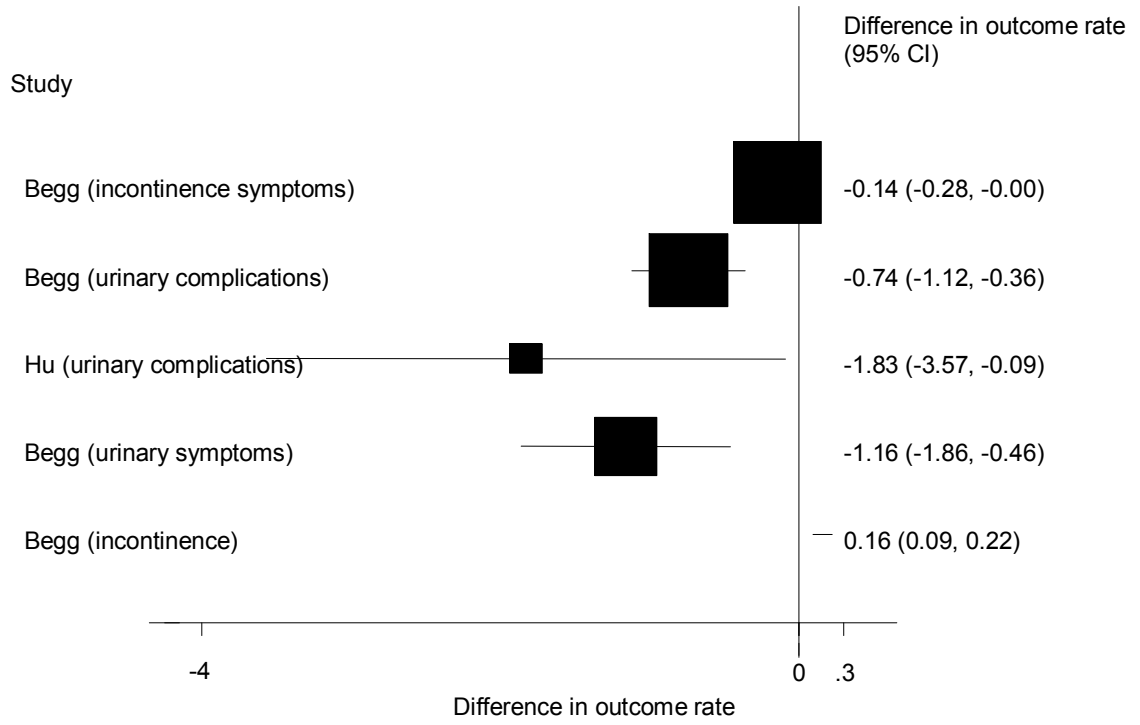


Figure C40. Difference in length of stay and readmission rate corresponding to an increase by 10 procedures in annual hospital volume (results from individual studies)

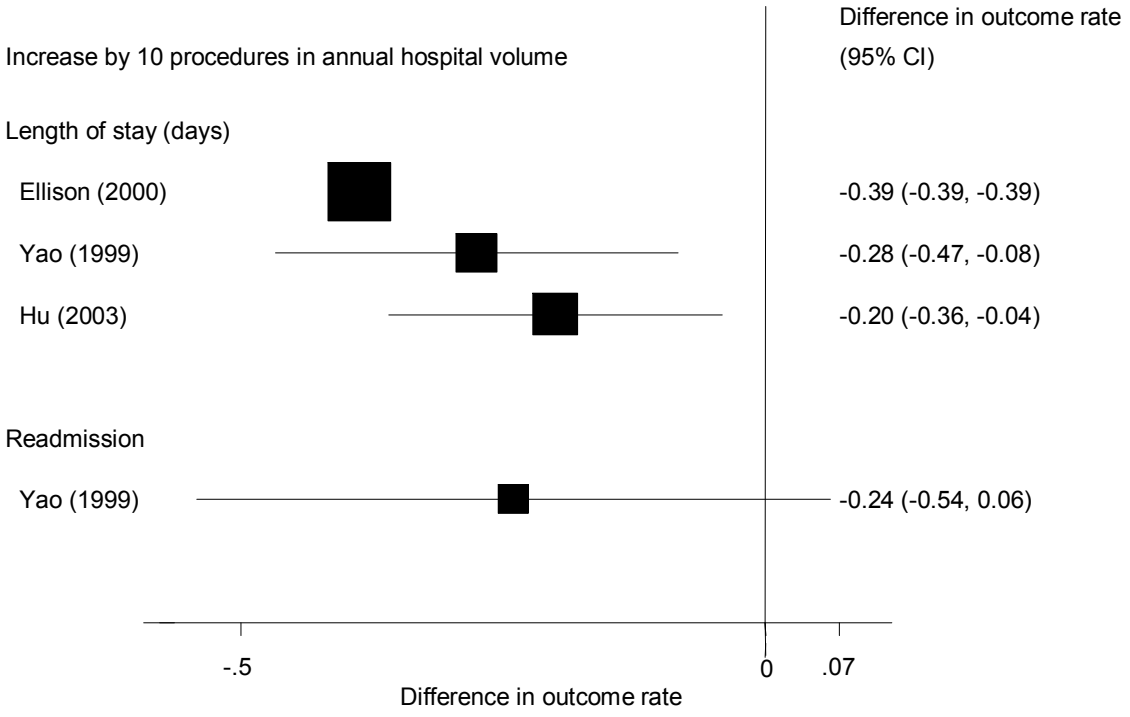
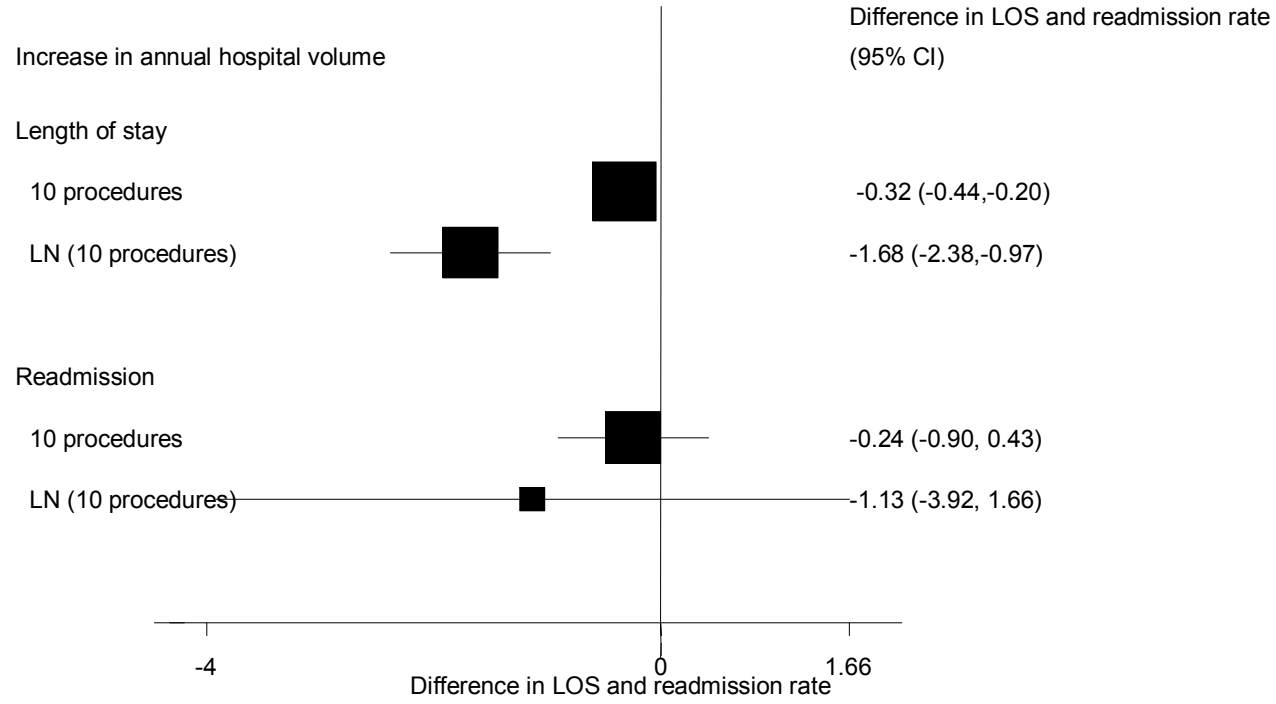


Figure C41. Difference in length of stay and readmission rate corresponding to an increase by ten procedures in annual hospital volume (pooled analysis)



LN = natural logarithm of hospital volume; LOS = length of stay in hospital

Figure C42. Difference in length of stay and readmission rate in categories of hospital volume (pooled analysis)

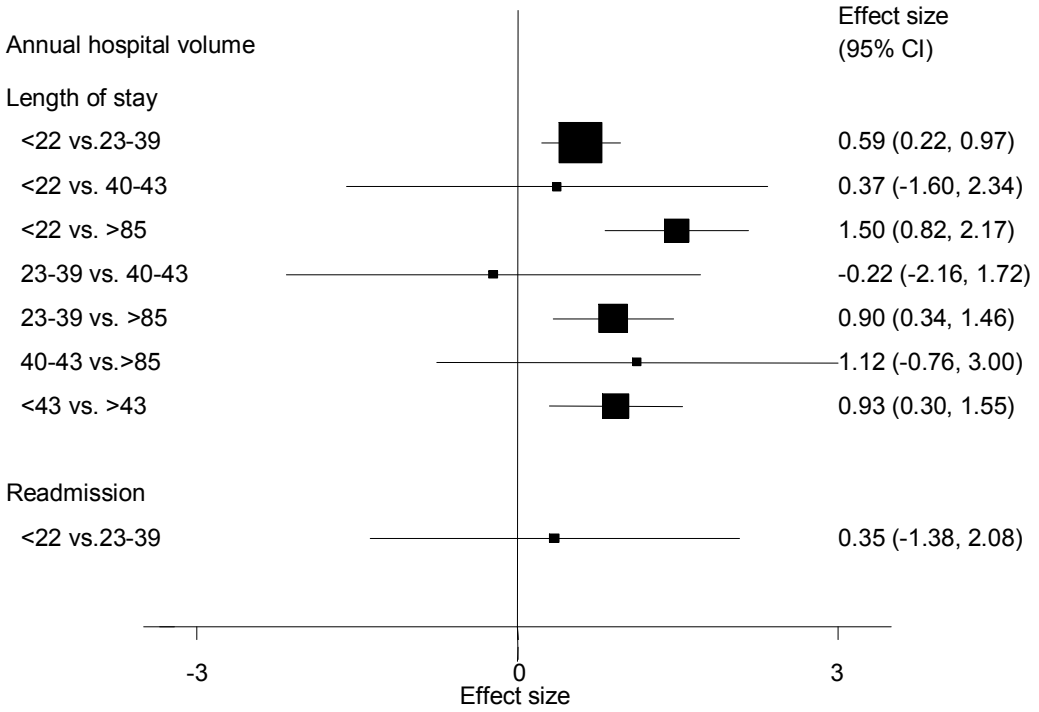


Figure C43. Difference in rates of surgery-related urinary complications, long term incontinence, and positive surgical margins corresponding to an increase by one radical prostatectomy performed by a surgeon (the results from individual studies)

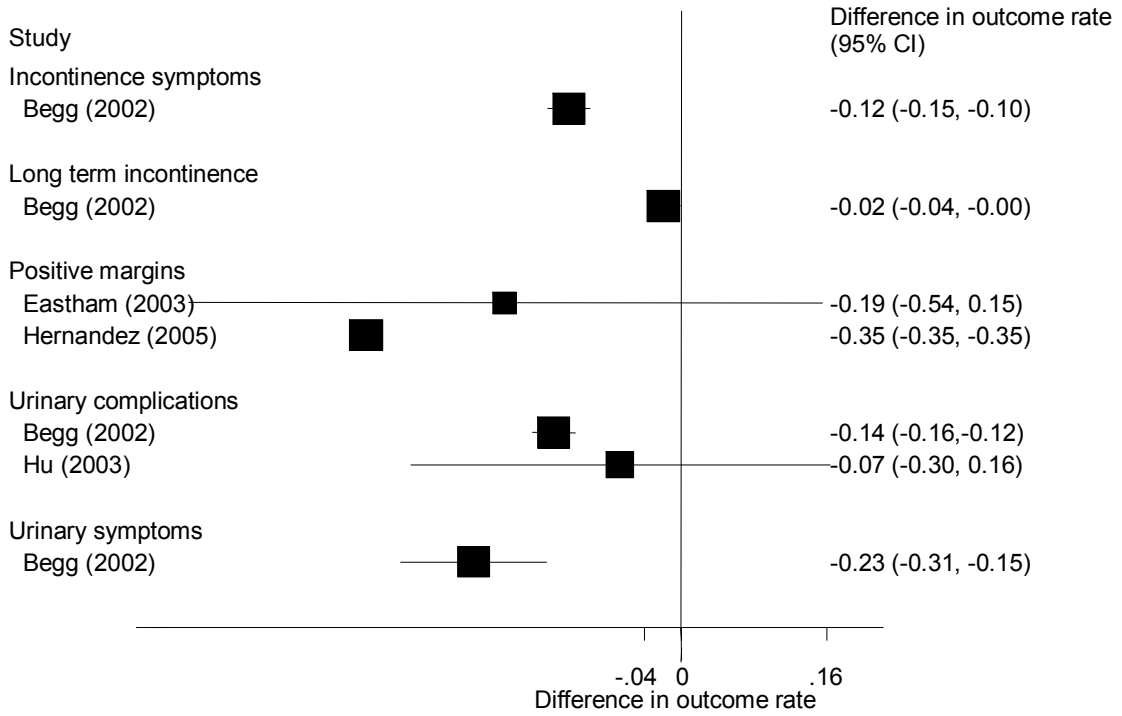
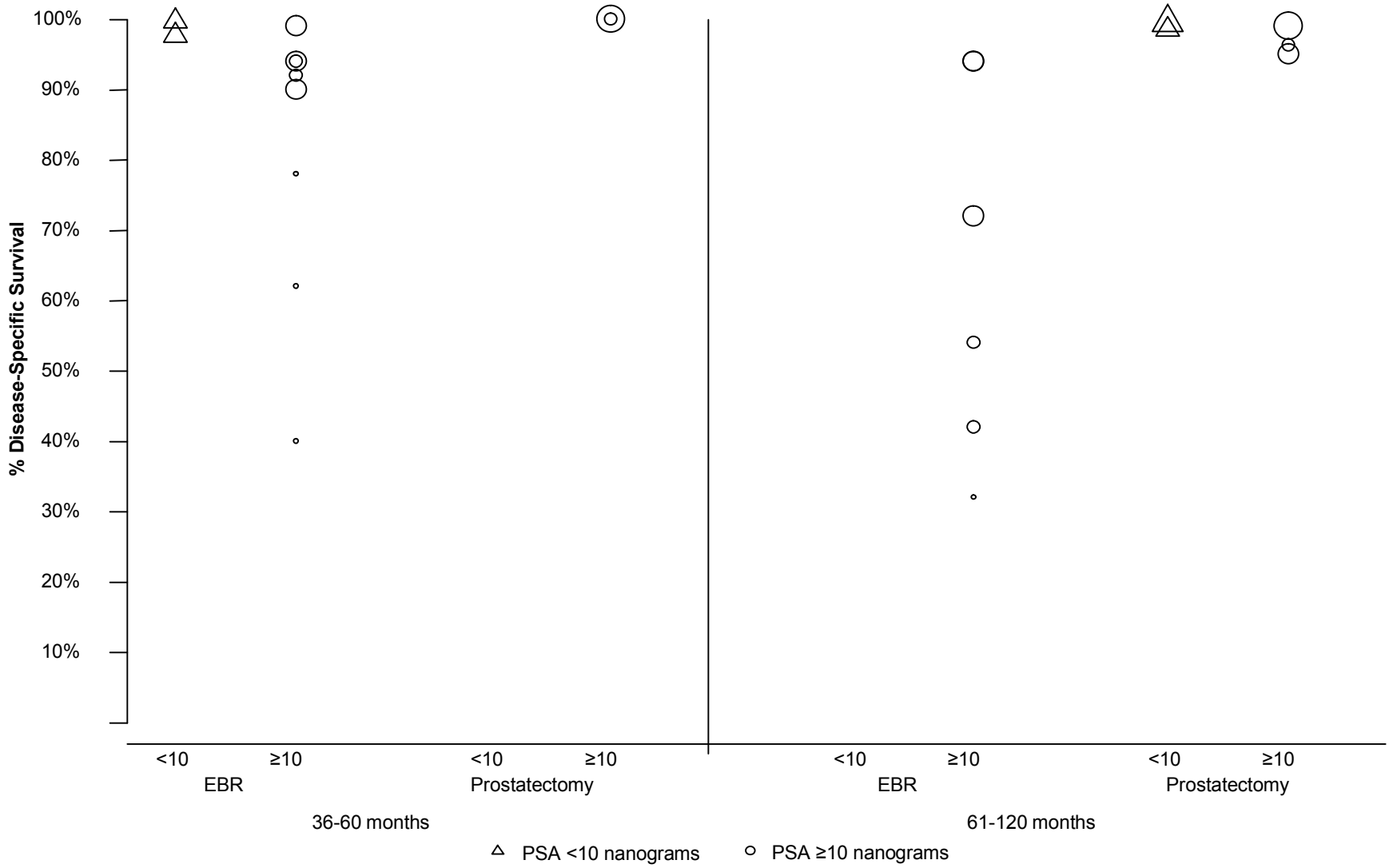


Figure C44. Disease-specific survival at time points by treatment and PSA level (ng/ml)



Point size indicates N, <50 (smallest), 50-150 (next smallest) 150-300 (next largest) and >300 (largest)

Table C76. Odds ratio and attributable events of clinical outcomes after different treatments I patients with localized prostate cancer

Design	Quality	Studies Reference	Active	Control	Outcomes	Effect: Odds Ratio (95%CI)	Attributable Fraction of Events (%)	Rate (%) in Active Group	Rate (%) in Control Group	NNT	Number of Avoided (Excessive) Events per 1,000 Hospitalized
RCT	Moderate	Bill-Axelson, 2005[179]	Radical prostatectomy at 10 years	Watchful waiting at 10 years	Overall mortality	0.74 (0.56 ;0.99)**	26	27	32	20	50
RCT	Moderate	Wirth, 2004[19]	Bicalutamide and watchful waiting	Placebo and adjuvant therapy	Overall mortality	1.31 (1.04; 1.65)	23.7	30	20	-21	-47
RCT	Moderate	Zietman, 2005[6]	External beam radiation: high dose (79.2 Gy)	External beam radiation: conventional dose (70 Gy)	3 consecutive increases in PSA level, with the failure backdated to a point halfway between the first increase and the last non-increasing value	0.40 (0.25; 0.62)	60.5	20	40	5	190
RCT	Moderate	D'Amico, 2004[8]	Conformal radiation therapy and androgen suppression therapy	Conformal radiation therapy (70 Gy)	PSA >1.0 ng/ml and increasing >0.2 ng/ml on 2 consecutive visits	0.34 (0.18; 0.63)	66.2	20	40	4	232
RCT	Moderate	Paulson, 1982[13]	Radical prostatectomy	Radiation therapy	Acid phosphatase elevation on 2 consecutive followups or by appearance of bony or parenchymal disease with or without con-comitant acid phosphatase elevation	0.27 (0.11; 0.71)	72.6	10	40	4	250
RCT	Moderate	Sathya, 2005[15]	EBRT	Iridium implant + EBRT	PSA failure, clinical failure	3.70 (1.27; 10.73)	72.9	60	30	-3	-315

Table C77. Comparative effectiveness of adverse events after different treatments in patients with localized prostate cancer

Design	Study Quality	Outcomes: Adverse Events and Quality of Life	WW % (n=230)	AD % (n=179)	EBRT/Brachy % (n=583)	RP % (n=1,373)
Large population	Moderate	Satisfied with treatment : delighted/pleased**	17.6/30.8	22.9/40.3	32.1/37.8	22.5/36.1
Large population based	Moderate	Make same decision again: definitely yes*/ probably yes*	51.2/40.8	64.4/30.6	62.4/31.4	56.2/34.5
Large population based	Moderate	Bowel urgency: almost everyday*	0.2	3.3	3.2	0.9
Large population based	Moderate	Urinary leakage: daily or more often*	7	10.8	11.8	34.8
Large population based	Moderate	Erectile dysfunction: no erections at all*	32.5	85.8	42.7	58.4
			n=326, %			n = 376, %
RCT	Moderate	Erectile dysfunction ^	45			80
RCT	Moderate	Urinary leakage ^	21			49
RCT	Moderate	Urinary obstruction ^	44			28
RCT	Moderate	Diarrhea ^	0.9			5
RCT	Moderate	Fecal leakage ≥once/week^	7			6

WW = watchful waiting; AD = androgen deprivation; EBRT/Brachy = external beam radiation/brachytherapy; RP = radical prostatectomy
* PCOS study; ^ Steineck study

Table C78. Odds ratio of outcomes, attributable proportion of events among exposed, number needed to treat to harm one patient, and the number of avoided events per 1000 treated patients: radical prostatectomy vs. watchful waiting

Design	Study Quality	Outcomes	Effect: Odds ratio of events, 95% CI			Attributable Fraction of Events (%)	NNT to Harm	Number of Avoided (Excessive) Events
Large population based study	Moderate	Satisfied with treatment: delighted*	1.34	0.68	2.73	26.4	-20	-49
Large population based study	Moderate	Satisfied with treatment: pleased*	1.27	0.70	2.29	21.2	-19	-53
Large population based study	Moderate	Would make same decision again: definitely yes*	1.22	0.70	2.13	18.2	-20	-50
Large population based study	Moderate	Would make same decision again: probably yes*	0.76	0.43	1.36	-30.9	16	63
Large population based study	Moderate	Bowel urgency: almost every day*	4.53	0.04	580.71	77.9	-143	-7
Large population based study	Moderate	Urinary leakage: daily or more often*	7.09	2.97	16.95	85.9	-4	-278
Large population based study	Moderate	Erectile dysfunction: no erections at all*	2.92	1.64	5.19	65.7	-4	-259
RCT	Moderate	Erectile dysfunction^	4.89	2.61	9.17	79.5	-3	-350
RCT	Moderate	Urinary leakage^	3.61	1.94	6.72	72.3	-4	-280
RCT	Moderate	Urinary obstruction^	0.49	0.28	0.89	-102.0	6	160
RCT	Moderate	Diarrhea^	5.79	0.60	55.64	82.7	-24	-41
RCT	Moderate	Fecal leakage ≥ once/week^	0.85	0.28	2.62	-17.9	100	10

*-PCOS study
^ Steineck study

References for Appendix C

(Note that reference numbers are different than those in the text of the report)

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Appendix D: List of Excluded Studies

For Key Questions 1, 2, and 4: Excluded studies are available from the American Urological Association Guideline for the Management of Clinically Localized Prostate Cancer Database. (In press.)

There were 13,888 citations retrieved and reviewed. Of these, 1,764 were selected for winnowing; 759 accepted for further review, and 592 articles, judged potentially eligible, underwent an extraction process. The main reasons (and number of rejected articles) for rejection to narrow articles from 1,764 to 759 were: no outcomes data (435) and T3/T2 contamination (401). Upon further review of the 592 potentially eligible articles, 156 were rejected. Reasons for rejection (and number of rejected articles) included: no outcomes data (31); not local disease (38); T1-T2 patients <50 (7); known duplicate publications (10); other (60).

Question 1. Quality of Life

PCOS

1. Hoffman RM, Gilliland FD, Penson DF, Stone SN, Hunt WC, Potosky AL. Cross-sectional and longitudinal comparisons of health-related quality of life between patients with prostate carcinoma and matched controls. Cancer 2004;101(9):2011-9. *Previously published data*
2. Legler J, Potosky AL, Gilliland FD, et al. Validation Study of Retrospective Recall of Disease-Targeted Function: Results From the Prostate Cancer Outcomes Study. Medical Care 2000;38(8):847-57. *Validation study*
3. Penson DF, Feng Z, Kuniyuki A, et al. General Quality of Life 2 Years Following Treatment for Prostate Cancer: What Influences Outcomes? Results From the Prostate Cancer Outcomes Study. J Clin Oncol 2003;21:1147-54. *Not localized prostate cancer*
4. Potosky AL, Harlan LC, Stanford JL, et al. Prostate Cancer Practice Patterns and Quality of Life: the Prostate Cancer Outcomes Study. Journal of the National Cancer Institute 1999;91(20):1719-24. *No outcomes data*
5. Potosky AL, Knopf K, Clegg LX, et al. Quality-of-Life Outcomes After Primary Androgen Deprivation Therapy: Results >From the Prostate Cancer Outcomes Study. J Clin Oncol 2001;19:3750-57. *Not localized prostate cancer*
6. Potosky AL, Legler J, Albertsen PC, et al. Health outcomes after prostatectomy or radiotherapy for prostate cancer: results from the Prostate Cancer Outcomes Study. Journal of the National Cancer Institute 2000;92(19):1582-92. *Previously published data updated*
7. Potosky AL, Reeve BB, Clegg LX, et al. Quality of life following localized prostate cancer treated initially with androgen deprivation therapy or no therapy. Journal of the National Cancer Institute 2002;94(6):430-7. *Previously published data updated*

Non-PCOS

1. Abdalla I, Basu A, Hellman S. An evidence-based analysis of the management of localized prostate cancer. Cancer Journal 2002;8(1):40-6. *Review article*
2. Abouassaly R, Lane BR, Lakin MM, Klein EA, Gill IS. Ejaculatory urine incontinence after radical prostatectomy. Urology 2006 Dec;68(6):1248-52. *Less than 100 patients per study arm*
3. Agarwal PK, Oefelein MG. Testosterone replacement therapy after primary treatment for prostate cancer. Journal of Urology 2005;173(2):533-6. *Less than 100 patients per study arm*
4. Ahmad MM. Psychometric evaluation of the Cognitive Appraisal of Health Scale with patients with prostate cancer. Journal of Advanced Nursing 2005;49(1):78-86. *Not comparative treatments*
5. Ahmad MM, Musil CM, Zauszniewski JA, Resnick MI. Prostate cancer: appraisal, coping, and health status. Journal of Gerontological Nursing 2005;31(10):34-43. *Not comparative treatments*
6. Ahmed S, Davies J. Managing the complications of prostate cryosurgery. BJU International 2005;95(4):480-1. *No QOL outcomes*
7. Al-Abany M, Helgason AR, Adolfsson J, Steineck G. Reliability of assessment of urgency and other symptoms indicating anal sphincter, large bowel or urinary dysfunction. Scandinavian Journal of Urology & Nephrology 2006;40(5):397-408. *Not comparative treatments*
8. Alberts SR, Novotny PJ, Sloan JA, Danella J, Bostwick DG, Sebo TJ, et al. Flutamide in men with prostatic intraepithelial neoplasia: a randomized, placebo-controlled chemoprevention trial. Am J Ther 2006 Jul-Aug;13(4):291-7. *Less than 100 patients per study arm*
9. Albertsen PC. Clinical and physical determinants for toxicity of 125-I seed prostate brachytherapy. Journal of Urology 2005;174(5):1969-70. *No QOL outcomes*
10. Alexianu M, Weiss GH. Radical prostatectomy versus brachytherapy for early-stage prostate cancer. Journal of Endourology 2000;14(4):325-8. *No QOL outcomes*
11. Alibhai SM, Naglie G, Nam R, Trachtenberg J, Krahn MD. Do older men benefit from curative therapy of localized prostate cancer? Journal of Clinical Oncology 2003;21(17):3318-27. *No QOL outcomes*
12. Allen ZA, Merrick GS, Butler WM, Wallner KE, Kurko B, Anderson RL, et al. Detailed urethral dosimetry in the evaluation of prostate brachytherapy-related urinary morbidity. International Journal of Radiation Oncology, Biology, Physics 2005;62(4):981-7. *No QOL outcomes*
13. Anast JW, Sadetsky N, Pasta DJ, Bassett WW, Latini D, DuChane J, et al. The impact of obesity on health related quality of life before and after radical prostatectomy (data from CaPSURE). Journal of Urology 2005;173(4):1132-8. *Not comparative treatments*
14. Anastasiadis AG, Sachdev R, Salomon L, Ghafar MA, Stisser BC, Shabsigh R, et al. Comparison of health-related quality of life and prostate-associated symptoms after primary and salvage cryotherapy for prostate cancer. Journal of Cancer Research & Clinical Oncology 2003;129(12):676-82. *Not RCT*
15. Anger JT, Maliski SL, Krupski TL, Kwan L, Gore JL, Fink A, et al. Outcomes in men denied access to a California public assistance program for prostate cancer. Public Health Rep 2007 Mar-Apr;122(2):217-23. *Not comparative treatments*
16. Anonymous. Researchers study quality of life after prostate cancer. ONS News 2000;15(8):13. *Not prospective or longitudinal survey study or RCT*
17. Anonymous. Patient comfort an important consideration for treating men with prostate cancer. Urologic Nursing 2002;22(4):285. *Not prospective or longitudinal survey study or RCT*
18. Anonymous. Bush vs. Kerry: who is healthier? Both candidates are active, so their cardiovascular systems seem to be in tip-top shape. But they've had health problems typical of men their age. Harvard Health Letter 2004;30(1):6-7. *Not localized prostate cancer*
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21. Arredondo SA, Latini DM, Sadetsky N, Kawakami J, Pasta DJ, DuChane J, et al. Quality of life for men receiving a second treatment for prostate cancer. Journal of Urology 2007 Jan;177(1):273-8; discussion 8-9. *Not comparative treatments*
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25. Bacon CG, Giovannucci E, Testa M, Glass TA, Kawachi I. The association of treatment-related symptoms with quality-of-life outcomes for localized prostate carcinoma patients. Cancer 2002;94(3):862-71. *Not comparative treatments*
26. Bacon CG, Giovannucci E, Testa M, Kawachi I. The impact of cancer treatment on quality of life outcomes for patients with localized prostate cancer. Journal of Urology 2001;166(5):1804-10. *Not prospective or longitudinal survey study*
27. Bailey DE, Mishel MH, Belyea M, Stewart JL, Mohler J. Uncertainty intervention for watchful waiting in prostate cancer. Cancer Nursing 2004;27(5):339-46. *Not comparative treatments*
28. Ball AJ, Gambill B, Fabrizio MD, Davis JW, Given RW, Lynch DF, et al. Prospective longitudinal comparative study of early health-related quality-of-life outcomes in patients undergoing surgical treatment for localized prostate cancer: a short-term evaluation of five approaches from a single institution. Journal of Endourology 2006 Oct;20(10):723-31. *Less than 1 year duration or follow-up*
29. Bang H, Jung SH, George SL. Sample size calculation for simulation-based multiple-testing procedures. Journal of Biopharmaceutical Statistics 2005;15(6):957-67. *Not localized prostate cancer*
30. Barqawi A, O'Donnell C, Kumar R, Koul H, Crawford ED. Correlation between LUTS (AUA-SS) and erectile dysfunction (SHIM) in an age-matched racially diverse male population: data from the Prostate Cancer Awareness Week (PCAW). International Journal of Impotence Research 2005;17(4):370-4. *Not comparative treatments*
31. Barreto F, Dall'Oglio M, Srougi M. Recurrent vesicourethal stenosis after radical prostatectomy: how to treat it? International Braz J Urol 2005;31(6):552-4. *Less than 100 patients per study arm*
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Proton beam radiation therapy (PBRT), high-intensity focused ultrasound (HIFU), intensity modulated radiation therapy (IMRT), cryosurgery, and laparoscopic/ robotic surgery

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Question 3. Provider Characteristics Associated with Patient Outcomes

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Appendix E: Sample Abstraction Forms

Project Title Comparison of Therapies for Clinically Localized Prostate Cancer

Research question: How do provider/hospital characteristics affect outcomes overall and differentially (e.g. geographic region and volume)?

Abstraction Form (complete for each article)

Study ID (PUBMED)_____

Title:_____

Authors: _____

Reference:_____

Description of Database:_____

Abstractor:_____

VERIFICATION/SELECTION OF STUDY ELIGIBILITY

Language of the publication			
English	Yes	No	
Target population			
Patients with prostate adenocarcinoma	Yes	No	Combined
Stage of cancer			
I-II	Yes	No	Combined
Treatments			
Radical prostatectomy	Yes	No	
Radiation therapy	Yes	No	
Interstitial brachytherapy	Yes	No	
Cryosurgery	Yes	No	
Expectant management	Yes	No	
Hormonal therapy as primary therapy	Yes	No	
Provider characteristics			
Hospital volume	Yes	No	
Surgeon volume	Yes	No	
Hospital status	Yes	No	
Physician specialty	Yes	No	
Provider location	Yes	No	
Clinical outcomes			
Mortality	Yes	No	
Morbidity	Yes	No	
Urinary complications	Yes	No	
Long term incontinence	Yes	No	
Operational quality indicators	Yes	No	
Positive margins	Yes	No	
Length of stay	Yes	No	

Publication type (mark one)
☐ Published article
☐ Administrative report
☐ Dissertation
☐ Abstract/Presentation
☐ Book/book chapter

Purpose/aim of study _____

Design of the study (mark one)
☐ prospective cohort
☐ retrospective cohort
☐ cross-sectional
☐ descriptive study
☐ case-control
☐ case-series
☐ randomized controlled clinical trial
☐ not randomized clinical interventions
☐ ecologic

ASSESSMENT OF STUDY QUALITY

Score each domain on a scale of 0 (poor, not defined) to 5 (excellent, clearly defined)

1. Study question clearly focused and appropriate
2. The objectives and primary hypothesis of the study clearly stated
3. Description of the target population
4. Description and clear definition of the exposure
5. Description and clear definition of primary and secondary outcomes
6. Validation of the measurements of the exposure
7. Validation of the measurements of the outcomes
8. The process of the subjects' selection
9. The adequacy of the sampling (random selection or not)
10. The assessment of selection bias
11. Was the sample size justified
12. Censoring (when applicable)
13. Loss of followup
14. Length of followup (when applicable)
15. Assessment of possible confounding factors:
16. Validity of the measurements
17. Matching
18. Adjustment
19. Standardization
20. Measurement of possible effect measure modification
21. Reporting of the statistical analysis
22. Precision of the reported estimates of the association between exposure and outcomes (95% CI; maximum likelihood test, p value, the ratio of the highest 95% CI to the lowest)
23. Comparison of crude and adjusted estimates
24. Justification of the used models statistical models
25. Assessment of nonlinear associations
26. Appropriate multivariate–techniques to adjust for confounding factors (multivariate regression, propensity scores)
27. Subgroups analysis - Single site vs. multi center study
28. Limitations of the study
29. The major results of the study
30. The appropriate conclusions of the study
31. External validity of the study

Level of evidence of the individual study (mark one)

Interventions:

☐ I – Well-designed randomized controlled trial
☐ II-1A - Well-designed controlled trial with pseudo-randomization
☐ II-1B - Well-designed controlled trial without randomization

Observational studies

☐ I-2A - Well-designed cohort (prospective) study with concurrent controls
☐ II-2B - Well-designed cohort (prospective) study with historical controls
☐ II-2C - Well-designed cohort (retrospective) study with concurrent controls
☐ II-3 – Well-designed case-controlled (retrospective)study
☐ III – Large differences from comparisons between times and/or places
☐ Y – Opinion of respected authorities based in clinical experience

Source of sampling and data collection (define)_____

Country where the study was conducted _____

Financial Support: Industry, National Grant or foundations, other, define _____

Time interval outcomes occurred _____

Data to collect outcomes information: Administrative database, define _____
Medical Records _____

Adjustment for patient characteristics:

Patient age	Yes	No
Patient Race	Yes	No
Cancer stage	Yes	No
Patient Socio-economic Status	Yes	No
Patient Co morbidity	Yes	No
Hospital Affiliation with Medical School	Yes	NO

Patient Demographics

Number of patients (n, N, %): _____ _____ _____

Age (years, %): _____ _____ Mean: _____ Min: _____ Max: _____ ±SD: _____ ±SE: _____

Race (n, %) White: _____ _____ African-American: _____ _____

Other: _____ _____ Describe: _____

Tumor characteristics, Describe _____

Comments:_____

_____

_____

Patient Inclusion Criteria: _____

_____

Patient Exclusion Criteria: _____

_____

Surgeon Inclusion Criteria: _____

_____

Surgeon Exclusion Criteria: _____

_____

Group/Sub-Group Definitions

Group ID	Patients (n)	Define

Physician specialty: Urologist Radiation oncologist, General Internist, Other, define_____

Provider Location: State, Region, County, Other, define_____

Type of Volume

Hospital Volume

1. Number of patients: _____
2. Number of hospitals: _____
   (e.g., low, medium, high)
3. Description: _____
4. Annual Volume, Define: _____
5. Mean: _____

1. Number of patients: _____
2. Number of hospitals: _____
   (e.g., low, medium, high)
3. Description: _____
4. Annual Volume, Define: _____
5. Mean: _____

Comments:_____

_____

Number of patients: _____

1. Number of hospitals: _____
   (e.g., low, medium, high)
2. Description: _____
3. Annual Volume, Define: _____
4. Mean: _____

Comments:

_____

_____

Surgeon Volume

1. Number of patients: _____
   (e.g., low, medium, high)
2. Description: _____
3. Annual Volume, Define: _____
4. Mean: _____
5. Median: _____

1. Number of patients: _____
   (e.g., low, medium, high)
2. Description: _____
3. Annual Volume, Define: _____
4. Mean: _____

Median: _____

1. Number of patients: _____
   (e.g., low, medium, high)
2. Description: _____
3. Annual Volume, Define: _____
4. Mean: _____
5. Median: _____

Outcomes

Treatment utilization

Treatment	Rate/ 100,000 males	% of Treated/ diagnosed	Relative risk of treatment utilization	Cost $	Length of stay, Days
Radical prostatectomy					
Radiation therapy					
Interstitial brachytherapy					
Cryosurgery					
Expectant management					
Hormonal therapy as primary therapy					

Comments: _____

_____

Prostate Cacner screening, Incidence, and mortality

Provider characteristics	PSA testing, %	Incidence total/100,000	Incidence, localized PC/100,000	Mortality total/ 100,000	Mortality, cancer specific/ 100,000
Physician specialty					
Number of urologists					
Number of radiation oncologists					
Provider location					

Clinical outcomes in patients with prostate cancer treated with radical prostatectomy

Clinical outcomes	Events Rate Standard Deviation	Relative Risk, 95% CI
Surgery related mortality		
Morbidity		
Urinary complications		
Long-term incontinence		
Operational quality indicators		
Positive margins		
Blood loss		
Adjuvant therapy		
Length of stay		
Readmission		

Comments: _____

_____

Appendix F: Definitions of Outcomes

1) Incidence of prostate cancer—the number of new cases per 100,000 age standardized male population during a given period of time
2) Prostate cancer screening—proportion of males who reported PSA testing at the state level
3) Mortality in patients with prostate cancer—all cause and prostate cancer deaths/100,000 age standardized male population during a given period of time
4) Treatment utilization—rate of radical prostatectomy per 100,000 age adjusted male population; percent of patients with localized prostate cancer receiving radical prostatectomy, external beam therapy, brachytherapy, primary androgen deprivation therapy, radiation, and watchful waiting as a primary treatment of prostate cancer
5) Intrahospital mortality—crude and adjusted death rate from all causes during hospitalization and 30 days after submission in patients with prostate cancer treated with radical prostatectomy
6) Followup mortality—crude and adjusted death rate from all causes during the time of followup (90 days from surgery, 10 years from surgery) in patients with prostate cancer treated with radical prostatectomy
7) Positive surgical margins—proportion of the patients with extension of the tumor to the inked surface of the resected specimens
8) Intraoperation complication—proportion of the patients who needed blood transfusion during the prostatectomy
9) Volume of blood loss in ml. Postoperative complications—proportion of the patients with potentially life-threatening events during the 30 days after surgery in the following categories: cardiac, respiratory, or vascular events; the need for reoperation; bleeding; and other events including renal failure and shock
10) Late urinary complications—proportion of the patients treated for bladder-neck obstruction, urethral or ureteral strictures, intestinal or vesical fistulas, pelvic abscess, or any complication that resulted in early, definitive treatment of incontinence
11) Long-term incontinence—proportion of patients with symptoms of incontinence and the proportion of patients treated with corrective procedures, including periurethral injections of collagen or placement of an artificial urinary sphincter and other invasive procedures 24 months after prostatectomy
12) Failure of cancer control—proportion of patients treated with adjuvant hormone ablative therapy including orchiectomy, LupronT, goserelin and diethylstilbestrol
13) Length of hospital stay—number of overnight stays in the hospital
14) Cost—total hospital discharge in patients with localized prostate cancer in dollars
15) Readmission rate—proportion of patients who were readmitted to the hospital within 30 days after the operation
16) Operation quality indicators to assess radical prostatectomy specimens included: submission of a frozen section location of the adenocarcinoma, proportion of specimen involved by adenocarcinoma, perineural involvement, vascular involvement, seminal vesicle status, periprostate fat status, number of nodes submitted, status of nodes, and PIN (prostate intra-epithelial neoplasia)