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MODERN RADIATION ONCOLOGY
35° RESIDENTIAL COURSE

Clinical Cases

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Policlinico Universitario Fondazione Agostino Gemelli

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Università Cattolica del Sacro Cuore

GART
Advanced Radiation Therapy

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FC, Male, 63 years old

Comorbidities: Hypertension treated with Ramipril 5 mg/day

- (11.2024) iPSA: 7 ng/ml
- (17.03.2025) Multiparametric prostate MRI: PIRADS 4 left apical lesion involving <50% of the lobe. Prostate volume: 30 cc
- (14.04.2025) Biopsy: adenocarcinoma GS 3+4, 2/7 cores in the left lobe (target zone)
- (16.05.2025) Bone scintigraphy: negative for bone metastases
- (13.05.2025) CT TAP with contrast: oncologically negative

TO SUMMARIZE:

iPSA: 7 ng/ml
Gleason score: 3+4, 2/7 positive cores in the left lobe
cT2a N0 M0

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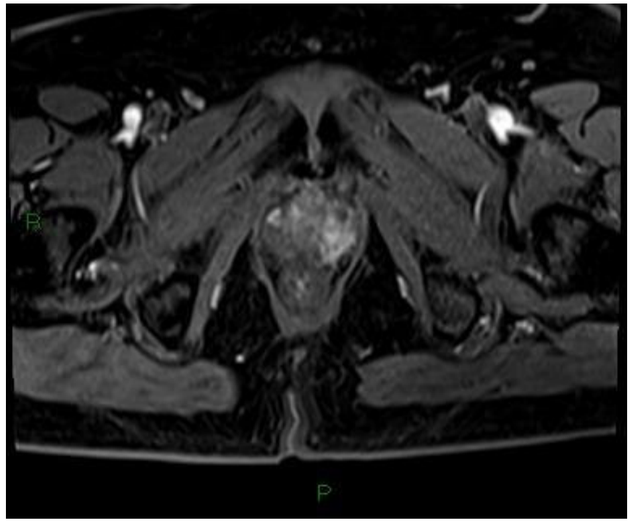
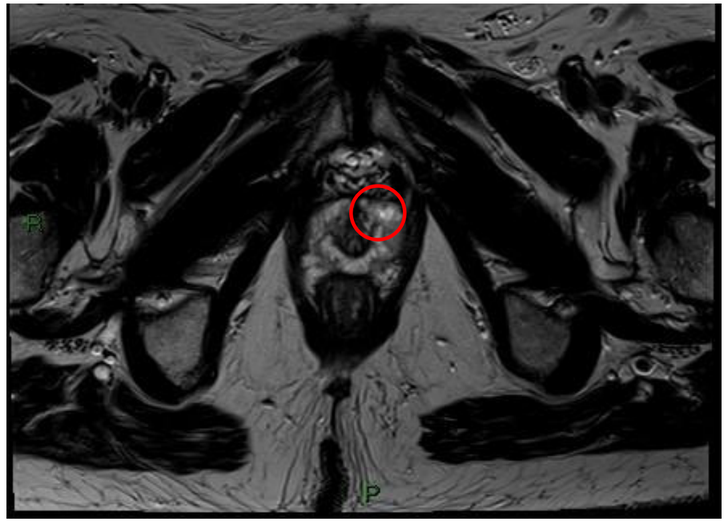
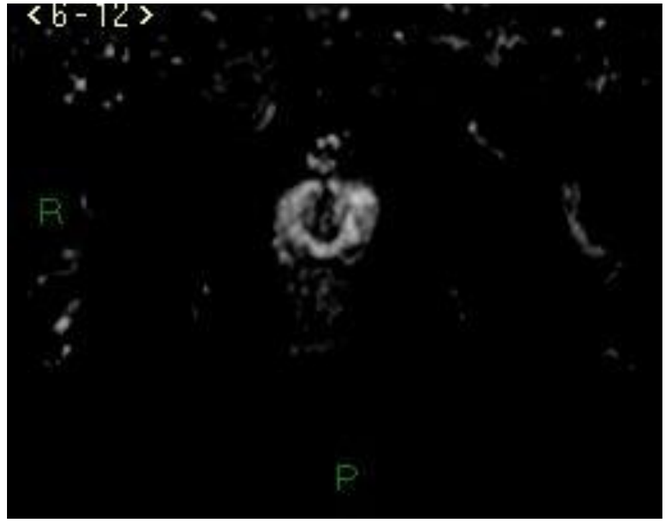
FC, Male, 63 years old

Multiparametric prostate MRI: PIRADS 4 left apical lesion involving <50% of the lobe. Prostate volume: 30 cc







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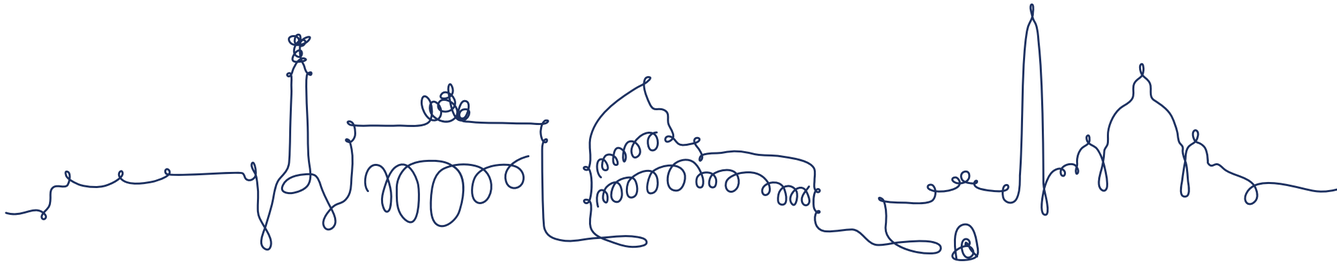

Which treatment strategy do you believe to be the most appropriate in this scenario?

1. Active surveillance
2. Surgery +/- Hormonal Therapy
3. External Beam RT +/- Hormonal Therapy
4. Interventional RT (Modern Brachytherapy) +/- Hormonal Therapy
5. Hormonal Therapy alone

SCAN ME!

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MRO.35: Equity and research in oncology. The subtle balance between personalized medicine and accessibility to care

26-27-28 OCTOBER 2025 - Fondazione Policlinico Universitario A. Gemelli IRCCS

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Università Cattolica del Sacro Cuore

GSTeP
Gemelli Science and Technology Park

From Guidelines to living practice
Panel discussion on local therapy: clinical cases

Prof. Bernardo Rocco
Dir. UOC Urologia – Fondazione Policlinico Gemelli, Roma

Recommendations for intermediate risk Pca (favorable)

Table 4.3: EAU risk groups for biochemical recurrence of localised and locally-advanced prostate cancer (based on systematic biopsy)

Definition				
Low-risk	**Intermediate-risk**		**High-risk**	
	Favourable	**Unfavourable**		
ISUP grade 1 and PSA < 10 ng/mL and cT1-2a*	ISUP grade 2 and PSA < 10 ng/ml and cT1-2b* **Or** ISUP grade 1 and PSA 10 – 20 ng/ml and cT1-2b* **Or** ISUP grade 1 and PSA < 10 ng/ml and cT2b*	ISUP grade 2 and PSA 10 – 20 ng/ml and cT1-2b* **Or** ISUP grade 3 and cT1-2b*	ISUP grade 4/5 **Or** PSA > 20 ng/ml **Or** cT2c*	cT3-4* and/or cN+** any ISUP grade* any PSA
Localised				**Locally advanced**

GS = Gleason score; ISUP = International Society for Urological Pathology; PSA = prostate-specific antigen.
** Based on digital rectal examination.*
*** Based on CT/bone scan.*

Active surveillance for favorable intermediate risk Pca? Maybe yes, BUT …

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*6.3.2.6 Recommendations for the management of intermediate-risk disease**

Recommendations	Strength rating
Expectant management	
Offer watchful waiting in asymptomatic patients with life expectancy < 10 years (based on comorbidities and age).	Strong
Offer active surveillance (AS) to selected patients with ISUP grade group 2 disease e.g., < 10% pattern 4, PSA < 10 ng/mL, ≤ cT2a, low disease extent on imaging and low extent of tumour in biopsies (≤ 3 positive cores with Gleason score 3+4 and ≤ 50% cancer involvement/core), or another single element of intermediate-risk disease with low disease extent on imaging and low biopsy extent, accepting the potential increased risk of metastatic progression.	Weak

NCCN National Comprehensive Cancer Network®

Overall, the Panel interpreted these data to show that a subset of patients with favorable intermediate-risk prostate cancer and life expectancy greater than 10 years may be considered for active surveillance. However, the precise inclusion criteria and follow-up protocols need continued refinement. Patients must understand that a significant proportion of those clinically staged as having favorable intermediate-risk prostate cancer may have higher risk disease.[274-277] Particular consideration to active surveillance may be appropriate for those patients with a low percentage of Gleason pattern 4 cancer, low tumor volume, low PSA density, and/or low genomic risk (from tissue-based molecular tumor analysis), but should be approached with caution, include informed decision-making, and use close monitoring for progression.

=> Only to those with low disease extent, low genomic risk and **counsel for potential increased risk of metastasis**

Favorable intermediate risk Pca with potential aggressiveness

MY choice?

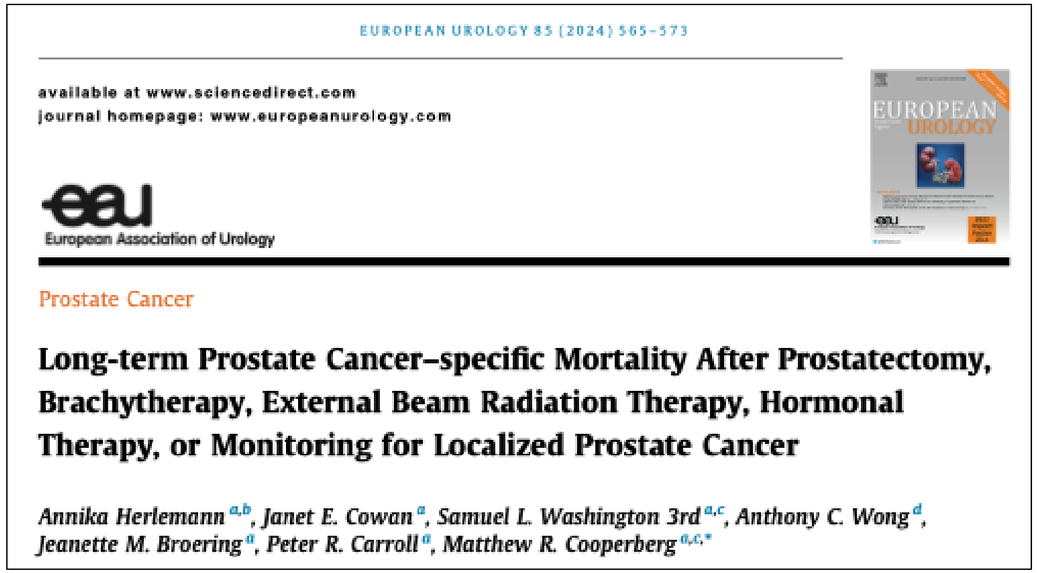
ACTIVE SURVEILLANCE

RADIATION TREATMENT
FOCAL TREATMENT

ROBOTIC RADICAL PROSTATECTOMY

Adequate survival outcomes with surgery

Long term PC specific mortality stratified by primary treatment of Pca



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Prostate Cancer

Long-term Prostate Cancer–specific Mortality After Prostatectomy, Brachytherapy, External Beam Radiation Therapy, Hormonal Therapy, or Monitoring for Localized Prostate Cancer

Annika Herlemann [a,b], Janet E. Cowan [a], Samuel L. Washington 3rd [a,c], Anthony C. Wong [d], Jeanette M. Broering [a], Peter R. Carroll [a], Matthew R. Cooperberg [a,c,]*

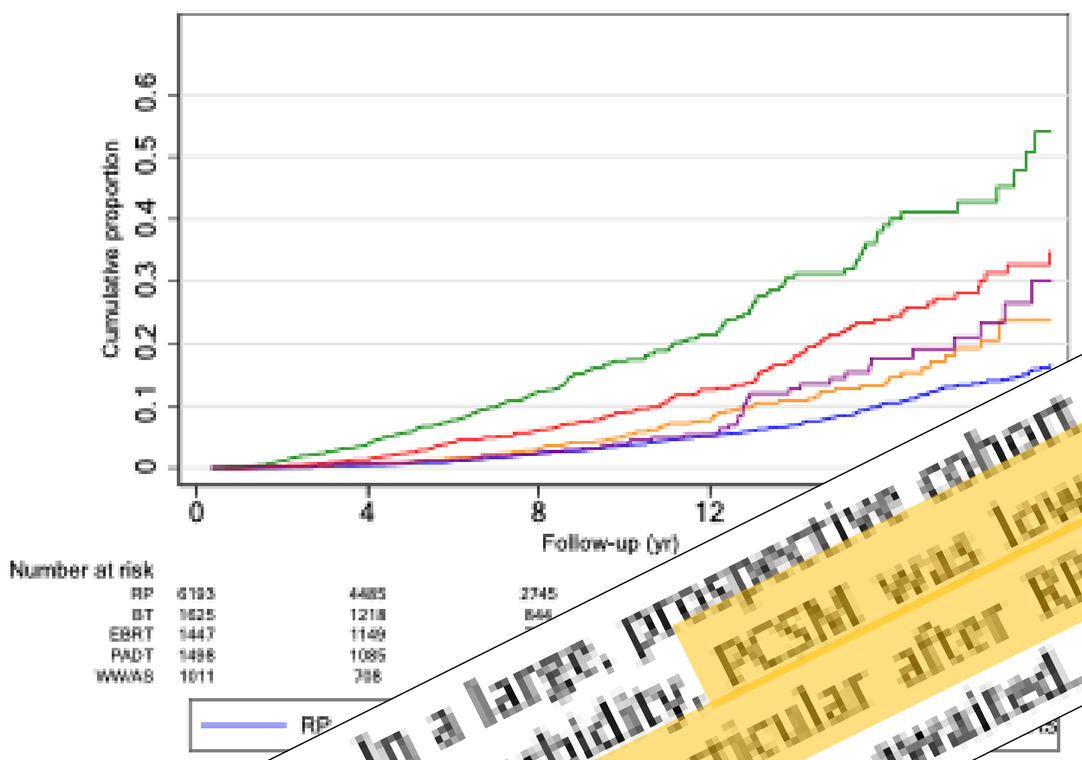
Methods:

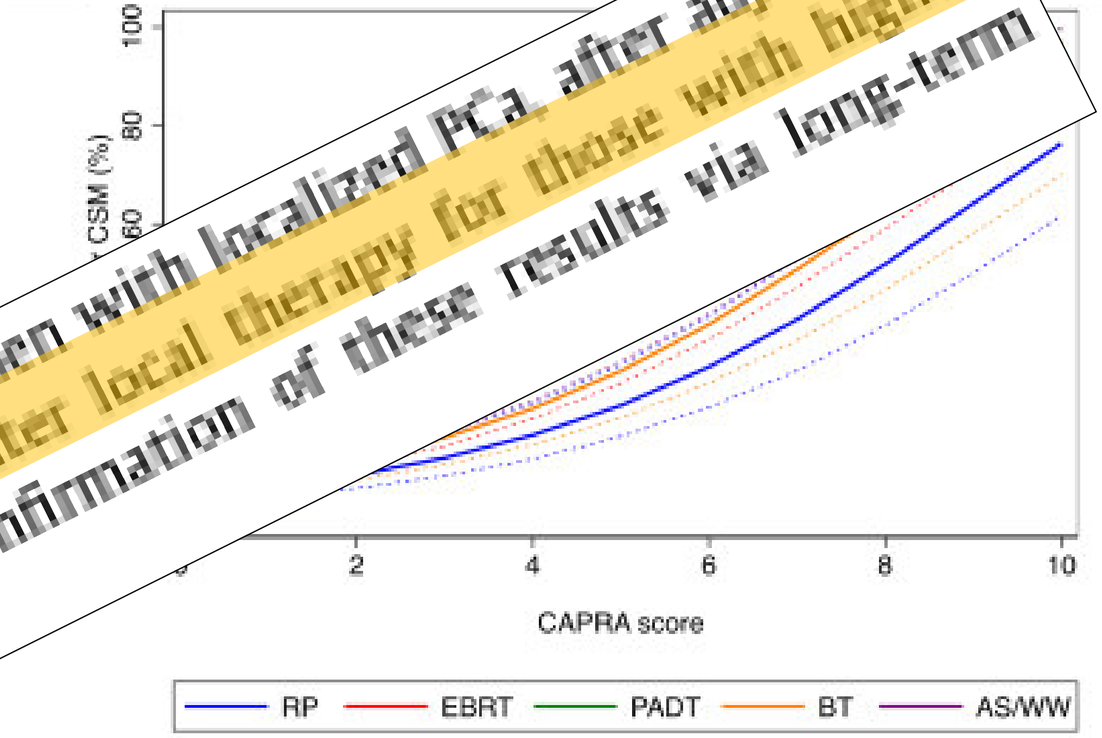
- Cohort study with long-term follow-up from the multicenter, prospective, largely community-based Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) registry
- Endpoint: PCSM and all-cause mortality by primary treatment

Results :

- **11 864 men**, 6227 (53%) RP, 1645 (14%) BT, 1462 (12%) EBRT, 1510 (13%) PADT, and 1020 (9%) were managed with AS/WW.
- At a **median of 9.4 yr** (IQR 5.8–13.7) after treatment, **764 Pca deaths**

PCSM by primary treatment





Conclusions: In a large, prospective cohort of men with localized PCa after adjustment for age and comorbidity, PCSM was lower after local therapy for those with higher-risk disease, and in particular after RP. Confirmation of these results via long-term follow-up of ongoing trials is awaited.

With [illegible] lower

- [illegible] p < 0.001) for BT
- [illegible].91; p < 0.001) for EBRT
- [illegible] 1.94–2.87; p < 0.001) for PADT
- 1.7[illegible]% CI 1.30–2.40; p < 0.001) for AS/WW.

Differences in PCSM were negligible for low-risk disease and increased progressively with risk.

Robotic surgery may improve survival outcomes compared with open surgery

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journal homepage: euoncology.europeanurology.com

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Robotic Versus Open Radical Prostatectomy, Differences in Prostate Cancer–specific Survival—12 Years of Follow-up in the LAParoscopic Prostatectomy Robot Open Trial

Anna Lantz [a,b,c,], Ying Li [d,e], Stefan Carlsson [a,b], Johan Stranne [f,g], Eva Angenete [d,h], Olof Akre [a,b], Anders Bjartell [i,j], Mehbod Mansoori [i,j], Carolina Ehrencrona [d], Peter Wiklund [a,b,k], Eva Haglind [d,h]*

Methods

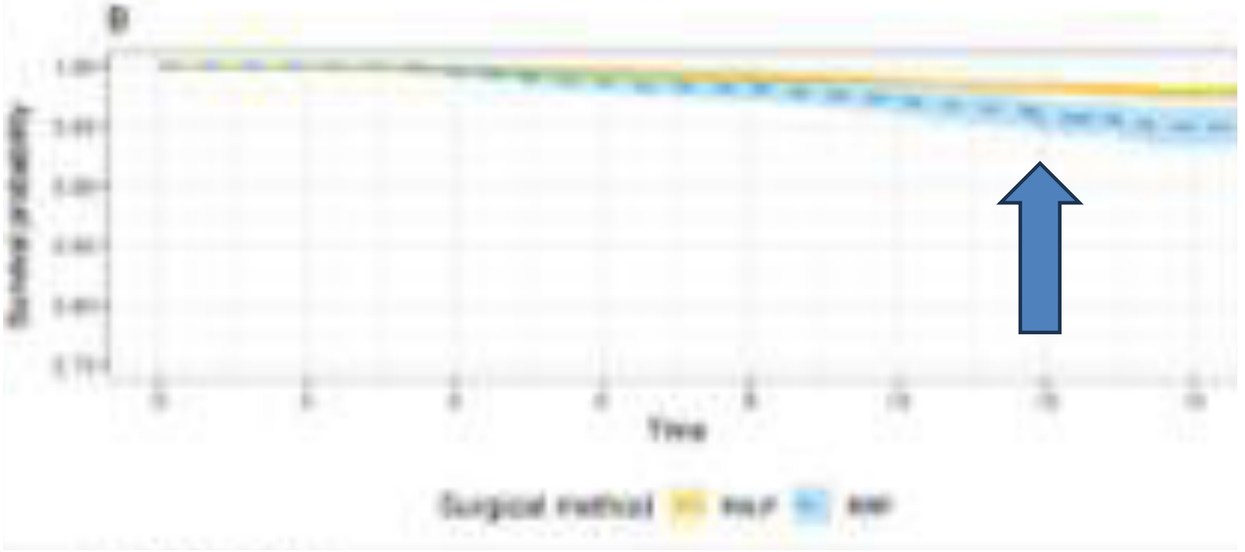
- The non-randomized multicenter observational study LAParoscopic Prostatectomy Robot Open (LAPPRO) trial enrolled patients from 2008 to 2011
- 3583 pts, of whom 2698 (75%) underwent RALP and 885 (25%) RRP.

=> Comparison between robotic and open RP in terms of PCSM

Results:

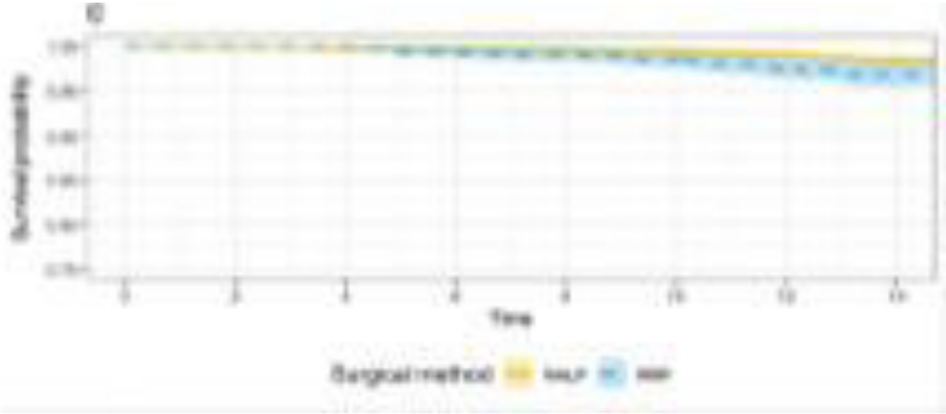
- At 12 yrs, PCSM significantly lower after RALP (2.0% vs 4.5%; adjusted HR: 0.36, 95% [CI] 0.23–0.55).
- Difference was more pronounced at 12 yr than at 8 yr of follow-up; significant difference in all-cause mortality as well.

PCSM



When stratifying by D'Amico risk group, the mortality difference between RALP and RRP was seen primarily in the high-risk group

Low- and intermediate risk



High risk

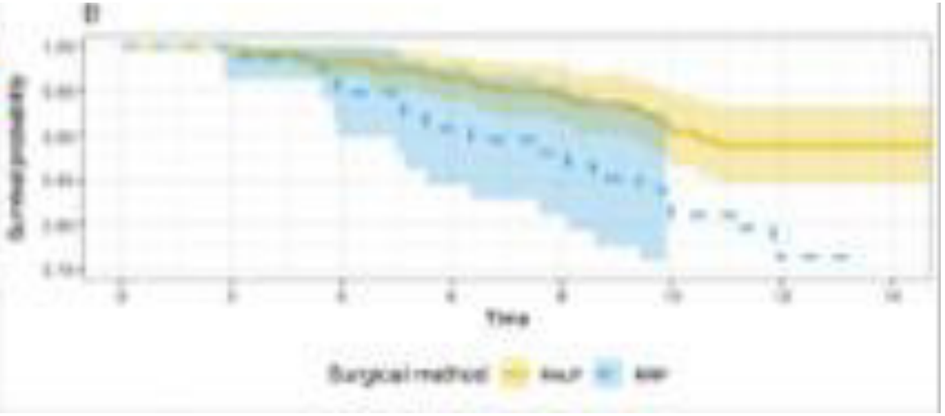


Table 2 – Oncological outcomes in patients undergoing RALP versus RRP 12 yr after surgery

	Main analysis		Sub group analysis 1 [a]			
	Overall		D'Amico low and intermediate risk		D'Amico high risk	
	RALP	RRP	RALP	RRP	RALP	RRP
	(*n* = 2698)	(*n* = 885)	(*n* = 2443)	(*n* = 779)	(*n* = 220)	(*n* = 77)
Residual disease, *n*/total (%)	74/2639 (2.8) [b]	31/841 (3.7) [b]			14/214 (6.5) [b]	14/70 (20) [b]
Relative risk, unadjusted (95% CI)	0.76 (0.50–1.15)				0.33 (0.18–0.65)	
Relative risk, adjusted [c] (95% CI)	Not converged				Not converged	
Elevated PSA, *n*/total (%)	411/2620 (16)	156/854 (18)	334/2381 (14)	125/762 (16)	76/205 (37)	24/63 (38)
Hazard ratio, unadjusted (95% CI)	0.83 (0.69, 1.00)		0.83 (0.68, 1.02)		0.94 (0.60, 1.49)	
Hazard ratio, adjusted [d] (95% CI)	0.83 (0.67, 1.02)		0.91 (0.72, 1.14)		0.92 (0.55, 1.54)	
Recurrence, *n*/total (%)	616/2620 (24)	211/854 (25)	509/2381 (21)	172/762 (23)	99/205 (48)	29/63 (46)
Hazard ratio, unadjusted (95% CI)	0.93 (0.80, 1.09)		0.93 (0.79, 1.11)		1.03 (0.68, 1.56)	
Hazard ratio, adjusted [d] (95% CI)	0.91 (0.76, 1.08)		0.99 (0.82, 1.19)		0.97 (0.62, 1.52)	
Overall mortality, *n*/total (%)	371/2698 (14)	145/885 (16)	314/2443 (13)	114/779 (15)	54/220 (25)	27/77 (35)
Hazard ratio, unadjusted (95% CI)	0.83 (0.68, 1)		0.87 (0.70, 1.08)		0.66 (0.44, 1.04)	
Hazard ratio, adjusted [d] (95% CI)	0.81 (0.66, 0.99)		0.84 (0.66, 1.06)		0.75 (0.44, 1.28)	
Prostate cancer–specific mortality, *n*/total (%)	55/2698 (2)	40 /885 (5)	32/2433 (1)	22/779 (3)	23/220 (10)	18/77 (23)
Hazard ratio, unadjusted (95% CI)	0.45 (0.30, 0.67)		0.48 (0.29, 0.80)		0.42 (0.23, 0.78)	
Hazard ratio, adjusted [f] (95% CI)	0.36 (0.23, 0.55)		0.43 (0.25, 0.74)		0.40 (0.21, 0.77)	

In the high-risk group, the rates of residual disease was significantly lower for RALP than for RRP (6.5% vs 20%; risk ratio 0.33, 95% CI 0.16–0.65)

Robotic surgery provides adequate functional outcomes

Retrograde release of NVB

EUROPEAN UROLOGY 77 (2020) 628–635

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journal homepage: www.europeanurology.com

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Surgery in Motion

Retrograde Release of the Neurovascular Bundle with Preservation of Dorsal Venous Complex During Robot-assisted Radical Prostatectomy: Optimizing Functional Outcomes

Paulo Afonso de Carvalho[a], João A.B.A. Barbosa[a], Giuliano B. Guglielmetti[a], Maurício Dener Cordeiro[a], Bernardo Rocco[b], William C. Nahas[a], Vipul Patel[c], Rafael Ferreira Coelho[a,d,]*

12 mo continence rate: 98,4%
12 mo potency rate: 86%

Hood technique

EUROPEAN UROLOGY 80 (2021) 213–221

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journal homepage: www.europeanurology.com

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Surgery in Motion

Hood Technique for Robotic Radical Prostatectomy—Preserving Periurethral Anatomical Structures in the Space of Retzius and Sparing the Pouch of Douglas, Enabling Early Return of Continence Without Compromising Surgical Margin Rates

Vinayak G. Wagaskar[a,], Ankur Mittal[b], Stanislaw Sobotka[a], Parita Ratnani[a], Anna Lantz[a], Ugo Giovanni Falagario[a], Alberto Martini[a], Zach Dovey[a], Patrick-Julien Treacy[a], Prachee Pathak[a], Suit Nair[a], Berryhill Roy[a], Dimple Chakravarty[a], Sara Lewis[c], Kenneth Haines III[d], Peter Wiklund[a], Ash Tewari[a]*

48 wk continence rate: 95%

Retzius sparing

EUROPEAN UROLOGY 79 (2021) 839–857

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

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Surgery in Motion

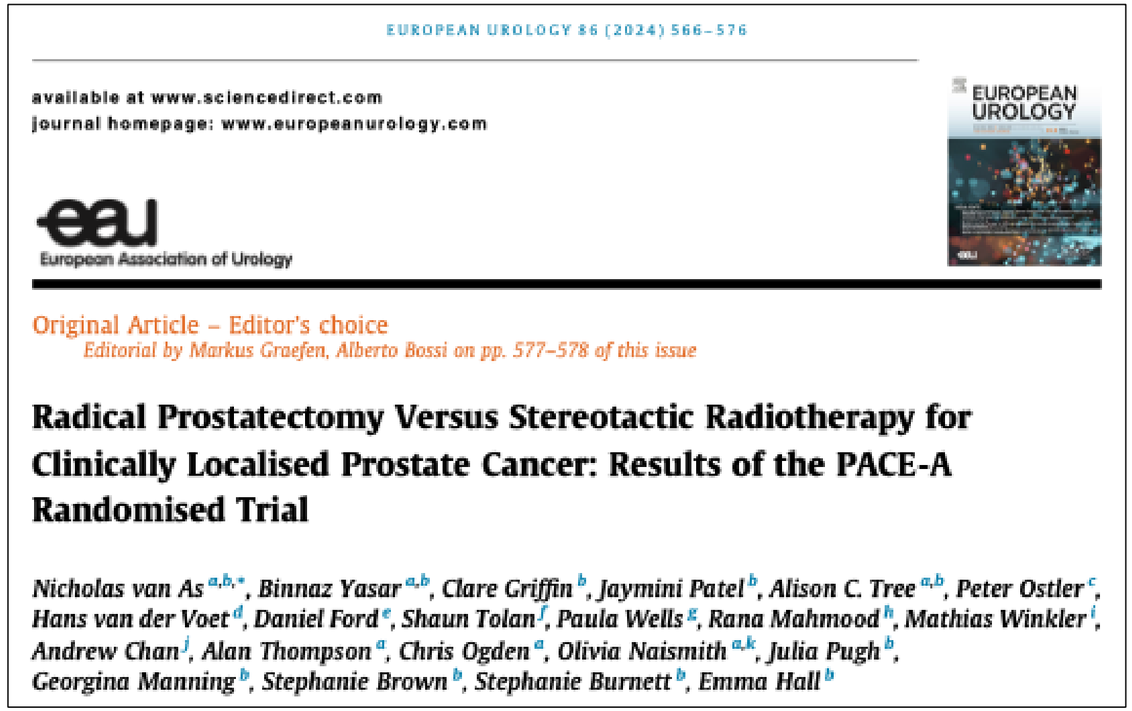
Retzius-sparing Robot-assisted Radical Prostatectomy Leads to Durable Improvement in Urinary Function and Quality of Life Versus Standard Robot-assisted Radical Prostatectomy Without Compromise on Oncologic Efficacy: Single-surgeon Series and Step-by-step Guide

Jillian Egan[a], Shawn Marhamati[a], Filipe L.F. Carvalho[a], Meghan Davis[a], John O'Neill[a], Harry Lee[a], John H. Lynch[a], Ryan A. Hankins[a], Jim C. Hu[b], Keith J. Kowalczyk[a,]*

12 mo continence rate: 97,6%

Is continence a real issue of surgery?

The PACE-A RCT compared surgery and radiation for local treatment of PCa:
<u>IN</u>continence after surgery as high as 50%! BUT …



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EUROPEAN UROLOGY

Original Article – Editor's choice
Editorial by Markus Graefen, Alberto Bossi on pp. 577–578 of this issue

Radical Prostatectomy Versus Stereotactic Radiotherapy for Clinically Localised Prostate Cancer: Results of the PACE-A Randomised Trial

Nicholas van As [a,b,], Binnaz Yasar [a,b], Clare Griffin [b], Jaymini Patel [b], Alison C. Tree [a,b], Peter Ostler [c], Hans van der Voet [d], Daniel Ford [e], Shaun Tolan [f], Paula Wells [g], Rana Mahmood [h], Mathias Winkler [i], Andrew Chan [j], Alan Thompson [a], Chris Ogden [a], Olivia Naismith [a,k], Julia Pugh [b], Georgina Manning [b], Stephanie Brown [b], Stephanie Burnett [b], Emma Hall [b]*

50 surgeries (small sample size …)
32 with full data (data completeness?)
42 robot + 8 lap (different techniques ?)

«accrual of 50 RP over a ten-year period across 8 centers»
(slow recruitment ….)

«The minimum annual surgical caseload was specified as at least 25 cases»
Low volume centers

Designing a RCT does not allow drafting conclusions on surgical outcomes

=>>>> Surgery is not a drug and the way it is «administered» matters!

Online version at https://www.minervamedica.it

Minerva Urology and Nephrology 2025 mese;77(0):000-000
DOI: 10.23736/S2724-6051.25.06422-5

EDITORIAL COMMENT

Should every randomized controlled trial be considered Level 1 evidence?

Bernardo ROCCO [1] *, Maria C. SIGHINOLFI [1], Alessandro ANTONELLI [2], Andrea MINERVINI [3], Vipul PATEL [4], Rafael COELHO [5], Marcio COVAS MOSCHOVAS [4], Michele AMENTA [6], Filippo ANNINO [7], Riccardo BERTOLO [2], Marco BORGHESI [8], Pierluigi BOVE [9], Giorgio BOZZINI [10], Giovanni CACCIAMANI [11], Antonio CELIA [12], Carlo CERUTI [13], Orietta DALPIAZ [14], Roberto FALABELLA [15], Mario FALSAPERLA [16], Antonio GALFANO [17], Fabrizio GALLO [18], Francesco GRECO [19], Paolo PARMA [20], Antonio PASTORE [21], Giovanni PINI [22], Angelo PORRECA [19], Carmine SCIORIO [23], Riccardo SCHIAVINA [24], Silvia SECCO [17], Tommaso SILVESTRI [12], Virginia VARCA [25], Domenico VENEZIANO [26], Paolo VERZE [27], Alessandro VOLPE [28], Stefano ZARAMELLA [29], Marco SANDRI [30], Cristian FIORI [31], Luigi SCHIPS [32], Francesco PORPIGLIA [31]

The continence rates reported in the PACE-A trial significantly diverge from those observed in contemporary studies, underscoring the need for transparency regarding surgical expertise and techniques employed. The individual volume of surgeons participating to the PACE-A is not reported, and "the minimum annual caseload specified as at least 25 cases" is seemingly attributable to the hospital level.

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CLINICAL CASE DISCUSSION ON PC:

Radiation Oncology point of view

PROF FILIPPO ALONGI,

-Direttore dip. Radioterapia oncologica avanzata, IRCCS OSPEDALE SACRO CUORE DON CALABRIA , NEGRAR DI VALPOLICELLA,

-Professore Ordinario, UNIVERSITA'DI BRESCIA

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CLINICAL INDICATION:
INTERNATIONAL GUIDELINES

EAU - EANM - ESTRO - ESUR - ISUP - SIOG
Guidelines on
Prostate Cancer

P. Cornford (Chair), D. Tilki (Vice-chair), R.C.N. van den Bergh, E. Briers, Patient Advocate (European Prostate Cancer Coalition/Europa UOMO), D. Eberli, G. De Meerleer, M. De Santis, S. Gillessen, A.M. Henry, G.J.L.H. van Leenders, J. Oldenburg, I.M. van Oort, D.E. Oprea-Lager, G. Ploussard, M. Roberts, O. Rouvière, I.G. Schoots, J. Stranne, T. Wiegel
Guidelines Associates: T. Van den Broeck, O. Bruncknorst, A. Farolfi, G. Gandaglia, N. Grivas, M. Lardas, M. Liew, E. Linares Espinós, P-P.M. Willemse
Guidelines Office: J. Darraugh, E. Smith, N. Schouten

PROSTATE CANCER - LIMITED UPDATE MARCH 2025

6.3.2.6 *Recommendations for the management of intermediate-risk disease**

Recommendations	Strength rating
Expectant management	
Offer watchful waiting in asymptomatic patients with life expectancy < 10 years (based on comorbidities and age).	Strong
Offer active surveillance (AS) to selected patients with ISUP grade group 2 disease e.g., < 10% pattern 4, PSA < 10 ng/mL, ≤ cT2a, low disease extent on imaging and low extent of tumour in biopsies (≤ 3 positive cores with Gleason score 3+4 and ≤ 50% cancer involvement/core), or another single element of intermediate-risk disease with low disease extent on imaging and low biopsy extent, accepting the potential increased risk of metastatic progression.	Weak
Patients with ISUP grade group 3 disease should be excluded from AS protocols.	Strong
Re-classify patients with low-volume ISUP grade group 2 disease included in AS protocols, if repeat non-MRI-based systematic biopsies performed during monitoring reveal > 3 positive cores or maximum CI > 50%/core of ISUP grade group 2 disease.	Weak
Radical prostatectomy (RP)	
Offer RP to patients with a life expectancy of > 10 years.	Strong
Radical prostatectomy can be safely delayed for at least three months.	Weak
Offer nerve-sparing surgery to patients with a low risk of extra-capsular disease on that side.	Strong
Radiotherapeutic treatment	
Offer low-dose rate (LDR) brachytherapy to patients with good urinary function and NCCN favourable intermediate-risk disease	Strong
Offer intensity-modulated radiotherapy (IMRT)/volumetric modulated arc therapy (VMAT) plus image-guided radiotherapy (IGRT), with a total dose of 76–78 Gy or moderate hypofractionation (60 Gy/20 fx in 4 weeks or 70 Gy/28 fx in 6 weeks), in combination with short-term androgen deprivation therapy (ADT) (four to six months).	Strong
Offer focal boosting to MRI-defined dominant intra-prostatic tumour when using conventionally fractionated IMRT/IGRT (1.8-2.0 Gy per fraction) ensuring that Organ at Risk constraints are not exceeded	Weak
Offer ultra-hypofractionated IMRT/IGRT or SBRT, using either 36.25 Gy (40 Gy to prostate) in 5 fx or 42.7 Gy in 7 fx delivered alternate days.	Weak
Offer LDR brachytherapy boost combined with IMRT/VMAT plus IGRT to patients with good urinary function and NCCN unfavourable intermediate-risk disease, in combination with short-term ADT (four to six months).	Weak
Offer high-dose rate (HDR) brachytherapy boost combined with IMRT/VMAT plus IGRT to patients with good urinary function and NCCN unfavourable intermediate-risk disease, in combination with short-term ADT (four to six months).	Weak
Other therapeutic options	
Only offer whole-gland ablative therapy (such as cryotherapy, high-intensity focused ultrasound, etc.) or focal ablative therapy within clinical trials or registries.	Strong
Do not offer ADT monotherapy to asymptomatic men not able to receive any local treatment.	Weak

**All recommendations are based on conventional imaging with isotope bone scan and CT/MR abdomen/pelvis.*

INTERMEDIATE (FAVOURABLE)

FC, Male, 63 years old
Comorbidities: Hypertension treated with Triatec 5 mg/day

- (11.2024) iPSA: 7 ng/ml
- (17.03.2025) Multiparametric prostate MRI: PIRADS 4 left apical lesion involving <50% of the lobe. Prostate volume: 40 cc
- (14.04.2025) Biopsy: adenocarcinoma GS 3+4, 2/7 positive cores in the left lobe
- (16.05.2025) Bone scintigraphy: negative for bone metastases
- (13.05.2025) CT TAP with contrast: oncologically negative

TO SUMMARIZE: iPSA: 7 ng/ml
Gleason score: 3+4, 2/7 positive cores in the left lobe
cT2a N0 M0

INTERMEDIATE (UNFAVOURABLE)

PB, Male, 69 years old
Comorbidities: None

- (10.2024) iPSA: 14 ng/ml
- (28.11.2024) Multiparametric prostate MRI: PIRADS 3/4 Bilateral prostatic lesions without capsular involvement. Prostate volume: 25 cc
- (12.2024) Genitourinary MDT: staging cT2c
- (20.12.2024) Biopsy: adenocarcinoma GS 4+3, 8/12 positive cores bilaterally
- (02.02.2025) F-PSMA PET/CT: pathological uptake in the prostate bilaterally. No seminal vesicle involvement. No pathological pelvic lymph node uptake. Indeterminate uptake at right 7th rib.

TO SUMMARIZE: iPSA: 14 ng/ml
Gleason score: 4+3, 8/12 positive cores bilaterally
cT2c N0 M0

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CLINICAL INDICATION:
INTERNATIONAL GUIDELINES

NCCN National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2026
Prostate Cancer

NCCN Guidelines Index
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Discussion

INITIAL RISK STRATIFICATION AND STAGING WORKUP FOR CLINICALLY LOCALIZED DISEASE[i]

Risk Group	Clinical/Pathologic Features (Staging, ST-1)			Additional Evaluation[g,i]	Initial Therapy
Low[j]	Has all of the following: • cT1–cT2a • Grade Group 1 • PSA <10 ng/mL			• Confirmatory testing can be used to assess the appropriateness of active surveillance (PROS-F 2 of 5)	PROS-3
Intermediate[j]	Has all of the following: • No high-risk group features • No very-high-risk group features • Has one or more intermediate risk factors (IRFs): ▸ cT2b–cT2c ▸ Grade Group 2 or 3 ▸ PSA 10–20 ng/mL	Favorable intermediate	Has all of the following: • 1 IRF • Grade Group 1 or 2 • <50% biopsy cores positive (eg, <6 of 12 cores)[k]	• Confirmatory testing can be used to assess the appropriateness of active surveillance (PROS-F 2 of 5)	PROS-4
		Unfavorable intermediate	Has one or more of the following: • 2 or 3 IRFs • Grade Group 3 • ≥50% biopsy cores positive (eg, ≥6 of 12 cores)[k]	• Soft tissue imaging and consider bone imaging[g] ▸ If regional metastases are found, see PROS-7 ▸ If distant metastases are found, see PROS-14 for Low-Volume M1(Metachronous or Synchronous) or Synchronous Oligometastatic[h] CSPC or PROS-15 for High-Volume M1 CSPC	PROS-5
High	Has one or more high-risk features, but does not meet criteria for very high risk: • cT3–cT4 • Grade Group 4 or Grade Group 5 • PSA >20 ng/mL			Bone and soft tissue imaging[g] ▸ If regional metastases are found, see PROS-7 ▸ If distant metastases are found, see PROS-14 for Low-Volume M1 (Metachronous or Synchronous) or Synchronous Oligometastatic[h] CSPC or PROS-15 for High-Volume M1 CSPC	PROS-6
Very high	Has at least two of the following: • cT3–cT4 • Grade Group 4 or 5 • PSA >40 ng/mL			Bone and soft tissue imaging[g] ▸ If regional metastases are found, see PROS-7 ▸ If distant metastases are found, see PROS-14 for Low-Volume M1 (Metachronous or Synchronous) or Synchronous Oligometastatic[h] CSPC or PROS-15 for High-Volume M1 CSPC	PROS-6

INTERMEDIATE (FAVOURABLE)

FC, Male, 63 years old
Comorbidities: Hypertension treated with Triatec 5 mg/day

- (11.2024) iPSA: 7 ng/ml
- (17.03.2025) Multiparametric prostate MRI: PIRADS 4 left apical lesion involving <50% of the lobe. Prostate volume: 40 cc
- (14.04.2025) Biopsy: adenocarcinoma GS 3+4, 2/7 positive cores in the left lobe
- (16.05.2025) Bone scintigraphy: negative for bone metastases
- (13.05.2025) CT TAP with contrast: oncologically negative

TO SUMMARIZE: iPSA: 7 ng/ml
Gleason score: 3+4, 2/7 positive cores in the left lobe
cT2a N0 M0

INTERMEDIATE (UNFAVOURABLE)

PB, Male, 69 years old
Comorbidities: None

- (10.2024) iPSA: 14 ng/ml
- (28.11.2024) Multiparametric prostate MRI: PIRADS 3/4 Bilateral prostatic lesions without capsular involvement. Prostate volume: 25 cc
- (12.2024) Genitourinary MDT: staging cT2c
- (20.12.2024) Biopsy: adenocarcinoma GS 4+3, 8/12 positive cores bilaterally
- (02.02.2025) F-PSMA PET/CT: pathological uptake in the prostate bilaterally. No seminal vesicle involvement. No pathological pelvic lymph node uptake. Indeterminate uptake at right 7th rib.

TO SUMMARIZE: iPSA: 14 ng/ml
Gleason score: 4+3, 8/12 positive cores bilaterally
cT2c N0 M0

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PRINCIPLES OF RADIATION THERAPY

All patients diagnosed with intermediate-, high-, very-high-, regional-risk, low-volume mCSPC, biochemically recurrent, low-volume metastatic castration-sensitive prostate cancer (mCSPC) and oligometastatic mCRPC are recommended to be evaluated by a radiation oncologist as part of a multidisciplinary discussion of treatment options.

General

- **EBRT**
  - **Treatment Planning: Intensity modulated RT (IMRT) is recommended over 3-dimensional conformal RT to improve dose conformality.**
  - **Image Guidance: Methods to improve accuracy of treatment delivery, thereby enabling reduction in planning target value (PTV) margins, which generally result in reduced toxicity are encouraged and may include one or more of the following:**
    - **Image guidance with daily 3D imaging is recommended with either a cone beam CT (CBCT) or MRI.**
    - **Devices that assist with optimal image guidance (fiducial markers) or reduce motion (endorectal balloons).**
    - **Real-time intrafraction volumetric tracking.**
    - **Online adaptive radiotherapy if target is near mobile organs (ie, performing a simultaneous integrated boost to a positive pelvic lymph node adjacent to bowel).**
  - **Beam Type: Photon and proton RT are acceptable forms of EBRT and appear to have similar outcomes in regard to toxicity, QOL, and tumor control. Potential financial toxicity should be discussed with patients.**
  - **Fractionation: An extensive list of fractionation schedules have been studied. These are grouped into three categories, conventional fractionation (1.8–2 Gy/fraction), moderate hypofractionation (>2.5 to 4 Gy/fraction), and ultra-hypofractionation (>6 Gy/fraction).[1] Common dose/fraction schedules are shown in Table 1. In general, iso-effective moderate hypofractionation dosing has demonstrated noninferior tumor control, toxicity, and QOL over conventional fractionation and is more convenient for patients and thus preferred. Similarly, ultra-hypofractionation has been demonstrated to be noninferior to both moderate hypofractionation and conventional fractionation.[2] Thus, use of conventionally fractionated radiotherapy is no longer preferred for localized prostate cancer.**
    - **Ultra-hypofractionation encompasses stereotactic body radiation therapy (SBRT), which requires precision treatment setup and required additional image guidance techniques.**

MODERATE HYPOFRACTIONATION & PROSTATE CANCER

✓Trials investigating the clinical and toxicity outcomes of moderate hypofractionation schedules (**CHHiP, RTOG 0415, PROFIT**) **have sufficient follow-up** data to show that the efficacy and toxicity of these schedules are similar to those of conventionally fractionated regimens (**non-inferiority of all Hypo arms, excluding HYPRO**)

✓More specifically, based on **evidence level 1B**, dose-escalated conventionally fractionated RT with IMRT appears to have similar outcomes and toxicities to hypofractionated RT with IMRT.

Arcangeli et al, Nature Review Urology 2016
Zaorsky et al, Cancer Treatment Review 2016
Beckta et et al, Urologic Oncology 2019

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

HYPO-RT-PC IN 7 FX

This large phase III clinical trial enrolled 1,200 men with intermediate- to high-risk localised prostate cancer. Participants were randomly assigned to receive either:

1. Short-course radiotherapy: 42.7 Gray (Gy) delivered in 7 sessions over 2.5 weeks
2. Standard-course radiotherapy: 78.0 Gy delivered in 39 sessions over 8 weeks

Key outcomes after 10 years:

- Failure-free survival: 72% in the short-course group vs 65% in the standard group.
- Overall survival: 81% for short-course vs 79% for standard
- Prostate cancer-specific mortality: 4% in both groups
- Side effects: Urinary and bowel symptoms were similar in both groups, and most were mild to moderate.

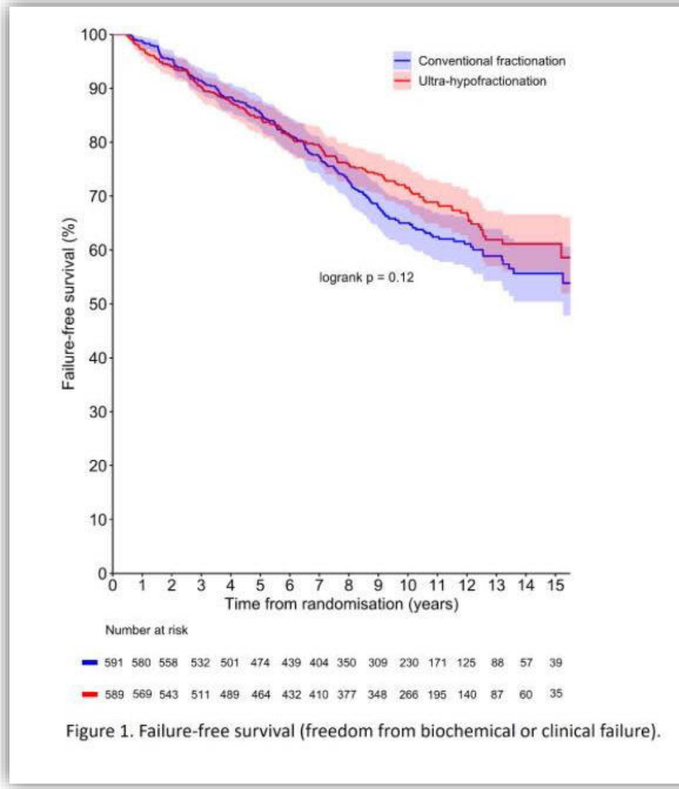


Figure 1. Failure-free survival (freedom from biochemical or clinical failure).

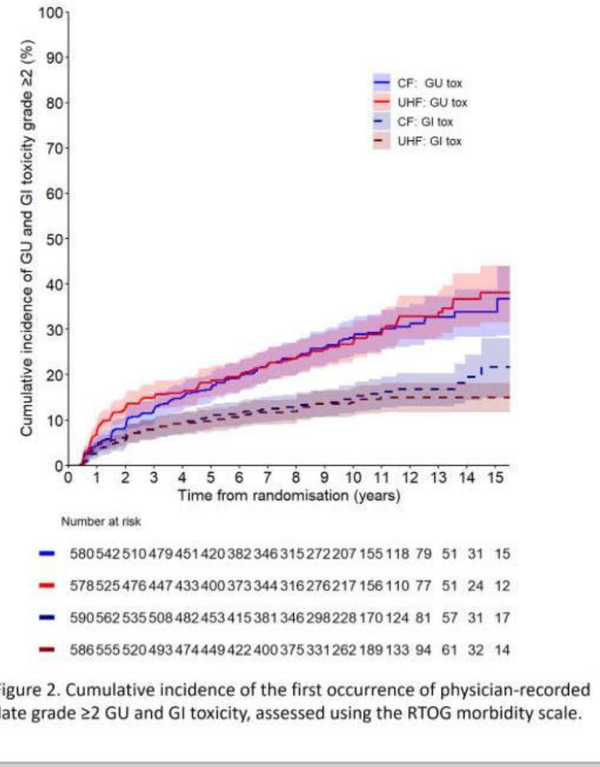


Figure 2. Cumulative incidence of the first occurrence of physician-recorded late grade ≥2 GU and GI toxicity, assessed using the RTOG morbidity scale.

CONCLUSIONS:
These findings confirm that the shorter course does not increase long-term side effects and provides equally durable cancer control", added **Camilla Thellenberg-Karlsson, MD, PhD,** at Umeå University, who presented the results at the ESTRO meeting

Thellenberg-Karlsson, Radioth Oncol suppl. ESTRO 2025

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

RCT: PACE A

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

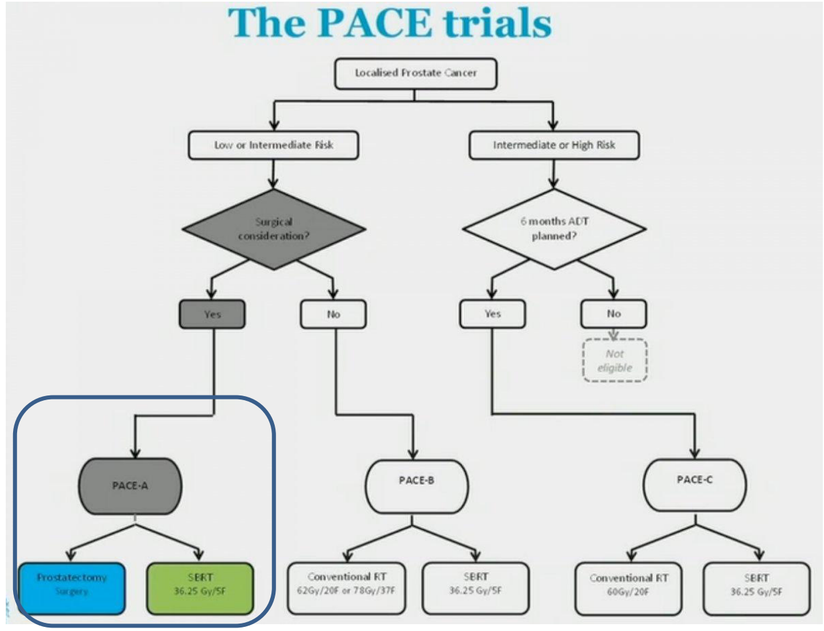
EUROPEAN UROLOGY

European Association of Urology

Original Article

Radical Prostatectomy Versus Stereotactic Radiotherapy for Clinically Localised Prostate Cancer: Results of the PACE-A Randomised Trial

Nicholas van As[a,b,], Binnaz Yasar[a,b], Clare Griffin[b], Jaymini Patel[b], Alison C. Tree[a,b], Peter Ostler[c], Hans van der Voet[d], Daniel Ford[e], Shaun Tolan[f], Paula Wells[g], Rana Mahmood[h], Mathias Winkler[i], Andrew Chan[j], Alan Thompson[a], Chris Ogden[a], Olivia Naismith[a,k], Julia Pugh[b], Georgina Manning[b], Stephanie Brown[b], Stephanie Burnett[b], Emma Hall[b]*



- **Phase 3** open-label multiple-cohort RCT. In PACE-A, people with LPCa, T1-T2, Gleason≤3+4, PSA≤20ng/mL & suitable for surgery were randomised (1:1) to SBRT or surgery. SBRT dose was 36.25Gy/5 fractions in 1-2 weeks; surgery was laparoscopic or robotically assisted prostatectomy
- From Aug 2012 to Feb 2022, 123 men from 10 UK centres were randomised
- **Compared to surgery, pts receiving SBRT had better urinary continence & sexual bother score;** clinician reported GI toxicity was low but SBRT pts reported more bowel bother at 2 years

The results suggest that stereotactic body radiotherapy may lead to lower rates of urinary incontinence and sexual dysfunction compared to radical prostatectomy, albeit with a potential increase in bowel dysfunction.

Van As N, et al. JCO suppl 2024
Van As N, Eur Urol 2024

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

ASTRO 2025: Quality of Life Results from NRG-GU005: A Phase III Trial of SBRT vs. Hypofractionated IMRT for Localized Intermediate Risk Prostate Cancer

NRG-GU005

Study Design: NRG GU005 Randomized Phase III Trial

N=698 intermediate-risk prostate cancer patients (accrued 11/2017 to 6/2022)

STRATIFY

Risk Group
1.Gleason score 7(3+4) with PSA <10 ng/mL
2.Gleason score 7(3+4) with 10 ng/mL <= PSA < 20 ng/mL
3.Gleason score 6(3+3) with 10 ng/mL < PSA < 20 ng/mL

Use of Rectal Manipulation
1. No
2. Rectal balloon
3. SpaceOAR
4. SpaceOAR and rectal balloon

IMRT Standard Arm
1) 70 Gy in 28 fractions
2) 60 Gy in 20 fractions

RANDOMIZE

Arm 1: IMRT
70 Gy in 28 fractions of 2.5 Gy to the prostate or 60 Gy in 20 fractions of 3 Gy
+/- proximal 1cm of seminal vesicles

Minimal Margins:
8 mm uniform in expansion,
5 mm posteriorly

Arm 2: SBRT
36.25 Gy in 5 fractions of 7.25 Gy to the prostate +/- proximal 1 cm of seminal vesicles

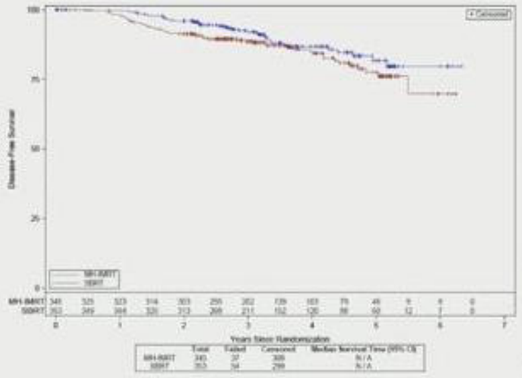
Minimal Margins:
5 mm superior inferior & laterally,
3 mm anterior & posterior

HRQOL – Bowel Outcomes

- **24-month rate of MCID**
  (Minimal Clinically Important Difference)
  - SBRT: 35%
  - IMRT: 44%
  - **p = 0.034 significant**
- Longitudinal treatment effect:
  - LS Mean Diff: +2.68
    (95% CI: 1.02–4.34)
  - **p = 0.0016 significant**

Disease-Free Survival

- Futility bound was crossed for DFS for 30% superiority of SBRT over MH-IMRT
- HR=1.38
  (95% CI: 0.91-2.09)
  p=0.13
- DFS at 5 years:
  - SBRT: 89%
    (95% CI: 85–92)
  - IMRT: 92%
    (95% CI : 89–95)



📣 NRGGU005 Phase III: 698 pts with intermediate-risk #ProstateCancer RCT; SBRT (n=353) vs M-IMRT (n=345)
✅ SBRT → better bowel HRQOL (MCID 35% vs 44%, p=0.03)
⚖️No diff in urinary HRQOL; EPIC continence favours SBRT
❌futile for DFS; IMRT had ⬇️3-yr biochemical failure (4.2% vs 7.8%)
SBRT safe, better QoL, ⁉️but not superior for DFS #ASTRO25 #RadOnc #PCSM

Ellis et al ASTRO 2025

The Role of interventional radiotherapy (modern brachytherapy) in favorable intermediate risk prostate cancer

LUCA TAGLIAFERRI - MD, PhD

Fondazione Policlinico Univeristario «Agostino Gemelli» IRCCS

Gemelli ART (Advanced Radiation Therapy) - Interventional Oncology Center (IOC)

27th October 2025

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Fondazione Policlinico Universitario Agostino Gemelli IRCCS
Università Cattolica del Sacro Cuore

GART Advanced Radiation Therapy

IOC Interventional Oncology Center
Centro di Oncologia Interventistica

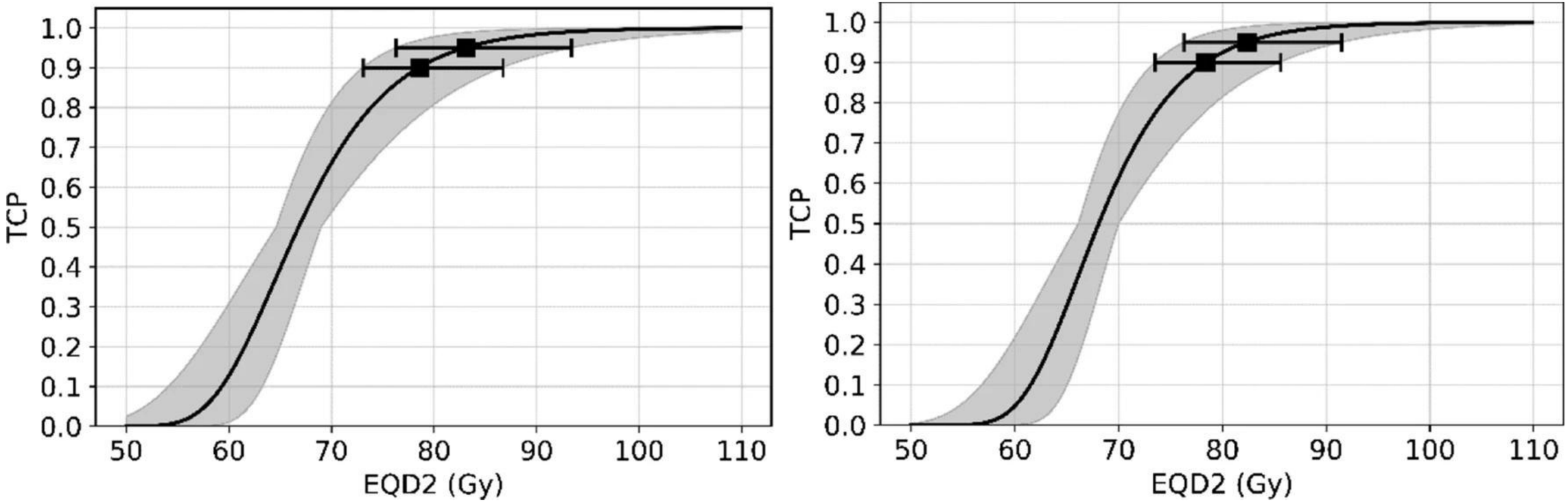
TOC Theragnostic Oncology Center

BEST HOSPITALS 2025 Newsweek
2st Italian Hospital
Top 50 World Hospital
POLICLINICO UNIVERSITARIO A. GEMELLI

Organization Accredited by Joint Commission International

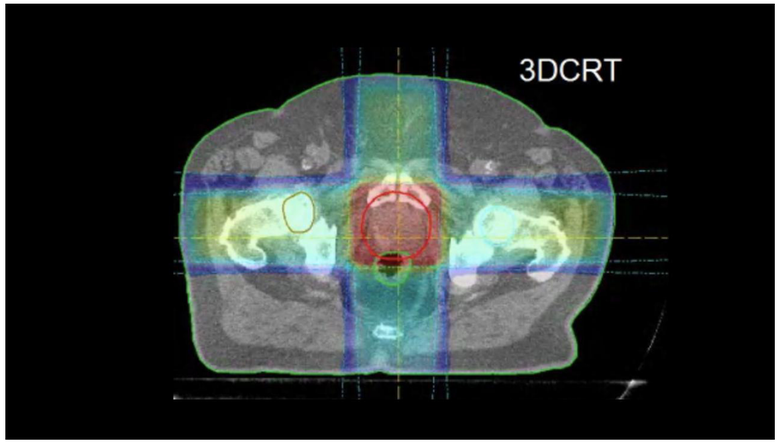
Interventional and External beam
INTERACTS
Radiotherapy Active Teaching School

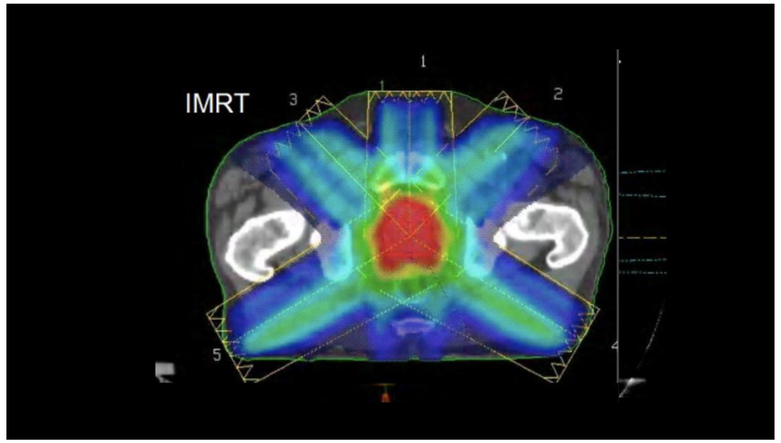
TUMOR CONTROL PROBABILITY

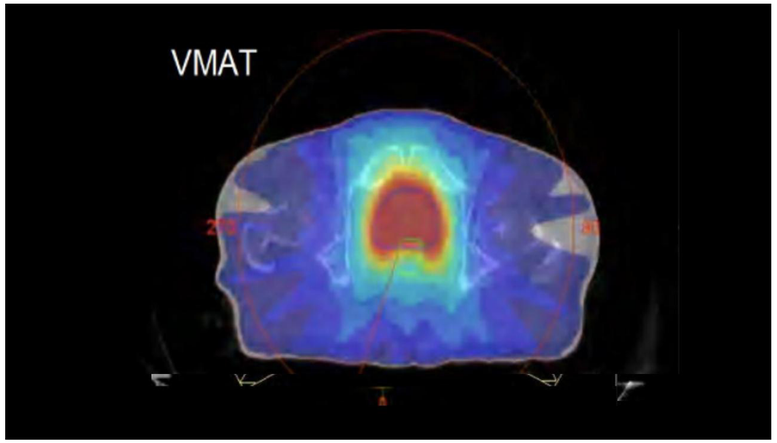


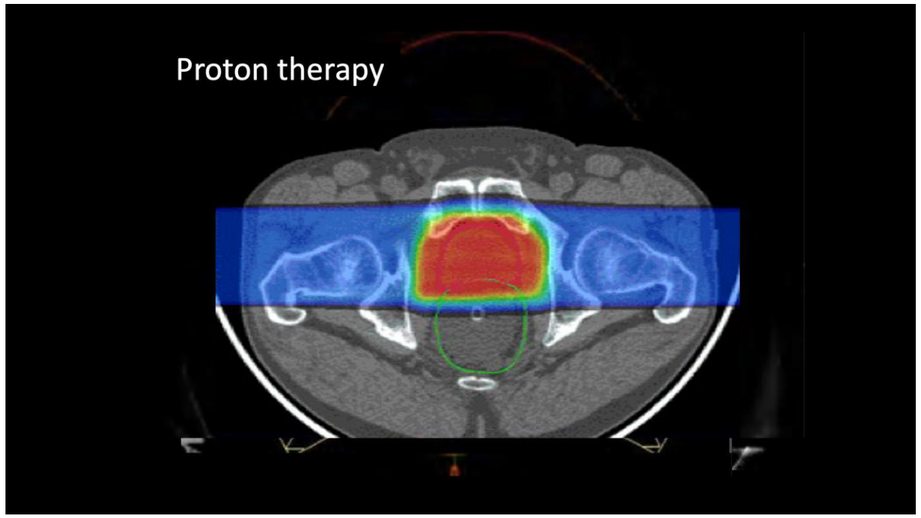
Response curves of linear-quadratic Poisson model for prostate gland with $\alpha/\beta = 1.3$ Gy (left) and for mpMRI-GTV with $\alpha/\beta = 2.9$ Gy (right).
Grey area represents the 95% CI.

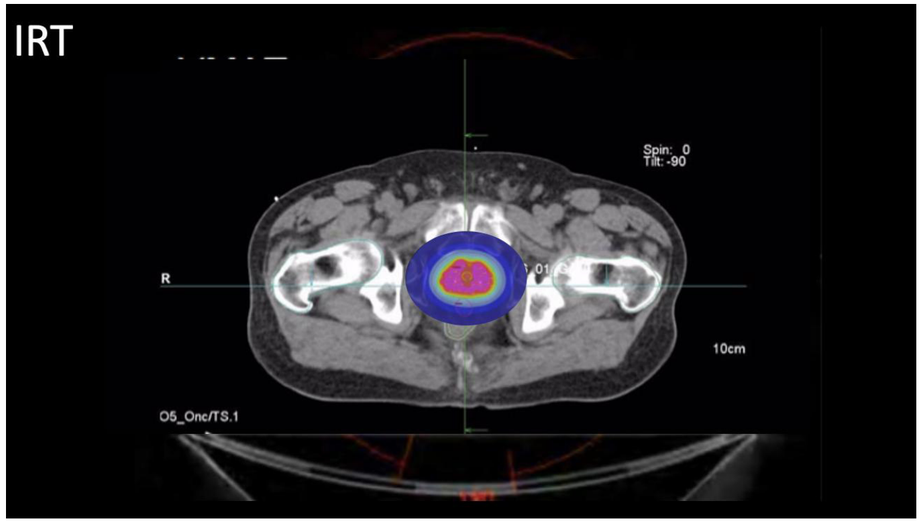
INTERVENTIONAL RADIOTHERAPY (BRACHYTHERAPY)







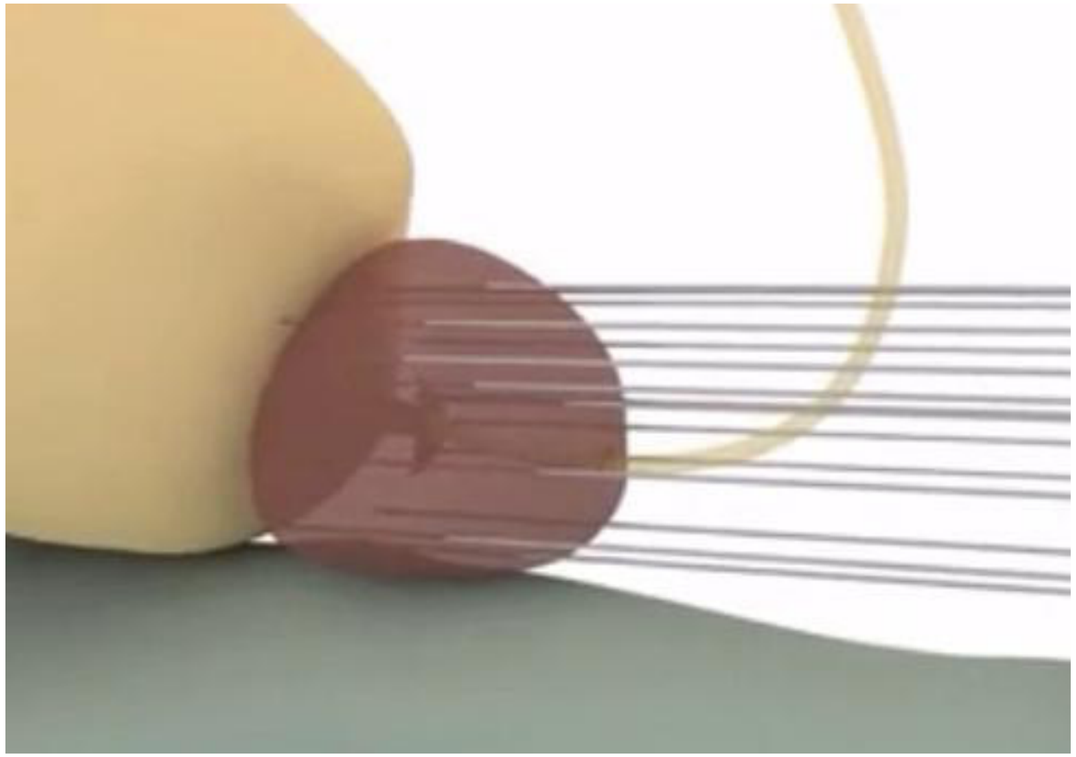




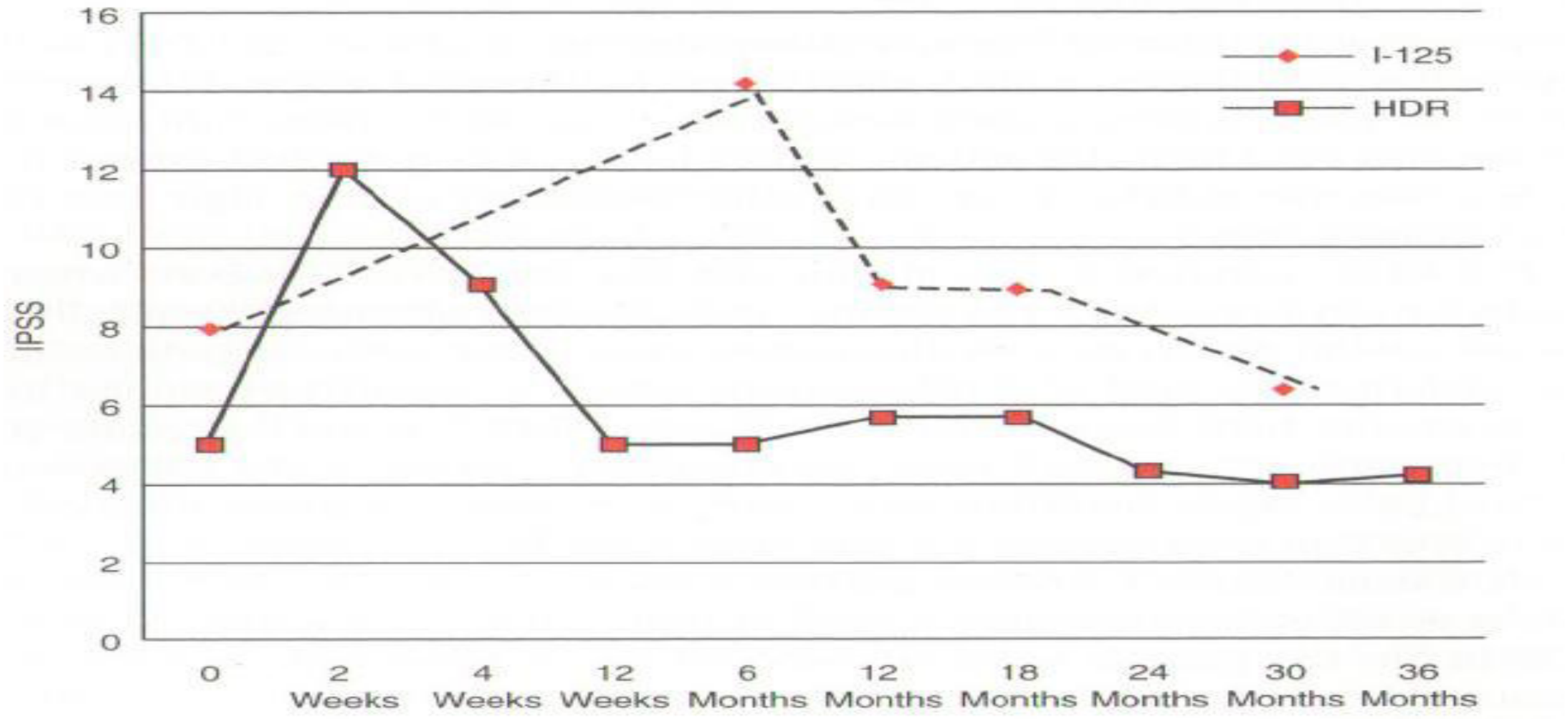
INTERVENTIONAL RADIOTHERAPY (BRACHYTHERAPY)

MODERN HDR INTERVENTIONAL RT

- Intensity modulated IRT
- Image guided RT

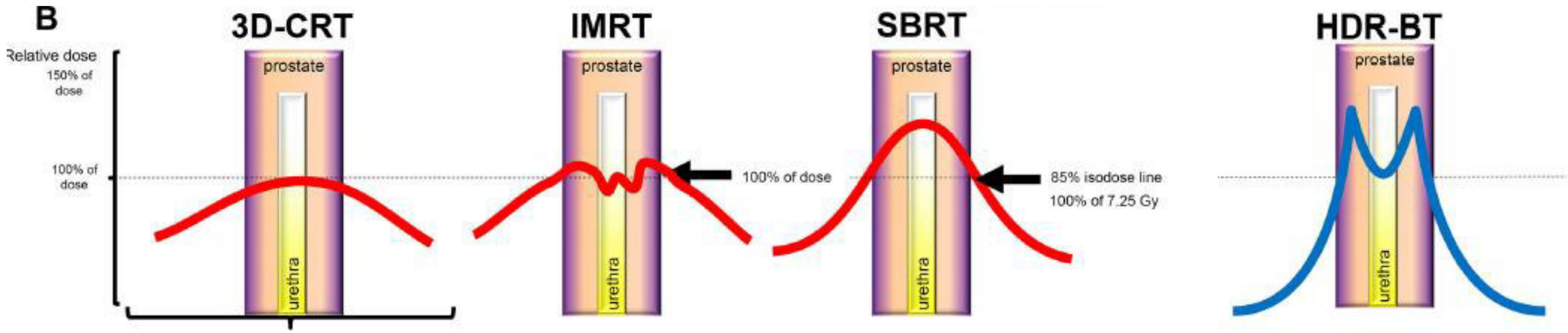


INTERVENTIONAL RADIOTHERAPY (BRACHYTHERAPY)



- *IPSS scores after LDR and HDR prostate brachytherapy. In: Kovács & Hoskin (Eds) Interstitial prostate brachytherapy, Chapter 14: HDR versus LDR seeds, Springer, 2013*

INTERVENTIONAL RADIOTHERAPY (BRACHYTHERAPY)

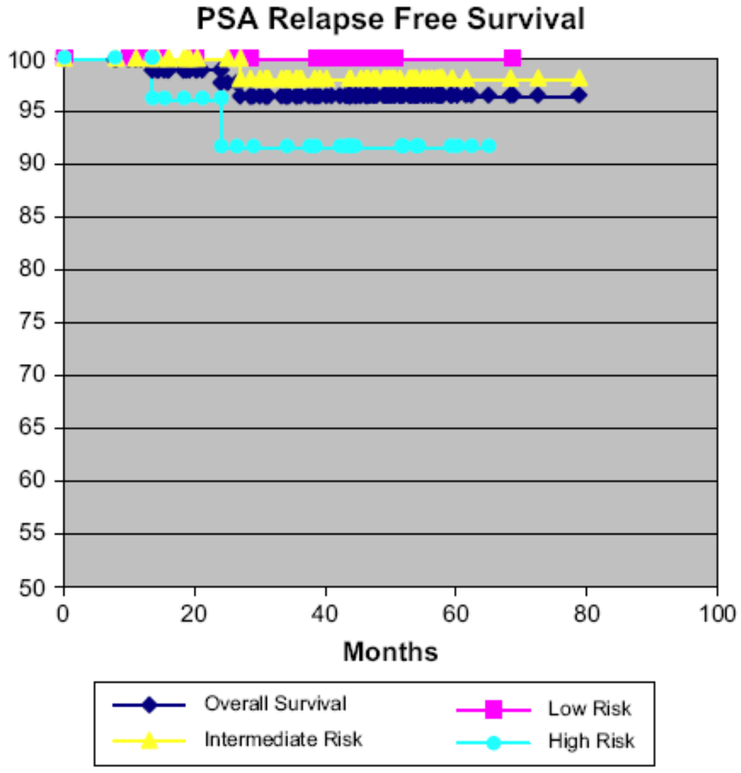


Zaorsky NG et al. The evolution of brachytherapy for prostate cancer. Nat Rev Urol. 2017

HDR Interventional Radiotherapy (monotherapy)

Author	year	# pts	HDR	ADT	Risk	F-up	BNED	GI gr3	GU gr3
Hauswald Demanes	2016	448	6 x7.25	9%	LR IR	6.5 Max15	98% (10)	0	4.7%
Hoskin	2017	293	1 x19-20 2 x 13 3 x 10.5	75% 6m	IR HR	4.1 5.2 9	94% (4y) 93% 91%	0 1%	2% 11%
Jawad Martinez Krauss	2016	494	4 x 9.5 2 x 12 2 x 13.5	14%	LR IR	5.5 3.5 2.9	97% 87% 90%	0	2% str 2% inc 7% hem
Patel	2017	190	6 x 7.25	0	IR	6.2	97% (5) 90% (8)	0	3.7% Str/inc
Prada	2016	60	1 x 19	33%	LR IR	6	66% (6)	0	0
Strouthos	2017	450	3 x 11.5	13%	IR HR	4.8	95%	0	0.8%
Yoshioka	2017	524	2 x 13.5 7 x 6.5-7 9 x 6	70%	LR IR HR	5.9	95% 94% 89%	0	1%

N=2459



Y. Yamada et al. / Brachytherapy 5 (2006) 157–164

HDR Interventional Radiotherapy (monotherapy)

Table 4. Comparison of patient satisfaction between treatment groups up to 48 months

The "Other" category comprises "Uncertain", "Dissatisfied" and "Extremely dissatisfied"

Time	Patient satisfaction	Brachytherapy	Robotic Prostatectomy	P-value
12 Months				**<0.001**
	Extremely Satisfied	113(74.3%)	63(50.4%)	
	Satisfied	29(19.1%)	37(29.6%)	
	Other	10(6.58%)	25(20%)	
24 Months				**<0.001**
	Extremely Satisfied	112(75.2%)	50(51%)	
	Satisfied	29(19.5%)	31(31.6%)	
	Other	8(5.37%)	17(13.4%)	
36 Months				**0.04**
	Extremely Satisfied	105(72.4%)	43(55.8%)	
	Satisfied	27(18.6%)	25(32.5%)	
	Other	13(9%)	9(11.7%)	
48 Months				0.06
	Extremely Satisfied	71(71.7%)	44(55%)	
	Satisfied	19(19.2%)	22(27.5%)	
	Other	9(9.1%)	14(17.5%)	

Blanchard P et al. Quality of life after brachytherapy or bilateral nerve-sparing robot-assisted radical prostatectomy for prostate cancer: a prospective cohort. BJU Int. 2018

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PB, Male, 69 years old

Comorbidities: None

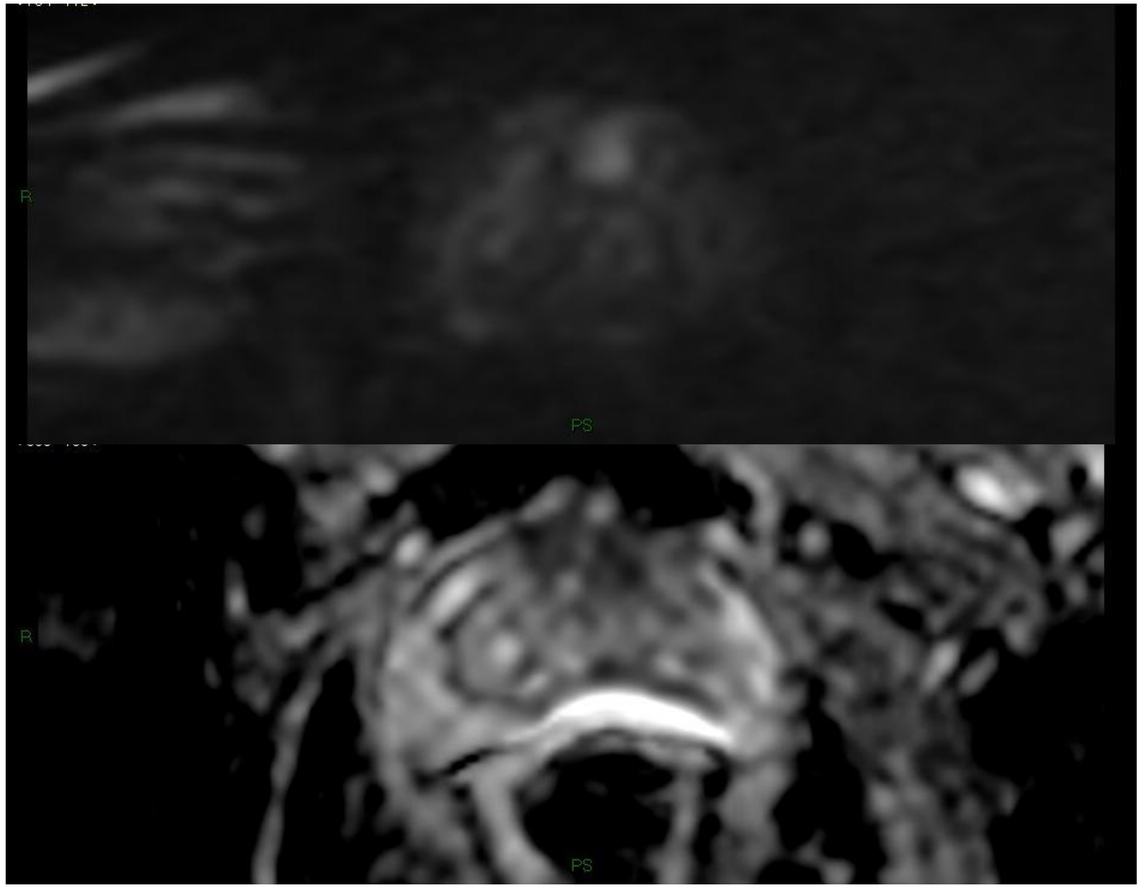
- (10.2024) iPSA: 14 ng/ml
- (28.11.2024) Multiparametric prostate MRI: PIRADS 3/4, Bilateral prostatic lesions without capsular involvement. Prostate volume: 49 cc, PSAd: 0,28
- (12.2024) Genitourinary MDT: staging cT2c
- (20.12.2024) Biopsy: adenocarcinoma GS 4+3, 8/12 positive cores bilaterally
- (02.02.2025) F-PSMA PET/CT: pathological uptake in the prostate bilaterally. No seminal vesicle involvement. No pathological pelvic lymph node uptake. Indeterminate uptake at right 7th rib.

TO SUMMARIZE:

iPSA: 14 ng/ml
Gleason score: 4+3, 8/12 positive cores bilaterally
cT2c N0 M0

PB, Male, 69 years old

Multiparametric prostate MRI: PIRADS 3/4 Bilateral prostatic lesions without capsular involvement. Prostate volume: 49 cc, PSAd: 0,28



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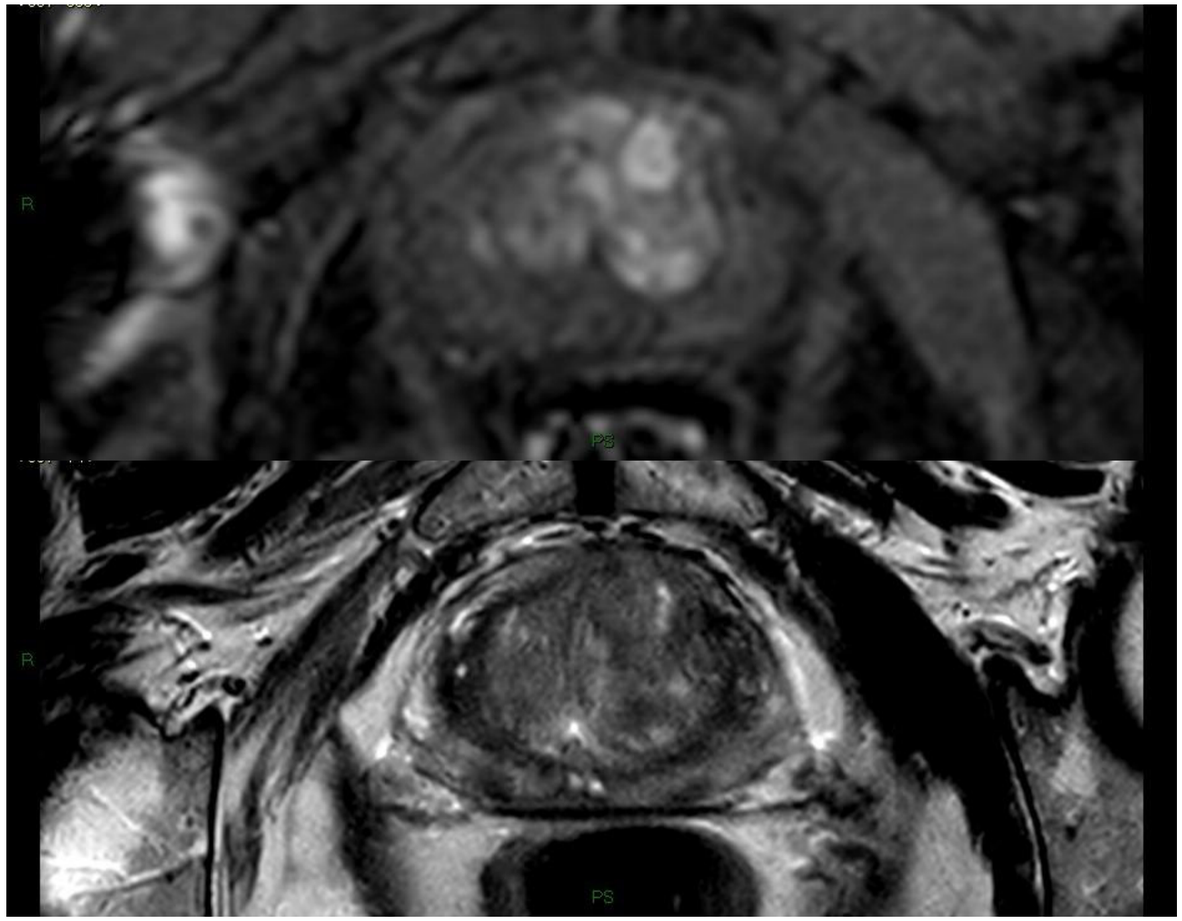
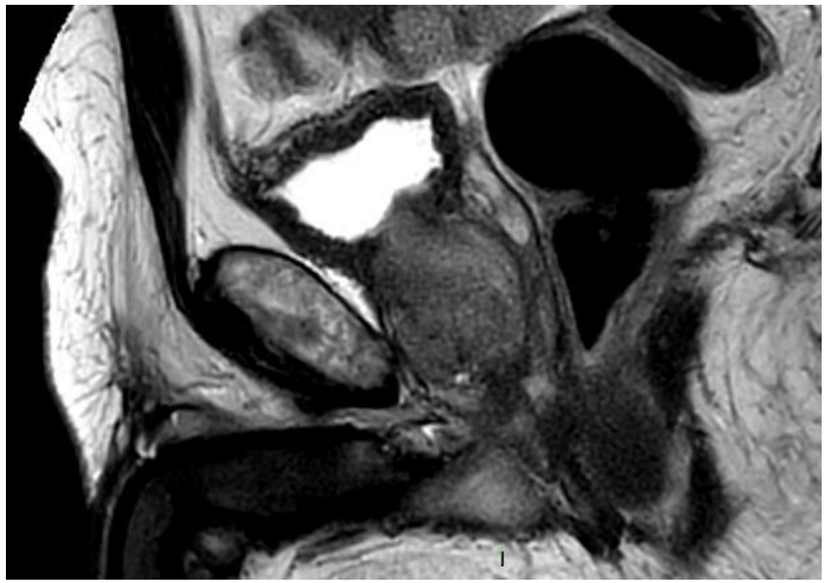
PB, Male, 69 years old

Multiparametric prostate MRI: PIRADS 3/4 Bilateral prostatic lesions without capsular involvement. Prostate volume: 49 cc, PSAd: 0,28





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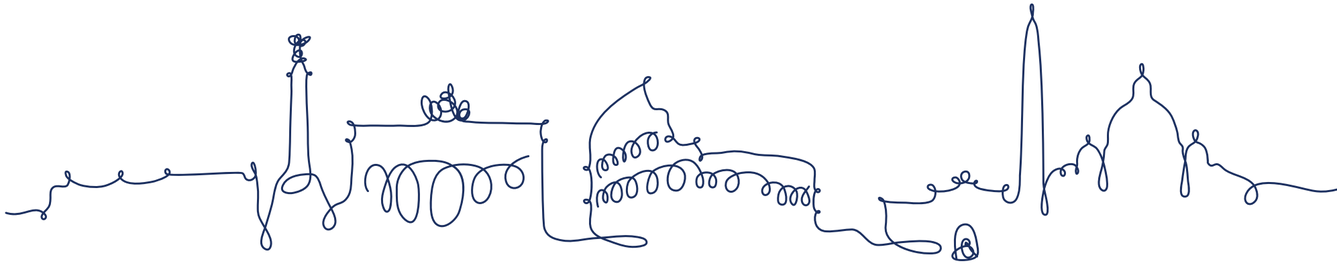

Which treatment strategy do you believe to be the most appropriate in this scenario?

1. Active surveillance
2. Surgery +/- Hormonal Therapy
3. External Beam RT +/- Hormonal Therapy
4. Interventional RT (Modern Brachytherapy) +/- Hormonal Therapy
5. Hormonal Therapy alone

SCAN ME!

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MODERN RADIATION ONCOLOGY

MRO.35: Equity and research in oncology. The subtle balance between personalized medicine and accessibility to care

26-27-28 OCTOBER 2025 - Fondazione Policlinico Universitario A. Gemelli IRCCS

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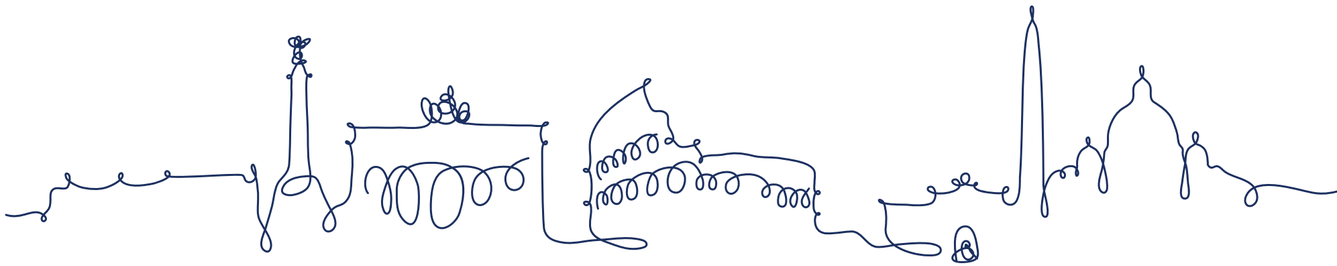
CART
Advanced Radiation Therapy



Prof. Bernardo Rocco

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MODERN RADIATION ONCOLOGY
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CLINICAL CASE DISCUSSION ON PC:

Radiation Oncology point of view

PROF FILIPPO ALONGI,

-Direttore dip. Radioterapia oncologica avanzata, IRCCS OSPEDALE SACRO CUORE DON CALABRIA , NEGRAR DI VALPOLICELLA,

-Professore Ordinario, UNIVERSITA'DI BRESCIA

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ART
Advanced Radiation Therapy

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

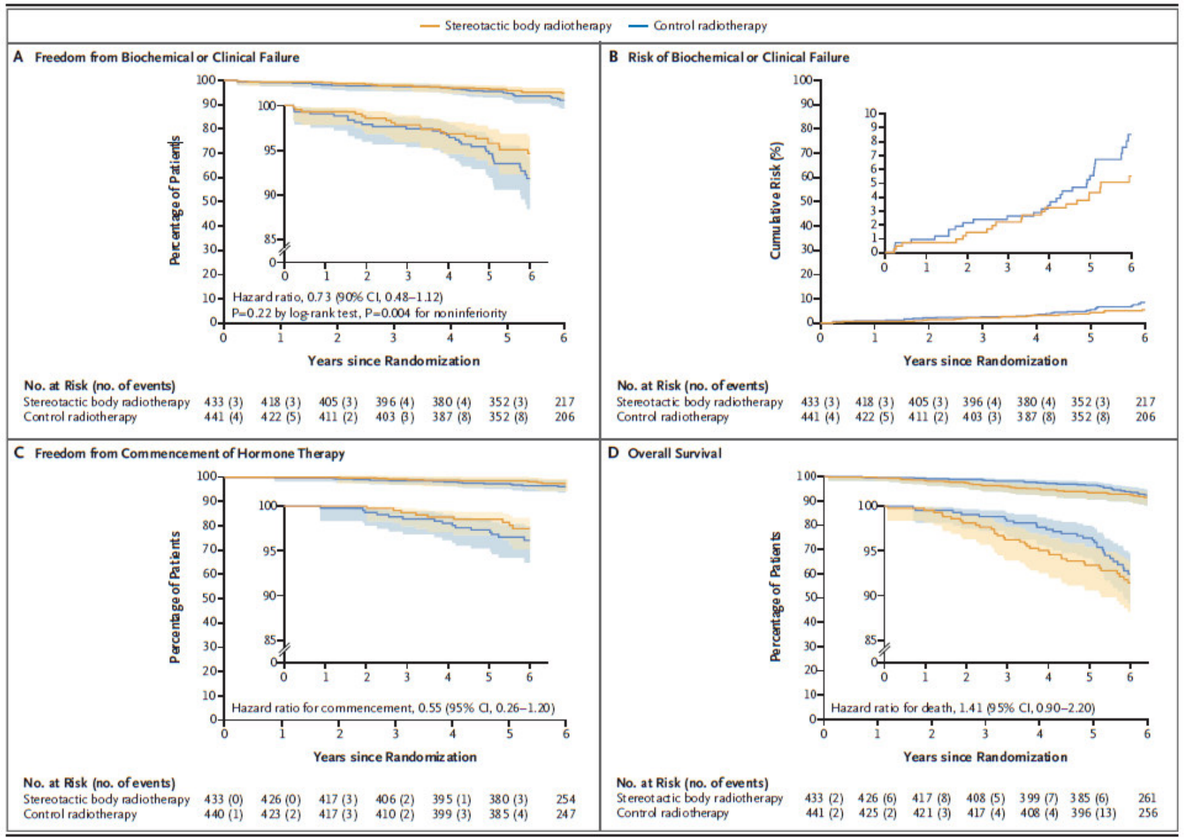
RCT: PACE B

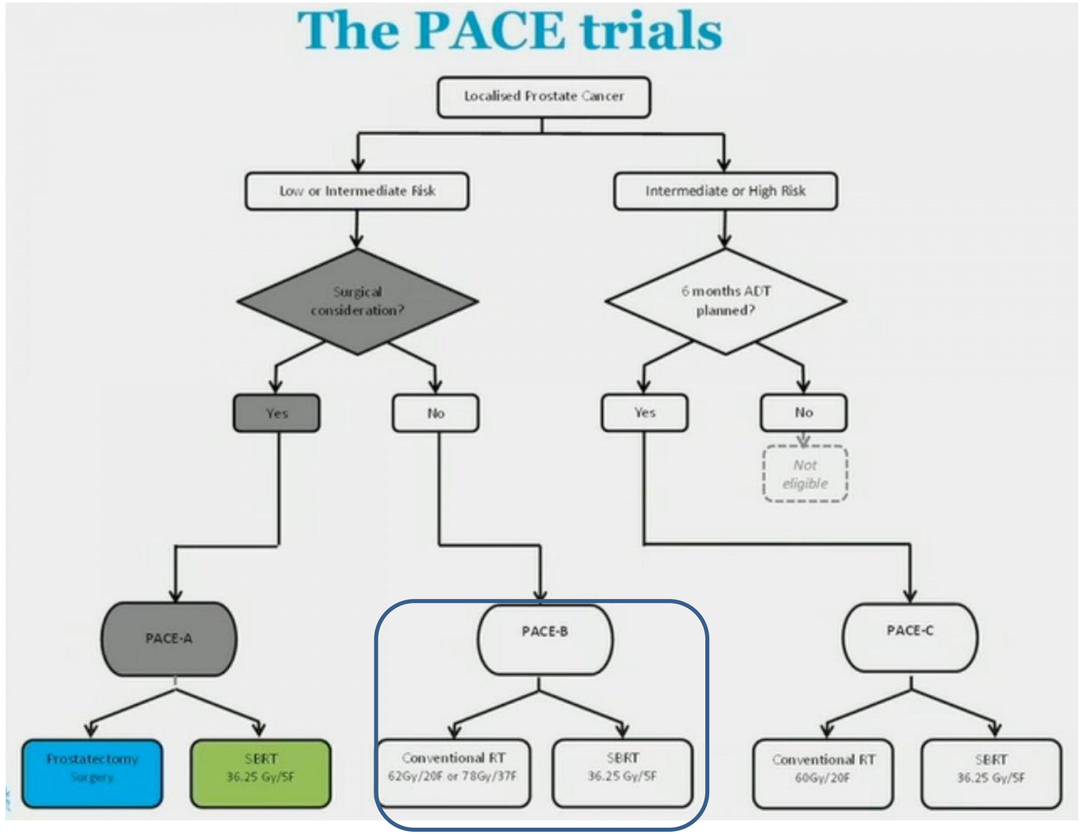
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Phase 3 Trial of Stereotactic Body Radiotherapy in Localized Prostate Cancer

N. van As, C. Griffin, A. Tree, J. Patel, P. Ostler, H. van der Voet, A. Loblaw, W. Chu, D. Ford, S. Tolan, S. Jain, P. Camilleri, K. Kancherla, J. Frew, A. Chan, O. Naismith, J. Armstrong, J. Staffurth, A. Martin, I. Dayes, P. Wells, D. Price, E. Williamson, J. Pugh, G. Manning, S. Brown, S. Burnett, and E. Hall

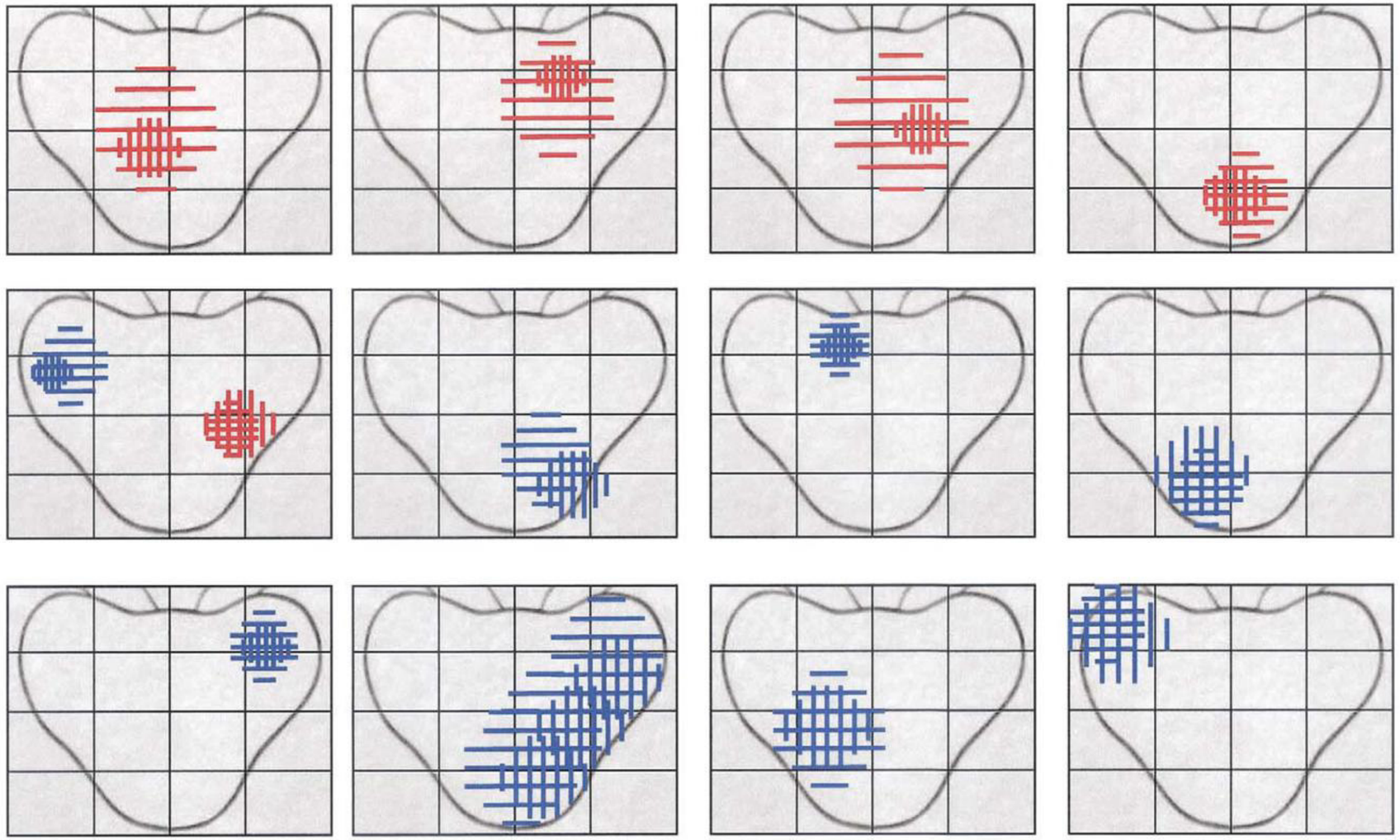




CONCLUSIONS: **Five-fraction SBRT was non inferior to control radiotherapy with respect to biochemical or clinical failure** and may be an efficacious treatment option for patients with low-to-intermediate-risk localized prostate cancer as defined in this trial.

Van As N, et al. NEJM 2024

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE



local recurrence usually originates in the primary tumor

- Cellini N, Morganti AG, Mattiucci GC, Valentini V, Leone M, Luzi S, Manfredi R, Dinapoli N, Digesu' C, Smaniotto D. Analysis of intraprostatic failures in patients treated with hormonal therapy and radiotherapy: implications for conformal therapy planning. Int J Radiat Oncol Biol Phys. 2002

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

PURPOSE: *This study investigates whether* ***focal boosting of the macroscopic visible tumor*** *with external beam radiotherapy* ***increases biochemical disease-free survival (bDFS)*** *in patients with localized prostate cancer*

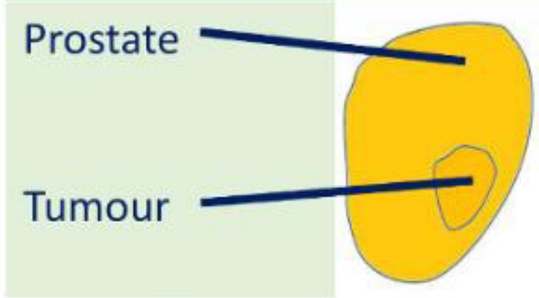
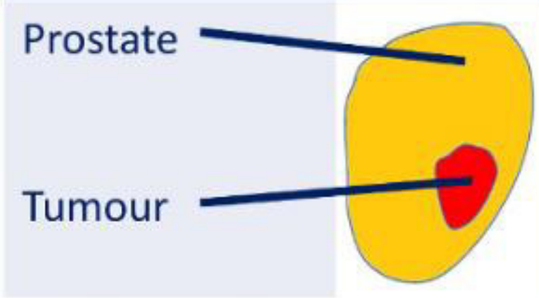
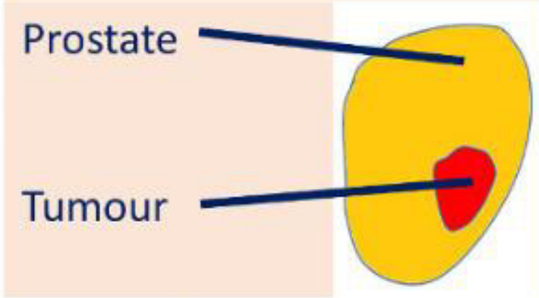
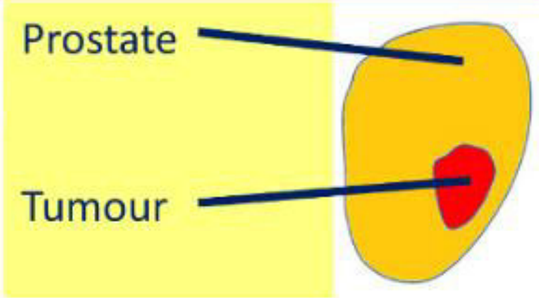
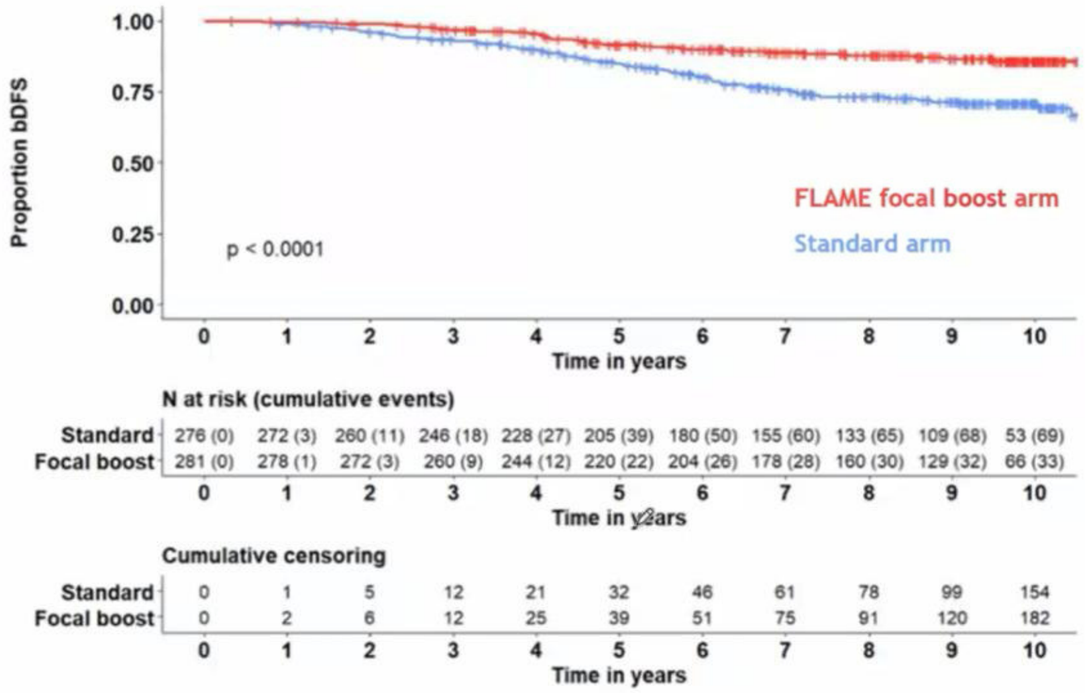
Standard treatment	FLAME (NCT01168479; phase III)	hypo-FLAME (NCT02853110; phase II)	hypo-FLAME 2.0 (NCT04045717; phase II)
OTT = 7-8 weeks	OTT = 7 weeks	OTT = 29 days	OTT = 15 days
35-40 fractions, 5x/week	35 fractions, 5x/week	5 fractions, 1x/week	5 fractions, 2x/week
Whole gland irradiation	Whole gland irradiation ± focal tumour boost	Whole gland irradiation + focal tumour boost	Whole gland irradiation + focal tumour boost
			

Figure 1. Overview of the FLAME consortium trials investigating focal boosting strategies in prostate cancer

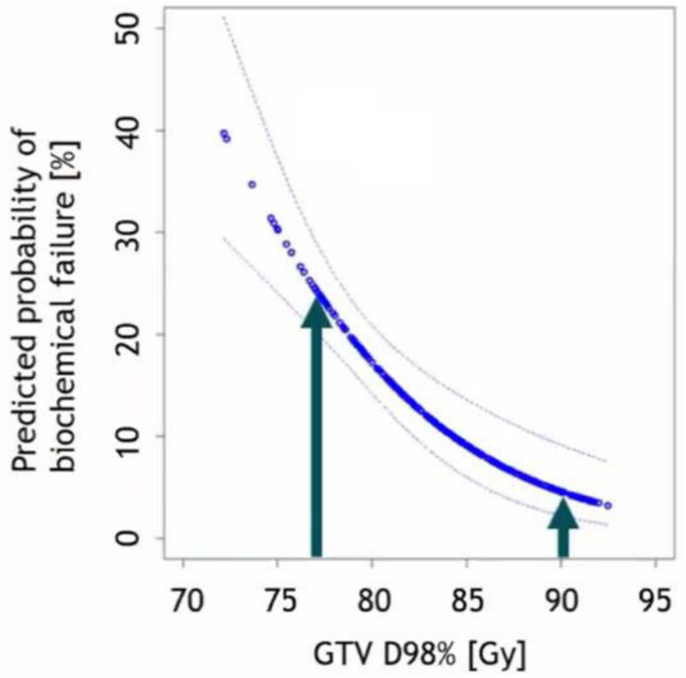
- https://www.urotoday.com/recent-abstracts/urologic-oncology/prostate-cancer/122180-sbrt-and-the-boost-a-love-story-primary-endpoint-analysis-of-the-phase-ii-hypo-flame-trial-beyond-the-abstract.html

CLINICAL INDICATION:
LITERATURE PUBLISHED EVIDENCE

Biochemical disease-free survival



Dose-response curve (bDFS) at 10 years



For biochemical survival at 10 years, the dose-response data revealed that the biochemical failure rate at 77 Gy (the standard dose) was approximately 25%. However, at doses of 90 Gy or higher, the failure rate dropped to 5%, suggesting that **higher doses to the GTV are crucial for improved outcomes**

- ESTRO 2025 – Menne-Guricova Karolina
- Images downloaded from: ESTRO 2025 app and https://oncodaily.com/science/flame-trial-estro-2025 and ESTRO2025

CLINICAL INDICATION:
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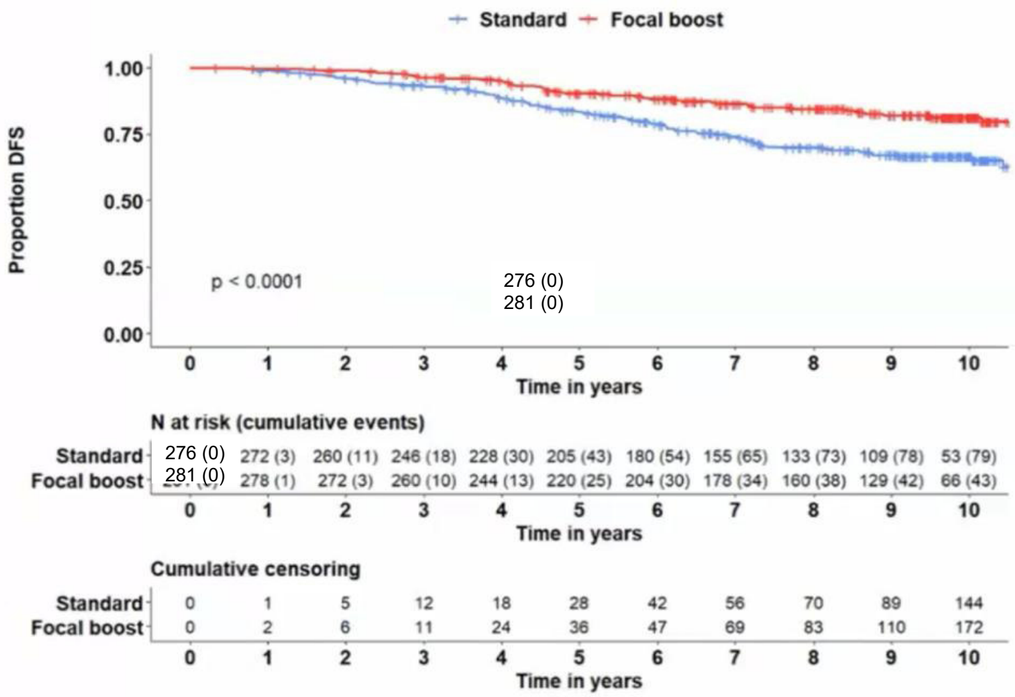
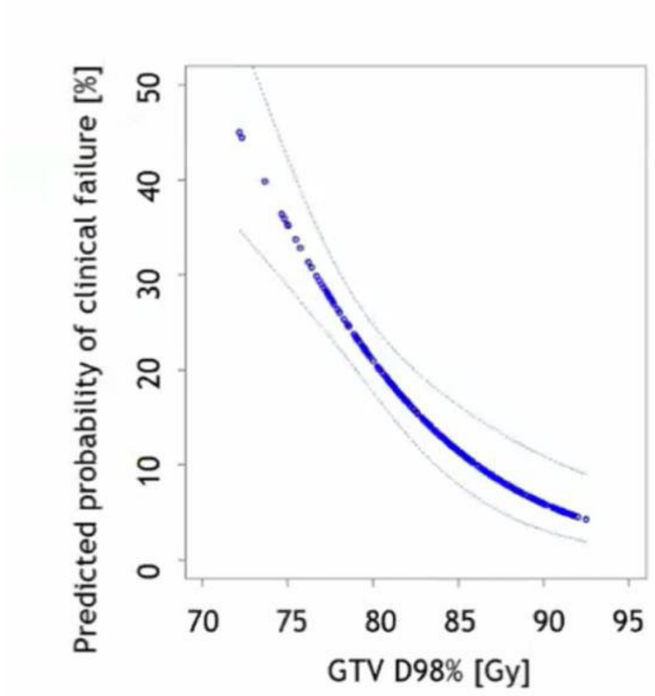


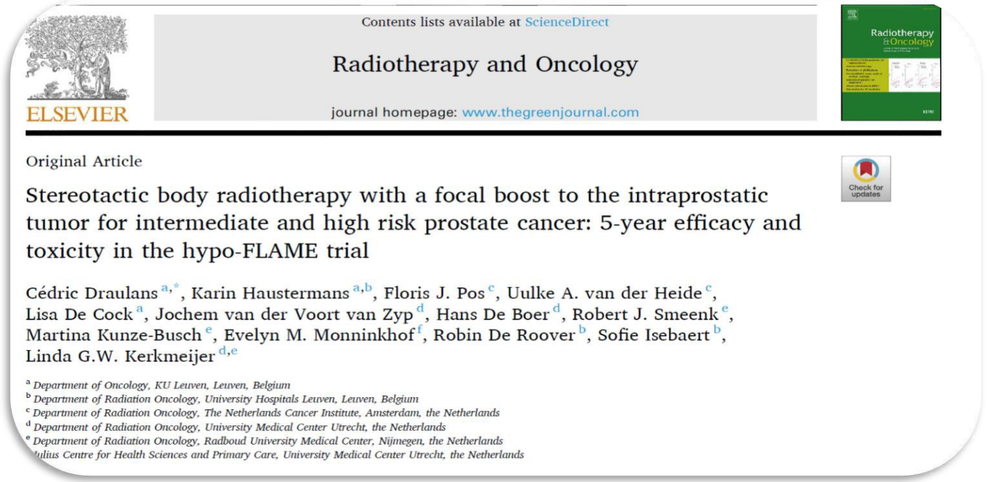


The focal boost arm had a 10-year DFS of 81% compared to 67% in the standard treatment arm. This outcome showed a strong association between **dose escalation and better survival**, supporting the efficacy of focal boosting.

- ESTRO 2025 – Menne-Guricova Karolina
- Images downloaded from: ESTRO 2025 app and https://oncodaily.com/science/flame-trial-estro-2025 and ESTRO2025

FUTURE DIRECTIONS:
DOSE ESCALATION (BOOST)

HYPO-FLAME



Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Original Article

Stereotactic body radiotherapy with a focal boost to the intraprostatic tumor for intermediate and high risk prostate cancer: 5-year efficacy and toxicity in the hypo-FLAME trial

Cédric Draulans [a,*], Karin Haustermans [a,b], Floris J. Pos [c], Uulke A. van der Heide [c], Lisa De Cock [a], Jochem van der Voort van Zyp [d], Hans De Boer [d], Robert J. Smeenk [e], Martina Kunze-Busch [e], Evelyn M. Monninkhof [f], Robin De Roover [b], Sofie Isebaert [b], Linda G.W. Kerkmeijer [d,e]

[a] Department of Oncology, KU Leuven, Leuven, Belgium
[b] Department of Radiation Oncology, University Hospitals Leuven, Leuven, Belgium
[c] Department of Radiation Oncology, The Netherlands Cancer Institute, Amsterdam, the Netherlands
[d] Department of Radiation Oncology, University Medical Center Utrecht, the Netherlands
[e] Department of Radiation Oncology, Radboud University Medical Center, Nijmegen, the Netherlands
[f] Julius Centre for Health Sciences and Primary Care, University Medical Center Utrecht, the Netherlands

- 100 Patients with intermediate-high-risk PCa were enrolled in the phase II hypo-FLAME trial.
- All were treated with 35 Gy in 5 weekly fractions to the whole prostate gland with an integrated boost up to 50 Gy to the multiparametric MRI-defined tumor(s).
- If the dose constraints to the normal tissues would be exceeded, these were prioritised over the focal boost dose.
- F-up 61 months

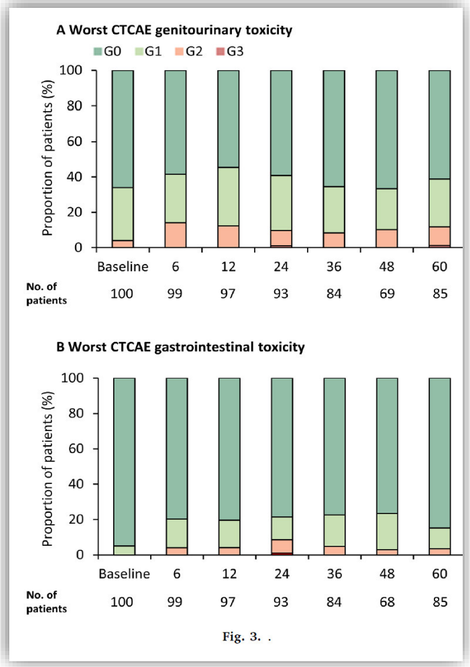


Fig. 3. .

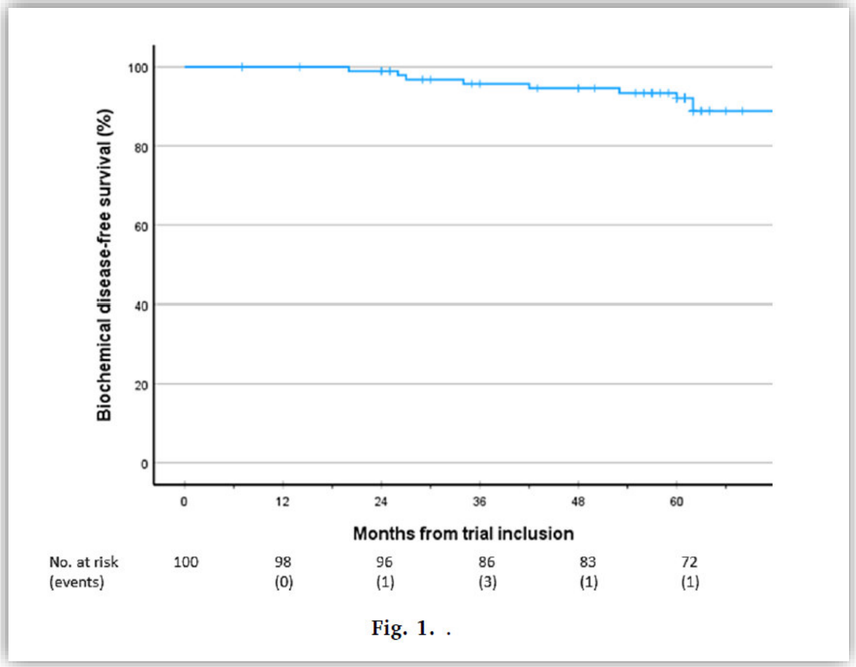


Fig. 1. .

- ✓ At 5 years, the prevalence of grade 2 + GU and GI toxicity was 12 % and 4 %, respectively.
- ✓ The estimated 5-year bDFS was 93 %.

Ultra-hypofractionated focal boost SBRT is associated with encouraging biochemical control up to 5-year follow-up in pts with intermediate and high-risk PCa

Draulans et al, Radioth Oncol 2024

The Role of interventional radiotherapy (modern brachytherapy) in unfavorable intermediate risk prostate cancer

LUCA TAGLIAFERRI - MD, PhD

Fondazione Policlinico Univeristario «Agostino Gemelli» IRCCS

Gemelli ART (Advanced Radiation Therapy) - Interventional Oncology Center (IOC)

27th October 2025

Fondazione Policlinico Universitario Agostino Gemelli IRCCS
Università Cattolica del Sacro Cuore

Advanced Radiation Therapy

Interventional Oncology Center
Centro di Oncologia Interventistica

Theragnostic Oncology Center

2025 BEST HOSPITALS 2st Italian Hospital Top 50 World Hospital Newsweek statista
POLICLINICO UNIVERSITARIO A. GEMELLI

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Interventional and External beam
INTERACTS
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INTERVENTIONAL RADIOTHERAPY AS A BOOST TECHNIQUE

Single fraction
Simultaneous Integrated Boost

CTV1 10 Gy – Prostate

CTV2 12 Gy – Peripheral prostate area

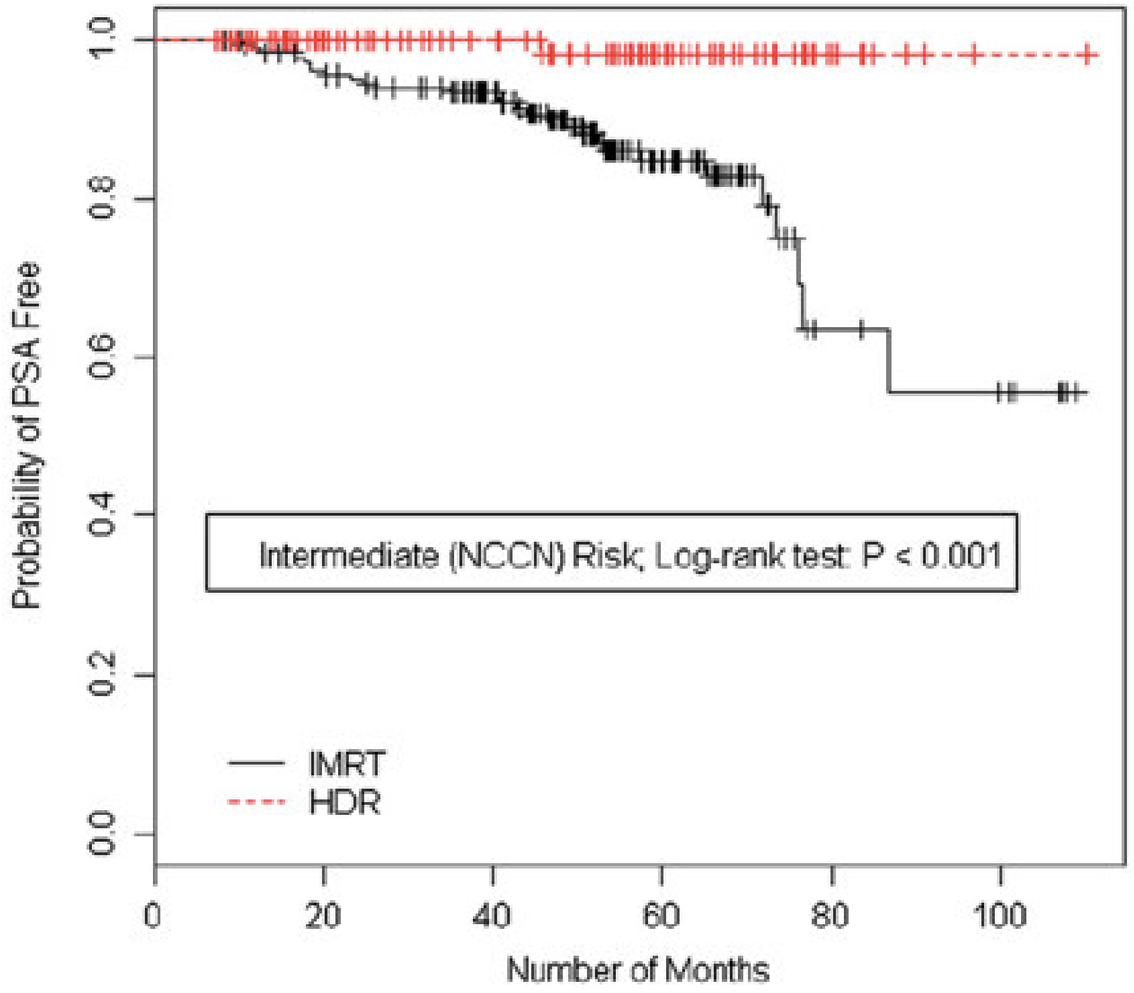
CTV3 15 Gy – Dominant Intraprostatic Lesion (DIL)

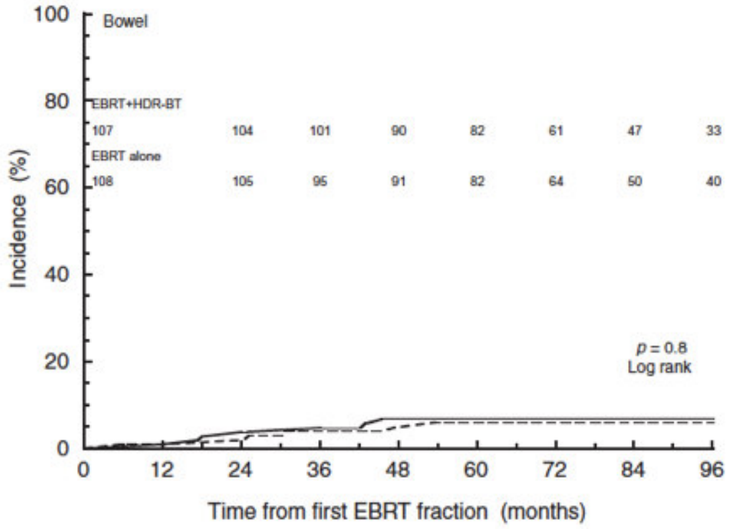
ERT (46Gy – 2Gydie) + IRT – SIB (10-15Gy)

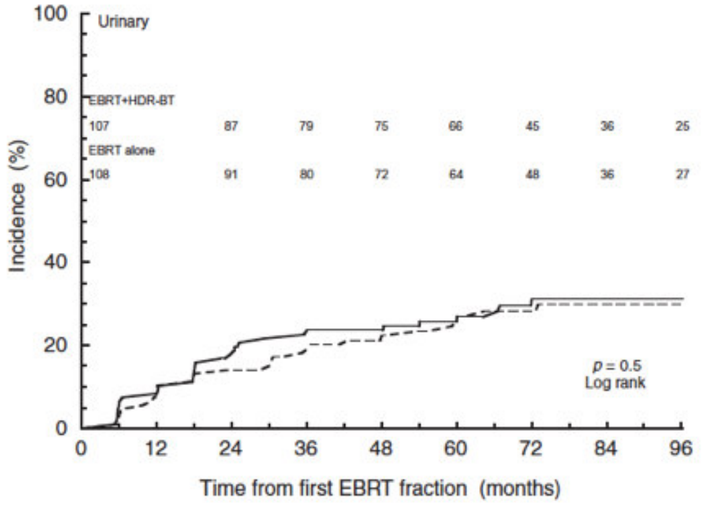
- *L. Tagliaferri, G. Alemanno, B. Fionda, A.R. Alitto, V. Frascino, F. Cellini, V. Lancellotta, E. Placidi, A.G. Morganti, G. Kovács, A. Giordano, R. Manfredi, V. Valentini - Multiparametric imaging guided HDR interventional radiotherapy (brachytherapy) boost in localized prostate cancer: a multidisciplinary experience - Eur Rev Med Pharmacol Sci. 2023; Article in Press*
- *Alitto AR, Tagliaferri L, Lancellotta V, D'Aviero A, Piras A, Frascino V, Catucci F, Fionda B, Staackmann C, Saldi S, Valentini V, Kovacs G, Aristei C, Mantini G. BIT-ART: Multicentric Comparison of HDR-brachytherapy, Intensity-modulated Radiotherapy and Tomotherapy for Advanced Radiotherapy in Prostate Cancer. In Vivo. 2020*

GART
Advanced Radiation Therapy

INTERVENTIONAL RADIOTHERAPY AS A BOOST TECHNIQUE







- *Hoskin PJ, Motohashi K, Bownes P, Bryant L, Ostler P. High dose rate brachytherapy in combination with external beam radiotherapy in the radical treatment of prostate cancer: initial results of a randomised phase three trial. Radiother Oncol. 2007*

CART
Advanced Radiation Therapy

INTERVENTIONAL RADIOTHERAPY AS A BOOST TECHNIQUE

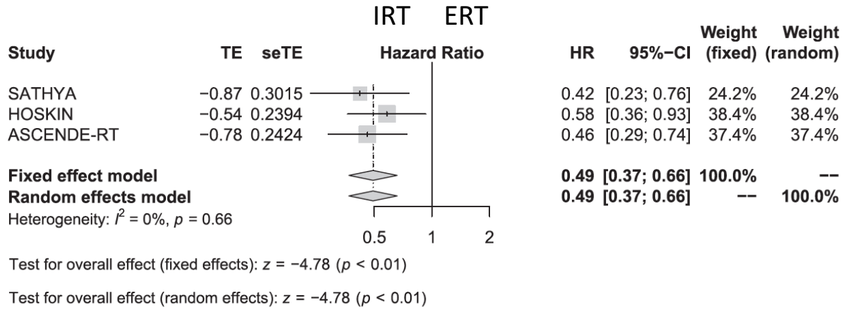


Fig. 2. Forest plots of 5-year biochemical progression free survival for brachytherapy boost versus external beam boost in intermediate and high-risk prostate cancer.

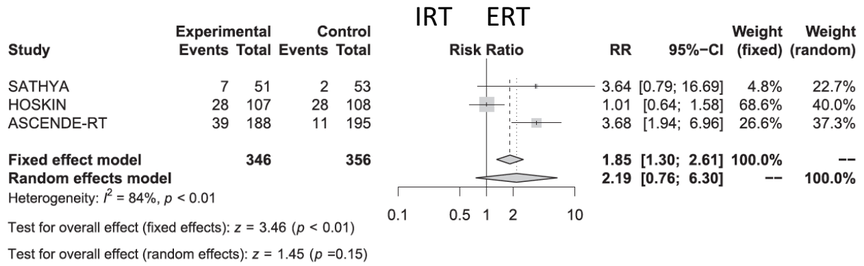


Fig. 4. Forest plots of 5-year rates of late genito-urinary ≥ G3 toxicity for brachytherapy boost versus external beam boost in intermediate and high-risk prostate cancer.

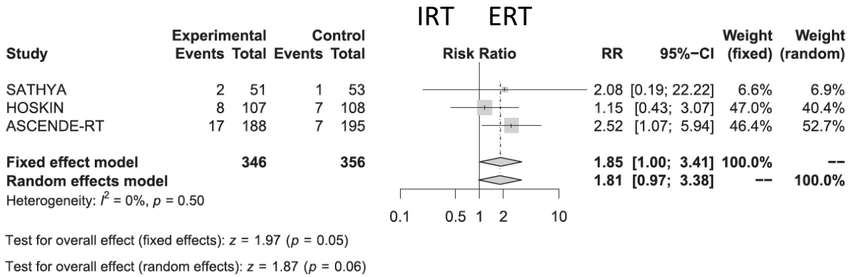


Fig. 5. Forest plots of 5-year rates of late gastro-intestinal ≥ G3 toxicity for brachytherapy boost versus external beam boost in intermediate and high-risk prostate cancer.


Cancer Treatment Reviews 70 (2018) 265–271
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ELSEVIER
Systematic or Meta-analysis Studies

Brachytherapy versus external beam radiotherapy boost for prostate cancer: Systematic review with meta-analysis of randomized trials

Daniel Lam Cham Kee[a], Jocelyn Gal[b], Alexander T. Falk[a], Renaud Schiappa[b], Marie-Eve Chand[a], Mathieu Gautier[a], Jérôme Doyen[a], Jean-Michel Hannoun-levi[a,*]

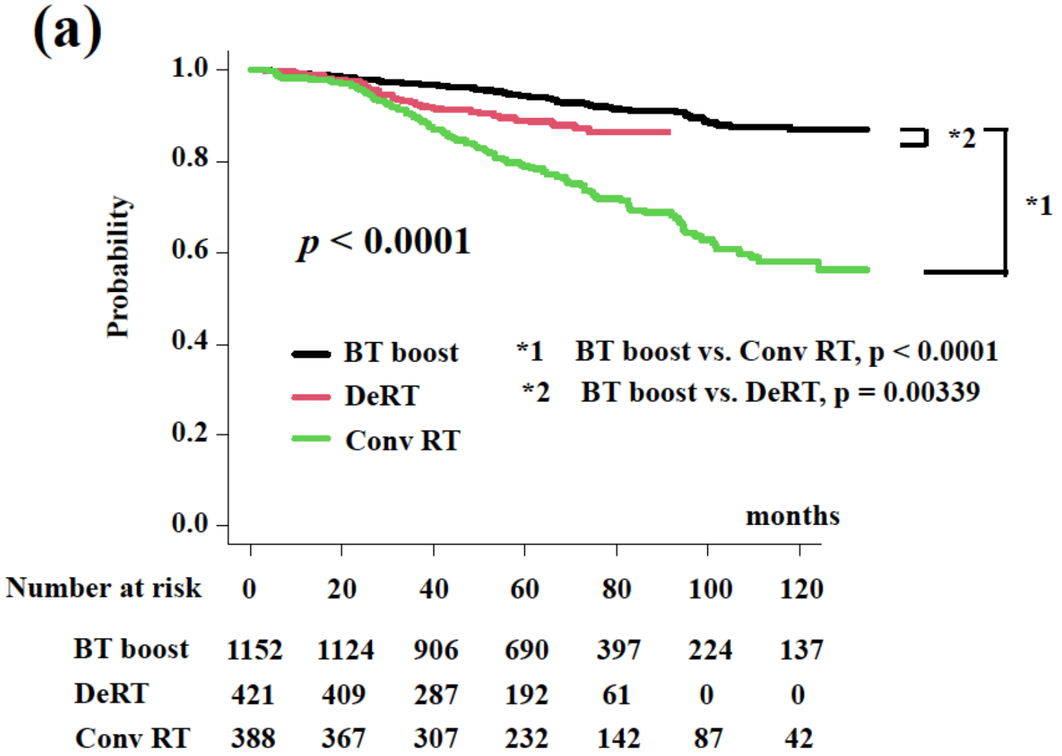
This meta-analysis provides further evidence in favor of BT boost for intermediate and high-risk prostate cancer in terms of b-PFS improvement, leading to suggest ***BT boost as level I and grade A recommendation***.

However, the risk of grade ≥ 3 late toxicity must be carefully investigated.

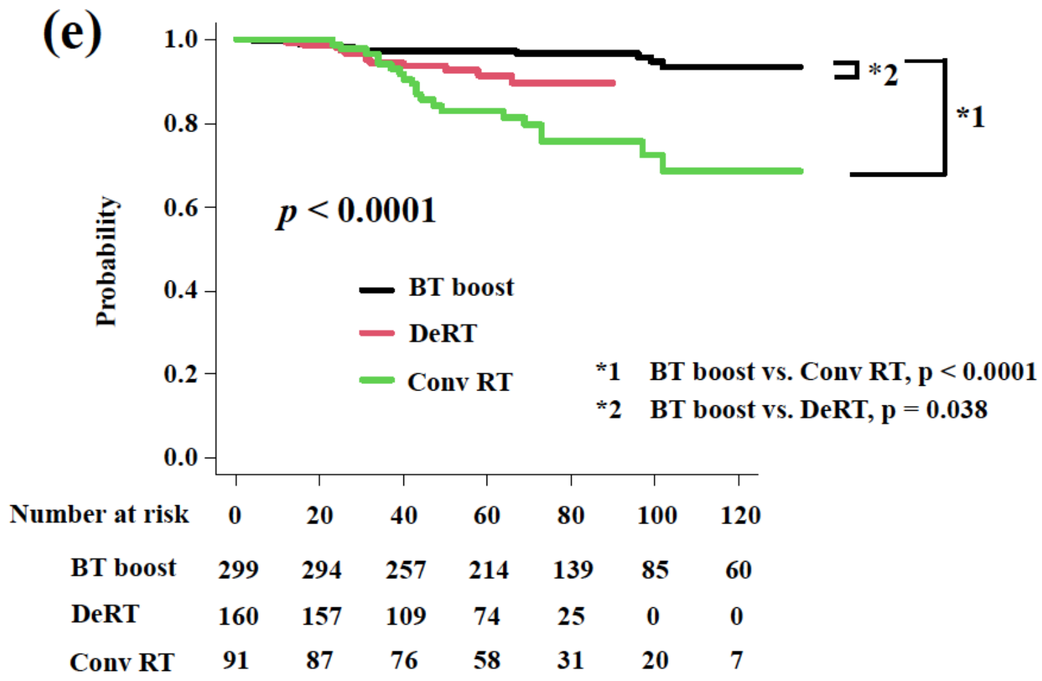
- *Kee DLC, Gal J, Falk AT, Schiappa R, Chand ME, Gautier M, Doyen J, Hannoun-Levi JM. Brachytherapy versus external beam radiotherapy boost for prostate cancer: Systematic review with meta-analysis of randomized trials. Cancer Treat Rev. 2018*

INTERVENTIONAL RADIOTHERAPY AS A BOOST TECHNIQUE

Biochemical disease-free survival rate (bDFS)



intermediate-risk group



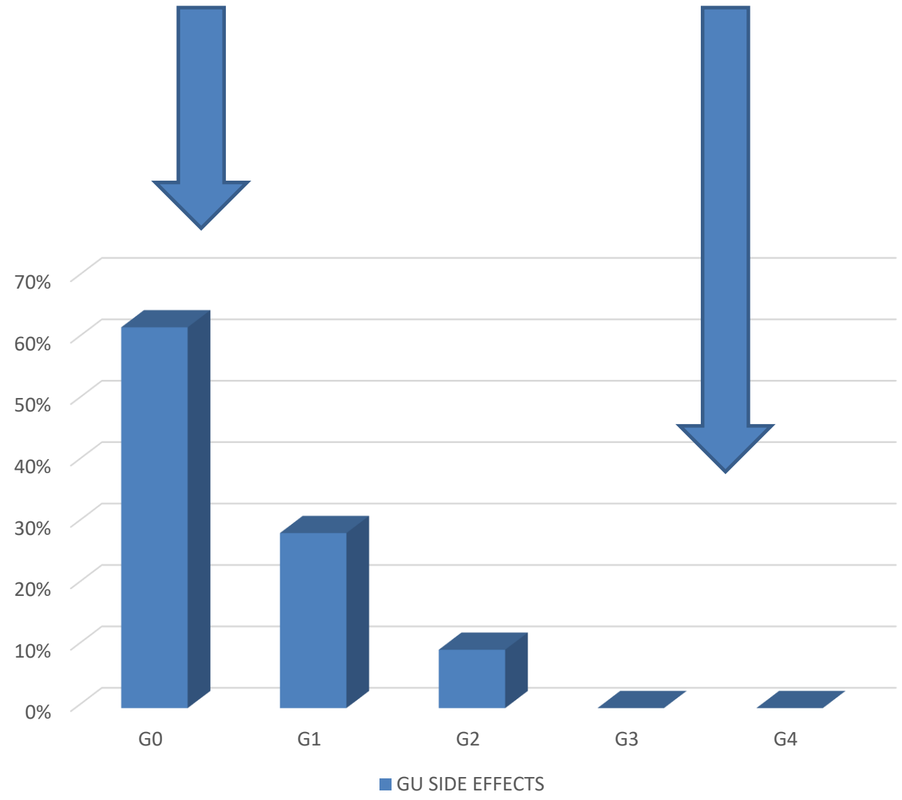
DeRT: Dose Escalation RT

- Yamazaki H, Suzuki G, Masui K, Aibe N, Shimizu D, Kimoto T, Yamada K, Okihara K, Ueda T, Narukawa T, Shiraishi T, Fujihara A, Yoshida K, Nakamura S, Kato T, Hashimoto Y, Okabe H. Role of Brachytherapy Boost in Clinically Localized Intermediate and High-Risk Prostate Cancer: Lack of Benefit in Patients with Very High-Risk Factors T3b-4 and/or Gleason 9-10. Cancers (Basel). 2022

INTERVENTIONAL RADIOTHERAPY AS A BOOST TECHNIQUE

60%
No side effects

0%
(G3-G4)



100%
preserved urinary and sexual function

NO

Substantial Changes
IIEF/IPSS

100%
Local and biochemical control

NO

recurrence

- Tagliaferri L, Alemanno G, Fionda B, Alitto AR, Frascino V, Cellini F, Lancellotta V, Placidi E, Morganti AG, Kovács G, Giordano A, Manfredi R, Valentini V. Multiparametric imaging guided HDR interventional radiotherapy (brachytherapy) boost in localized prostate cancer: a multidisciplinary experience. Eur Rev Med Pharmacol Sci. 2023