

# Focal Therapy – A Paradigm Shift

**Art Rastinehad, DO**

Vice Chairman, Department of Urology  
Lenox Hill Hospital  
System Director, Prostate Cancer  
Northwell Health





## DISCLOSURES

Invivo, Philips Health Care:

- Research Equipment / Consultant (current)
- Nanospectra
- National PI / Consultant (through 2023)
- Patent 3D Navigation 2/20/24

# Changing Prostate Cancer Care

## FOCAL PROSTATE CANCER THERAPY

### WHY?

OVER DIAGNOSIS AND OVER TREATMENT

All Current Therapies Have Risk

- Sexual Side Effects
- Urinary Incontinence

Can You  
Avoid  
Surgery?



OUTPATIENT / SAME DAY TREATMENT  
LOWER RISK SEXUAL/URINARY SIDE EFFECTS  
NO CATHETER

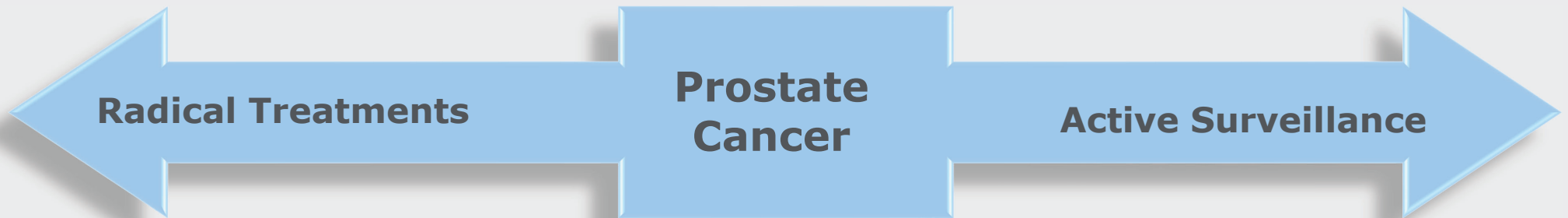
DURABILITY  
CANCER CONTROL



# Treatment Options for Localized Prostate Cancer

Certainty of Cancer Control

Low risk of Side-effects



## Problems

Incontinence (5-20%)  
Impotence (30-60%)  
Rectal toxicity (5-10%)  
Cost / Over-treatment

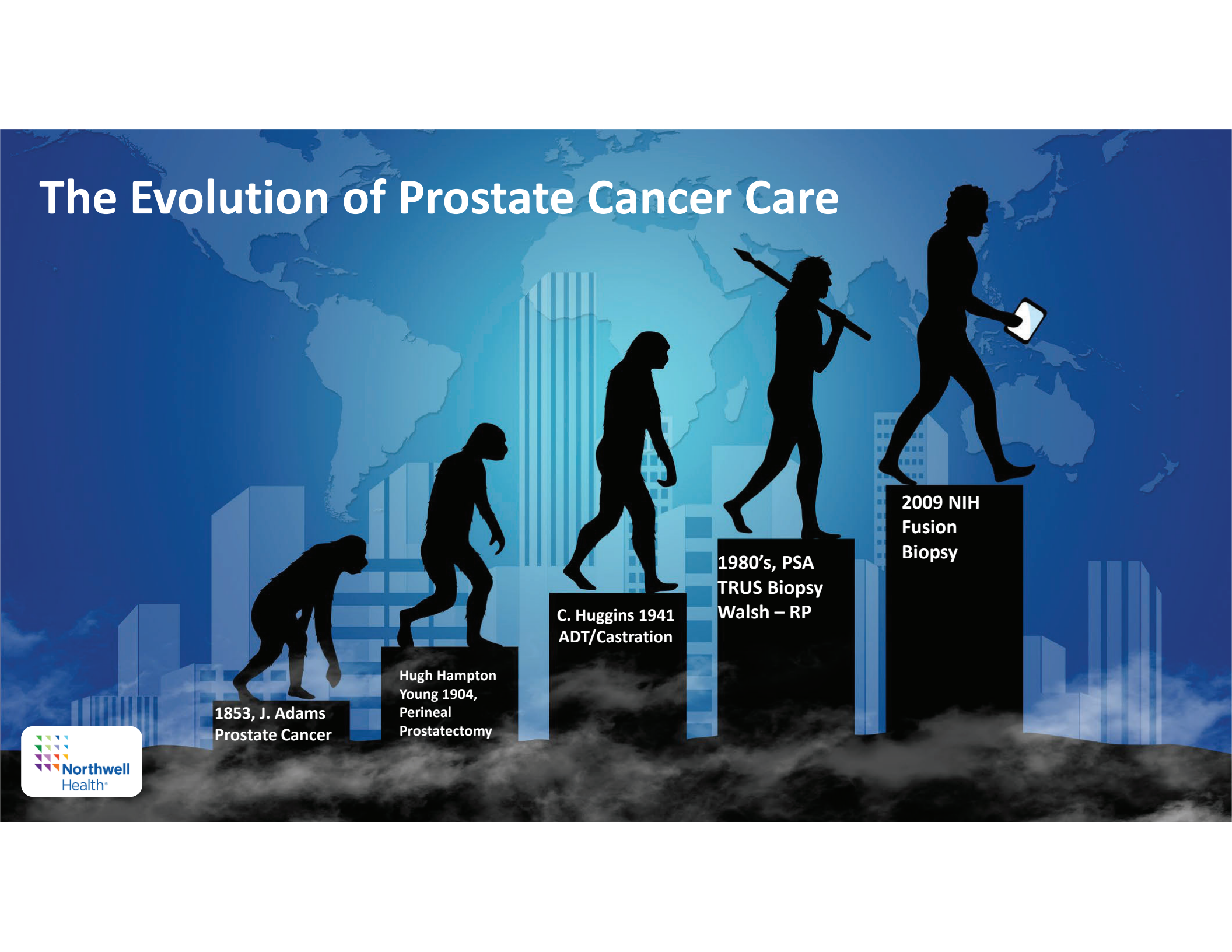


**FOCAL**

## Problems

Cancer Progression  
Psychological Burden  
Surveillance Burden  
Surveillance Cost

# The Evolution of Prostate Cancer Care



1853, J. Adams  
Prostate Cancer

Hugh Hampton  
Young 1904,  
Perineal  
Prostatectomy

C. Huggins 1941  
ADT/Castration

1980's, PSA  
TRUS Biopsy  
Walsh – RP

2009 NIH  
Fusion  
Biopsy



# Guidelines Overview (2022–2025)



## AUA

Ablation may be considered  
in select, well-informed  
patients



## NCCN 2024

Focal Therapy GG2/3 on Ideally on  
on trial, not routine;  
HIFU/Cryo only Cat 2B salvage after RT  
after RT



## EAU 2024

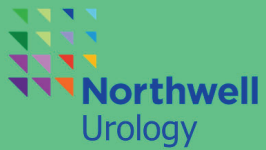
Focal therapy is not standard of care; can be  
can be considered in select patients within  
within clinical trials or registries with  
structured follow-up.

**Focal therapy remains investigational, best if in  
trials/registries, with the best rationale in select  
intermediate-risk disease.**

*Low-risk disease should remain on active surveillance.*

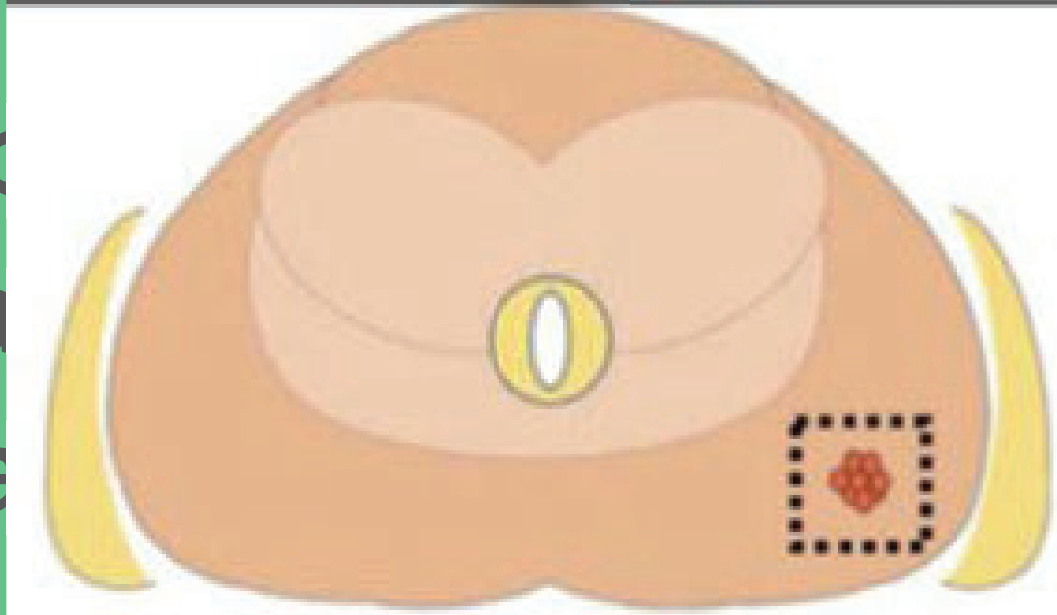


Typical  
Treatment  
Parameters



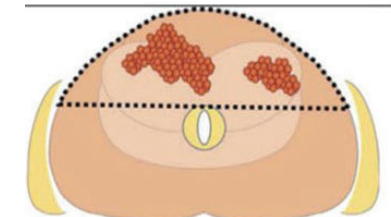
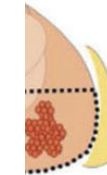
Tumor + Margin = Focal Therapy

Focal therapy of prostate

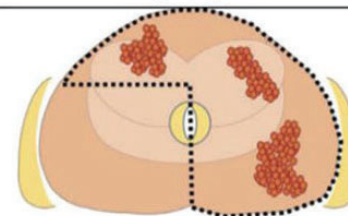


 = Cancerous lesion

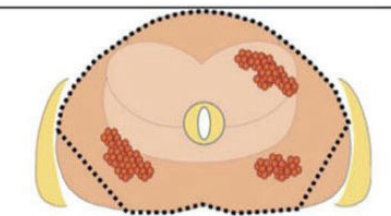
of prostate



Hemiablation  
(anterior)



Hockey Stick



Subtotal ablation



# Imaging & Planning



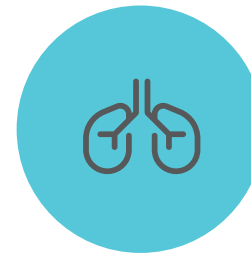
## Multiparametric MRI (mpMRI)

Foundation for focal therapy planning - provides detailed anatomical and functional information about the prostate



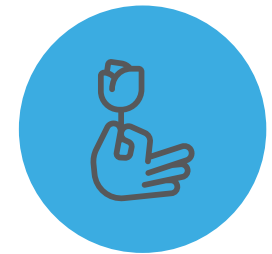
## Targeted Biopsies

Biopsy of MRI-visible lesions to confirm the location and grade of the cancer



## Systematic Biopsy

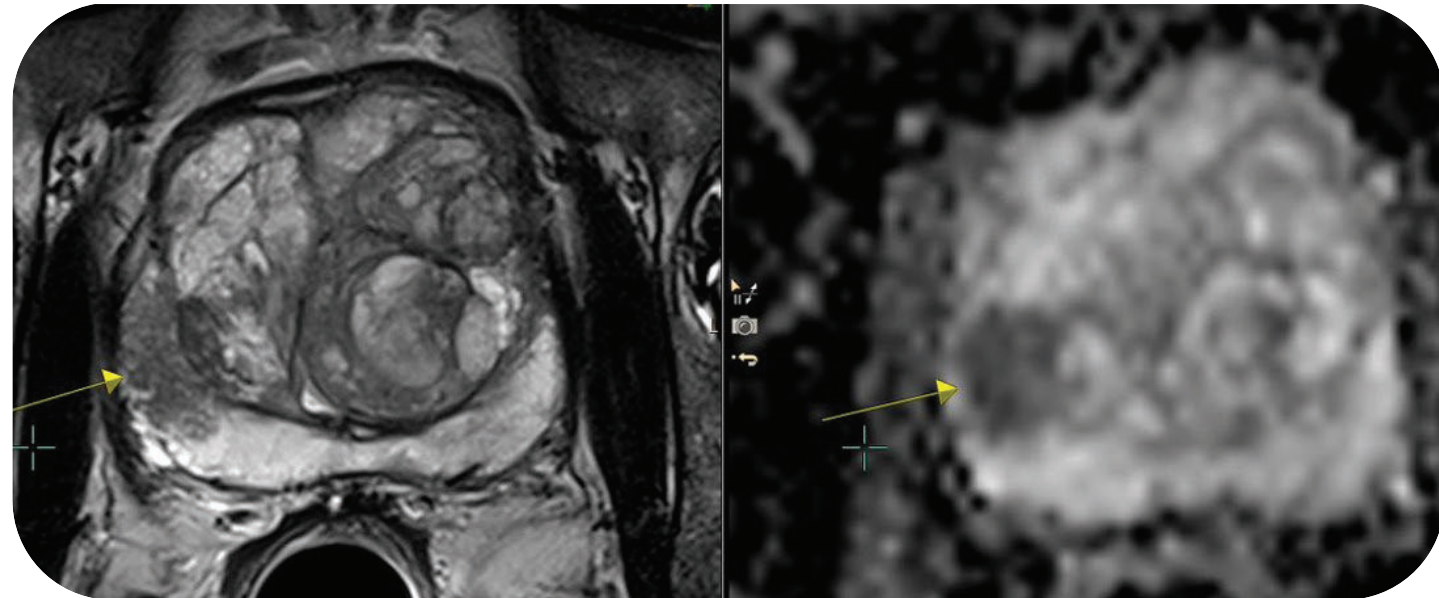
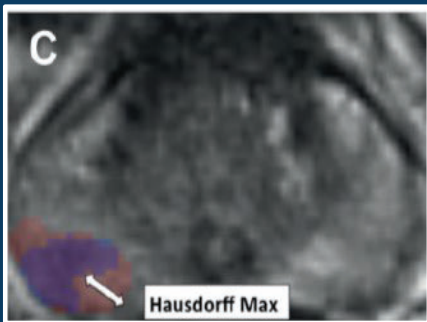
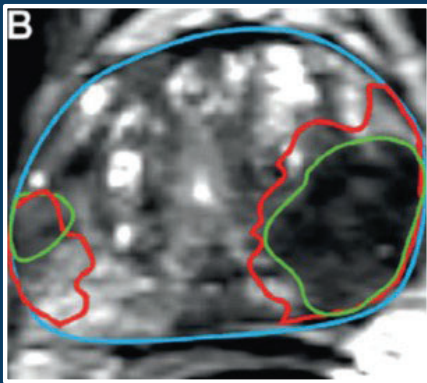
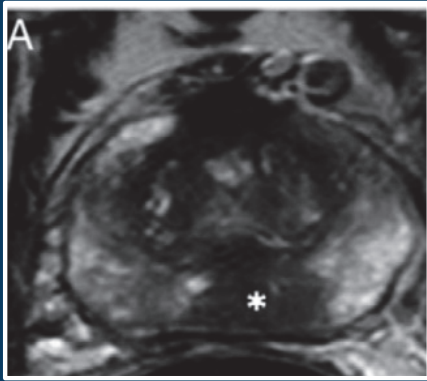
Sampling of the entire prostate to rule out undetected cancer elsewhere



## PSMA PET Imaging

Emerging modality that may help identify occult disease, but role in focal therapy planning is still limited

# How good is your neighborhood MRI center?



**This can impact patient care!**

# Selection Criteria

- **MRI-visible lesion**

Focal therapy requires clear identification of the cancer location using multiparametric MRI imaging.

- **Concordant biopsy**

Targeted biopsies must confirm the presence and location of the cancer identified on MRI.

- **ISUP  $\leq 3$  (selected intermediate)**

- **PSA  $\leq 10-15$ , PSAD  $< 0.15-0.20$**

- **Unifocal/unilateral disease**

Focal therapy is most appropriate for patients with localized, unilateral prostate cancer.

- **Life expectancy  $> 10y$**

Patients must have a long enough life expectancy to benefit from the long-term outcomes of focal therapy.

- **No high-risk features**

Patients with high-risk factors, such as extraprostatic extension or lymph node involvement, are not suitable candidates for focal therapy.

THE WHO?



# The Prostate



## Chicken Nugget of Cancer

- Freeze it
- Fry It
- Steam It
- Microwave it
- Electrocute it
- Stuff it (Nanoparticles)
- Cook it
- Chop It
- Radiate It



# FOCAL THERAPY



**51% of Patients  
Could Avoid Surgery**



**Candidates:  
Gleason 7 or less  
PSA < 20  
Localized/Focal Disease**



**AVOID THE SIDE  
EFFECTS**  
NO URINARY LEAKS  
NO ERECTILE DYSFUNCTION

# Follow-Up Protocol



## PSA Monitoring

PSA assessed every 3-6 months for the first 2 years, then every 6-12 months thereafter



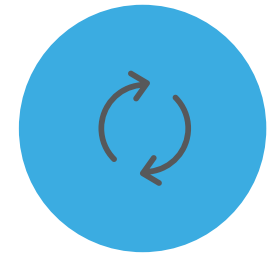
## Multiparametric MRI

Perform mpMRI at 6-12 months post-treatment to evaluate for residual or recurrent disease



## 12-Month Biopsy

Undergo a 12-month re-biopsy to confirm absence of clinically significant cancer



## Repeat Imaging/Biopsy

If PSA rises or MRI shows abnormalities, repeat imaging and targeted biopsies as needed

**A structured and comprehensive follow-up protocol is essential to monitor for treatment success, detect any recurrence, and guide further management decisions after focal therapy.**

# Salvage Pathways



- **Repeat Focal Therapy**

Option to re-target and ablate any residual or recurrent disease in the prostate, preserving healthy tissue

- **Completion Ablation**

Ablation of the entire prostate if initial focal therapy did not achieve complete cancer eradication

- **Radical Prostatectomy**

Surgical removal of the entire prostate gland as a salvage option after failed focal therapy

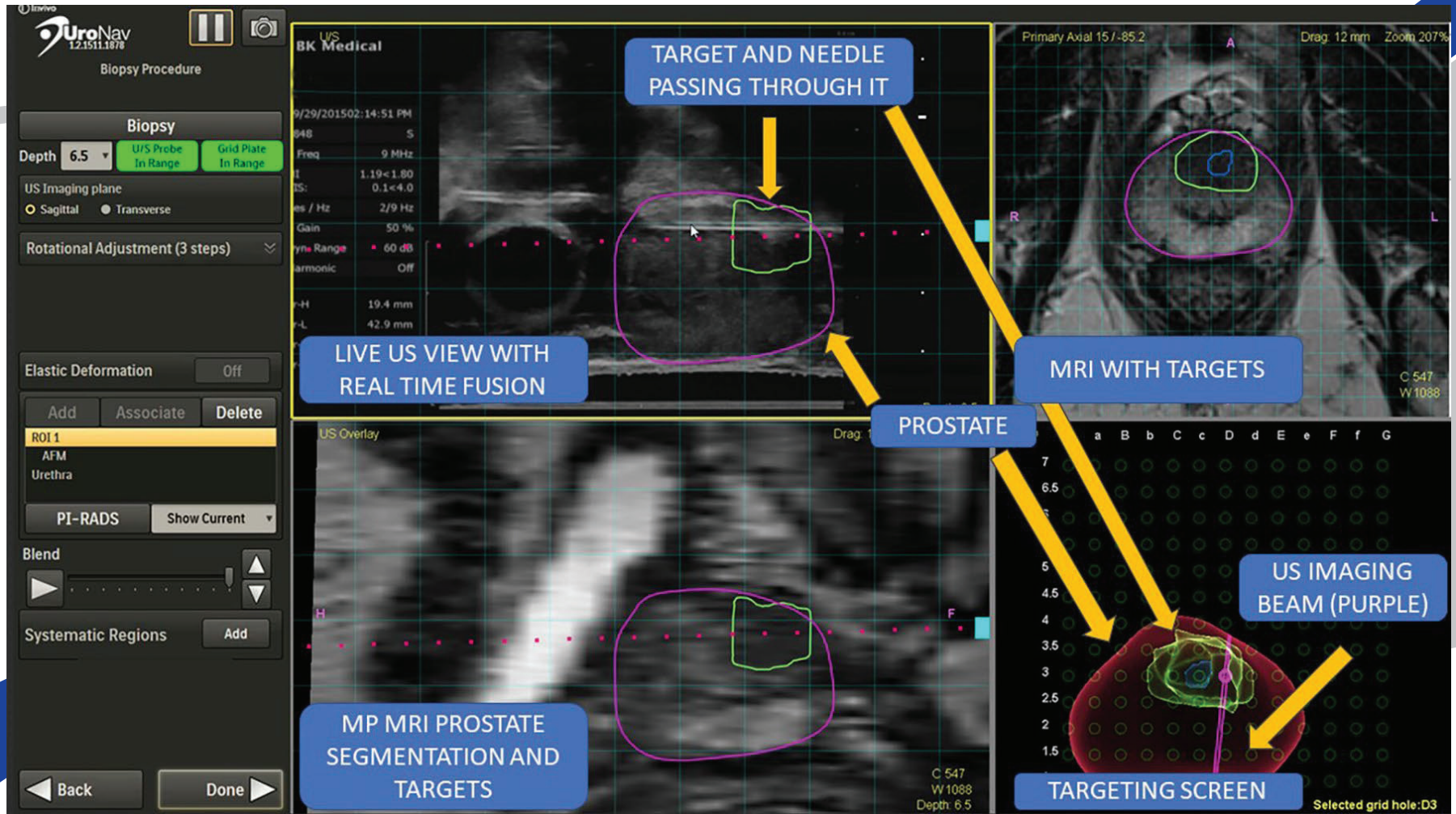
- **Radiation Therapy**

External beam radiation or brachytherapy as a salvage option for recurrent disease after focal therapy

- **Individualized Pathways**

AUA 2024 Salvage guidelines emphasize the importance of tailoring the salvage approach to each patient's specific circumstances

# Ablation / Biopsy – Guidance for Needle Placement



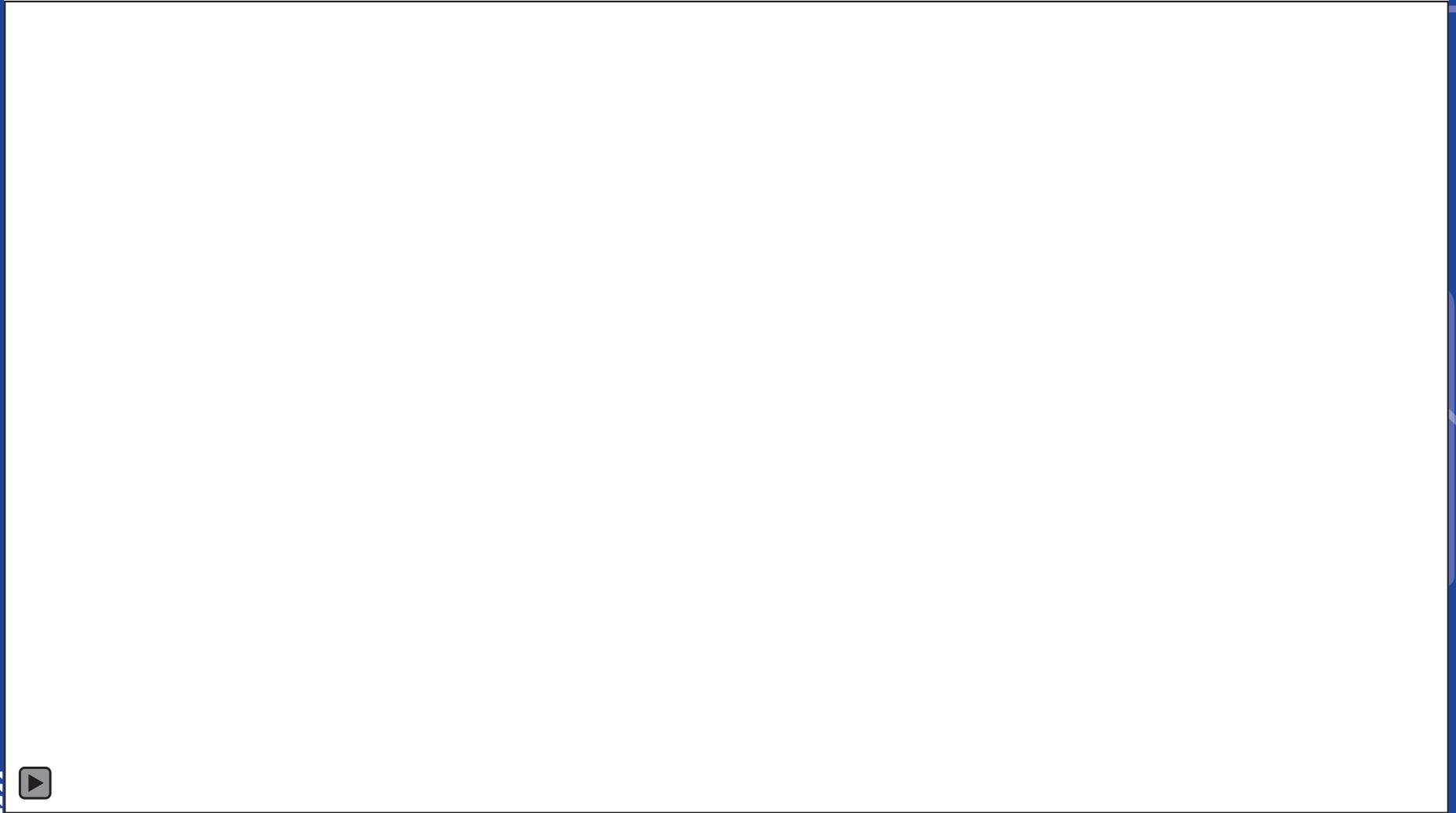
# Advanced Annotation (Research)



# Advanced Annotation / Treatment Planning (Research)



## URONAV 4.3 Ablation

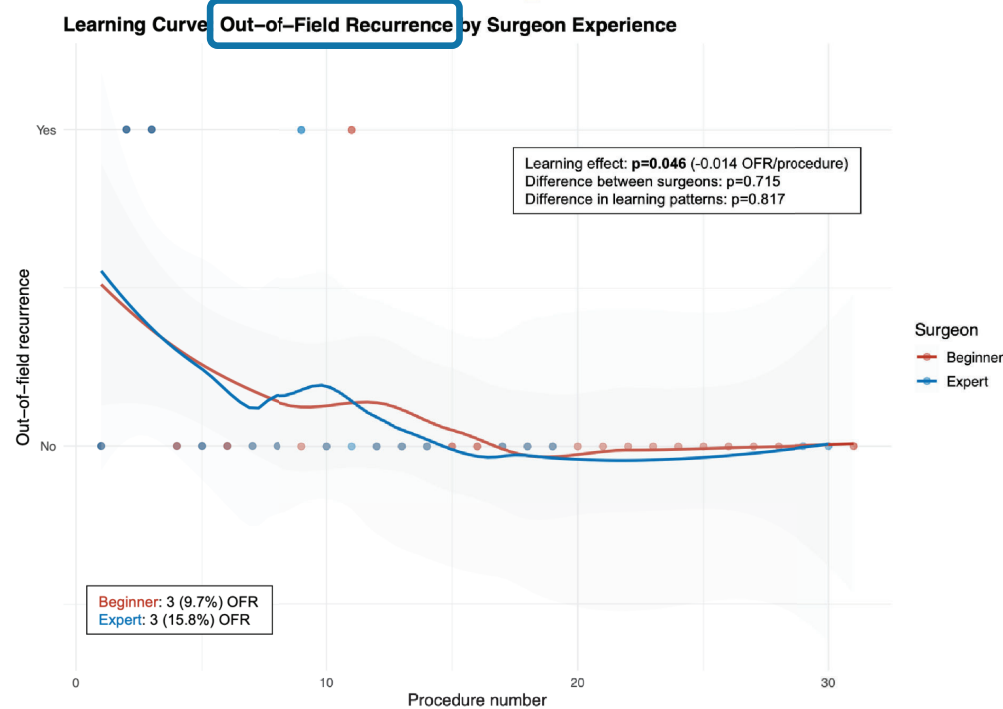
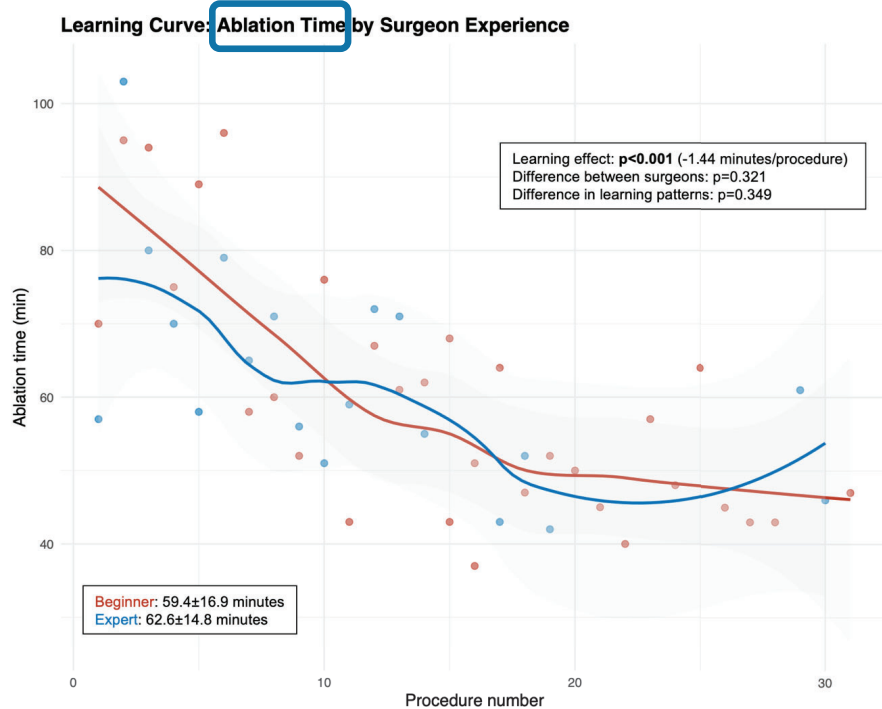


# Assessing the Learning Curve in Focal Cryoablation for Prostate Cancer: Expert vs. Beginner Surgeon Assisted by the UroNav/DynaCAD Advance Annotation Platform

Alessandro Marquis<sup>1</sup>, Alexandre Armache<sup>1</sup>, Kenneth Solosky<sup>1</sup>, Cynthia J. Knauer<sup>1</sup>, Ravleen Kaur<sup>1</sup>, Matthew Nemshin<sup>1</sup>, Scott F. Thompson<sup>2</sup>, Samuel W. Coons<sup>2</sup>, Michael J. Schwartz<sup>1</sup>, Ardeshir R. Rastinehad<sup>1</sup>



Figure 3. Linear regression model to assess the presence of a learning curve



No learning curve and difference between surgeons for:

- In-field recurrence
- Complication rate
- Number of cryoprobes/lesion



- MRI reading
- Prostate biopsy experience
- Technology (vs energy)

# Focal therapy compared to radical prostatectomy for non-metastatic prostate cancer: a propensity score-matched study

**Methods:** Multicenter Trial 761 FT and 572 RP cases (November/2005-September/2018),

- PSA < 20 ng/ml
- Gleason  $\leq 4 + 3$  and stage  $\leq T2c$
- 1-1 propensity score-matched for treatment year, age, PSA, Gleason, T-stage, cancer core length and use of neoadjuvant hormones. FT included 1-2 sessions.

**Primary outcome was failure-free survival (FFS) defined by need for salvage local or systemic therapy or metastases.**

**Results:** 335 RP and 501 FT identified

After matching, 246 RP and 246 FT cases were identified.

At 3, 5 and 8 years,

RP: FFS 86% (81-91%), 82% (77-88%) and 79% (73-86%) for radical prostatectomy

FT: FFS 91% (87-95%), 86% (81-92%) and 83% (76-90%) following focal therapy ( $p = 0.12$ ).

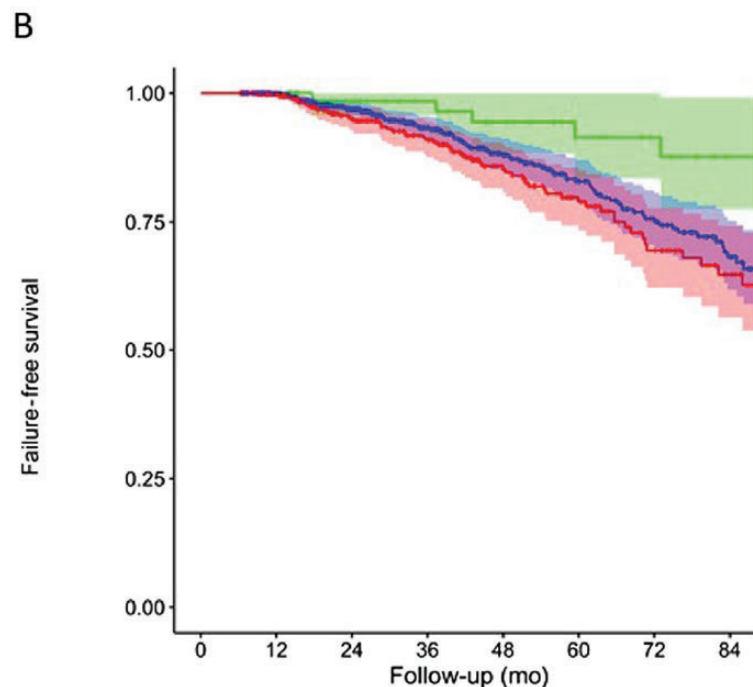
**Conclusions:**

In patients with non-metastatic low- intermediate prostate cancer, oncological outcomes over 8 years were similar between focal therapy and radical prostatectomy.

# Cancer Control Outcomes Following Focal Therapy Using High-intensity Focused Ultrasound in 1379 Men with Nonmetastatic Prostate Cancer: A Multi-institute 15-year Experience

EUROPEAN UROLOGY 81 (2022) 598–605

Deepika Reddy<sup>a,b,\*</sup>, Max Peters<sup>c</sup>, Taimur T. Shah<sup>a,b</sup>, Marieke van Son<sup>c</sup>, Mariana Bertinelli Tanaka<sup>b</sup>, Philipp M. Huber<sup>d</sup>, Derek Lomas<sup>e</sup>, Arnas Rakauskas<sup>f</sup>, Saiful Miah<sup>g</sup>, David Eldred-Evans<sup>a</sup>, Stephanie Guillaumier<sup>h,i</sup>, Feargus Hosking-Jervis<sup>a</sup>, Ryan Engle<sup>a</sup>, Tim Dudderidge<sup>j</sup>, Richard G. Hindley<sup>k,l</sup>, Amr Emara<sup>k,x</sup>, Raj Nigam<sup>m,n</sup>, Neil McCartan<sup>h,i</sup>, Massimo Valerio<sup>f</sup>, Naveed Afzal<sup>o</sup>, Henry Lewi<sup>p</sup>, Clement Orczyk<sup>h,i</sup>, Chris Ogden<sup>q</sup>, Iqbal Shergill<sup>r</sup>, Raj Persad<sup>s</sup>, Jaspal Viridi<sup>t</sup>, Caroline M. Moore<sup>h,i,u,v</sup>, Manit Arya<sup>b,h,i</sup>, Mathias Winkler<sup>a,b</sup>, Mark Emberton<sup>h,i,u,v,i</sup>, Hashim U. Ahmed<sup>a,b,v,w,†</sup>



D'Amico	Number at risk							
	0	12	24	36	48	60	72	84
Low risk	84	77	58	49	41	31	24	17
Intermediate risk	895	787	528	347	245	167	119	66
High risk	386	360	269	208	135	95	60	35

FFS is defined as transition to whole-gland salvage treatment or third focal therapy treatment, systematic treatment, and/or development of prostate cancer metastases and/or prostate cancer-specific death

- At 7 years follow up
  - 69% FFS after primary focal HIFU therapy for nonmetastatic prostate cancer.
  - Metastasis-free survival 100%
  - Prostate cancer-specific survival was 100%
  - Overall survival was 97%



# Cryoablation

All Data was Before  
MR US Fusion  
Guidance

Currently, the only treatment modality that is  
FDA Cleared for cancer treatment

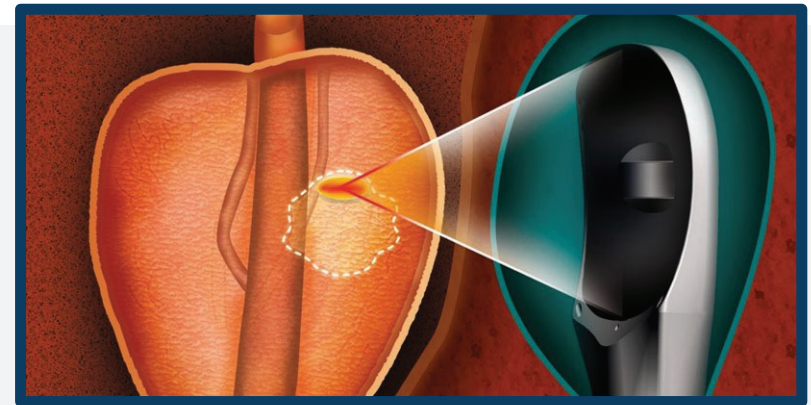
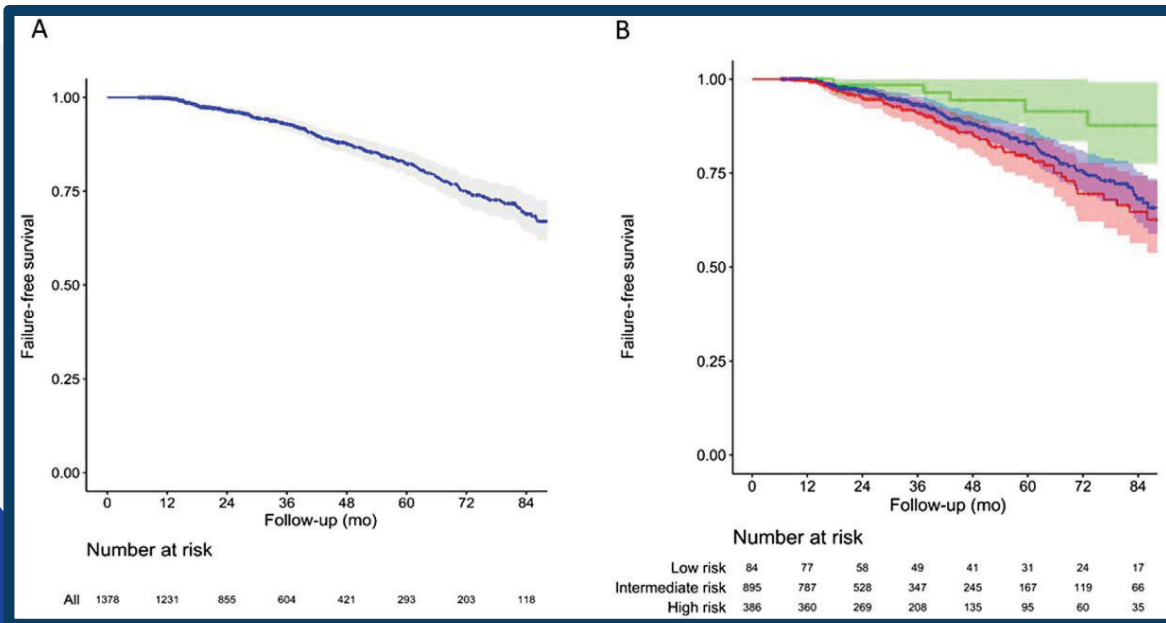
A systematic review evaluated ~1600 men

52% were low-risk, 38% intermediate-risk, 10%  
high-risk

8-25% (+) post-treatment biopsy rate



# High-Intensity Focused Ultrasound



Cancer Control Outcomes Following Focal Therapy Using High-intensity Focused Ultrasound in 1379 Men with Nonmetastatic Prostate Cancer: A Multi-institute 15-year Experience, *EuroU* 2022



“Metanalysis evaluating >7000 men  
4.5% - 91.1% (+) biopsy after treatment

20% re-treatment rate



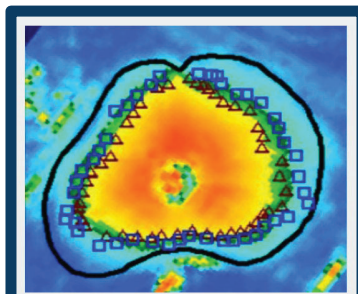
## MRI-Ultrasound Ablation

Received FDA 510(k) Clearance for prostate tissue ablation

At 12 months...

- 77% of men with low volume GG1 were disease free
- 77% of men with high volume GG1 had no cancer or low volume GG1
- 79% of men with  $\geq$  GG2 79% were free of  $\geq$  GG2

***Pivotal Study of MRI-guided  
Transurethral Ultrasound Ablation in  
Patients With Localized Prostate  
Cancer***  
(TACT NCT02766543)



***A Comparison of TULSA Procedure  
vs. Radical Prostatectomy in  
Participants With Localized Prostate  
Cancer***  
(CAPTAIN NCT05027477)

## MRI-Ultrasound Ablation



Received FDA 510(k) clearance for prostate tissue ablation

At 24 months

- 78 (88% [95% CI 79–94]) of 89 men had no evidence of grade group 2 or higher prostate cancer in the treated area.

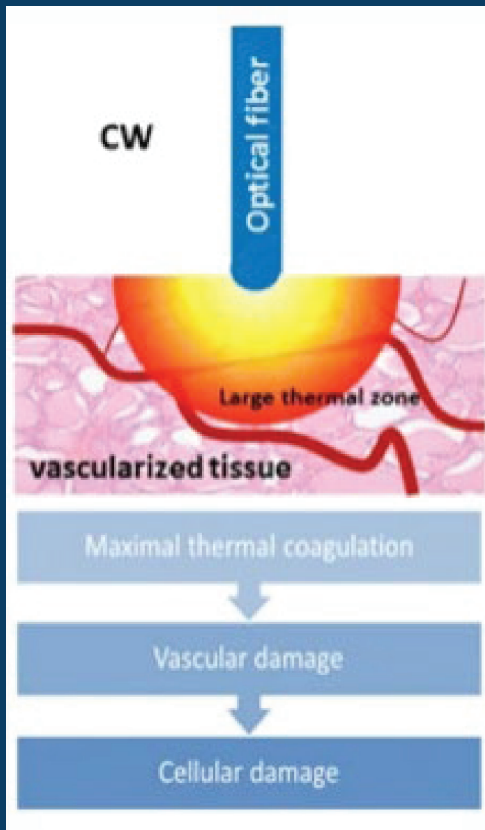
ClinicalTrials.gov Identifier: NCT01226576

Recruitment Status ⓘ : Completed

First Posted ⓘ : October 22, 2010

Last Update Posted ⓘ : March 13, 2019

# Laser Interstitial Thermal Therapy



Included 15 men with Gleason Grade Group 1-2  
46.67% noted to have residual cancer

## 11-year data

- 42/155 (27%) of men were positive and clinically significant\*
- 91/154 (59%) of men were negative.
  
- Metastasis-free survival rate is 99%
- Prostate cancer-specific survival rate is 100%
- Overall survival rate is 98%.

Diagn Interv Radiol, . 2021 May;27(3):394-400. doi: 10.5152/dir.2021.20095

MP46-15

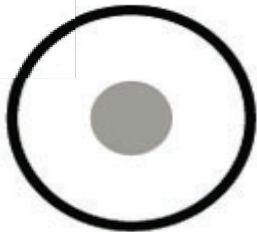
OUTPATIENT TRANS-RECTAL MR-GUIDED LASER FOCAL  
THERAPY PHASE II CLINICAL TRIAL: 11-YEAR INTERIM RESULTS  
Vol. 206, No. 3S, Supplement, Sunday, September 12, 2021

# Irreversible Electroporation

- 121 men with predominately intermediate risk disease
- At 12 months, 79% had no disease seen at biopsy (2025)



Electrical Field



Cell



IRE  
Irreversible Electroporation



Apoptosis

Potential Immune system  
response



Macrophages aid in  
clearing cell debris  
- Phagocytosis



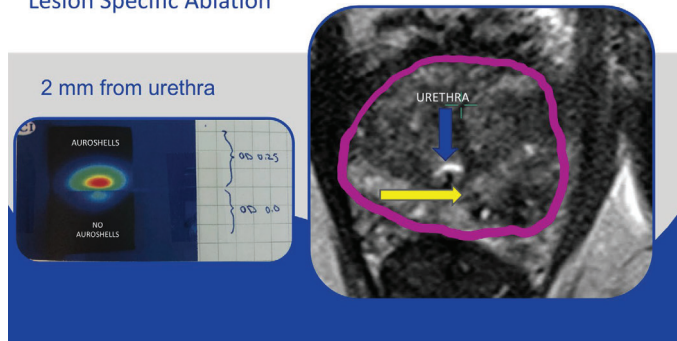
*Pivotal Study of the NanoKnife System for the Ablation of Prostate Tissue in an Intermediate-Risk Patient Population (PRESERVE NCT04972097)*

# Nanoparticle MR US Fusion Directed Laser Ablation

102 (feasibility: 44, extension: 58)

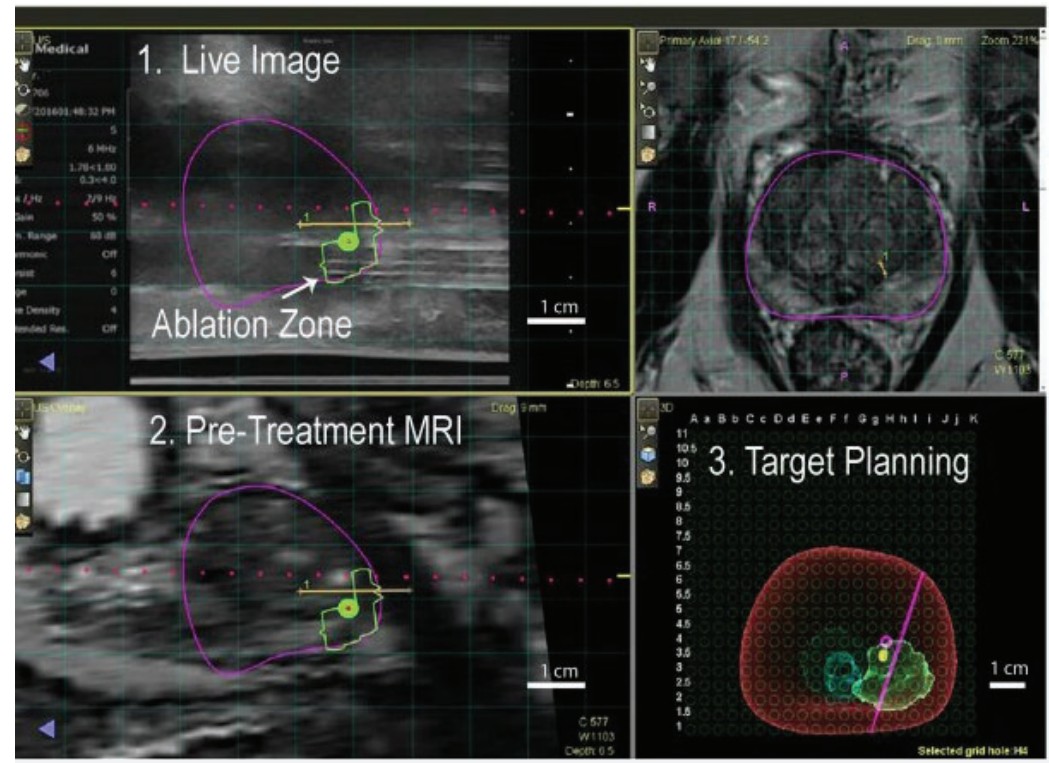
- no SAEs
- 1-year post-treatment negative biopsy 68% (69/101) treated men

Lesion Specific Ablation



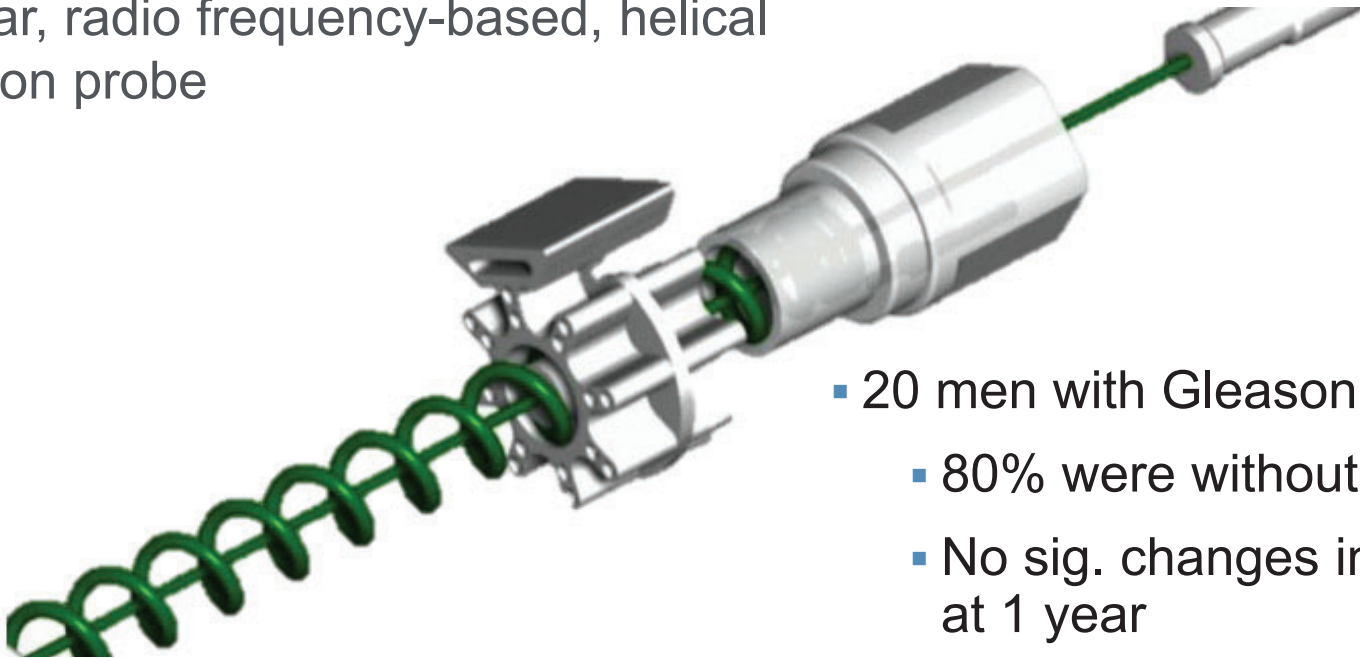
AUA 2025

Complete Clinical Trials of Gold NanoShells Based Therapy for Localized Prostate Cancer Ablation Treatment - Multiple Investigational Clinical Sites



# Bipolar Radiofrequency Ablation

Bipolar, radio frequency-based, helical ablation probe



- 20 men with Gleason Grade Group 2 CaP
  - 80% were without csCaP, 75% cancer free
  - No sig. changes in IPSS, QoL, or IIEF-15 at 1 year



**Prostate Radiofrequency Ablation Focal Treatment (proRAFT): results of a prospective development study for localized prostate cancer**

Clement Orczyk<sup>1</sup>, Chris Brew-Graves<sup>1</sup>, Norman Williams<sup>1</sup>, Ingrid Potyka<sup>1</sup>, Navin Ramanchandran<sup>1</sup>, Alex Freeman<sup>1</sup>, Mark Emberton<sup>1</sup>, Hashim Uddin Ahmed<sup>2</sup>

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

100 men were treated with a median follow-up of 61 months.

- 5-year bDFS (95 % CI) was 93 % (86 % to 97 %).
- At 5 years, the prevalence of grade 2 + genitourinary and gastrointestinal toxicity was 12 % and 4 %, respectively.

**Biochemical recurrence (BCR)** was defined as an increase in serum PSA of at least 2 ng/mL above the nadir value.



- Biochemical failure observed in 6 patients:**
- 1 patient had **local recurrence and distant metastases**.
  - 2 patients had **pelvic lymph node failure**.
  - 3 patients developed **distant metastases** without local recurrence.



Shiradkar et al. *Radiation Oncology* (2019) 11:148  
DOI 10.1186/s13014-019-0719-3

Radiation Oncology

RESEARCH

Open Access



Radiomics based targeted radiotherapy planning (Rad-TRaP): a computational framework for prostate cancer treatment planning with MRI

Rakesh Shiradkar<sup>1\*</sup>, Tarun K. Podder<sup>2</sup>, Ahmad Alqohary<sup>1</sup>, Satish Viswanath<sup>1</sup>, Rodney J. Ellis<sup>2</sup> and Anant Madabhushi<sup>1</sup>



Original Article

Intra-prostatic recurrences after radiotherapy with focal boost: Location and dose mapping in the FLAME trial

- **Recurrence Location: 24 out of 28** patients had a recurrence at the site of the original tumor (GTV).
- **Only one patient** had a recurrence in the prostate gland outside the GTV.

# Water Vapor Ablation (Vanquish)

Uses phase shift energy, stored in sterile water vapor, to convectively transfer thermal energy to cancerous tissue, causing cell death.

At 6 months

13/15 (87%) biopsies showed no Gleason pattern  $\geq 4$  or  $\geq$ GGG2 cancer on the treated side of prostates

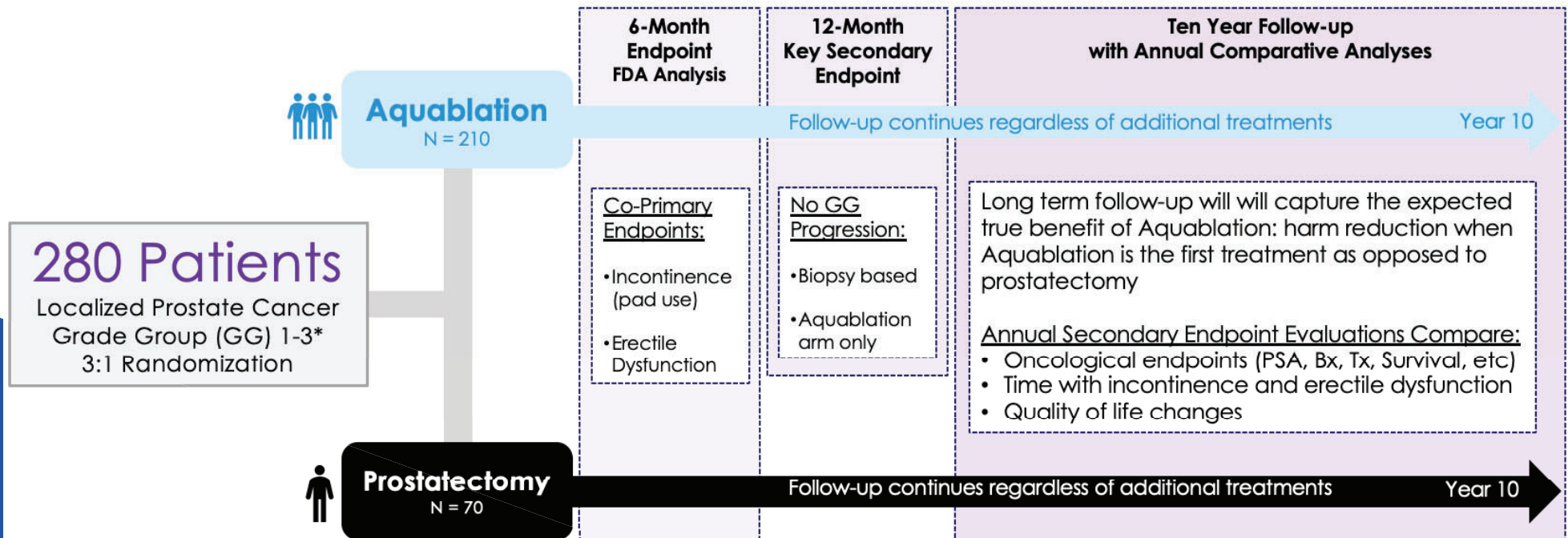
Ten of 15 (67%) subjects were biopsy negative.



J Endourol . 2023 Feb;37(2):225-232.

# WATER IV PCa: Radical Aquablation vs. Prostatectomy RCT

NCT06651632



\*GG1 subjects must have already chosen a radical therapy; GG3 subjects must have a metastatic evaluation

# Targeted Microwave Ablation (TMA) under MRI-USG fusion guidance



## Targeted Microwave Ablation for Prostate Cancer Under Magnetic Resonance Imaging-Ultrasound Fusion and Organ-based Tracking: Final Results from the First Phase 2 Trial (TMA-HK)

Peter Ka-Fung Chiu<sup>a,\*</sup>, Alex Qinyang Liu<sup>a</sup>, Chi-Hang Yee<sup>a</sup>, Ho-Fai Wong<sup>a</sup>, Chun-Hong Chan<sup>a</sup>, Angel Kong<sup>a</sup>, Sui-Yan Lau<sup>a</sup>, Jeremy Yuen-Chun Teoh<sup>a</sup>, Ka-Lun Lo<sup>a</sup>, Tsz-Yau Yuen<sup>b</sup>, Kin-Hoi Wong<sup>c</sup>, Cheuk-Man Chu<sup>b</sup>, Hiu-Yee Hung<sup>b</sup>, Carmen Chi-Min Cho<sup>b</sup>, Chi-Fai Ng<sup>a,\*</sup>

<sup>a</sup>SH Ho Urology Centre, Department of Surgery, The Chinese University of Hong Kong, Hong Kong, China; <sup>b</sup>Department of Imaging and Interventional Radiology, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong, China; <sup>c</sup>Department of Radiology, North District Hospital, Hong Kong, China

42 areas were treated in 30 patients (seven low-risk and 23 intermediate-risk PC)

### 6-month per protocol biopsy showed

No cancer in **90.5% (38/42)** of the treated areas.

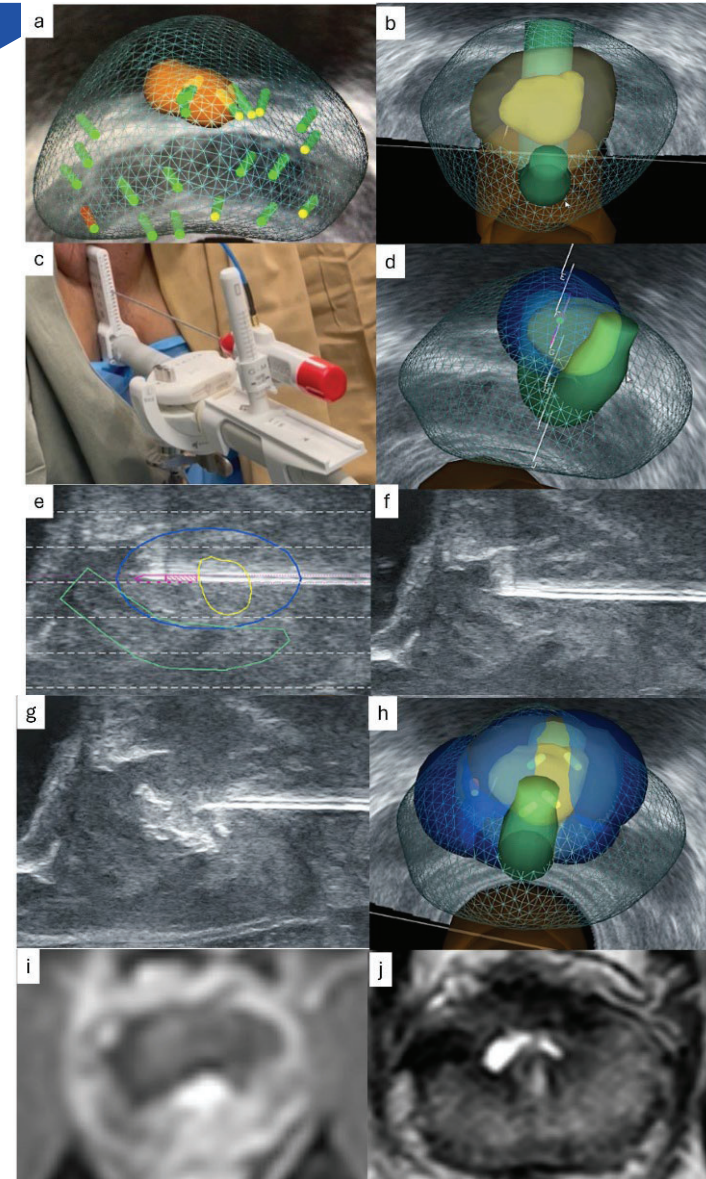
Per-patient analysis revealed in-field recurrence in 10.0% (three of 30) of patients, of whom two had grade group 1 and one had grade group 2 disease.

Only grade 1 and 2 complications were reported

AROU (grade 2, Foley): 3.3%, Hematuria (grade 1): 16.7%, Dysuria (Grade 1): 6.7%, Perineal discomfort (Grade 1): 6.7%



Eur Urol Oncol. 2024 Dec 16



# Vascular-Targeted Photodynamic Therapy (VTP)

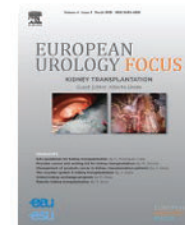
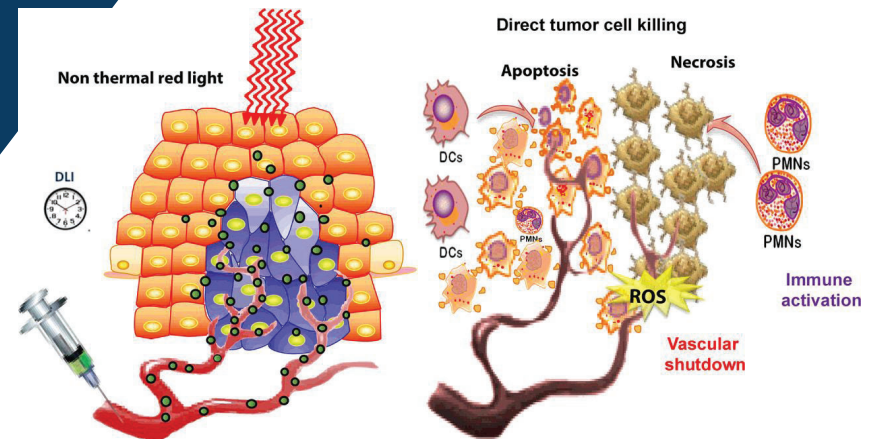
Infusion of photosensitizer (WST11) → drug travels to cancerous tissue

Near infrared light laser excitation → release of reactive oxygen species → cell damage and apoptosis

Padeliporfin vascular-targeted photodynamic therapy versus active surveillance in men with low-risk prostate cancer (CLIN1001 PCM301): an open-label, phase 3, randomised controlled trial

## Medium-term Follow-up of Vascular-targeted Photodynamic Therapy of Localized Prostate Cancer Using TOOKAD Soluble WST-11 (Phase II Trials)☆

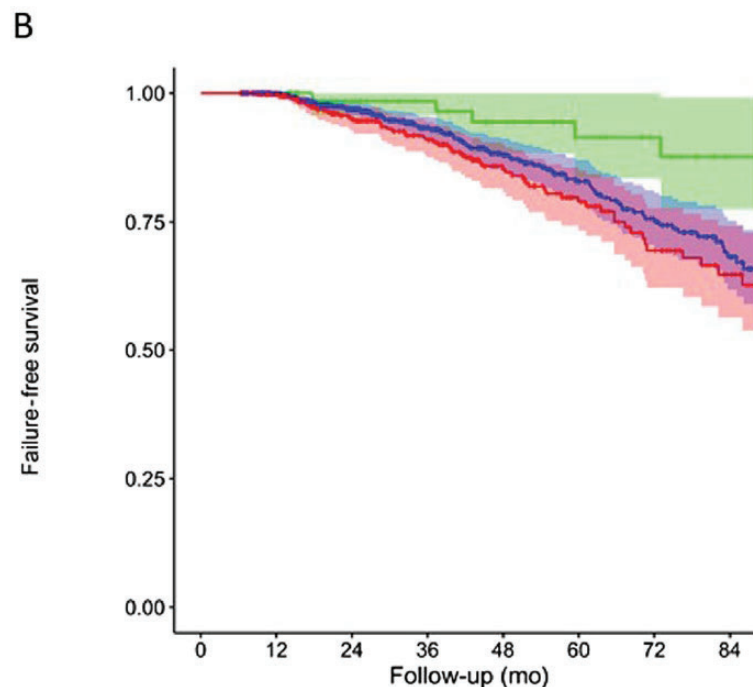
3.5-yr follow-up,  
overall successful focal ablation was achieved for 51 patients (75%).  
17 patients (25%).  
34 patients (50%) were cancer-free in both the prostate lobes.  
64 related adverse events (AEs): 48% were Clavien grade I,  
47% were grade II, and 5% were grade III.



# Cancer Control Outcomes Following Focal Therapy Using High-intensity Focused Ultrasound in 1379 Men with Nonmetastatic Prostate Cancer: A Multi-institute 15-year Experience

EUROPEAN UROLOGY 81 (2022) 598–605

Deepika Reddy<sup>a,b,\*</sup>, Max Peters<sup>c</sup>, Taimur T. Shah<sup>a,b</sup>, Marieke van Son<sup>c</sup>, Mariana Bertinelli Tanaka<sup>b</sup>, Philipp M. Huber<sup>d</sup>, Derek Lomas<sup>e</sup>, Arnas Rakauskas<sup>f</sup>, Saiful Miah<sup>g</sup>, David Eldred-Evans<sup>a</sup>, Stephanie Guillaumier<sup>h,i</sup>, Feargus Hosking-Jervis<sup>a</sup>, Ryan Engle<sup>a</sup>, Tim Dudderidge<sup>j</sup>, Richard G. Hindley<sup>k,l</sup>, Amr Emara<sup>k,x</sup>, Raj Nigam<sup>m,n</sup>, Neil McCartan<sup>h,i</sup>, Massimo Valerio<sup>f</sup>, Naveed Afzal<sup>o</sup>, Henry Lewi<sup>p</sup>, Clement Orczyk<sup>h,i</sup>, Chris Ogden<sup>q</sup>, Iqbal Shergill<sup>r</sup>, Raj Persad<sup>s</sup>, Jaspal Viridi<sup>t</sup>, Caroline M. Moore<sup>h,i,u,v</sup>, Manit Arya<sup>b,h,i</sup>, Mathias Winkler<sup>a,b</sup>, Mark Emberton<sup>h,i,u,v,i</sup>, Hashim U. Ahmed<sup>a,b,v,w,†</sup>



D'Amico	Number at risk							
	0	12	24	36	48	60	72	84
Low risk	84	77	58	49	41	31	24	17
Intermediate risk	895	787	528	347	245	167	119	66
High risk	386	360	269	208	135	95	60	35

FFS is defined as transition to whole-gland salvage treatment or third focal therapy treatment, systematic treatment, and/or development of prostate cancer metastases and/or prostate cancer-specific death

- At 7 years follow up
  - 69% FFS after primary focal HIFU therapy for nonmetastatic prostate cancer.
  - Metastasis-free survival 100%
  - Prostate cancer-specific survival was 100%
  - Overall survival was 97%



# Prediction and Mapping of Intraprostatic Tumor Extent with Artificial Intelligence

Alan Priester<sup>a,b,\*</sup>, Richard E. Fan<sup>c</sup>, Joshua Shubert<sup>b</sup>, Mirabela Rusu<sup>d</sup>, Sulaiman Vesal<sup>c</sup>, Wei Shao<sup>d,e</sup>, Yash Samir Khandwala<sup>c</sup>, Leonard S. Marks<sup>a</sup>, Shyam Natarajan<sup>a,b</sup>, Geoffrey A. Sonn<sup>c,d</sup>

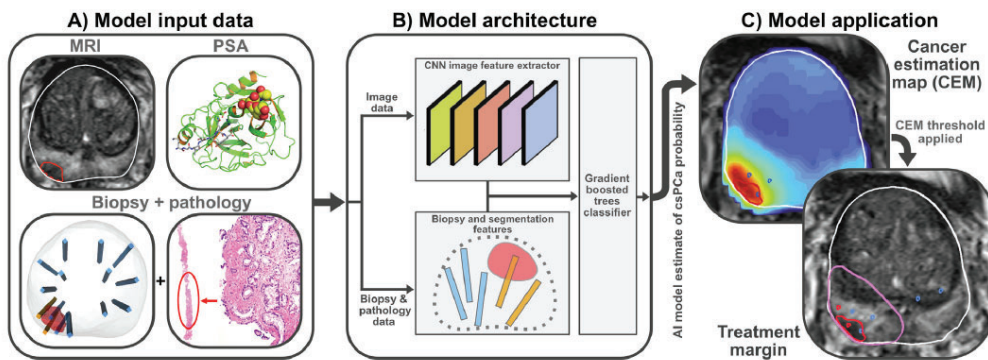


Fig. 1 – Overview of artificial intelligence (AI) model input and output, including: (A) input data, which consists of T2-weighted magnetic resonance imaging (MRI), serum prostate-specific antigen (PSA), and biopsy core locations with pathology labels; (B) high-level model architecture, wherein image features are generated via a convolutional neural network and other features are engineered from biopsy and pathology data; and (C) application of the model to produce a cancer estimation map (CEM) showing voxel-level predictions of clinically significance prostate cancer (csPCa). The CEM is thresholded in order to produce a treatment margin.

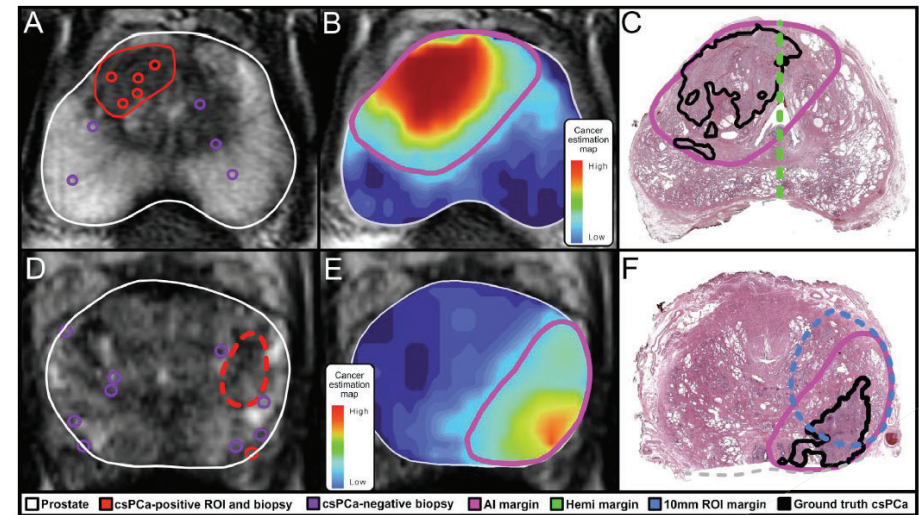


Fig. 3 – Two exemplary cases from the independent test dataset where artificial intelligence (AI) margins were negative, having succeeded in encapsulating extensions of the index lesion that were invisible on magnetic resonance imaging (MRI): (A–C) a case for which hemigland margins were positive and (D–F) a case for which 10-mm MRI region of interest (ROI) margins were positive. Figures 3A and 3D show input data including MRI, biopsy, and projected ROI location; Figures 3B and 3E show the cancer estimation map and default AI margin; and Figures 3C and 3F show whole mount histopathology along with segmentation of clinically significant prostate cancer (csPCa).



of THE JOURNAL  
UROLOGY®

[www.auajournals.org/journal/juro](http://www.auajournals.org/journal/juro)

## Findings in 1,123 Men with Preoperative <sup>68</sup>Ga-Prostate-Specific Membrane Antigen Positron Emission Tomography/Computerized Tomography and Multiparametric Magnetic Resonance Imaging Compared to Totally Embedded Radical Prostatectomy Histopathology: Implications for the Diagnosis and Management of Prostate Cancer

S. Raveenthiran,<sup>1,2</sup> W. J. Yaxley,<sup>2,3</sup> T. Franklin,<sup>4</sup> G. Coughlin,<sup>4</sup> M. Roberts,<sup>1,2,5,6</sup> T. Gianduzzo,<sup>2,7</sup> B. Kua,<sup>4</sup> H. Samaratunga,<sup>2,8</sup> B. Delahunt,<sup>9</sup> L. Egevad,<sup>10</sup> D. Wong,<sup>5,11</sup> L. McEwan,<sup>11</sup> N. Brown,<sup>11</sup> R. Parkinson,<sup>11</sup> R. Esler<sup>2,4,5</sup> and J. W. Yaxley<sup>2,4,5,\*</sup>

- Ga68-PSMA PET/CT identified cancer in 117 (10%) men not identified on mpMRI
  - mpMRI identified cancer in 93 (8%) men not seen on Ga68-PSMA PET/CT.
- 
- Retrospective
  - Enriched cohort with known CaP

How do these combined imaging modalities affect our treatment pathway?

When will tissue be obsolete?



## The role of novel imaging in prostate cancer focal therapy: treatment and follow-up

*Michael B. Rothberg<sup>a</sup>, Jacob J. Enders<sup>a</sup>, Zachary Kozel<sup>a</sup>, Nikhil Gopal<sup>a</sup>, Baris Turkbey<sup>b</sup> and Peter A. Pinto<sup>a</sup>*

Curr Opin Urol 2022, 32:231–238

### KEY POINTS

- Limitations associated with mpMRI have led to the development of new imaging technologies with the goal of better characterizing intraprostatic disease burden to more accurately guide treatment planning and surveillance for prostate cancer focal therapy.
- Compared to mpMRI, PSMA-targeted radiotracers combined with computerized tomography or MR imaging may improve index lesion detection, more accurately estimate intraprostatic gross tumor volume, and better predict the presence of adverse pathology.

### Combination of mpMRI and PSMA PET CT

- Improves
  - Index lesion detection
  - Gross Tumor Volume
  - Detection of adverse pathology

The CHRONOS-B trial is a **pioneering study** assessing whether **hormonal pre-treatment (finasteride or bicalutamide)** enhances the efficacy of focal therapy. The study will provide valuable insights into oncological control, side effects, and patient quality of life over a **five-year follow-up period**.

#### Treatment Arms in CHRONOS-B

- **Arm 1 (Control):** Focal therapy alone (HIFU or cryotherapy).
- **Arm 2:** Focal therapy after **12 weeks of finasteride (5 mg daily)**.
- **Arm 3:** Focal therapy after **12 weeks of bicalutamide (50 mg daily)**.

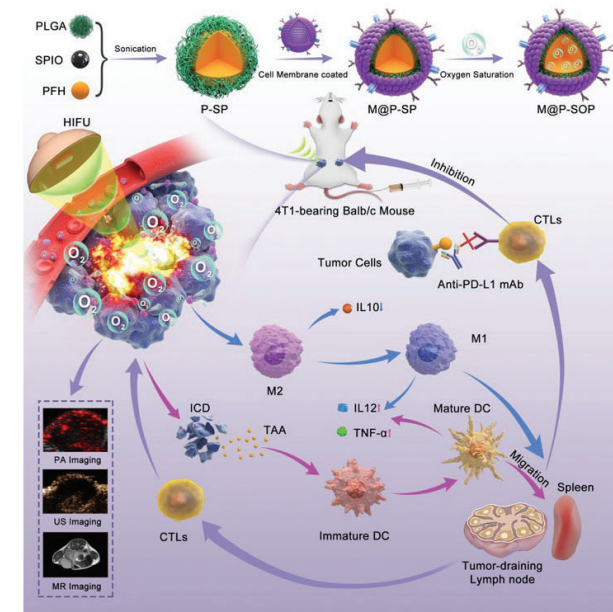
## DEVICE DRUG COMBINATIONS

Open access

Original research

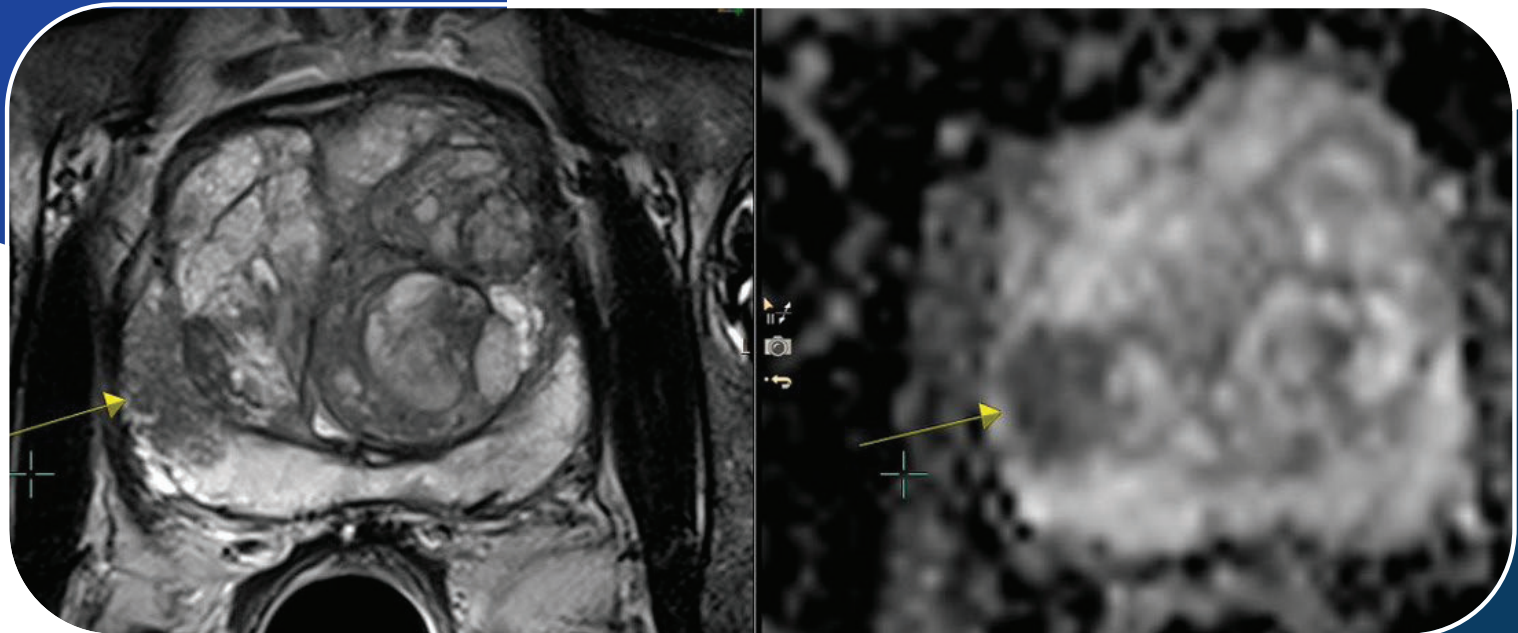
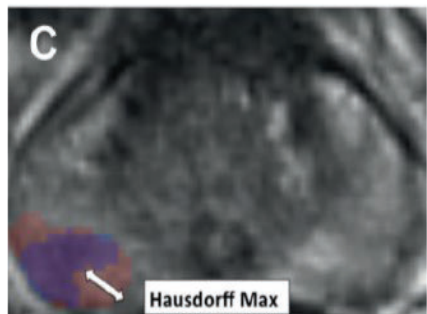
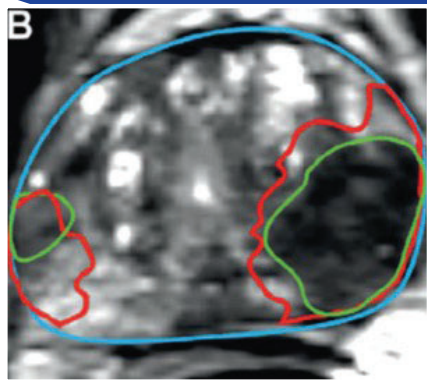
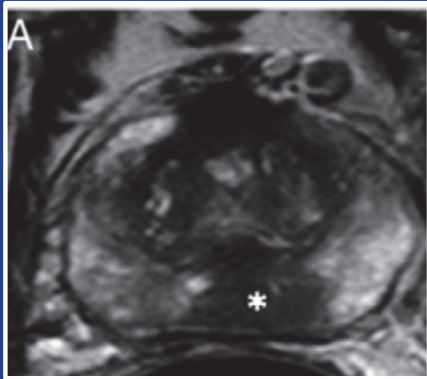


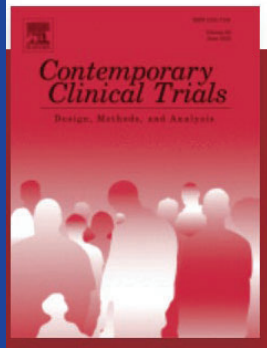
**Novel combination strategy of high intensity focused ultrasound (HIFU) and checkpoint blockade boosted by bioinspired and oxygen-supplied nanoprobe for multimodal imaging-guided cancer therapy**



# MRI QUALITY MATTERS

## How to Quantify and Assess Trial Outcomes?





The CHRONOS-B trial is a **pioneering study** assessing whether **hormonal pre-treatment (finasteride or bicalutamide)** enhances the efficacy of focal therapy. The study will provide valuable insights into oncological control, side effects, and patient quality of life over a **five-year follow-up period**.



### Treatment Arms in CHRONOS-B

- **Arm 1 (Control):** Focal therapy alone (HIFU or cryotherapy).
- **Arm 2:** Focal therapy after **12 weeks of finasteride (5 mg daily)**.
- **Arm 3:** Focal therapy after **12 weeks of bicalutamide (50 mg daily)**.

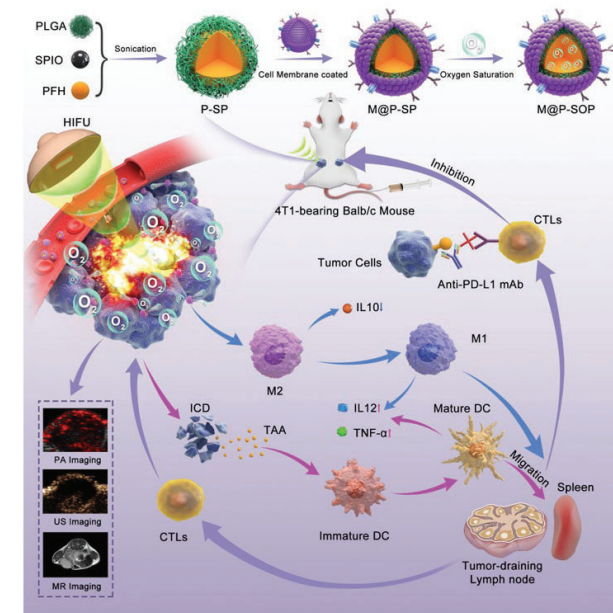
# DEVICE DRUG COMBINATIONS

Open access

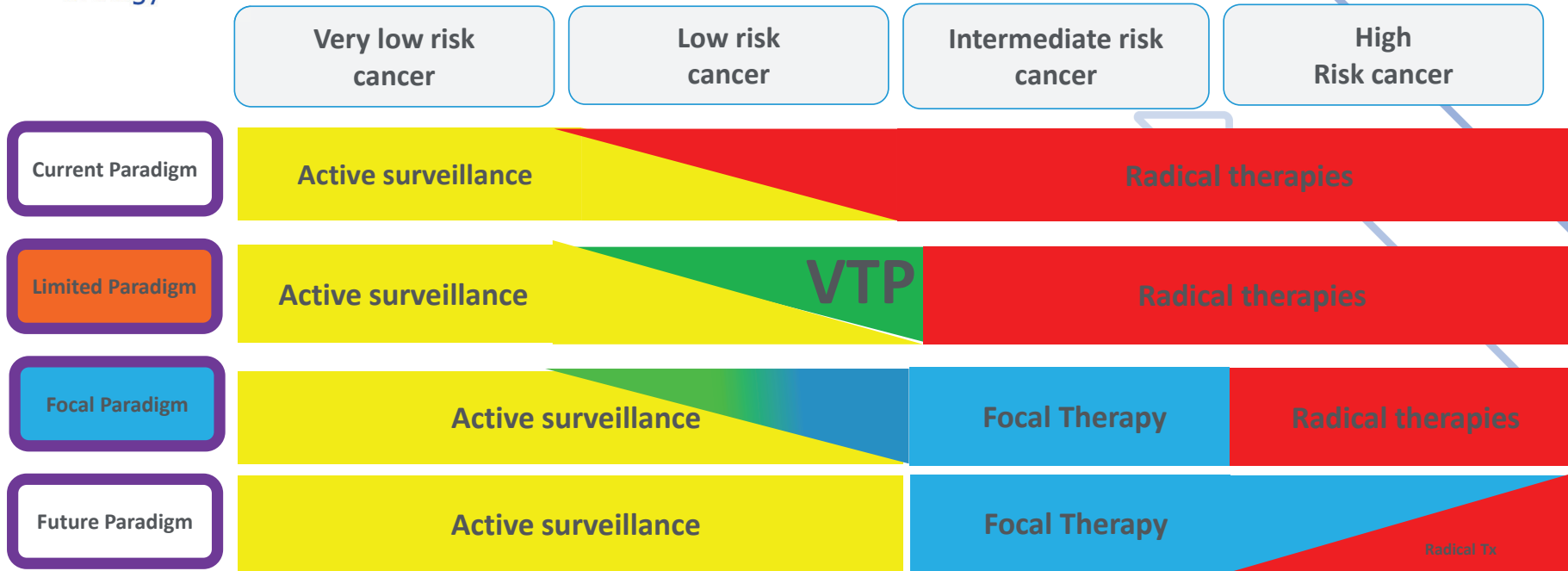
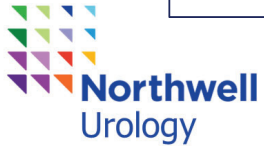
Original research



**Novel combination strategy of high intensity focused ultrasound (HIFU) and checkpoint blockade boosted by bioinspired and oxygen-supplied nanoprobe for multimodal imaging-guided cancer therapy**



# Where does focal therapy fit into the paradigm?



What happens with transition to MR targeted biopsy only during the screening process?

- Less Patients Meeting AS Criteria
- More CS disease



# Take-Home Messages



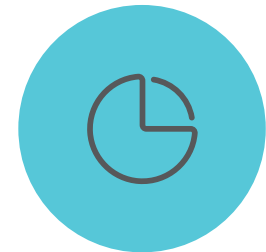
## Patient selection drives outcomes

Appropriate patient selection based on disease characteristics and risk factors is crucial for achieving optimal outcomes with focal focal therapy.



## Mid-term data = oncologic safety + functional advantage

Current mid-term data demonstrates the oncologic oncologic safety and functional benefits of focal focal therapy compared to traditional treatments.



## Focal therapy remains investigational for primary use; strongest evidence in salvage

While focal therapy is a promising approach, it is still considered investigational for primary primary treatment, with its strongest evidence in evidence in the salvage setting.

**As the field of focal prostate cancer therapy continues to evolve, ongoing research and guideline development are essential to establish its role in the broader treatment landscape**