Second Primary Cancer after Prostate Brachytherapy

Dr Darren Mitchell
Consultant Clinical Oncologist
Northern Ireland Cancer Centre

HSC Belfast Health and Social Care Trust

Why?

- Atomic Bomb survivors
- Radiation workers
- Ankylosing spondylitis
- Children irradiated with benign conditions

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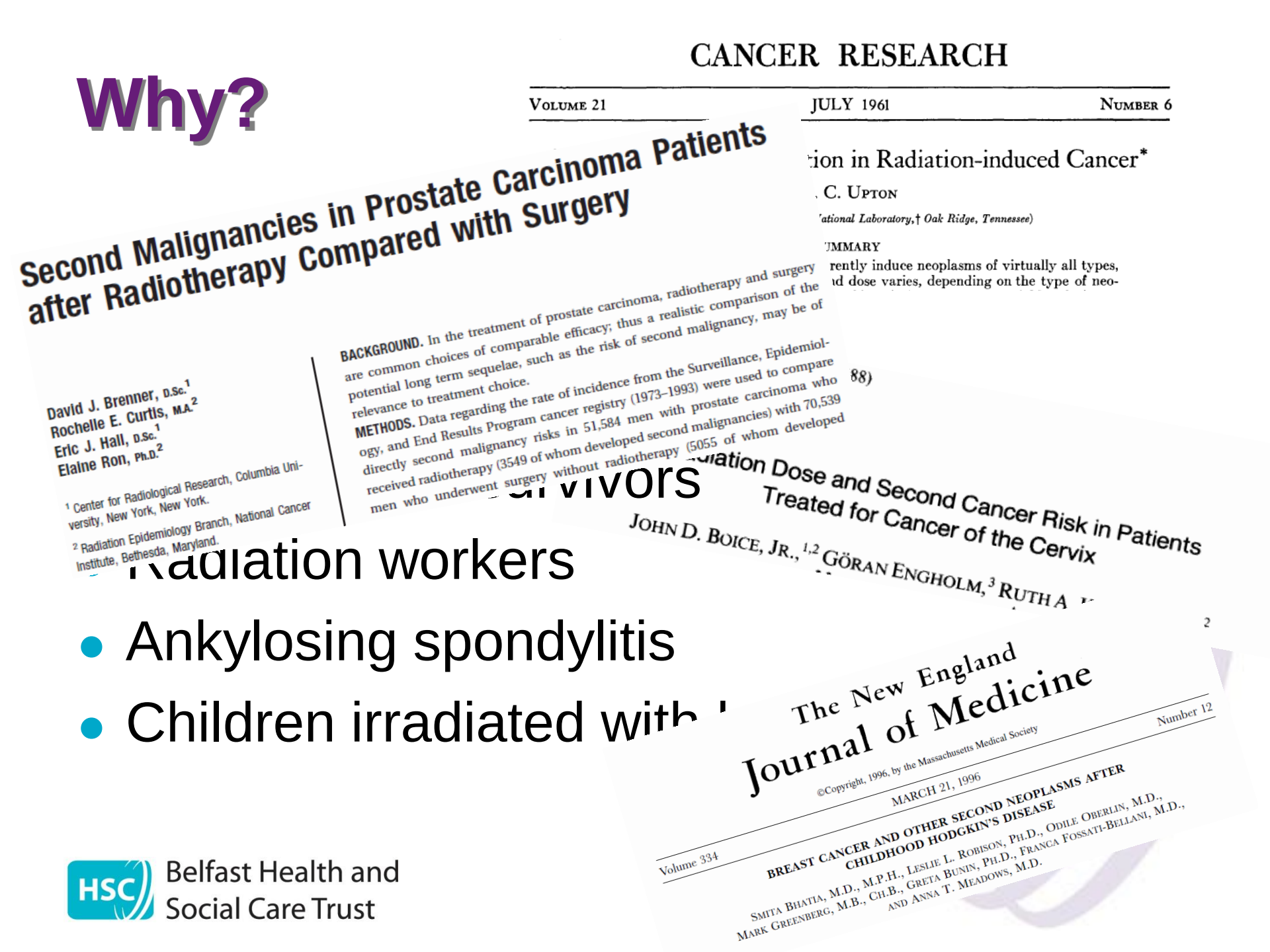
- Children irradiated with



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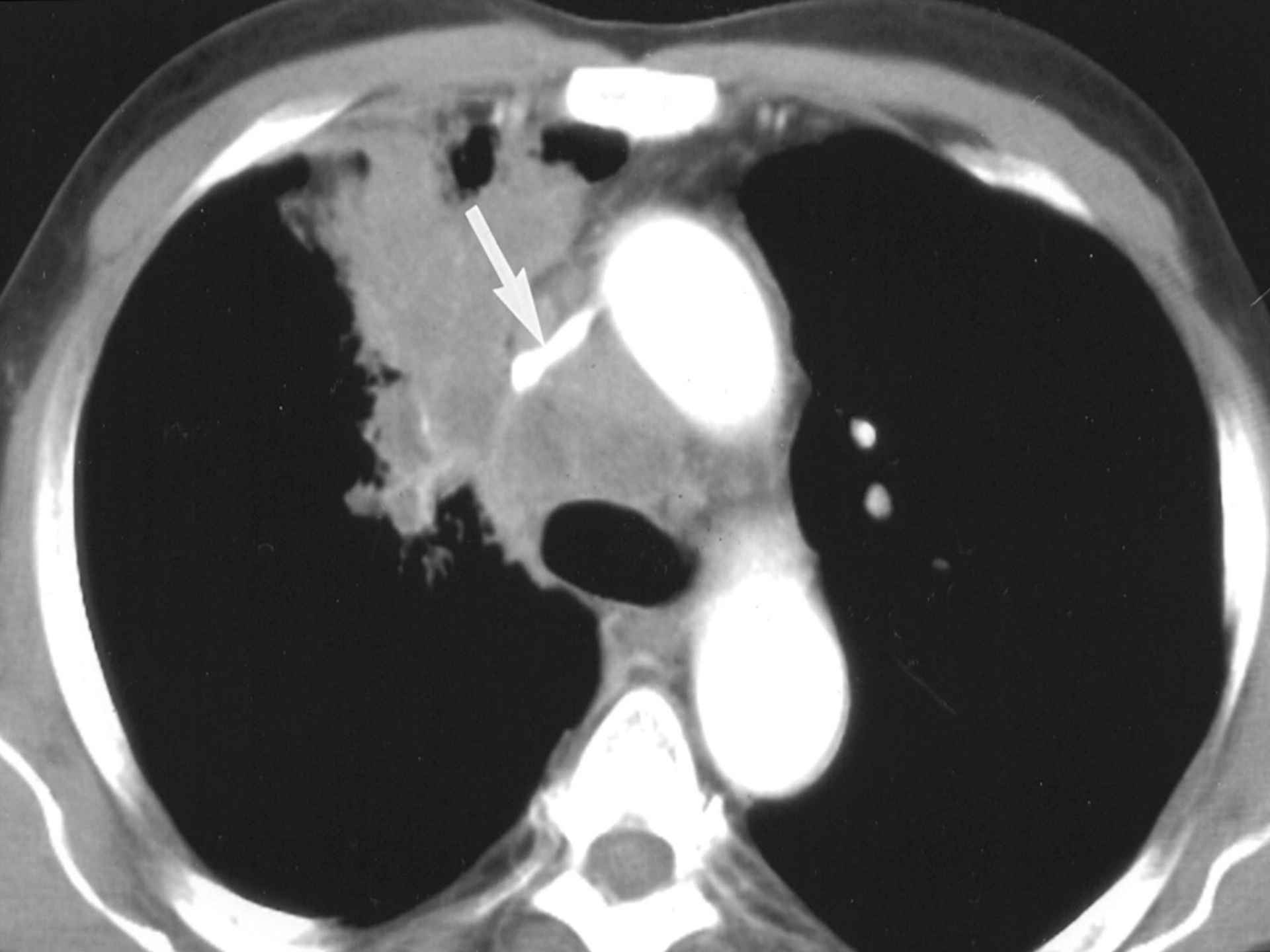
Criteria

1. Tumours should have a different histological diagnosis from the primary.
2. Appropriate latent period should be observed between the treatment of the primary tumour and the secondary cancer (>5yrs).
3. Secondary cancers should be within the radiation treatment field.

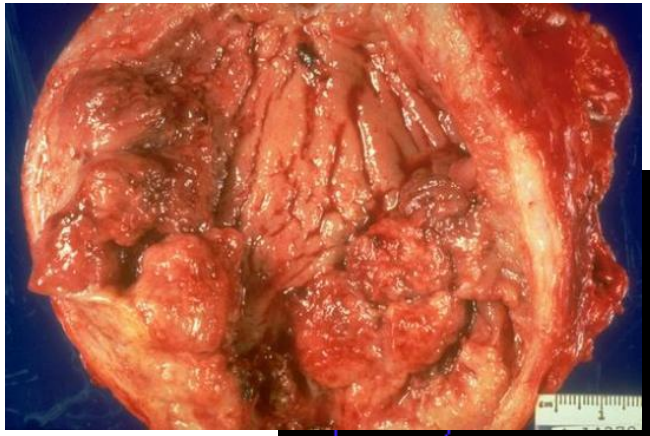
Increased Cancer Incidence

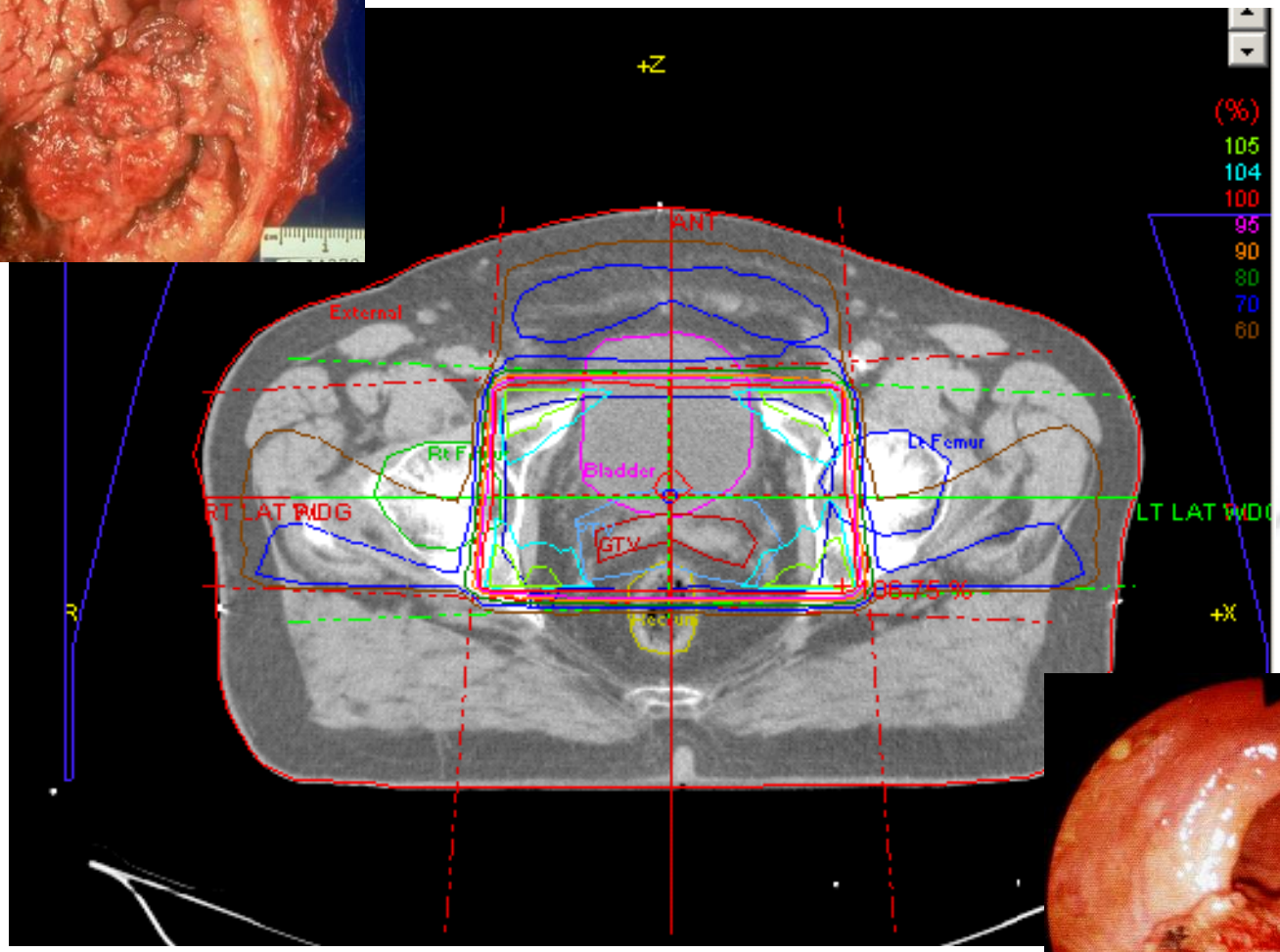
- Radiation carcinogenesis

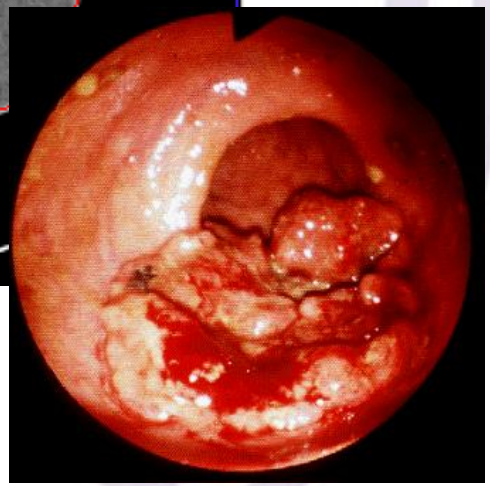
- Sporadic
- Genetic susceptibility
- Exogenous (Environmental factors)
- Greater follow-up



- Localised prostate cancer
  - Active surveillance
  - Radical Prostatectomy
  - Radical Radiotherapy
  - Prostate Brachytherapy
    - HIFU
    - Cryotherapy
- Survivorship







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Second Malignancies in Prostate Carcinoma Patients after Radiotherapy Compared with Surgery

David J. Brenner, D.Sc.[1]
Rochelle E. Curtis, M.A.[2]
Eric J. Hall, D.Sc.[1]
Elaine Ron, Ph.D.[2]

BACKGROUND. In the treatment of prostate carcinoma, radiotherapy and surgery are common choices of comparable efficacy; thus a realistic comparison of the potential long term sequelae, such as the risk of second malignancy, may be of relevance to treatment choice.

- SEER database

- 3549 / 51,584 (6.8%)treated with radiotherapy.
- 5055 / 70,539 (7.1%)treated with surgery.

- Increased risk of Bladder, Colorectal and Lung
  - Estimated Radiation associated solid tumours
  - All years 1/290, >5years 1/125, >10years 1/70

Evidence of Second Primary cancers in Prostate Brachytherapy

- Single institution
  - Limited statistical power.
  - Better information (dose, co-morbidities).
    H/o IBD, smoking, APC, FHx.
- Large population based studies
  - Statistical power.
  - Limitations.

SECOND MALIGNANCIES AFTER PROSTATE BRACHYTHERAPY: INCIDENCE OF BLADDER AND COLORECTAL CANCERS IN PATIENTS WITH 15 YEARS OF POTENTIAL FOLLOW-UP

STANLEY L. LIAUW, M.D.,* JOHN E. SYLVESTER, M.D.,†‡ CHRISTOPHER G. MORRIS, M.S.,§
JOHN C. BLASKO, M.D.,† AND PETER D. GRIMM, D.O.†

348 Men

Median FU 10.5years

I^{125} Monotherapy †
– 2 / 125 (1.6%)

I^{125} /EBRT combined therapy
– 13 / 213 (5.8%) (p=0.0623)

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15 pelvic malignancies

- 11 Bladder cancer
  - 8 Non-invasive
  - 3 Invasive
- 1 Prostatic urethra †
- 3 Colorectal
  - 1 Colon †
  - 1 Sigmoid
  - 1 Rectum

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15 pelvic malignancies

- 11 Bladder cancer
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  - 3 Invasive
- 1 Prostatic urethra †
- 3 Colorectal
- [illegible] †

All colorectal ca pt had additional risk Factors!

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Based on SEER database information

Observed / expected

11 / 4.7 = 2.34 relative risk

Absolute risk excess of 35 per 100,000

Cancer Incidence After Localized Therapy for Prostate Cancer

Kihyuck Moon, MD, PhD[1]

BACKGROUND. Second cancers may occur in patients who have undergone radia-

- Retrospective SEER based study
  - 297,069 men treated for prostate cancer
  - 140,767 treated >5years previously
    - Median follow-up 10.6years
    - EBRT / EBRT + Seeds / Seeds alone / No RT
    - Unlikely that 3D conformal or IMRT was used

Cancer Incidence After Localized Therapy for Prostate Cancer

Kihyuck Moon, MD, PhD[1]

BACKGROUND. Second cancers may occur in patients who have undergone radia-

	EBRT	EBRT+ seeds	Seeds	No RT
No	39,850	2219	1285	94,541
Rectum	0.44%	0.50%	0.08%	0.28%
Bladder	1.46%	1.15%	1.27%	0.89%
Lung and Bronchus	2.05%	1.68%	1.18%	1.64%

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Cancer Incidence After Localized Therapy for Prostate Cancer

Kihyuck Moon, MD, PhD[1]

BACKGROUND. Second cancers may occur in patients who have undergone radia-

	EBRT	EBRT + Seeds	Seeds
Sigmoid colon	1.26 ‡	0.93	0.25
Rectum	1.6 ‡	1.59	0.3
Bladder	1.63 ‡	1.08	1.4

Cancer Incidence After Localized Therapy for Prostate Cancer

Kihyuck Moon, MD, PhD[1]

BACKGROUND. Second cancers may occur in patients who have undergone radia-

- Conclusion
  - Rates of second malignancy are low
  - EBRT significantly increases the risk of developing a second malignancy
  - BT have the lowest risk of developing a second cancer

  ?? Short follow-up

  ?? Age at treatment and other contributing factors

SECOND PRIMARY CANCER AFTER RADIOTHERAPY FOR PROSTATE CANCER—A SEER ANALYSIS OF BRACHYTHERAPY VERSUS EXTERNAL BEAM RADIOTHERAPY

MAY ABDEL-WAHAB, M.D.,* ISILDINHA M. REIS, DR.P.H.,†‡ AND KARA HAMILTON, M.P.H.†

- Retrospective SEER based study

  228,235 men treated for prostate cancer 1988 - 2002

	No RT No Sx	EBRT	BT	EBRT+ BT
	40,433	48,400	10,223	9,096

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	No RT No Sx	EBRT	BT	EBRT+ BT
	40,433	48,400	10,223	9,096
Age >65	82.7%	82.1%	63.1%	64.3%
Age >75	48.7%	30%	15%	16%
Mean	73	70.5	66.7	66.7

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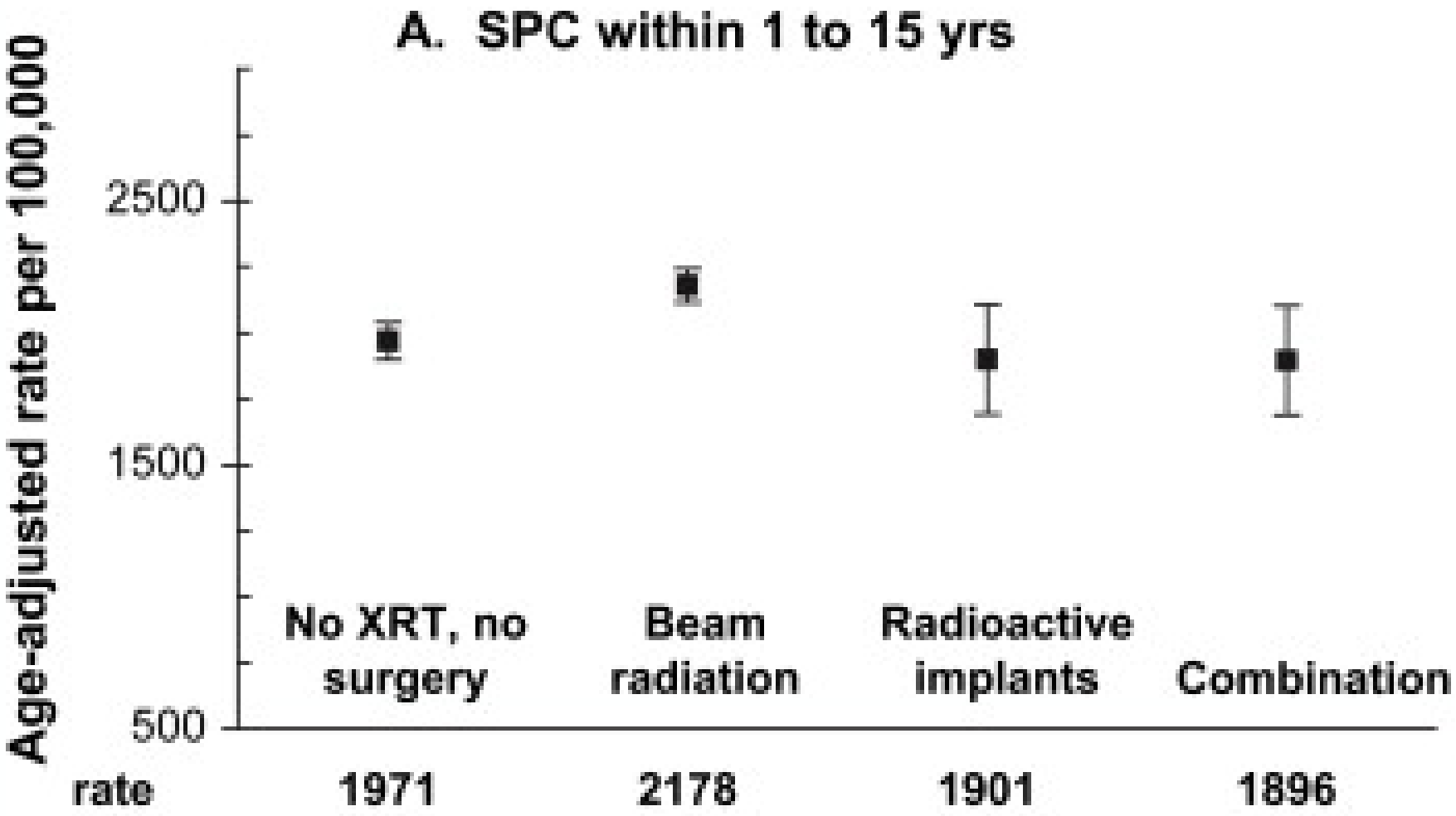
- >1yr

  EBRT significantly greater SPC than BT
  - 277/100,000

  EBRT significantly greater SPC than No RT/No Sx
  - 207/100,000

- >5yr

  EBRT significantly greater SPC than No RT/No Sx
  - 475/100,000



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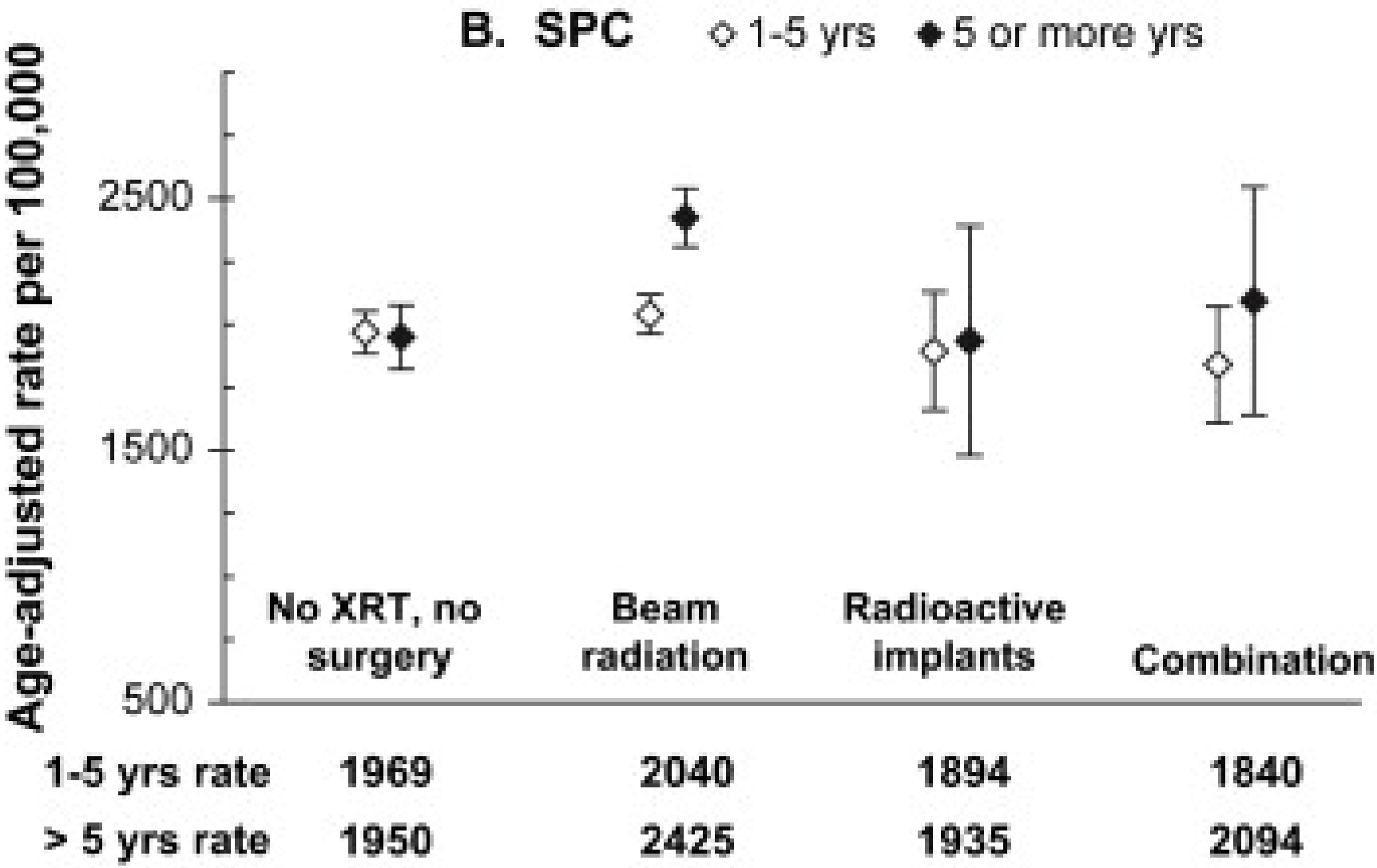

1-5 yrs rate	1969	2040	1894	1840
> 5 yrs rate	1950	2425	1935	2094

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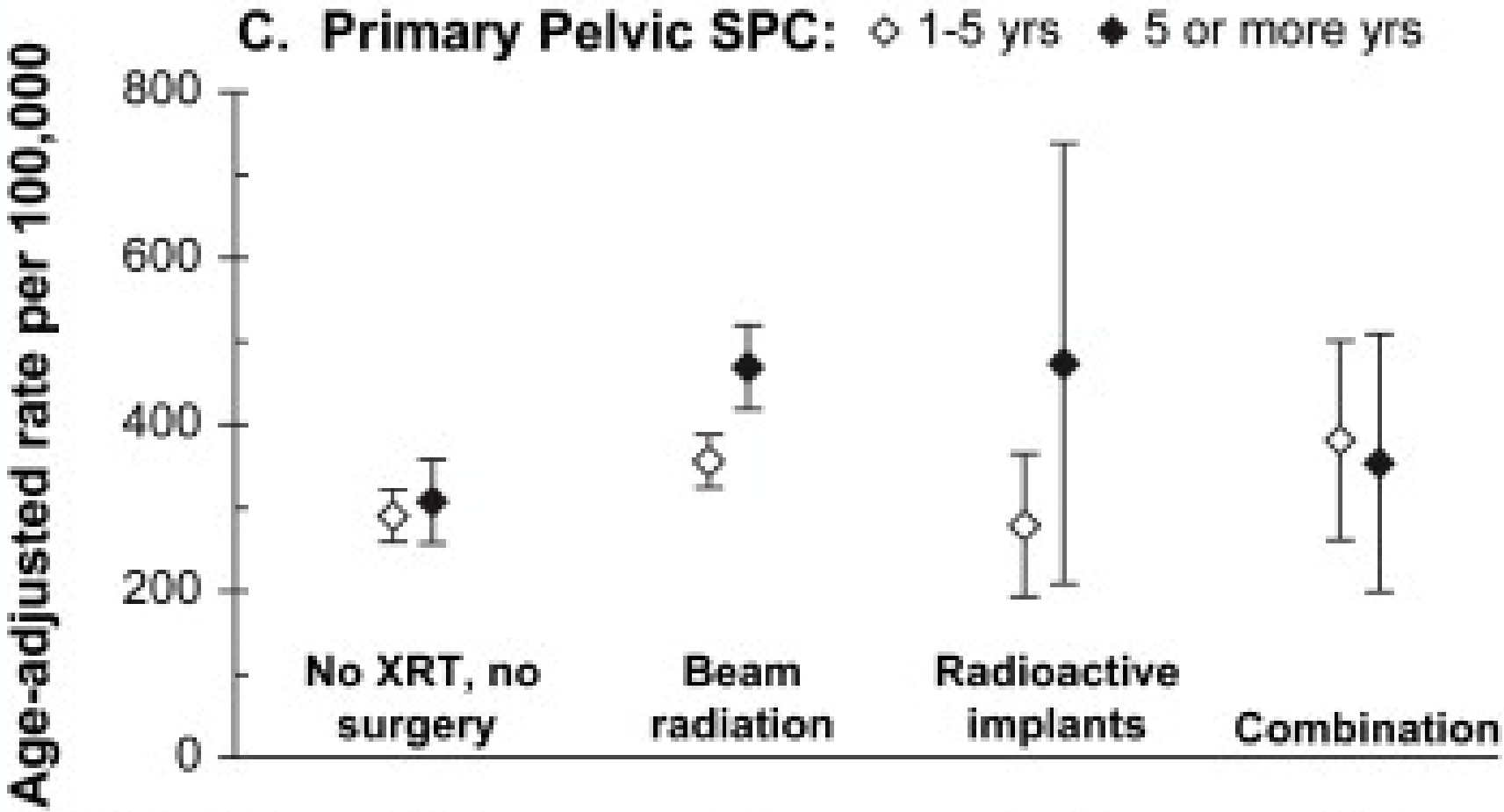
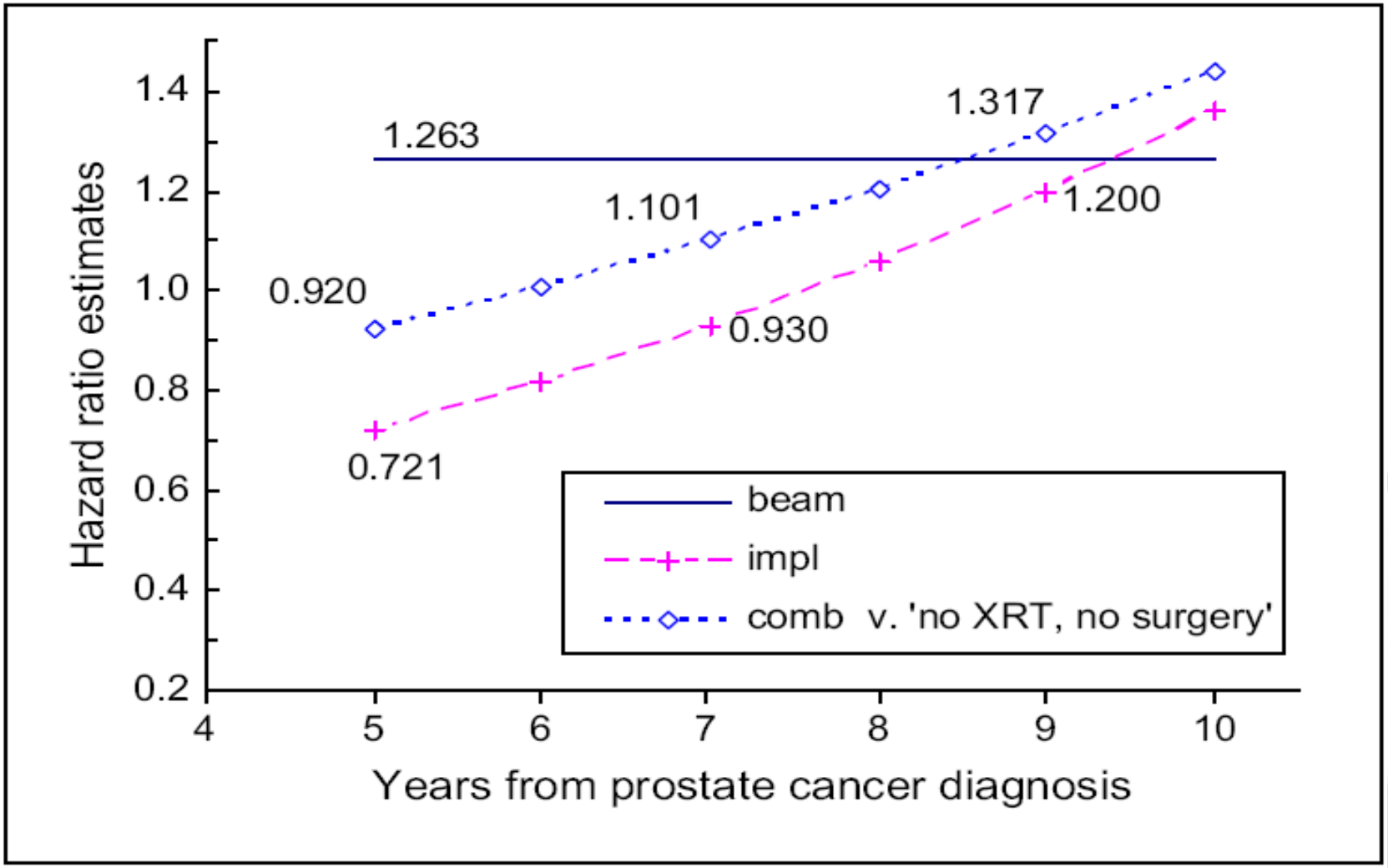


1-5 yrs rate	290	356	279	381
> 5 yrs rate	307	469	473	354



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Conclusion

- Limited evidence currently
- Informed consent for procedure
- Ongoing prevention
  - Surveillance sigmoidoscopy 5, 10, 15yrs
    - ‘RUF!’
  - Cystoscopy