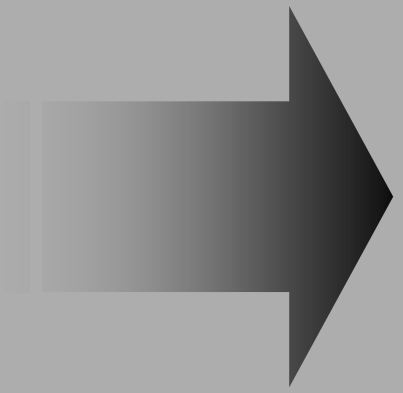
LDR Prostate Brachytherapy as a boost for HR Prostate Cancer – An under used resource?

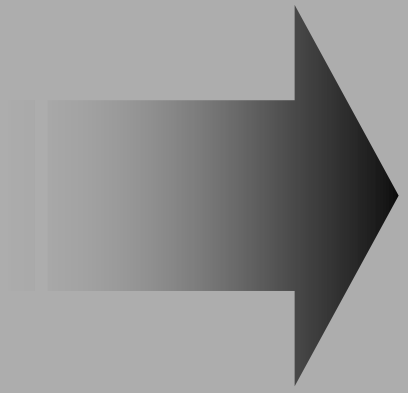
Robert Laing

Why boost? and Why LDR Bxt

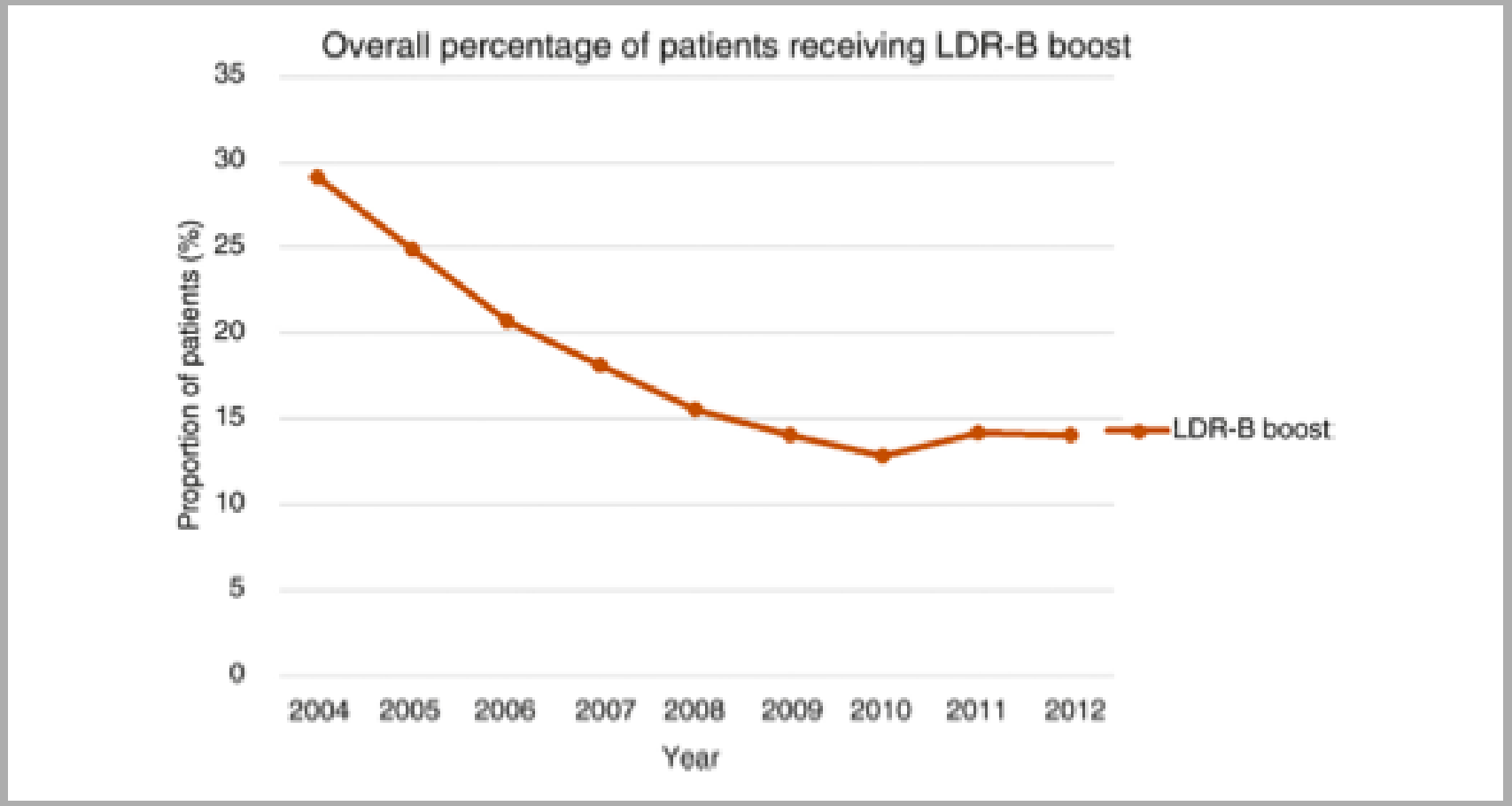
Retrospective and Randomised Data



Health economics



Reduction in use of LDR-Bxt - is it justified by results?



Brachytherapy Boost Utilization and Survival in Unfavorable-risk Prostate Cancer

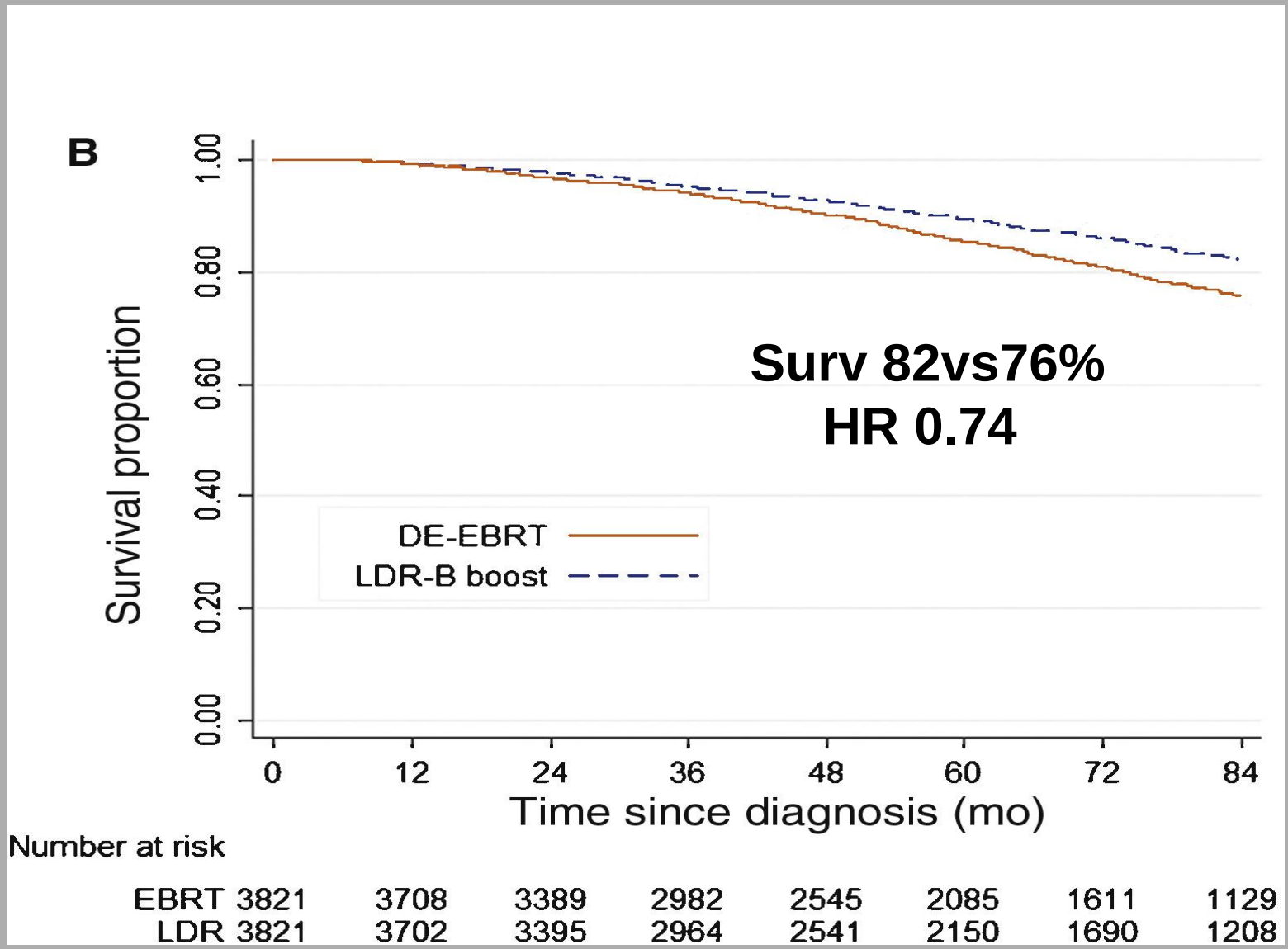
Skyler B. Johnson [a], Nataniel H. Lester-Coll [a], Jacqueline R. Kelly [a], Benjamin H. Kann [a], James B. Yu [a,b], Sameer K. Nath [a,]*

[a] *Department of Therapeutic Radiology, Yale School of Medicine, New Haven, CT, USA;* [b] *Cancer Outcomes, Public Policy, and Effectiveness Research Center, Yale School of Medicine, New Haven, CT, USA*

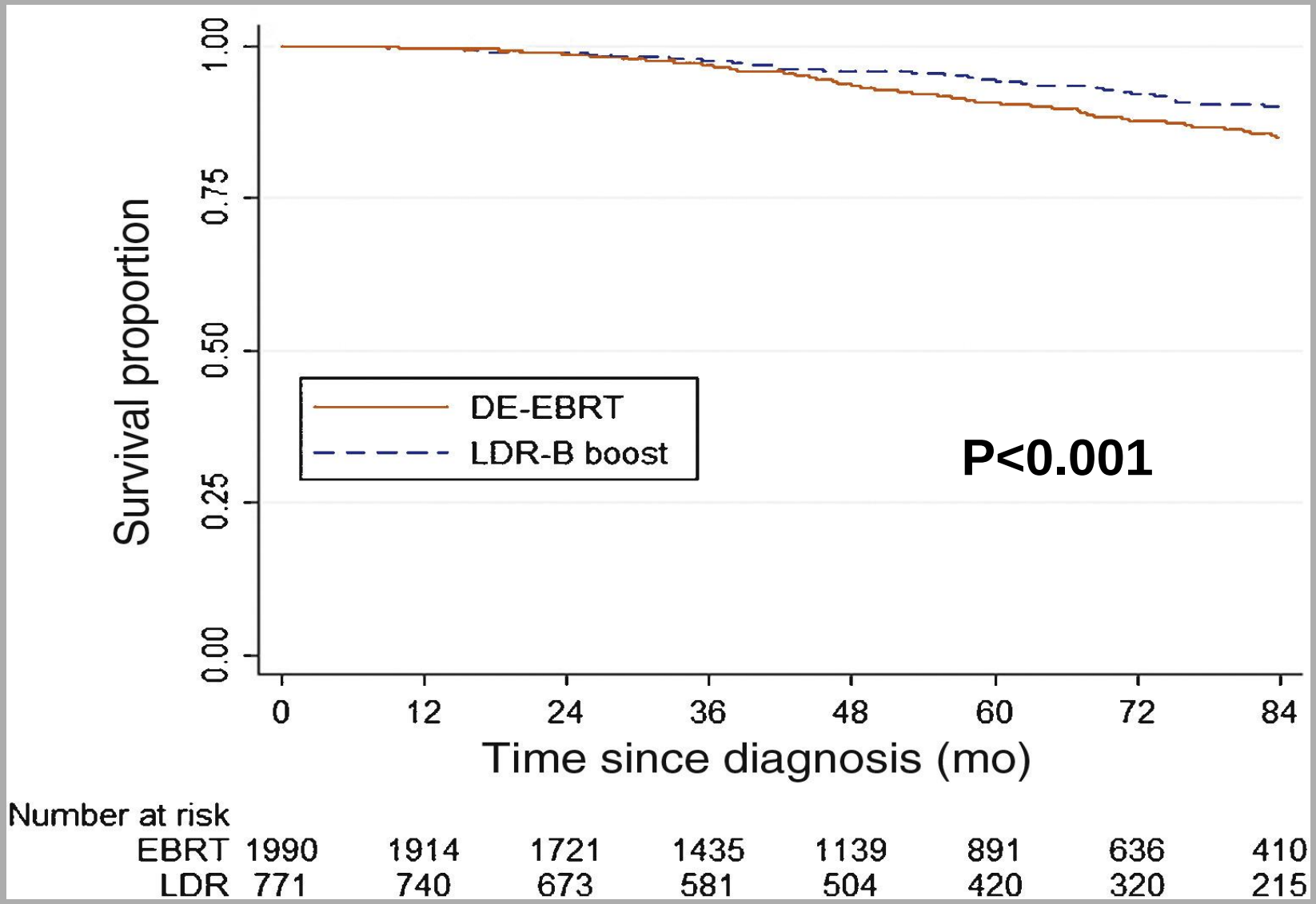
- 25,038 pts with unfavourable Ca Prostate (US Nat Ca Database)
- Similar to Acende-RT study
- 20,000 pts EBRT 75 – 84 Gy
- 4500 pts LDR Bxt boost
- Median FU 71 months for LDR-Bxt
- Retrospective but propensity matched study
- OS analysis

EUROPEAN UROLOGY 72 (2017) 738–744

7642 matched patients



Patients <61 and no comorbidities



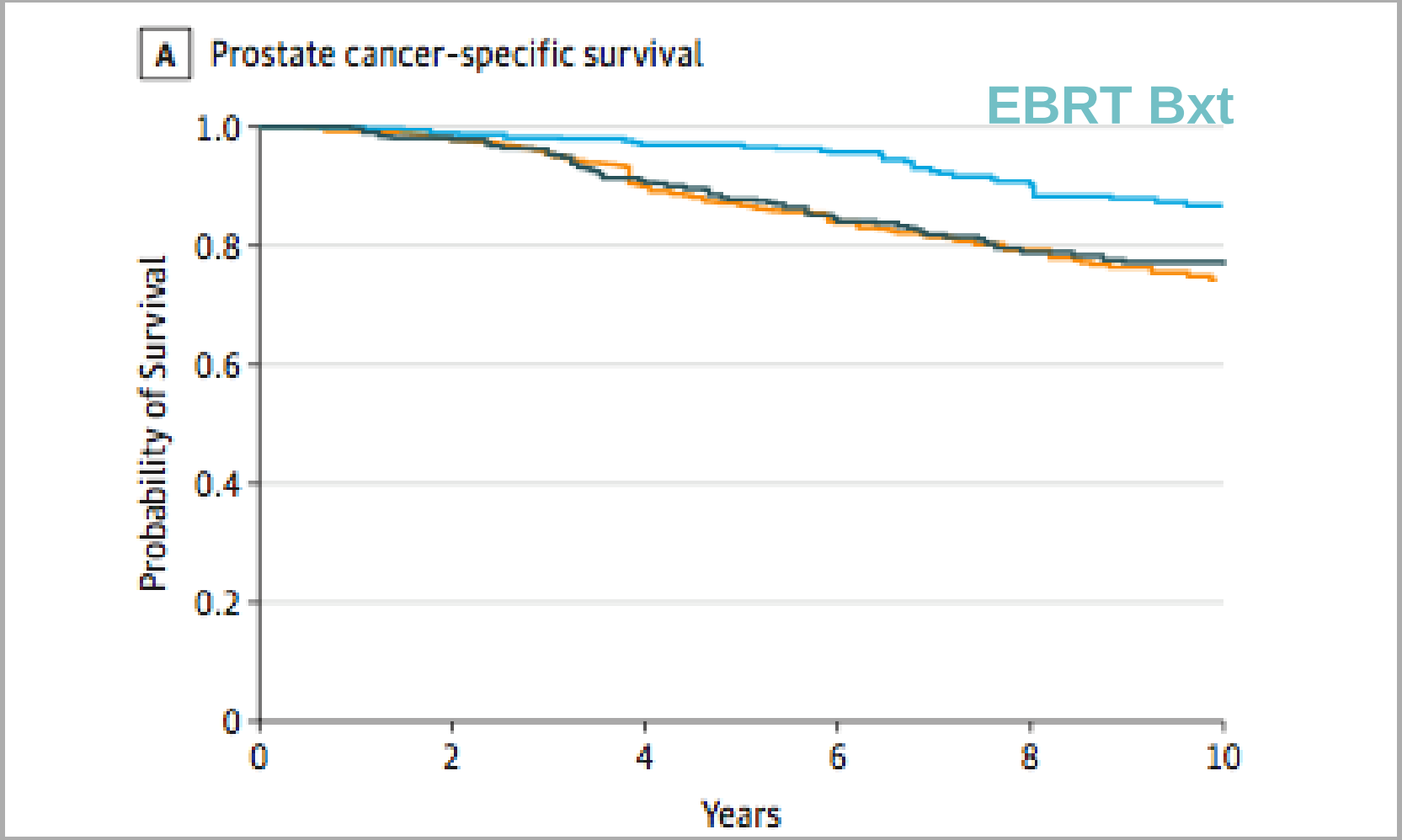
JAMA | Original Investigation

Radical Prostatectomy, External Beam Radiotherapy, or External Beam Radiotherapy With Brachytherapy Boost and Disease Progression and Mortality in Patients With Gleason Score 9-10 Prostate Cancer

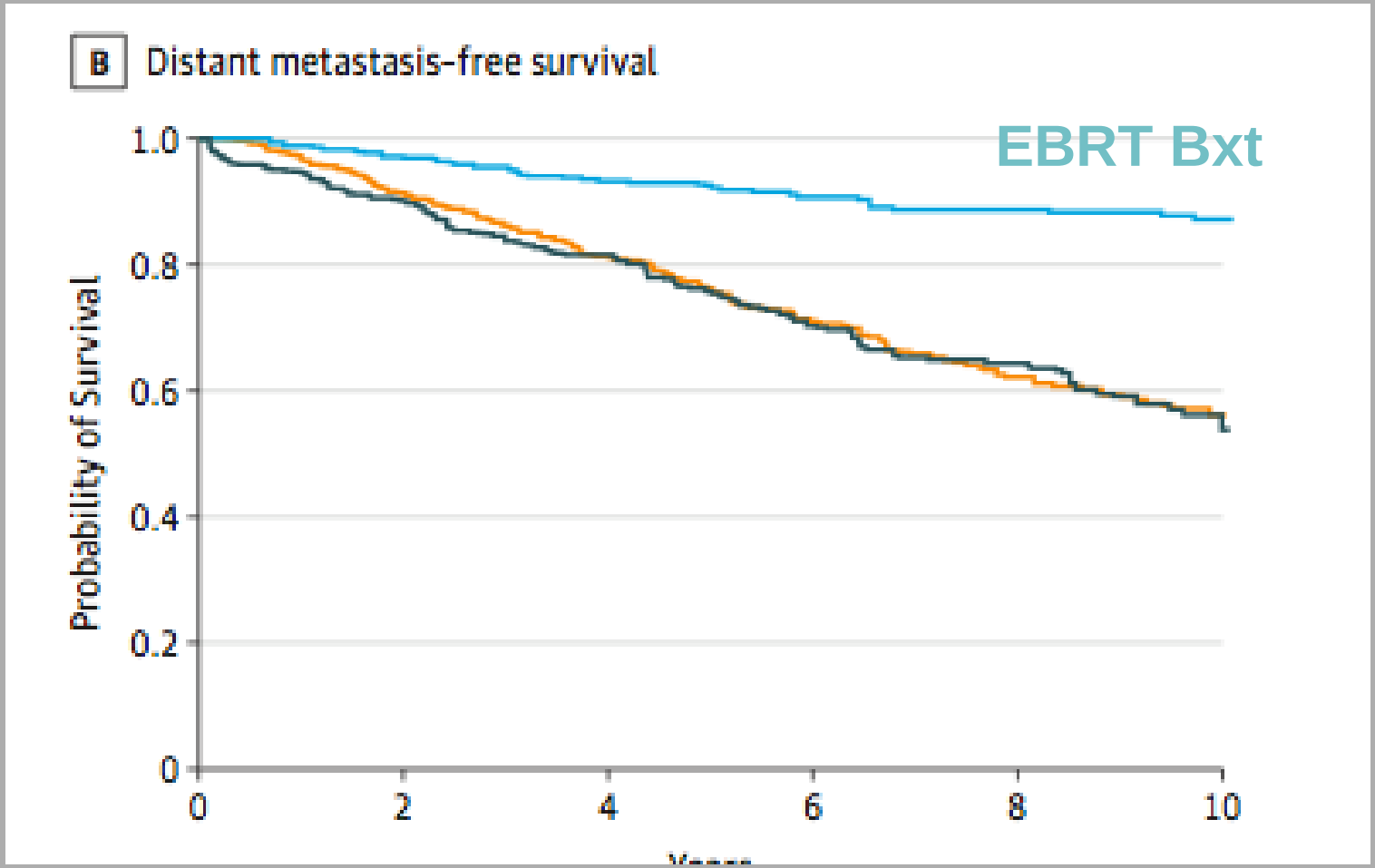
Amar U. Kishan, MD; Ryan R. Cook, MSPH; Jay P. Ciezki, MD; Ashley E. Ross, MD, PhD; Mark M. Pomerantz, MD; Paul L. Nguyen, MD; Talha Shaikh, MD;

- Multi-institutional retrospective study 1800 pts
- 12 centres
- EBRT median 24 months ADH, Boost pts 12 months
- 40% of Rad Prostatectomy pts had EBRT

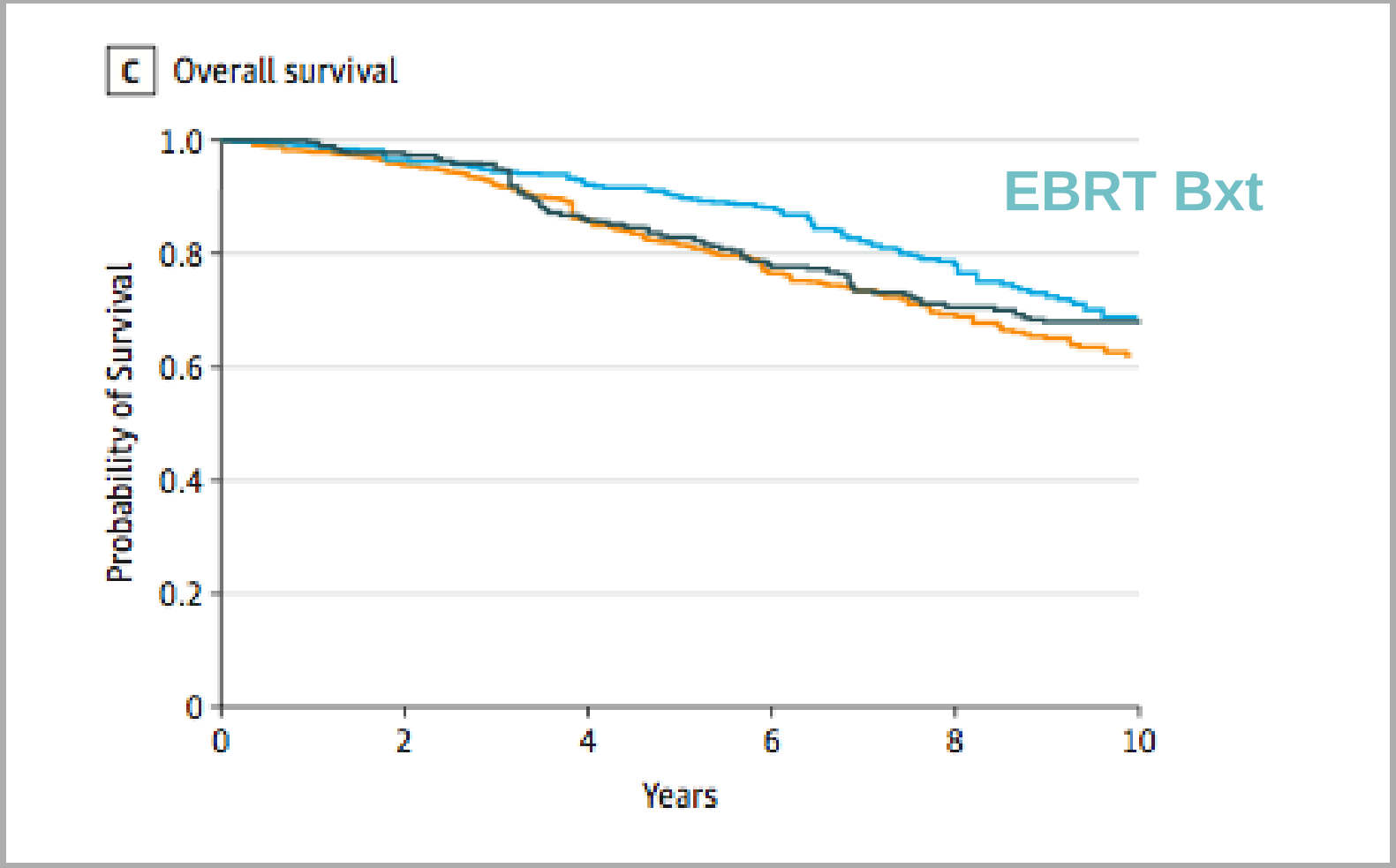
Prostate Specific Survival



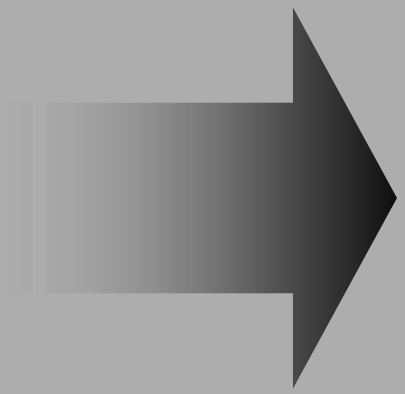
Distant Mets



Overall Survival



Randomised data



ASCENDE-RT

Androgen **S**uppression **C**ombined with **E**lective **N**odal and **D**ose **E**scalated **R**adiation **T**herapy

A Multicenter, Randomized Trial of Dose-Escalated External Beam Radiation Therapy (DE-EBRT) vs.Low-Dose-Rate Brachytherapy (LDR-PB) boosts for Men with Unfavorable Risk Localized Prostate Cancer

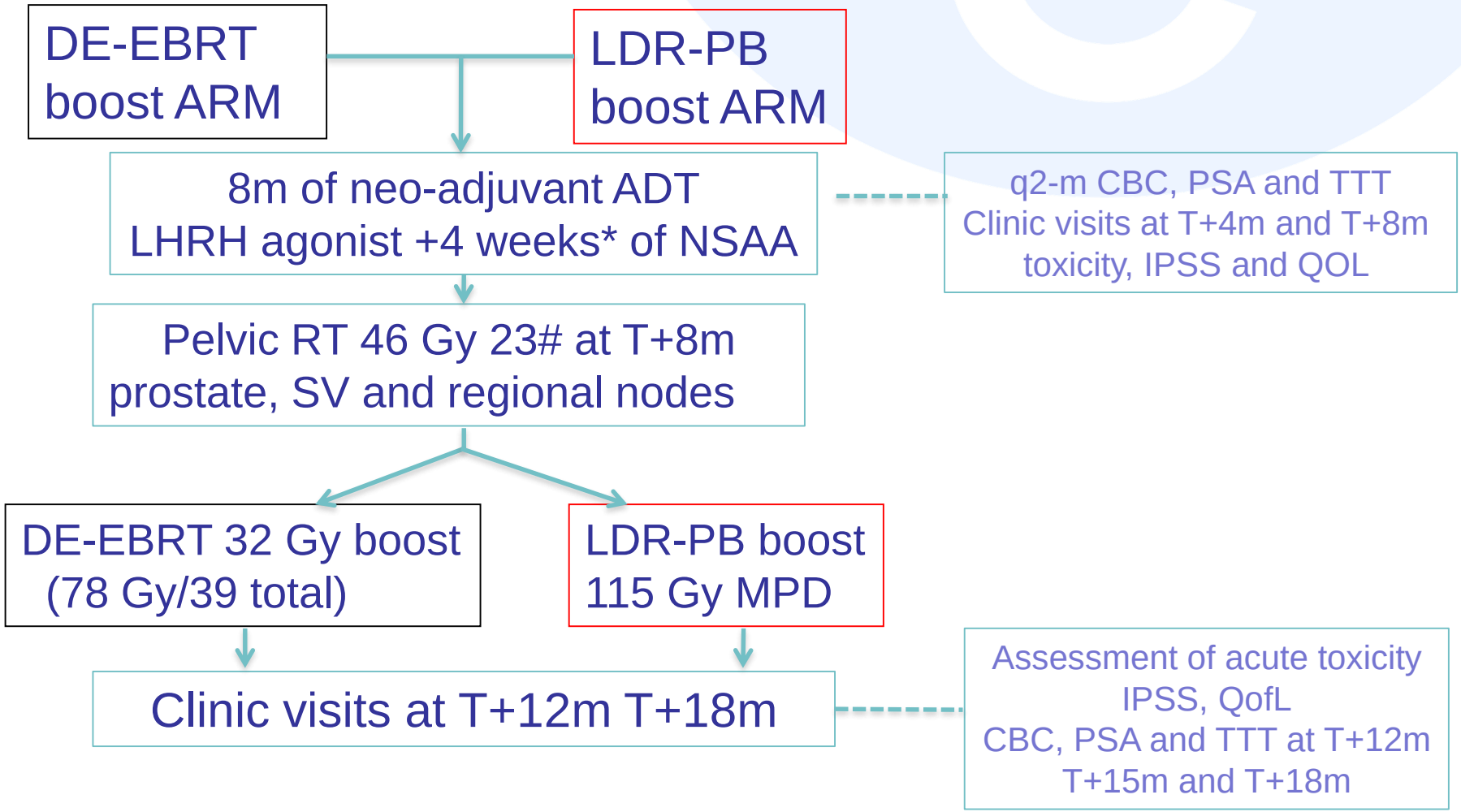
W. James Morris, Scott Tyldesley, Michael McKenzie, Graeme Duncan, Ross Halperin, Howard Pia, Nevin Murray, Sree Rodda, Gerard Morton, Jeremy Hamm

BC Cancer Agency: Vancouver, Vancouver Island, Southern Interior, and Fraser Valley Centres, BC

Sunnybrook Cancer Centre, Princess Margaret Hospital, Toronto, Ontario

BC Cancer Agency
CARE + RESEARCH
An agency of the Provincial Health Services Authority

Schema (to completion of primary intervention period)



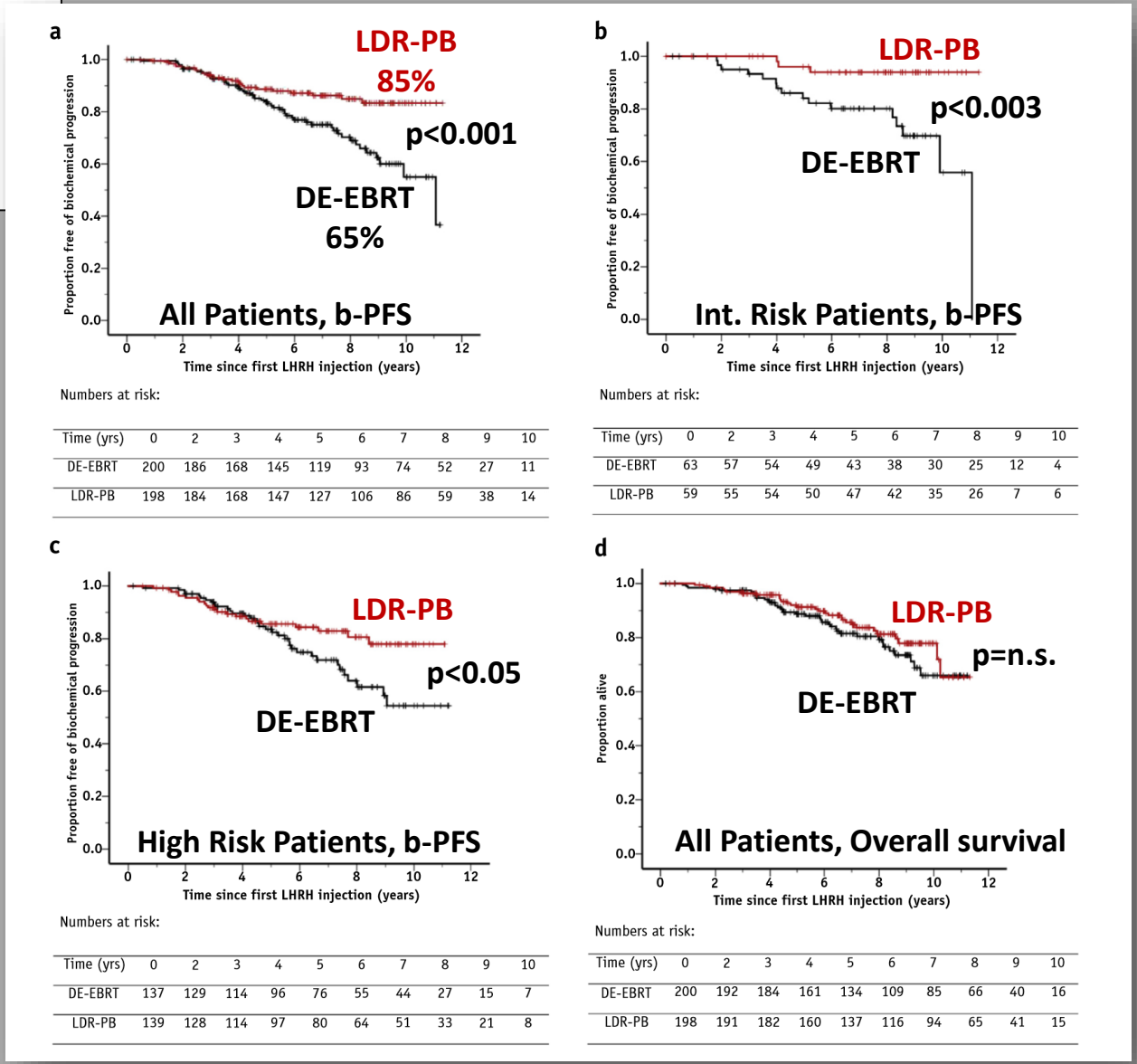
International Journal of Radiation Oncology biology • physics

Received Aug 25, 2016, and in revised form Nov 12, 2016. Accepted for publication Nov 16, 2016.

Androgen Suppression Combined with Elective Nodal and Dose Escalated Radiation Therapy (the ASCENDE-RT Trial): An Analysis of Survival Endpoints for a Randomized Trial Comparing a Low-Dose-Rate Brachytherapy Boost to a Dose-Escalated External Beam Boost for High- and Intermediate-risk Prostate Cancer

W. James Morris, MD, FRCPC,*,† Scott Tyldesley, MD, FRCPC,*,†

"..men treated with DE-EBRT were twice as likely to experience PSA failure than those treated with LDR-PB."



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W. James Morris, MD, FRCPC,*,† Scott Tyldesley, MD, FRCPC,*,†

Question

Why was there no correlation between Biochemical Failure & Overall Survival?

- 76 patients failed biochemically (PSA)
- 35 developed metastases – within 2 yrs same for each group
  - metastatic at diagnosis ? benefit from longer ADH?
- 46 failed biochemically, without early metastases
- 37 /46 (80%) DE EBRT, 9 (20) LDR-PB
  - ?failure of local control – likely result in AD

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Clinical Investigation

ASCENDE-RT: An Analysis of Treatment-Related Morbidity for a Randomized Trial Comparing a Low-Dose-Rate Brachytherapy Boost with a Dose-Escalated External Beam Boost for High- and Intermediate-Risk Prostate Cancer

Sree Rodda, MBBS, MRCP, FRCR,* Scott Tyldesley, MD, FRCPC,*,† W. James Morris, MD, FRCPC,*,† Mira Keyes, MD, FRCPC,*,†

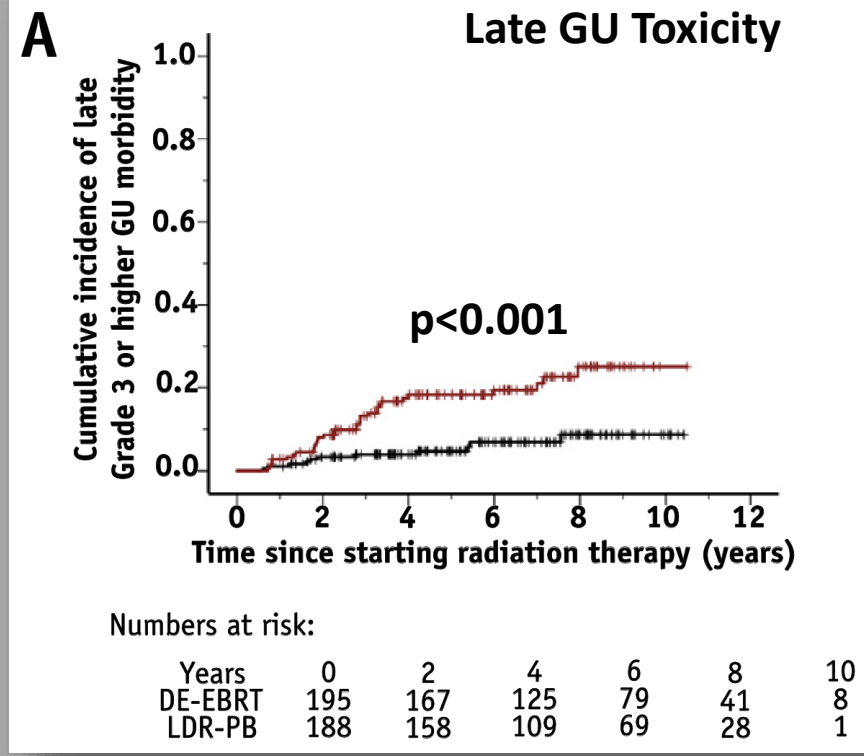
Late G3 GU events

LDR-PB

31/188 (16%), 50% strictures

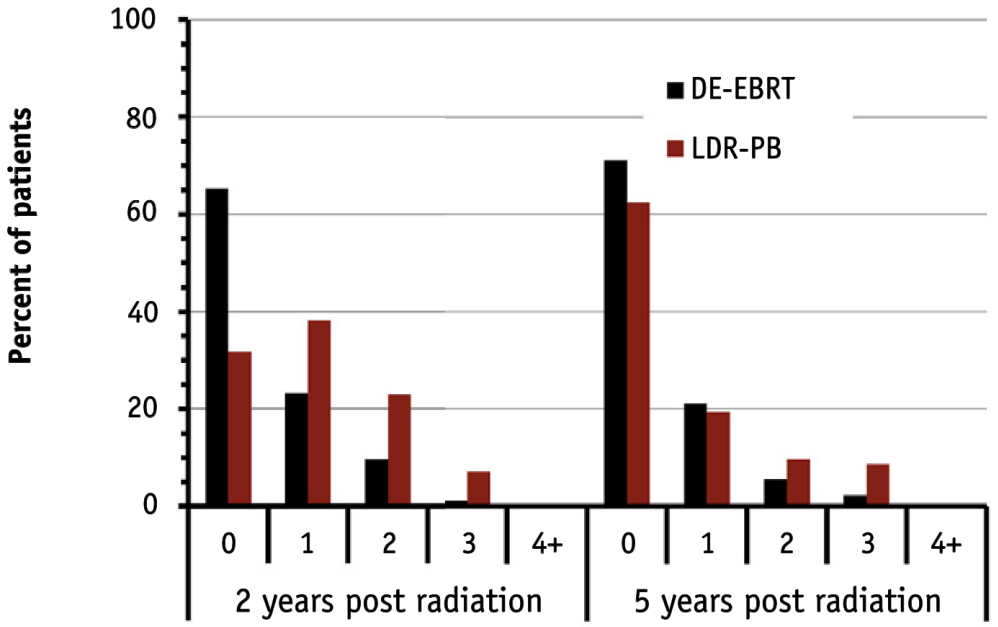
DE-EBRT

10/195 (5%) 20% strictures



Numbers at risk:

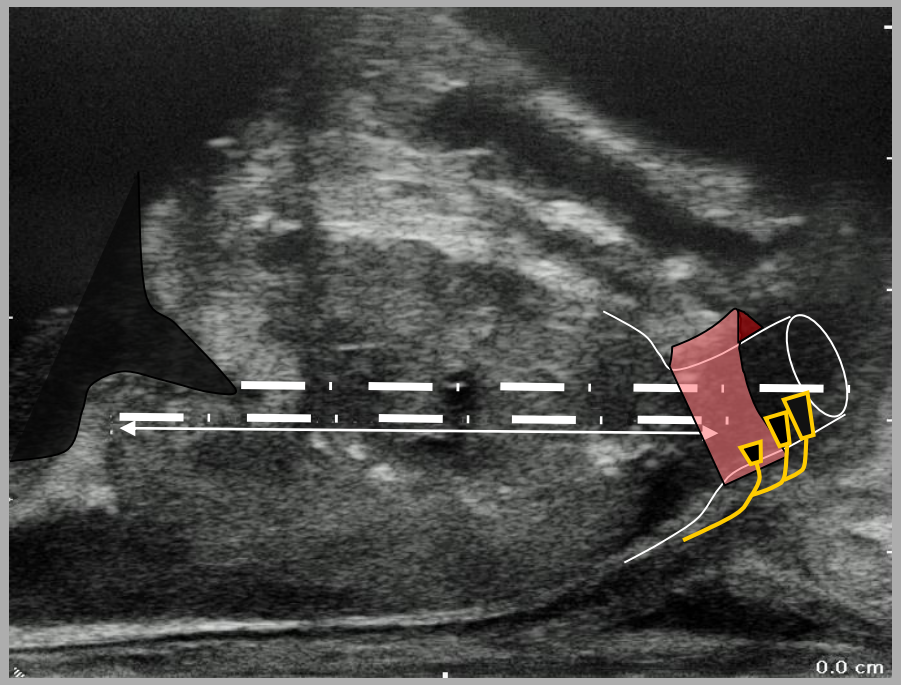
Years	0	2	4	6	8	10
DE-EBRT	195	167	125	79	41	8
LDR-PB	188	158	109	69	28	1



The prevalence of late GU morbidity by grade

Increased GU toxicity in Ascend RT

- Poor ultrasound visualisation of prostatic apex
- Reliance 2 stage stranded technique



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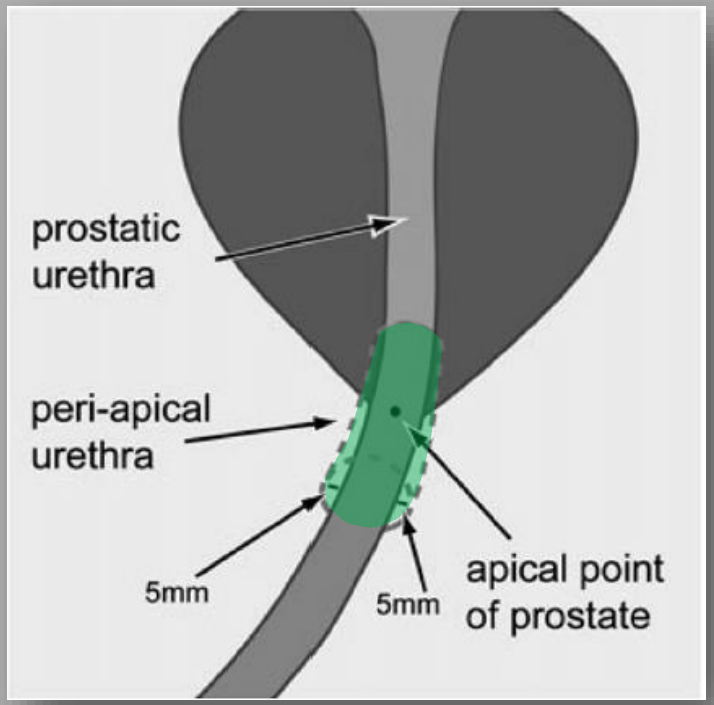
Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Prostate brachytherapy

Correlation between prostate brachytherapy-related urethral stricture and peri-apical urethral dosimetry: A matched case–control study

James J. Earley [a,*], Ather M. Abdelbaky [b], Melanie J. Cunningham [a], Eliot Chadwick [c], Stephen E.M. Langley [b], Robert W. Laing [c]

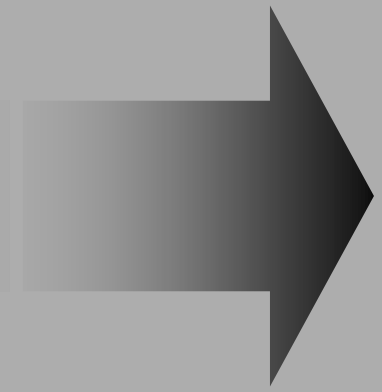


Urethral Strictures

- *Peri- urethral dose significant*
- *D90, V150, V100 not important*

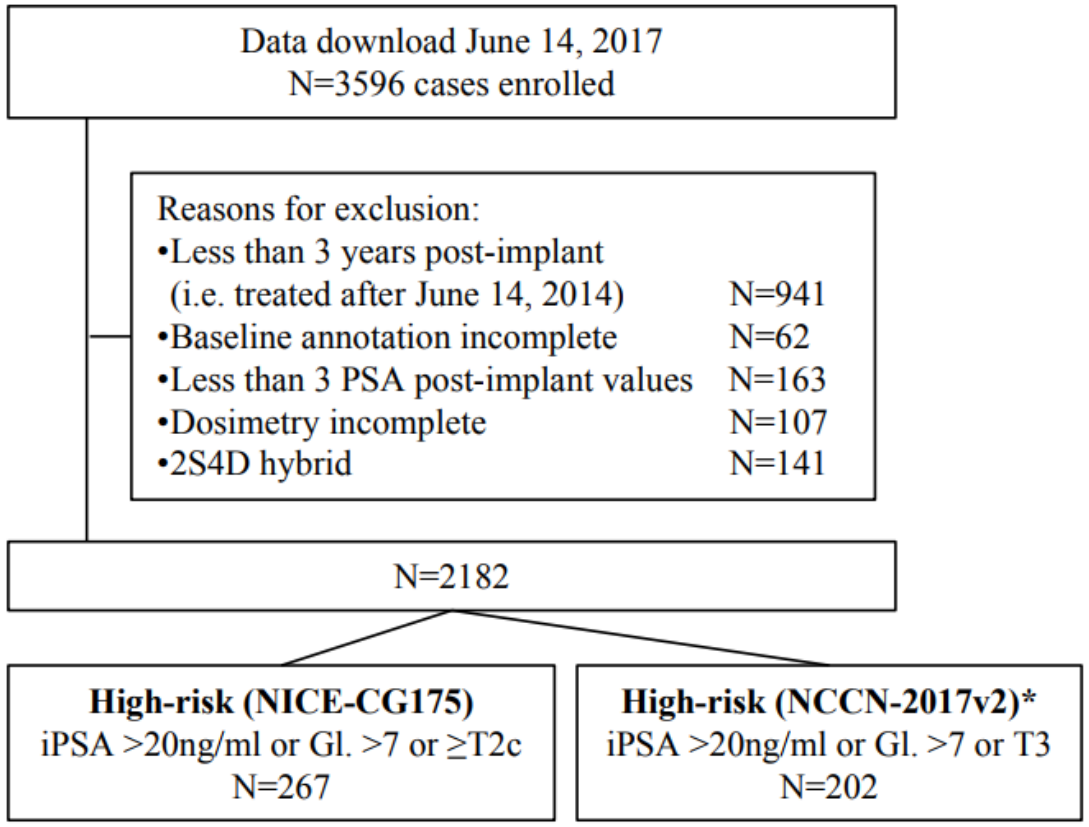
V_{150} (cc)	Stricture group	Control group	*p* Value
No margin	0.08 (0.13 ± 0.03)	0.02 (0.07 ± 0.02)	0.13
0.1 cm margin	0.2 (0.3 ± 0.1)	0.1 (0.13 ± 0.03)	0.06
0.5 cm margin	0.9 (1.1 ± 0.2)	0.6 (0.8 ± 0.1)	0.02*
1.0 cm margin	3.5 (3.5 ± 0.3)	2.4 (2.7 ± 0.2)	0.56

ASCENDE-RT & 4D Brachytherapy

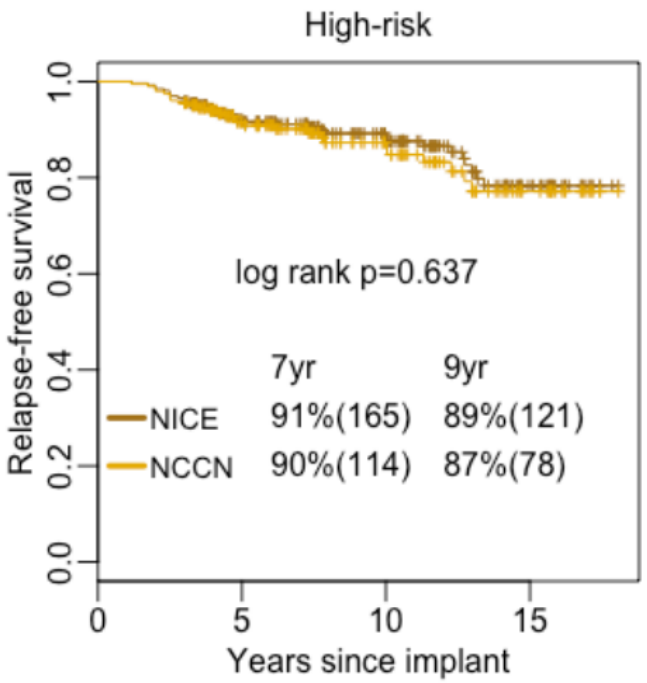


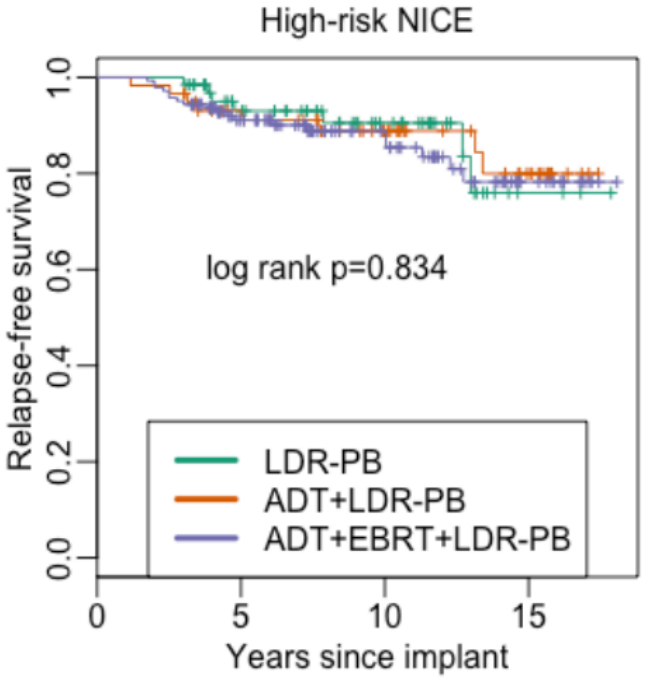
High Risk Prostate Cancer

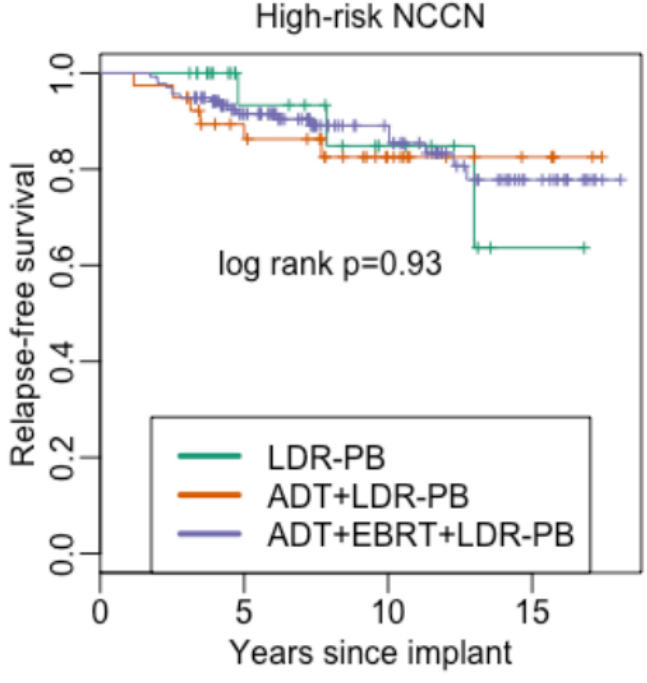
Figure 1. CONSORT diagram for case selection from prospective cohort.



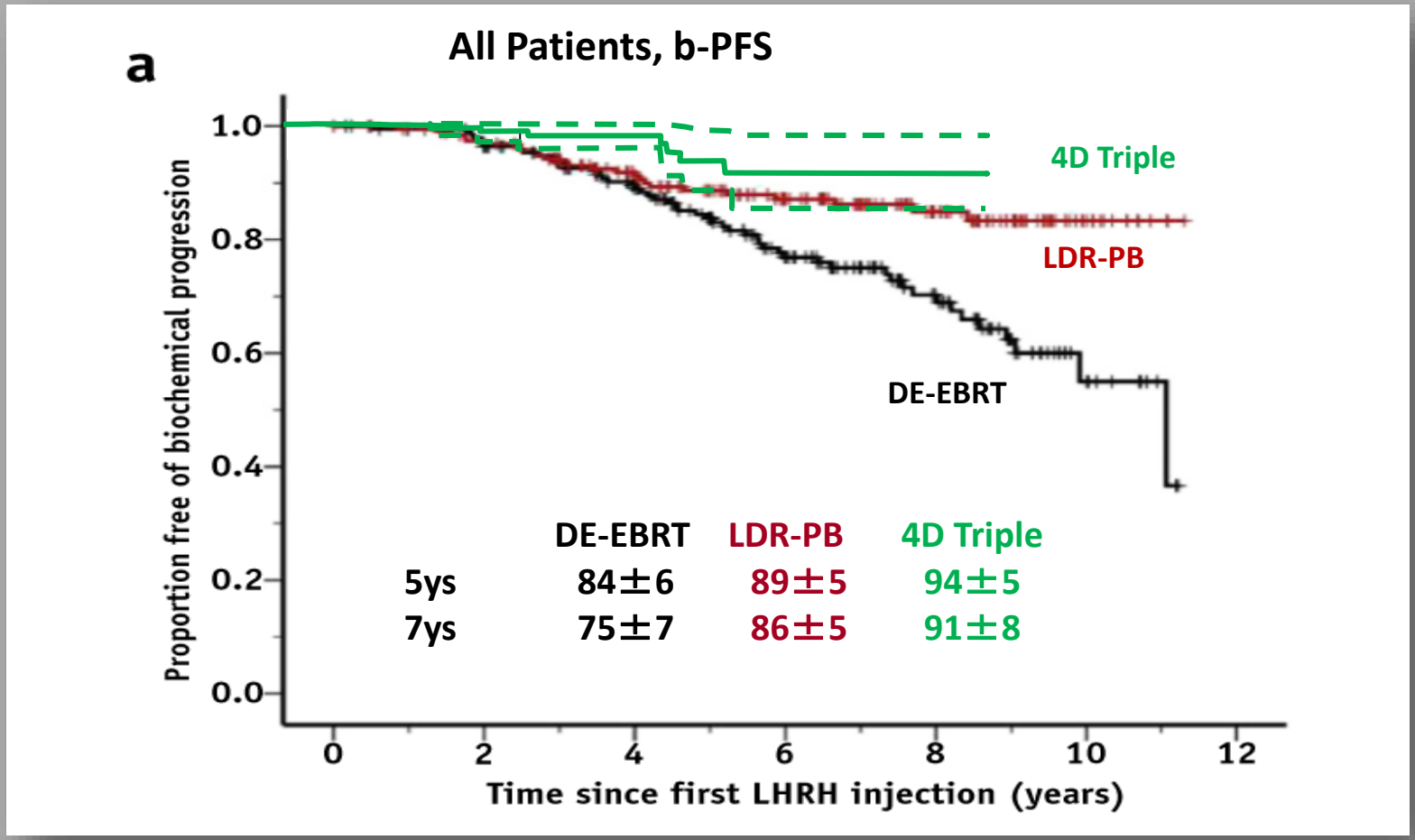
High Risk Prostate Cancer



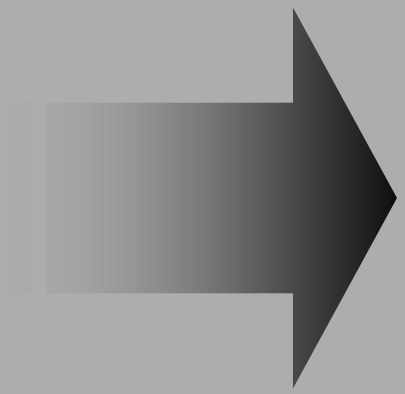




Comparison: 4D BXT vs Ascende RT



LDR Bxt in the NHS



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Original Article

Comparative Analysis of Clinical Outcomes and Procedural Costs between the Conventional Two-stage Technique and 4D Brachytherapy for Early Prostate Cancer

S.E.M. Langley, J. Uribe, S. Uribe-Lewis, J. Money-Kyrle, C. Perna, S. Khaksar, R. Soares, R. Laing

St Luke's Cancer Centre, Guildford, UK

Received 16 June 2017; received in revised form 5 September 2017; accepted 12 September 2017

Clinical Oncology xxx (2017) 1–8

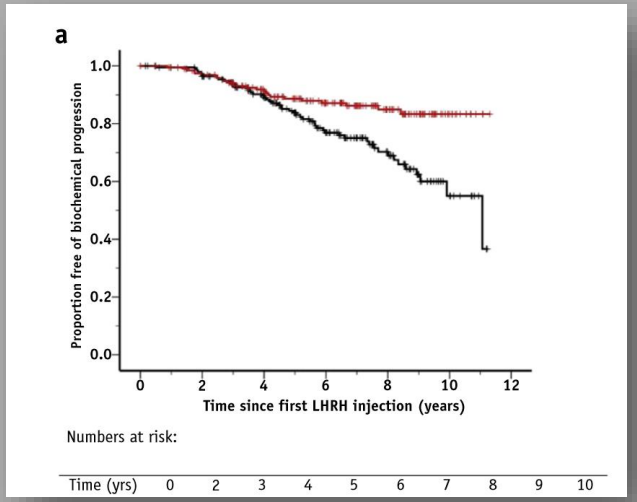
- Reducing implant time
- Reducing planning time

"4D Brachytherapy represents a cost saving of ~£1400 /case"

LDR boost and NHS - Guildford

- Approximately 300 LDR implants per year
- Last 12 months 381 radical EBRT
- If increase to 40% could have a boost
- If 2 hrs of theatre time = 300 hours/ 75 theatre sessions
- If 1 hr = 150 hours / 37 theatre sessions
- Extra 37 theatre sessions
- With 8 persons on average = £££££££££

Hidden cost of failure to control disease



- Significant difference in dfs
- Equates to ADH free survival - Qol and cardiovascular risk
- Zoladex cost £1200 per year
- For Guildford 300 if 10% difference in ADH use = £36,000 / yr

Conclusion – brachytherapy boost improves dfs and probably OS in some high risk groups

Financial Disclosures