Identification of Microorganisms Using Nucleic Acid Probes

Nucleic acid probes are available for the identification of a wide variety of microorganisms, offering more rapid identification than standard cultures. Nucleic acid probes can also be used to quantitate the number of microorganisms present. This technology offers advantages over standard techniques when rapid identification is clinically important, when microbial identification using standard culture is difficult or impossible, and/or when treatment decisions are based on quantitative results.

**Standard Microorganism Detection Techniques**
Classically, identification of microorganisms depended either on culture of body fluids or tissues or identification of antigens, using a variety of techniques including direct fluorescent antibody technique and qualitative or quantitative immunoassays. These techniques are problematic when the microorganism exists in very small numbers or is technically difficult to culture. Indirect identification of microorganisms by immunoassays for specific antibodies reactive with the microorganism, is limited by difficulties in distinguishing between past exposure and current infection.

**Nucleic Acid Probe Techniques**
The availability of nucleic acid probes has permitted the rapid direct identification of microorganisms’ DNA or RNA. Amplification techniques, result in exponential increases in copy numbers of a targeted strand of microorganism-specific DNA. The most commonly used amplification technique is the polymerase chain reaction (PCR) or reverse transcriptase (RT) PCR. In addition to PCR, other nucleic acid amplification techniques have been developed, such as transcription-mediated amplification (TMA), loop-mediated isothermal DNA amplification (LAMP), strand displacement amplification, nucleic acid sequence-based amplification and branched chain DNA signal amplification. After amplification, target DNA can be readily detected using a variety of techniques. The amplified product can also be quantified to give an assessment of how many microorganisms are present. Quantification of the amount of nucleic acids permits serial assessments of response to treatment; the most common clinical application of quantification is the serial measurement of human immunodeficiency virus (HIV) RNA (called viral load), which serves as a prognostic factor.

***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**
BCBSNC will provide coverage for identification of microorganisms using nucleic acid probes when it is determined to be medically necessary because the medical criteria and guidelines shown below are met.
Identification of Microorganisms Using Nucleic Acid Probes

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 Identification of Microorganisms Using Nucleic Acid Probes is covered

Nucleic acid identification using the specified assay(s) is considered medically necessary for the following microorganisms:

- Bartonella henselae or Quintana-Direct and Amplified Probe
- BK Virus-Direct Probe, Amplified Probe and Quantification
- Candida species-Direct and Amplified Probe
- Chlamydia trachomatis-Direct Probe and Amplified Probe
- Clostridium difficile-Direct and Amplified Probe
- Cytomegalovirus-Direct Probe, Amplified Probe and Quantification
- Enterococcus, Vancomycin resistant (e.g., enterococcus vanA, vanB)-Amplified Probe
- Epstein Barr Virus (EBV)-Direct Probe, Amplified Probe and Quantification
- Gardnerella vaginalis-Direct Probe
- Hepatitis B-Direct Probe, Amplified Probe and Quantification
- Hepatitis C-Direct Probe, Amplified Probe and Quantification
- Herpes simplex virus- Direct Probe and Amplified Probe
- Human Herpesvirus 6 Direct Probe, Amplified Probe and Quantification
- Human Herpesvirus 8 (Kaposi’s Sarcoma Herpes Virus)-Direct Probe, Amplified Probe and Quantification
- Human Immunodeficiency Virus 1 HIV-1 Direct Probe, Amplified Probe and Quantification
- Human Immunodeficiency Virus 2 (HIV-2) Direct Probe, Amplified Probe and Quantification
- Human Papillomavirus-Direct Probe and Amplified Probe
- Influenza virus-Direct Probe, Amplified Probe and Quantification
- Mycobacterium species-Direct Probe
- Mycobacterium tuberculosis-Direct Probe and Amplified Probe
- Mycobacterium avium intracellulare-Direct Probe
- Neisseria gonorrhoeae-Direct Probe and Amplified Probe
- Respiratory virus panel-Direct Probe and Amplified Probe
- Staphylococcus aureus and Staphylococcus aureus, methicillin resistant- Amplified Probe
- Streptococcus group A*-Direct Probe
- Streptococcus group B- Amplified Probe
- Trichomonas vaginalis-Direct and Amplified Probe

*The direct DNA probe test for streptococcus A is designed to be an alternative to a confirmatory culture. Therefore, the simultaneous use of confirmatory culture and DNA probe test is considered not medically necessary. Antibiotic sensitivity of streptococcus A cultures is frequently not performed for throat cultures. However, if an antibiotic sensitivity is considered, then the most efficient method of diagnosis would be a combined culture and antibiotic sensitivity.
Identification of Microorganisms Using Nucleic Acid Probes

In the evaluation of Group B streptococcus, the primary advantage of a DNA probe technique compared to traditional culture techniques is the rapidity of results. This advantage suggests that the most appropriate use of the DNA probe technique is in the setting of impending labor, for which prompt results could permit the initiation of intrapartum antibiotic therapy.

**When Identification of Microorganisms Using Nucleic Acid Probes is not covered**

Nucleic acid identification of microorganisms using direct probe, amplified probe, or quantification is considered investigational except as outlined in the section above titled “When Identification of Microorganisms Using Nucleic Acid Probes is covered.”

The use of nucleic acid testing with quantification of viral load is considered investigational for microorganisms that are not included in the list of microorganisms for which probes with or without quantification are considered medically necessary as listed above.

**Policy Guidelines**

The evidence for the use of nucleic acid probes for Chlamyphila pneumoniae or hepatitis G virus in individuals with suspected C. pneumoniae or with hepatitis, respectively, includes prospective and retrospective evaluations of the tests’ sensitivity and specificity. Relevant outcomes are test accuracy and validity, other test performance measures, symptoms, and change in disease status. The body of evidence is limited for both types of organisms. For C. pneumoniae, one study was identified that reported relatively high sensitivity and specificity for a polymerase chain reaction–based test. However, the total number of patients in this study was small (N=56), and most other studies were conducted in the investigational setting. In addition to the limitations in the evidence base on test characteristics, the clinical implications of these tests are unclear. The evidence is insufficient to determine the effects of the technology on health outcomes.

The evidence for the use of a nucleic acid-based gastrointestinal pathogen panel in individuals who have signs and/or symptoms of gastroenteritis includes prospective and retrospective evaluations of the tests’ sensitivity and specificity. Relevant outcomes include test accuracy and validity, other test performance measures, symptoms, and change in disease status. The evidence suggests that gastrointestinal pathogen panels are likely to identify both bacterial and viral pathogens with high sensitivity, compared with standard methods. Access to a rapid method for etiologic diagnosis of gastrointestinal infections may lead to more effective early treatment and infection-control measures. However, in most instances, when a specific pathogen is suspected, individual tests could be ordered. There may be a subset of patients with an unusual presentation who would warrant testing for a panel of pathogens at once, but that subset has not been well defined. The evidence is insufficient to determine the effects of the technology on health outcomes.

**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.

*It should be noted that the technique for quantification includes both amplification and direct probes; therefore, simultaneous coding for both quantification with either amplification or direct probes, is not warranted.*
Identification of Microorganisms Using Nucleic Acid Probes

Applicable service codes: 87470, 87471, 87472, 87475, 87476, 87477, 87480, 87481, 87482, 87483, 87485, 87486, 87487, 87490, 87491, 87492, 87493, 87495, 87496, 87497, 87498, 87505, 87506, 87507, 87510, 87511, 87512, 87515, 87516, 87517, 87520, 87521, 87522, 87525, 87526, 87527, 87528, 87529, 87530, 87531, 87532, 87533, 87534, 87535, 87536, 87537, 87538, 87539, 87540, 87541, 87542, 87550, 87551, 87552, 87555, 87556, 87557, 87560, 87561, 87562, 87580, 87581, 87582, 87590, 87591, 87592, 87623, 87624, 87625, 87631, 87632, 87633, 87640, 87641, 87650, 87651, 87652, 87653, 87660, 87661, 87797, 87798, 87799, 87806, 0004U

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


Medical Director review 10/2013

Specialty Matched Consultant Advisory Panel review 1/2014


Specialty Matched Consultant Advisory Panel review 4/2015

Medical Director review 4/2015


Specialty Matched Consultant Advisory Panel review 3/2017
Identification of Microorganisms Using Nucleic Acid Probes

Medical Director review 3/2017

Policy Implementation/Update Information

11/27/12 New policy developed. BCBSNC will provide coverage for identification of microorganisms using nucleic acid probes when it is determined to be medically necessary because the medical criteria and guidelines are met. Medical Director review 10/2012. Policy noticed on 11/27/12 for effective date 2/26/13. (mco)

10/29/13 “When Covered” section updated to include Candida species-Amplified Probe and Trichomonas vaginalis-Amplified Probe. Description section updated. References updated. Medical Director review 10/2013. (mco)

12/31/13 Added CPT code 87661 to Billing/Coding section. (mco)


11/11/14 References updated. No Changes to Policy Statements. (td)

12/30/14 Deleted CPT codes 87620, 87621 and 87622 and added CPT codes 87505, 87506, 87507, 87623, 87624, 87625, 87806 to Billing/Coding section effective as of 1/1/15. (td)


4/29/16 Description section revised. Corrections/clarifications made to coverage statements: C. difficile added to list of medically necessary probes and investigational policy statement added for probes with quantification of viral load that do not meet criteria for quantification. Policy Guidelines section revised. References updated. Specialty Matched Consultant Advisory Panel review 3/30/2016. (jd)

12/30/16 Code 87483 added to Billing/Coding section. (jd)


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.