Prostate Cancer Screening: Phantom menace to society

Folusho Ogunfiditimi, DM, MPH, PA-C
Vattikuti Urology Institute
Henry Ford Health System
Objectives

- USPTF Recommendations on PSA testing
- Justification for the recommendations
- Journal club: Evidence Pros and Cons to screening
- What is PSA
- The Politics of Screening
- Where do we go from here
- Discuss AUA guidelines
Urologist v. World
USPSTF Recommendation

- Goal of USPSTF is to “separate the science of screening from the politics of screening—“theoretically”

- Mammography Guidelines of 2009
  - Stop screening for women below 50 years
  - Screening should be every 2 years for women above 50 yrs

- Prostate Cancer guidelines have been in place since 2009 but not released till Oct 2011

USPSTF Recommendation

- Downgrade PSA screening rating from “I” to “D”.
  - “I” = Inconclusive, insufficient evidence (Current status)
  - “D” = No Benefit for screening men below 75 - Mod- high evidence that service has no net benefit
- USPSTF represents a pillar of evidence based medicine in the US Government
- Level 1 Evidence - 5 RCTs – Quebec Trial-2004, ERSPC Trial-2009, PLCO – 2009, Goteborg Trial (Sweden, 2010), Norrkoping (Sweden, 2011-Update)

Initial Reaction......
Risk Reduction of CaP Mortality

- Quebec (2004) – 64% reduction
- ERSPC (2009) – 20% reduction
- PLCO (2009) – No reduction
- Goteborg (2010) – 44% reduction
- Norrkoping (2011) – No reduction
### Summary of Trials

<table>
<thead>
<tr>
<th>Screening trial</th>
<th>Age range</th>
<th>Median follow-up, Years (Time Period)</th>
<th>Method of screening</th>
<th>PSA threshold</th>
<th>Cumulative CaP incidence: screened vs control</th>
<th>CaP deaths/Total screened vs control</th>
<th>Risk of death from prostate cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec (2004) [5]</td>
<td>45–80</td>
<td>11 (1988–1999)</td>
<td>PSA + DRE ± TRUS (annual)</td>
<td>&lt;3.0</td>
<td>not provided</td>
<td>10/7 348 vs 74/14 231</td>
<td>Relative risk = 0.36 (CI 0.19–0.65) i.e. 64% reduction in CaP mortality</td>
</tr>
<tr>
<td>ERSPC (2009) [6]</td>
<td>55–69</td>
<td>9 (1991–2003)</td>
<td>PSA ± DRE ± TRUS (4-yearly in 6 of 7 centres)</td>
<td>&lt;3.0–4.0</td>
<td>8.2% vs 4.8%</td>
<td>214/72 890 vs 326/89 353</td>
<td>Rate ratio = 0.80 (CI 0.65–0.98) i.e. 20% reduction in CaP mortality</td>
</tr>
<tr>
<td>PLCO (2009) [7]</td>
<td>55–74</td>
<td>11.5 (1993–2001)</td>
<td>PSA (yearly for 6 years) + DRE (yearly for 4 years)</td>
<td>&lt;4.0</td>
<td>7.4% vs 6.1%</td>
<td>50/38 343 vs 44/38 350 (at 7 years)</td>
<td>Rate ratio = 1.11 (CI 0.83–1.50) i.e. no reduction in CaP mortality</td>
</tr>
<tr>
<td>Göteborg study (2010) [8]</td>
<td>50–64</td>
<td>14 (1995–2008)</td>
<td>PSA (every 2 years)</td>
<td>&lt;2.5–3.4</td>
<td>12.7% vs 8.2%</td>
<td>44/9 952 vs 78/9 952</td>
<td>Relative risk = 0.56 (CI, 0.39–0.82) i.e. 44% reduction in CaP mortality</td>
</tr>
<tr>
<td>Norrkoping (2011) [9]</td>
<td>50–69</td>
<td>20 (1987–2008)</td>
<td>DRE for first round; PSA + DRE after (3-yearly)</td>
<td>&lt;4.0</td>
<td>5.7% vs 3.9%</td>
<td>30/1 494 vs 130/7 532</td>
<td>Risk ratio = 1.16 (CI 0.78–1.73) i.e. no reduction in CaP mortality</td>
</tr>
</tbody>
</table>

Ghani, K, et. BJU 2011
Critique

- Quebec (2004) – Old Study, Old data, low compliance
- ERSPC (2009) – Gold Standard, but only 20% reduction in mortality@ 7 years,
- PLCO (2009) – US study, poor screening interval (5-6yrs), controls were contaminated by unlimited amount of prescreening (44%) and higher PSA cut off.
- Goteborg (2010) – younger patients, lower PSA threshold, shorter screening trial, low number of participants
- Norrkoping (2011) – Longest follow, significant under screening and drop out rate. Change in screening protocol from DRE to PSA screening, 2/3rd did not get a second PSA screening.

Ghani, K, et. BJU 2011
What is the PSA Test

PSA ≠ Perfect Serum Assay

PSA = Prostate Specific Antigen (No cancer in the definition)

Good Specificity to Prostate Tissue

Poor Sensitivity to Prostate Cancer

The best non perfect serum tumor marker for prostate cancer

Its cheap

Mammograms for Breast
CT scans for Kidneys, MRIs...etc.
Other Prostate Cancer Screening Options

- Ultrasensitive PSA [redefined PSA assay]
- % Free PSA [% free <20, suspect CaP]
- PSA Velocity [>0.75 rise in PSA annually]
- PSA Density [PSA/Prostate mL. High ratio =? CaP]
- Alkaline Phosphatase [only present with advanced CaP]
Economics about PSA Screening

- NNS and NNT (ratio to mortality)
  - ERSPC = 1410 NNS, 48 NNT
  - Gothburg = 293 NNS, 12 NNT
- PSA based screening results in earlier diagnosis of CaP
- Politics, Prostate Cancer and Your Health
- Cost and Funding
- Impact of Health Care Reform
  - Mammography
  - Congressional Influences
NNT = Screened

NNS = No Cancer

NNS = Cancer

NNS = No Cancer

NNS = Cancer

NNS = No Cancer

NNS = Cancer

NNT = No treat

NNT = Treat

NNT = Mortality

Treat
# Lifetime Economic Burden of Prostate Cancer


Michael E Stokes (michael.stokes@unitedbiosource.com)
Jack Ishak (Jack.Ishak@unitedbiosource.com)
Irina Proskorovsky (Irina.Proskorovsky@unitedbiosource.com)
Libby K Black (libby.k.black@gsk.com)
Yijian Huang (yhuang5@emory.edu)

## Table 3. Mean Life-time Costs and Survival, by Cancer Stage (US$ 2004)*

<table>
<thead>
<tr>
<th>Study Measure</th>
<th>Stage I</th>
<th>Stage II</th>
<th>Stage III</th>
<th>Stage IV</th>
<th>All Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>71,861</td>
<td>25,590</td>
<td>22,103</td>
<td>21,011</td>
<td>140,565</td>
</tr>
<tr>
<td>Total costs</td>
<td>$120,085</td>
<td>$113,616</td>
<td>$110,943</td>
<td>$73,587</td>
<td>$110,520</td>
</tr>
<tr>
<td>PCa-related costs</td>
<td>$39,182</td>
<td>$31,915</td>
<td>$26,078</td>
<td>$30,038</td>
<td>$34,432</td>
</tr>
<tr>
<td>Average years of survival</td>
<td>14.3</td>
<td>15.0</td>
<td>16.4</td>
<td>3.7</td>
<td>13.2</td>
</tr>
<tr>
<td>Total costs per year</td>
<td>$8,398</td>
<td>$7,574</td>
<td>$6,765</td>
<td>$19,888</td>
<td>$8,373</td>
</tr>
<tr>
<td>PCa-related costs per year</td>
<td>$2,740</td>
<td>$2,128</td>
<td>$1,590</td>
<td>$8,118</td>
<td>$2,608</td>
</tr>
</tbody>
</table>

*Costs discounted at 3%
Prostate-cancer screening--what the U.S. Preventive Services Task Force left out.

- 3 points that influence PSA Screening
  - Office based decision not based on evidence based medicine
    - No such things as clear evidenced based medicine
    - 2 large trials are conflicting at best
    - Can informed consent truly be informed if there is no concrete Data to support
  - Variability in PSA level Management in urology and PC practices
    - The influence of ABX on PSA – no data to support
    - Multiple screenings to asses degree of variability
    - 2.5 – 4.0. for everyone, or for individuals
  - Impact of Health Policy and Cost on Health Care Practices and decision making
    - ERSPC = 5.2m spent to prevent 1 death from CaP
    - Impact of Health Disparities – Should we segregate screening
      - Brett AS, Ablin RJ.
Prostate cancer is the most common noncutaneous cancer in men in the US, and the second leading cause of male cancer death (28,660 in 2008)

CaP is heterogeneous - autopsy studies= 1/3 men >50ys has CaP, with 80% limited in size and grade and, clinically insignificant.

The lifetime risk of prostate cancer death = 3%.

All clinicians should discuss the benefits and harms associated with CaP with Patients

Decision to screen should be based on individual patient preferences.

AUA Guidelines

- AUA Guidelines...2009
Candidates for early detection testing:

Baseline PSA age 40 years with anticipated lifespan of 10 or more years

What tests should be offered?

Prostate specific antigen and Digital rectal examination

Family history, race, PSA history, prior biopsy

1. DRE abnormal/PSA low for age (consider possible causes: prostate cancer, BPH, infection, trauma, etc)
2. PSA high for age or
3. DRE abnormal and PSA high

Both tests are low/not suspicious

Return regularly for PSA and DRE

Counsel patient regarding both risks and benefits of biopsy

Biopsy not done

Biopsy done, extended, local anesthesia

Biopsy positive

Management discussion and risk assessment

Active surveillance or Treatment

Figure 1: Early Detection
Summary

- PSA = Over detection: Yes
- Overreaction = Overtreatment: Yes
- Alternate Options = Little to none
- Consider all factors influencing Cap Screening
- What to do
  - Improved Counseling on screening and treatment options
  - Earlier detection is better than late cure
  - Research for better test,
  - Improve on existing treatment options including active surveillance
It boils down to this.....

....I just turned 40 and I’m getting my PSA test and MORE on Monday.
Questions and answers
References

- Ghani, K., Trinh, Q-D., Menon, M. The Phantom Menace of Prostate Cancer Screening. BJUI. Nov. 2011.
- [http://www.familymedicine.vcu.edu/research/misc/psa/index.html](http://www.familymedicine.vcu.edu/research/misc/psa/index.html)
- [http://www.auanet.org/content/media/psa09.pdf](http://www.auanet.org/content/media/psa09.pdf)