

17-Year Cause-Specific Survival Following Permanent Prostate Brachytherapy

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Objective: To determine the pre-treatment and treatment related factors that influence 17-year cause-specific survival (CSS) in men undergoing permanent seed implantation (PSI) for localized prostate cancer

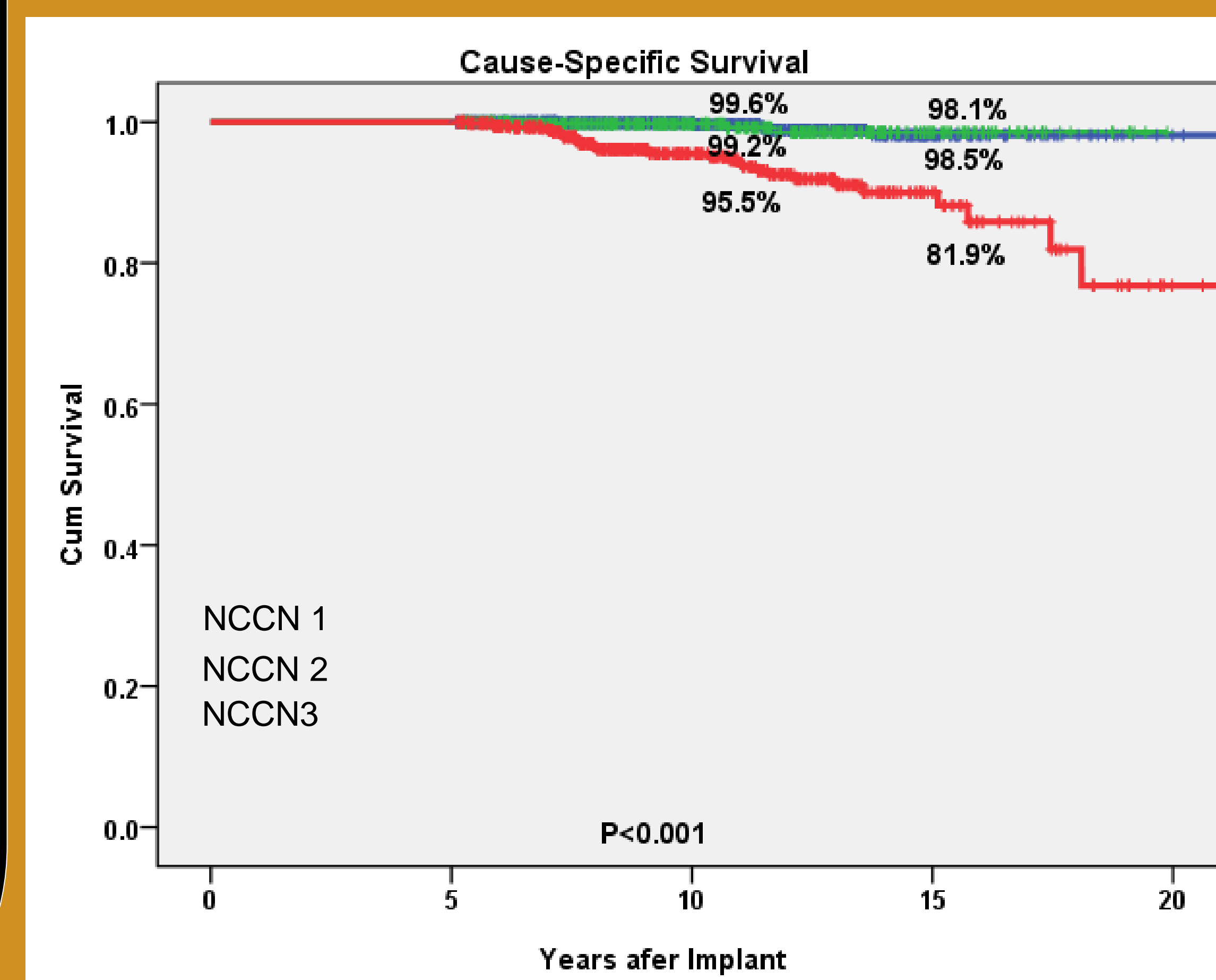
Materials/Methods

- 1776 men followed a minimum of 6 years (mean 10.3, range 6-22.4) 705 (39.7%) had PSI alone, 123 (6.9%) had PSI plus external beam irradiation (EBRT), 434 (24.4%) had PSI plus neoadjuvant hormone therapy (NHT) and 514 (28.9%) had and PSI plus NHT/EBRT.
- 948 (53.4%) received NHT for a median of 6 months (75%ile 3-9). NHT was given in men with NCCN1 (798, 44.9%) for 3 months for prostate volume > 50 cc, in NCCN2 (413, 23.3%) for 6 months and for 9 months in men with NCCN3 (565, 31.8%). 123 men received EBRT boost instead of NHT (NCCN2) and 434 of the NCCN3 received both NHT and EBRT.
- Radiation doses were converted to the biological equivalent dose (BED) using an α/β of 2.
- CSS was determined by the absence of clinical recurrence at the time of death. Means were compared by ANOVA. Survival estimates were calculated by Kaplan-Meier method with comparison of variables by log rank and hazard rates (HR) computed by Cox regression.

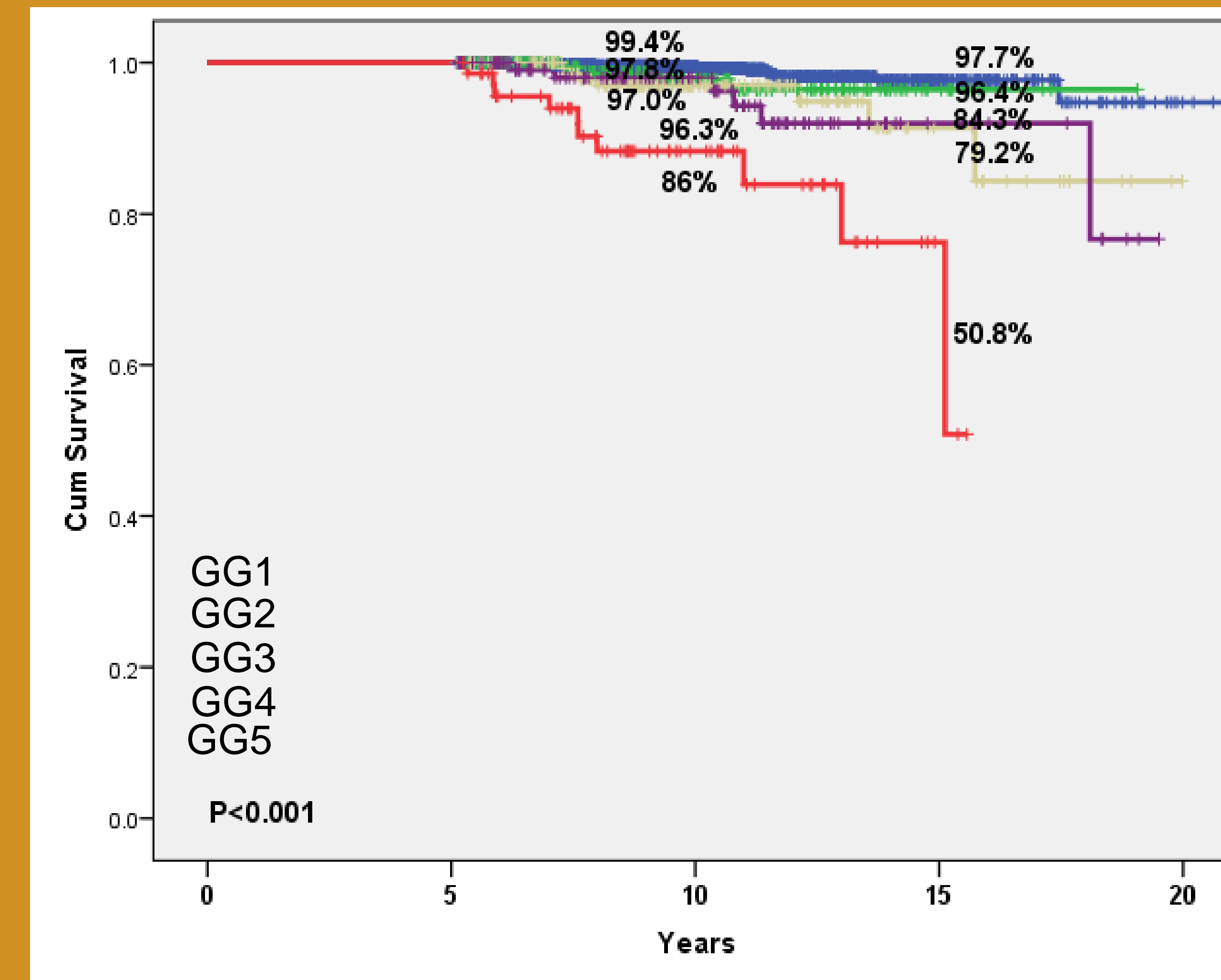
Patient Characteristics

Variable	Number	%
PSA (ng/ml)		
0-10	1337	75.2
>0-20	316	17.8
> 20	123	7.0
Clinical stage		
≤ T2a	1197	67.4
T2b-c	535	30.1
T3	44	2.5
Gleason score		
≤6	1170	65.9
7	406	22.9
8-10	200	11.2
NCCN Risk		
low	798	44.9
intermediate	413	23.3
high	565	31.8
Implant type		
Implant alone	705	39.7
Implant plus NT	434	24.5
Implant plus EBRT	123	6.9
Implant plus NHT/EBRT	514	28.9
BED (Gy)*		
< 150	152	8.8
150-200	707	40.7
>200	877	50.5

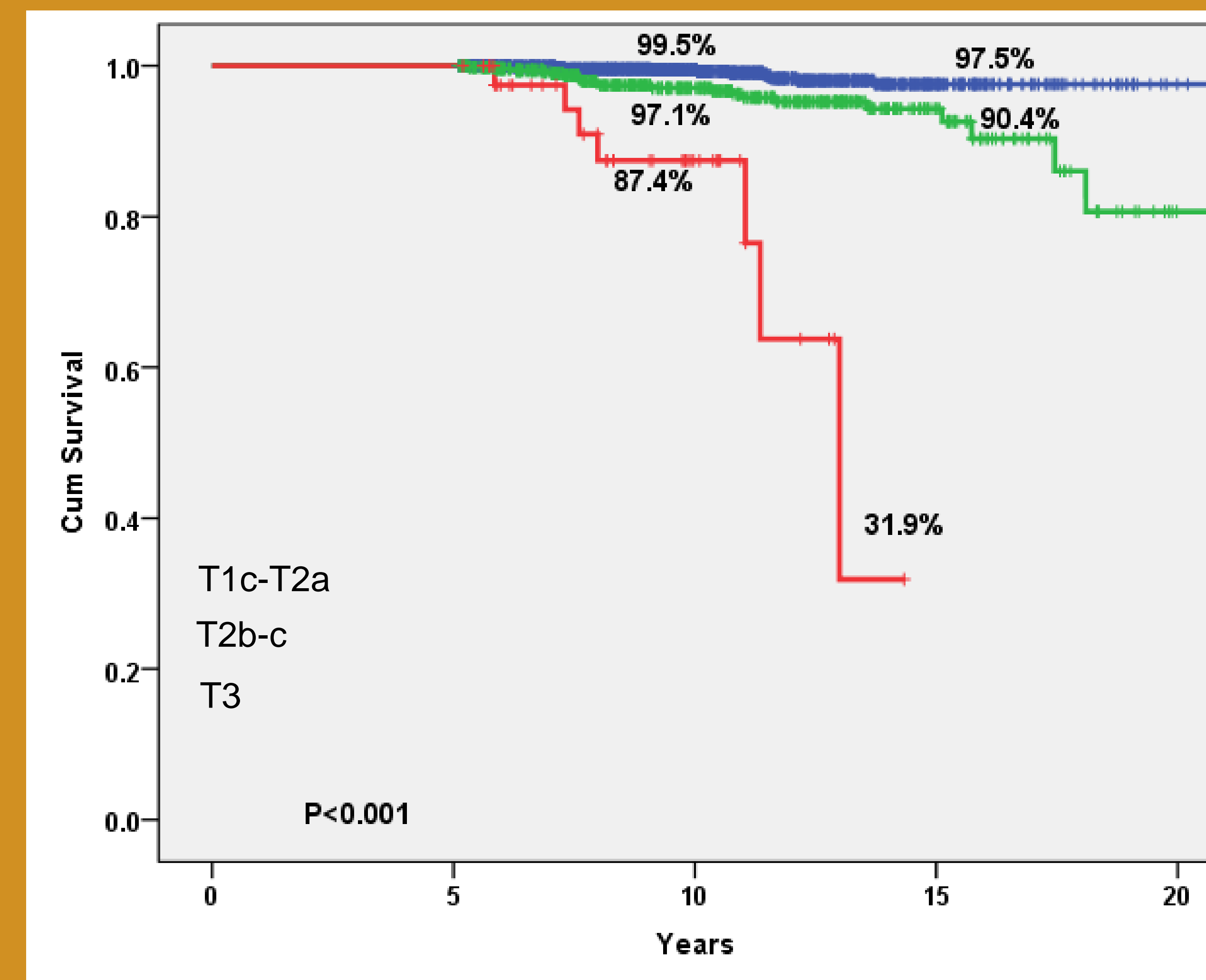
*Biologic equivalent dose (BE) 1736/1776 (97.7%) had dosimetry data



CSS by NCCN Risk Group



Cause-specific survival by Gleason Group



Cause-specific survival by stage

BED and CSS (DOD vs not, ANOVA)

171.8 vs 194.9 Gy (p<0.001)

BED < 170 vs ≥ 170Gy, Pearson χ^2

4.2 vs. 1.7% OR 0.397 95%CI 0.197-0.799

Variable (n)	10-year (%)	17-year (%)	Mean Survival Years (95% CI)	P value
NCCN Group				
1	99.6	98.1	21.8 (21.6-21.9)	
2	99.2	98.5	19.7 (19.6-19.9)	
3	95.5	81.9	20 (19.3-20.7)	<0.001
Gleason Risk Group				
1	99.4	97.7	21.6 (21.3-21.9)	
2	97.8	96.4	18.7 (18.4-19.1)	
3	97	84.3	18.9 (18.1-19.5)	<0.001
4	96.3	79.2	18.4 (17.8-19.3)	
5	86	50.8	14.0 (13.2-14.9)	
PSA (ng/ml)				
<10	99.3	97.4	21.6 (21.5-21.8)	
10-19.9	97.4	94.2	20.8 (20.0-21.5)	
>20	93.2	75.0	19.0 (17.6-20.4)	<0.001
Stage				
T1c-T2a	99.5	97.5	21.7 (21.5-21.8)	
T2b-c	97.1	90.4	20.5 (19.8-21.2)	
T3	87.4	31.9	12.3 (11.2-13.4)	<0.001

Cox Regression

Variable	Sig.	Hazard Rates	95.0% CI for HR	
			Lower	Upper
NHT	.813	1.117	.448	2.783
T1c-T2a	.000	.087	.029	.262
T2b-c	.000	.159	.059	.425
Gleason 6	.000	.182	.071	.462
Gleason 7	.046	.399	.162	.984
PSA	.099	1.008	.999	1.017
BED (Gy)	.018	.990	.982	.998

Conclusions

- Substantial decrease in CSS after 10 years in GG5
- Higher radiation doses improve survival
- No apparent benefit to hormonal therapy