

# Aktuelle strahlentherapeutische Konzepte & Ergebnisse beim Prostata, Harnblasen & Nierenzellkarzinom

KKRBB – Entitätenspezifische Qualitätskonferenz zum Prostatakarzinom und zu urologischen Tumoren

Arne Grün | 13.09.2023

**1 Harnblasenkarzinom**

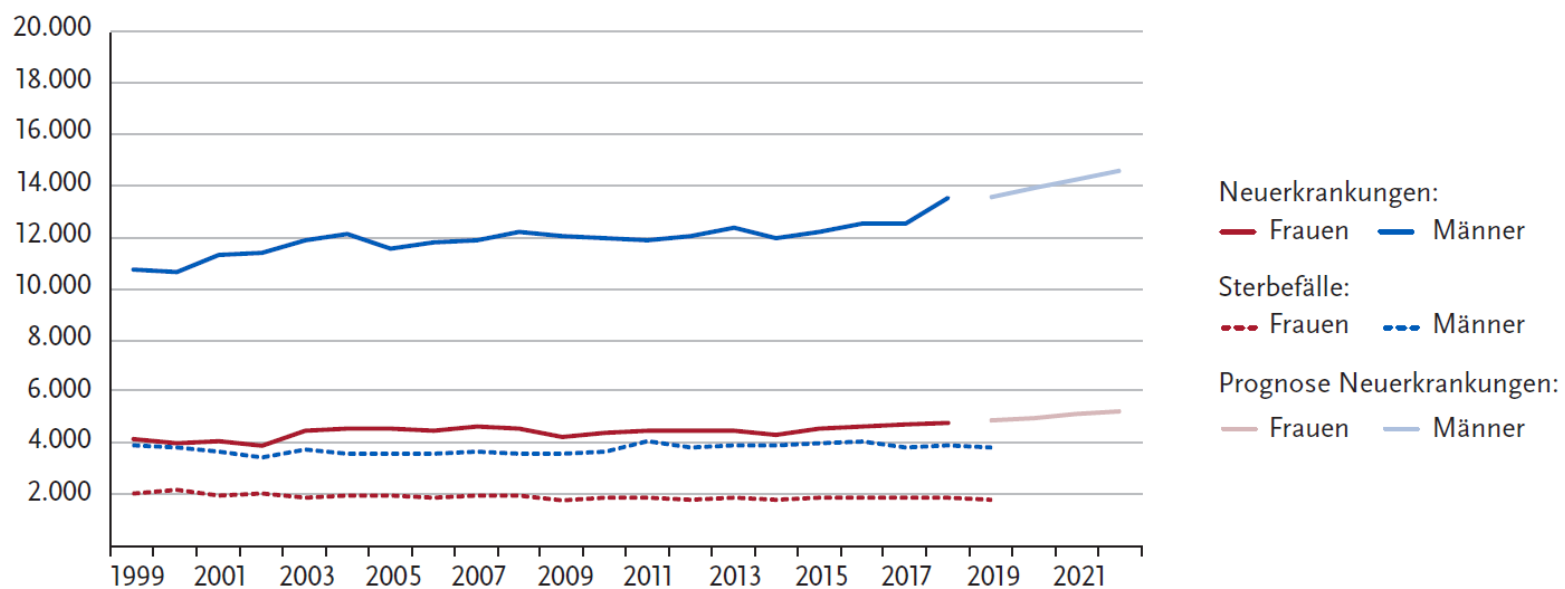
**2 Nierenzellkarzinom**

**3 Prostatakarzinom**

1

# Harnblasenkarzinom

Abbildung 3.25.1b  
 Absolute Zahl der Neuerkrankungs- und Sterbefälle nach Geschlecht, ICD-10 C67, Deutschland 1999–2018/2019,  
 Prognose (Inzidenz) bis 2022



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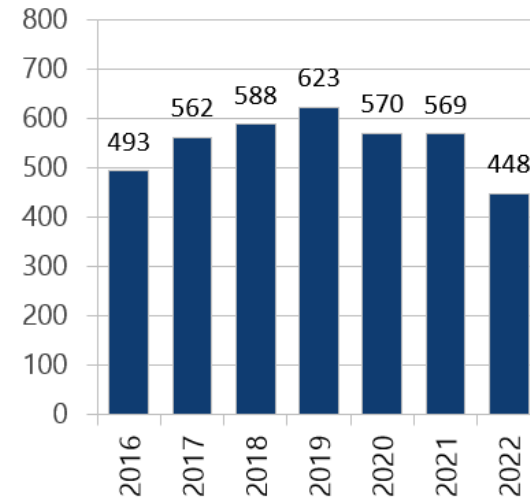
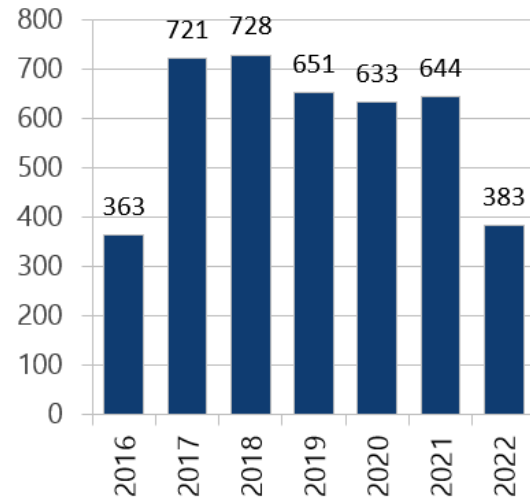
# 1

## Harnblasenkarzinom - Risikofaktoren

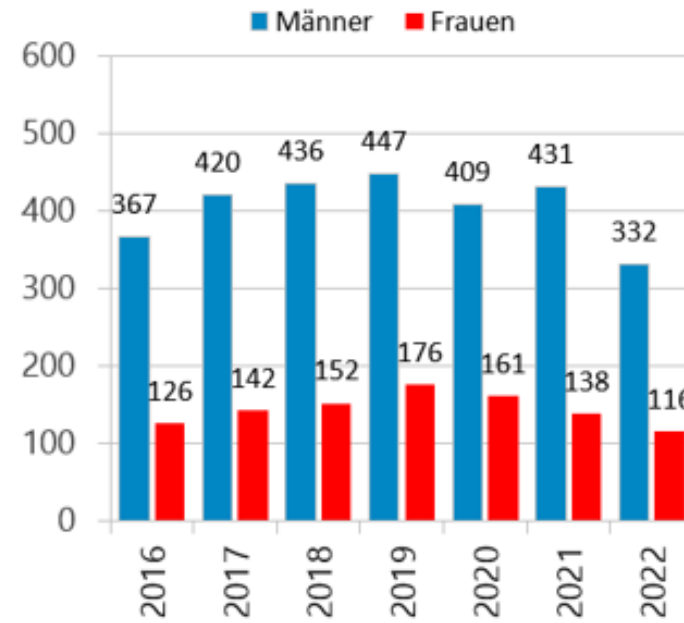
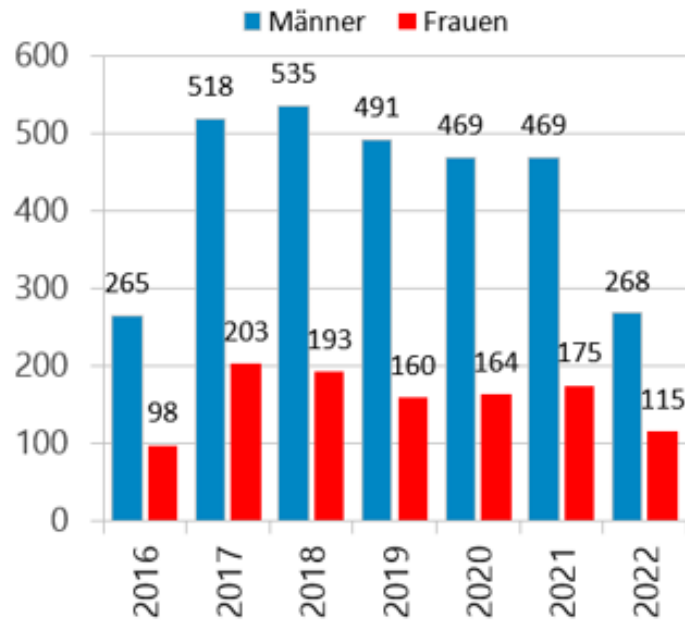
- Rauchen
- Arbeitsstoffe (Aromatische Amine)
- Zytostatika
- Strahlentherapie
- Pioglitazon

## 1.1. Invasive Neuerkrankungen

Wohnort Berlin	Wohnort Brandenburg
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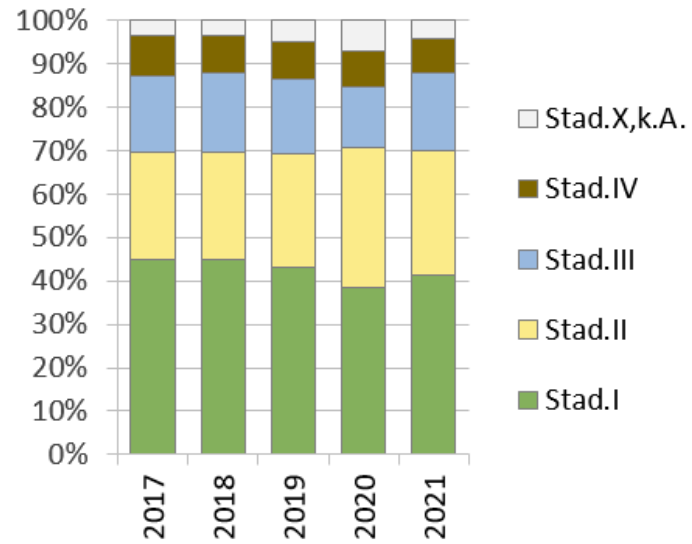


Abbildung 13 Tumorstadium nach Diagnosejahr, C67, Wohnort Berlin, Diagnosejahre 2017-2021, n=3.034

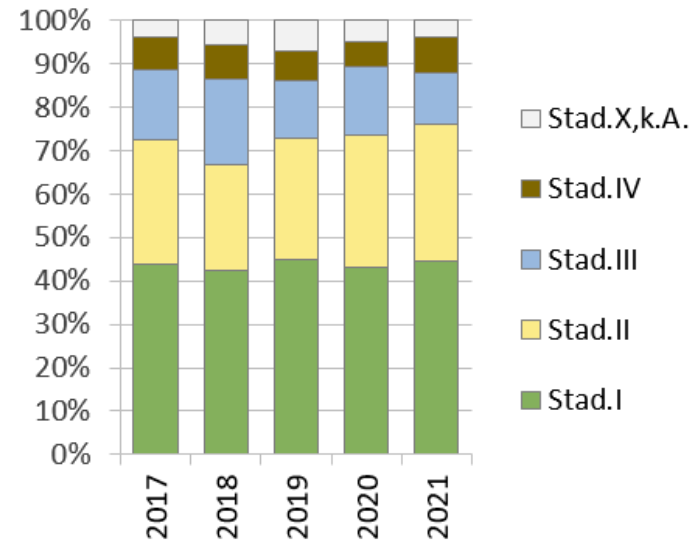






Abbildung 14 Tumorstadium nach Diagnosejahr, C67, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=2.800

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TNM	Ausdehnung
Ta	Nicht-invasives papilläres Karzinom
Tis	Carcinoma in situ „flat tumour“ mit intakter Basalmembran  
T1	Infiltration bis ins subepitheliale Bindegewebe (Lamina propria der Harnblase)
T2	Infiltration bis in Harnblasenmuskulatur <ul style="list-style-type: none"> <li>• T2a: Innere Hälfte der Tunica muscularis</li> <li>• T2b: Äußere Hälfte der Tunica muscularis</li> </ul>
T3	Infiltration bis ins perivesikale Fettgewebe  <ul style="list-style-type: none"> <li>• T3a: Mikroskopische Infiltration</li> <li>• T3b: Makroskopische Infiltration</li> </ul>
T4	Infiltration von Nachbarorganen <ul style="list-style-type: none"> <li>• T4a: Prostata, Uterus, Vagina</li> <li>• T4b: Andere Organe, Becken- oder Bauchwand</li> </ul>
N1	Solitäre Lymphknotenmetastasen: hypogastrisch, obturatorisch, externe iliakale oder präsakrale Lymphknoten
N2	Multiple Lymphknotenmetastasen: hypogastrisch, obturatorisch, externe iliakale oder präsakrale Lymphknoten
N3	Lymphknotenmetastasen entlang der Aa. iliaca communes
M1	Fernmetastasen 

<b>UICC-Stadium</b>	<b>TNM</b>
Stadium 0	Ta oder Tis
Stadium I	T1
Stadium II	T2
Stadium III	T3 oder T4a
Stadium IV	T4b oder N1 oder M1

Amboss.de

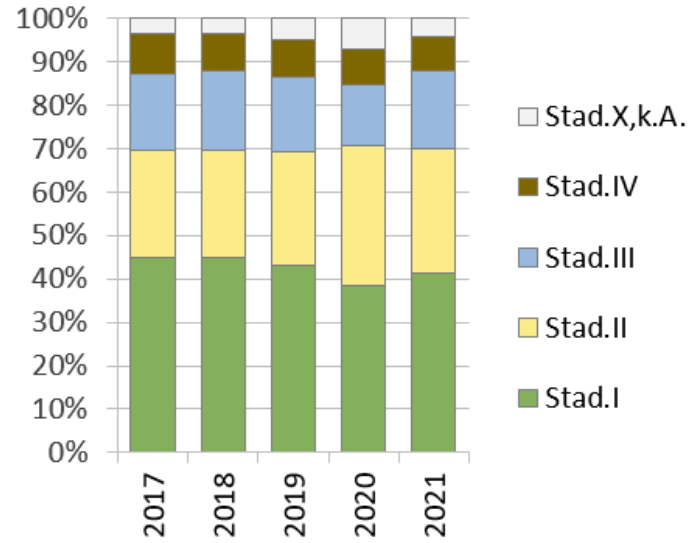


Abbildung 13 Tumorstadium nach Diagnosejahr, C67, Wohnort Berlin, Diagnosejahre 2017-2021, n=3.034

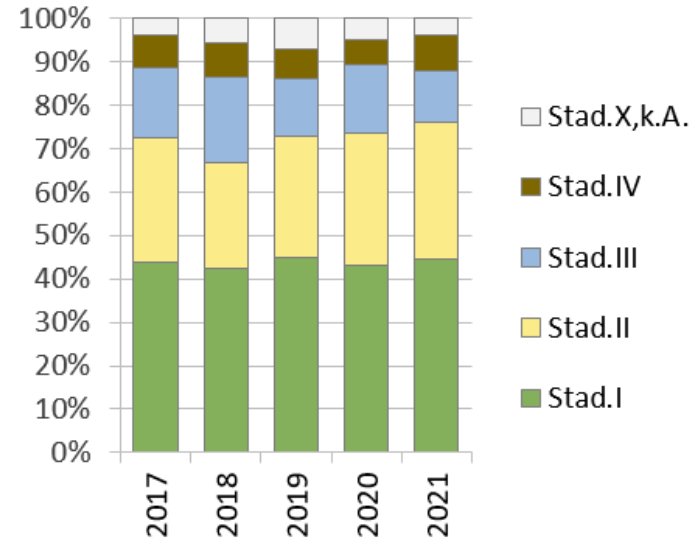
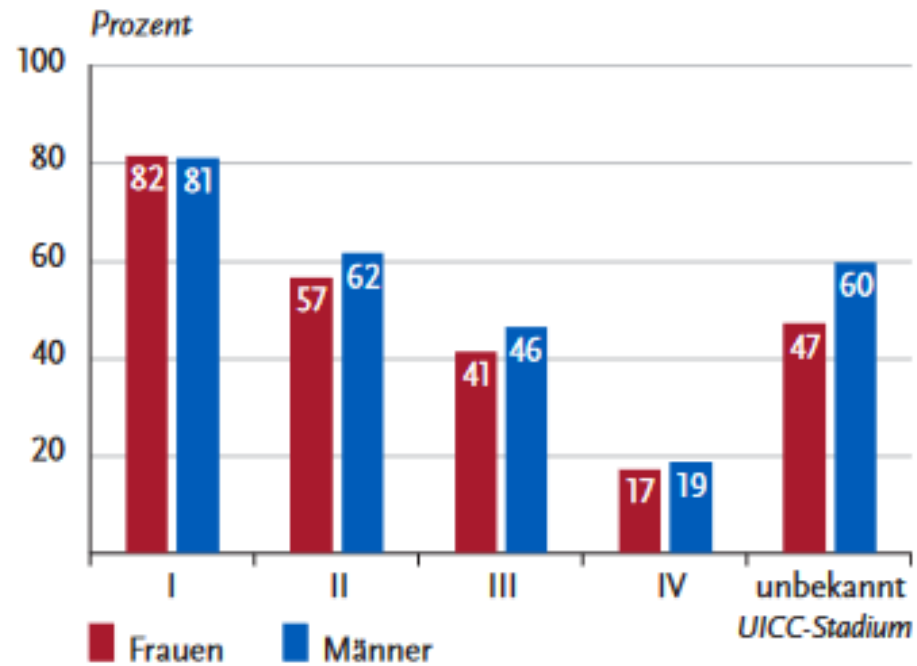


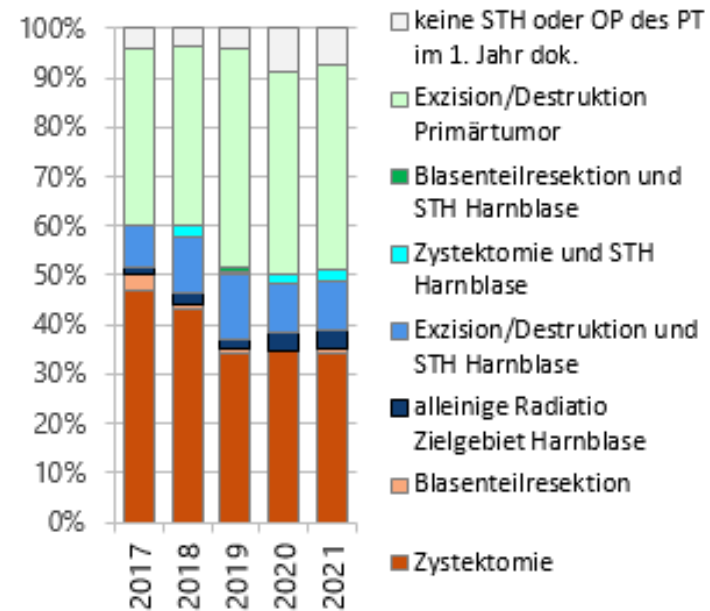
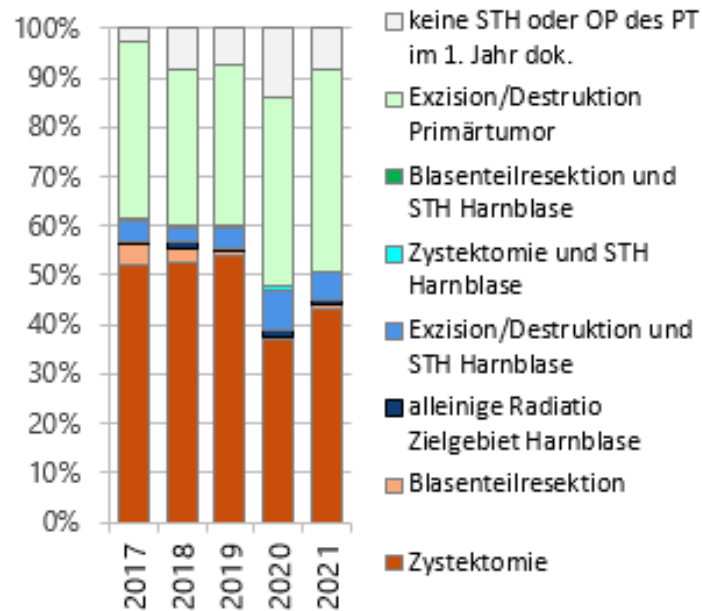
Abbildung 14 Tumorstadium nach Diagnosejahr, C67, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=2.800

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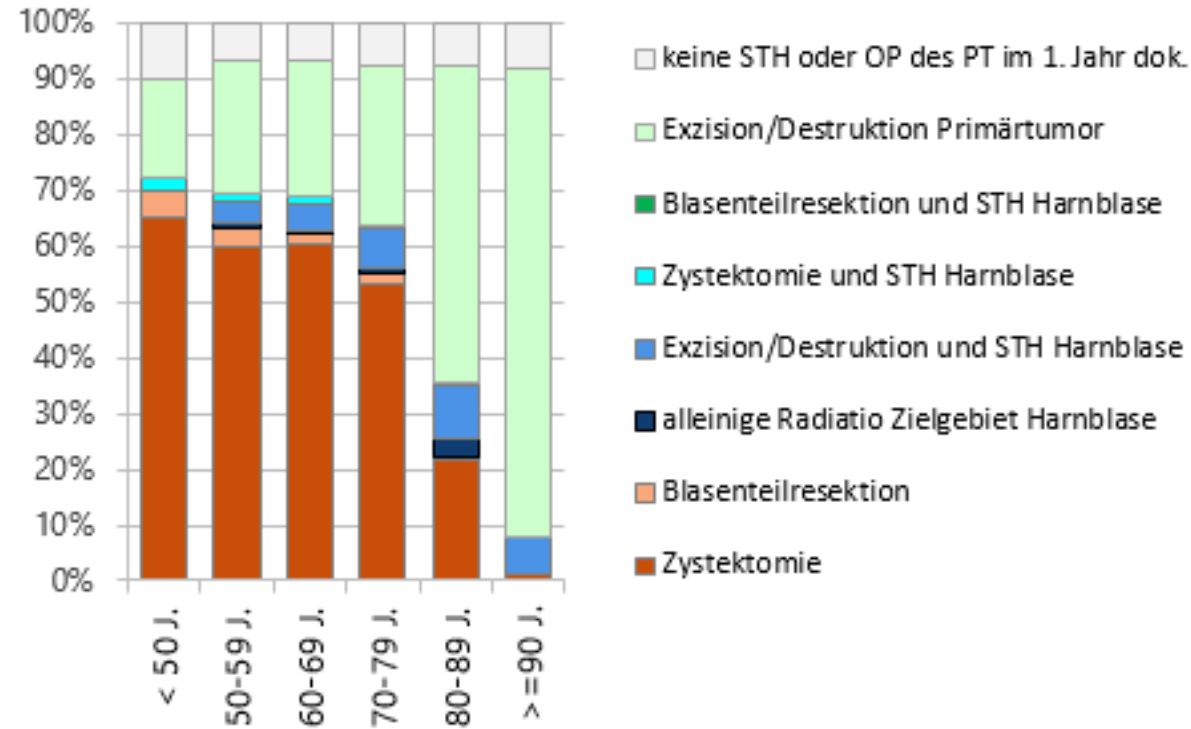
**Abbildung 3.25.5**  
**Relatives 5-Jahres-Überleben nach UICC-Stadium**  
**(7. Auflage TNM) und Geschlecht, ICD-10 C67,**  
**Deutschland 2016–2018**



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## LIFE AND DEATH OF SPARE (SELECTIVE BLADDER PRESERVATION AGAINST RADICAL EXCISION): REFLECTIONS ON WHY THE SPARE TRIAL CLOSED

Robert A. Huddart, Emma Hall, Rebecca Lewis, Alison Birtle,  
on behalf of the SPARE Trial Management Group

Huddart et al., BJUI. 2010

Clinical Investigation

# Radical Cystectomy Compared to Combined Modality Treatment for Muscle-Invasive Bladder Cancer: A Systematic Review and Meta-Analysis

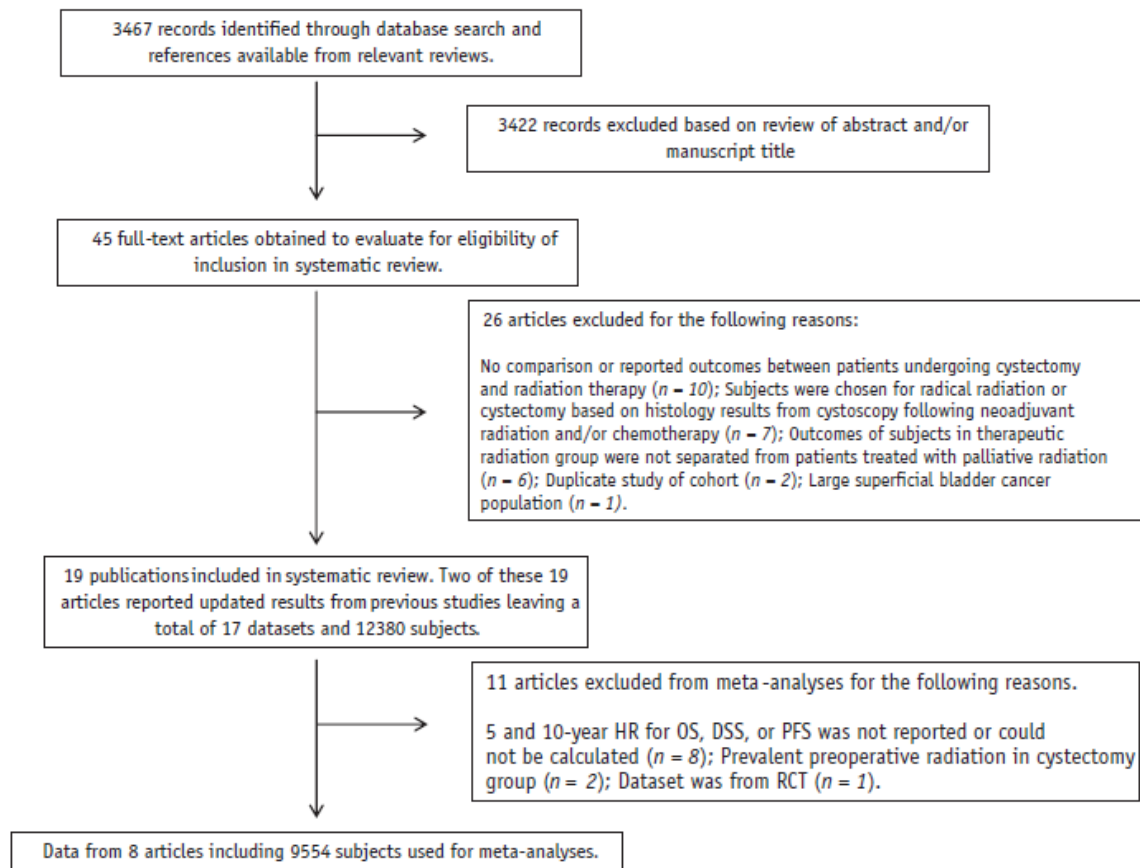


Vishal Vashistha, MD,<sup>\*</sup> Hanzhang Wang, MS,<sup>†</sup> Andrew Mazzone, BS,<sup>‡</sup>  
Michael A. Liss, MD,<sup>†</sup> Robert S. Svatek, MD,<sup>†</sup> Mary Schleicher, RN, BSN, MLIS,<sup>\*</sup>  
and Dharam Kaushik, MD<sup>†</sup>

*<sup>\*</sup>Department of Internal Medicine, Cleveland Clinic Foundation, Cleveland, Ohio; <sup>†</sup>Department of Urology, University of Texas Health Science Center at San Antonio, San Antonio, Texas; and <sup>‡</sup>Rush Medical College, Rush University Medical Center, Chicago, Illinois*

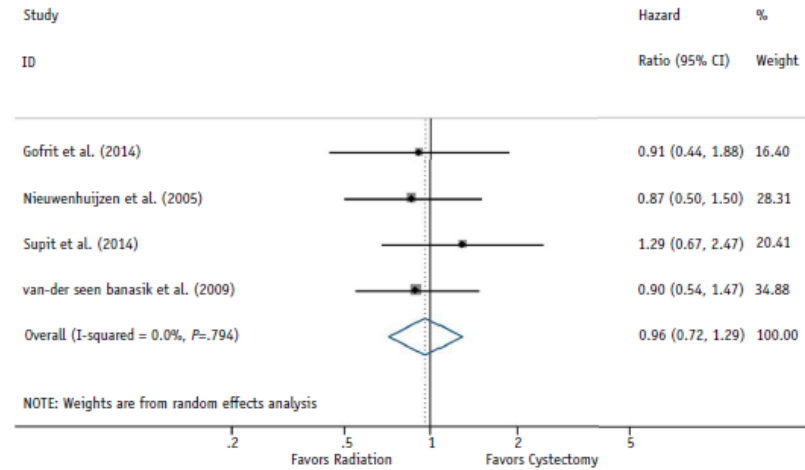
Vashistha et al., IJROBP.2016



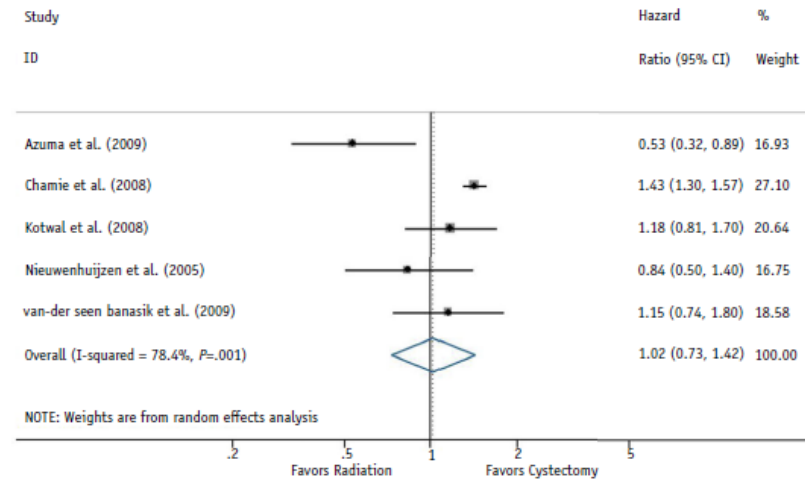


Vashistha et al., IJROBP.2016

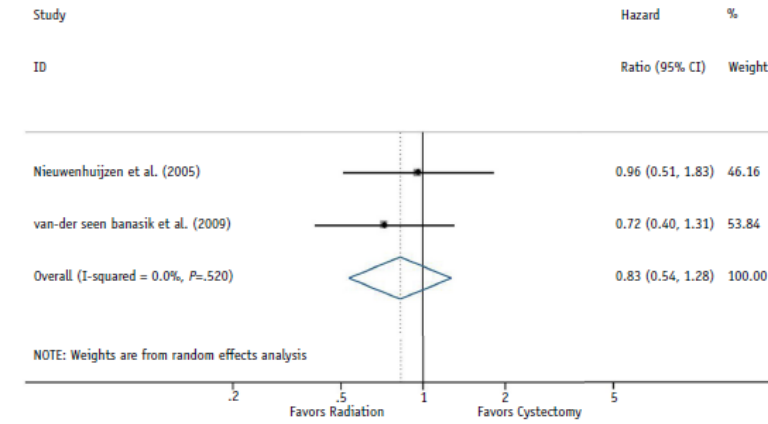
### A Univariate HR of 5 year Overall Mortality Radiation vs Cystectomy



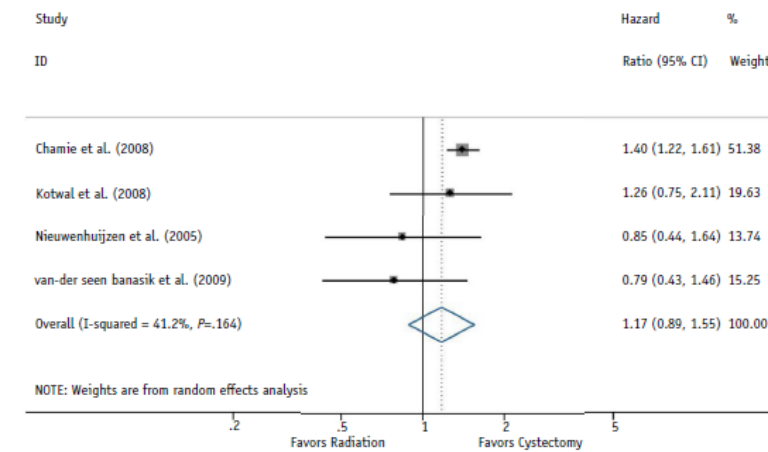
### B Univariate HR of 10 year Overall Mortality Radiation vs Cystectomy



### C Univariate HR of 5 year Disease Specific Mortality Radiation vs Cystectomy



### D Univariate HR of 10 year Disease Specific Mortality Radiation vs Cystectomy





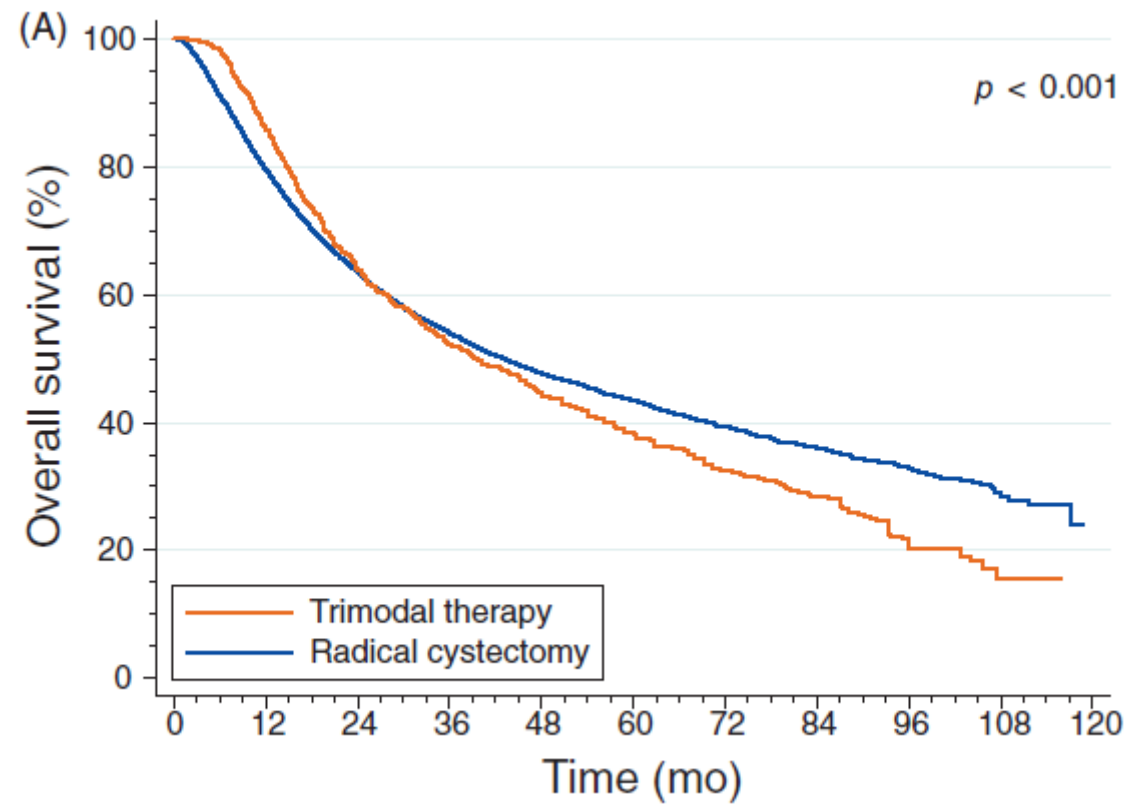
Platinum Priority – Brief Correspondence

*Editorial by Girish S. Kulkarni and Zachary Klaassen on pp. 488–489 of this issue*

## **Comparative Effectiveness of Trimodal Therapy Versus Radical Cystectomy for Localized Muscle-invasive Urothelial Carcinoma of the Bladder**

*Thomas Seisen<sup>a</sup>, Maxine Sun<sup>a</sup>, Stuart R. Lipsitz<sup>a</sup>, Firas Abdollah<sup>b</sup>, Jeffrey J. Leow<sup>a</sup>, Mani Menon<sup>b</sup>, Mark A. Preston<sup>a</sup>, Lauren C. Harshman<sup>c</sup>, Adam S. Kibel<sup>a</sup>, Paul L. Nguyen<sup>d</sup>, Joaquim Bellmunt<sup>c</sup>, Toni K. Choueiri<sup>c</sup>, Quoc-Dien Trinh<sup>a,\*</sup>*

Seisen et al., Europ Urol. 2017



Seisen et al., Europ Urol. 2017

# Radical cystectomy versus trimodality therapy for muscle-invasive bladder cancer: a multi-institutional propensity score matched and weighted analysis



*Alexandre R Zlotta\*, Leslie K Ballas, Andrzej Niemierko†, Katherine Lajkosz†, Cynthia Kuk, Gus Miranda, Michael Drumm, Andrea Mari, Ethan Thio, Neil E Fleshner, Girish S Kulkarni, Michael A S Jewett, Robert G Bristow, Charles Catton, Alejandro Berlin, Srikala S Sridhar, Anne Schuckman, Adam S Feldman, Matthew Wszolek, Douglas M Dahl, Richard J Lee, Philip J Saylor, M Dror Michaelson, David T Miyamoto, Anthony Zietman, William Shipley, Peter Chung, Siamak Daneshmand, Jason A Efsthathiou\**

	Before matching			After 3:1 matching		
	Radical cystectomy (n=440)	Trimodality therapy (n=282)*	p value	Radical cystectomy (n=837)†	Trimodality therapy (n=282)*	p value
Age, years	71.2 (63.7-77.2)	71.6 (64.0-78.9)	0.22	71.4 (66.0-77.1)	71.6 (64.0-78.9)	0.76
Sex	..	..	0.31	..	..	0.65
Female	92 (21%)	68 (24%)	..	213 (25%)	68 (24%)	..
Male	348 (79%)	214 (76%)	..	624 (75%)	214 (76%)	..
Carcinoma in situ	..	..	0.096	..	..	0.51
No	324 (74%)	223 (79%)	..	646 (77%)	223 (79%)	..
Yes	116 (26%)	59 (21%)	..	191 (23%)	59 (21%)	..
Clinical T-stage	..	..	0.0024	..	..	0.91
T2	362 (82%)	255 (90%)	..	755 (90%)	255 (90%)	..
T3-4	78 (18%)	27 (10%)	..	82 (10%)	27 (10%)	..
BMI	..	..	0.014	..	..	0.40
<30 kg/m <sup>2</sup>	340 (77%)	192 (69%)	..	600 (72%)	192 (69%)	..
≥30 kg/m <sup>2</sup>	100 (23%)	86 (31%)	..	237 (28%)	86 (31%)	..
Missing	0	4	..	0	4	..
Hydronephrosis	..	..	<0.0001	..	..	0.35
No	339 (77%)	255 (90%)	..	740 (88%)	255 (90%)	..
Yes	101 (23%)	27 (10%)	..	97 (12%)	27 (10%)	..
Neoadjuvant or adjuvant chemotherapy	..	..	<0.0001	..	..	0.42
No	259 (60%)	123 (44%)	..	340 (41%)	123 (44%)	..
Yes	176 (40%)	159 (56%)	..	492 (59%)	159 (56%)	..
Missing	5	0	..	5	0	..
Smoking history	..	..	0.57	..	..	0.91
Never smoked	115 (26%)	69 (24%)	..	201 (24%)	69 (24%)	..
Current or former smoker	321 (74%)	213 (76%)	..	632 (76%)	213 (76%)	..
Missing	4	0	..	4	0	..
ECOG status	..	..	0.59	..	..	0.57
0	189 (75%)	218 (77%)	..	392 (76%)	218 (77%)	..
1 or 2	62 (25%)	64 (23%)	..	127 (24%)	64 (23%)	..
Missing	189	0	..	318	0	..

**722 Patienten, 3 Zentren, medianer FU FU 4.38 / 4.88**

Inclusion criteria:

T2-T4 N0 M0 MIBC

Primary endpoints:

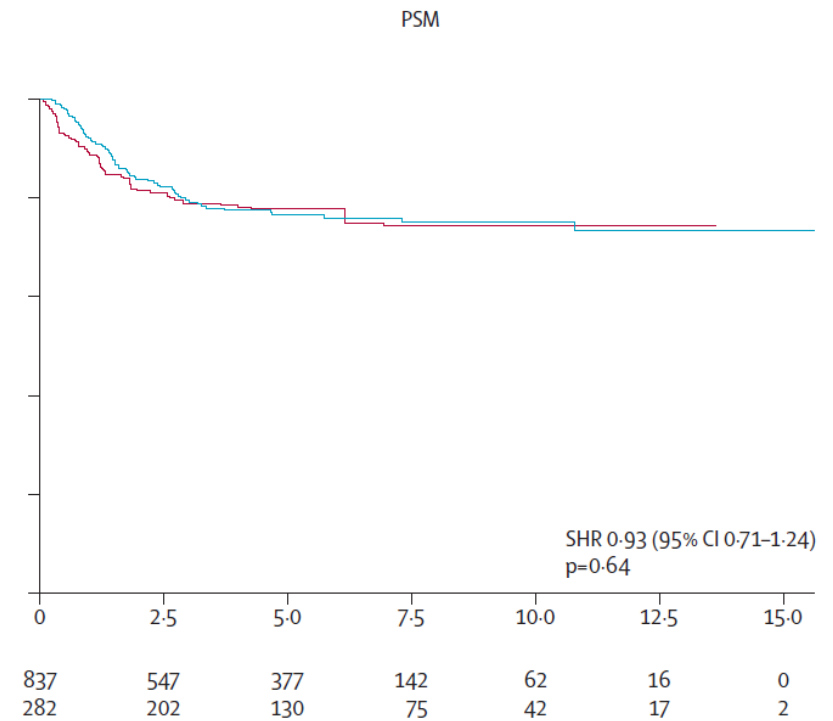
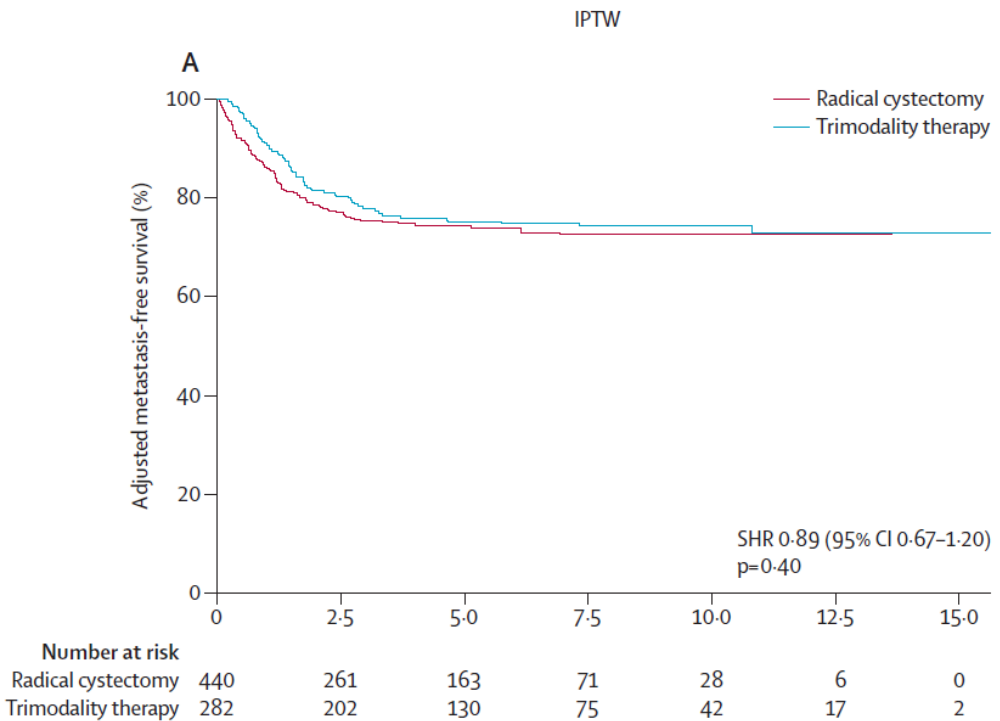
Metastasis-free survival

Secondary endpoints:

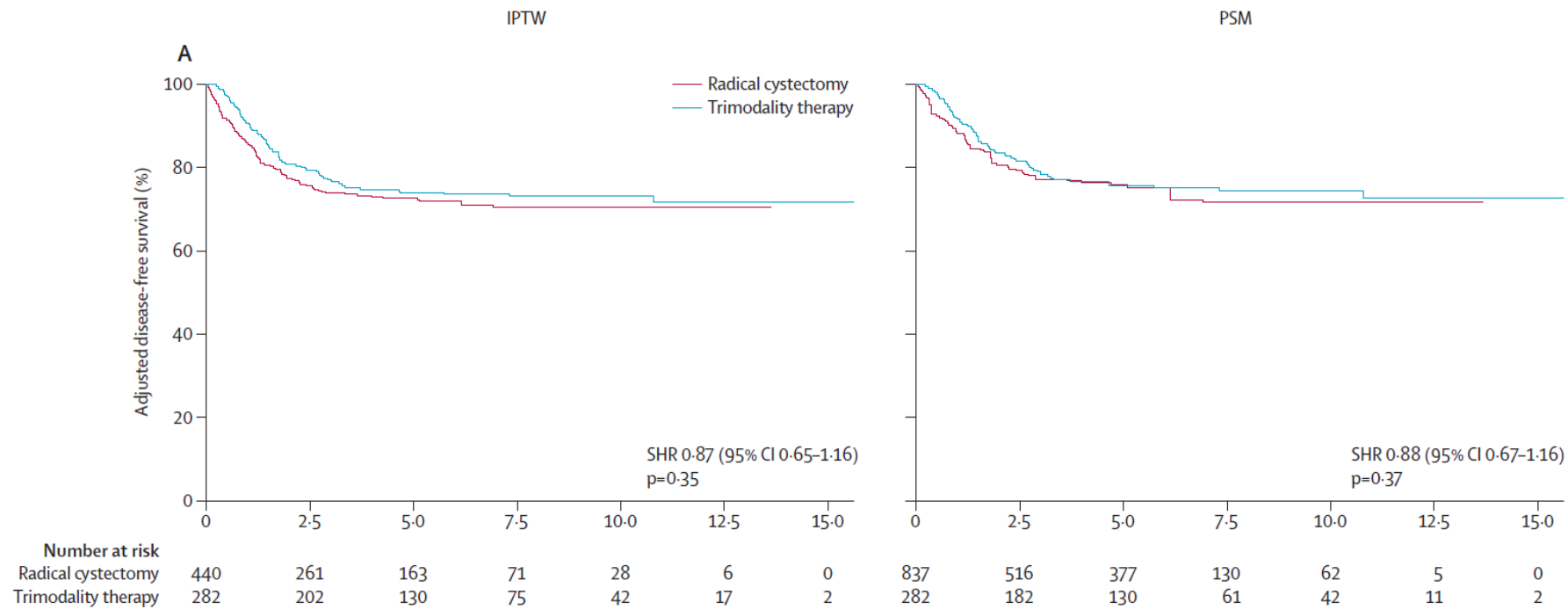
Overall survival

Cancer-specific survival

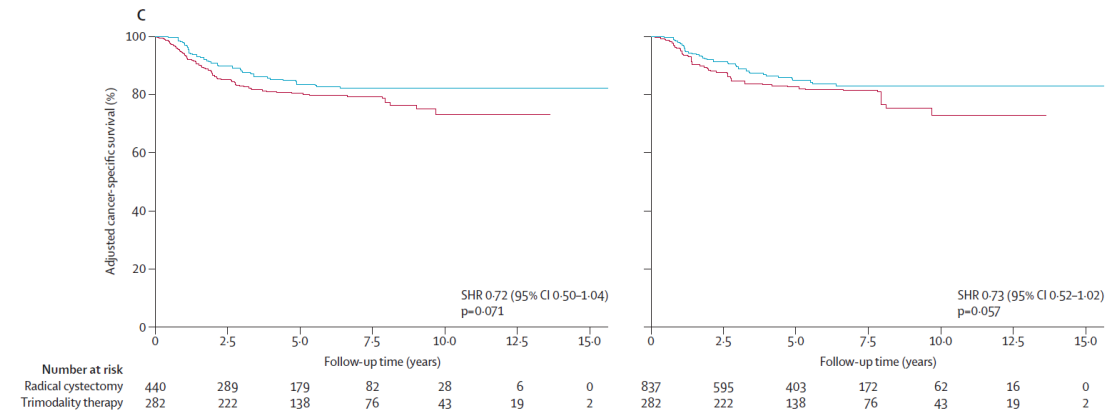
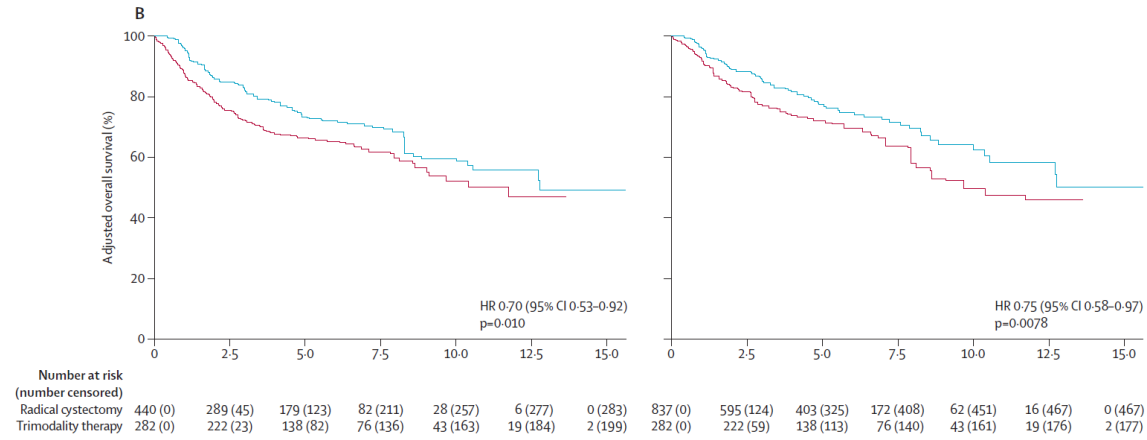
Disease-free survival







peri-OP Mortalität ~ 2,5%



Mediane Anzahl untersuchter Lymphknoten: 39

R1-Resektion: 1%

Lokalrezidive: 3%

VOLUME 27 · NUMBER 25 · SEPTEMBER 1 2009

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

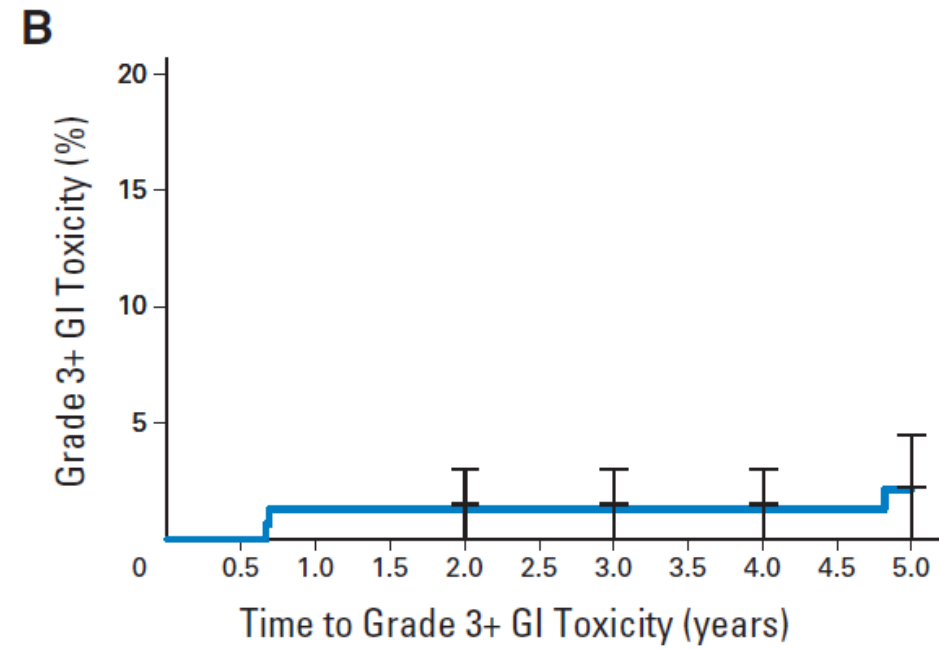
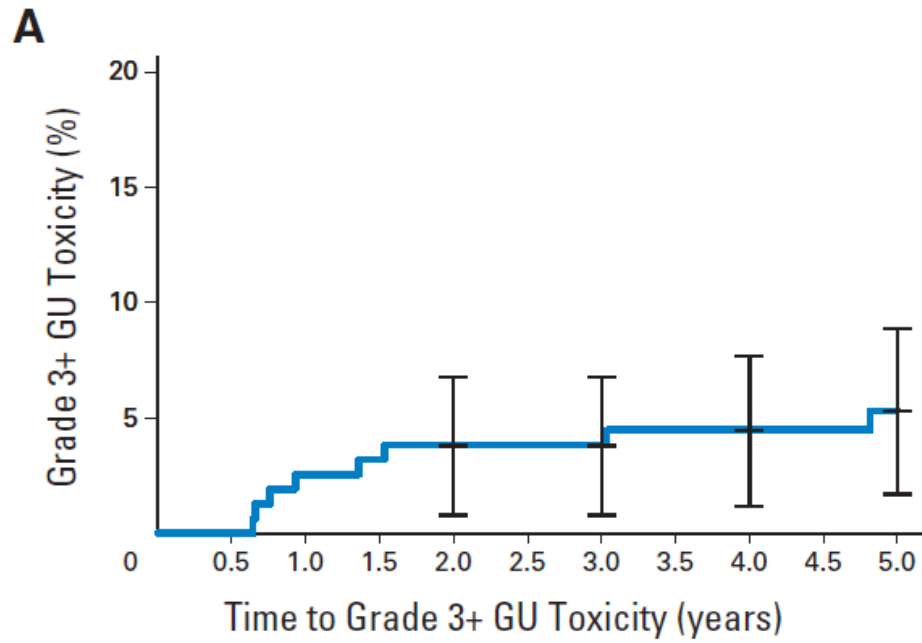
## Late Pelvic Toxicity After Bladder-Sparing Therapy in Patients With Invasive Bladder Cancer: RTOG 89-03, 95-06, 97-06, 99-06

*Jason A. Efstathiou, Kyoung-hwa Bae, William U. Shipley, Donald S. Kaufman, Michael P. Hagan, Niall M. Heney, and Howard M. Sandler*

**Table 2.** Radiation Therapy Oncology Group Late Radiation Morbidity Scoring Schema

Organ	Grade			
	1	2	3	4
GI	Mild diarrhea	Moderate diarrhea and colic	Obstruction or bleeding requiring minor surgery	Necrosis/perforation
	Mild cramping Bowel movement 5 times daily	Bowel movement > 5 times daily Excessive rectal mucus or intermittent bleeding		Fistula
	Slight rectal discharge or bleeding			
GU	Slight epithelial atrophy	Moderate frequency	Severe frequency and dysuria	Necrosis/contracted bladder (capacity < 100 mL)
	Minor telangiectasia (microscopic hematuria)	Generalized telangiectasia Intermittent macroscopic hematuria	Severe generalized telangiectasia (often with petechiae) Frequent hematuria Reduction in bladder capacity (< 150 mL)	Severe hemorrhagic cystitis

Abbreviation: GU, genitourinary.

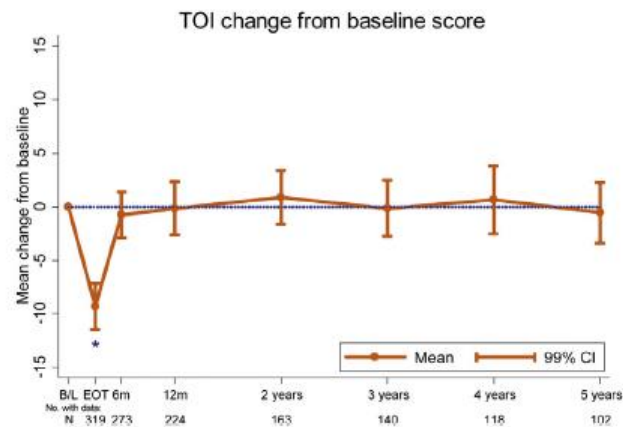
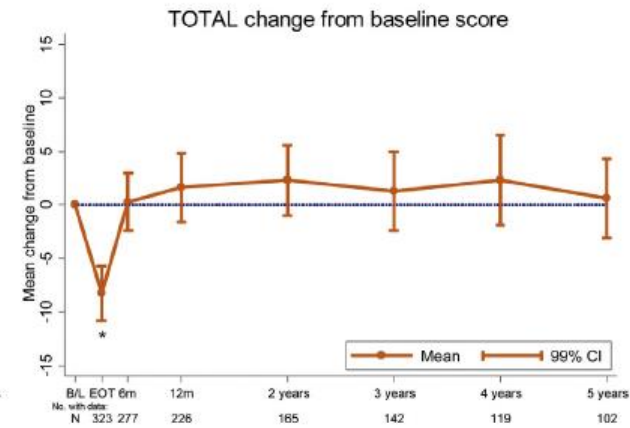
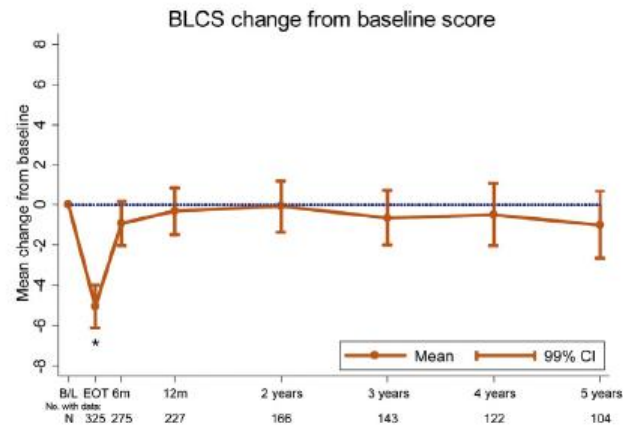




## **Patient-reported Quality of Life Outcomes in Patients Treated for Muscle-invasive Bladder Cancer with Radiotherapy $\pm$ Chemotherapy in the BC2001 Phase III Randomised Controlled Trial**

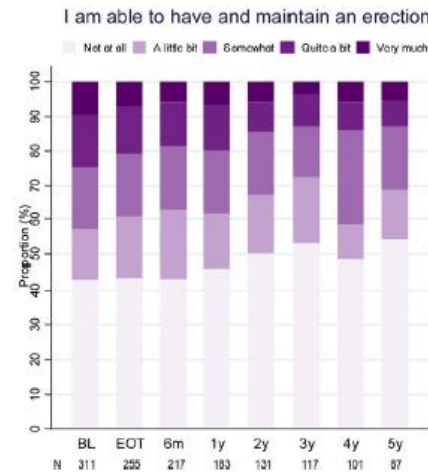
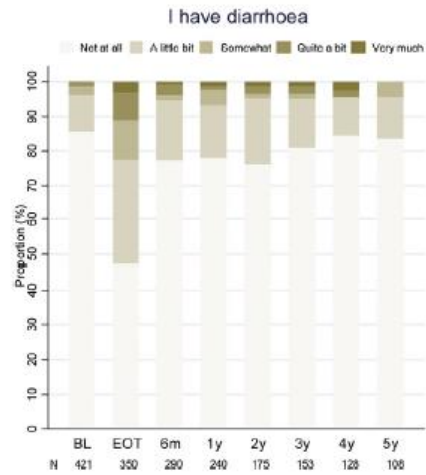
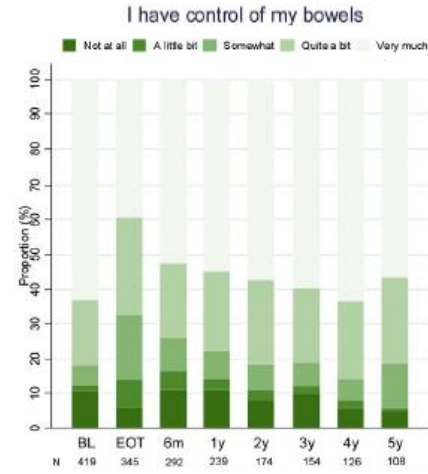
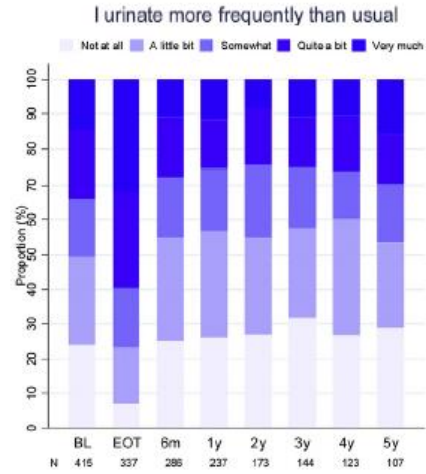
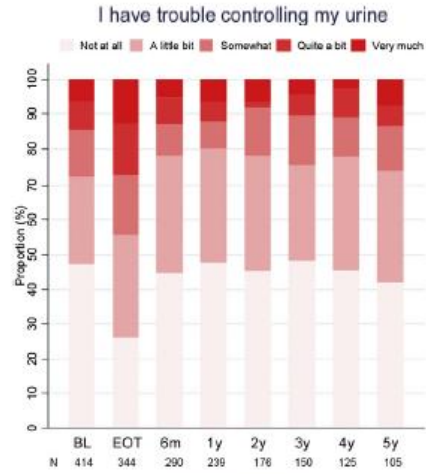
*Robert A. Huddart<sup>a,i,\*,<sup>†</sup></sup>, Emma Hall<sup>a,<sup>†</sup></sup>, Rebecca Lewis<sup>a</sup>, Nuria Porta<sup>a</sup>, Malcolm Crundwell<sup>b</sup>, Peter J. Jenkins<sup>c</sup>, Christine Rawlings<sup>d</sup>, Jean Tremlett<sup>e</sup>, Leila Campani<sup>f</sup>, Carey Hendron<sup>f</sup>, Syed A. Hussain<sup>g,<sup>†</sup></sup>, Nicholas D. James<sup>f,h,<sup>†</sup></sup>, on behalf of the BC2001 Investigators*

Huddart et al., Europ Urol. 2020



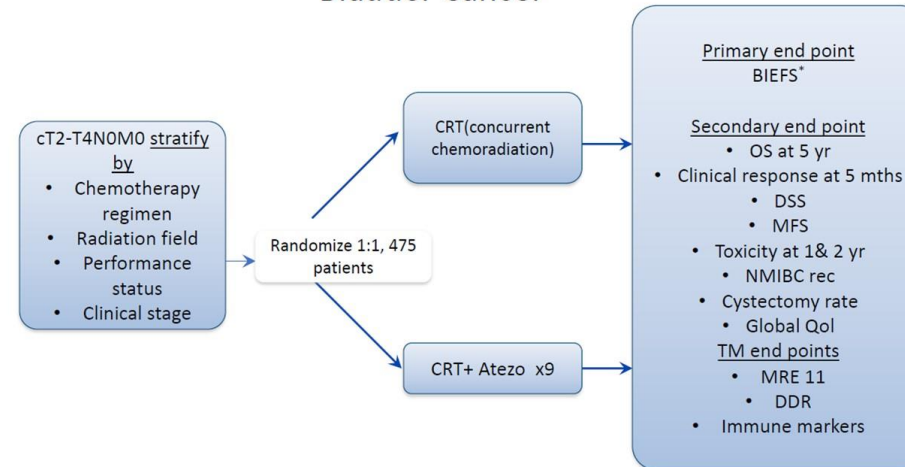
Huddart et al., Europ Urol. 2020





Huddart et al., Europ Urol. 2020

## SWOG/NRG Intergroup Trial (1806): Phase III Trial of Concurrent Chemoradiation With or Without Atezolizumab for Localized Muscle Invasive Bladder Cancer



\*BIEFS (bladder intact event free survival) includes: muscle invasive recurrence in the bladder, regional pelvic soft tissue or nodal recurrence, distant metastases, cystectomy, death due to any cause

NCT03775265

ASCO Genitourinary  
Cancers Symposium

#GU22

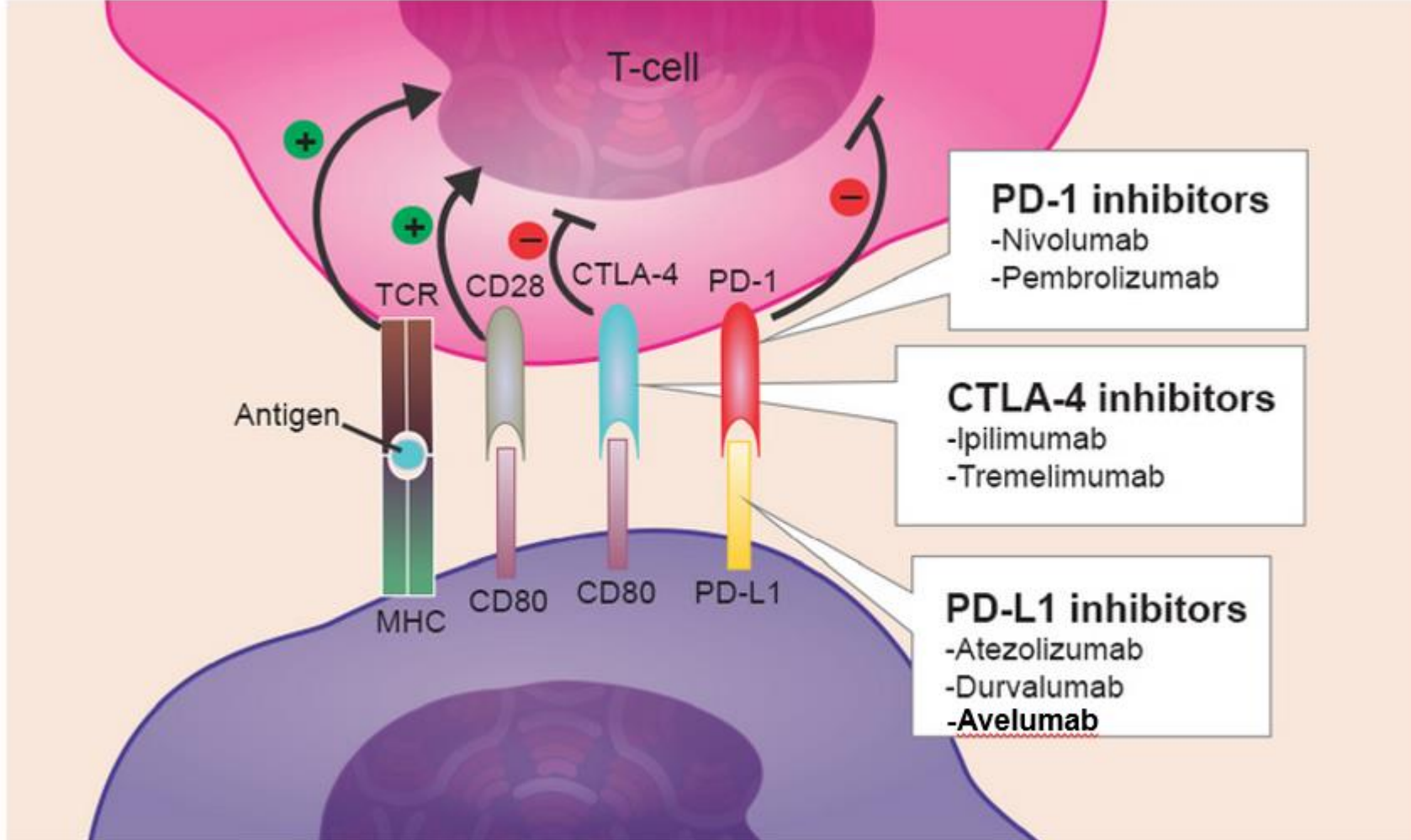
PRESENTED BY: Sophia C. Kamran MD

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@sophia\_kamran

ASCO AMERICAN SOCIETY OF  
CLINICAL ONCOLOGY  
KNOWLEDGE CONQUERS CANCER

Kamran et al., ASCO GU 22



# Hypofractionation + ICI: Jury still out?

- Caution is necessary, but studies are ongoing to evaluate further

Disease type	NCT	Design	Enrollment	Intervention	Hypofractionated RT
BCG-unresponsive NMIBC	NCT03317158	Phase I/II	186	Durvalumab + BCG + RT	6 Gy x 3 (total 18 Gy) <sup>^</sup>
MIBC	NCT02621151	Phase II	60	Pembrolizumab + gemcitabine + RT	52 Gy in 20 fractions
MIBC	NCT04543110	Phase II	25	RT + Durvalumab prior to cystectomy	8 Gy x 1 to the bladder <sup>^</sup>
MIBC	NCT03747419	Phase II	24	RT + Avelumab	Two schemes allowed: 65 Gy in 35 fractions or 55 Gy in 20 fractions
anti-PD-1/L1 refractory Bladder Cancer <sup>‡</sup>	NCT03915678	Phase II	247	RT + Atezolizumab + BDB001	Stereotactic RT to non-injected metastasis: 3-5 fractions for total dose between 27-60 Gy <sup>^</sup>
Metastatic urothelial carcinoma	NCT03115801	Phase II	112 (actual = 6, terminated due to lack of accrual)	Atezolizumab or Pembrolizumab + RT	30 Gy in 3 fractions of 10 Gy each over a 1 week interval <sup>^</sup>
Urothelial carcinoma	NCT03511391	Phase II	99 <sup>**</sup>	(Pembrolizumab or Nivolumab or Atezolizumab) ± SBRT	Maximum 3 lesions to be treated with 3 fractions of 8 Gy each <sup>^</sup>

<sup>‡</sup>Trials enrolling multiple cancers, data shown for bladder cancers; <sup>\*\*</sup>Actual enrollment to date; <sup>^</sup>Studies incorporate "sensitizing" RT rather than definitive RT

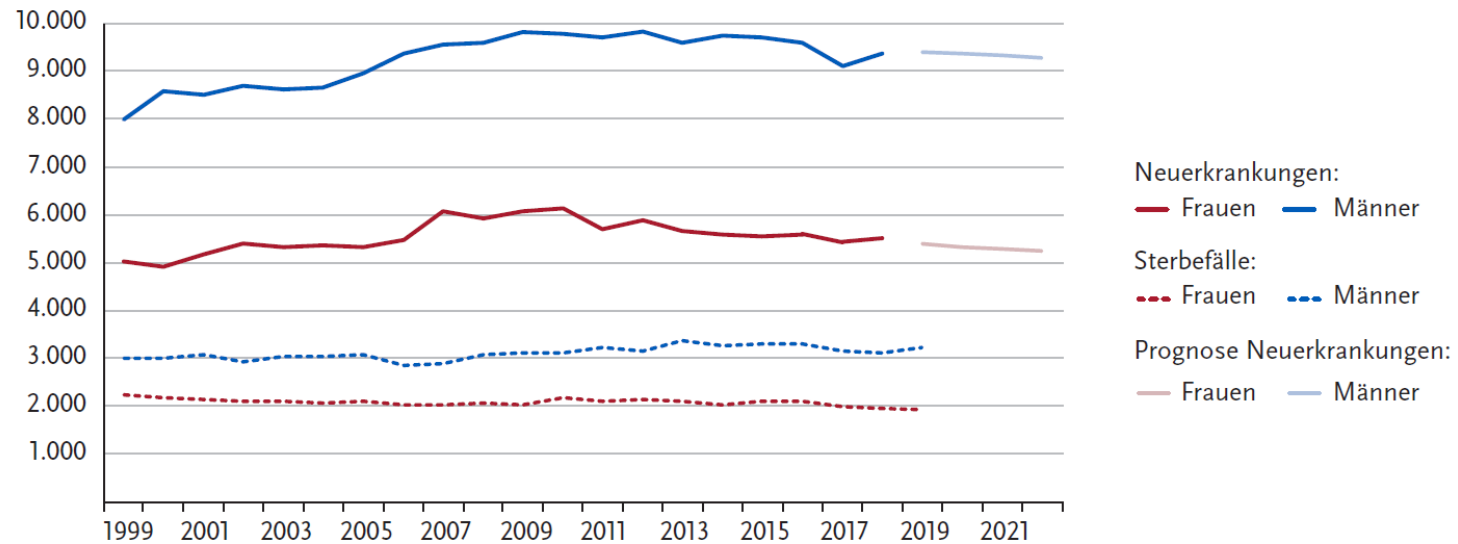
7.41.	Konsensbasierte Empfehlung
<b>EK</b>	Die multimodale, primär organerhaltende Therapie sollte Patienten mit lokal begrenzten, muskelinvasivem Urothelkarzinom (cT2-4 cN0/Nx M0) angeboten werden, die sich nicht für eine radikale Zystektomie eignen oder die eine Alternative zur radikalen Operation anstreben. Besonders geeignete Patienten sind solche mit frühen Tumoren (cT2N0) ohne Hydronephrose oder assoziiertem Carcinoma in situ, bei denen die initial transurethrale Resektion zur möglichst kompletten Tumorentfernung führt.
	Starker Konsens

AWMF

# 2

## Nierenzellkarzinom

Abbildung 3.24.1b  
 Absolute Zahl der Neuerkrankungs- und Sterbefälle nach Geschlecht, ICD-10 C64, Deutschland 1999–2018/2019,  
 Prognose (Inzidenz) bis 2022



rki.de

## 2

# Nierenzellkarzinom - Risikofaktoren

- Rauchen
- Bluthochdruck
- Adipositas
- Syndromale Erkrankungen
- Mangelnde körperliche Aktivität
- Chronische Niereninsuffizienz



### Wohnort Berlin

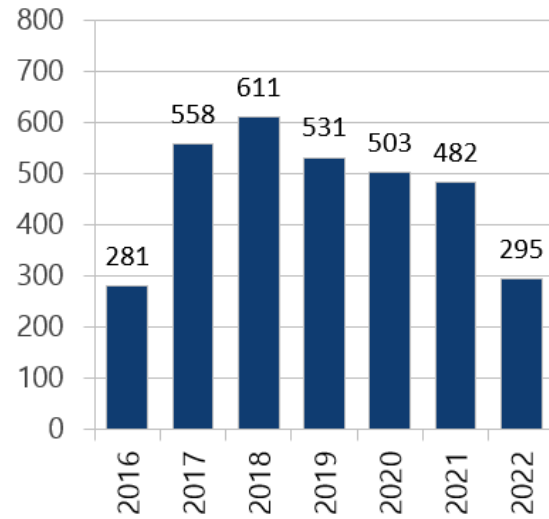


Abbildung 1 Anzahl Neudiagnosen C64 nach Diagnosejahr, Wohnort Berlin, Diagnosejahre 2016-2022, n=3.216

### Wohnort Brandenburg

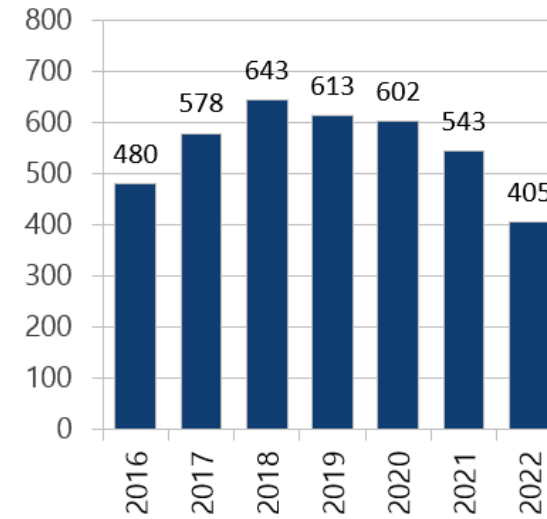


Abbildung 2 Anzahl Neudiagnosen C64 nach Diagnosejahr, Wohnort Brandenburg, Diagnosejahre 2016-2022, n=3.864

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### Wohnort Berlin

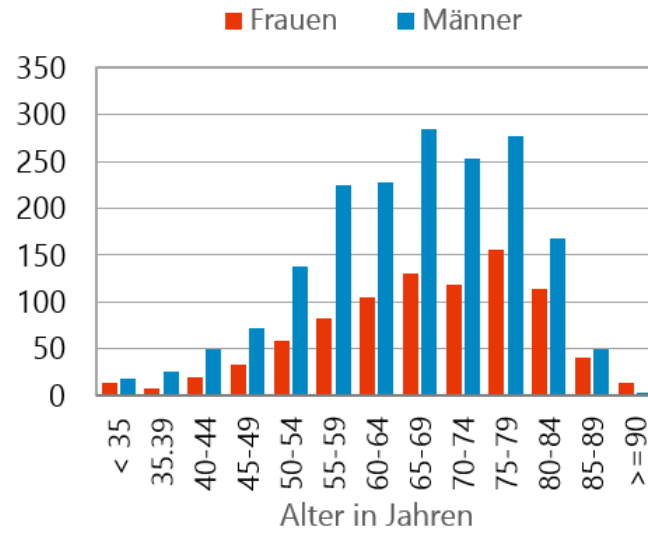


Abbildung 6 Alter bei Neuerkrankung, C64, Wohnort Berlin, Diagnosejahre 2017-2021, n=2.685

### Wohnort Brandenburg

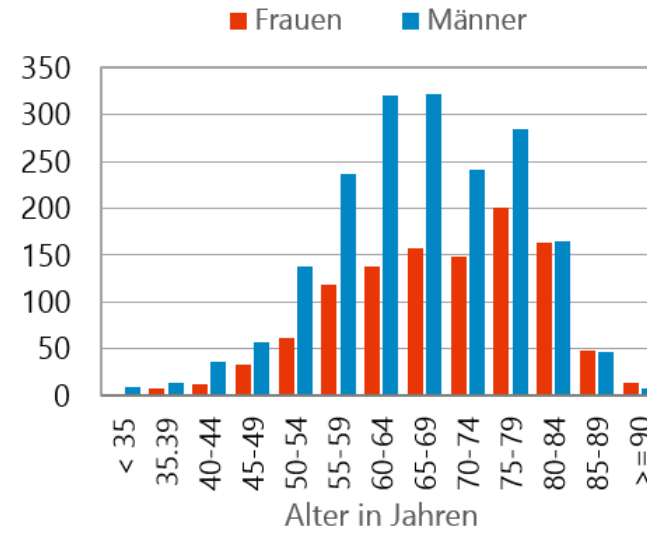


Abbildung 7 Alter bei Neuerkrankung, C64, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=2.979

KKRBB

### Wohnort Berlin

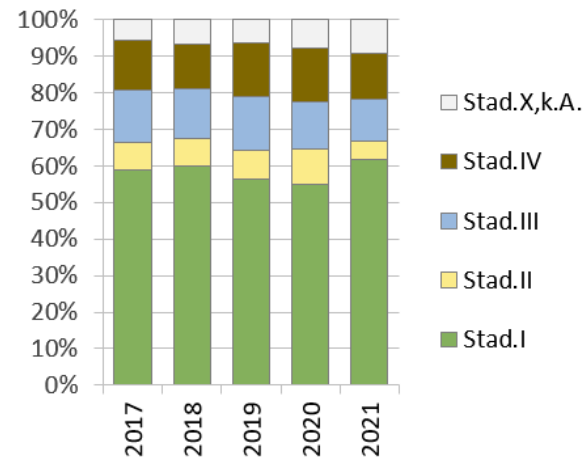


Abbildung 9 Tumorstadium nach Diagnosejahr, C64, Wohnort Berlin, Diagnosejahre 2017-2021, n=2.445

### Wohnort Brandenburg

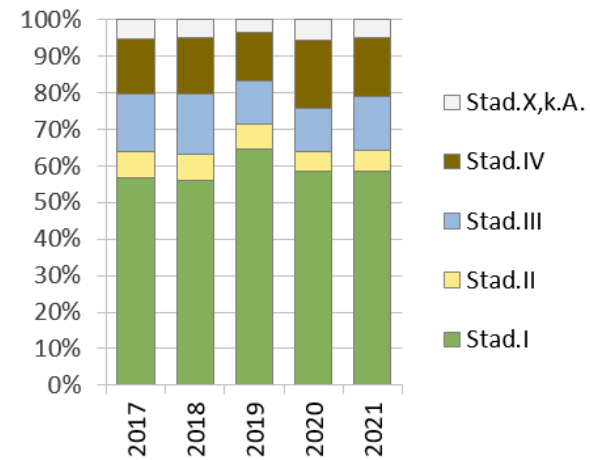


Abbildung 10 Tumorstadium nach Diagnosejahr, C64, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=2.873

KKRBB

**Stadieneinteilung der UICC (Union for International Cancer Control, 7. Edition, 2010)**

UICC-Stadium	TNM
Stadium I	T1
Stadium II	T2
Stadium III	T3 oder T1-T3, N1
Stadium IV	T4 oder N2 oder M1

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### TNM-Klassifikation maligner Tumoren (7. Edition, 2010)

TNM	Ausdehnung
T1	Tumor begrenzt auf die Niere, TumorgroÙe <7 cm (T1a: <4 cm; T1b: 4–7 cm)
T2	Tumor begrenzt auf die Niere, TumorgroÙe >7 cm (T2a: 7–10 cm; T2b: >10 cm)
T3	Perirenale- oder Gefäßinfiltration, jedoch innerhalb Gerota-Faszie und ohne ipsilateralen Nebennierenbefall <ul style="list-style-type: none"> <li>• T3a: Infiltration ins perirenale Fettgewebe oder in die Nierenvene (auch segmentale Äste)</li> <li>• T3b: Vena cava-Infiltration: Unterhalb des Zwerchfells</li> <li>• T3c: Vena cava-Infiltration: Oberhalb des Zwerchfells oder Befall der Venenwand</li> </ul>
T4	Infiltration über Gerota-Faszie hinaus oder ipsilateraler Nebennierenbefall ☒
N1	Regionärer Lymphknotenbefall: Ein Lymphknoten
N2	Regionärer Lymphknotenbefall: Mehrere Lymphknoten
M1	Fernmetastasen

Amboss.de

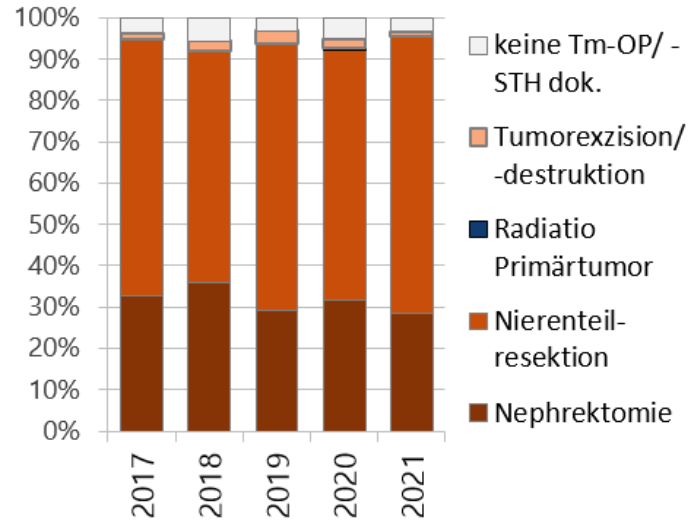


Abbildung 24 Therapie in den ersten 18 Monaten, C64, nach Diagnosejahr, Behandlung in Berlin, Diagnosejahre 2017-2021, n=2.125

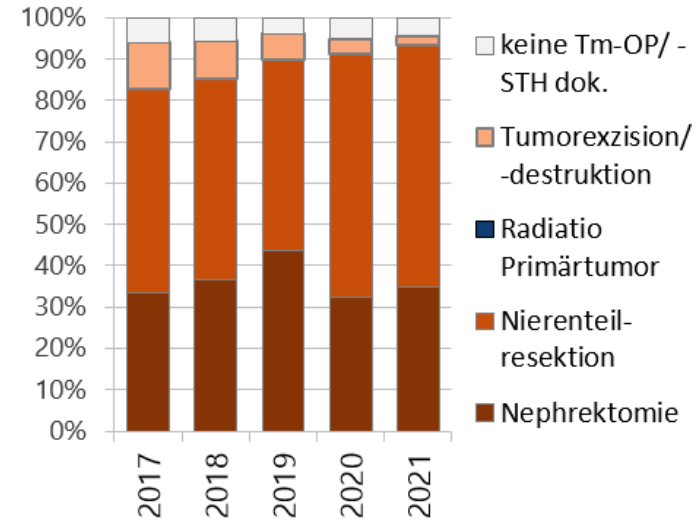
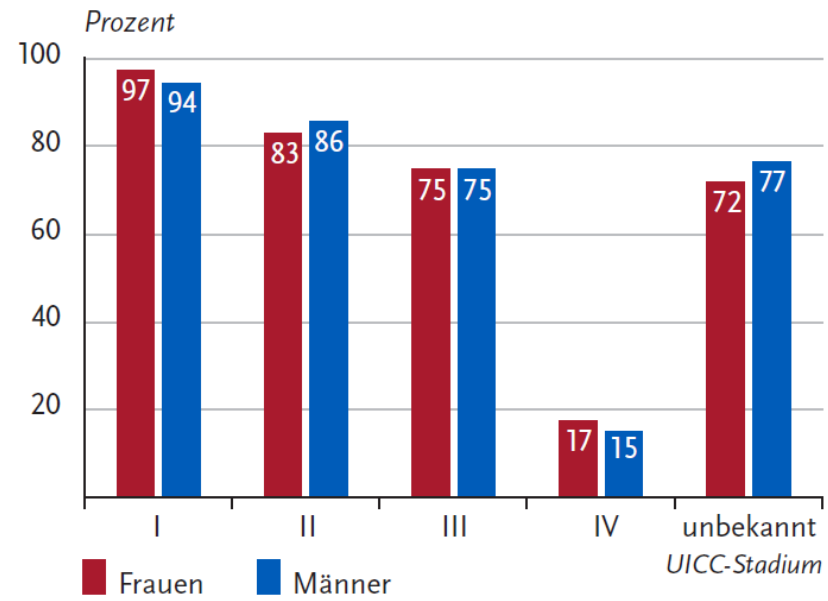


Abbildung 25 Therapie in den ersten 18 Monaten, C64, nach Diagnosejahr, Behandlung in Brandenburg, Diagnosejahre 2017-2021, n=1.186

KKRBB

Abbildung 3.24.5  
Relatives 5-Jahres-Überleben nach UICC-Stadium  
(7. Auflage TNM) und Geschlecht, ICD-10 C64,  
Deutschland 2016–2018



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## 2

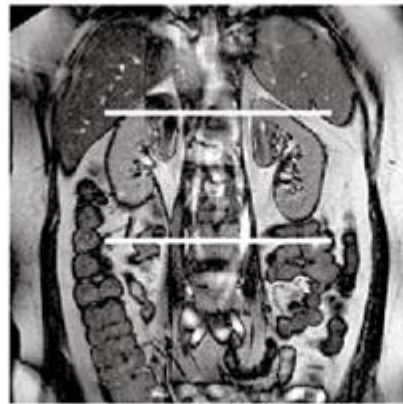
# Nierenzellkarzinom – Risikofaktoren bzgl. OP

- Alter
- Antikoagulation

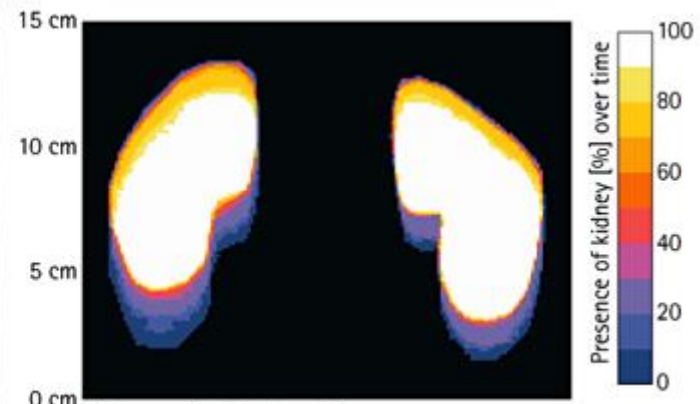




free breathing end-inspiration

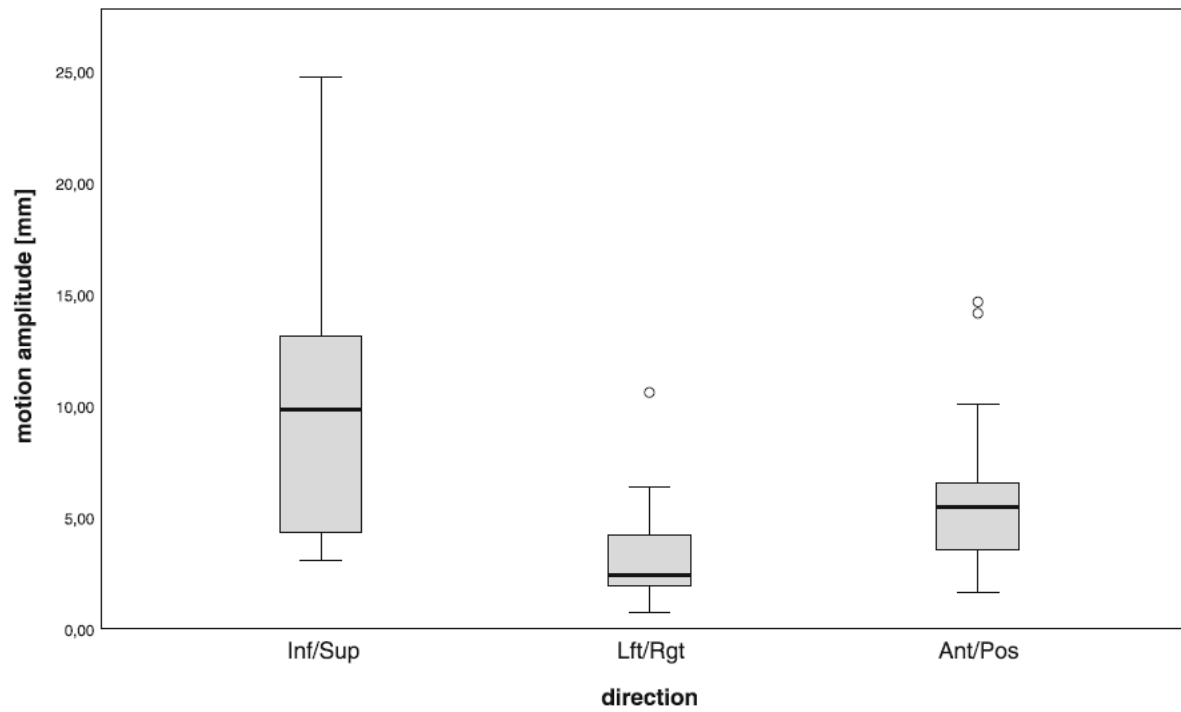


free breathing end-expiration

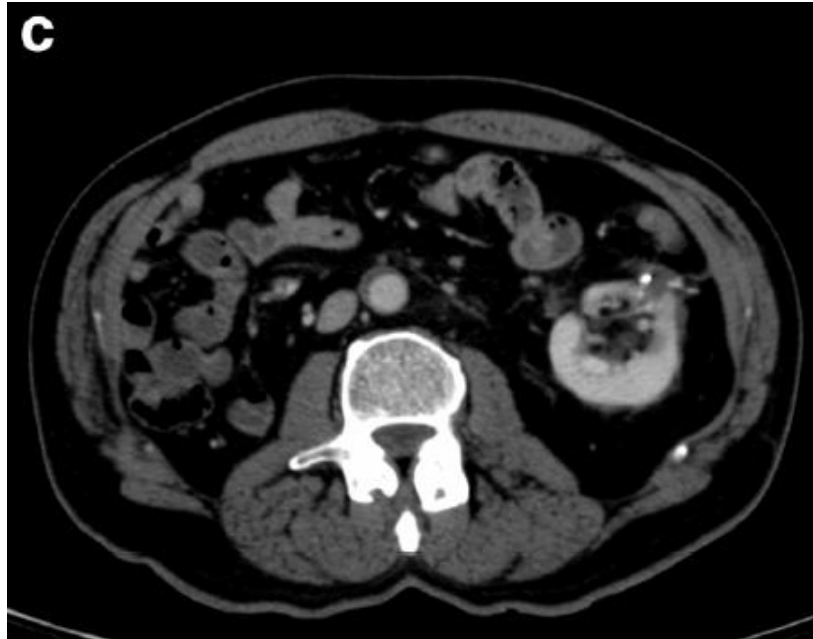


kidney motion free breathing

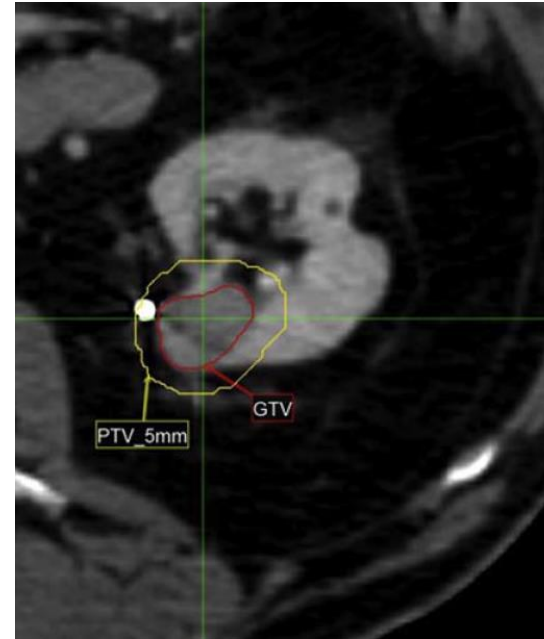
Kerkhof et al., BJU Int. 2011



Senger et al., BMC Urol. 2019



Senger et al., BMC Urol. 2019

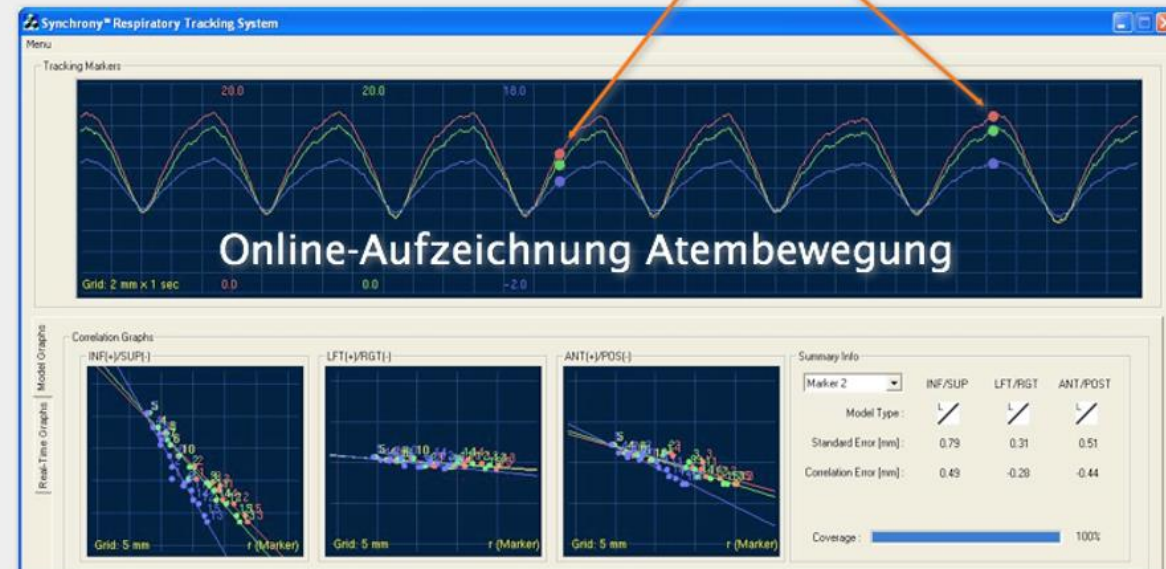


Peddada et al. Adv Radiat Oncol. 2019



externe Atemkurve

interne Tumorposition



Korrelationsmodell





Original Article

## **Pooled Analysis of Stereotactic Ablative Radiotherapy for Primary Renal Cell Carcinoma: A Report From the International Radiosurgery Oncology Consortium for Kidney (IROCK)**

Siva et al., Cancer. 2018



No. (%), Mean  $\pm$  SD, or Median [Min, Max]

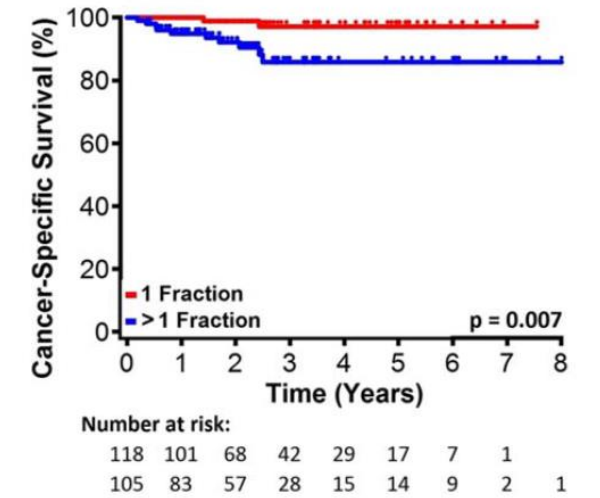
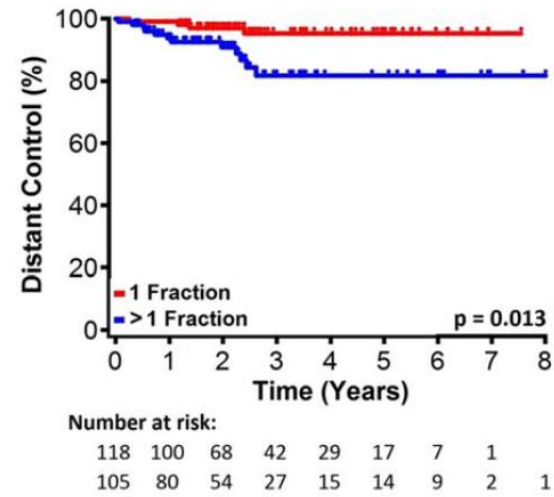
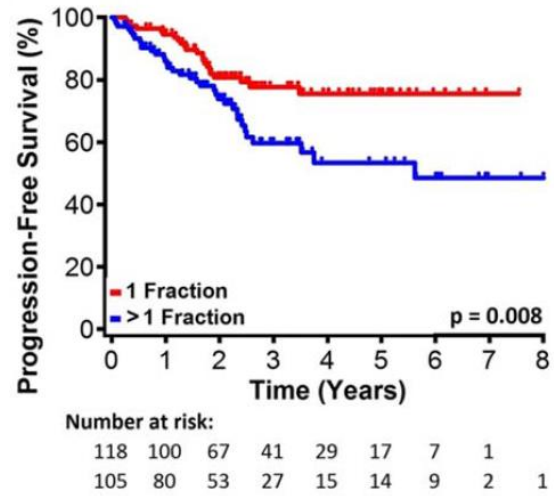
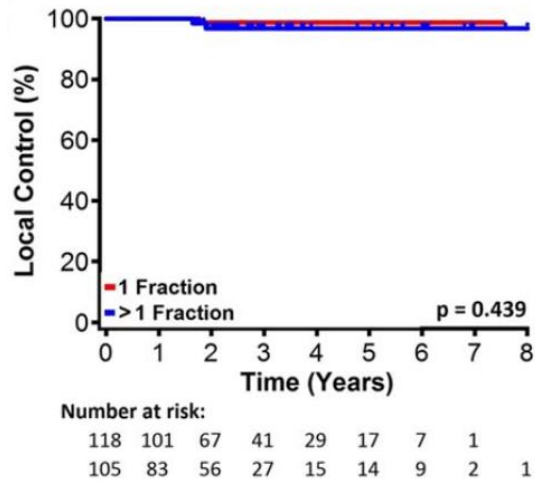
Characteristic	No. of Patients	All Patients, n = 223	1 Fraction, n = 118	>1 Fraction, n = 105	P
Age at SABR, y	223	72.0 $\pm$ 11.8	69.0 $\pm$ 11.9	75.3 $\pm$ 10.9	< .001 <sup>a</sup>
Men	223	155 (69.5)	82 (69.5)	73 (69.5)	.996
Good performance status: ECOG 0-1 or KPS $\geq$ 70	223	195 (87.4)	114 (96.6)	81 (77.1)	< .001 <sup>a</sup>
Pathologic confirmation	223	189 (84.8)	116 (98.3)	73 (69.5)	< .001 <sup>a</sup>
Histologic type	189				
Clear cell		163 (86.2)	114 (97.4)	49 (68.1)	< .001 <sup>a</sup>
Papillary		9 (4.8)	2 (1.7)	7 (9.7)	
Chromophobe		2 (1.1)	—	2 (2.8)	
Other RCC		11 (5.8)	—	11 (15.3)	
Urothelial		4 (2.1)	1 (0.9)	3 (4.2)	
Greatest tumor dimension, mm	223	43.6 $\pm$ 27.7	37.1 $\pm$ 10.6	50.9 $\pm$ 37.6	.009 <sup>a</sup>
Greatest tumor dimension $\geq$ 40 mm	223	110 (49.3)	52 (44.1)	58 (55.2)	0.096
Total dose, Gy	223	25.0 [14.0, 70.0]	25.0 [14.0, 26.0]	40.0 [24.0, 70.0]	< .001 <sup>a</sup>
No. of fractions	223	1 [1, 10]	1.0	4 [2, 10]	—
BED <sub>10</sub> , Gy	223	87.5 [33.6, 124.8]	87.5 [33.6, 93.6]	80.0 [37.5, 124.8]	.577
Serum urea pre-SABR, mmol/L	109	9.9 $\pm$ 5.5	11.9 $\pm$ 7.2	9.5 $\pm$ 5.0	.121
Serum creatinine pre-SABR, $\mu$ mol/L	220	130.8 $\pm$ 78.2	132.5 $\pm$ 84.8	128.9 $\pm$ 70.6	.738
eGFR pre-SABR, mL/min <sup>b</sup>	220	59.9 $\pm$ 21.9	66.4 $\pm$ 20.6	52.6 $\pm$ 21.2	< .001 <sup>a</sup>

Siva et al., Cancer. 2018

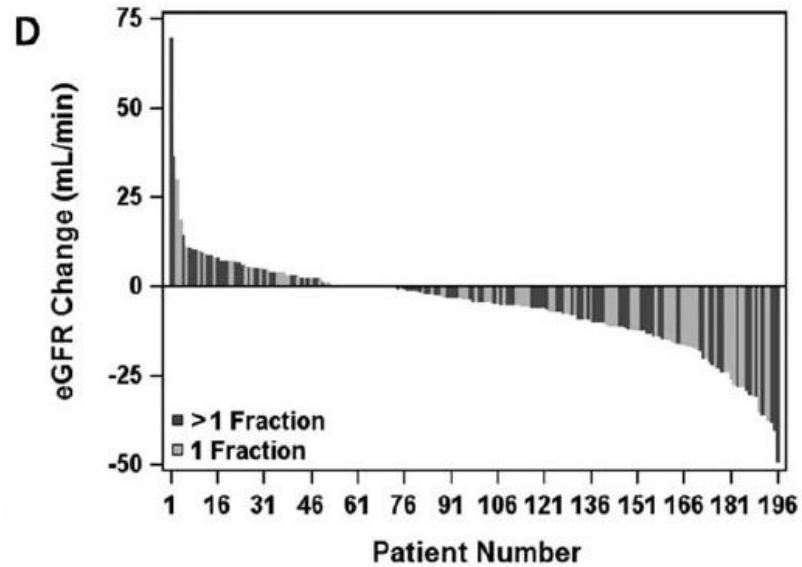
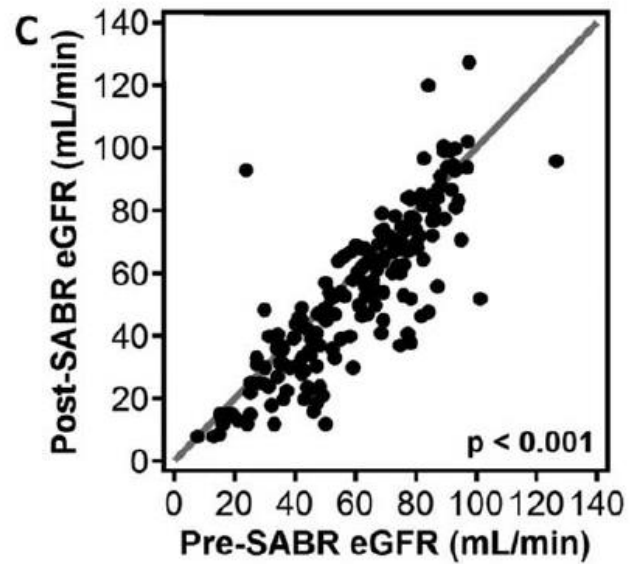
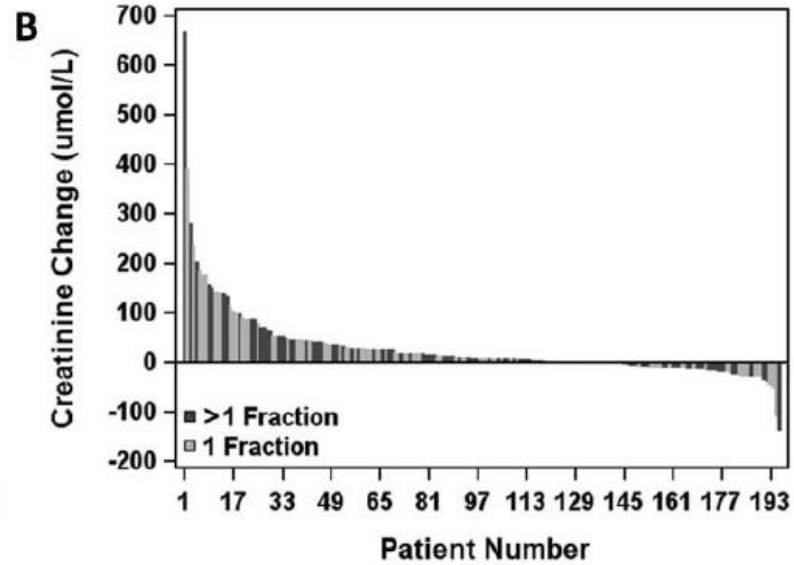
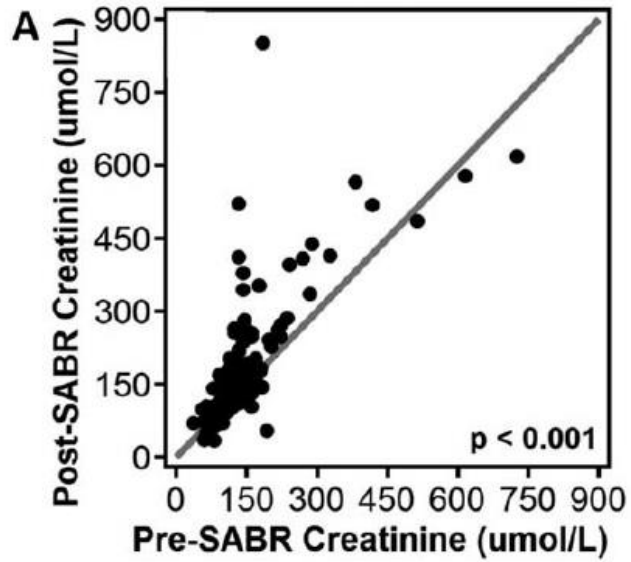
No. (%), Mean  $\pm$  SD, or Median [Min, Max]

Characteristic	No. of Patients	All Patients, n = 223	1 Fraction, n = 118	>1 Fraction, n = 105	P
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Pathologic confirmation	223	189 (84.8)	116 (98.3)	73 (69.5)	< .001 <sup>a</sup>
Histologic type	189				
Clear cell		163 (86.2)	114 (97.4)	49 (68.1)	< .001 <sup>a</sup>
Papillary		9 (4.8)	2 (1.7)	7 (9.7)	
Chromophobe		2 (1.1)	—	2 (2.8)	
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Greatest tumor dimension, mm	223	43.6 $\pm$ 27.7	37.1 $\pm$ 10.6	50.9 $\pm$ 37.6	.009 <sup>a</sup>
Greatest tumor dimension $\geq$ 40 mm	223	110 (49.3)	52 (44.1)	58 (55.2)	0.096
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No. of fractions	223	1 [1, 10]	1.0	4 [2, 10]	—
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Serum urea pre-SABR, mmol/L	109	9.9 $\pm$ 5.5	11.9 $\pm$ 7.2	9.5 $\pm$ 5.0	.121
Serum creatinine pre-SABR, $\mu$ mol/L	220	130.8 $\pm$ 78.2	132.5 $\pm$ 84.8	128.9 $\pm$ 70.6	.738
eGFR pre-SABR, mL/min <sup>b</sup>	220	59.9 $\pm$ 21.9	66.4 $\pm$ 20.6	52.6 $\pm$ 21.2	< .001 <sup>a</sup>

Siva et al., Cancer. 2018



Siva et al., Cancer. 2018



## 5.2. Fokale Therapie des Nierenzellkarzinoms

### 5.2.1. Ablative Verfahren

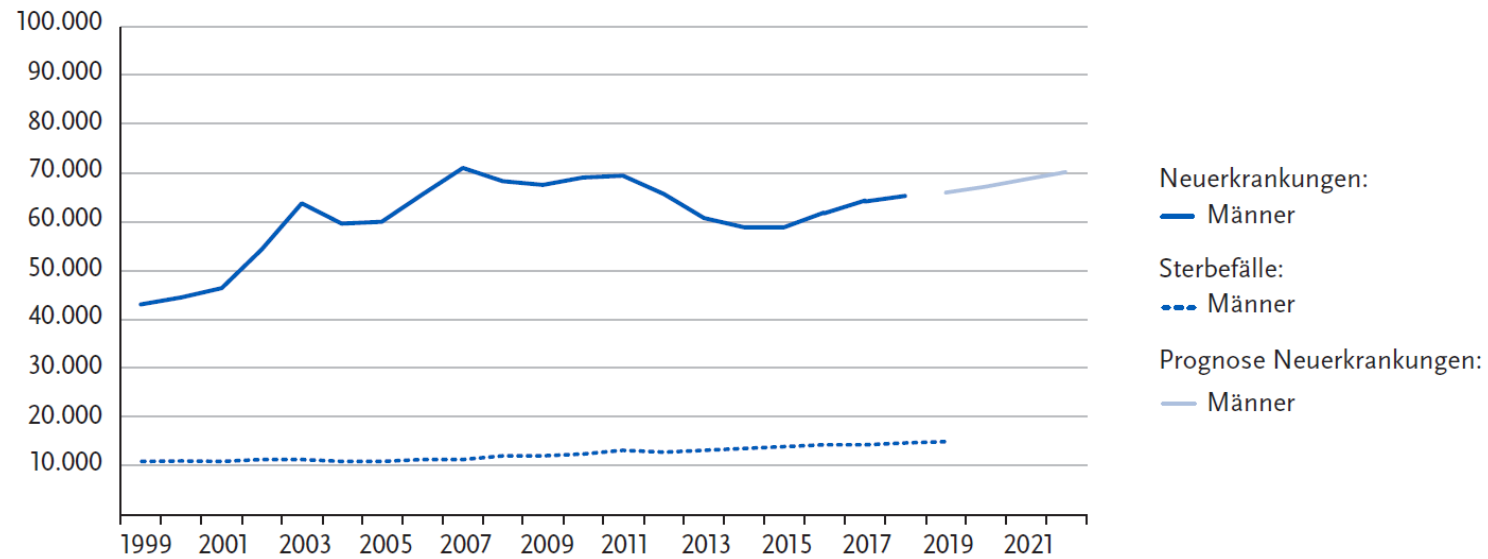
5.4.	Evidenzbasierte Empfehlung	2015
Empfehlungsgrad <b>0</b>	Kryoablation und Radiofrequenzablation können Patienten mit kleinen Nierentumoren und hoher Komorbidität und/oder begrenzter Lebenserwartung angeboten werden.	
Level of Evidence <b>2</b>	Literatur: [143-145]	
	Starker Konsens	

5.5.	Evidenzbasierte Empfehlung	2015
Empfehlungsgrad <b>A</b>	Vor Einsatz ablativer Verfahren soll eine perkutane Nierentumorbiopsie erfolgen.	
Level of Evidence <b>3</b>	Literatur: [143, 146]	
	Konsens	

# 3

## Prostatakarzinom

Abbildung 3.22.1b  
 Absolute Zahl der Neuerkrankungs- und Sterbefälle, ICD-10 C61, Deutschland 1999–2018/2019,  
 Prognose (Inzidenz) bis 2022



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# 3

## Prostatakarzinom - Risikofaktoren

- **Alter**
- **Ethnie**
- **Familiäre Belastung**
- Chronische Entzündungen der Prostata
- Sexuell übertragbare Erkrankungen



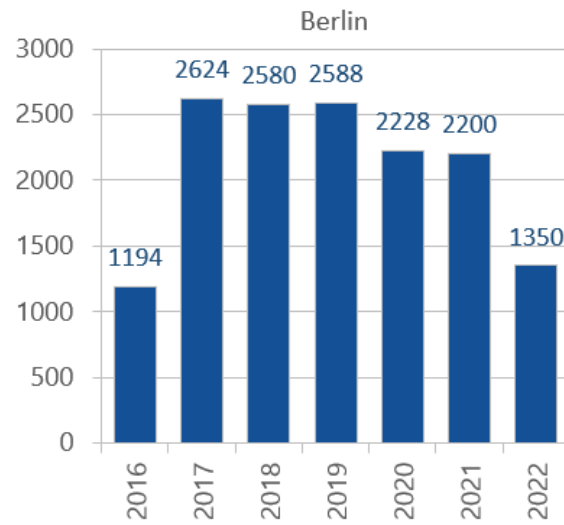


Abbildung 1 Anzahl Neudiagnosen C61 nach Diagnosejahr, Wohnort Berlin, Diagnosejahre 2016-2022, n=14.764

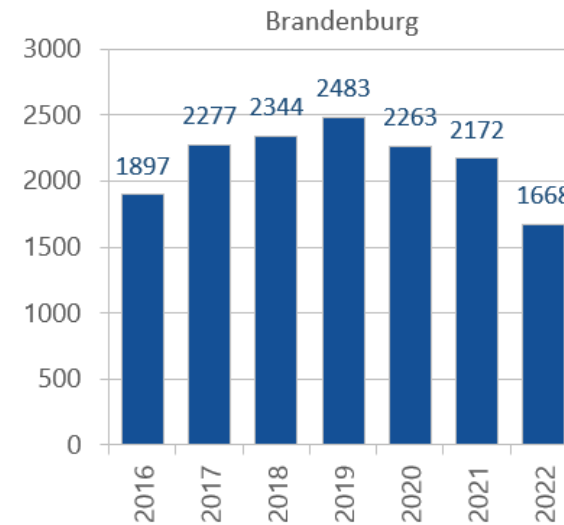


Abbildung 2 Anzahl Neudiagnosen C61 nach Diagnosejahr, Wohnort Brandenburg, Diagnosejahre 2016-2022, n=15.1040

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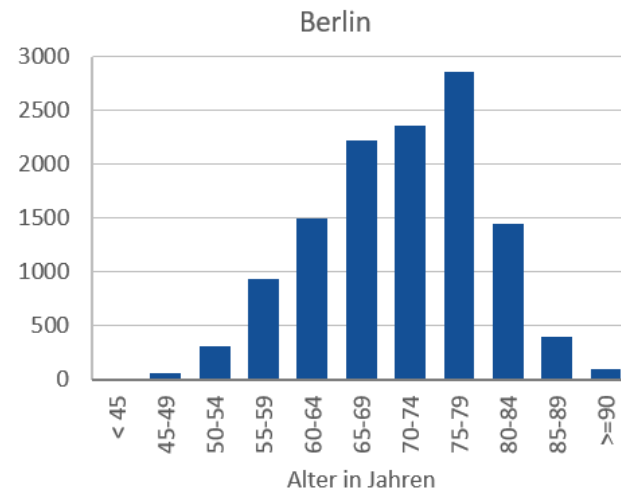


Abbildung 4 Alter bei Neuerkrankung, C61, Wohnort Berlin, Diagnosejahre 2017-2021, n=12.220

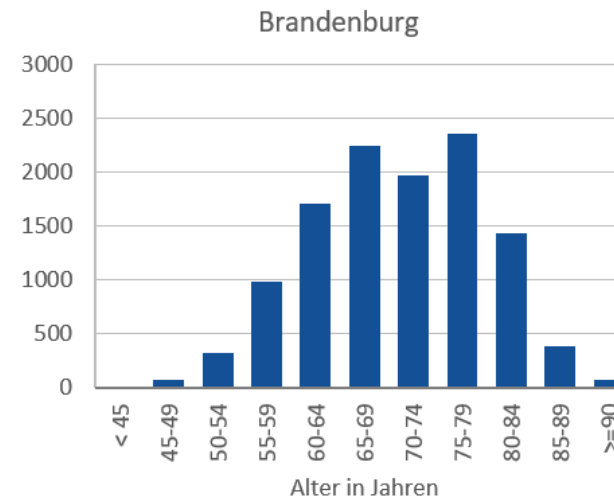


Abbildung 5 Alter bei Neuerkrankung, C61, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=11.539

KKRBB

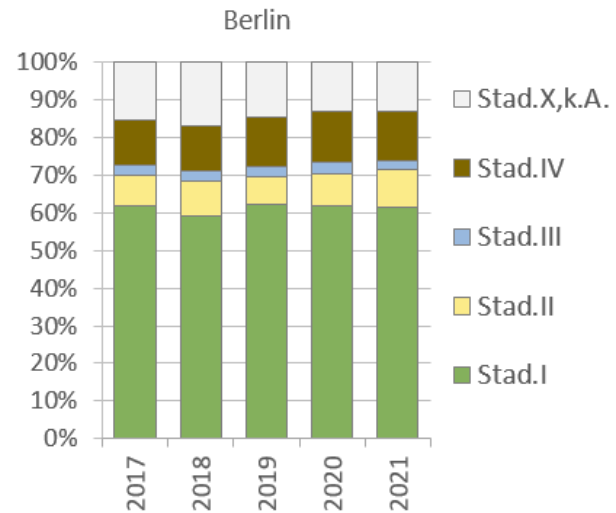


Abbildung 7 Klinisches UICC-Stadium nach Diagnosejahr, C61, Wohnort Berlin, Diagnosejahre 2017-2021, n=10.512

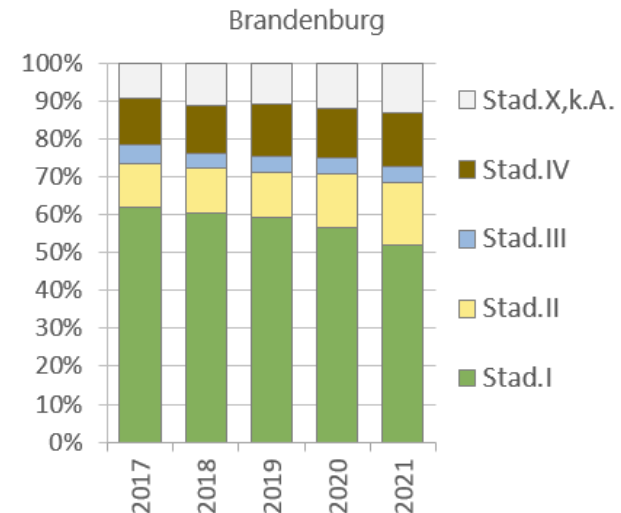


Abbildung 8 Klinisches UICC-Stadium nach Diagnosejahr, C61, Wohnort Brandenburg, Diagnosejahre 2017-2021, n=11.059

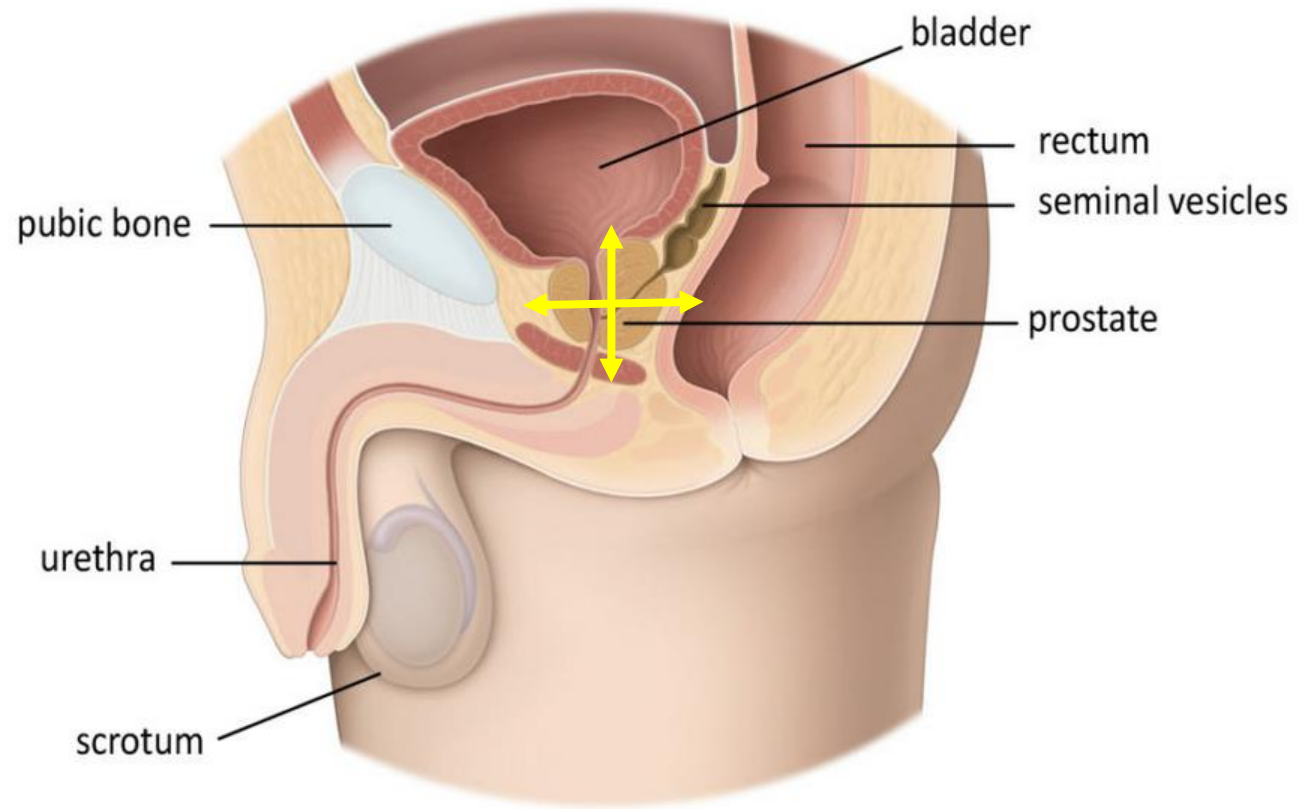
KKRBB

TNM	Ausdehnung	Klinische Einteilung
T1	<p>Klinisch nicht erkennbarer <u>Tumor</u>: Weder tast- noch sichtbar</p> <ul style="list-style-type: none"> <li>• T1a: Prostatakarzinom in &lt;5% des untersuchten Präparats (z.B. Resektionsspäne nach <u>TUR-P</u>)</li> <li>• T1b: Prostatakarzinom in &gt;5% des untersuchten Präparats</li> <li>• T1c: Prostatakarzinom in <u>Stanzbiopsie</u> bei nicht-tastbarem <u>Tumor</u></li> </ul>	Lokal begrenztes Prostatakarzinom
T2	<p>Auf die <u>Prostata</u> beschränkt, Prostatakapself intakt</p> <ul style="list-style-type: none"> <li>• T2a: Befall von &lt;50% eines Seitenlappens</li> <li>• T2b: Befall von &gt;50% eines Seitenlappens</li> <li>• T2c: Befall beider Seitenlappen</li> </ul>	
T3	<p>Extraprostatisches Tumorwachstum, <u>Tumor</u> durchbricht Prostatakapself</p> <ul style="list-style-type: none"> <li>• T3a: Extrakapsuläre Ausbreitung</li> <li>• T3b: Samenblaseninfiltration</li> </ul>	Lokal fortgeschrittenes Prostatakarzinom
T4	<p>Infiltration von Nachbarorganen (über <u>Samenblase</u> hinaus): <u>Harnblase</u>, <u>Rektum</u>, <u>Schließmuskel</u> oder Beckenwand</p>	
N1	<p>Regionärer Lymphknotenbefall ☒</p>	Fortgeschrittenes bzw. metastasiertes Prostatakarzinom
M1	<p>Fernmetastasen</p> <ul style="list-style-type: none"> <li>• M1a: Extraregionäre Lymphknotenmetastasen</li> <li>• M1b: <u>Knochenmetastasen</u></li> <li>• M1c: Andere Fernmetastasen</li> </ul>	

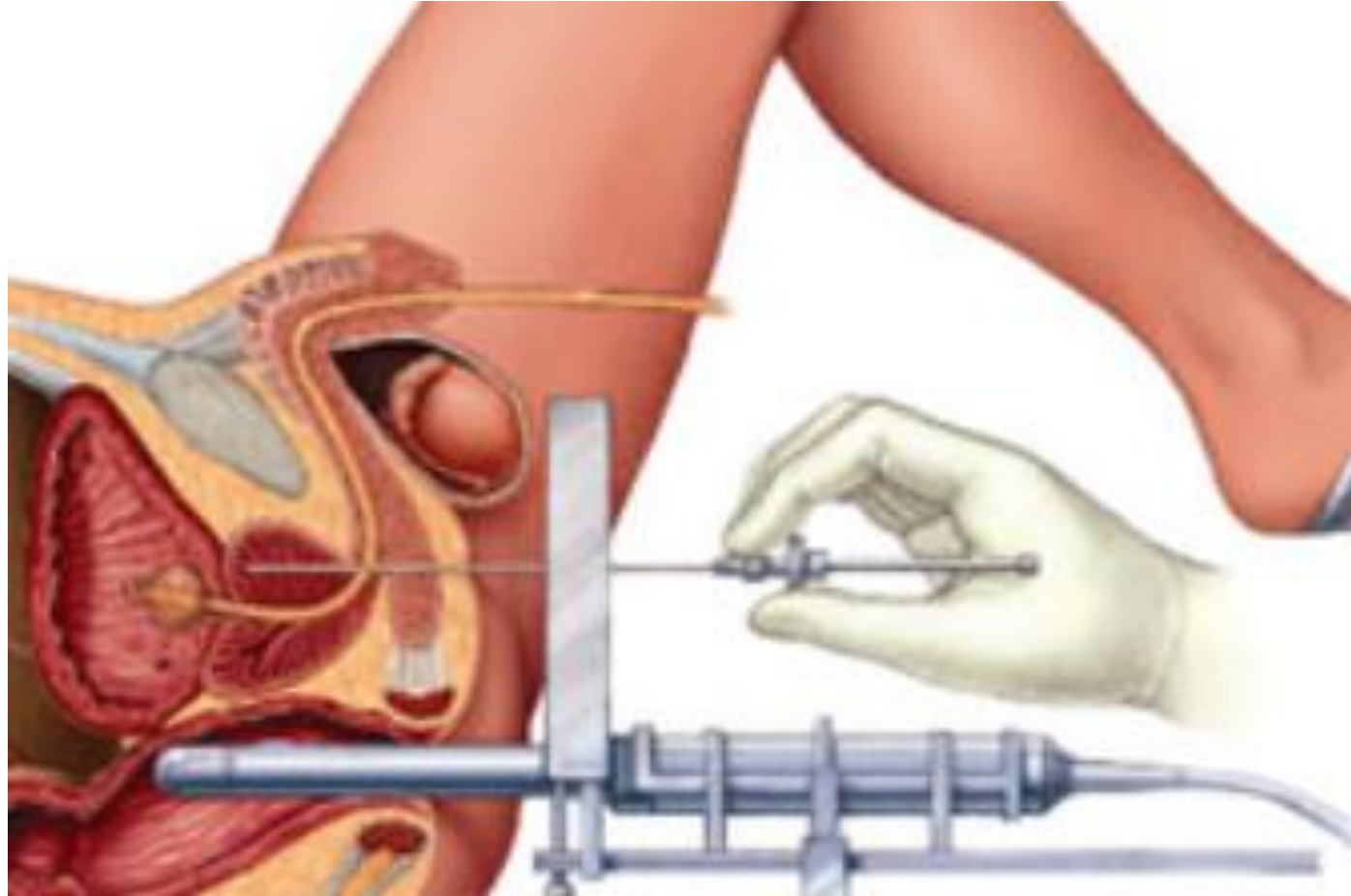
Amboss.de

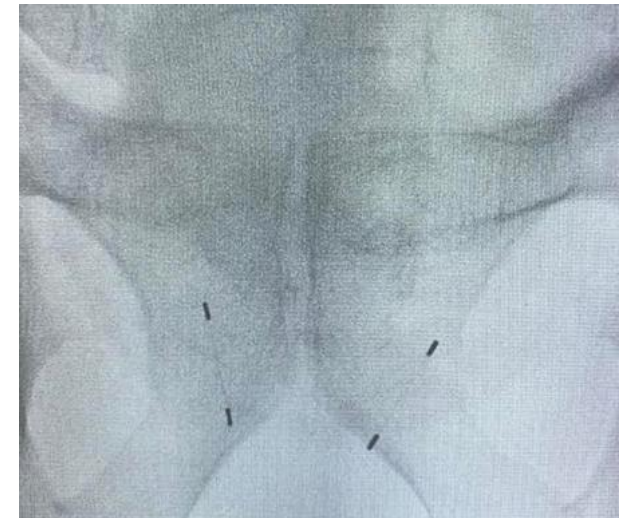
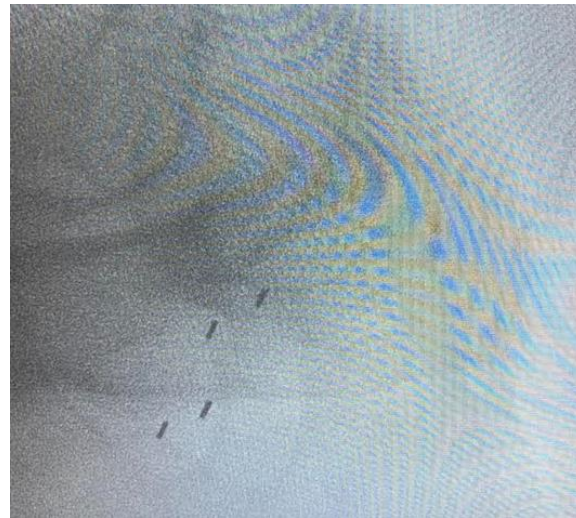
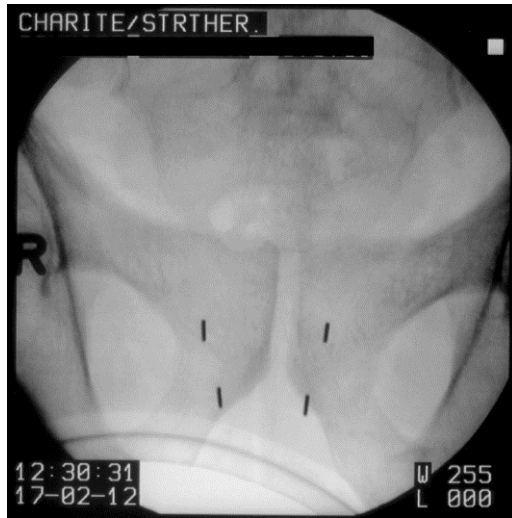
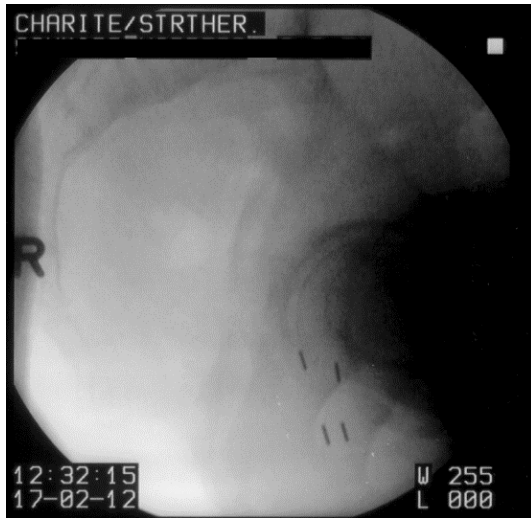
<u>UICC-Stadium</u>	<u>TNM</u>
Stadium I	Bis T2a
Stadium II	T2b oder T2c
Stadium III	T3
Stadium IV	T4 oder N1 oder M1

Amboss.de

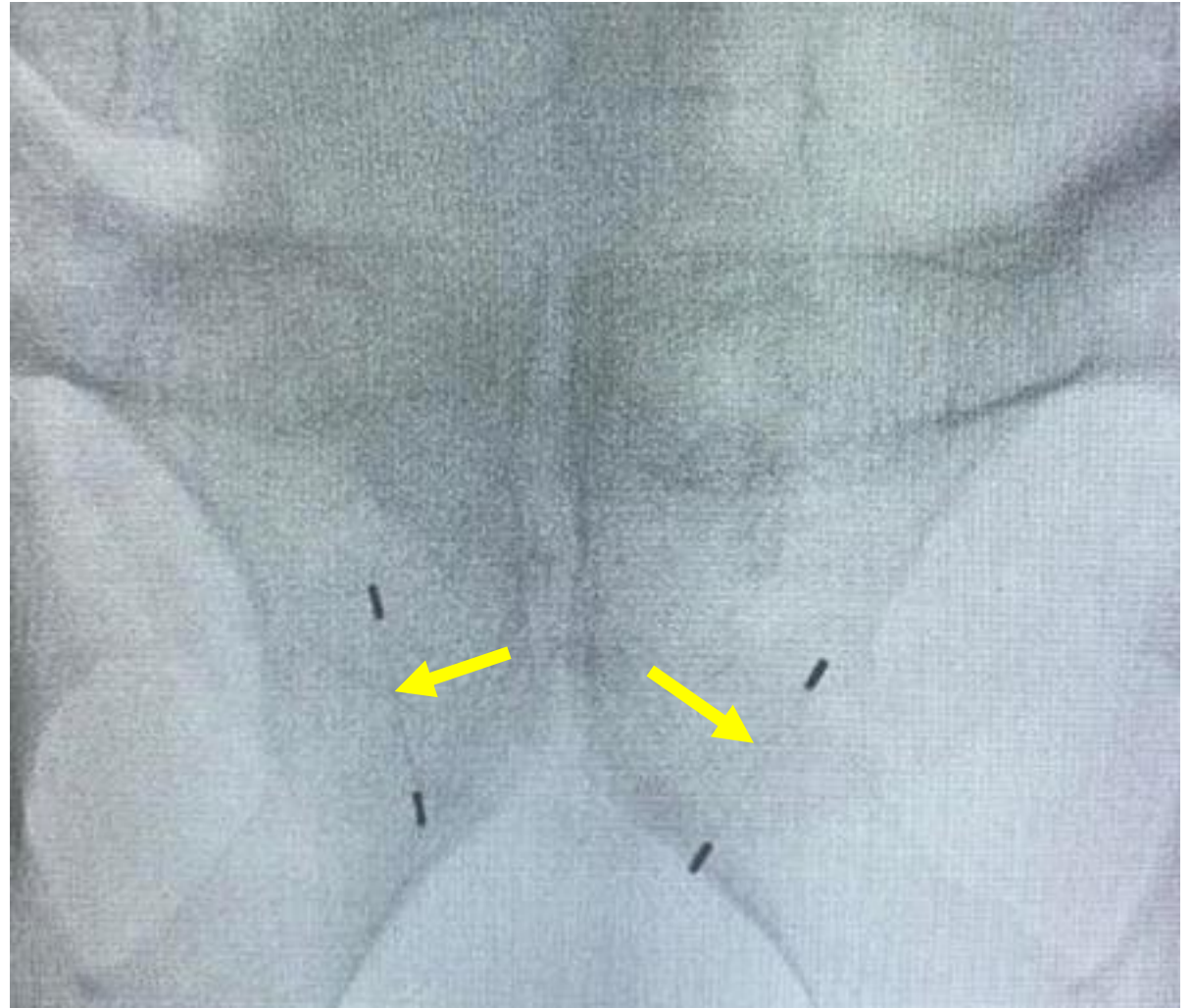
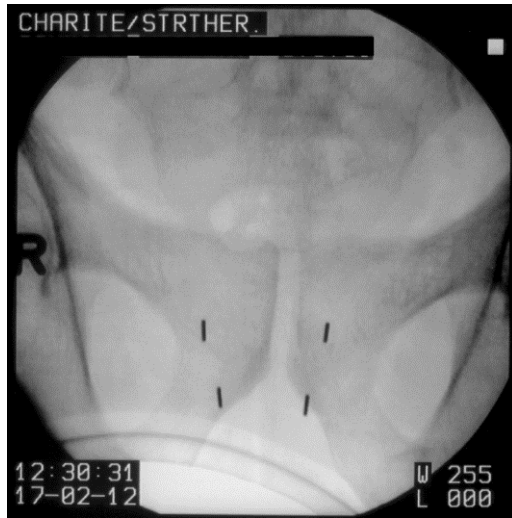
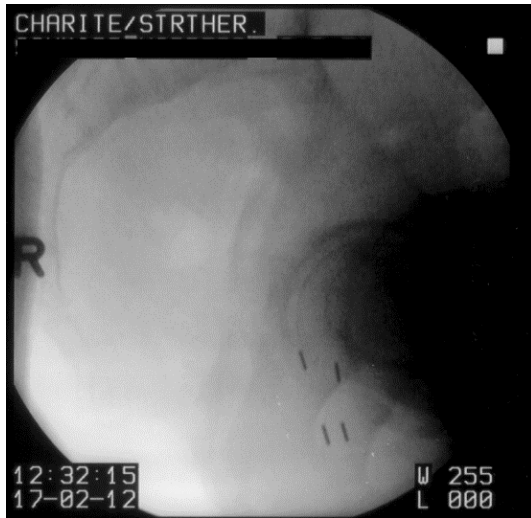


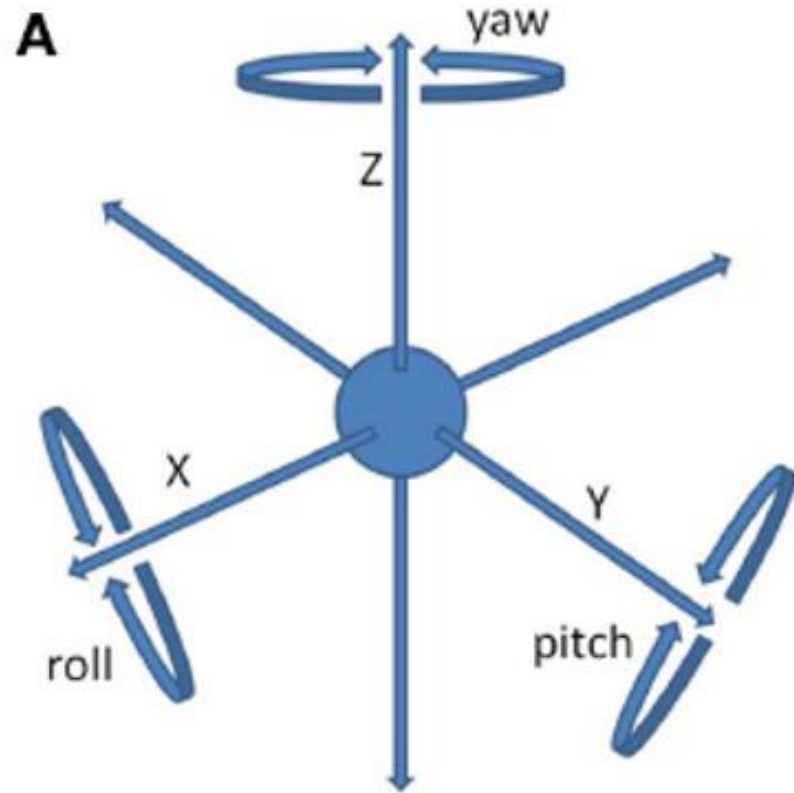
[patients.uroweb.org](http://patients.uroweb.org)



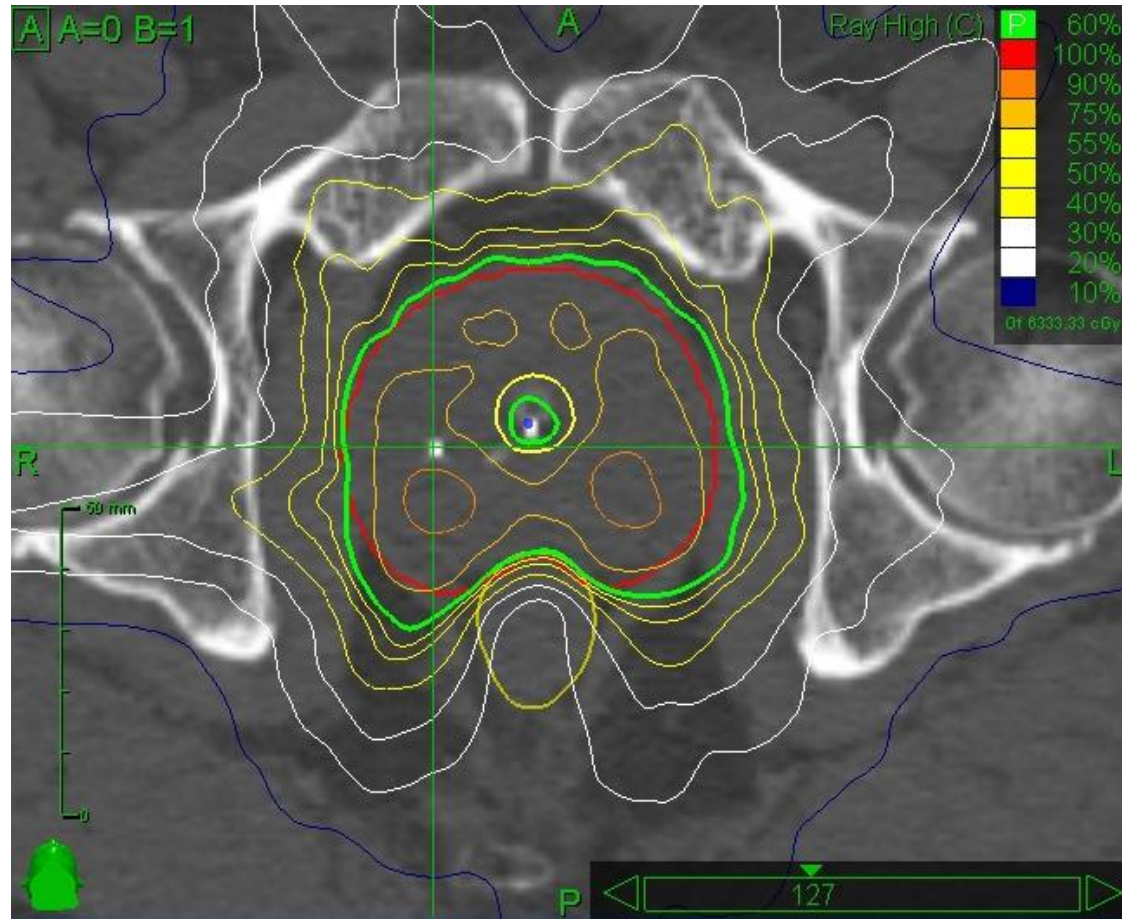








**A: 6D of possible prostate motions**



6000 Patienten

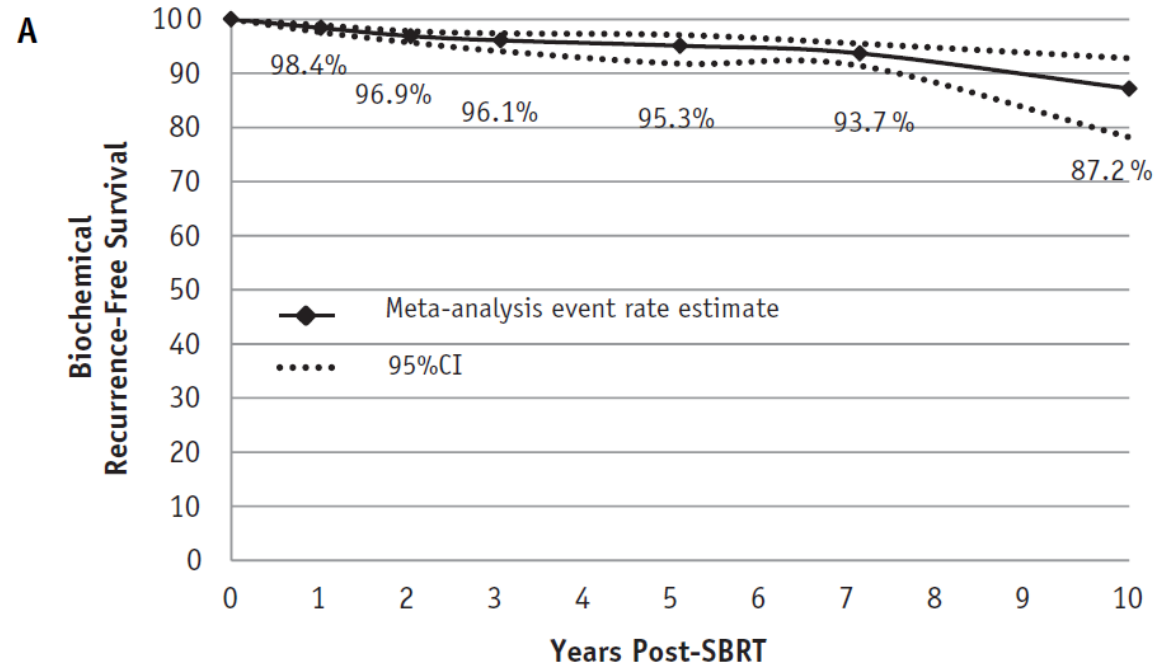
mittlere Nachbeobachtungszeit 3,25 Jahre

# **Stereotactic Body Radiation Therapy for Localized Prostate Cancer: A Systematic Review and Meta-Analysis of Over 6,000 Patients Treated On Prospective Studies**

Jackon et al., IJROBP 2019

6000 Patienten

mittlere Nachbeobachtungszeit 3,25 Jahre

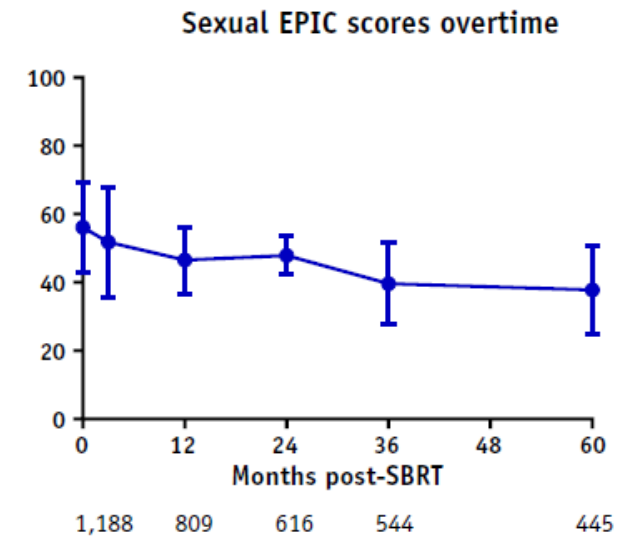
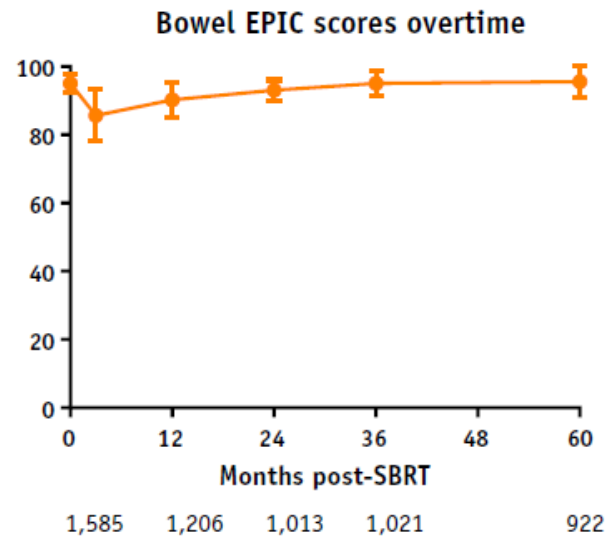
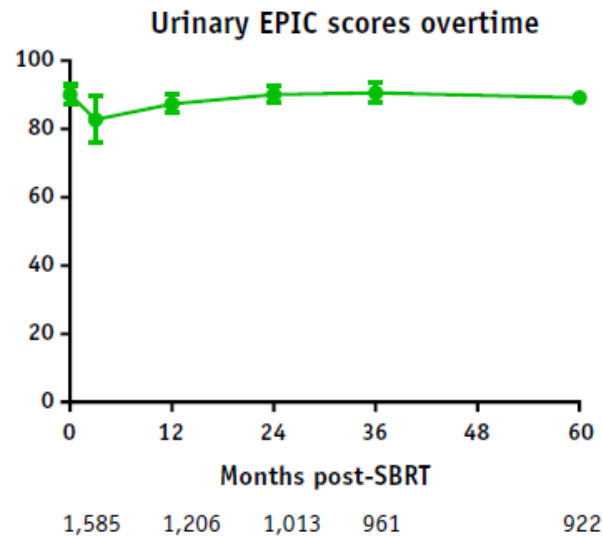


Number at risk	0	1	2	3	5	7	10
Studies	31	23	16	10	2	1	1

Jackon et al., IJROBP 2019

6000 Patienten

mittlere Nachbeobachtungszeit 3,25 Jahre



Jackon et al., IJROBP 2019

# Ultra-hypofractionated versus conventionally fractionated radiotherapy for prostate cancer: 5-year outcomes of the HYPO-RT-PC randomised, non-inferiority, phase 3 trial

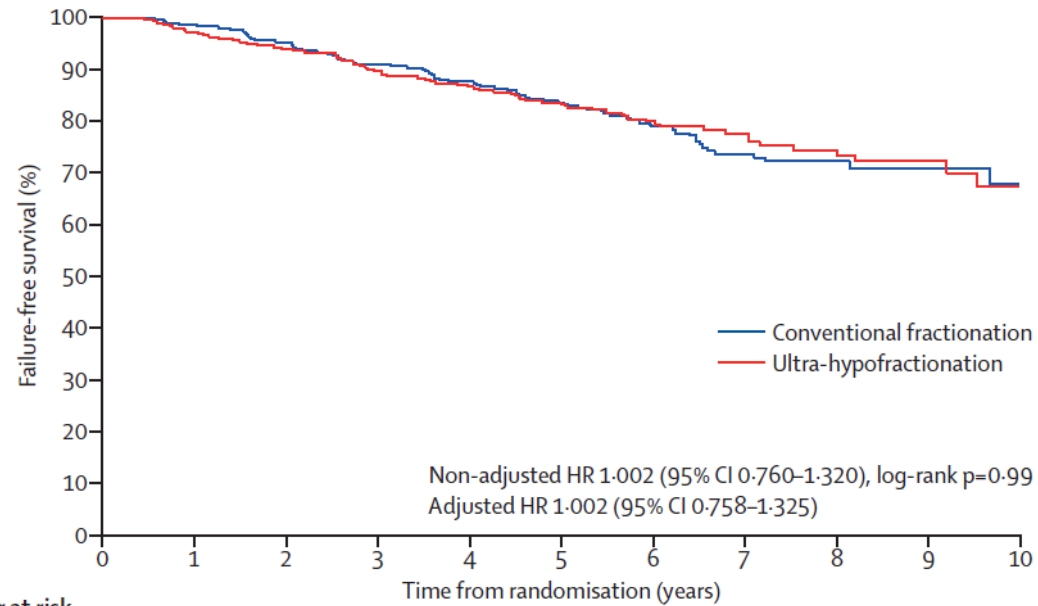
*Anders Widmark, Adalsteinn Gunnlaugsson, Lars Beckman, Camilla Thellenberg-Karlsson, Morten Hoyer, Magnus Lagerlund, Jon Kindblom, Claes Ginman, Bengt Johansson, Kirsten Björnlinger, Mihajl Seke, Måns Agrup, Per Fransson, Björn Tavelin, David Norman, Björn Zackrisson, Harald Anderson, Elisabeth Kjellén, Lars Franzén, Per Nilsson*



Widmark et al., Lancet. 2019

1200 Patienten

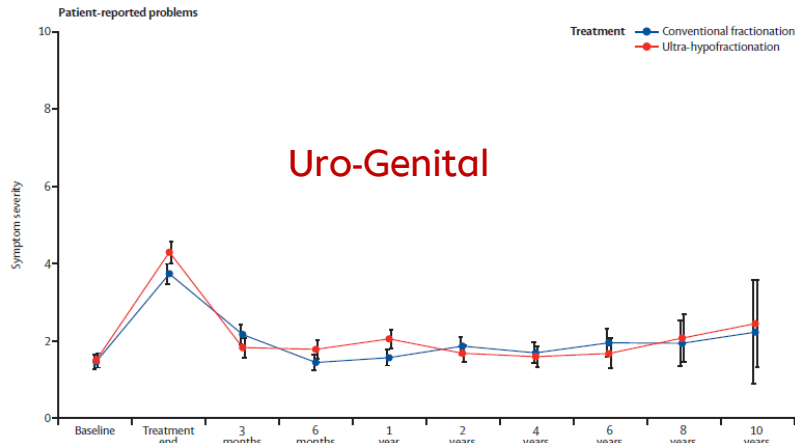
mittlere Nachbeobachtungszeit 5 Jahre



Number at risk (number censored)		0	1	2	3	4	5	6	7	8	9	10
Conventional fractionation	591 (0)	580 (4)	540 (24)	433 (108)	332 (196)	242 (273)	171 (332)	108 (386)	67 (425)	37 (454)	23 (467)	
Ultra-hypofractionation	589 (0)	569 (4)	527 (27)	408 (125)	325 (196)	242 (269)	160 (342)	113 (385)	71 (423)	38 (454)	20 (470)	

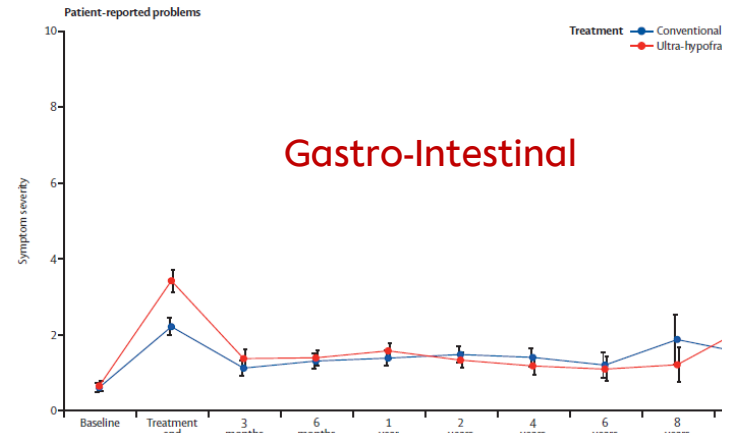
Widmark et al., Lancet. 2019





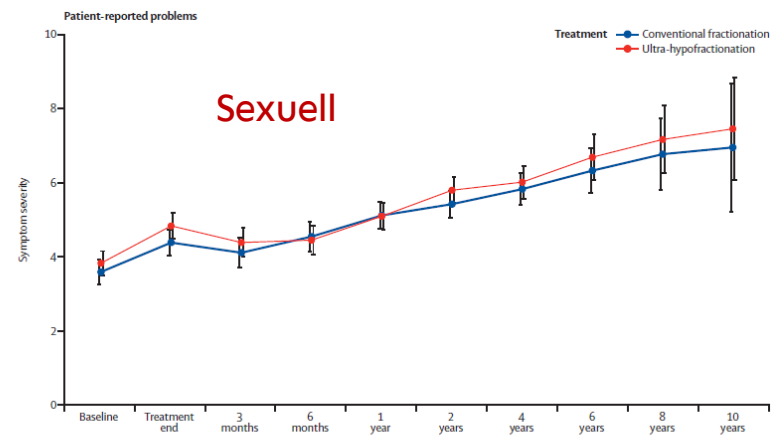
### Uro-Genital

	Baseline	Treatment end	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years
Number assessed										
Conventional fractionation	468	464	336	347	427	404	272	156	59	21
Ultra-hypofractionation	478	439	330	358	425	425	275	143	72	24
p value	0.78	0.0066	0.018	0.16	0.0036	0.18	0.49	0.19	0.98	0.57



### Gastro-Intestinal

	Baseline	Treatment end	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years
Number assessed										
Conventional fractionation	469	463	329	346	423	404	273	152	61	
Ultra-hypofractionation	485	440	335	359	426	427	277	145	73	
p value	0.93	<0.0001	0.26	0.42	0.059	0.32	0.20	0.75	0.035	

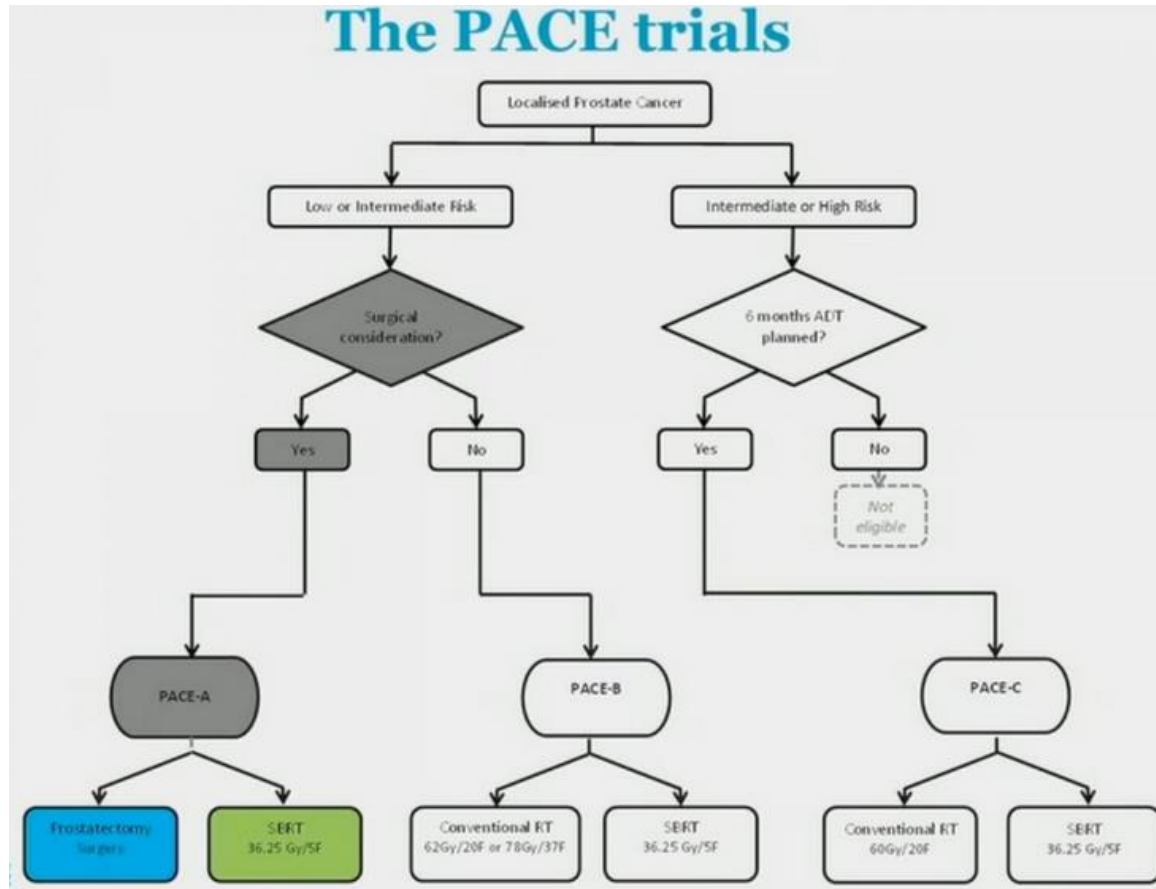


### Sexuell

	Baseline	Treatment end	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years
Number assessed										
Conventional fractionation	453	443	318	331	412	396	266	153	61	21
Ultra-hypofractionation	470	414	319	346	410	405	260	125	66	22
p value	0.31	0.066	0.28	0.62	0.74	0.18	0.57	0.41	0.47	0.90

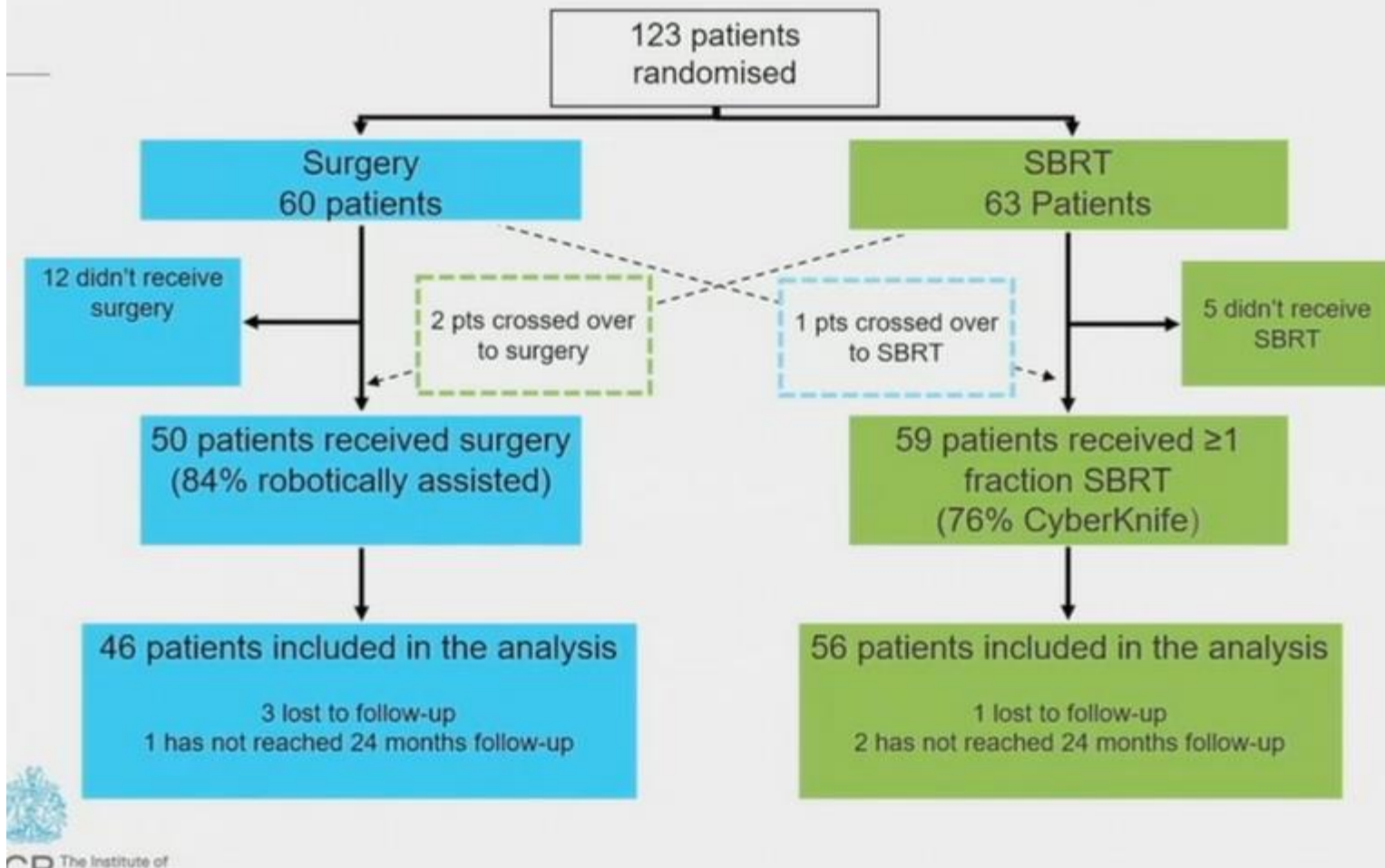
Widmark et al., Lancet. 2019

## The PACE trials

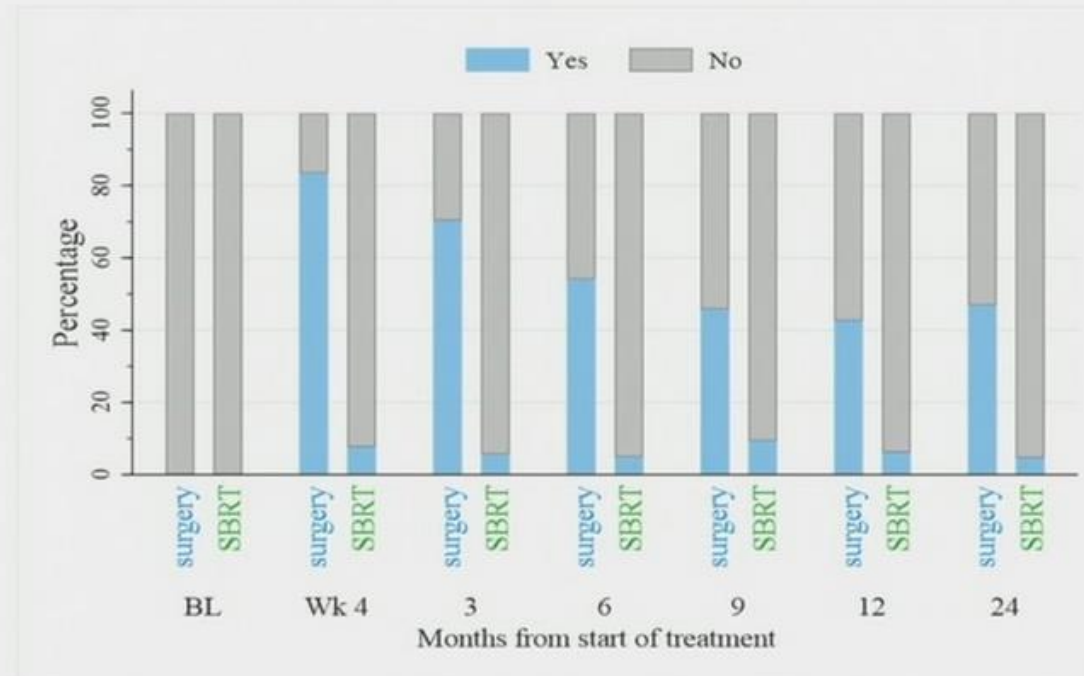


Van As, ASCO GU. 2023

# Consort Flowchart



## Co-primary endpoint: urinary incontinence

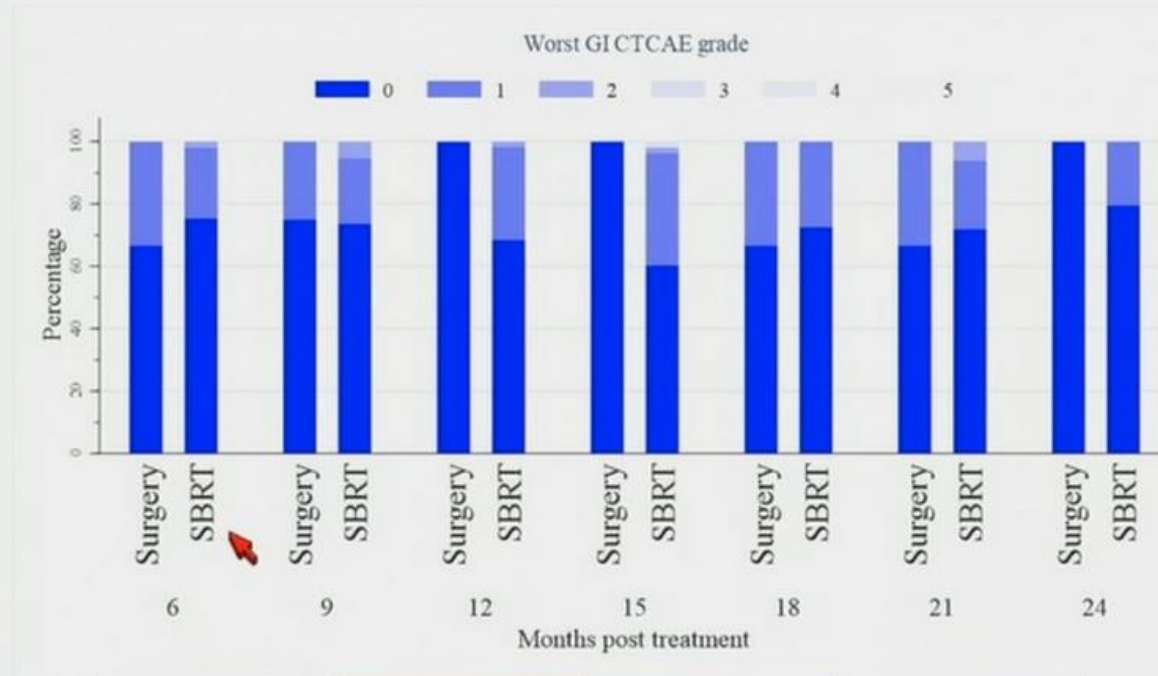


N	Surgery	55	33	42	37	36	41	32
	SBRT	56	53	56	42	43	53	44

Anteil der Patienten, die 2 Jahre nach Therapie noch Vorlagen tragen mussten:

- OP: 15/ 32 (47%)
- Bestrahlung: 2/ 44 (4.5%; p-Wert < 0.001)

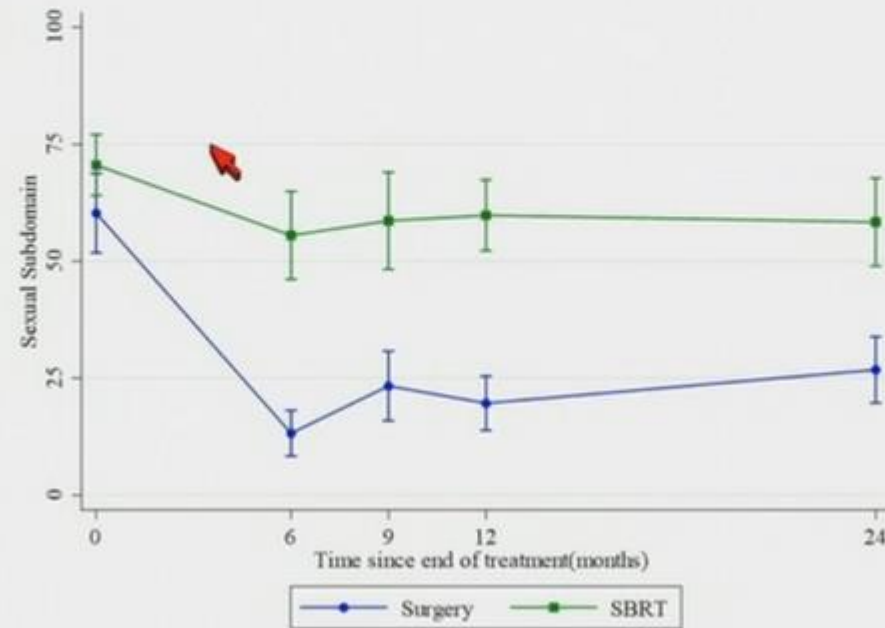
## CTCAE GI toxicity up to 2 years

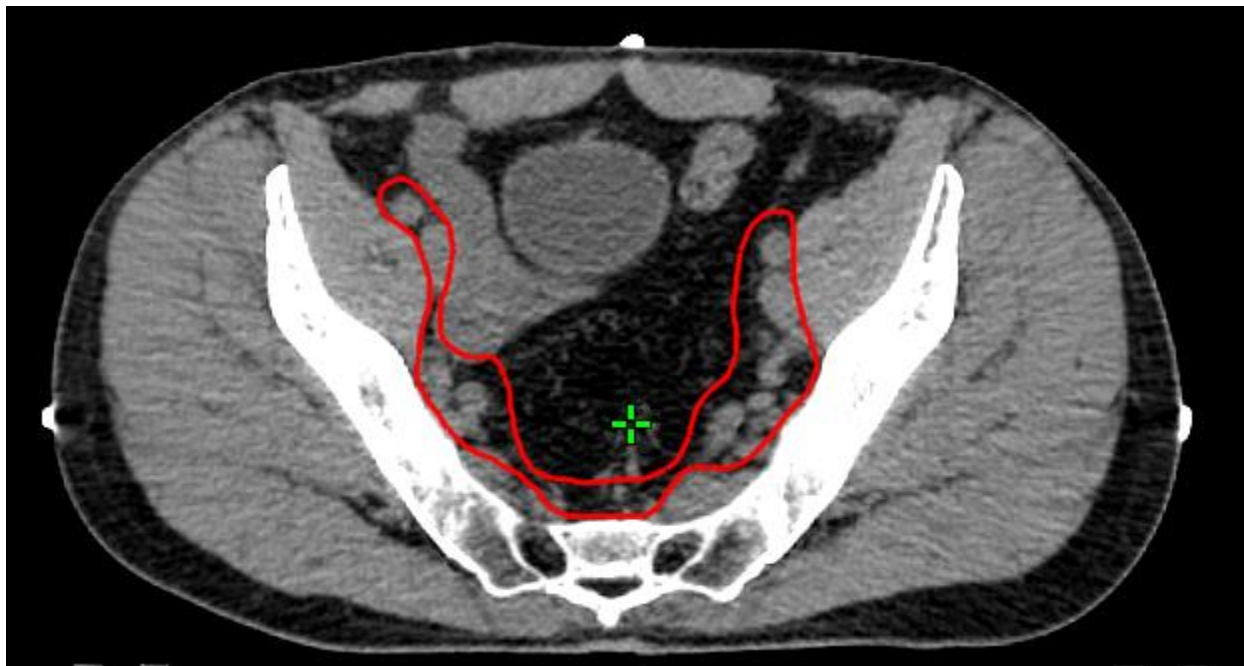


2 years	Surgery N (%)	SBRT N (%)	P-value
Grade 0/1	43 (100)	54 (100)	-
Grade 2+	0	0	

the Institute of  
Cancer Research

## EPIC sexual subdomain scores up to 2 years







TNM	Ausdehnung	Klinische Einteilung
T1	<p>Klinisch nicht erkennbarer <u>Tumor</u>: Weder tast- noch sichtbar</p> <ul style="list-style-type: none"> <li>• T1a: Prostatakarzinom in &lt;5% des untersuchten Präparats (z.B. Resektionsspäne nach <u>TUR-P</u>)</li> <li>• T1b: Prostatakarzinom in &gt;5% des untersuchten Präparats</li> <li>• T1c: Prostatakarzinom in <u>Stanzbiopsie</u> bei nicht-tastbarem <u>Tumor</u></li> </ul>	Lokal begrenztes Prostatakarzinom
T2	<p>Auf die <u>Prostata</u> beschränkt, Prostatakapself intakt</p> <ul style="list-style-type: none"> <li>• T2a: Befall von &lt;50% eines Seitenlappens</li> <li>• T2b: Befall von &gt;50% eines Seitenlappens</li> <li>• T2c: Befall beider Seitenlappen</li> </ul>	
T3	<p>Extraprostatisches Tumorwachstum, <u>Tumor</u> durchbricht Prostatakapself</p> <ul style="list-style-type: none"> <li>• T3a: Extrakapsuläre Ausbreitung</li> <li>• T3b: Samenblaseninfiltration</li> </ul>	Lokal fortgeschrittenes Prostatakarzinom
T4	<p>Infiltration von Nachbarorganen (über <u>Samenblase</u> hinaus): <u>Harnblase</u>, <u>Rektum</u>, <u>Schließmuskel</u> oder Beckenwand</p>	
N1	<p>Regionärer Lymphknotenbefall ☒</p>	Fortgeschrittenes bzw. metastasiertes Prostatakarzinom
M1	<p>Fernmetastasen</p> <ul style="list-style-type: none"> <li>• M1a: Extraregionäre Lymphknotenmetastasen</li> <li>• M1b: <u>Knochenmetastasen</u></li> <li>• M1c: Andere Fernmetastasen</li> </ul>	

Amboss.de

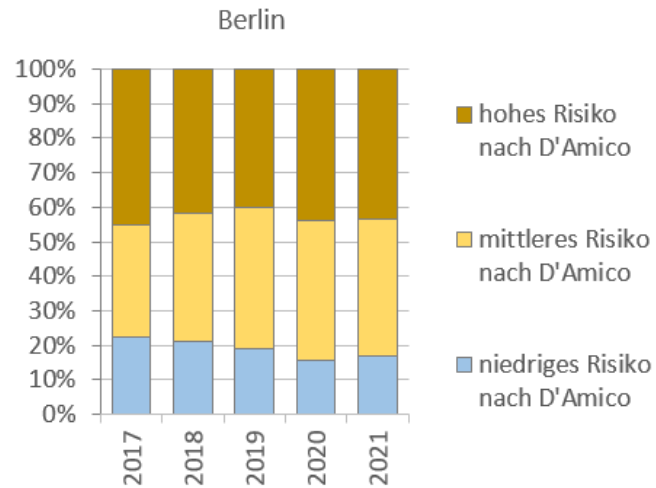


Abbildung 20 Risikoeinteilung nach D'Amico, lokal begrenzte Prostatakarzinome, Wohnort Berlin, Diagnosejahre 2017-2021, n=5.211

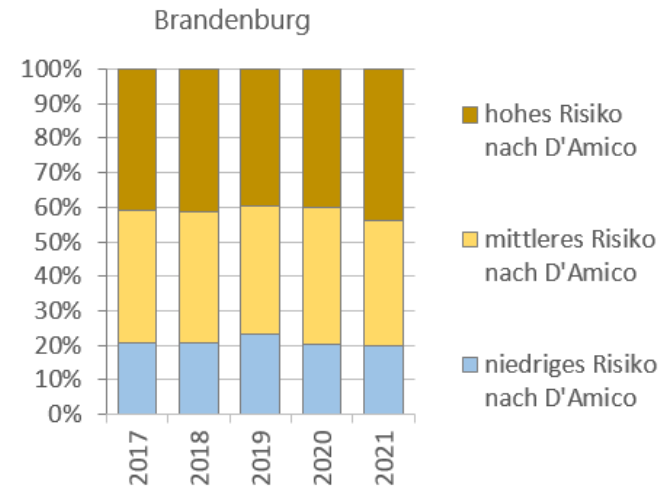
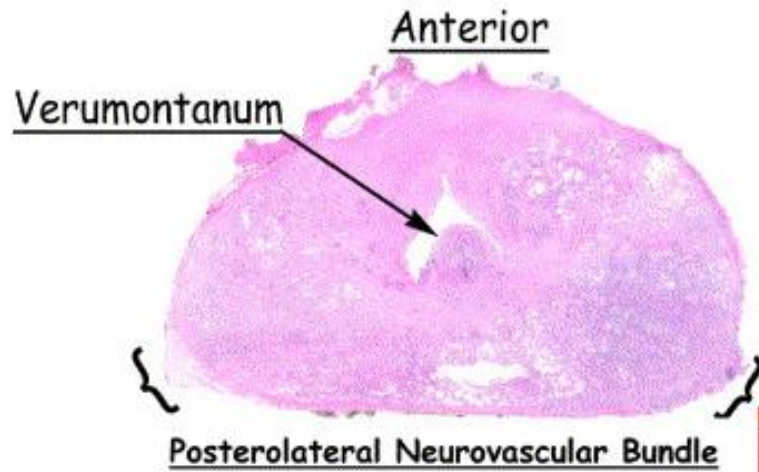


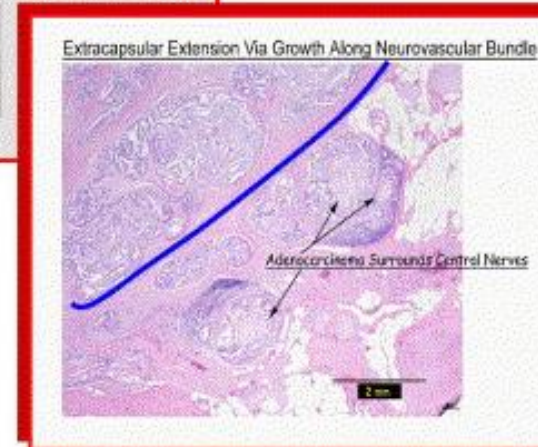
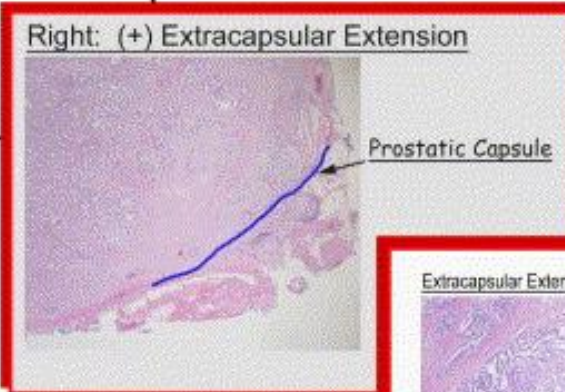
Abbildung 21 Risikoeinteilung nach D'Amico, lokal begrenzte Prostatakarzinome, Wohnort Berlin, Diagnosejahre 2017-2021, n=6.059

KKRBB

# Whole Mount Section



frühe extra-kapsuläre  
Extension (ECE)



Kenneth Chao et al., IJROBP 2006



Memorial Sloan Kettering  
Cancer Center

# Prostate Cancer Nomograms

<https://www.mskcc.org/nomograms/prostate>

## Extent of Disease Probability

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Each extent-of-disease probability percentage is an independent prediction. We therefore would not expect these percentages to equal 100.

 ORGAN-CONFINED DISEASE	14%
 EXTRACAPSULAR EXTENSION	82%
 LYMPH NODE INVOLVEMENT	28%
 SEMINAL VESICLE INVASION	30%

<https://www.mskcc.org/nomograms/prostate>

original reports

# Prostate-Only Versus Whole-Pelvic Radiation Therapy in High-Risk and Very High-Risk Prostate Cancer (POP-RT): Outcomes From Phase III Randomized Controlled Trial

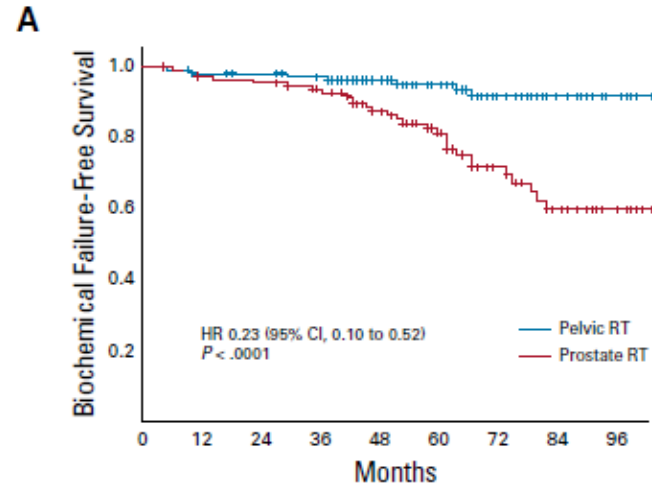
Vedang Murthy, MD<sup>1</sup>; Priyamvada Maitre, MD<sup>1</sup>; Sadhana Kannan, MSc<sup>2</sup>; Gitanjali Panigrahi, MSc<sup>1</sup>; Rahul Krishnatry, MD<sup>1</sup>; Ganesh Bakshi, MCh<sup>3</sup>; Gagan Prakash, DNB<sup>3</sup>; Mahendra Pal, DNB<sup>3</sup>; Santosh Menon, MD<sup>4</sup>; Reena Phurailatpam, MSc<sup>5</sup>; Smruti Mokal, MSc<sup>2</sup>; Dipika Chaurasiya, BSc<sup>1</sup>; Palak Popat, DNB<sup>6</sup>; Nilesh Sable, MD<sup>6</sup>; Archi Agarwal, DNB<sup>7</sup>; Venkatesh Rangarajan, DNB<sup>7</sup>; Amit Joshi, DM<sup>8</sup>; Vanita Noronha, DM<sup>8</sup>; Kumar Prabhash, DM<sup>8</sup>; and Umesh Mahantshetty, MD<sup>1</sup>

Murthy et al., J Clin Oncol. 2021

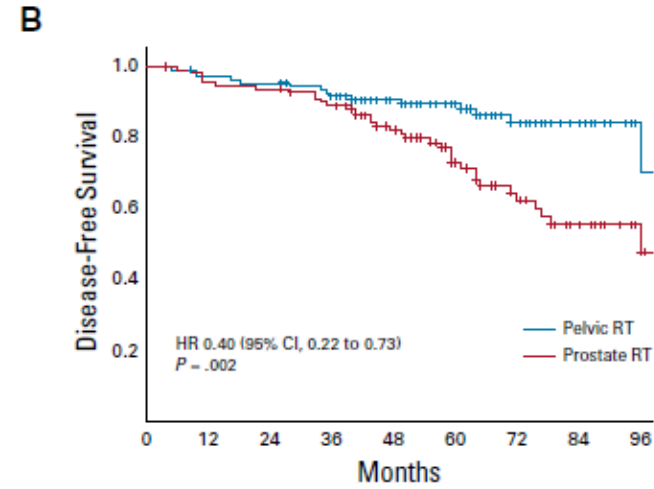
**TABLE 1.** Baseline Characteristics

Characteristic	All Patients (N = 222), N (%)	PORT (n = 112), N (%)	WPRT (n = 110), N (%)
Median age, years	66	66	66
Median PSA, ng/mL	28.2	27.4	29.9
Nodal risk, % <sup>a</sup>			
≤ 40%	119 (53.6)	60 (53.6)	59 (53.6)
> 40%	103 (46.4)	52 (46.4)	51 (46.4)
Gleason grade group			
1	22 (9.9)	11 (9.8)	11 (10)
2	38 (17.1)	20 (17.9)	18 (16.4)
3	53 (23.9)	25 (22.3)	28 (25.5)
4	53 (23.9)	26 (23.2)	27 (24.5)
5	56 (25.3)	30 (26.8)	26 (23.6)
ADT			
Orchiectomy	42 (18.9)	26 (23.2)	16 (14.5)
Medical	180 (81.1)	86 (76.8)	94 (85.5)
History of TURP			
Yes	60 (27)	30 (26.8)	30 (27.3)
No	162 (73)	82 (73.2)	80 (72.7)
Tumor stage			
T1	2 (0.9)	1 (0.9)	1 (0.9)
T2	46 (20.7)	19 (17)	27 (24.5)
T3a	70 (31.5)	38 (33.9)	32 (29.1)
T3b	86 (38.7)	44 (39.3)	42 (38.2)
T4	18 (8.1)	10 (8.9)	8 (7.3)

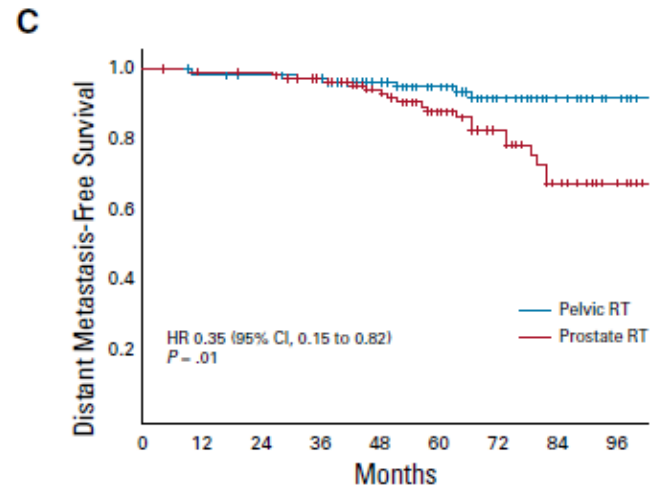
Murthy et al., J Clin Oncol. 2021



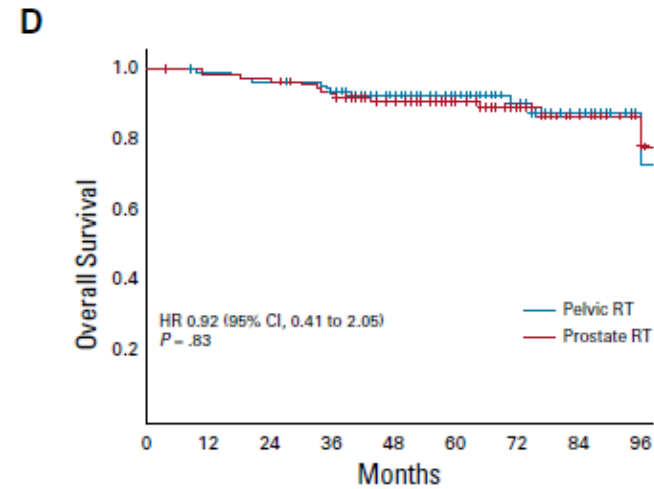
No. at risk		0	12	24	36	48	60	72	84	96
WPRT	110	106	104	100	81	64	40	20	10	
PORT	112	106	104	97	77	55	34	22	10	



No. at risk		0	12	24	36	48	60	72	84	96
WPRT	110	107	105	102	82	66	42	20	10	
PORT	112	108	106	99	79	56	39	19	10	



No. at risk		0	12	24	36	48	60	72	84	96
WPRT	110	107	105	100	80	64	41	20	9	
PORT	112	108	107	99	80	56	39	21	10	



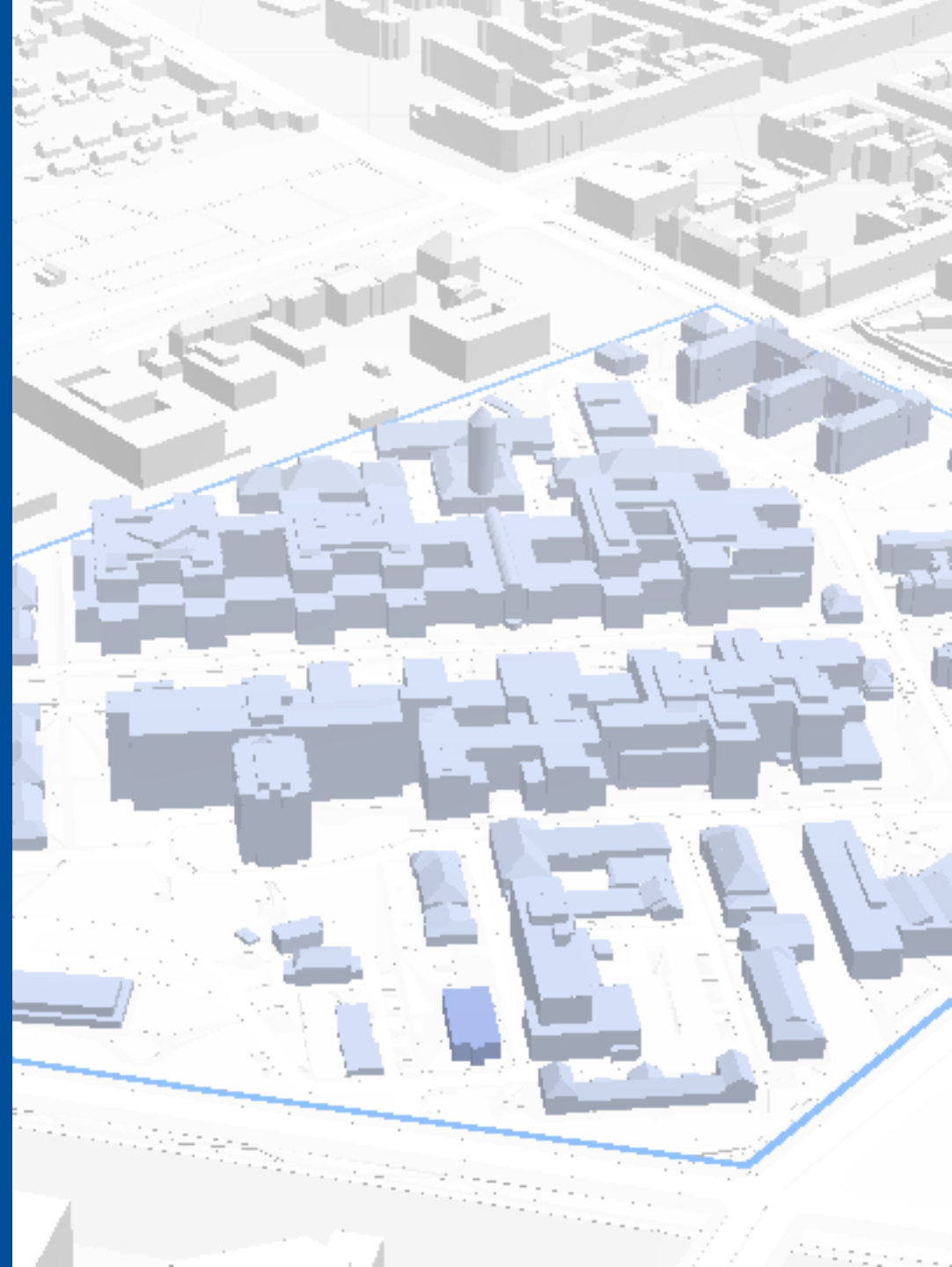
No. at risk		0	12	24	36	48	60	72	84	96
WPRT	110	108	105	101	83	67	43	21	10	
PORT	112	110	108	102	85	65	47	29	15	



**TABLE 2.** Cumulative Late Toxicity (RTOG)

<b>RTOG Grade</b>	<b>All Patients (N = 222), N (%)</b>	<b>P0RT (n = 112), N (%)</b>	<b>WPRT (n = 110), N (%)</b>	<b>P (grade 0-1 v grade ≥ II)</b>
<b>GU</b>				
0	85 (38.3)	45 (40.2)	40 (36.4)	.02
I	105 (47.3)	57 (50.9)	48 (43.6)	
II	28 (12.6)	8 (7.1)	20 (18.2)	
III	4 (1.8)	2 (1.8)	2 (1.8)	
<b>GI</b>				
0	138 (62.2)	74 (66.1)	64 (58.2)	.28
I	70 (31.5)	33 (29.5)	37 (33.6)	
II	12 (5.4)	5 (4.5)	7 (6.4)	
III	2 (0.9)	0 (0)	2 (1.8)	

# Zusammenfassung



# Zusammenfassung

Die Alternativen werden immer attraktiver



Vielen Dank für die Aufmerksamkeit!