Prostate Cancer Screening –
Make an Informed Decision

Kevin Bundy, M.D.
Boulder Creek Family Medicine
Introductions

Kevin Bundy MD FAAFP

- Family Medicine Physician

- 20 years in practice
- Boulder Creek Family Medicine
- Boulder Community Health
Objectives

1. To inform you about prostate cancer
2. To educate you about the basics of medical screening
3. To review guidelines regarding prostate cancer screening
4. To empower you to make informed decisions about screening
What is the prostate?
The Prostate Gland

- Walnut/ping pong ball sized gland
- Sits in front of the rectum and below the bladder
- Only men have a prostate
- Produces fluid to help carry sperm during ejaculation
- Surrounds the urethra as it exits the bladder
Prostates Gone Wild: diseases of the prostate

1. Prostatitis

2. Benign Prostatic Hypertrophy

3. Prostate Cancer
Prostate Cancer: How common is it?

- 1.3 million cases per year - worldwide
- 192 thousand cases per year - US
- Third leading cause of cancer / Second in men
- 12% lifetime risk of developing prostate cancer
Prostate Cancer: How deadly is it?

- 359 thousand deaths per year - worldwide
- 33 thousand deaths per year - US
- 2.4% lifetime risk of death from prostate cancer
Prostate Cancer: How deadly is it?

• Most men die of something else before prostate cancer kills them

• Prostate cancer found incidentally at autopsy
  – 50-70 years old = 30%
  – >70 years old = 70%
Prostate Cancer: 

*Risk factors*

- Having a prostate
  - All men have some risk
- Age
  - Rare younger than 50
- African American
  - More common dx and death
- Family history
  - First degree relative with prostate cancer
  - Female relatives with BRCA related cancer
- Diet
  - High animal fat/low vegetables
Screening Tests: The basics

• Screening is providing a test to an asymptomatic person to determine the likelihood of them having the disease
• Screening may not diagnose the illness
• Positive screens usually require further evaluation
Screening Tests: What’s the point?

- The goal of screening is to reduce morbidity or mortality from the disease by detecting it in an early stage when treatment is usually more successful.
Screening Tests: 

What makes a good screening test?

• High Sensitivity/Specificity
• High Predictive Value
• Cost effective
  – Common disease
  – Low cost compared to treatment
• Easily available
• Safe/minimal discomfort
• Appropriate follow up
• Disease could have serious and irreversible consequences if not treated early/ early treatment must be more effective than waiting for symptoms
Screening Tests:

*Bio-statistics 101-Evaluation of a test*

**Sensitivity:**
- the test’s ability to identify the presence of a disease
- Low sensitivity = false negatives

**Specificity:**
- the test’s ability to identify the absence of a disease
- Low specificity = false positives
Screening Tests:

Bio-statistics 101-Evaluation of a patient

Positive Predictive Value:
• The likelihood of a person having the disease if the test is positive
• Low PPV = false positives
• Overdiagnosis

Negative Predictive Value:
• The likelihood of a person NOT having the disease if the test is negative
• Low NPV = false negatives
• Missed cases
Prostate Cancer Screening: What tests do we have?

- Digital Rectal Exam (DRE)
- Prostate Specific Antigen (PSA)
Prostate Cancer Screening: 

*Digital Rectal Exam*
Prostate Cancer Screening: 
**Digital Rectal Exam**

- Early cancers (T1) not palpable
- Positive DRE = ninefold increase in odds of metastatic disease (non curable)
- High variability between providers
- Low concordance/agreement between examiners
  - Urologists disagree regarding exam findings about 20% of the time
    - Smith DS, Catalona WS
    - Urology 1995
- When added to PSA detection rates increased 1.2%
Prostate Cancer Screening:  
*Digital Rectal Exam*

- Sensitivity = 51%
  - 49% false negatives
- Specificity = 59%
  - 41% false positives
- Positive predictive value = 41%
  - 59% false positives
- Negative predictive value = 64%
  46% false negatives
Prostate Cancer Screening: 
*Digital Rectal Exam*
Prostate Cancer Screening: 
**PSA**
Prostate Cancer Screening:  
*PSA – What is it?*

- Protein produced by the prostate/measured in the blood

- Experiments started in 1960s
  - Quantitative blood test 1980s
  - Tested as cancer marker
Prostate Cancer Screening: 

**PSA**

- Elevated in prostate cancer
- Most common reason for elevation = BPH (benign growth)
- Also elevated with infection, trauma, sexual activity
Prostate Cancer Screening: *PSA*

- Decreased with some drugs
  - 5 alpha reductase inhibitors (BPH)
    - Up to 50% reduction
  - NSAIDS/ASA
    - Up to 40%
  - Thiazide diuretics
    - Up to 26% reduction
  - Statins
    - 4% reduction
      » Reduced incidence of prostate cancer
Prostate Cancer Screening: 
*PSA numbers – it’s complicated*

- Incidence increases with age
  - Skews predictive values

- PSA is quantitative
  - Cut off value changes sensitivity and specificity (standard is 4.0 ng/ml)

- Serial testing has different attributes than one-time testing
Prostate Cancer Screening: 
*PSA - numbers*

- **Sensitivity**
  - 20% - 80%

- **Specificity**
  - 60% - 94%

- **Positive predictive value (PPV)**
  - 30% 70% *false positives*
    - *Overdiagnosis*

- **Negative predictive value**
  - 85% 15% *false negative*
    - *Missed cases*
Prostate Cancer Screening:

PSA – Should we use it?
Prostate Cancer Screening: Recommendations

• USPSTF
  – Shared decision making at 55-69*
    • Younger if increased risk
• ACP
  – Shared decision making at 50-69
    • Younger if increased risk
• National Cancer Institute
  – Insufficient evidence for or against

*suggest screening only if > 10 year life expectancy
Prostate Cancer Screening: Recommendations

• AUA
  – Screen 40-54 only if increased risk
  – 55-69 shared decision making
  – 2-year interval

• ACS
  – Shared decision making

• Choosing wisely
  – No routine screening

*suggest screening only if > 10 year life expectancy
<table>
<thead>
<tr>
<th>Pros-</th>
<th>Cons-</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 20% lower chance of dying from prostate cancer after 13 years</td>
<td>• 1 fewer death for 1,000 men screened after 13 years (other studies have found no decrease in mortality)</td>
</tr>
<tr>
<td>• 30% lower chance of metastatic disease</td>
<td>• 75% of men with an elevated PSA underwent prostate biopsy with no cancer</td>
</tr>
<tr>
<td>• Screening finds earlier disease</td>
<td>• 5-year survival for early stage prostate cancer is 100%</td>
</tr>
<tr>
<td>• 5-year survival for early stage prostate cancer is 100%</td>
<td>• Many cancers found are unlikely to cause death or disability</td>
</tr>
<tr>
<td>• Test is easy and accurate</td>
<td></td>
</tr>
</tbody>
</table>
Prostate Cancer Screening: *A picture’s worth a thousand words*
Prostate Cancer Screening: How to Decide? - food for thought

• Do I want to know if I have prostate cancer?

• Would I choose to be treated?

• How do I feel about the risks of being treated?

• How do I feel about the possibility of getting aggressive prostate cancer?

• Would I be willing to accept side effects from treatment in return for a small chance of living longer?
Time stands still for no recommendation
“Grey Zone” PSA (4-10)

<table>
<thead>
<tr>
<th>Watchful Waiting-</th>
<th>Active Surveillance-</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Palliative approach</td>
<td>- Curative approach</td>
</tr>
<tr>
<td>- Occasional PSA</td>
<td>- Frequent PSA</td>
</tr>
<tr>
<td>- No/ limited biopsies</td>
<td>- Repeat biopsy</td>
</tr>
<tr>
<td>- Late treatment based on symptoms</td>
<td>- Early treatment based on PSA testing / Gleason score</td>
</tr>
<tr>
<td>- Older/Sicker men</td>
<td>- Younger/Healthy men</td>
</tr>
</tbody>
</table>
Time stands still for no recommendation
“Grey Zone” PSA (4-10)

• Age adjusted PSA
• PSA velocity
• PSA Density
• Free/Total PSA

• Complexed PSA
• Percent pro[-2]PSA
  Ppsa/Fpsa
• Prostate Health Index
  %pPSA/Total PSA
Leaving Science Behind  
– My Opinion/Approach

Does not reflect the opinion of Boulder Community Health

<table>
<thead>
<tr>
<th>Patient has an opinion-</th>
<th>Patient wants me to decide-</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Listen to the patient</td>
<td>1. Remember the stats</td>
</tr>
<tr>
<td>2. Listen to the patient</td>
<td>PSA = PPV 30%  NPV 85%</td>
</tr>
<tr>
<td>3. Listen to the patient</td>
<td>2. Remember the incidence</td>
</tr>
<tr>
<td></td>
<td>12% lifetime risk = 88% likelihood on not</td>
</tr>
<tr>
<td></td>
<td>3. Play the odds</td>
</tr>
<tr>
<td></td>
<td>4. Trust in advancements</td>
</tr>
<tr>
<td></td>
<td>5. Educate the patient</td>
</tr>
</tbody>
</table>
Prostate Cancer Screening:  
How to decide? – more information

- Up-to-date
- National Cancer Institute
- American Cancer Society
- American Society of Clinical Oncology
- US Centers for Disease Control and Prevention
- Mayo Clinic
Questions?
Prostate Cancer Screening – Make an Informed Decision

Kevin Bundy, M.D.
Boulder Creek Family Medicine