Conditional Prostate Cancer-Specific Survival Probabilities in Recurrent Prostate Cancer Patients Receiving Radiation ± Antiandrogen Therapy: Secondary Analysis of a Randomized Clinical Trial

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Objective

Primary: To analyze conditional survival (CS) estimates for recurrent prostate cancer (Pca) patients undergoing salvage radiation therapy (SRT) ± androgen-deprivation therapy (ADT).
Secondary: To determine if factors prognostic of prostate cancer-specific survival (PCSS) at diagnosis remain relevant in survivorship.

Background

SRT and ADT are routinely used in patients with elevated PSA after radical prostatectomy. NRG/RTOG 9601 demonstrated increased biochemical failure free survival and overall survival (OS) for patients treated with SRT + ADT:

- 12 year OS: 71% -> 76% with addition of ADT
- Prognostic factors for survival at time of SRT: Gleason Score (GS), PSA, Age

Utility of PCSS data following SRT diminishes over time.
CS provides more relevant estimates given long-term PCa survivorship.

Methods

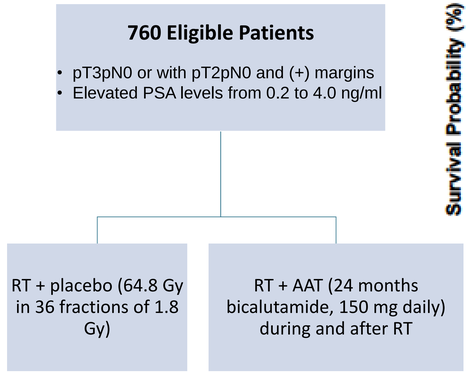
Data from NRG/RTOG 9601 was obtained from the NCTN Data Archive:

Median age	65 y
Median PSA at entry	0.6 ng/ml
Median follow-up	13 y
Median interval between surgery and first detectable PSA	1.4 y
Median interval between surgery and trial entry	2.1 y

OS was calculated (Kaplan–Meier), cumulative incidence was used to estimate PCSS rates at diagnosis and at different points of survivorship

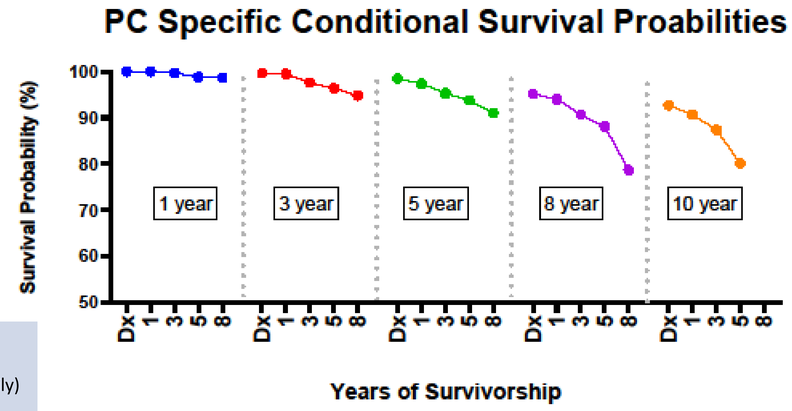
Prognostic factors (see below) associated with PCSS were analyzed by multivariable Cox proportional hazards modeling (MVA):

- Age
- Omission of ADT
- GS 7
- GS 8–10
- Higher pretreatment PSA



Results

- Patients followed for median of 13 y
- 5- and 10-y PCSS estimates from diagnosis were 98.52% and 92.7%.
- At 1- (*n* = 755), 3- (*n* = 727), 5- (*n* = 680), and 8-y (*n* = 602) survivorship, chances of PCSS at an additional 5-y were 97.41%, 95.29%, 93.76%, and 91.04%.
- On MVA at diagnosis, omission of ADT, increasing age, GS 7, and GS 8−10 were associated with PCa-specific mortality.
- For those who achieved survivorship at 1-, 3-, 5-, and 8-y, all variables remained prognostic of PCa-specific mortality on MVA.



Risk Factor	Diagnosis			5-year PCSS		
	Hazard Ratio	95% CI	P-value	Hazard Ratio	95% CI	P-value
Omission of ADT	**2.156**	**1.417-3.28**	**0.0003**	**1.793**	**1.163-2.765**	**0.0082**
Increasing age	**1.833**	**1.06-3.169**	**0.0300**	**1.992**	**1.107-3.583**	**0.0214**
GS 7	**2.356**	**1.283-4.326**	**0.0057**	**2.201**	**1.189-4.075**	**0.0120**
GS 8-10	**4.841**	**2.525-9.28**	**<.0001**	**4.046**	**2.062-7.939**	**<.0001**
Higher Pre-tx PSA	1.311	0.748-2.298	0.3447	1.492	0.835-2.664	0.1764

Time (no. at risk)	Additional years survived (%)				
	1y	3y	5y	8y	10y
Diagnosis	**100%** (n=755)	**99.73%** (n=727)	**98.52%** (n=680)	**95.18%** (n=602)	**92.72%** (n=543)
1-year Survived	**100%** (n=744)	**99.46%** (n=712)	**97.41%** (n=657)	**93.98%** (n=574)	**90.69%** (n=500)
3-Years Survived	**99.72%** (n=712)	**97.61%** (n=657)	**95.29%** (n=602)	**90.72%** (n=500)	**87.35%** (n=281)
5-Years Survived	**98.82%** (n=657)	**96.40%** (n=602)	**93.76%** (n=543)	**88.14%** (n=281)	**80.09%** (n=57)
8-Years Survived	**98.66%** (n=574)	**94.84%** (n=500)	**91.04%** (n=281)	**78.57%** (n=9)	

Conclusions

- Conditional risk of death from PCa for patients treated with SRT increases over time.
- Initial risk of dying from PCa over a given period is higher than if already having survived a portion of the period.
- ADT, younger age, and lower GS continue to confer reduced risk of PCa-specific mortality.
- This data can be used to inform survivorship care planning, giving patients more relevant prognostic information during continued surveillance after completion of treatment.

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