

eCQM Title	Prostate Cancer: Avoidance of Overuse of Bone Scan for Staging Low Risk Prostate Cancer Patients		
eCQM Identifier (Measure Authoring Tool)	129	eCQM Version Number	14.1.000
CBE Number	Not Applicable	GUID	1635c14d-e612-4fa6-96cd-285361aa77b
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	Centers for Medicare & Medicaid Services (CMS)		
Measure Developer	Mathematica		
Measure Developer	American Medical Association (AMA)		
Measure Developer	PCPI(R) Foundation (PCPI[R])		
Endorsed By	None		
Description	Percentage of patients, regardless of age, with a diagnosis of prostate cancer at low (or very low) risk of recurrence receiving interstitial prostate brachytherapy, OR external beam radiotherapy to the prostate, OR radical prostatectomy who did not have a bone scan performed at any time since diagnosis of prostate cancer		
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Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	<p>Multiple studies have indicated that a bone scan is not clinically necessary for staging prostate cancer in men with a low (or very low) risk of recurrence and receiving primary therapy. For patients who are categorized as low risk, bone scans are unlikely to identify their disease. Furthermore, bone scans are not necessary for low risk patients who have no history of bony involvement or if the clinical examination suggests no bony involvement. Less than 1% of low risk patients are at risk of metastatic disease.</p> <p>While clinical practice guidelines do not recommend bone scans in low risk prostate cancer patients, overuse is still common. An analysis of prostate cancer patients in the Surveillance, Epidemiology and End Results Medicare database diagnosed from 2004-2007 found that 42% of patients for whom a bone scan was not recommended received it (Falchok, Hendrix, &amp; Chen, 2015). The analysis also found that the use of bone scans in low risk patients leads to an annual cost of \$4 million dollars to Medicare. The overuse of bone scan imaging for low risk prostate cancer patients is a concept included on the American Urological Association's (AUA) list in the Choosing Wisely Initiative as a means to promote adherence to evidence-based imaging practices and to reduce health care dollars wasted (AUA, 2019). This measure is intended to promote adherence to evidence-based imaging practices, lessen the financial burden of unnecessary imaging, and ultimately to improve the quality of care for prostate cancer patients in the United States.</p>		
Clinical Recommendation Statement	<p>For symptomatic patients and/or those with a life expectancy of greater than 5 years, bone imaging is appropriate for patients with unfavorable intermediate-risk prostate cancer, high-risk and very-high-risk prostate cancer (National Comprehensive Cancer Network, 2022) (Evidence Level: Category 2A).</p> <p>Clinicians should not perform routine bone scans in the staging of asymptomatic very low- or low-risk localized prostate cancer patients (AUA, American Society for Radiation Oncology, &amp; Society of Urologic Oncology, 2017) (Strong Recommendation; Evidence Level: Grade C).</p> <p>Very low-risk or low-risk patients are unlikely to have disease identified by bone scan. Accordingly, bone scans are generally unnecessary in patients with newly diagnosed prostate cancer who have a PSA &lt;10.0 ng/mL and a Gleason score less than 7 unless the patient's history or clinical examination suggests bony involvement. Progression to the bone is much more common in advanced local disease or in high-grade disease that is characterized by fast and aggressive growth into surrounding areas such as bones or lymph nodes (AUA, 2019).</p>		
Improvement Notation	Higher score indicates better quality		
Reference	<p>Reference Type: CITATION</p> <p>Reference Text: "American Urological Association. (2019). A routine bone scan is unnecessary in men with very low-risk or low-risk prostate cancer. <a href="http://www.choosingwisely.org/clinician-lists/american-urological-association-routine-bone-scans-with-low-risk-prostate-cancer/">http://www.choosingwisely.org/clinician-lists/american-urological-association-routine-bone-scans-with-low-risk-prostate-cancer/</a> (Original work published in 2013)"</p>		
Reference	<p>Reference Type: CITATION</p> <p>Reference Text: "American Urological Association, American Society for Radiation Oncology, &amp; Society of Urologic Oncology. (2017). Clinically localized prostate cancer: AUA/ASTRO/SUO Guideline. <a href="https://www.astro.org/uploadedFiles/_MAIN_SITE/Patient_Care/Clinical_Practice_Statements/Content_Pieces/ClinicallyLocalizedProstateCancer.pdf">https://www.astro.org/uploadedFiles/_MAIN_SITE/Patient_Care/Clinical_Practice_Statements/Content_Pieces/ClinicallyLocalizedProstateCancer.pdf</a>"</p>		
Reference	<p>Reference Type: CITATION</p> <p>Reference Text: "Falchok, A. D., Hendrix, L. H., &amp; Chen, R. C. (2015). Guideline-discordant use of imaging during work-up of newly diagnosed prostate cancer. <i>Journal of Oncology Practice</i>, 11(2), e239-e246. doi:10.1200/jop.2014.001618"</p>		
Reference	<p>Reference Type: CITATION</p> <p>Reference Text: "National Comprehensive Cancer Network. (2022). Clinical Practice Guidelines in Oncology: Prostate Cancer. Version 1.2023. <a href="https://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf">https://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf</a>"</p>		
Definition	<p>Risk Strata Definitions: Very Low, Low, Intermediate, High, or Very High</p> <p>Very Low/Low Risk - PSA &lt; 10 ng/mL; AND Gleason score 6 or less/Gleason grade group 1; AND clinical stage T1 to T2a.</p> <p>Intermediate Risk - PSA 10 to 20 ng/mL; OR Gleason score 7/Gleason grade group 2-3; OR clinical stage T2b to T2c.</p> <p>High/Very High Risk - PSA &gt; 20 ng/mL; OR Gleason score 8 to 10/Gleason grade group 4-5; OR clinically localized stage T3 to T4 (adapted from the National Comprehensive Cancer Network, 2018).</p> <p>External beam radiotherapy - external beam radiotherapy refers to 3D conformal radiation therapy, intensity modulated radiation therapy, stereotactic body radiotherapy, and proton beam therapy.</p> <p>Bone scan - bone scan refers to the conventional technetium-99m-methyl diphosphonate bone scan as well as 18F-sodium fluoride or prostate-specific membrane antigen (PSMA) PET/CT scan.</p>		
Guidance	<p>A higher score indicates appropriate treatment of patients with prostate cancer at low (or very low) risk of recurrence. Only patients with prostate cancer with low (or very low) risk of recurrence will be counted in the performance denominator of this measure.</p> <p>In 2022, the American Urological Association published guidance recommending that clinicians not perform bone scan in asymptomatic patients with low or favorable intermediate risk prostate cancer. However, this quality measure remains focused on patients with low (or very low) risk of recurrence.</p> <p>This eCQM is a patient-based measure.</p> <p>Telehealth encounters are not eligible for this measure because the measure does not contain telehealth-eligible codes.</p> <p>This version of the eCQM uses QDM version 5.6. Please refer to the eCQI resource center (<a href="https://ecqi.healthit.gov/qdm">https://ecqi.healthit.gov/qdm</a>) for more information on the QDM.</p>		
Transmission Format	TBD		
Initial Population	All patients, regardless of age, with a diagnosis of prostate cancer		
Denominator	Equals Initial Population at low (or very low) risk of recurrence receiving interstitial prostate brachytherapy, OR external beam radiotherapy to the prostate, OR radical prostatectomy		
Denominator Exclusions	None		
Numerator	Patients who did not have a bone scan performed after diagnosis of prostate cancer and before the end of the measurement period		
Numerator Exclusions	Not Applicable		
Denominator Exceptions	Documentation of reason(s) for performing a bone scan (including documented pain, salvage therapy, or other medical reasons)		
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex		

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## Population Criteria

### Initial Population

exists "Prostate Cancer Diagnosis"

### Denominator

"Initial Population" and "First Prostate Cancer Treatment during day of Measurement Period" is not null and "Most Recent Prostate Cancer Staging T1a to T2a" is not null and "Most Recent PSA Test Result is Low" and "Most Recent Gleason Score is Low"

### Denominator Exclusions

None

### Numerator

not exists "Bone Scan Study Performed"

### Numerator Exclusions

None

### Denominator Exceptions

"Has Diagnosis of Pain Related to Prostate Cancer" or "Has Salvage Therapy Performed After Prostate Cancer Diagnosis" or "Has Bone Scan Study Performed with Documented Reason"

### Stratification

None

## Definitions

### Bone Scan Study Performed

["Diagnostic Study, Performed": "Bone Scan"] BoneScan where Global."NormalizeInterval" (BoneScan.relevantDateime, BoneScan.relevantPeriod) starts after start of ActiveProstateCancer.prevalencePeriod where Global."NormalizeInterval" ( BoneScan.relevantDateime, BoneScan.relevantPeriod) ends during day of "Measurement Period"

### Denominator

"Initial Population" and "First Prostate Cancer Treatment during day of Measurement Period" is not null and "Most Recent Prostate Cancer Staging T1a to T2a" is not null and "Most Recent PSA Test Result is Low" and "Most Recent Gleason Score is Low"

### Denominator Exceptions

"Has Diagnosis of Pain Related to Prostate Cancer" or "Has Salvage Therapy Performed After Prostate Cancer Diagnosis" or "Has Bone Scan Study Performed with Documented Reason"

### First Prostate Cancer Treatment during day of Measurement Period

First(["Procedure, Performed": "Prostate Cancer Treatment"] ProstateCancerTreatment where Global."NormalizeInterval" (ProstateCancerTreatment.relevantDateime, ProstateCancerTreatment.relevantPeriod) ends during day of "Measurement Period" sort by start of Global."NormalizeInterval" (relevantDateime, relevantPeriod) )

### Has Bone Scan Study Performed with Documented Reason

exists "Bone Scan Study Performed" BoneScanAfterDiagnosis where BoneScanAfterDiagnosis.reason = "Procedure reason record (record artifact)"

### Has Diagnosis of Pain Related to Prostate Cancer

exists ["Diagnosis": "Pain Warranting Further Investigation for Prostate Cancer"] ProstateCancerPain with "Prostate Cancer Diagnosis" ActiveProstateCancer such that ProstateCancerPain.prevalencePeriod starts after start of ActiveProstateCancer.prevalencePeriod

### Has Salvage Therapy Performed After Prostate Cancer Diagnosis

exists ["Procedure, Performed": "Salvage Therapy"] SalvageTherapy with "Prostate Cancer Diagnosis" ActiveProstateCancer such that Global."NormalizeInterval" ( SalvageTherapy.relevantDateime, SalvageTherapy.relevantPeriod) starts after start of ActiveProstateCancer.prevalencePeriod

### Initial Population

exists "Prostate Cancer Diagnosis"

### Most Recent Gleason Score is Low

( Last(["Laboratory Test, Performed": "Gleason score in Specimen Qualitative"] GleasonScore with "First Prostate Cancer Treatment during day of Measurement Period" FirstProstateCancerTreatment such that Global."NormalizeInterval" (GleasonScore.relevantDateime, GleasonScore.relevantPeriod) starts before start of Global."NormalizeInterval" (FirstProstateCancerTreatment.relevantDateime, FirstProstateCancerTreatment.relevantPeriod) sort by start of Global."NormalizeInterval" (relevantDateime, relevantPeriod) ) LastGleasonScore return LastGleasonScore.result <= 6

### Most Recent Prostate Cancer Staging T1a to T2a

( Last(["Procedure, Performed": "Tumor staging (tumor staging)"] ProstateCaStaging where exists "Prostate Cancer Diagnosis" ProstateCaDx where ProstateCaDx.id in ProstateCaStaging.relatedTo ) ProstateCancerStaging with "First Prostate Cancer Treatment during day of Measurement Period" FirstProstateCancerTreatment such that Global."NormalizeInterval" (ProstateCancerStaging.relevantDateime, ProstateCancerStaging.relevantPeriod) starts before start of Global."NormalizeInterval" (FirstProstateCancerTreatment.relevantDateime, FirstProstateCancerTreatment.relevantPeriod) sort by start of Global."NormalizeInterval" (relevantDateime, relevantPeriod) ) LastProstateCancerStaging ) where ( LastProstateCancerStaging.result = "American Joint Committee on Cancer cT1a (qualifier value)" or LastProstateCancerStaging.result = "American Joint Committee on Cancer cT1b (qualifier value)" or LastProstateCancerStaging.result = "American Joint Committee on Cancer cT1c (qualifier value)" or LastProstateCancerStaging.result = "American Joint Committee on Cancer cT2a (qualifier value)" )

### Most Recent PSA Test Result is Low

( Last(["Laboratory Test, Performed": "Prostate Specific Antigen Test"] PSATest with "Most Recent Prostate Cancer Staging T1a to T2a" MostRecentProstateCancerStaging such that Global."NormalizeInterval" (PSATest.relevantDateime, PSATest.relevantPeriod) starts before Global."NormalizeInterval" (MostRecentProstateCancerStaging.relevantDateime, MostRecentProstateCancerStaging.relevantPeriod) sort by start of Global."NormalizeInterval" (relevantDateime, relevantPeriod) ) LastPSATest return LastPSATest.result < 10 'ng/mL'

### Numerator

not exists "Bone Scan Study Performed"

### Prostate Cancer Diagnosis

["Diagnosis": "Prostate Cancer"] ProstateCancer where ProstateCancer.prevalencePeriod overlaps day of "Measurement Period"

### SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

### SDE Payer

["Patient Characteristic Payer": "Payer Type"]

### SDE Race

["Patient Characteristic Race": "Race"]

### SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

## Functions

### Global.NormalizeInterval(pointInTime DateTime, period Interval<DateTime>)

if pointInTime is not null then Interval[pointInTime, pointInTime] else if period is not null then period else null as Interval<DateTime>

## Terminology

- code "American Joint Committee on Cancer cT1a (qualifier value)" ("SNOMEDCT Code (1228892002)")
- code "American Joint Committee on Cancer cT1b (qualifier value)" ("SNOMEDCT Code (1228895000)")
- code "American Joint Committee on Cancer cT1c (qualifier value)" ("SNOMEDCT Code (1228899006)")
- code "American Joint Committee on Cancer cT2a (qualifier value)" ("SNOMEDCT Code (1228891008)")
- code "Gleason score in Specimen Qualitative" ("LOINC Code (35266-6)")
- code "Procedure reason record (record artifact)" ("SNOMEDCT Code (433611000124109)")
- code "Tumor staging (tumor staging)" ("SNOMEDCT Code (254292007)")
- valueset "Bone Scan" (2.16.840.1.119893.3.526.3.320)
- valueset "Ethnicity" (2.16.840.1.114222.4.11.837)
- valueset "ONC Administrative Sex" (2.16.840.1.113762.1.4.1)
- valueset "Pain Warranting Further Investigation for Prostate Cancer" (2.16.840.1.113883.3.526.3.451)
- valueset "Payer Type" (2.16.840.1.114222.4.11.3591)
- valueset "Prostate Cancer" (2.16.840.1.113883.3.526.3.319)
- valueset "Prostate Cancer Treatment" (2.16.840.1.113883.3.526.3.398)
- valueset "Prostate Specific Antigen Test" (2.16.840.1.113883.3.526.3.401)
- valueset "Race" (2.16.840.1.114222.4.11.836)
- valueset "Salvage Therapy" (2.16.840.1.113883.3.526.3.399)

## Data Criteria (QDM Data Elements)

- "Diagnosis: Pain Warranting Further Investigation for Prostate Cancer" (2.16.840.1.113883.3.526.3.451)"
- "Diagnosis: Prostate Cancer" using "Prostate Cancer (2.16.840.1.113883.3.526.3.319)"
- "Diagnostic Study, Performed: Bone Scan" using "Bone Scan (2.16.840.1.113883.3.526.3.320)"
- "Laboratory Test, Performed: Gleason score in Specimen Qualitative" using "Gleason score in Specimen Qualitative (LOINC Code 35266-6)"
- "Laboratory Test, Performed: Prostate Specific Antigen Test" using "Prostate Specific Antigen Test (2.16.840.1.113883.3.526.3.401)"
- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer Type" using "Payer Type (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex (2.16.840.1.113762.1.4.1)"
- "Procedure, Performed: Prostate Cancer Treatment" using "Prostate Cancer Treatment (2.16.840.1.113883.3.526.3.398)"
- "Procedure, Performed: Salvage Therapy" using "Salvage Therapy (2.16.840.1.113883.3.526.3.399)"
- "Procedure, Performed: Tumor staging (tumor staging)" using "Tumor staging (tumor staging) (SNOMEDCT Code 254292007)"

## Supplemental Data Elements

### SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

### SDE Payer

["Patient Characteristic Payer": "Payer Type"]

### SDE Race

["Patient Characteristic Race": "Race"]

### SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

## Risk Adjustment Variables

None

Measure Set	None