Prostate Cancer

Cancer Support Community

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OUTLINE

- Prostate anatomy and imaging of the prostate
- Staging / Risk Stratification
- Treatment options with a review of different radiation modalities
- Resources for prognosis and potential side effects of treatments
- Role of radiation in patients with oligometastatic prostate cancer
  - To prostate
  - To metastatic sites
- Prostate cancer at Christ Hospital
- Questions

Prostate Anatomy and Imaging

Prostate

Bladder

Rectum

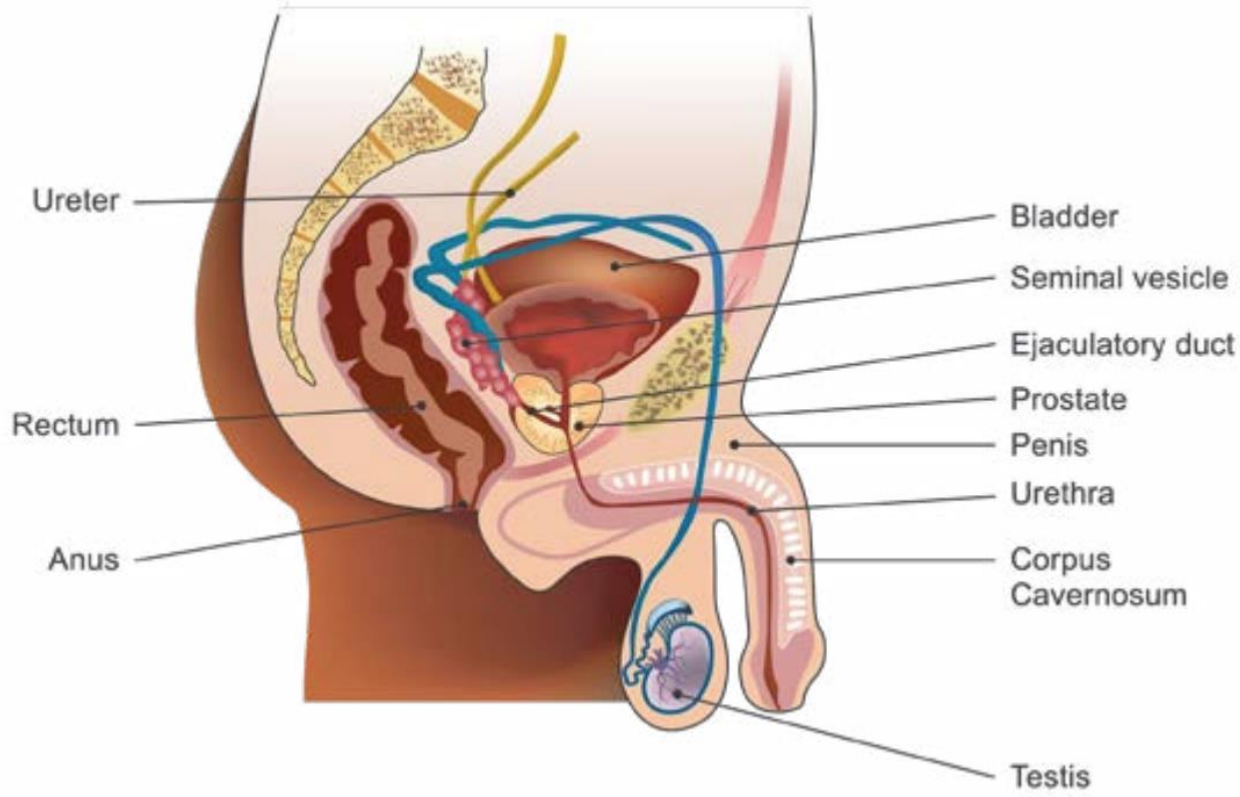
Seminal vesicles

Urethra

ANATOMY

The prostate

The prostate gland is located below the bladder.



NCCN Guidelines for Patients®:
Early-Stage Prostate Cancer, 2020

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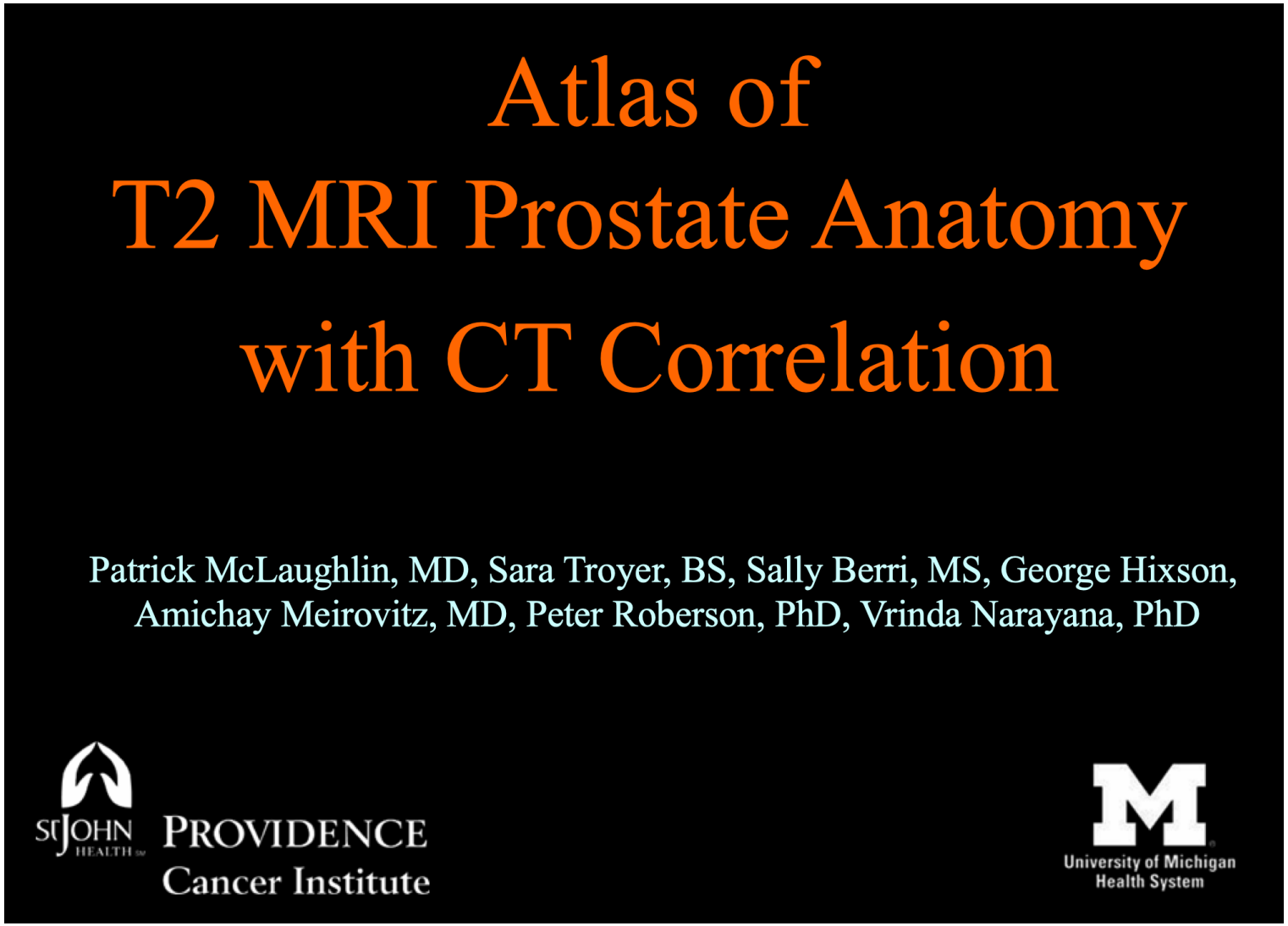
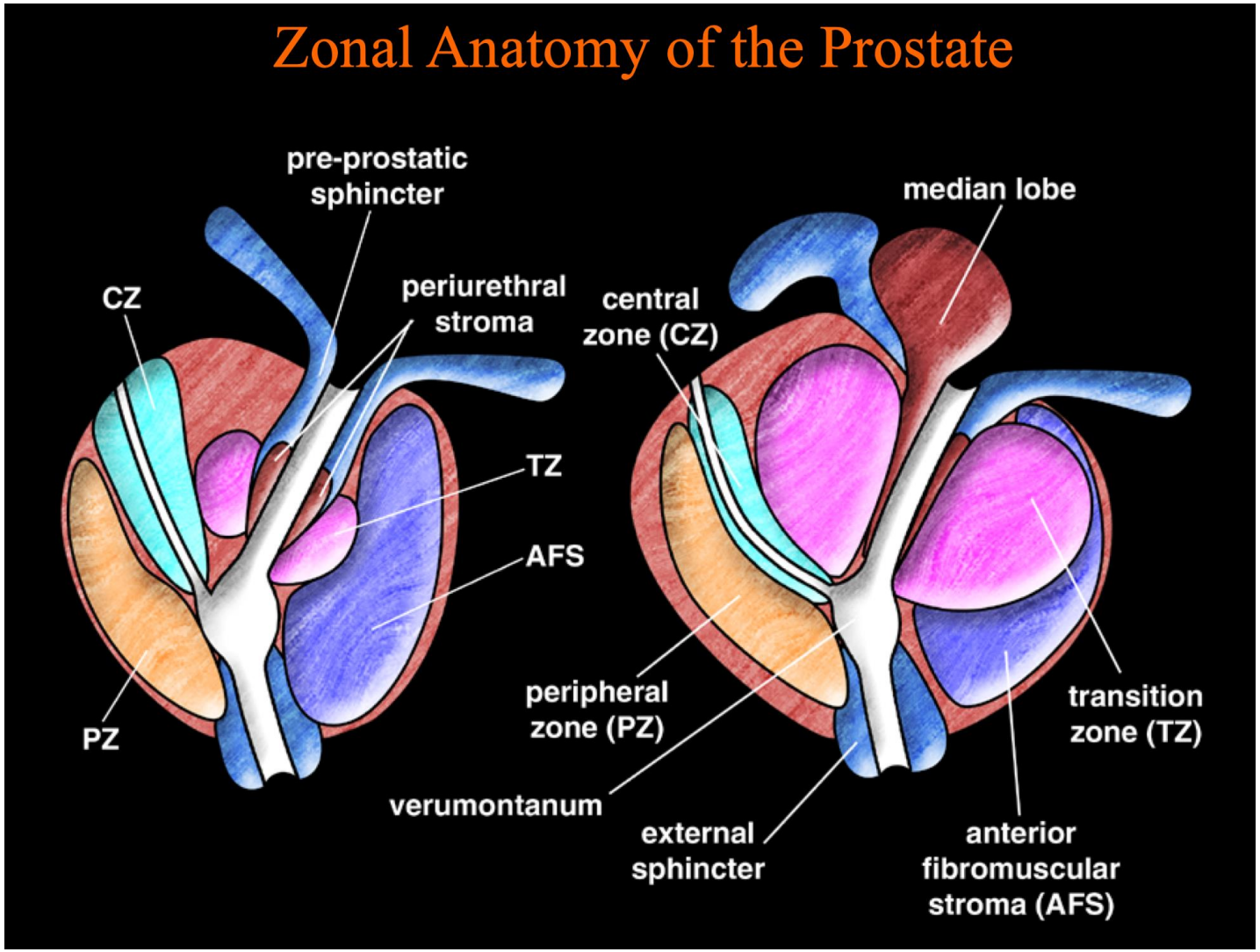
IMAGING THE PROSTATE

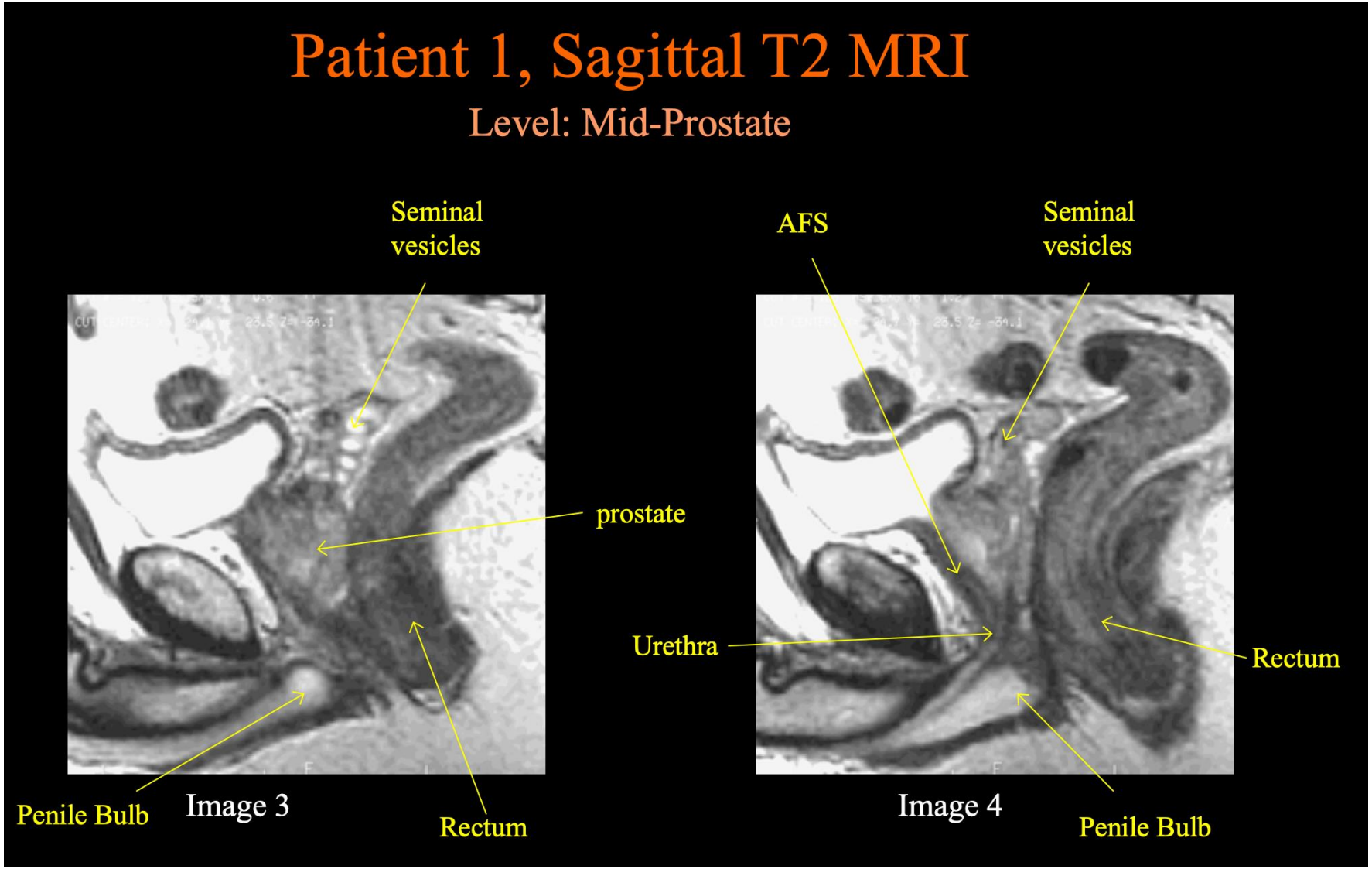


IMAGING OF THE PROSTATE

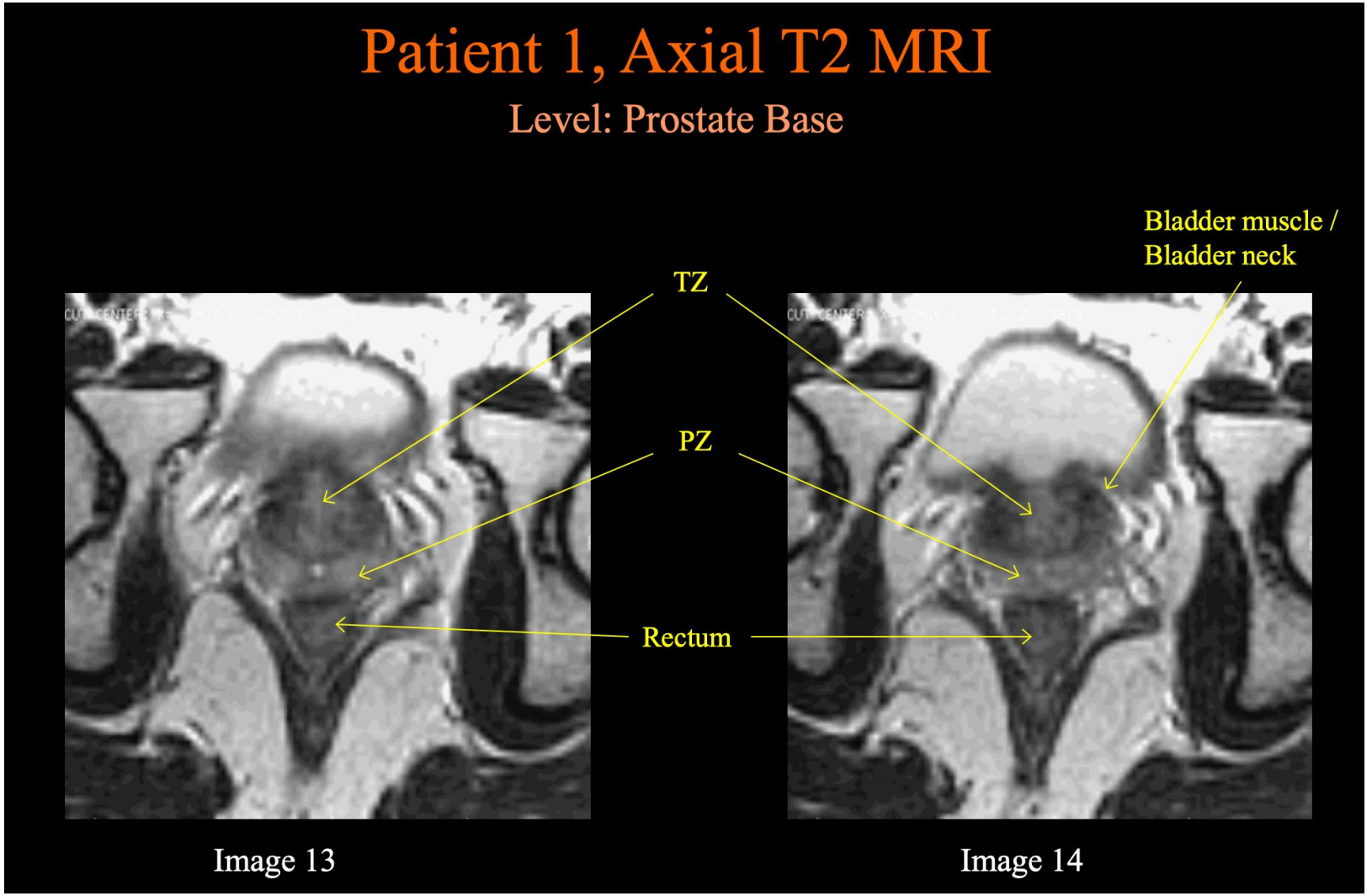
- Peripheral zone
- Transitional zone



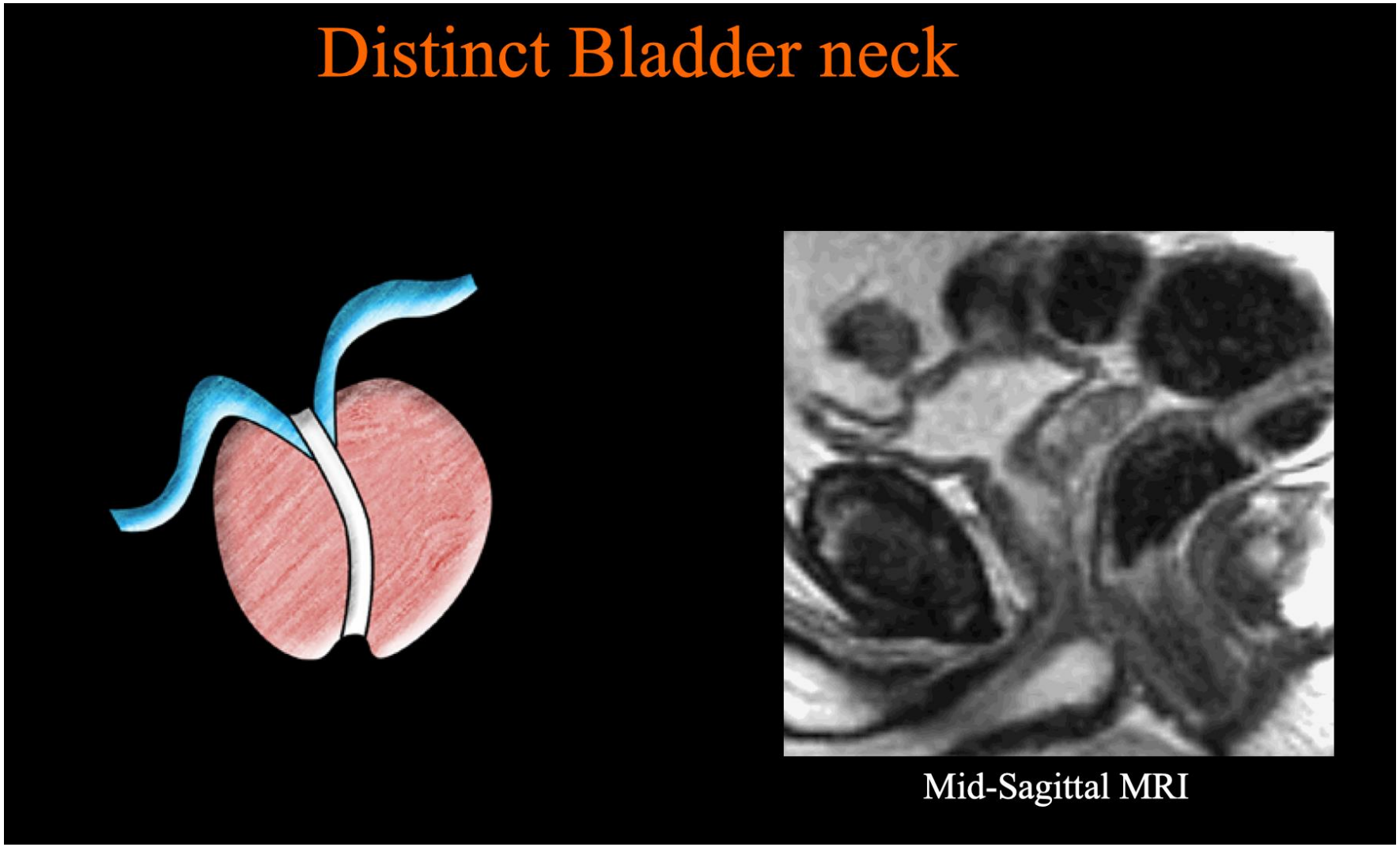
PROSTATE MRI



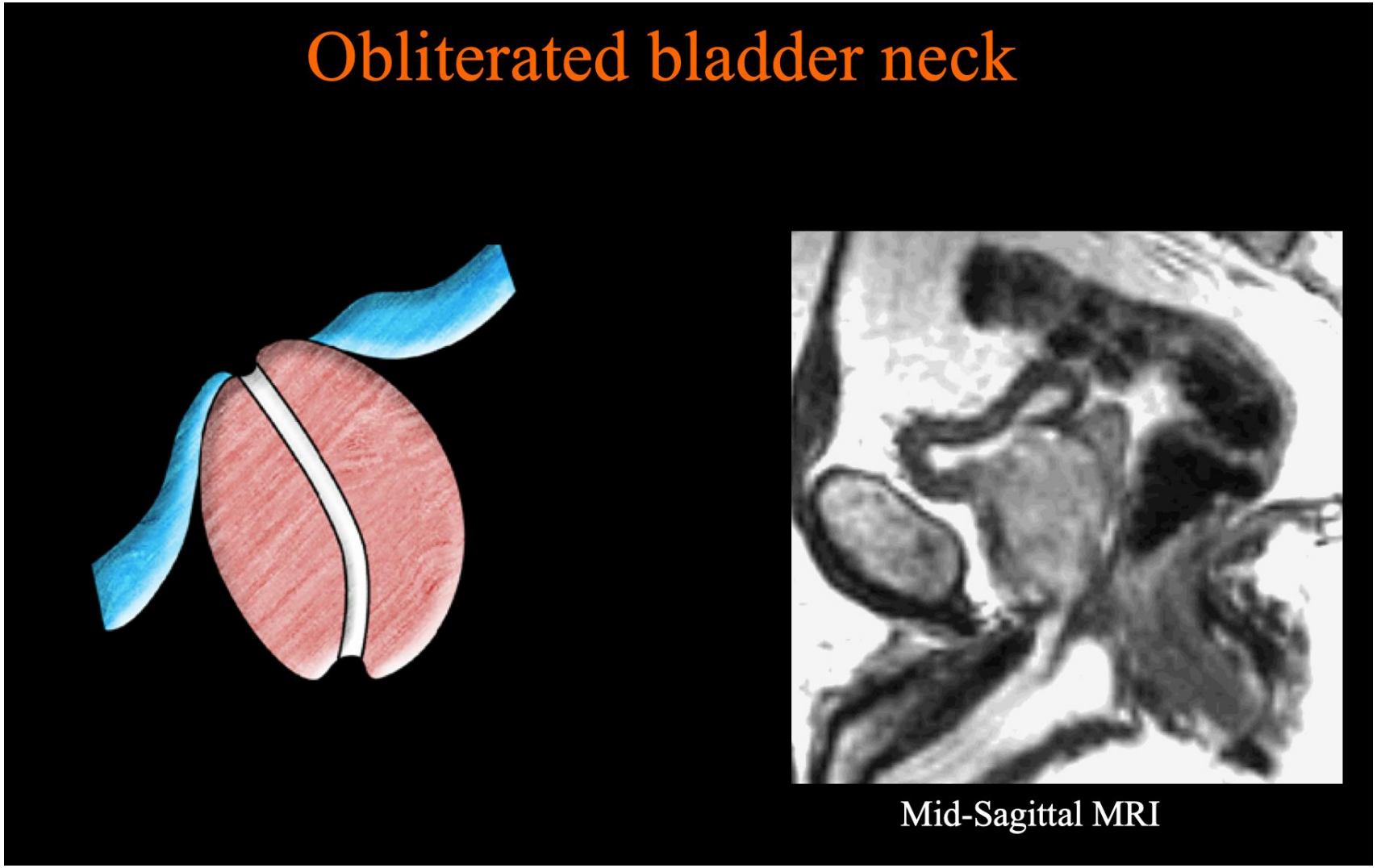
PROSTATE MRI



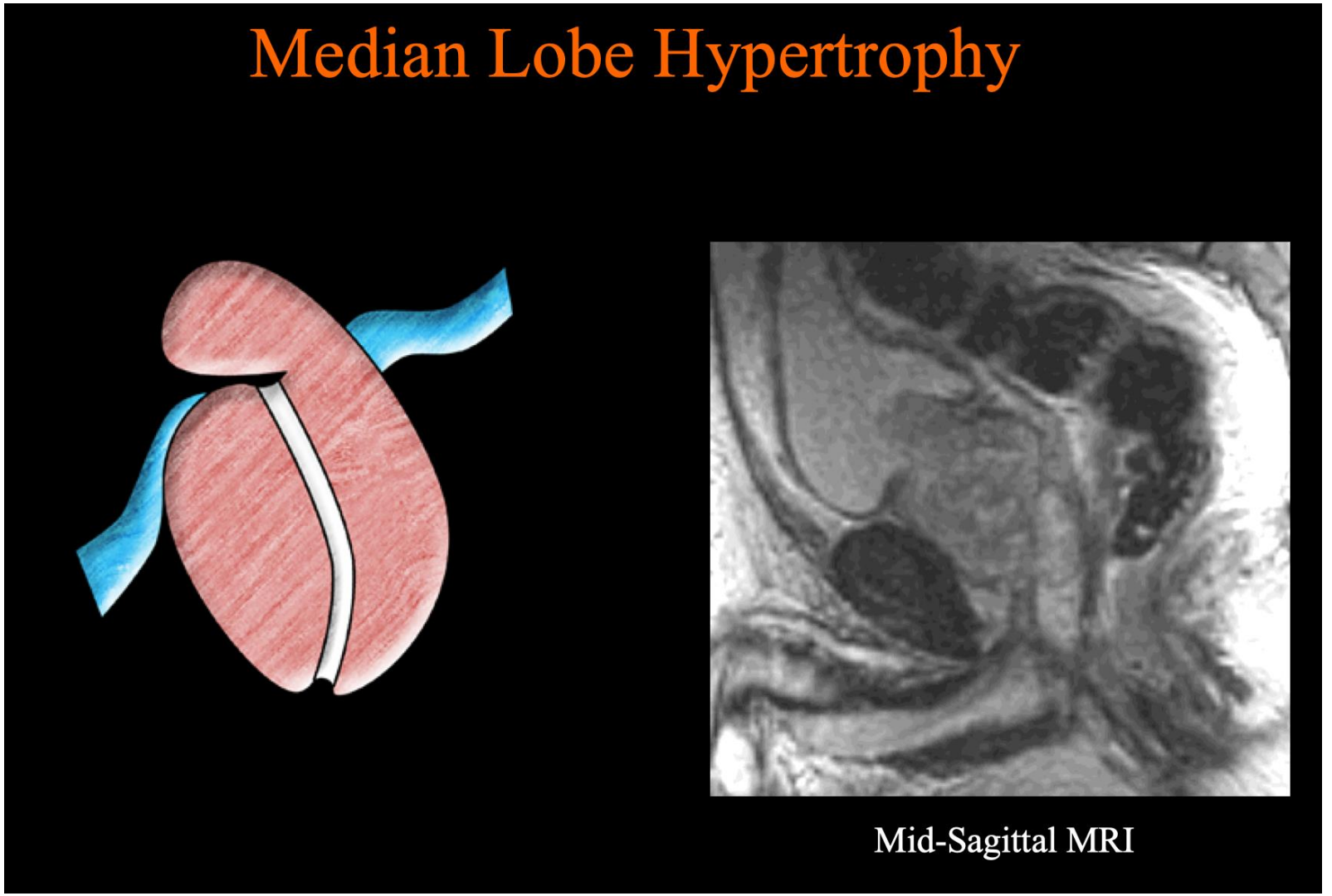
PROSTATE MRI



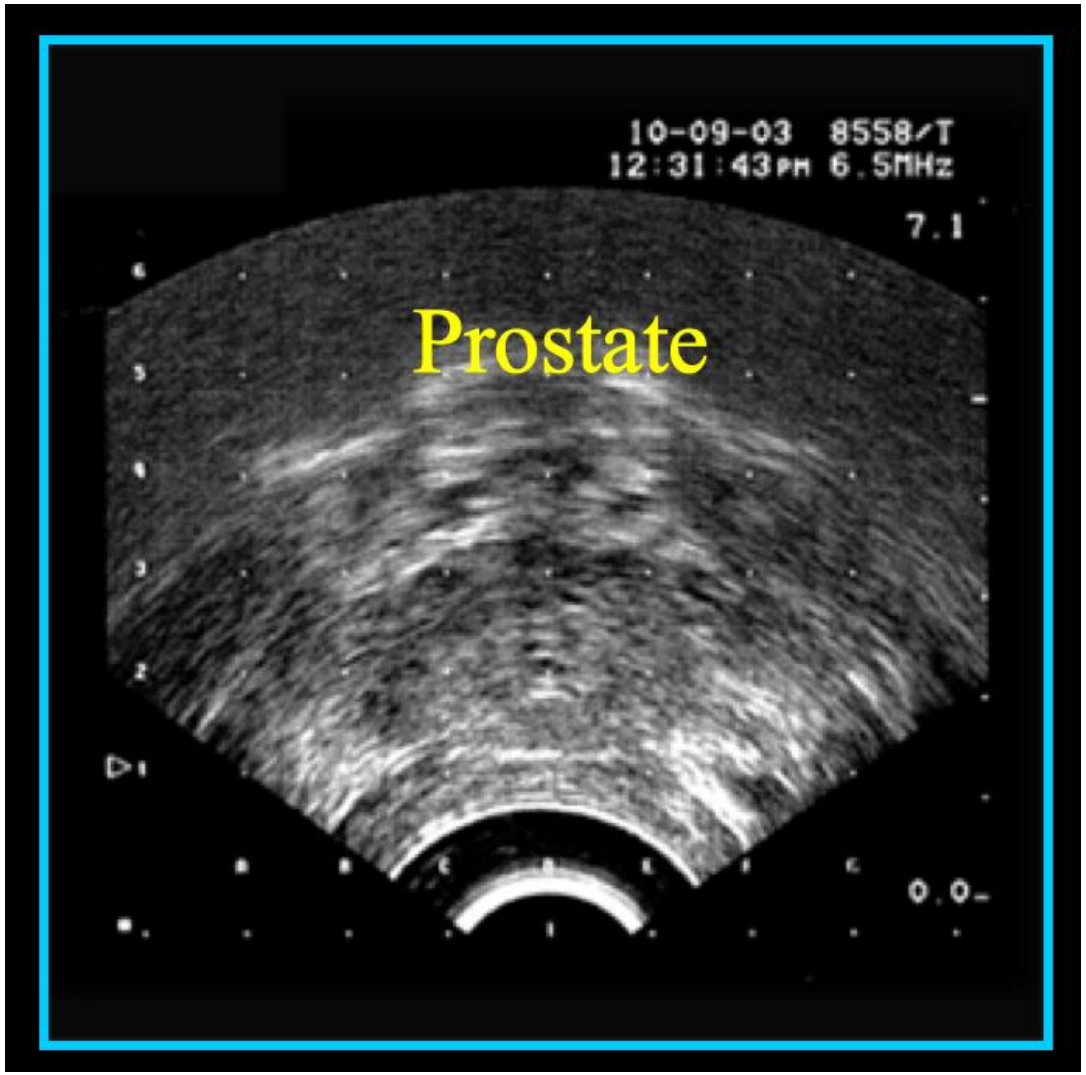
PROSTATE MRI



PROSTATE MRI



PROSTATE ULTRASOUND AND CT



Prostate Cancer Risk Stratification

Low

Intermediate

Favorable

Unfavorable

High

INITIAL RISK STRATIFICATION AND STAGING WORKUP FOR CLINICALLY LOCALIZED DISEASE

Risk Group	Clinical/Pathologic Features			Imaging[f,g]	Germline Testing[c]	Molecular/ Biomarker Analysis of Tumor[c]	Initial Therapy
Very low[d]	Has all of the following: • T1c • Grade Group 1 • PSA <10 ng/mL • Fewer than 3 prostate biopsy fragments/cores positive, ≤50% cancer in each fragment/core[e] • PSA density <0.15 ng/mL/g			• Consider confirmatory prostate biopsy ± mpMRI to establish candidacy for active surveillance	Recommended if family history positive See PROS-1	Not indicated	See PROS-3
Low[d]	Has all of the following but does not qualify for very low risk: • T1–T2a • Grade Group 1 • PSA <10 ng/mL			• Consider confirmatory prostate biopsy ± mpMRI to establish candidacy for active surveillance	Recommended if family history positive See PROS-1	Consider if life expectancy ≥10 y[j]	See PROS-4
Intermediate[d]	Has all of the following: • No high-risk group features • No very-high-risk group features • Has one or more intermediate risk factors (IRF): ▸ T2b–T2c ▸ Grade Group 2 or 3 ▸ PSA 10–20 ng/mL	Favorable intermediate	Has all of the following: • 1 IRF • Grade Group 1 or 2 • <50% biopsy cores positive[e]	• Consider confirmatory prostate biopsy ± mpMRI to establish candidacy for active surveillance • Bone imaging[h]: not recommended for staging • Pelvic ± abdominal imaging[i]: recommended if nomogram predicts >10% probability of pelvic lymph node involvement • If regional or distant metastases are found, see PROS-8	Recommended if family history positive or intraductal/cribriform histology See PROS-1	Consider if life expectancy ≥10 y[j]	See PROS-5
		Unfavorable intermediate	Has one or more of the following: • 2 or 3 IRFs • Grade Group 3 • ≥ 50% biopsy cores positive[e]	• Bone imaging[h]: recommended if T2 and PSA >10 ng/mL • Pelvic ± abdominal imaging[i]: recommended if nomogram predicts >10% probability of pelvic lymph node involvement • If regional or distant metastases are found, see PROS-8	Recommended if family history positive or intraductal/cribriform histology See PROS-1	Consider if life expectancy ≥10 y[j]	See PROS-6
High	Has no very-high-risk features and has exactly one high-risk feature: • T3a OR • Grade Group 4 or Grade Group 5 OR • PSA >20 ng/mL			• Bone imaging[h]: recommended • Pelvic ± abdominal imaging[i]: recommended • If regional or distant metastases are found, see PROS-8	Recommended	Consider if life expectancy ≥10 y[j]	See PROS-7
Very high	Has at least one of the following: • T3b–T4 • Primary Gleason pattern 5 • 2 or 3 high-risk features • >4 cores with Grade Group 4 or 5			• Bone imaging[h]: recommended • Pelvic ± abdominal imaging[i]: recommended • If regional or distant metastases are found, see PROS-8	Recommended	Not routinely recommended	See PROS-7

See Footnotes for Initial Risk Stratification And Staging Workup For Clinically Localized Disease (PROS-2A).

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Treatment Options

Observation

Active surveillance

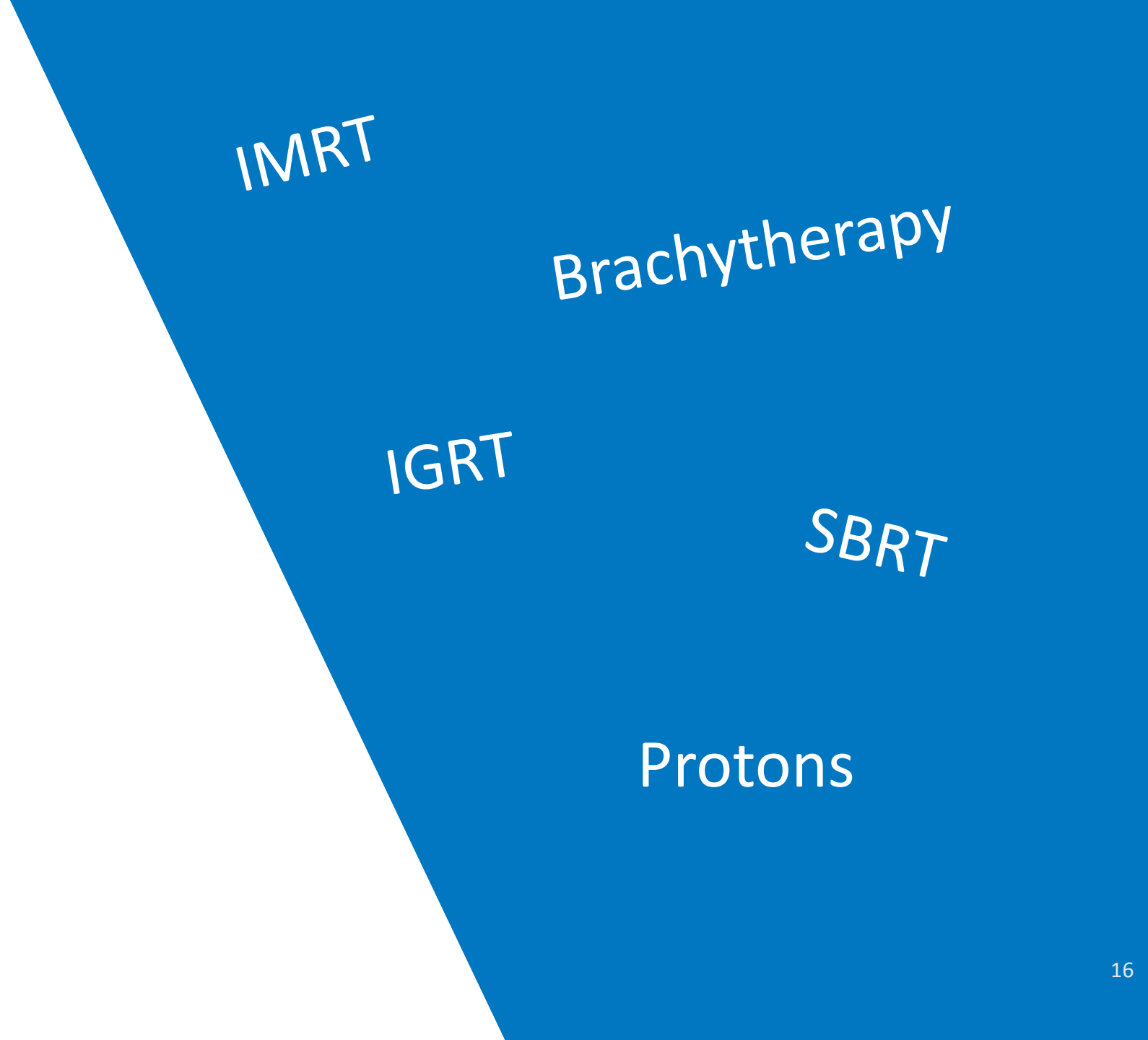
Surgery

Radiation

Hormone therapy

Radiation Modalities

NCCN Patient Guidelines



Radiation therapy

Radiation therapy (RT) can be used as the main or primary treatment instead of surgery. RT uses high-energy radiation from x-rays, gamma rays, and other sources to kill cancer cells and shrink tumors. It is given over a certain period of time. Radiation can be used to cure cancer instead of surgery. Sometimes, it is given after surgery to reduce the chance that your cancer will return. Also, if your PSA begins to rise after surgery, RT might be recommended to try to kill the cancer cells that could have been left behind.

There are 2 main types of radiation treatment:

- **External beam radiation therapy** (EBRT) uses a machine outside of the body to aim radiation at the tumor(s).
- **Internal radiation** is placed inside the body as a solid like seeds. This is called brachytherapy.

EBRT

There is more than one type EBRT used in the treatment of prostate cancer. These allow for safer, higher doses of radiation.

Types of EBRT that may be used to treat your cancer include:

- **Stereotactic body radiation therapy** (SBRT) uses high-energy radiation beams to treat cancers in five or fewer treatments.
- **Proton beam radiation therapy** uses streams of particles called protons to kill tumor cells.
- **Three-dimensional conformal radiation therapy** (3D-CRT) uses computer software and CT images to aim beams that match the shape of the tumor.
- **Intensity-modulated radiation therapy** (IMRT) uses small beams of different strengths to match the shape of the tumor. IMRT is a type of 3D-CRT that may be used for more aggressive prostate cancer.
- **Image-guided radiation therapy** (IGRT) uses a computer to create a picture of the tumor. This helps guide the radiation beam during treatment. IGRT is used with all of the types listed above to ensure that the radiation beams are always hitting the target. This spares normal tissues from radiation damage.

Brachytherapy

Brachytherapy is another standard radiation therapy option for prostate cancer. In this treatment, radiation is placed inside or next to the tumor. Brachytherapy may be used alone or combined with EBRT, androgen deprivation therapy (ADT), or both. You might hear it called brachy (said braykey) for short.

Brachytherapy alone may be an option for men with very-low-, low-, or favorable intermediate-risk prostate cancer depending on life expectancy. Those with high-risk cancers are not usually considered for brachytherapy alone.

There are 2 types of brachytherapy:

- Low dose-rate (LDR) brachytherapy
- High dose-rate (HDR) brachytherapy

LDR brachytherapy

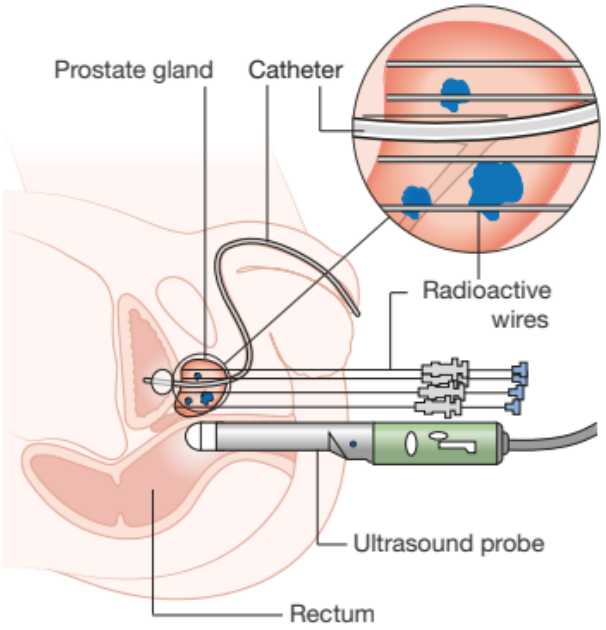
Low dose-rate (LDR) brachytherapy uses thin, hollow needles to place radioactive seeds into your prostate. The seeds are about the size of a grain of rice. They are inserted into your body through the perineum and guided into your prostate with imaging tests.

The seeds usually consist of either radioactive iodine or palladium. They will stay in your prostate and give a low dose of radiation for a few months. The radiation travels a very short distance. This allows for a large amount of radiation within a small area while sparing nearby healthy tissue. Over time, the seeds will stop radiating, but will stay in your body (permanent).

Brachytherapy

In brachytherapy, radiation is placed inside or next to the tumor.

https://commons.wikimedia.org/wiki/File:Diagram_showing_how_you_have_high_dose_brachytherapy_for_prostate_cancer_CRUK_419.svg



PRINCIPLES OF RADIATION THERAPY

Table 1: Below are examples of regimens that have shown acceptable efficacy and toxicity. The optimal regimen for an individual patient warrants evaluation of comorbid conditions, voiding symptoms and toxicity of therapy. Additional fractionation schemes may be used as long as sound oncologic principles and appropriate estimate of BED are considered.

See PROS-3, PROS-4, PROS-5, PROS-6, PROS-7, PROS-9, PROS-13, and PROS-G for other recommendations, including recommendations for neoadjuvant/concomitant/adjuvant ADT.

Regimen	Preferred Dose/Fractionation	NCCN Risk Group (✓ indicates an appropriate regimen option if radiation therapy is given)					
		Very Low and Low	Favorable Intermediate	Unfavorable Intermediate	High and Very High	Regional N1	Low Volume M1[a]
EBRT							
Moderate Hypofractionation (Preferred)	3 Gy x 20 fx 2.7 Gy x 26 fx 2.5 Gy x 28 fx	✓	✓	✓	✓	✓	
	2.75 Gy x 20 fx						✓
Conventional Fractionation	1.8–2 Gy x 37–45 fx	✓	✓	✓	✓	✓	
Ultra-Hypofractionation	7.25–8 Gy x 5 fx 6.1 Gy x 7 fx	✓	✓	✓	✓		
	6 Gy x 6 fx						✓
Brachytherapy Monotherapy							
LDR Iodine 125 Palladium 103 Cesium 131	145 Gy 125 Gy 115 Gy	✓	✓				
HDR Iridium-192	13.5 Gy x 2 implants 9.5 Gy BID x 2 implants	✓	✓				
EBRT and Brachytherapy (combined with 45–50.4 Gy x 25–28 fx or 37.5 Gy x 15 fx)							
LDR Iodine 125 Palladium 103 Cesium 131	110–115 Gy 90–100 Gy 85 Gy			✓	✓		
HDR Iridium-192	15 Gy x 1 fx 10.75 Gy x 2 fx			✓	✓		

[a] High-volume disease is differentiated from low-volume disease by visceral metastases and/or 4 or more bone metastases, with at least one metastasis beyond the pelvis vertebral column. Patients with low-volume disease have less certain benefit from early treatment with docetaxel combined with ADT.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Resources

RESOURCES

- NCCN guidelines for patients – textbook like approach
  - https://www.nccn.org/patients/guidelines/content/PDF/prostate-early-patient.pdf
  - https://www.nccn.org/patients/guidelines/content/PDF/prostate-advanced-patient.pdf
- Nomograms / Predictive models
  - Prognosis and side effects, mainly meant for patients deciding between active surveillance or radical treatment - https://prostate.predict.nhs.uk/
  - Prognosis - https://www.mskcc.org/nomograms/prostate

Websites

American Cancer Society
cancer.org/cancer/prostatecancer/index

California Prostate Cancer Coalition (CPCC)
prostatecalif.org

Malecare Cancer Support
malecare.org

National Alliance of State Prostate Cancer Coalitions (NASPCC)
naspcc.org

National Coalition for Cancer Survivorship
Canceradvocacy.org/toolbox

National Prostate Cancer Awareness Foundation (PCaAware)
pcaaware.org

Nomograms
nomograms.mskcc.org/Prostate/index.aspx

Prostate Cancer Foundation
pcf.org

Prostate Conditions Education Council (PCEC)
prostateconditions.org

Prostate Health Education Network (PHEN)
prostatehealthed.org

Urology Care Foundation
urologyhealth.org

Us TOO International Prostate Cancer Education and Support Network
ustoo.org/Home

Veterans Prostate Cancer Awareness
vetsprostate.org

ZERO - The End of Prostate Cancer
zerocancer.org

Role of Radiation in Oligometastatic Prostate Cancer

STAMPEDE

SABR-COMET

ORIOLE

STOMP

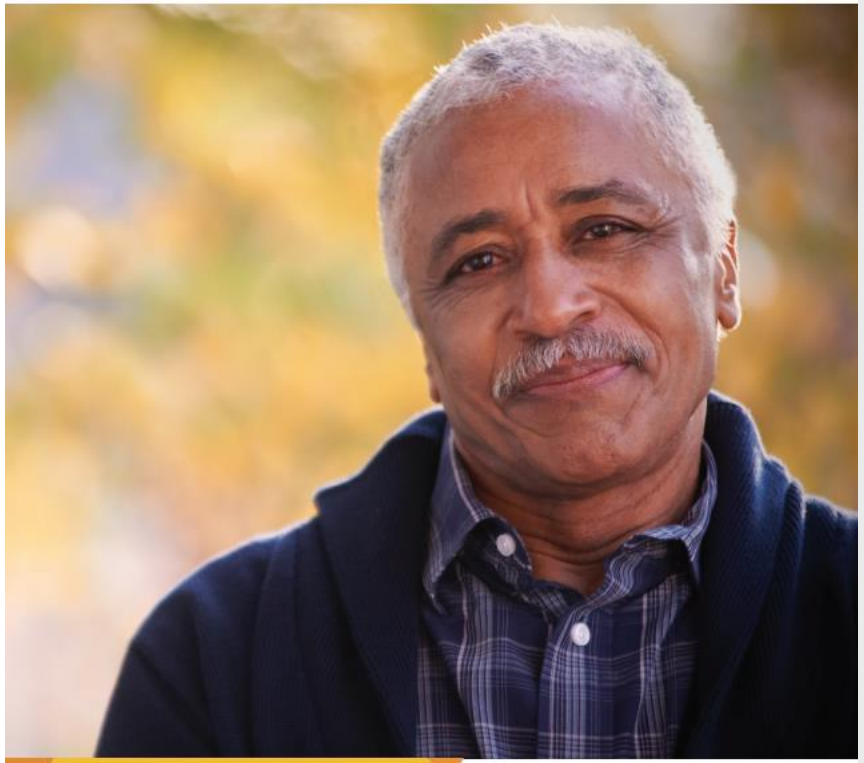
ROLE OF RADIATION

- Treatment of the prostate
  - In patients with low volume metastatic disease (3 or fewer metastases and no visceral metastases), treatment to the prostate without treatment to the metastatic sites has been associated with a survival benefit
- Treatment of metastatic site(s)
  - Promising phase 2 results
    - STOMP: 1-3 metastases
    - ORIOLE: 1-3 metastases
    - SABR-COMET: 1-5 metastases (most pts had 1-3)
  - Await results from larger phase 3 trials
    - SABR-COMET-3: 1-3 metastases
    - SABR-COMET-10: 4-10 metastases

Prostate Cancer at Christ Hospital

Prostate Cancer Collaborative

A multidisciplinary team approach to complex prostate cancer care



The Christ Hospital Health Network

Our Team of Physicians

The team of specialists include physicians from multiple disciplines including urology, radiation oncology and medical oncology and are led by:

JUSTIN COX, MD
Medical Director of Urology Services
The Christ Hospital Health Network
Dr. Cox is a board certified urologist with more than 8 years of experience. Dr. Cox specializes in urological cancers of the prostate, kidney and bladder and is skilled at minimally invasive surgery. He grew up in Florence, KY, attended undergraduate school at Mt. St. Joseph, medical school at Louisville and completed his urology training at the University of Cincinnati College of Medicine.

BRIAN MANNION, MD
Executive Medical Director of Oncology Services
The Christ Hospital Health Network
Dr. Mannion is a board certified medical oncologist with more than 20 years of experience. He completed his internship and residency in internal medicine at Brigham & Women's Hospital and a fellowship in medical oncology at Dana Farber Cancer Institute, both in Boston, MA. He provides care for all types of malignancies but has a special interest in genitourinary cancers which include cancers of the prostate. Dr. Mannion is one of the founders of the Prostate Cancer Collaborative at The Christ Hospital.

CHRISTOPHER FREESE, MD
Radiation Oncologist
The Christ Hospital Health Network
Dr. Freese is a board certified radiation oncologist. He completed his undergraduate studies at the Ohio University and completed medical school at the University of Cincinnati College of Medicine. Dr. Freese holds several professional memberships including American Society for Radiation Oncology, the American College of Radiology, the American Radium Society, and the American Medical Association.

DAVID LONG, MD
Radiation Oncologist
The Christ Hospital Health Network
Dr. Long is a board certified radiation oncologist and has a special interest in reducing normal tissue toxicities with treatment. He completed his undergraduate studies at Miami University and earned his medical degree from the University of Cincinnati College of Medicine. He completed his residency at Indiana University. Dr. Long holds several professional memberships such as the American Society for Radiation Oncology, the American College of Radiology, the Radiological Society of North America, and the Institute for Healthcare Improvement.

How the collaborative works:

- The collaborative is most appropriate for patients who would benefit from multi-specialty care or who are seeking a second opinion on treatment.
- Prostate Cancer Collaborative clinics are held the second Monday of each month. To schedule, patients may call our prostate nurse navigator at 513-585-3138.
- Once the patient is scheduled, he will meet with a specially trained nurse and the team of physicians, together in one room, to discuss his diagnosis and the team's recommended course of treatment. The team will also answer any questions the patient may have.
- After the consultation, our care team will keep the patient's referring physician informed of any treatment recommendations discussed and will encourage the patient to continue to see his referring physician.

513-585-3138

Amber Michael, RN
Prostate Cancer
Patient Navigator

Amber is our prostate cancer patient navigator. She works alongside our physicians and is part of the care team. The goal of the navigator is to improve prostate cancer outcomes by removing any barriers to care and provide patients and their families with the support, education, and the guidance they may need.

Questions?

Thank you!