



Reducing Inappropriate Use of PSA Screening for Prostate Cancer: a Population Health Case Study

Clinical Informatics, Data Analytics, and Population Health Methodologies Lead to Significant Reduction in the Clinically Inappropriate Use of PSA-Based Screening for Prostate Cancer



Valor Healthcare, Inc.

JANUARY 2022 Dallas, TX
www.valorhealthcare.com

Thought Papers & Case Studies Series



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Clinical Informatics, Data Analytics, and Population Health Methodologies Lead to Significant Reduction in the Clinically Inappropriate Use of PSA-Based Screening for Prostate Cancer

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Scott C. Wise, MD, MBA, Hope Jordan, DO, Casey Jordan, et al. (2022)



Background

The lifetime risk of a man being diagnosed with prostate cancer is approximately 11% while the risk of dying from prostate cancer is 2.5%.¹ While certain patient populations are at higher risk than others (African American men and men with a family history of prostate cancer), many men with prostate cancer never experience symptoms and would never know they have the disease without being screened.

The goal of prostate cancer screening is early identification of localized, treatable cancer. In contrast, screening for prostate cancer also carries with it potential physical and mental/emotional harms.

The U.S. Preventive Services Task Force (USPSTF) is an independent panel of experts in disease prevention and evidence-based medicine. The USPSTF works to improve the health of people nationwide by making evidence-based recommendations about clinical preventive services². Their recommendations are well-accepted and followed by the medical community and are held as a reliable set of clinical practice guidelines to be followed. In its 2018 update, the **“USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older”** (Figure 1).

“USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older”

¹ Screening for Prostate Cancer. US Preventive Services Task Force Recommendation Statement. *JAMA*. 2018;319(18):1901-1913.doi:10.1001/jama.2018.3710

² U.S. Preventive Services Task Force, [Home page | United States Preventive Services Taskforce \(uspreventiveservicestaskforce.org\)](https://www.uspreventiveservicestaskforce.org)

Clinical Summary: Screening for Prostate Cancer

Population	Men aged 55 to 69 y	Men 70 y and older
Recommendation	The decision to be screened for prostate cancer should be an individual one. Grade: C	Do not screen for prostate cancer. Grade: D

Informed Decision Making	Before deciding whether to be screened, men aged 55 to 69 years should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; overdiagnosis and overtreatment; and treatment complications, such as incontinence and erectile dysfunction. Harms are greater for men 70 years and older. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, comorbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening and should not routinely screen men 70 years and older.
Risk Assessment	Older age, African American race, and family history of prostate cancer are the most important risk factors for prostate cancer.
Screening Tests	Screening for prostate cancer begins with a test that measures the amount of prostate-specific antigen (PSA) protein in the blood. An elevated PSA level may be caused by prostate cancer but can also be caused by other conditions, including an enlarged prostate (benign prostatic hyperplasia) and inflammation of the prostate (prostatitis). Some men without prostate cancer may therefore have false-positive results. Men with a positive PSA test result may undergo a transrectal ultrasound-guided core-needle biopsy of the prostate to diagnose prostate cancer.
Treatments	The 3 most common treatment options for men with screen-detected, localized prostate cancer are surgical removal of the prostate gland (radical prostatectomy), radiation therapy (external-beam radiation therapy, proton beam therapy, or brachytherapy), and active surveillance.

For a summary of the evidence systematically reviewed in making this recommendation, the full recommendation statement, and supporting documents, please go to <https://www.uspreventiveservicestaskforce.org>.

Figure 1. Clinical Summary: Screening for Prostate Cancer. Clinician Summary, USPSTF. [Recommendation: Prostate Cancer: Screening | United States Preventive Services Taskforce \(uspreventiveservicestaskforce.org\)](https://www.uspreventiveservicestaskforce.org)

The Challenge

Valor Healthcare, Inc. is a federal government healthcare services contractor and is the largest provider of Community Based Outpatient Clinic (CBOC) services to the U.S. Department of Veterans Affairs (VA). Caring for over 160,000 veterans in 50+ locations across the United States, Valor is second only to the VA itself in the direct delivery of primary care and preventive services to our nation’s heroes.

In November of 2019, a systematic review of data obtained from the electronic health records (EHR) of veterans seen at Valor outpatient clinics, it was noted that many of our medical providers (physicians, physician assistants, and nurse practitioners) were routinely ordering PSA screening blood tests in a fashion inconsistent with national clinical practice guidelines and USPSTF recommendations. Specifically, for men 70 years

and older, our providers were (in aggregate) unnecessarily screening for prostate cancer using the PSA blood test 31.8% of the time. In contrast, for veterans enrolled in VA healthcare across the country, the rate was 30%.

Following the **Plan-Do-Study-Act (PDSA) model for process improvement**, we initiated a plan to identify reasons for the inappropriate ordering as well as a multi-faceted approach to improvement. We found that the reasons for inappropriate ordering of PSA screening in men 70 years and older fell into three broad categories. **One was a basic knowledge deficit in our veteran patients, community medical providers and our own clinical staff.** Many male veterans 70 years and older presented to our outpatient VA clinics with the expectation of having a PSA blood test performed yearly, with no clear end date.

INAPPROPRIATE PSA ORDERING DRIVEN BY KNOWLEDGE DEFICITIS

- ★ Basic Knowledge Deficit
- ★ Lack of Clear, Consistent & Company-Wide Clinic Level Process
- ★ Bias Among Staff to Acquiesce to Patient Wishes

In general, the requests stemmed from a lack of education regarding the appropriate clinical application for the screening test as well as the potential harms associated with PSA screening for prostate cancer. These potential harms include frequent false positive results and the associated psychological stress and anxiety caused by the false positive test. Additional harms include unnecessary diagnostic procedures, including complications from prostate biopsy. Finally, large randomized controlled trials suggest that 20-50% of men diagnosed with prostate cancer are over diagnosed, leading to treatments and associated side effects such as erectile dysfunction and urinary incontinence.

Despite all of the above, veterans were often presenting to our clinic asking to have blood drawn for PSA screening ordered by their private sector physician, likely because their private insurance would not pay for the test because the USPSTF guidelines recommended against it.

The second contributing factor identified was **lack of a clear, consistent, and company-wide clinic-level process to identify PSA blood tests ordered** in patients for whom the

test is not recommended. We found this was often due to PSA being included in routine annual pre-arranged lab order sets.

Third, we identified that there was a **bias among the staff to acquiesce to the patient's wishes** to have the blood test performed, regardless of whether or not the test was clinically indicated, in order to improve the veteran's perceived patient experience during his visit to our clinic.

The Solution

Once the factors contributing to the inordinately high percentage of men 70 and older having a PSA drawn were identified and contributing factors were assessed, an **actionable process improvement plan was designed** as detailed below. Data sets were reported on a monthly basis, which allowed for close and rapid follow up with staff to ensure compliance with the improvement plan and overall improvement of the metric nationwide.

Based on best demonstrated practices in our highest-performing clinics, the improvement plan was implemented as follows:

1. Education

An in-service was presented for all clinical staff, including medical providers, nursing staff, and laboratory staff. The in-service included general information on the diagnosis and treatment of prostate cancer and a specific review of the USPSTF recommendations on screening for prostate cancer. The training also reviewed the possible unintended physical and mental harms that can result from false positive test results, prostate biopsies, and the various treatments for over diagnosed prostate cancer.

Dispelling the somewhat frequently held belief that we were limiting care to veterans, we instead focused the education on the fact that following national clinical practice guidelines instead allows us to provide the **best evidence-based care possible to our veteran patients.**

All staff were provided the opportunity to ask questions in order to fully understand the evidence-based rationale for the process change. This led to a new, fact-based ability of the staff to knowledgeably interact with and educate patients on the guidelines around screening for prostate cancer.

One of Valor’s Ph.D. Pharmacists developed an educational flyer for veterans that clearly explains that for men 70 years and older, the risks of PSA screening outweigh the benefits (**Figure 2**). The flyers were laminated and placed in each exam room nationwide for review by our veteran patients. The information on the flyers was discussed as appropriate with the patients by both nursing and provider staff at the time of the visit.

PROSTATE CANCER AND THE PSA TEST

Understanding the link and expert recommendations

What tests are used to screen for prostate cancer?


- Prostate Specific Antigen (PSA):** The PSA looks for a protein in the blood that *may* indicate prostate cancer. Many other noncancerous conditions can cause this level to be elevated
- Prostate Biopsy:** Cells are removed from the prostate and looked at microscopically to identify cancerous cells. Biopsy is necessary for diagnosis

What is the harm in getting a PSA test?

- ✓ False positives lead to unnecessary biopsies
- ✓ Biopsies can cause overdiagnosis, overtreatment, pain, bleeding and infections
- ✓ **20-50%** of men will be diagnosed with cancer that never grows, spreads or harms them post biopsy

What is the bottom line?

- ❖ Men 55-69 years old should discuss with their provider before obtaining a PSA testing
- ❖ Men over the age of 70 without symptoms, the potential harms of PSA screening outweigh the benefits

Screening for Prostate Cancer	
<p>Population</p>  <p>ADULT MEN Without symptoms of prostate cancer</p>	<p>USPSTF recommendation grade</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; display: flex; align-items: center;"> C <div> <p>Men aged 55 to 69 years</p> <p>Recommendation depends on the patient's situation.</p> </div> </div> <div style="border: 1px solid black; padding: 5px;"> D <div> <p>Men aged 70 years or older</p> <p>Not recommended</p> </div> </div>

Source: US Preventive Services Task Force. Screening for prostate cancer: US

Figure 2. Prostate Cancer and the PSA Test. Proprietary Valor PSA patient education flyer.

When veterans come into the clinic with a prescription from a private practice physician for a PSA blood test to be drawn the staff then provide evidenced-based education on the appropriate guidelines for prostate cancer screening in men 70 years and older.

2. Process



To proactively identify veterans for whom PSA screening was ordered inappropriately, Valor staff utilized VA's EHR and electronic Quality Measure (eQM) report. Once the correctly filtered patient list was created, a new Standard Operating Procedure (SOP) was implemented as follows:



a. The Patient Aligned Care Team (PACT) Registered Nurse (RN) accesses the provider-specific eQM report and drills down to find all veterans 70 years and older who have had a PSA blood test ordered.



b. The PACT RN consults with the assigned primary care provider (PCP) to ascertain whether or not there was a clinical indication for ordering PSA screening in that particular patient.



c. If the PCP indicates a clinical reason, the RN ensures there is documentation in the medical record to support/explain the clinical indication for screening.



d. If there is no clinical reason to have the PSA drawn (e.g., PSA was simply included in a larger prearranged set of lab orders), the PACT RN will discontinue the lab order once confirmed with the PCP.



e. The PACT Licensed Practical Nurse (LPN) shows appropriate patients the PSA education flyer posted in each exam room. The LPN will provide the veteran with a copy of the PSA education flyer if requested.



f. When a veteran presents to the lab, the lab tech will look for PSA orders on veterans 70 years and older and consult with the PACT RN as to whether or not the PCP truly wants the lab test performed. The PACT RN will check the patient's chart for documentation by the PCP that s/he does/does not want PSA screening performed. If there is no documentation supporting the clinical need for the test, the PACT RN is to verify with the PCP whether or not the PSA screening

should be performed. If PSA screening is deemed as not clinically appropriate, the lab order will be discontinued.



g. For veteran patients 70 years and older, the PCP will document in the medical record that the risks and benefits of PSA screening were discussed, and that the screening test is/is not going to be ordered.

The Outcome

Once the process improvement plan and associated SOP were implemented, company-wide performance on this clinical metric (identified in VA data sets as psa1_ec: Non-Recommended PSA-Based Screening) was tracked longitudinally for 24 consecutive months from November 2019 to October 2021. As demonstrated in **Figure 3** below, Valor Healthcare’s providers **achieved dramatic improvement in the clinically appropriate use of PSA-based prostate cancer screening** in veteran patients 70 years and older.

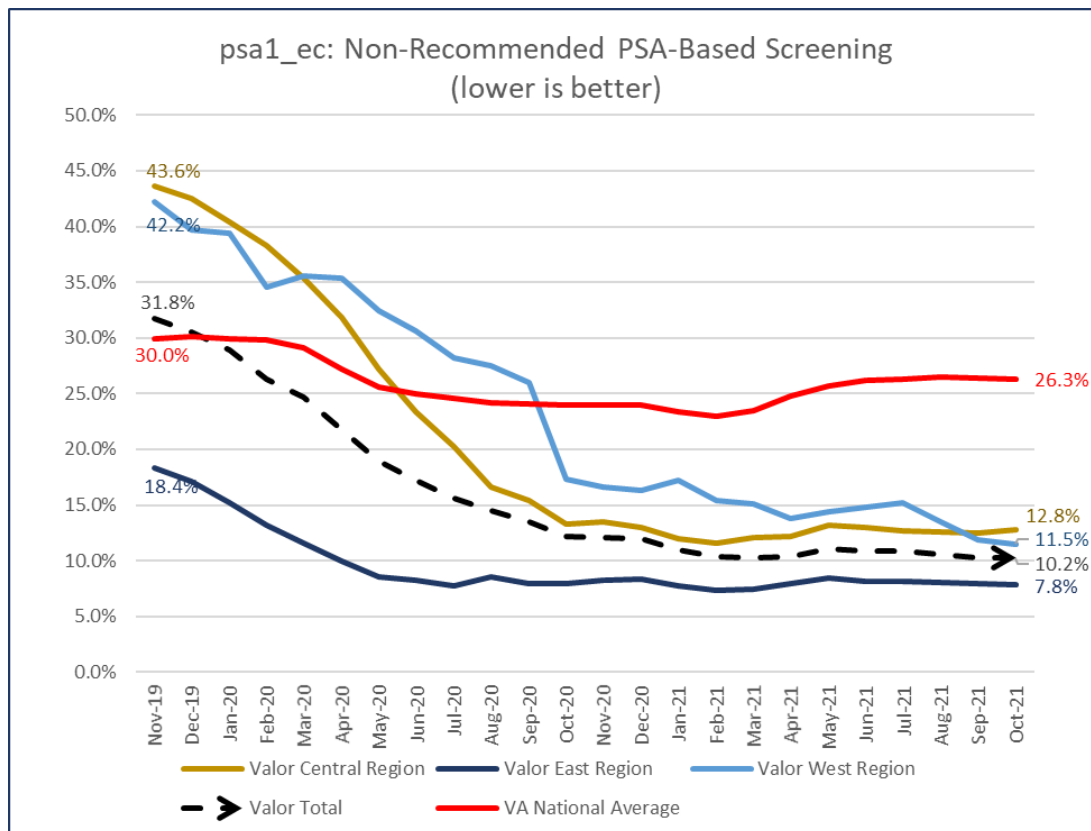


Figure 3. psa1_ec: Non-Recommended PSA-Based Screening. Valor Healthcare achieved significant reductions nationwide in the use of non-recommended PSA screening for prostate cancer in men 70 years and older.

As a benchmark, the VA national average on this metric improved by 12% over the two-year period specified above. In contrast, **Valor’s VA outpatient clinics achieved reductions in the inappropriate use of PSA screening in men 70 years and older ranging from 58% to 73% across all regions and a total reduction of 68% companywide.**

Conclusion

Primum non nocere. The ancient Greek physician Hippocrates is attributed with saying, “First, do no harm.” We have demonstrated herein the value of applied clinical informatics, data analytics, and population health methodologies in reducing the inappropriate use of PSA-based prostate cancer screening. This reduction has undoubtedly led to lower morbidity and mortality associated with false positive test results, unnecessary surgical and non-surgical treatments, and the accompanying stress and anxiety caused by the same.

Valor Healthcare has been physician-led since 2014. A study by U.S. News and World Report examined the CEOs of the top-100 healthcare organizations in the country. The study found that **clinical quality scores are 25% higher in physician-run organizations.**³ When a physician leads a healthcare organization, it signals they have “walked the walk” and the organizations they lead are focused on the most important value – the needs of the patient come first. Our organization is keenly focused on delivering evidence-based, outcomes-proven, best-in-industry healthcare for the federal government and its many serving patriots.

“Clinical quality scores are 25% higher in physician-run organizations”

³ Study Shows that Doctors Make Better Hospital Leaders, Bruce Y. Lee. Forbes.com



For further Information:

Scott C. Wise MD, MBA
President & CEO
t: 972.635.0474
e: Scott.Wise@valorhealthcare.com

14643 Dallas Parkway
Suite 100
Dallas, TX 75252

www.valorhealthcare.com