Diagnosing Prostate Cancer

PSA to Prostate MRI

for patients and curious doctors

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PSA (Prostate Specific Antigen) biomarker

**Prompts prostate cancer**

- PSA may indicate benign prostate hypertrophy (BPH), urine infection, urine retention, instrumentation or cancer.
- Prostates grow bigger with age (BPH) PSA usually ↑ with age.
- Obtain Baseline PSA age 30, men at high risk age 40, men with concern.
- PSA Trend, progression is faster, higher with aggressive cancers more accurate predictor than PSA alone.

- **PSA** • 4 ng/ml upper limit of normal is incorrect.
  - less than 4 ng/ml aggressive significant cancers may be present.
  - over 4 ng/ml mostly caused by BPH.

When used carefully and with PSA trend PSA is a good inexpensive available widely used cancer predictor.

PSA Density (PSAD)

*PSAD is doubly better than PSA as a cancer predictor.*

- PSAD is the ratio of PSA to prostate volume.
- \[ \text{PSAD} = \frac{\text{PSA}}{\text{prostate volume}} \]
  - \[ \text{PSA} 6.2 \text{ ng/ml} \text{ vol 77 cc} = 0.08 \text{ (normal)} \]
  (Prostate volume obtained from Trans Rectal Ultrasound and MRI).
- Prostate cancers usually produce more PSA than BPH.
  - **Normal** PSAD - less than 0.10.
  - **Borderline** PSAD - 0.10 to 0.15.
  - **Abnormal** PSAD - greater than 0.15.
Prostate MRI

**Identifies** prostate cancer

**94 % accurate**

(with precise image acquisition and experienced radiologist)

- Identifies cancer nodule(s), size and location
- Predicts degree of malignancy (Gleason Grade)
- Stages local extension of the cancer

Prostate MRI T2w image

Courtesy of Dr. M. Emberton

Prostate Cancer **Risk Assessment**

selects men for MRI

MRI selects men for biopsy
Prostate Cancer

Men at High Risk

> Less than 70 years
> More than 10 year life expectancy
  (prostate cancers grow slowly, take years to grow dangerous;)
> Family – Genetic History of prostate cancer
> Black gentlemen
> Prostate nodule on digital rectal exam
> PSA Trend, progression faster, higher than expected
> PSA increases in men on Avodart, Proscar, Testosterone
> PSA more than 10
> PSAD more than 0.15
> Abnormal Prostate Cancer Biomarkers/Predictor Tables
> Previous MRI, biopsy or diagnosis of prostate cancer
> MRI PI-RADS Score 4,5, nodule ≥ 0.5 cc

MRI image based prostate cancer accurate diagnosis and treatment

(Learn more, pamphlets 3, 4 and 5)