

Local Coverage Determination (LCD): MoIDX: Percepta© Bronchial Genomic Classifier (L37195)

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Contractor Information

Contractor Name	Contract Type	Contract Number	Jurisdiction	State(s)
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	05101 - MAC A	J - 05	Iowa
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	05102 - MAC B	J - 05	Iowa
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	05201 - MAC A	J - 05	Kansas
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	05202 - MAC B	J - 05	Kansas
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	05301 - MAC A	J - 05	Missouri - Entire State
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	05302 - MAC B	J - 05	Missouri - Entire State
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	05401 - MAC A	J - 05	Nebraska
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	05402 - MAC B	J - 05	Nebraska
				Alaska
				Alabama
				Arkansas
				Arizona
				Connecticut
				Florida
				Georgia
				Iowa
				Idaho
				Illinois
				Indiana
				Kansas
				Kentucky
				Louisiana
				Massachusetts
				Maine
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	05901 - MAC A	J - 05	Michigan
				Minnesota
				Missouri - Entire State
				Mississippi
				Montana
				North Carolina
				North Dakota
				Nebraska
				New Hampshire
				New Jersey
				Ohio
				Oregon
				Rhode Island
				South Carolina
				South Dakota
				Tennessee
				Utah

Contractor Name	Contract Type	Contract Number	Jurisdiction	State(s)
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	08101 - MAC A	J - 08	Virginia Virgin Islands Vermont Washington Wisconsin West Virginia Wyoming
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	08102 - MAC B	J - 08	Indiana
Wisconsin Physicians Service Insurance Corporation	MAC - Part A	08201 - MAC A	J - 08	Michigan
Wisconsin Physicians Service Insurance Corporation	MAC - Part B	08202 - MAC B	J - 08	Michigan
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LCD Information

Document Information

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L37195

Original Effective Date
For services performed on or after 09/16/2017

LCD Title
MolDX: Percepta© Bronchial Genomic Classifier

Revision Effective Date
For services performed on or after 09/16/2017

Proposed LCD in Comment Period
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Revision Ending Date
N/A

Source Proposed LCD
[DL37195](#)

Retirement Date
N/A

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Notice Period End Date
09/15/2017

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CMS National Coverage Policy

Title XVIII of the Social Security Act (the "Act"), Section 1862(a)(1)(A). This section limits coverage and payment to those items and services that are reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member.

Title XVIII of the Social Security Act, Section 1833(e). This section prohibits Medicare payment for any claim that lacks the necessary information to process the claim.

42 C.F.R. § 410.32 "Diagnostic X-ray tests, diagnostic laboratory tests, and other diagnostic tests: Condition."

Medicare Internet Online Manual Pub. 100-2 (Medicare Benefit Policy Manual), Chapter 15, Section 80, "Requirements for Diagnostic X-Ray, Diagnostic Laboratory, and Other Diagnostic Tests"

Medicare Internet Online Manual Pub. 100-4 (Medicare Claims Processing Manual), Chapter 16, Sections:
50.5 Jurisdiction of Laboratory Claims:
60.12 Independent Laboratory Specimen Drawing
60.2 Travel Allowance

Medicare Internet Online Manual Pub. 100-4 (Medicare Claims Processing Manual), Chapter 23 (Section 10) "Reporting ICD Diagnosis and Procedure Codes"

Coverage Guidance

Coverage Indications, Limitations, and/or Medical Necessity

This Medicare contractor will provide limited coverage for the Percepta Bronchial Genomic Classifier (Veracyte, Inc., South San Francisco, CA) to identify patients with clinical low- or intermediate-risk of malignancy, after a non-diagnostic bronchoscopy, who may be followed with CT surveillance in lieu of further invasive biopsies or surgery. A patient's clinical risk of malignancy may be ascertained by the McWilliams or Gould risk assessment models. Coverage does not include clinical high risk patients or patients with known lung cancer.

Summary of Evidence

Lung cancer is the leading cause of cancer deaths in the United States¹. New screening programs are expected to save lives through early detection, but are also expected to increase the number of patients who undergo invasive procedures to evaluate suspicious lung nodules and lesions².

Traditionally, following the identification of a suspicious lung nodule or lesion, clinical characteristics are utilized to determine risk and to determine whether patients should proceed to an invasive biopsy. Clinical characteristics that have statistically correlated with a higher risk of malignancy in risk assessment models include older age, smoking history, nodule size and spiculation^{3,4}. Anatomic location, solid versus part-solid or non-solid characteristics, and time since smoking discontinuation have had less consistent correlation. However, variation in cohort demographics and data availability used in developing these models, including prevalence of malignancy (3.7% to 54%), have challenged consistent utilization of these models when used alone in clinical practice.

The American College of Chest Physicians published clinical guidelines in 2013 to assist clinicians with assigning risk allocation⁵.

Table 1: American College of Chest Physicians (ACCP) – Assessment of the probability of malignancy based on clinical factors alone⁵.

Probability of Malignancy		
Low (<5%)	Intermediate (5-65%)	High (>65%)
Young, less smoking, no prior cancer, smaller nodule size, regular margins, and/or non-upper-lobe location	Mixture of low and high probability features	Older, heavy smoking, prior cancer, larger size, irregular/spiculated margins, and/or upper-lobe location

At the current time, in the absence of definitive guidelines, patients assigned with a physician-assessed low or intermediate risk for malignancy may be considered for serial CT surveillance or invasive biopsy⁵, and many of these patients ultimately undergo surgery for benign disease⁶.

Newer predictive models, which incorporate a number of radiological and clinical features to predict malignancies, may be more predictive than physician assessment alone in preventing invasive procedures in patients with benign nodules^{3,4}. Even with these risk models, supplementary methods to improve diagnostic accuracy are important to prevent unneeded morbidity, mortality and costs from invasive procedures, without increasing the risk of missing a malignancy.

Bronchoscopy is a non-surgical diagnostic method that enables physicians to visualize and collect cells from the patient's lung airways. An estimated 250,000 patients undergo bronchoscopy each year in the United States to evaluate lung nodules that are suspicious for cancer⁷. Up to 40% of bronchoscopy procedures result in a non-diagnostic outcome, which means the clinician could not reach a clinically actionable benign or malignant diagnosis⁴. Physicians are then faced with the dilemma of whether to monitor these patients with CT surveillance or proceed to a surgical lung biopsy or transthoracic needle biopsy associated with a greater risk of morbidity, such as pneumothorax or hemorrhage, or mortality^{8, 9}.

Percepta™ Bronchial Genomic Classifier (Percepta BGC) Test Description and Performance

The Percepta BGC is a messenger-RNA assay measuring gene expression of 23 lung cancer associated genes and patient age. The assay is performed on cytology brushings of bronchial epithelial cells collected during a bronchoscopy from the main stem bronchus and stored in an RNA preservative at 4°C immediately after collection. The assay results are reported as a categorical result based on the patient's physician-assessed pretest risk of malignancy as described below.

Table 2: Percepta Classifier Results

Pretest Risk of Malignancy	Post Test Risk of Malignancy	
	Percepta Negative Result	Percepta Positive Result
Low (<10%)	Very Low (<1%)	Low (<10%)
Intermediate (10-65%)	Low (<10%)	Intermediate (10-65%)
High (>65%)	High (>65%)	Very High (>85%)

The clinical performance of Percepta BGC has been demonstrated in two prospective-retrospective, multicenter and blinded trials^{8,10}. The results from these trials showed that the classifier is able to detect cancer with a high sensitivity exceeding the performance of bronchoscopy alone¹¹. In the low and intermediate pretest risk groups, negative classifier results identified patients at a low risk of malignancy with a high negative predictive value (NPV) of 100% (95% CI 89-100%) and 91% (95% CI 75-98%), respectively, who may be followed with CT surveillance in lieu of further invasive investigation.

The analytical and clinical performance of the Percepta BGC is summarized below.

General

Intended Use	To assess the risk of primary lung cancer in current or former smokers (>100 cigarettes in lifetime) 21 years of age or older with no concurrent or prior cancer who (1) are assessed by their physician to have a low or intermediate pretest risk of malignancy and (2) have had an inconclusive bronchoscopy
Validated Specimen Type(s)	Bronchial epithelial brushing specimen preserved in RNAProtect at the point of collection

Analytical Performance

Description	Results (with 95% Confidence Intervals if applicable) ¹
Precision, inter-assay total variability (2 operators; 3 independent runs; 3 manufacturing reagent lots; 10 unique samples run in triplicate with expected scores ranging from -1.10 to +3.29; all in CLIA lab)	Qualitative (categorical call concordance): 86.7% (26 of 30; 95% CI: 69.3% -96.2%) Quantitative (score): pooled SD = 0.259 (95% CI 0.217 to 0.304) (Represents 4.3% of score range, roughly -3 to +3)
Reproducibility (2 operators; 2 independent runs; 2 manufacturing reagent lots; 46 unique samples run in singlicate with expected scores ranging from -1.77 to +4.21; R&D and CLIA labs)	Qualitative (categorical call concordance): 93.5% (43 of 46; 95% CI: 82.1% -98.6%)
Analytical sensitivity: Minimum input	Total RNA: 157 – 243 ng (standard input is 200 ng) RNA Integrity Number ≥4
Critical reagent shelf-life stability (when stored per manufacturer's recommendations)	Ambion WT Expression Kit: 24 months from manufacturing, 1 year from receipt Affymetrix Gene ST Arrays: 24 months from manufacturing, 1 year from Receipt Qiagen RNAProtect: 2 years from manufacturing
Specimen stability	21 days at 2-8 °C

¹Using Clopper-Pearson method
Clinical Performance

Description	Results (with 95% Confidence Intervals if applicable)*	
	Low pretest risk (n = 62)	Intermediate pretest risk (n = 101)
Sensitivity	100% (16-100%)	88% (68-97%)
Specificity	56% (42-69%)	48% (35-62%)
Negative Predictive Value (NPV)	100% (89-100%)	91% (75-98%)
Positive Predictive Value (PPV)	7% (1-24%)	40% (27-55%)

Cancer prevalence	5%	41%
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*Using Clopper-Pearson method

The usefulness of the assay in the low and intermediate pretest risk groups has been evaluated in two additional modeling studies . These studies suggest that use of the classifier may safely reduce invasive surgical procedures among patients with a low or intermediate pretest risk following a non-diagnostic bronchoscopy. This Medicare contractor is aware that Veracyte is also currently running the PERCEPTA Registry Trial to prospectively evaluate the clinical utility of the classifier.

The potential usefulness of this test is that it allows physicians to determine which patients with a low or intermediate physician-assessed pretest risk and a non-diagnostic bronchoscopy may be candidates for CT surveillance in lieu of further invasive biopsies or surgical procedures.

Criteria for Coverage

Percepta BGC is covered only when the following clinical conditions are met:

- Current or former smokers age 21 and greater, **and**
- Physician-assessed low or intermediate pretest risk of malignancy based upon the following clinical characteristic stratification ^{3, 4} **and**:

Low Risk (<10%)	Intermediate Risk (10-60%)	High Risk (>60%)
Nodules < 10 mm <10 pk/yr smoking history	Nodules 10 - 30 mm 10 to 60 pk/yr smoking history	Nodules >30 mm >60 pk/yr smoking history

- Bronchoscopy is non-diagnostic (actionable benign or malignant diagnosis cannot be reached), **and**
- Percepta BGC results will be utilized to determine whether CT surveillance is appropriate in lieu of further invasive biopsies or surgical procedures as outlined below, **and**

Pre-Test Risk:	Post-Test Risk:	Post-Test Diagnostic Strategy
Intermediate	Intermediate	Proceed to further work up
Intermediate	Low Risk	CT surveillance
Low Risk	Low Risk	CT surveillance
Low Risk	Very Low Risk	CT surveillance

- Test is ordered by physician certified in Percepta Certification and Training Registry (CTR), **and**
- Patient is monitored for malignancy (suggested monitoring includes serial CT scans at 3 to 6, 9 to 12, and 18 to 24 months, using thin sections and non-contrast, low-dose techniques), **and**
- Physician will report outcomes in all risk groups including those monitored initially and those who undergo immediate intervention, **and**
- Clinical management is consistent with the post-test diagnostic strategy described above in ≥80% of tested patients.

Note: The Percepta BGC test should not be ordered if a physician does not intend to act upon the test result.

Certification and Training Registry Program

The Percepta® Bronchial Genomic Classifier will be made available only to Medicare patients through physicians who participate in a MolDx approved Percepta Certification and Training Registry (CTR) program. This CTR serves to assure the appropriate selection of patients and follow-up to ensure the benefits of the test outweigh its risks. As part of this requirement Veracyte will provide to this Medicare contractor reports every 6 months in a mutually agreed upon format. The CTR will continue for 36 months from the issuance of the final LCD or the presentation of prospective data demonstrating the clinical utility and safety of the assay.

The goals of the Percepta CTR program are as follows:

- To inform physicians and patients on the safe use of Percepta BGC, **and**
- To ensure that physicians understand the limitations of the test based on its validation studies, **and**
- Make a good faith effort to identify any safety concerns from the use of the test, **and**
- To identify the clinical utility of the Percepta BGC test in the intended use patient population.

This Medicare contractor expects Veracyte to:

- Establish and maintain the Percepta Certification and Training Registry (CTR);
- Ensure that healthcare providers who order the Percepta BGC assay are registered and certified in the Percepta CTR program and that the Percepta BGC assay is available only through these providers for Medicare patients;
- Report utilization data by final Percepta risk group;
- Report clinical outcomes in each Percepta risk group;
- Report all patients receiving a "Low or "Very Low" Percepta BGC assay result who are diagnosed with cancer during the CTR program;
- Share all required data and reports in a HIPAA compliant fashion;
- Publish final results in a peer-reviewed scientific journal with an impact factor of ≥ 4.5 .

Analysis of Evidence (Rationale for Determination)

Level of Evidence:

Quality – Moderate

Strength – Limited

Weight - Limited

This contractor recognizes that evidence for clinical utility for Percepta Bronchial Genomic Classifier to identify patients with clinical low- or intermediate-risk of malignancy after a non-diagnostic bronchoscopy is promising at the current time. This contractor is aware that Veracyte is currently running the PERCEPTA Registry Trial to prospectively evaluate the clinical safety and utility of the classifier. Veracyte will continue to accrue patients in the PERCEPTA Registry Trial and, at interim analyses, demonstrate that in intended-use patients whose post-test risk is very low- or low that there is a statistically significant decrease in the rate of nodule progression as compared to current screening standards. There is no coverage for pretest 'High Risk' patients or 'never smokers'. Continued coverage for the Percepta assay will be dependent on semi-annual review of interim data and/or peer-reviewed publications of clinical utility data demonstrates decreased nodule progression and that patients can be followed with CT surveillance in lieu of further invasive biopsies or surgery.

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Coding Information

Bill Type Codes:

Contractors may specify Bill Types to help providers identify those Bill Types typically used to report this service. Absence of a Bill Type does not guarantee that the policy does not apply to that Bill Type. Complete absence of all Bill Types indicates that coverage is not influenced by Bill Type and the policy should be assumed to apply equally to all claims.

N/A

Revenue Codes:

Contractors may specify Revenue Codes to help providers identify those Revenue Codes typically used to report this service. In most instances Revenue Codes are purely advisory. Unless specified in the policy, services reported under other Revenue Codes are equally subject to this coverage determination. Complete absence of all Revenue Codes indicates that coverage is not influenced by Revenue Code and the policy should be assumed to apply equally to all Revenue Codes.

N/A

CPT/HCPCS Codes

Group 1 Paragraph: N/A

Group 1 Codes:

81479 UNLISTED MOLECULAR PATHOLOGY PROCEDURE

ICD-10 Codes that Support Medical Necessity

Group 1 Paragraph: N/A

Group 1 Codes:

ICD-10 Codes	Description
R91.1	Solitary pulmonary nodule
R91.8	Other nonspecific abnormal finding of lung field

ICD-10 Codes that DO NOT Support Medical Necessity N/A

ICD-10 Additional Information

NA

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General Information

Associated Information

N/A

Sources of Information

N/A

Bibliography

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13. Ferguson JS. Impact of a bronchial genomic classifier on clinical decision making in patients undergoing diagnostic evaluation for lung cancer. BMC Pulmonary Medicine. 2016 Apr 11;:1–25.

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Revision History Information

Revision History Date	Revision History Number	Revision History Explanation	Reason(s) for Change
09/16/2017	R1	07/28/2017 - First sentence in Summary of Evidence: superscripted the number 1. Under the Certification and Training Registry Program: bolded the word "and" after first 3 bullet points.	<ul style="list-style-type: none"> • Typographical Error

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Associated Documents

Attachments N/A

Related Local Coverage Documents Article(s) [A55646 - Response to Comments: MoIDX: Percepta© Bronchial Genomic Classifier \(DL37195\)](#). LCD(s) [DL37195 - MoIDX-CDD: Percepta© Bronchial Genomic Classifier](#)

Related National Coverage Documents N/A

Public Version(s) Updated on 07/28/2017 with effective dates 09/16/2017 - N/A [Updated on 07/21/2017 with effective dates 09/16/2017 - N/A](#) [Back to Top](#)

Keywords

N/A Read the [LCD Disclaimer](#) [Back to Top](#)