Prostate MRI

Prostate Imaging ERA

> Mid-2000's, clinical use begins in Europe

> MRI prudently develops 3 parameters
- T2w -detailed internal anatomy
- DWI/ADC - water restriction among cancer cells
- DCE – miniangiogram

> 90 % accurate **diagnosis** of aggressive life threatening cancers (not felt on digital rectal exam, not imaged on Ultrasound or CT Scan)

> MRI clinical implementation requires:
- High quality MRIs
- Experienced radiologist; clinical useful MRI reports
- MRI knowledgeable urologist
- Pathologist to prove the presence of cancer from tissue samples

> 2012, clinical utilization begins in Quebec

> MRI becoming essential for:
- Screening men at risk of prostate cancer
- TRUS/MRI fusion targeted biopsy
- Discriminates clinical stage T2 from T3
- Treatment selection and planning
- Post-treatment monitoring for residual or recurrent cancer
- Selects patients for biopsy
- Local staging
- Active surveillance
- Focal Therapy, Surgery, Radiation

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an educational pamphlet

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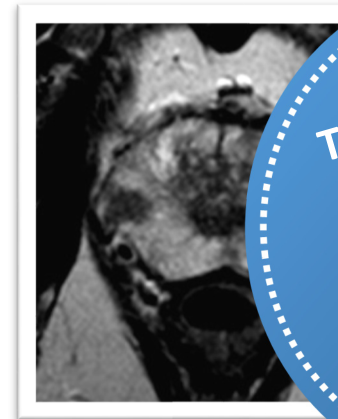
Prostate Cancer MRI
Accurate Diagnosis and Treatment

PSA 2018



To read all the Educational Pamphlets go to pcamri.com

PSA to Prostate MRI

for patients and curious doctors

Samuel Aronson, M.D.
Franck Bladou, M.D.
Armen Aprikian, M.D. & Marc Emberton, M.D. Forewords

Prostate Specific Antigen

A biomarker which predicts Prostate Cancer

a good misused test with a bad reputation

PSA ERA

- > Early 1990's, PSA clinical use starts
- > PSA widely adopted before thorough scientific study
  4 ng/ml assigned as upper limit of normal
- > PSA screening becomes widely popular
- > Millions of men with PSA greater than 4 ng/ml undergo schematic non-targeted Trans Rectal Ultrasound (TRUS) prostate biopsy
- > 2012, US Preventive Services Task Force
  recommends against PSA testing
  - Harms of screening outweighs benefits
  - Overdiagnosis and unnecessary treatment of non-aggressive insignificant cancers which progress so slowly they do not cause harm
- > Much less PSA testing by doctors and patients
- > 2016, with no prior PSA testing
  patients presenting with advanced cancers
- > 2017 US Preventive Services Task Force recommends patient informed PSA testing

PSA in diagnosis

- > PSA may indicate benign prostatic hypertrophy, urine retention, infection, instrumentation or cancer
- > No assigned PSA normal value
  - 4 ng/ml upper limit of normal is incorrect
  - As PSA increases chances of cancer increases
  - Over 4 ng/ml mostly caused by BPH
  - Less than 4 ng/ml aggressive cancers may be present
  - Always confirm an unusual value. PSA's vary at different laboratories and at different times

PSA Progression (Trend)

A better prostate cancer predictor then PSA alone

- PSA normally increases over many years
- Prostates grow bigger with age (BPH), PSA usually ↑ with age
- Prostate cancers can cause more rapid PSA Progression

PSA Density

An even better prostate cancer predictor than PSA Progression

- > PSA Density - the ratio of PSA to prostate volume $\frac{\text{PSA}}{\text{Prostate volume}}$
- > Prostate volume obtained from Trans Rectal Ultrasound (TRUS) or MRI
- > PSA Density (PSAD)
  - less than 0.10 (cancer unlikely)
  - 0.10-0.15 (borderline)
  - greater than 0.15 (cancer likely)

PSA Testing

Obtain baseline values

Age 30 - men at risk (Family-Genetic History, Black Gentlemen)

Age 40 - men with concern

Recheck every 2 to 4 years

PSA when used carefully and with PSA Progression and PSA Density is an inexpensive, available, widely used good cancer predictor

Prostate Cancer Risk Assessment includes PSA

Selects men for Prostate MRI (Pamphlet 18)

Life expectancy, age, major illnesses, Family-Genetic History, Race, 5 alpha reductase inhibitors, testosterone, exposures, urine infections, previous MRI, biopsy, pelvic surgery and radiation, Predictor Tables, Urology Exam, PSA, PSA Progression, Biomarkers, TRUS-PSAD

PSA after treatment

Accurate, reliable, biomarker monitoring for residual or recurrent prostate cancer.