Molecular Testing of Bronchial Brushings AHS - M2160

Description of Procedure or Service

Percepta™ Bronchial Genomic Classifier is a test developed by Veracyte, a genomic diagnostics company (Veracyte, 2017). “Percepta Bronchial Genomic Classifier uses advanced genomic technology to help reduce the number of unnecessary surgeries and other procedures that can follow when potentially cancerous lung nodules or lesions are found on CT scans” (Veracyte, 2017).

***Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.

Policy

Reimbursement is not allowed for the molecular testing of bronchial brushings is for all applications.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Molecular Testing of Bronchial Brushings is covered

Not applicable.

When Molecular Testing of Bronchial Brushings is not covered

Reimbursement is not allowed for gene expression profiling on bronchial brushings, including but not limited to Percepta Bronchial Genomic Classifier for all indications, including in patients with indeterminate bronchoscopy results from undiagnosed pulmonary nodules.

Policy Guidelines

In the United States, over 1.5 million lung nodules are detected annually (Kearney, et al., 2017). Low-dose computed tomography (LCCT) is the current standard for lung cancer screening. However, a limitation of the screening is that LCCT shows indeterminate pulmonary nodules which are not clearly defined as benign or cancerous. Introduced in 2015, Percepta Bronchial Genomic Classifier uses cells collected during bronchoscopy which detects genomic changes indicative of a cancerous nodule. Percepta “is designed to reduce the number of invasive biopsies and other procedures that can follow...
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when suspicious lung nodules are found on computerized tomography (CT) scans” (Boston University, 2015).

The use of gene expression profiles to detect malignant and premalignant changes in samples of bronchial epithelial cells has generated sets of differential expression data associated with precancerous (Beane et al., 2017) and cancerous (Beane et al., 2011; Pavel et al., 2017; Spira et al., 2007) lesions.

Clinical Validity and Utility

Whitney, et al. (2015) collected bronchial epithelial cells of 223 cancer-positive and 76 cancer-free subjects undergoing bronchoscopy for suspected lung cancer in a prospective, multi-center study. RNA from these samples was run on gene expression microarrays for training a gene-expression classifier. Out of the 232 genes whose expression levels in the bronchial airway were found to be associated with lung cancer, the authors built a classifier based on the combination of 17 cancer genes, gene expression predictors of smoking status, smoking history, and gender, plus patient age. The authors concluded that “we developed a gene expression classifier measured in bronchial airway epithelial cells that is able to detect lung cancer in current and former smokers who have undergone bronchoscopy for suspicion of lung cancer. Due to the high NPV of the classifier, it could potentially inform clinical decisions regarding the need for further invasive testing in patients whose bronchoscopy is non-diagnostic.”

Silvestri, et al. (2015) reported on the diagnostic performance of a gene-expression classifier. 639 current or former smokers undergoing bronchoscopy for suspected lung cancer enrolled in two multicenter prospective studies (AEGIS-1 and AEGIS-2) were evaluated. A gene-expression classifier was measured in epithelial cells to assess the probability of lung cancer. In AEGIS-1, the classifier had a sensitivity of 88% and a specificity of 47%. In AEGIS-2, the classifier had a sensitivity of 89% and a specificity of 47%. The combination of the classifier plus bronchoscopy had a sensitivity of 96% in AEGIS-1 and 98% in AEGIS-2. The authors concluded that “the gene-expression classifier improved the diagnostic performance of bronchoscopy for the detection of lung cancer. In intermediate-risk patients with a nondiagnostic bronchoscopic examination, a negative classifier score provides support for a more conservative diagnostic approach.”

Hu, et al. (2016) conducted studies to evaluate analytical performance of gene expression profiling test (Percepta test) using bronchial brushing specimen. The authors found that “analytical sensitivity studies demonstrated tolerance to variation in RNA input (157 ng to 243 ng). Analytical specificity studies utilizing cancer positive and cancer negative samples mixed with either blood (up to 10 % input mass) or genomic DNA (up to 10 % input mass) demonstrated no assay interference.” The authors concluded that “analytical sensitivity, analytical specificity and robustness of the Percepta test were successfully verified, supporting its suitability for clinical use.”

Ferguson, et al. (2016) conducted a randomized, prospective decision impact survey study to evaluate pulmonologist recommendations in patients undergoing workup for lung cancer who had an inconclusive bronchoscopy. The goal was to examine if a negative genomic classifier result that down-classifies a patient from intermediate risk to low risk (<10 %) for lung cancer would reduce the rate that physicians recommend more invasive testing among patients with an inconclusive bronchoscopy. The authors found that “invasive procedure recommendations were reduced from 57 % without the classifier result to 18 % with a negative (low risk) classifier result. Invasive procedure recommendations increased from 50 to 65 % with a positive (intermediate risk) classifier result.” The authors concluded that “the results support the potential clinical utility of the classifier to improve management of patients undergoing bronchoscopy for suspect lung cancer by reducing additional invasive procedures in the setting of benign disease.”

Lee et all (2017) published Interim results from a large prospective registry of 665 patients undergoing diagnostic bronchoscopy. In a subset of 209 patients with an intermediate pretest risk of malignancy, Advanced bronchoscopic techniques were used in in 68% of cases. The BGC test results reclassified 74 patients as low risk. At 10 months post follow up the patients reclassified as low risk had a 40% relative reduction in the use of invasive procedures. They concluded that The BGC improves the sensitivity of diagnostic bronchoscopy for patients undergoing evaluation for lung cancer and can reduce the number if unnecessary invasive procedures.
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Feller-Kopman et al (2017) assessed the cost effectiveness of bronchoscopy plus a genomic classifier versus bronchoscopy alone in the diagnostic work-up of patients at intermediate risk for lung cancer. They found that “Use of the genomic classifier reduced invasive procedures by 28% at 1 month and 18% at 2 years, respectively. Total costs and QALY gain were similar with classifier use ($27,221 versus $27,183 and 1.512 versus 1.509, respectively), resulting in an incremental cost-effectiveness ratio of $15,052 per QALY.” They concluded that use of a genomic classifier was associated with meaningful cost reduction in invasive procedures.

State and Federal Regulations, as applicable

This test is considered a laboratory developed test (LDT); developed, validated and performed by individual laboratories.

LDTs are regulated by the Centers for Medicare and Medicaid (CMS) as high-complexity tests under the Clinical Laboratory Improvement Amendments of 1988 (CLIA’88).

As an LDT, the U. S. Food and Drug Administration has not approved or cleared this test; however, FDA clearance or approval is not currently required for clinical use.

American College of Chest Physicians

In 2013, the ACCP published evidence-based clinical practice guidelines for diagnosis and management of lung cancer (Detterbeck, Lewis, Diekemper, Addrizzo-Harris, & Alberts, 2013). The guidelines did not mention gene expression profiling as a potential diagnostic or screening tool.

National Comprehensive Cancer Network

The NCCN guidelines v5.2018 for Non-Small Cell Lung Cancer did not mention gene expression profiling as a potential diagnostic or screening tool.

The NCCN Guidelines v2.2018 for Small Cell Lung Cancer did not mention gene expression profiling as a potential diagnostic or screening tool.

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable service codes: 81479

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources


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Policy Implementation/Update Information

1/1/2019 New policy developed. Molecular testing/Gene expression profiling on bronchial brushings, including but not limited to Percepta Bronchial Genomic Classifier, is considered investigational for all indications, including in patients with indeterminate bronchoscopy results from undiagnosed pulmonary nodules. Medical Director review 1/1/2019. Policy noticed 1/1/2019 for effective date 4/1/2019. (lpr)

10/1/19 Policy statement revised to read: Reimbursement is not allowed for the molecular testing of bronchial brushings is for all applications. “Investigational” changed to read “Reimbursement is not allowed…” Deleted coding grid. Notification given 10/1/2019 for effective date 12/2/2019. (an)

12/10/19 Coding section updated per Avalon Q3 CAB review. No change to policy statement. (eel)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.