Trends in Active Surveillance for Low-Risk Prostate Cancer

Richard Hoffman, MD, MPH[1,2,3], Brad McDowell, PhD[1,3], Sonia Anand, MS[1,3], Sarah L Mott, MS[1], Kenneth G. Nepple, MD[1,2,3]

University of Iowa [1]Holden Comprehensive Cancer, [2]Carver College of Medicine, [3]College of Public Health

Background

- Professional guidelines recommend that men with low-risk prostate cancer (PCa) consider active surveillance (AS)
- AS is a monitoring strategy for deferring curative treatment in the absence of cancer progression or patient preference
  - Monitoring includes periodic prostate biopsies ± MRI scans
- AS effectively reduces the harms of undergoing unnecessary treatments without increasing PCa mortality
- Men with low-risk PCa are increasingly deferring active treatment
- There are little data on either treatment trends among men with very-low risk PCa or on adherence with surveillance procedures

Objectives

Describe trends and factors associated with selecting and adhering to AS among a population-based sample of men with low- or very low-risk prostate cancer

Methods

- **Data source**: SEER-Medicare database, 2010-2014
- **Subjects**
  - Men, aged 66+, newly-diagnosed with invasive PCa, 2010-2013
- **Variables**
  - Sociodemographic
  - Charlson comorbidity score
  - Tumor characteristics
- **Outcomes**
  - Receipt of active treatment
    - Surgery, radiation, cryotherapy, hormone
  - Receipt of surveillance monitoring
    - Prostate biopsy ± MRI
- **Analyses**
  - Low risk (Stage T1c, T2a; PSA < 10 ng/mL, Gleason = 6)
    - Treatment < 1 year vs. no (deferred)

    Deferred treatment cohort
    - Surveillance monitoring (cumulative)
    - Treatment > 1 year (cumulative)
  - Very low-risk (Stage T1c, PSA < 10 ng/mL, Gleason = 6, % positive biopsies < 25%)
    - Treatment < 1 year vs. no (deferred)

    Deferred treatment cohort
    - Surveillance monitoring (cumulative)
    - Treatment > 1 year (cumulative)
  - Multivariable logistic and Cox regression analyses

Results

Study Flow Chart

SEER-Medicare database, men aged 66+ diagnosed with prostate cancer, 2010-2013
(N = 101,317)

Medicare Part A and B (no HMO) for ±1 year of diagnosis
Any NCH, OUTPAT, or MEDPAR claims within 1 year of diagnosis
Alive for ≥ 1 year after diagnosis
(N = 52,134)

PSA < 10 ng/mL
Gleason = 6
Stage T1c, T2a
(N = 7731)

Low-risk

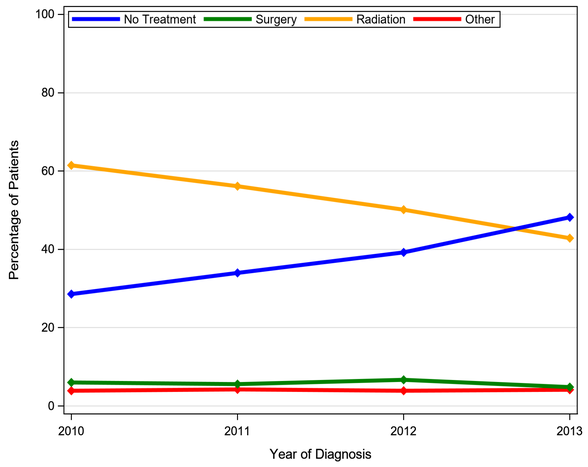
PSA < 10 ng/mL
Gleason = 6
Stage T1c
+ biopsy cores < 25%
(N = 2929)

Very low-risk

Baseline sociodemographic, clinical, and tumor characteristics by initial treatment selection

Variable	No treatment (n = 2796)	Treatment (n = 4935)
Sociodemographic Characteristics		
Age at diagnosis (N, %)		
< 70	959 (34.3)	1875 (38.0)
70+	1837 (65.7)	3060 (62.0)
Race (N, %)		
White	2371 (87.9)	4193 (86.5)
Black	237 (8.8)	522 (10.8)
Other	88 (3.3)	133 (2.7)
Ethnicity (N, %)		
Hispanic	113 (4.0)	326 (6.6)
Marital status (N, %)		
Married	1818 (78.8)	3489 (81.2)
Zip code education (N, %)		
Some college (> 30%)	912 (34.7)	1475 (31.7)
Zip code median income (%)		
> $60,000	970 (37.0)	1359 (29.2)
Clinical Characteristics		
Charlson comorbidity (N, %)		
0	1673 (60.9)	2818 (57.7)
1	628 (22.9)	1154 (23.6)
2+	444 (16.2)	914 (18.7)
Tumor Characteristics		
AJCC stage		
T1c	2595 (92.8)	4247 (86.1)
T2a	201 (7.2)	688 (13.9)
PSA (ng/mL; N, %)		
<4	460 (16.5)	1128 (14.6)
4 – 9.9	2336 (83.5)	6603 (85.4)
Percent positive biopsy cores		
< 25%	1276 (75.1)	1633 (56.8)
≥ 25%	424 (24.9)	1243 (43.2)
Missing	1096	2059

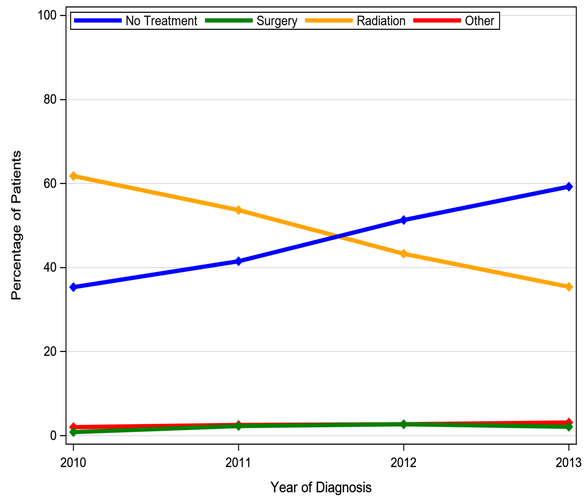
Treatment trends: low-risk prostate cancer



Low-risk cancer: multivariable model predicting deferring active treatment

Variable	Level	Odds ratio (95% CI)	P-value
Age at diagnosis	70+	1.18 (1.05, 1.32)	< 0.01
	<70	Reference	
Ethnicity	Hispanic	0.73 (0.56, 0.95)	0.02
	Non-Hispanic	Reference	
Marital status	No	1.22 (1.06, 1.40)	< 0.01
	Yes	Reference	
Income (median)	>$60,000	1.72 (1.49, 1.98)	0.03
	$40-60,000	1.48 (1.28, 1.70)	
	< $40,000	Reference	
AJCC stage	T1c	2.37 (1.95, 2.87)	< 0.01
	T2a	Reference	
PSA (ng/mL)	< 4	1.45 (1.24, 1.69)	< 0.01
	4+	Reference	
Year of diagnosis	2013	2.34 (2.00, 2.75)	< 0.01
	2012	1.69 (1.44, 1.97)	
	2011	1.26 (1.09, 1.45)	
	2010	Reference	

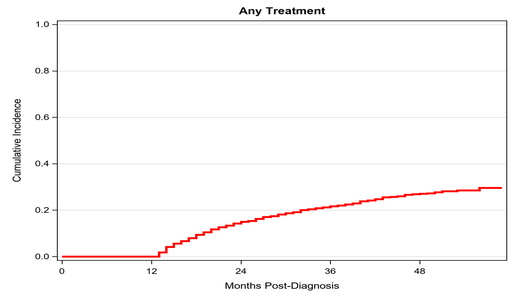
Treatment trends: very low-risk prostate cancer



Very low-risk cancer: multivariable model predicting deferring active treatment

Variable	Level	Odds ratio (95% CI)	P-value
Ethnicity	Hispanic	0.66 (0.45, 0.97)	0.03
	Non-Hispanic	Reference	
Income (median)	>$60,000	1.63 (1.32, 2.01)	0.03
	$40-60,000	1.38 (1.11, 1.70)	
	< $40,000	Reference	
PSA (ng/mL)	< 4	1.25 (0.97, 1.61)	0.09
	4+	Reference	
Year of diagnosis	2013	2.66 (2.09, 3.38)	< 0.01
	2012	1.84 (1.46, 2.32)	
	2011	1.32 (1.05, 1.66)	
	2010	Reference	

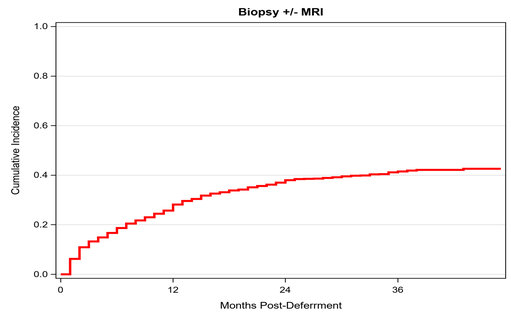
Switching to active treatment (low-risk)



Factors associated with switching

Variable	Hazard ratio (95% CI)
Baseline PSA < 4 ng/mL	0.74 (0.49, 0.79)
Surveillance biopsy	5.95 (4.69, 7.54)

Surveillance monitoring (low-risk)



Limitations

- Missing data (biopsy cores, NOS cancer stages)
- Misclassifying cohort based on using SEER stage
- Generalizability (age ≥ 66, Medicare enrollment criteria, no VA or Medicare-HMO patients)

Conclusions

- Increasing trend of deferring active treatment for low and very-low risk PCa
- Tumor characteristics, SES associated with deferring treatment for low-risk PCa, SES for very low-risk PCa
- Nearly three-quarters of men deferring active treatment did not switch to active treatment, though only 42% obtained a surveillance biopsy

  Biopsy associated with switching, likely reflecting Gleason change