Analysis of Human DNA in Stool Samples as a Technique for Colorectal Cancer Screening

Policy # 00003
Original Effective Date: 08/25/2003
Current Effective Date: 01/09/2023

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the “Company”), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

When Services May Be Eligible for Coverage
Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:

• Benefits are available in the member’s contract/certificate, and
• Medical necessity criteria and guidelines are met.

Based on review of available data, the Company may consider analysis of stool samples using the Cologuard® multi-targeted stool deoxyribonucleic acid (DNA) test as a screening technique for colorectal cancer (CRC) at intervals of one test every one to three years to be eligible for coverage.**

Patient Selection Criteria
Cologuard multi-targeted stool deoxyribonucleic acid (DNA) test as a screening technique for colorectal cancer (CRC) will be eligible for coverage in individuals meeting all of the following criteria:

• Age 45 to 85 years, AND
• Asymptomatic (no signs or symptoms of colorectal disease including but not limited to lower gastrointestinal pain, blood in stool, positive guaiac fecal occult blood test or fecal immunochemical test), AND
• At average risk of developing colorectal cancer ([CRC] no personal history of adenomatous polyps, colorectal cancer [CRC], or inflammatory bowel disease, including Crohn’s disease and ulcerative colitis; no family history of colorectal cancers [CRCs], familial adenomatous polyposis, or hereditary nonpolyposis colorectal cancer [HNPCC]).
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When Services Are Considered Investigational
Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers deoxyribonucleic acid (DNA) analysis of stool samples as a screening technique for colorectal cancer (CRC) when patient selection criteria are not met or using any stool deoxyribonucleic acid (DNA) test other than Cologuard to be investigational.*

Background/Overview
Colorectal Cancer
Several cellular genetic alterations have been associated with CRC. In the proposed multistep model of carcinogenesis, the tumor suppressor gene p53 and the proto-oncogene KRAS are most frequently altered. Variants in adenomatous polyposis coli genes and epigenetic markers (eg, hypermethylation of specific genes) have also been detected. CRC is also associated with DNA replication errors in microsatellite sequences (termed microsatellite instability) in individuals with Lynch syndrome (formerly known as hereditary nonpolyposis CRC) and in subgroups of individuals with sporadic colon carcinoma. Tumor-associated gene variants and epigenetic markers can be detected in exfoliated intestinal cells in stool specimens. Because cancer cells are shed into the stool, tests have been developed to detect these genetic alterations in the DNA from shed CRC cells isolated from stool samples.

FDA or Other Governmental Regulatory Approval
U.S. Food and Drug Administration (FDA)
On August 12, 2014, Cologuard®‡ (Exact Sciences Corporation) was approved by the U.S. Food and Drug Administration (FDA) through the premarket approval process as an automated fecal DNA testing product for use in average risk adults aged 50 to 84 years (P130017). Cologuard is intended for the qualitative detection of colorectal neoplasia-associated DNA markers and of occult hemoglobin in human stool. A positive result may indicate the presence of CRC or advanced adenoma and should be followed by diagnostic colonoscopy. On September 20, 2019, the FDA approved the expansion of the Cologuard label to include average risk adults aged ≥45 years. Cologuard is not a replacement for diagnostic colonoscopy or surveillance colonoscopy in high-risk
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individuals. On August 26, 2020, the FDA approved the post-approval study (PAS) protocol titled: "A Real-World Study of Patients Under the Age of 50 Screened for Colorectal Cancer (CRC) Using Cologuard in the U.S. (Tidal)."

Rationale/Source
This medical policy was developed through consideration of peer-reviewed medical literature generally recognized by the relevant medical community, U.S. Food and Drug Administration approval status, nationally accepted standards of medical practice and accepted standards of medical practice in this community, technology evaluation centers, reference to federal regulations, other plan medical policies, and accredited national guidelines.

Description
Detection of DNA abnormalities associated with colorectal cancer (CRC) in stool samples has been proposed as a screening test for CRC. This technology is another potential alternative to currently available screening approaches such as fecal occult blood testing, fecal immunochemical testing (FIT), and colonoscopy. The currently available stool DNA test combines FIT and DNA analysis and is referred to as FIT-DNA in this review, though other publications also use the terms stool DNA (sDNA)-FIT and multitarget stool DNA (mt-sDNA).

Summary of Evidence
For individuals who are asymptomatic and at average risk of CRC who receive FIT-DNA, the evidence includes a number of small studies comparing FIT-DNA (in early stages of development) with colonoscopy, screening studies comparing the final version of the FIT-DNA (using colonoscopy as the reference standard), 2 systematic reviews of screening studies, and modeling studies. Relevant outcomes are overall survival and disease-specific survival. The screening studies have reported that FIT-DNA has higher sensitivity and lower specificity than FIT. There are no studies directly assessing health outcomes such as overall survival or disease-specific survival. The test characteristics of FIT-DNA show the potential of the test to be an effective CRC screening test, but there is uncertainty about other aspects of it. The screening interval for the test has not been firmly established nor is there evidence on the adherence of the test at a recommended screening interval. Effective screening for CRC requires a screening program with established screening intervals and appropriate follow-up for positive tests. Clinical utility of FIT-DNA is based on modeling studies. These studies have demonstrated that the diagnostic characteristics of FIT-DNA
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are consistent with decreases in CRC mortality that are in the range of other accepted modalities. FIT-DNA every 3 years is less effective than most other accepted screening strategies, while FIT-DNA every year is close to the efficacy of colonoscopy every 10 years. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

**Supplemental Information**

**Practice Guidelines and Position Statements**
Guidelines or position statements will be considered for inclusion in ‘Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

**National Comprehensive Cancer Network**
The National Comprehensive Cancer Network (NCCN) guidelines (v.2. 2022) for colorectal cancer (CRC) screening includes the use of fecal immunochemical testing (FIT)-DNA to screen individuals with an average risk for colon cancer. Following a negative test, the recommendation is to rescreen with any modality in 3 years. Use of FIT-DNA is not described for the screening of high-risk individuals. Follow-up colonoscopy is recommended within 6 to 10 months after a positive test.

**Multi-Society Task Force on Colorectal Cancer**
A U.S. Multi-Society task force representing the American College of Gastroenterology, the American Gastroenterological Association (AGA), and the American Society for Gastrointestinal Endoscopy (2017) provided recommendations for CRC screening. The recommended first-tier tests for individuals with average risk were colonoscopy every 10 years, and for individuals who decline colonoscopy, annual FIT. Recommended second-tier tests in individuals who declined the first-tier tests were computed tomography colonography every 5 years, FIT-DNA every 3 years, or flexible sigmoidoscopy every 5 to 10 years. Capsule colonoscopy was listed as a third-tier test. The task force recommended, “[computed tomography] colonography every 5 years or FIT-fecal DNA every 3 years (strong recommendation, low-quality evidence), or flexible sigmoidoscopy every 5-10 years (strong recommendation, high-quality evidence) in individuals who refuse colonoscopy and FIT.” In 2022, a focused update to the 2017 CRC screening recommendations from the task force was published that addressed the age to begin and stop CRC screening in average-risk individuals. The

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task force now suggests CRC screening in average-risk individuals aged 45 to 49 years. Unchanged from 2017 are the following recommendations: a) offer CRC screening to all average-risk individuals aged 50 to 75 years, b) consider starting or continuing screening for individuals aged 76 to 85 years on an individualized basis.

**American Cancer Society**
In 2018, the American Cancer Society updated its guidelines for CRC screening for average-risk adults. Regular screening with either a structural examination (ie, colonoscopy) or a high-sensitivity stool-based test is recommended to start in adults who are age 45 years and older (qualified recommendation) or who are age 50 years and older (strong recommendation). Recommendations for screening with stool-based tests include FIT repeated every year, high-sensitivity guaiac-based fecal occult blood test repeated every year, or multitarget stool DNA test repeated every 3 years.

**American Gastroenterological Association**
In 2022, the AGA published a clinical practice update commentary that reviewed the evidence on noninvasive CRC screening options. Similar to the U.S. Multi-Society task force, the ACG recommends FIT-DNA every 3 years as an average-risk option for CRC screening. The commentary compares this recommendation to that of the U.S. Preventive Services Task Force (USPSTF), which recommends FIT-DNA every 1 to 3 years.

**U.S. Preventive Services Task Force Recommendations**
In 2021, the U.S. Preventive Services Task Force published updated recommendations for CRC screening in asymptomatic, average risk adults (defined as no prior diagnosis of CRC, adenomatous polyps, or inflammatory bowel disease; no personal diagnosis or family history of known genetic disorders that predispose them to a high lifetime risk of CRC [such as Lynch syndrome or familial adenomatous polyposis]). The USPSTF recommended universal screening for average risk adults aged 45 to 49 years (B recommendation) and for adults aged 50 to 75 years (A recommendation). For adults aged 76 to 85 years, the USPSTF recommends selective screening due to the small magnitude of net benefit (C Recommendation). The USPSTF reviewed evidence for 6 screening strategies, including FIT-DNA. They do not recommend one screening strategy over another, and noted the lack of direct evidence on clinical outcomes when comparing screening strategies. Clinical considerations noted for FIT-DNA testing appear in Table 1.
Table 1. U.S. Preventative Services Task Force Considerations for Fecal Immunochemical-DNA Testing

<table>
<thead>
<tr>
<th>Recommended screening interval</th>
<th>Efficacy</th>
<th>Other considerations</th>
</tr>
</thead>
</table>
| 1 to 3 years                  | • Improved sensitivity compared with FIT per 1-time application of screening test  
                              | • Specificity is lower than that of FIT, resulting in more false-positive results, more follow-up colonoscopies, and more associated adverse events per FIT-DNA screening test compared with per FIT test  
                              | • Modeling suggests that screening every 3 years does not provide a favorable balance of benefits and harms compared with other stool-based screening options (annual FIT or FIT-DNA every 1 or 2 years)  
                              | • Insufficient evidence about appropriate longitudinal follow-up  | • Harms from screening with FIT-DNA arise from colonoscopy to follow-up abnormal FIT-DNA results  
                              |                                                   | • Can be done with a single stool sample but involves collecting an entire bowel movement  
                              |                                                   | • Requires good adherence over multiple rounds of testing  
                              |                                                   | • Does not require bowel preparation, anesthesia or sedation, or transportation to and from the screening examination (test is performed at home)  |
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| of abnormal findings after a negative follow-up colonoscopy |
| No direct evidence evaluating the effect of FIT-DNA on colorectal cancer mortality |

FIT: fecal immunochemical testing.

Medicare National Coverage
In 2014, a Centers for Medicare & Medicaid Services decision memo indicated Medicare Part B will cover the Cologuard test “once every 3 years for beneficiaries who meet all of the following criteria:”

- "Age 50 to 85 years,
- Asymptomatic (no signs or symptoms of colorectal disease including but not limited to lower gastrointestinal pain, blood in stool, positive guaiac fecal occult blood test or fecal immunochemical test), and
- At average risk of developing colorectal cancer (no personal history of adenomatous polyps, colorectal cancer, or inflammatory bowel disease, including Crohn’s Disease and ulcerative colitis; no family history of colorectal cancers or adenomatous polyps, familial adenomatous polyposis, or hereditary nonpolyposis colorectal cancer).

As noted in the Centers for Medicare & Medicaid Services decision memo, the optimal screening interval for Cologuard is unknown. In the interim, Centers for Medicare & Medicaid Services has indicated it will cover Cologuard every three years as previously specified and would reevaluate the screening interval after the Food and Drug Administration approval study is completed.

Ongoing and Unpublished Clinical Trials
Some currently ongoing and unpublished trials that might influence this review are listed in Table 2.
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Table 2. Summary of Key Trials

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
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<tbody>
<tr>
<td>Ongoing</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NCT04144738(^a)</td>
<td>Clinical Validation of An Optimized Multi-Target Stool DNA (Mt-sDNA 2.0) Test, for Colorectal Cancer Screening &quot;BLUE-C&quot;</td>
<td>24,000</td>
<td>Oct 2022</td>
</tr>
<tr>
<td>NCT04124406(^a)</td>
<td>Voyage: Real-World Impact of the Multi-target Stool DNA Test on CRC Screening and Mortality</td>
<td>150,000</td>
<td>Dec 2029</td>
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<tr>
<td>Unpublished</td>
<td>A Longitudinal Study of Cologuard in an Average Risk Population Assessing a 3 Year Test Interval</td>
<td>2,404</td>
<td>Mar 2020</td>
</tr>
</tbody>
</table>

NCT: national clinical trial.
\(^a\) Denotes industry-sponsored or cosponsored trial.

References


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08/19/2003 Medical Policy Committee review
08/25/2003 Managed Care Advisory Council approval
08/03/2005 Medical Director review
08/16/2005 Medical Policy Committee review. No change to coverage eligibility.
08/24/2005 Managed Care Advisory Council approval
07/07/2006 Format revision, including addition of FDA and or other governmental regulatory approval and rationale/source. Coverage eligibility unchanged.
05/02/2007 Medical Director review
05/23/2007 Medical Policy Committee approval. Coverage eligibility unchanged.
05/07/2009 Medical Director review
05/20/2009 Medical Policy Committee approval. Coverage eligibility unchanged.
05/06/2010 Medical Director review
06/16/2010 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
02/01/2011 Coding review
05/05/2011 Medical Director review
05/18/2011 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
05/03/2012 Medical Policy Committee review

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05/16/2012 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
02/04/2013 Coding updated
05/02/2013 Medical Director review
05/22/2013 Medical Policy Implementation Committee approval. No change to coverage.
03/06/2014 Medical Policy Committee review
03/19/2014 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
01/01/2015 Coding updated
04/02/2015 Medical Policy Committee review
04/20/2015 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
08/03/2015 Coding update: ICD10 Diagnosis code section added; ICD9 Procedure code section removed.
01/01/2016 Coding update: CPT code added
04/07/2016 Medical Policy Committee review
04/20/2016 Medical Policy Implementation Committee approval. Added coverage statement for Cologuard testing every three years in patients meeting criteria.
11/03/2016 Medical Policy Committee review
01/01/2017 Coding update: Removing ICD-9 Diagnosis codes
11/02/2017 Medical Policy Committee review
08/28/2018 Coding update
11/08/2018 Medical Policy Committee review
11/07/2019 Medical Policy Committee review
04/02/2020 Medical Policy Committee review

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<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>04/08/2020</td>
<td>Medical Policy Implementation Committee approval. Coverage eligibility unchanged.</td>
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<tr>
<td>04/01/2021</td>
<td>Medical Policy Committee review</td>
</tr>
<tr>
<td>04/14/2021</td>
<td>Medical Policy Implementation Committee approval. Coverage eligibility unchanged.</td>
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<tr>
<td>12/02/2021</td>
<td>Medical Policy Committee review</td>
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<tr>
<td>12/08/2021</td>
<td>Medical Policy Implementation Committee approval. Policy updated to comply with USPSTF guidelines to “Screen all asymptomatic adults aged 45 to 85 years for colorectal cancer.”</td>
</tr>
<tr>
<td>12/01/2022</td>
<td>Medical Policy Committee review</td>
</tr>
<tr>
<td>12/14/2022</td>
<td>Medical Policy Implementation Committee approval. No change to coverage. Minor editorial refinements to policy statements; intent unchanged.</td>
</tr>
</tbody>
</table>

Next Scheduled Review Date: 12/2023

*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or

B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:

1. Consultation with technology evaluation center(s);
2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
3. Reference to federal regulations.

**Medically Necessary (or “Medical Necessity”) - Health care services, treatment, procedures, equipment, drugs, devices, items or supplies that a Provider, exercising prudent clinical judgment,
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would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury, disease or its symptoms, and that are:

A. In accordance with nationally accepted standards of medical practice;
B. Clinically appropriate, in terms of type, frequency, extent, level of care, site and duration, and considered effective for the patient's illness, injury or disease; and
C. Not primarily for the personal comfort or convenience of the patient, physician or other health care provider, and not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient's illness, injury or disease.

For these purposes, “nationally accepted standards of medical practice” means standards that are based on credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community, Physician Specialty Society recommendations and the views of Physicians practicing in relevant clinical areas and any other relevant factors.

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NOTICE: If the Patient’s health insurance contract contains language that differs from the BCBSLA Medical Policy definition noted above, the definition in the health insurance contract will be relied upon for specific coverage determinations.

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