



InformedDNA®

Genetics, Decoded.

Oncology Screening Tests

Policy Number: GT04.1

Last Review Date: 07/03/2025
Previous Review Date: 10/01/2024

Table of Contents

| | |
|--|-----------|
| Scope..... | 3 |
| State Biomarker Legislation..... | 3 |
| Guideline Coverage Criteria..... | 3 |
| Colorectal Cancer Screening..... | 3 |
| Cutaneous Melanoma Screening..... | 4 |
| Indeterminate Thyroid Nodule Testing..... | 4 |
| Population-Based Cancer Screening..... | 4 |
| Prostate Cancer Early Detection (Symptomatic Screening)..... | 4 |
| Key Terms and Definitions..... | 4 |
| CPT® Codes..... | 5 |
| References..... | 6 |
| CPT Codes..... | 6 |
| Colon Cancer Screening..... | 7 |
| Cutaneous Melanoma Screening..... | 8 |
| Indeterminate Thyroid Nodules..... | 8 |
| Population Based Cancer Screening..... | 9 |
| Prostate Cancer Early Detection..... | 9 |
| Change Summary..... | 11 |

Scope

This evidence-based guideline addresses genetic testing for the purpose of screening for cancer and includes symptomatic as well as population-based screening.

This guideline's coverage criteria delineate medically necessary clinical scenarios for molecular testing and may include specific situations when testing is considered never medically necessary. In general, molecular testing is considered never medically necessary when evidence demonstrating its ability to improve diagnosis, management, or clinical outcomes is lacking in peer-reviewed literature.

State Biomarker Legislation

Medical necessity determinations must also take into consideration controlling state coverage mandates that may supersede these guidelines when applicable. When state biomarker legislation requirements impact coverage decisions, this guideline will initially be applied to determine if criteria are met for approval. If an approval cannot be granted based on the criteria in this guideline, some or all of the following sources will be reviewed, as defined by applicable state legislation, to determine if test coverage is supported in a manner that is consistent with the state biomarker legislation requirements:

- Medicare National Coverage Determinations (NCDs)
- Medicare Local Coverage Determinations (LCDs)
- U.S. Food and Drug Administration (FDA) approved or cleared tests
- Tests indicated for an FDA-approved drug
- Nationally recognized clinical practice guidelines
- Consensus statements

Guideline Coverage Criteria

Colorectal Cancer Screening

Cologuard (81528)/Cologuard Plus (0464U) is medically necessary when all of the following are met:

- individual is at an average risk* for colorectal cancer
- individual is ≥45 years of age with at least a 10 year life expectancy
- individual has either:
 - never had colorectal cancer screening
 - had prior negative screening and repeat screening is indicated per American Cancer Society Guidelines

**American Cancer Society Guidelines define those at average risk as not having any of the following: a personal history of colorectal cancer or certain types of polyps; a family history of colorectal cancer; a personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease); a confirmed or suspected hereditary colorectal cancer syndrome, such as familial adenomatous polyposis (FAP) or Lynch syndrome (hereditary non-polyposis colon cancer or HNPCC); a personal history of getting radiation to the abdomen (belly) or pelvic area to treat a prior cancer.*

Cutaneous Melanoma Screening

The use of gene expression classifier tests for indeterminate melanocytic lesions or indeterminate melanocytic neoplasms following histopathology is considered never medically necessary.

Indeterminate Thyroid Nodule Testing

Targeted multi-gene panels, Afirma® Genomic Sequence Classifier, ThyroSeq® v3, or ThyGeNEXT® / ThyraMIRv2™ are medically necessary for fine-needle aspiration samples of indeterminate thyroid nodules classified as The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) Category III atypia of undetermined significance or TBSRTC Category IV follicular neoplasm.

Population-Based Cancer Screening

The use of molecular testing for early cancer detection, e.g. multi-cancer early detection (MCED) testing, is never medically necessary.

Prostate Cancer Early Detection (Symptomatic Screening)

Gene expression classifiers for prostate cancer (symptomatic) screening are never medically necessary.

Key Terms and Definitions

Gene expression classifier testing is a molecular diagnostic technique that evaluates the activity levels of specific genes in a sample to classify or predict certain disease states or outcomes.

Genes are segments of DNA that contain the instructions for specific traits, characteristics, or functions within an organism.

Indeterminate thyroid nodules are growths (nodules) found in the thyroid gland with characteristics that make their diagnosis unclear based solely on a fine-needle aspiration (FNA) biopsy.

Multi-gene panels simultaneously analyze multiple genes associated with a particular condition or a group of related conditions.

Multi-cancer early detection (MCED) testing refers to non-invasive screening tests intended to detect cancer in individuals before they develop symptoms.

Population-based cancer screening is a systematic approach to screen a large segment of the population for cancer with the intention of identifying it at an early stage, e.g. MCED testing.

CPT® Codes

Medical necessity review of claims may include evaluation of the submitted codes. Laboratories must accurately represent their services using the most applicable and specific CPT code(s). Tier 1 molecular pathology procedure codes or Proprietary Laboratory Analyses (PLA) codes should be used when available for the specific test. Tier 2 molecular pathology procedure codes should only be used if the American Medical Association (AMA) has specifically assigned the performed test to such a code. Genomic sequencing procedures (GSP) codes (e.g., CPT codes 81410-81471) were developed by the AMA to represent multi-gene panels utilizing DNA or RNA analysis for specific clinical scenarios (e.g., carrier screening, tumor testing, etc.) and should be utilized when applicable.

Coding guidelines can be found in the AMA's CPT manual as well as the Centers for Medicare and Medicaid Services (CMS) National Correct Coding Initiative (NCCI) policy manuals. NCCI General Correct Coding Policy states that procedures should be reported with the most comprehensive CPT code describing the services performed and that the services described by a CPT code cannot be unbundled into multiple less specific codes. Additionally, GSP codes should be utilized when appropriate for the described test and should not be submitted along with other CPT codes that represent components of the GSP code.

Claims may not be approved if the submitted codes are not the most appropriate for the described procedure (i.e., as accurate and specific as available).

The following code(s) are medically necessary when coverage criteria are met. This list is not all inclusive.

| Code | Full Description |
|-------|--|
| 81528 | Oncology (colorectal) screening, quantitative real-time target and signal amplification of 10 DNA markers (KRAS mutations, promoter methylation of NDRG4 and BMP3) and fecal hemoglobin, utilizing stool, algorithm reported as a positive or negative result |
| 81546 | Oncology (thyroid), mRNA, gene expression analysis of 10,196 genes, utilizing fine needle aspirate, algorithm reported as a categorical result (eg, benign or suspicious) |
| 0018U | Oncology (thyroid), microRNA profiling by RT-PCR of 10 microRNA sequences, utilizing fine needle aspirate, algorithm reported as a positive or negative result for moderate to high risk of malignancy |
| 0026U | Oncology (thyroid), DNA and mRNA of 112 genes, next-generation sequencing, fine needle aspirate of thyroid nodule, algorithmic analysis reported as a categorical result ("Positive, high probability of malignancy" or "Negative, low probability of malignancy") |
| 0245U | Oncology (thyroid), mutation analysis of 10 genes and 37 RNA fusions and expression of 4 mRNA markers using next-generation sequencing, fine needle aspirate, report includes associated risk of malignancy expressed as a percentage |

| | |
|-------|---|
| 0464U | Oncology (colorectal) screening, quantitative real-time target and signal amplification, methylated DNA markers, including LASS4, LRRC4 and PPP2R5C, a reference marker ZDHHC1, and a protein marker (fecal hemoglobin), utilizing stool, algorithm reported as a positive or negative result |
|-------|---|

The following code(s) are considered never medically necessary. This list is not all inclusive.

| Code | Full Description |
|-------|--|
| 81313 | PCA3/KLK3 (prostate cancer antigen 3 [non-protein coding]/kallikrein-related peptidase 3 [prostate specific antigen]) ratio (eg, prostate cancer) |
| 81551 | Oncology (prostate), promoter methylation profiling by real-time PCR of 3 genes (GSTP1, APC, RASSF1), utilizing formalin-fixed paraffin-embedded tissue, algorithm reported as a likelihood of prostate cancer detection on repeat biopsy |
| 0005U | Oncology (prostate) gene expression profile by real-time RT-PCR of 3 genes (ERG, PCA3, and SPDEF), urine, algorithm reported as risk score |
| 0012M | Oncology (urothelial), mRNA, gene expression profiling by real-time quantitative PCR of five genes (MDK, HOXA13, CDC2 [CDK1], IGFBP5, and XCR2), utilizing urine, algorithm reported as a risk score for having urothelial carcinoma |
| 0089U | Oncology (melanoma), gene expression profiling by RTqPCR, PRAME and LINC00518, superficial collection using adhesive patch(es) |
| 0090U | Oncology (cutaneous melanoma), mRNA gene expression profiling by RT-PCR of 23 genes (14 content and 9 housekeeping), utilizing formalin-fixed paraffin-embedded (FFPE) tissue, algorithm reported as a categorical result (ie, benign, intermediate, malignant) |
| 0113U | Oncology (prostate), measurement of PCA3 and TMPRSS2-ERG in urine and PSA in serum following prostatic massage, by RNA amplification and fluorescence based detection, algorithm reported as risk score |
| 0287U | Oncology (thyroid), DNA and mRNA, next generation sequencing analysis of 112 genes, fine needle aspirate or formalin fixed paraffin-embedded (FFPE) tissue, algorithmic prediction of cancer recurrence, reported as a categorical risk result (low, intermediate, high) |
| 0339U | Oncology (prostate), mRNA expression profiling of HOXC6 and DLX1, reverse transcription polymerase chain reaction (RT-PCR), first-void urine following digital rectal examination, algorithm reported as probability of high-grade cancer |
| 0433U | Oncology (prostate), 5 DNA regulatory markers by quantitative PCR, whole blood, algorithm, including prostate-specific antigen, reported as likelihood of cancer |
| 0537U | Oncology (colorectal cancer), analysis of cell-free DNA for epigenomic patterns, next generation sequencing, >2500 differentially methylated regions (DMRs), plasma, algorithm reported as positive or negative |

References

CPT Codes

AMA CPT® Professional 2024. American Medical Association

NCCI Policy Manual for Medicare Services. Available at:
<https://www.cms.gov/Medicare/Coding/NationalCorrectCodInitEd>. Accessed quarterly.

NCCI Policy Manual for Medicaid Services. Available at:
<https://www.medicaid.gov/medicaid/program-integrity/national-correct-coding-initiative/medicaid-ncci-reference-documents/index.html>

Colon Cancer Screening

Barnell EK, Kang Y, Barnell AR, et al. Multitarget Stool RNA Test for Noninvasive Detection of Colorectal Neoplasias in a Multicenter, Prospective, and Retrospective Cohort. *Clin Transl Gastroenterol*. 2021 May 24;12(5):e00360. doi: 10.14309/ctg.0000000000000360. PMID: 34029233; PMCID: PMC8148418. | Supp data

Barnell EK, Wurtzler EM, La Rocca J, et al. Multitarget Stool RNA Test for Colorectal Cancer Screening. *JAMA*. 2023 Oct 23:e2322231. doi: 10.1001/jama.2023.22231. Epub ahead of print. PMID: 37870871; PMCID: PMC10594178.

Chung DC, Gray DM 2nd, Singh H, et al. A Cell-free DNA Blood-Based Test for Colorectal Cancer Screening. *N Engl J Med*. 2024 Mar 14;390(11):973-983. doi: 10.1056/NEJMoa2304714. PMID: 38477985.

Church TR, Wandell M, Lofton-Day C, et al. Prospective evaluation of methylated SEPT9 in plasma for detection of asymptomatic colorectal cancer. *Gut*. 2014 Feb;63(2):317-25. doi: 10.1136/gutjnl-2012-304149. Epub 2013 Feb 13. PMID: 23408352.

Dominitz JA, Robertson DJ, Ahnen DJ, et al. Colonoscopy vs. Fecal Immunochemical Test in Reducing Mortality From Colorectal Cancer (CONFIRM): Rationale for Study Design. *Am J Gastroenterol*. 2017 Nov;112(11):1736-1746. doi: 10.1038/ajg.2017.286. Epub 2017 Oct 10. PMID: 29016565.

Heichman KA. Blood-based testing for colorectal cancer screening. *Mol Diagn Ther*. 2014 Apr;18(2):127-35. doi: 10.1007/s40291-013-0074-z. PMID: 24307563.

Imperiale TF, Porter K, Zella J, et al. Next-Generation Multitarget Stool DNA Test for Colorectal Cancer Screening. *N Engl J Med*. 2024 Mar 14;390(11):984-993. doi: 10.1056/NEJMoa2310336. PMID: 38477986.

Issaka RB, Chan AT, Gupta S. AGA Clinical Practice Update on Risk Stratification for Colorectal Cancer Screening and Post-Polypectomy Surveillance: Expert Review. *Gastroenterology*. 2023 Nov;165(5):1280-1291. doi: 10.1053/j.gastro.2023.06.033. Epub 2023 Sep 21. PMID: 37737817; PMCID: PMC10591903.

Levin B, Lieberman DA, McFarland B, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *CA Cancer J Clin*. 2008 May-Jun;58(3):130-60. doi: 10.3322/CA.2007.0018. Epub 2008 Mar 5. PMID: 18322143.

Liebs S, Keilholz U, Kehler I, et al. Detection of mutations in circulating cell-free DNA in relation to disease stage in colorectal cancer. *Cancer Med*. 2019 Jul;8(8):3761-3769. doi: 10.1002/cam4.2219. Epub 2019 May 27. PMID: 31134762.

Lin JS, Piper MA, Perdue LA, et al. Screening for Colorectal Cancer: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2016 Jun 21;315(23):2576-94. doi: 10.1001/jama.2016.3332. Erratum in: *JAMA*. 2016 Aug 2;316(5):545. Erratum in: *JAMA*. 2016 Oct 4;316(13):1412. PMID: 27305422.

Lo YMD. Cell-free DNA for Colorectal Cancer Screening. *N Engl J Med*. 2024 Mar 14;390(11):1047-1050. doi: 10.1056/NEJMe2311101. PMID: 38477993.

Myint NNM, Verma AM, Fernandez-Garcia D, et al. Circulating tumor DNA in patients with colorectal adenomas: assessment of detectability and genetic heterogeneity. *Cell Death Dis*. 2018 Aug 30;9(9):894. doi: 10.1038/s41419-018-0934-x. PMID: 30166531.

Ørntoft MB, Nielsen HJ, Ørntoft TF, et al. Performance of the colorectal cancer screening marker Sept9 is influenced by age, diabetes and arthritis: a nested case-control study. *BMC Cancer*. 2015 Oct 29;15:819. doi: 10.1186/s12885-015-1832-6. PMID: 26514170.

Parikh RB, Prasad V. Blood-Based Screening for Colon Cancer: A Disruptive Innovation or Simply a Disruption? *JAMA*. 2016 Jun 21;315(23):2519-20. doi: 10.1001/jama.2016.7914. PMID: 27305625.

US Preventive Services Task Force, Davidson KW, Barry MJ, et al. Screening for Colorectal Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2021 May 18;325(19):1965-1977. doi: 10.1001/jama.2021.6238. Erratum in: *JAMA*. 2021 Aug 24;326(8):773. PMID: 34003218.

Wolf AMD, Fontham ETH, Church TR, et al. Colorectal cancer screening for average-risk adults: 2018 guideline update from the American Cancer Society. *CA Cancer J Clin*. 2018 Jul;68(4):250-281. doi: 10.3322/caac.21457. Epub 2018 May 30. PMID: 29846947.

Cutaneous Melanoma Screening

Amaral T, Ottaviano M, Arance A, et al. Cutaneous melanoma: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. *Ann Oncol*. 2024 Nov 14:S0923-7534(24)04912-3. doi: 10.1016/j.annonc.2024.11.006. Epub ahead of print. PMID: 39550033.

Funchain P, Tarhini AA. Using Genomic Sequencing to Improve Management in Melanoma. *Oncology (Williston Park)*. 2018 Mar 15;32(3):98-101, 104. PMID: 29548064.

Ludzik J, Lee C, Witkowski A. Potential Limitations in the Clinical Adoption of 3-GEP Pigmented Lesion Assay for Melanoma Triage by Dermatologists and Advanced Practice Practitioners. *Cureus*. 2022 Nov 26;14(11):e31914. doi: 10.7759/cureus.31914. PMID: 36579219; PMCID: PMC9792410.

Indeterminate Thyroid Nodules

Ali, SZ and VanderLaan P. The Bethesda System for Reporting Thyroid Cytopathology: Definitions, Criteria, and Explanatory Notes. 3rd ed. 2023 Edition. Springer; June 30, 2023.

Ali SZ, Baloch ZW, Cochand-Priollet B, et al. The 2023 Bethesda System for Reporting Thyroid Cytopathology. *Thyroid*. 2023 Jul 8. doi: 10.1089/thy.2023.0141. Epub ahead of print. PMID: 37427847.

Cohen DS, Tongson-Ignacio JE, Lolachi CM, et al. Rethinking Malignancy Risk in Indeterminate Thyroid Nodules with Positive Molecular Studies: Southern California Permanente Experience. *Otolaryngol Head Neck Surg*. 2019 Apr 23;194599819842859. doi: 10.1177/0194599819842859. [Epub ahead of print] PubMed PMID: 31013183.

Ferris RL, Baloch Z, Bernet V, et al. American Thyroid Association Statement on Surgical Application of Molecular Profiling for Thyroid Nodules: Current Impact on Perioperative Decision Making. *Thyroid*. 2015 Jul;25(7):760-8. doi: 10.1089/thy.2014.0502. Epub 2015 Jun 24. PMID: 26058403; PMCID: PMC4519104.

Gharib H, Papini E, Garber JR, et al. AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS, AMERICAN COLLEGE OF ENDOCRINOLOGY, AND ASSOCIAZIONE MEDICI ENDOCRINOLOGI MEDICAL GUIDELINES FOR CLINICAL PRACTICE FOR THE DIAGNOSIS AND MANAGEMENT OF THYROID NODULES–2016 UPDATE. *Endocr Pract*. 2016 May;22(5):622-39. doi: 10.4158/EP161208.GL. PMID: 27167915.

Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid*. 2016 Jan;26(1):1-133. doi: 10.1089/thy.2015.0020. PMID: 26462967; PMCID: PMC4739132.

Haugen BR, Sawka AM, Alexander EK, et al. American Thyroid Association Guidelines on the Management of Thyroid Nodules and Differentiated Thyroid Cancer Task Force Review and Recommendation on the Proposed Renaming of Encapsulated Follicular Variant Papillary Thyroid Carcinoma Without Invasion to Noninvasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features. *Thyroid*. 2017 Apr;27(4):481-483. doi: 10.1089/thy.2016.0628. Epub 2017 Feb 21. PMID: 28114862.

Kim NE, Raghunathan RS, Hughes EG, et al. Bethesda III and IV Thyroid Nodules Managed Nonoperatively after Molecular Testing with Afirma GSC or Thyroseq v3. *J Clin Endocrinol Metab*. 2023 Mar 30:dgad181. doi: 10.1210/clinem/dgad181. Epub ahead of print. PMID: 36995878.

Livhits MJ, Zhu CY, Kuo EJ, et al. Effectiveness of Molecular Testing Techniques for Diagnosis of Indeterminate Thyroid Nodules: A Randomized Clinical Trial. *JAMA Oncol.* 2021 Jan 1;7(1):70-77. doi: 10.1001/jamaoncol.2020.5935. PMID: 33300952; PMCID: PMC7729582.

Patel KN, Yip L, Lubitz CC, et al. The American Association of Endocrine Surgeons Guidelines for the Definitive Surgical Management of Thyroid Disease in Adults. *Ann Surg.* 2020 Mar;271(3):e21-e93. doi: 10.1097/SLA.0000000000003580. PMID: 32079830.

Raghuathan R, Longstaff XR, Hughes EG, et al. Diagnostic performance of molecular testing in indeterminate (Bethesda III and IV) thyroid nodules with Hürthle cell cytology. *Surgery.* 2024 Jan;175(1):221-227. doi: 10.1016/j.surg.2023.05.046. Epub 2023 Nov 3. PMID: 37926582.

Steward DL, Carty SE, Sippel RS, et al. Performance of a Multigene Genomic Classifier in Thyroid Nodules With Indeterminate Cytology: A Prospective Blinded Multicenter Study. *JAMA Oncol.* 2019 Feb 1;5(2):204-212. doi: 10.1001/jamaoncol.2018.4616. Erratum in: *JAMA Oncol.* 2019 Feb 1;5(2):271. PMID: 30419129; PMCID: PMC6439562.

Verma T, Marshall C, Dantey KE, et al. The role of the ThyGeNEXT oncogene panel used in combination with the expanded miRNA panel ThyraMIRv2 in Indeterminate thyroid nodules: A large, blinded, real-world, observational study. *Cancer Cytopathol.* 2024 May 30. doi: 10.1002/cncy.22829. Epub ahead of print. PMID: 38814813.

Population Based Cancer Screening

Bradley SH, Barclay ME. "Liquid biopsy" for cancer screening. *BMJ.* 2021 Jan 4;372:m4933. doi: 10.1136/bmj.m4933. PMID: 33397684.

Klein EA, Richards D, Cohn A, et al. Clinical validation of a targeted methylation-based multi-cancer early detection test using an independent validation set. *Ann Oncol.* 2021 Jun 23;S0923-7534(21)02046-9. PMID: 34176681.

De Rubis G, Krishnan SR, Bebaawy M. Circulating tumor DNA - Current state of play and future perspectives. *Pharmacol Res.* 2018 Oct;136:35-44. doi: 10.1016/j.phrs.2018.08.017. Epub 2018 Aug 22. PMID: 30142423.

Merker JD, Oxnard GR, Compton C, et al. Circulating Tumor DNA Analysis in Patients With Cancer: American Society of Clinical Oncology and College of American Pathologists Joint Review. *J Clin Oncol.* 2018 Jun 1;36(16):1631-1641. doi: 10.1200/JCO.2017.76.8671. Epub 2018 Mar 5. PMID: 29504847.

Post C, Braun TP, Etzioni R, et al. Multicancer Early Detection Tests: An Overview of Early Results From Prospective Clinical Studies and Opportunities for Oncologists. *JCO Oncol Pract.* 2023 Dec;19(12):1111-1115. doi: 10.1200/OP.23.00260. Epub 2023 Oct 18. PMID: 37851937.

Raoof S, Kennedy CJ, Wallach DA, et al. Molecular cancer screening: in search of evidence. *Nat Med.* 2021 Jul;27(7):1139-1142. PMID: 34211183.

Sumbal S, Javed A, Afroze B, et al. Circulating tumor DNA in blood: Future genomic biomarkers for cancer detection. *Exp Hematol.* 2018 Sep;65:17-28. doi: 10.1016/j.exphem.2018.06.003. Epub 2018 Jun 23. PMID: 29940219.

Prostate Cancer Early Detection

Akbayır S, Muşlu N, Erden S, et al. Diagnostic value of microRNAs in prostate cancer patients with prostate specific antigen (PSA) levels between 2, and 10 ng/mL. *Turk J Urol.* 2016 Dec;42(4):247-255. doi: 10.5152/tud.2016.52463. PMID: 27909617; PMCID: PMC5125738.

Alford AV, Brito JM, Yadav KK, et al. The Use of Biomarkers in Prostate Cancer Screening and Treatment. *Rev Urol.* 2017;19(4):221-234. doi: 10.3909/riu0772. PMID: 29472826; PMCID: PMC5811879.

- Brönimann S, Pradere B, Karakiewicz P, et al. An overview of current and emerging diagnostic, staging and prognostic markers for prostate cancer. *Expert Rev Mol Diagn.* 2020 Aug;20(8):841-850. doi: 10.1080/14737159.2020.1785288. Epub 2020 Jun 25. PMID: 32552088.
- Carlsson SV, Roobol MJ. Improving the evaluation and diagnosis of clinically significant prostate cancer in 2017. *Curr Opin Urol.* 2017 May;27(3):198-204. doi: 10.1097/MOU.0000000000000382. PMID: 28221219; PMCID: PMC5381721.
- Chunhua L, Zhao H, Zhao H, et al. Clinical Significance of Peripheral Blood PCA3 Gene Expression in Early Diagnosis of Prostate Cancer. *Transl Oncol.* 2018 Jun;11(3):628-632. doi: 10.1016/j.tranon.2018.02.019. Epub 2018 Mar 22. PMID: 29574327; PMCID: PMC6002384.
- Cucchiara V, Cooperberg MR, Dall'Era M, et al. Genomic Markers in Prostate Cancer Decision Making. *Eur Urol.* 2018 Apr;73(4):572-582. doi: 10.1016/j.eururo.2017.10.036. Epub 2017 Nov 10. PMID: 29129398.
- Duffy MJ. Biomarkers for prostate cancer: prostate-specific antigen and beyond. *Clin Chem Lab Med.* 2020 Feb 25;58(3):326-339. doi: 10.1515/cclm-2019-0693. PMID: 31714881.
- Grossman DC, Curry SJ, Owens DK, et al. Screening for Prostate Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2018 May 8;319(18):1901-1913. doi: 10.1001/jama.2018.3710. Erratum in: *JAMA.* 2018 Jun 19;319(23):2443. PMID: 29801017.
- Haese A, Trooskens G, Steyaert S, et al. Multicenter Optimization and Validation of a 2-Gene mRNA Urine Test for Detection of Clinically Significant Prostate Cancer before Initial Prostate Biopsy. *J Urol.* 2019 Aug;202(2):256-263. doi: 10.1097/JU.0000000000000293. Epub 2019 Jul 8. PMID: 31026217.
- Hamdy FC, Donovan JL, Lane JA, et al. Fifteen-Year Outcomes after Monitoring, Surgery, or Radiotherapy for Prostate Cancer. *N Engl J Med.* 2023 Mar 11. doi: 10.1056/NEJMoa2214122. Epub ahead of print. PMID: 36912538.
- Hatakeyama S, Yoneyama T, Tobisawa Y, et al. Recent progress and perspectives on prostate cancer biomarkers. *Int J Clin Oncol.* 2017 Apr;22(2):214-221. doi: 10.1007/s10147-016-1049-y. Epub 2016 Oct 11. PMID: 27730440; PMCID: PMC5378754.
- Hendriks RJ, van Oort IM, Schalken JA. Blood-based and urinary prostate cancer biomarkers: a review and comparison of novel biomarkers for detection and treatment decisions. *Prostate Cancer Prostatic Dis.* 2017 Mar;20(1):12-19. doi: 10.1038/pcan.2016.59. Epub 2016 Dec 6. PMID: 27922627.
- Kohaar I, Petrovics G, Srivastava S. A Rich Array of Prostate Cancer Molecular Biomarkers: Opportunities and Challenges. *Int J Mol Sci.* 2019 Apr 12;20(8):1813. doi: 10.3390/ijms20081813. PMID: 31013716; PMCID: PMC6515282.
- Matuszczak M, Schalken JA, Salagierski M. Prostate Cancer Liquid Biopsy Biomarkers' Clinical Utility in Diagnosis and Prognosis. *Cancers (Basel).* 2021 Jul 5;13(13):3373. doi: 10.3390/cancers13133373. PMID: 34282798; PMCID: PMC8268859.
- McKiernan J, Donovan MJ, O'Neill V, et al. A Novel Urine Exosome Gene Expression Assay to Predict High-grade Prostate Cancer at Initial Biopsy. *JAMA Oncol.* 2016 Jul 1;2(7):882-9. doi: 10.1001/jamaoncol.2016.0097. PMID: 27032035.
- McKiernan J, Donovan MJ, Margolis E, et al. A Prospective Adaptive Utility Trial to Validate Performance of a Novel Urine Exosome Gene Expression Assay to Predict High-grade Prostate Cancer in Patients with Prostate-specific Antigen 2-10ng/ml at Initial Biopsy. *Eur Urol.* 2018 Dec;74(6):731-738. doi: 10.1016/j.eururo.2018.08.019. Epub 2018 Sep 17. PMID: 30237023.

Mottet N, van den Bergh RCN, Briers E, et al. EAU-EANM-ESTRO-ESUR-SIOG Guidelines on Prostate Cancer-2020 Update. Part 1: Screening, Diagnosis, and Local Treatment with Curative Intent. Eur Urol. 2021 Feb;79(2):243-262. doi: 10.1016/j.eururo.2020.09.042. Epub 2020 Nov 7. PMID: 33172724.

Mottet N, Cornford P, van den Bergh RCN, et al. EAU-EANM-ESTRO-ESUR-ISUP-SIOG Guidelines on Prostate Cancer. European Association of Urology. [Internet]. 2023 March. Available from: <https://d56bochluxqnz.cloudfront.net/documents/full-guideline/EAU-EANM-ESTRO-ESUR-ISUP-SIOG-Guidelines-on-Prostate-Cancer-2023.pdf>.

Narayan VM, Konety BR, Warlick C. Novel biomarkers for prostate cancer: An evidence-based review for use in clinical practice. Int J Urol. 2017 May;24(5):352-360. doi: 10.1111/iju.13326. Epub 2017 Mar 27. PMID: 28345187.

Pinsky PF, Prorok PC, Kramer BS. Prostate Cancer Screening – A Perspective on the Current State of the Evidence. N Engl J Med. 2017 Mar 30;376(13):1285-1289. doi: 10.1056/NEJMsb1616281. PMID: 28355509.

Press B, Schulster M, Bjurlin MA. Differentiating Molecular Risk Assessments for Prostate Cancer. Rev Urol. 2018;20(1):12-18. doi: 10.3909/riu0787. PMID: 29942196; PMCID: PMC6003298.

Tosoian JJ, Trock BJ, Morgan TM, et al. Use of the MyProstateScore Test to Rule Out Clinically Significant Cancer: Validation of a Straightforward Clinical Testing Approach. J Urol. 2021 Mar;205(3):732-739. doi: 10.1097/JU.0000000000001430. Epub 2020 Oct 20. PMID: 33080150; PMCID: PMC8189629.

Trogdon JG, Falchook AD, Basak R, et al. Total Medicare Costs Associated With Diagnosis and Treatment of Prostate Cancer in Elderly Men. JAMA Oncol. 2019 Jan 1;5(1):60-66. doi: 10.1001/jamaoncol.2018.3701. PMID: 30242397; PMCID: PMC6439776.

Wei JT, Barocas D, Carlsson S, et al. Early detection of prostate cancer: AUA/SUO guideline part I: prostate cancer screening. J Urol. 2023;210(1):45-53.

Change Summary

| Version | Review Date | Effective Date | Summary of Revisions |
|---------|-------------------------------------|-----------------|--|
| Created | CSC: 8/11/2022 PAB: 9/12/2022 | November 2022 | Not applicable |
| v1.2023 | COOC: 2/15/2023 PAB: 3/16/2023 | April 1, 2023 | Semi-annual review. No criteria changes. |
| v2.2023 | COOC: 8/16/2023 PAB: 9/25/2023 | October 1, 2023 | Semi-annual review. ITN criteria were revised to remove the exclusion for follicular neoplasm - oncocytic follicular neoplasm (historically referred to as Hurthle cell predominance). |
| v1.2024 | COOC: 2/14/2023 PAB: 3/25/2024 | April 1, 2024 | Semi-annual review. No criteria changes. Clarifications were made to the scope and CPT code sections. References were updated. |
| v2.2024 | COOC: 08/19/2024 PAB: 09/20/2024 | October 1, 2024 | Semi-annual review. Cologuard Plus was added to the CRC screening section in anticipation of its commercial availability. CPT code and reference sections were updated. |
| v1.2025 | COOC: 02/17/2025 PAB: 03/24/2025 | July 3, 2025 | Semi-annual review. No criteria changes. CPT codes and references updated. |