

## Reimbursement Policy

### Coronavirus Testing in the Outpatient Setting

---

[POLICY DESCRIPTION](#) | [INDICATIONS AND/OR LIMITATIONS OF COVERAGE](#) | [APPLICABLE STATE AND FEDERAL REGULATIONS](#) | [APPLICABLE CPT/HCPCS PROCEDURE CODES](#) | [EVIDENCE-BASED SCIENTIFIC REFERENCES](#) | [REVISION HISTORY](#)

#### I. Policy Description

Human coronaviruses, first characterized in the 1960s, are named based on the spiked proteins located on their surface. As of 2020, seven coronaviruses are known to infect humans. Four, of which—229E, NL63, OC43, and HKU1—are associated with the common cold. MERS-CoV is the coronavirus that causes Middle East Respiratory Syndrome, or MERS. SARS-CoV is the causative agent of Severe Acute Respiratory Syndrome (SARS), and SARS-CoV-2 is the virus that causes coronavirus disease 2019, or COVID-19.<sup>1,2</sup> As of June 1, 2024, the United States had reported that nearly 1.2 million people have died of COVID-19.<sup>1</sup> Testing for a possible coronavirus infection can include molecular tests, such as nucleic acid-based testing like reverse transcription polymerase chain reaction (RT-PCR); host antibody testing; and antigen testing.

#### II. Indications and/or Limitations of Coverage

Application of coverage criteria is dependent upon an individual's benefit coverage at the time of the request. Specifications pertaining to Medicare and Medicaid can be found in the "Applicable State and Federal Regulations" section of this policy document.

*This policy only addresses testing for the purpose of medical decision making in the outpatient setting. This policy does not address work, school, state, or federally mandated SARS-CoV-2 testing.*

- 1) Targeted nucleic acid testing (e.g., RT-PCR, rapid molecular tests) for COVID-19 (SARS-CoV-2) **MEETS COVERAGE CRITERIA** in any of the following situations:
  - a) For individuals displaying signs and symptoms of possible COVID-19 infection (See Note 1).
  - b) For asymptomatic individuals with known exposure to COVID-19, **EXCEPT** when the individual has had a previous COVID-19 infection within the last 90 days.
- 2) For individuals with signs or symptoms of SARS and who have traveled to endemic areas or who have been exposed to persons with SARS, targeted nucleic acid testing (e.g., RT-PCR)

## Reimbursement Policy

for the detection of severe acute respiratory syndrome (SARS) coronavirus RNA **MEETS COVERAGE CRITERIA.**

- 3) For individuals with signs or symptoms of Middle East respiratory syndrome (MERS) and who have traveled to endemic areas or who have been exposed to persons with MERS, targeted nucleic acid testing (e.g., RT-PCR) for the detection of MERS coronavirus RNA **MEETS COVERAGE CRITERIA.**
- 4) To support a diagnosis of multisystem inflammatory syndrome in children (MIS-C) (see Note 2), multisystem inflammatory syndrome in adults (MIS-A) (see Note 3), or post-acute sequelae of SARS-CoV-2 infection (PASC), nucleic acid amplification testing and host antibody serology testing **MEET COVERAGE CRITERIA.**
- 5) For symptomatic individuals, antigen-detecting diagnostic tests for SARS-CoV-2 (e.g., antigen rapid tests) once every 48 hours **MEET COVERAGE CRITERIA.**
- 6) For the diagnosis of SARS-CoV-2 reinfection, whole genome sequencing of paired specimens from distinct lineages (as defined in Nextstrain or GISAID) **DOES NOT MEET COVERAGE CRITERIA.**
- 7) For all other situations not described above, host antibody serology testing **DOES NOT MEET COVERAGE CRITERIA.**

*The following does not meet coverage criteria due to a lack of available published scientific literature confirming that the test(s) is/are required and beneficial for the diagnosis and treatment of an individual's illness.*

- 8) In the outpatient setting, SARS-CoV-2 genotyping **DOES NOT MEET COVERAGE CRITERIA.**
- 9) For all situations, neutralization antibody testing for SARS-CoV-2 **DOES NOT MEET COVERAGE CRITERIA.**
- 10) Testing for other endemic coronaviruses, such as 229E, NL63, OC43, and HKU1, **DOES NOT MEET COVERAGE CRITERIA.**

---

### NOTES:

**Note 1:** Signs and symptoms associated with a possible COVID-19 infection can include fever, cough, fatigue, shortness of breath or difficulty breathing, congestion or runny nose, chills, muscle or body aches, headache, sore throat, new loss of taste or smell, nausea, vomiting, and diarrhea.<sup>3</sup>

## Reimbursement Policy

**Note 2:** According the CDC,<sup>4</sup> MIS-C is defined as an illness that is found in a person less than 21 years of age when **all** of the following conditions are met:

- Subjective or documented fever of at least 38°C;
- Clinical severity requiring hospitalization;
- Evidence of systemic inflammation indicated by elevated C-reactive protein (CRP);
- New onset of manifestations in at least **two** of the following categories:
  - Cardiac involvement indicated by **one** of the following:
    - Left ventricular ejection fraction <55%.
    - Coronary artery dilatation, aneurysm, or ectasia.
    - Elevated troponin.
  - Mucocutaneous involvement indicated by **one** of the following:
    - Rash.
    - Inflammation of the oral mucosa.
    - Conjunctivitis or conjunctival injection.
    - Extremity findings (e.g., erythema or edema of the hands or feet).
  - Shock.
  - Gastrointestinal involvement indicated by **one** of the following:
    - Abdominal pain.
    - Vomiting.
    - Diarrhea.
  - Hematologic involvement indicated by **one** of the following:
    - Platelet count <150,000 cells/μL.
    - Absolute lymphocyte count.

**Note 3:** According to the CDC,<sup>4</sup> MIS-A is defined as an illness that is found in a person 21 years of age or older when all of the following conditions are met:

- Hospitalization for 24 hours or more;
- Subjective or documented fever of at least 38°C for one of the following:
  - 24 or more hours prior to hospitalization.
  - Within the first 3 days of hospitalization.
- No alternative diagnosis (e.g., bacterial sepsis).
- At least **three** of the following (occurring prior to hospitalization or within the first three days of hospitalization), with at least one being a primary clinical criterion:
  - Primary clinical criteria:
    - Severe cardiac illness (e.g., myocarditis, pericarditis, coronary artery dilation/aneurysm, new-onset right or left ventricular dysfunction, 2<sup>nd</sup>/3<sup>rd</sup> degree A-V block, ventricular tachycardia).
    - Rash **and** non-purulent conjunctivitis.
  - Secondary clinical criteria:

## Reimbursement Policy

- New-onset neurologic signs and symptoms (e.g., encephalopathy in an individuals without prior cognitive impairment, seizures, meningeal signs, peripheral neuropathy including Guillain-Barré syndrome).
- Shock or hypotension not attributable to medical therapy.
- Abdominal pain, vomiting, or diarrhea.
- Thrombocytopenia.
- Evidence of SARS-CoV-2 infection;
- Evidence of systemic inflammation (elevated CRP, ferritin, interleukin-6, erythrocyte sedimentation rate, or procalcitonin).

### III. Applicable State and Federal Regulations

DISCLAIMER: If there is a conflict between this Policy and any relevant, applicable government policy for a particular member [e.g., Local Coverage Determinations (LCDs) or National Coverage Determinations (NCDs) for Medicare and/or state coverage for Medicaid], then the government policy will be used to make the determination. For the most up-to-date Medicare policies and coverage, please visit the Medicare search website: <https://www.cms.gov/medicare-coverage-database/search.aspx>. For the most up-to-date Medicaid policies and coverage, please visit the applicable state Medicaid website.

#### Food and Drug Administration (FDA)

Many labs have developed specific tests that they must validate and perform in house. These laboratory-developed tests (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). LDTs are not approved or cleared by the U. S. Food and Drug Administration; however, FDA clearance or approval is not currently required for clinical use.

The FDA issued an “Immediately in Effect Guidance on policy for diagnostics testing in laboratories certified to perform high complexity testing under CLIA prior to Emergency Use Authorization for Coronavirus Disease-2019 during the public health emergency” in February 2020.<sup>59</sup> This policy was updated on May 11, 2020 to state that the “policy is intended to remain in effect only for the duration of the public health emergency related to COVID-19 declared by the Secretary of Health and Human Services (HHS) on January 31, 2020, effective January 27, 2020, including any renewals made by the HHS Secretary in accordance with section 319(a)(2) of the Public Health Service Act (PHS Act)”.<sup>42</sup>

In March 2023, the FDA released a “transition plan for medical devices that fall within enforcement policies issued during the coronavirus disease 2019 (COVID-19) public health emergency” and a “transition plan for medical devices issued emergency use authorizations (EUAs) related to coronavirus disease 2019.”<sup>89</sup> These guidelines are meant to outline the FDA’s recommendations during the transition from the COVID-19 pandemic to normal operations.<sup>123,124</sup>

## Reimbursement Policy

### IV. Applicable CPT/HCPCS Procedure Codes

CPT	Code Description
86328	Immunoassay for infectious agent antibody(ies), qualitative or semiquantitative, single step method (eg, reagent strip); severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19])
86408	Neutralizing antibody, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID19]); screen
86409	Neutralizing antibody, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID19]); titer
86413	Severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) (Coronavirus disease [COVID-19]) antibody, quantitative
86769	Antibody; severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19])
87426	Infectious agent antigen detection by immunoassay technique, (eg, enzyme immunoassay [EIA], enzyme-linked immunosorbent assay [ELISA], fluorescence immunoassay [FIA], immunochemiluminometric assay [IMCA]) qualitative or semiquantitative; severe acute respiratory syndrome coronavirus (eg, SARS-CoV, SARS-CoV-2 [COVID-19])
87635	Infectious agent detection by nucleic acid (DNA or RNA);severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19]), amplified probe technique
87798	Infectious agent detection by nucleic acid (DNA or RNA), not otherwise specified; amplified probe technique, each organism
87811	Infectious agent antigen detection by immunoassay with direct optical (ie, visual) observation; severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19])
87913	Infectious agent genotype analysis by nucleic acid (DNA or RNA); severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (coronavirus disease [COVID-19]), mutation identification in targeted region(s)
0224U	Antibody, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19]), includes titer(s), when performed Proprietary test: COVID-19 Antibody Test Lab/Manufacturer: Mount Sinai Laboratory/Mt Sinai
0226U	Surrogate viral neutralization test (sVNT), severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Coronavirus disease [COVID-19]), ELISA, plasma, serum Proprietary test: Tru-Immune™ Lab/Manufacturer: Ethos Laboratories/GenScript® USA Inc

## Reimbursement Policy

CPT	Code Description
0408U	Infectious agent antigen detection by bulk acoustic wave biosensor immunoassay, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (coronavirus disease [COVID-19]) Proprietary test: Omnia™ SARS-CoV-2 Antigen Test Lab/Manufacturer: Qorvo Biotechnologies
U0001	CDC Novel Coronavirus (2019-nCoV) Real-Time RT-PCR Diagnostic Panel
U0002	Non-CDC laboratory test for 2019-nCoV (COVID-19), any method

Current Procedural Terminology© American Medical Association. All Rights reserved.

*Procedure codes appearing in Medical Policy documents are included only as a general reference tool for each policy. They may not be all-inclusive.*

### V. Evidence-based Scientific References

1. CDC. About COVID-19. Updated June 13, 2024. <https://www.cdc.gov/covid/about/index.html>
2. CDC. Human Coronavirus Types. Updated February 15, 2020. <https://archive.cdc.gov/#/details?url=https://www.cdc.gov/coronavirus/types.html>
3. CDC. Symptoms of COVID-19. Updated March 10, 2025. <https://www.cdc.gov/covid/signs-symptoms/>
4. CDC. Multisystem Inflammatory Syndrome: Case Definitions and Reporting. Updated May 29, 2024. <https://www.cdc.gov/mis/hcp/case-definition-reporting/index.html>
5. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta Biomed.* Mar 19 2020;91(1):157-160. doi:10.23750/abm.v91i1.9397
6. WHO. SARS (Severe Acute Respiratory Syndrome). World Health Organization. <https://www.who.int/ith/diseases/sars/en/>
7. WHO. Middle East respiratory syndrome coronavirus (MERS-CoV). World Health Organization. <https://www.who.int/emergencies/mers-cov/en/>
8. WHO. COVID-19 Clinical management: living guidance. World Health Organization. Updated November 2021. Accessed April 19, 2022. <https://apps.who.int/iris/bitstream/handle/10665/349321/WHO-2019-nCoV-clinical-2021.2-eng.pdf>
9. Gandhi R. COVID-19: Clinical features. Updated May 7, 2025. <https://www.uptodate.com/contents/covid-19-clinical-features>
10. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med.* May 2020;8(5):475-481. doi:10.1016/s2213-2600(20)30079-5
11. Ryding S. What is Viral Load? Updated April 4, 2023. <https://www.news-medical.net/health/What-is-Viral-Load.aspx>

## Reimbursement Policy

12. Kawasuji H, Takegoshi Y, Kaneda M, et al. Transmissibility of COVID-19 depends on the viral load around onset in adult and symptomatic patients. *PLOS ONE*. 2020;15(12):e0243597. doi:10.1371/journal.pone.0243597
13. Cevik M, Tate M, Lloyd O, Maraolo AE, Schafers J, Ho A. SARS-CoV-2, SARS-CoV, and MERS-CoV viral load dynamics, duration of viral shedding, and infectiousness: a systematic review and meta-analysis. *The Lancet Microbe*. January 1 2021;2(1):E13-E22. doi:10.1016/S2666-5247(20)30172-5
14. Griffin D. Viral Load as a Predictor of COVID-19 Patient Outcomes. Updated December 31, 2020. <https://www.cuimc.columbia.edu/news/viral-load-predictor-covid-19-patient-outcomes>
15. DeBiasi RL, Song X, Delaney M, et al. Severe COVID-19 in Children and Young Adults in the Washington, DC Metropolitan Region. *J Pediatr*. May 13 2020;doi:10.1016/j.jpeds.2020.05.007
16. WHO. Multisystem inflammatory syndrome in children and adolescents with COVID-19. World Health Organization. Updated May 15, 2020. 2020. <https://www.who.int/publications-detail/multisystem-inflammatory-syndrome-in-children-and-adolescents-with-covid-19>
17. Verdoni L, Mazza A, Gervasoni A, et al. An outbreak of severe Kawasaki-like disease at the Italian epicentre of the SARS-CoV-2 epidemic: an observational cohort study. *Lancet*. May 13 2020;doi:10.1016/s0140-6736(20)31103-x
18. Jones VG, Mills M, Suarez D, et al. COVID-19 and Kawasaki Disease: Novel Virus and Novel Case. *Hosp Pediatr*. Apr 7 2020;doi:10.1542/hpeds.2020-0123
19. Baum SG. Adult Multisystem Inflammatory Syndrome Associated with COVID-19. Updated October 21, 2020. <https://www.jwatch.org/na52622/2020/10/21/adult-multisystem-inflammatory-syndrome-associated-with>
20. Morris SB, Schwartz NG, Patel P, et al. Case Series of Multisystem Inflammatory Syndrome in Adults Associated with SARS-CoV-2 Infection - United Kingdom and United States, March-August 2020. *MMWR Morb Mortal Wkly Rep*. Oct 9 2020;69(40):1450-1456. doi:10.15585/mmwr.mm6940e1
21. CDC. Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States. Updated October 31, 2024. <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html>
22. Corman VM, Lienau J, Witznath M. [Coronaviruses as the cause of respiratory infections]. *Internist (Berl)*. Nov 2019;60(11):1136-1145. Coronaviren als Ursache respiratorischer Infektionen. doi:10.1007/s00108-019-00671-5
23. Ludwig S, Zarbock A. Coronaviruses and SARS-CoV-2: A Brief Overview. *Anesth Analg*. Mar 31 2020;doi:10.1213/ane.0000000000004845
24. The Native Antigen Company. Why We Need Antigen and Antibody Tests for COVID-19. The Native Antigen Company. Updated March 24, 2020. <https://thenativeantigencompany.com/why-we-need-antigen-and-antibody-tests-for-covid-19/>

## Reimbursement Policy

25. Li Y, Yao L, Li J, et al. Stability issues of RT-PCR testing of SARS-CoV-2 for hospitalized patients clinically diagnosed with COVID-19. *J Med Virol*. 2020;92(7):903-908. doi:10.1002/jmv.25786
26. Pfefferle S, Reucher S, Nörz D, Lütgehetmann M. Evaluation of a quantitative RT-PCR assay for the detection of the emerging coronavirus SARS-CoV-2 using a high throughput system. *Euro Surveill*. Mar 2020;25(9)doi:10.2807/1560-7917.Es.2020.25.9.2000152
27. Lippi G, Simundic AM, Plebani M. Potential preanalytical and analytical vulnerabilities in the laboratory diagnosis of coronavirus disease 2019 (COVID-19). *Clin Chem Lab Med*. Mar 16 2020;doi:10.1515/cclm-2020-0285
28. Chan JF, Yip CC, To KK, et al. Improved Molecular Diagnosis of COVID-19 by the Novel, Highly Sensitive and Specific COVID-19-RdRp/Hel Real-Time Reverse Transcription-PCR Assay Validated In Vitro and with Clinical Specimens. *J Clin Microbiol*. Apr 23 2020;58(5)doi:10.1128/jcm.00310-20
29. Backer JA, Klinkenberg D, Wallinga J. Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20-28 January 2020. *Euro Surveill*. Feb 2020;25(5)doi:10.2807/1560-7917.Es.2020.25.5.2000062
30. FDA. Accelerated Emergency Use Authorization (EUA) Summary. Updated June 21, 2022. <https://www.fda.gov/media/136151/download>
31. Lu Y, Li L, Ren S, et al. Comparison of the diagnostic efficacy between two PCR test kits for SARS-CoV-2 nucleic acid detection. *Journal of Clinical Laboratory Analysis*. 2020;34(10):e23554. doi:10.1002/jcla.23554
32. SansureBiotech. Novel Coronavirus (2019-nCoV) Nucleic Acid Diagnostic Kit (PCR-Fluorescence Probing). Updated March 25, 2022. <https://www.fda.gov/media/137651/download>
33. BioGerm. 2019-nCoV nucleic acid detection kit. <https://www.bio-germ.com/>
34. Li M, Wei R, Yang Y, et al. Comparing SARS-CoV-2 Testing in Anterior Nasal Vestibular Swabs vs. Oropharyngeal Swabs. *Front Cell Infect Microbiol*. 2021;11:653794. doi:10.3389/fcimb.2021.653794
35. Yau F, Ferreira R, Kamali R, et al. Clinical utility of a rapid 'on-demand' laboratory-based SARS-CoV-2 diagnostic testing service in an acute hospital setting admitting COVID-19 patients. *Clin Infect Pract*. Nov 2021;12:100086. doi:10.1016/j.clinpr.2021.100086
36. Dighe K, Moitra P, Alafeef M, Gunaseelan N, Pan D. A rapid RNA extraction-free lateral flow assay for molecular point-of-care detection of SARS-CoV-2 augmented by chemical probes. *Biosensors and Bioelectronics*. 2022/03/15/ 2022;200:113900. doi:10.1016/j.bios.2021.113900
37. Mawhorter ME, Nguyen P, Goldsmith M, Owens RG, Baer B, Raman JD. Diagnostic yield and costs associated with a routine pre-operative COVID-19 testing algorithm for asymptomatic patients prior to elective surgery. *Am J Clin Exp Urol*. 2022;10(5):341-344.
38. Woof JM, Kerr MA. The function of immunoglobulin A in immunity. *The Journal of Pathology*. 2006/01/01 2006;208(2):270-282. doi:10.1002/path.1877

## Reimbursement Policy

39. Morell A, Skvaril F, Nosedá G, Barandun S. Metabolic properties of human IgA subclasses. *Clin Exp Immunol.* Apr 1973;13(4):521-8.
40. Padoan A, Cosma C, Sciacovelli L, Faggian D, Plebani M. Analytical performances of a chemiluminescence immunoassay for SARS-CoV-2 IgM/IgG and antibody kinetics. *Clin Chem Lab Med.* Apr 16 2020;doi:10.1515/cclm-2020-0443
41. Espejo AP, Akgun Y, Al Mana AF, et al. Review of Current Advances in Serologic Testing for COVID-19. *Am J Clin Pathol.* Aug 5 2020;154(3):293-304. doi:10.1093/ajcp/aqaa112
42. FDA. Policy for Coronavirus Disease-2019 Tests During the Public Health Emergency (Revised). FDA. Updated January 2023. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/policy-coronavirus-disease-2019-tests-during-public-health-emergency-revised>
43. Zhao J, Yuan Q, Wang H, et al. Antibody responses to SARS-CoV-2 in patients of novel coronavirus disease 2019. *Clinical Infectious Diseases.* 2020;doi:10.1093/cid/ciaa344
44. Xiao DAT, Gao DC, Zhang DS. Profile of Specific Antibodies to SARS-CoV-2: The First Report. *J Infect.* Mar 21 2020;doi:10.1016/j.jinf.2020.03.012
45. Guo L, Ren L, Yang S, et al. Profiling Early Humoral Response to Diagnose Novel Coronavirus Disease (COVID-19). *Clinical Infectious Diseases.* 2020;doi:10.1093/cid/ciaa310
46. Okba NMA, Müller MA, Li W, et al. Severe Acute Respiratory Syndrome Coronavirus 2-Specific Antibody Responses in Coronavirus Disease 2019 Patients. *Emerg Infect Dis.* Apr 8 2020;26(7)doi:10.3201/eid2607.200841
47. Lisboa Bastos M, Tavaziva G, Abidi SK, et al. Diagnostic accuracy of serological tests for covid-19: systematic review and meta-analysis. *Bmj.* Jul 1 2020;370:m2516. doi:10.1136/bmj.m2516
48. Kontou PI, Braliou GG, Dimou NL, Nikolopoulos G, Bagos PG. Antibody Tests in Detecting SARS-CoV-2 Infection: A Meta-Analysis. *Diagnostics (Basel).* May 19 2020;10(5)doi:10.3390/diagnostics10050319
49. Ko JH, Joo EJ, Park SJ, et al. Neutralizing Antibody Production in Asymptomatic and Mild COVID-19 Patients, in Comparison with Pneumonic COVID-19 Patients. *J Clin Med.* Jul 17 2020;9(7)doi:10.3390/jcm9072268
50. Wu F, Liu M, Wang A, et al. Evaluating the Association of Clinical Characteristics With Neutralizing Antibody Levels in Patients Who Have Recovered From Mild COVID-19 in Shanghai, China. *JAMA Intern Med.* Aug 18 2020;doi:10.1001/jamainternmed.2020.4616
51. Kweon OJ, Lim YK, Kim HR, et al. Antibody kinetics and serologic profiles of SARS-CoV-2 infection using two serologic assays. *PLoS One.* 2020;15(10):e0240395. doi:10.1371/journal.pone.0240395
52. BodiTechMed. AFIAS COVID-19 Ab. [http://www.boditech.co.kr/eng/board/news/board\\_view.asp?num=30109](http://www.boditech.co.kr/eng/board/news/board_view.asp?num=30109)
53. EpitopeDiagnostics. EDI™ Novel Coronavirus COVID-19 ELISA Kits. <http://www.epitopediagnostics.com/covid-19-elisa>

## Reimbursement Policy

54. Caturegli G, Materi J, Howard BM, Caturegli P. Clinical Validity of Serum Antibodies to SARS-CoV-2 : A Case-Control Study. *Ann Intern Med.* Oct 20 2025;173(8):614-622. doi:10.7326/m20-2889
55. Churiwal M, Lin KD, Khan S, et al. Assessment of the Field Utility of a Rapid Point-of-Care Test for SARS-CoV-2 Antibodies in a Household Cohort. *Am J Trop Med Hyg.* Nov 24 2021;106(1):156-159. doi:10.4269/ajtmh.21-0592
56. Fox T, Geppert J, Dinnes J, et al. Antibody tests for identification of current and past infection with SARS-CoV-2. *Cochrane Database Syst Rev.* Nov 17 2022;11(11):Cd013652. doi:10.1002/14651858.CD013652.pub2
57. Loeffelholz MJ, Tang Y-W. Laboratory diagnosis of emerging human coronavirus infections – the state of the art. *Emerging Microbes & Infections.* 2020/01/01 2020;9(1):747-756. doi:10.1080/22221751.2020.1745095
58. Quidel Corporation. Sofia 2 SARS Antigen FIA. FDA. <https://www.fda.gov/media/137885/download>
59. FDA. Emergency Use Authorization. Updated December 23, 2024. <https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization>
60. BioSpace. Quidel to Update Packaging of Point-of-Care Sofia® SARS Antigen Test for COVID-19 to Include Either Nasal or Nasopharyngeal Swabs. <https://quickstart.quidel.com/docs/additonal-docs/FQ2037404EN00.pdf>
61. BD Veritor. Veritor™ System <https://www.fda.gov/media/139755/download>
62. LumiraDx. SARS-CoV-2 Ag Test. <https://www.fda.gov/media/141304/download>
63. FDA. In Vitro Diagnostics EUAs. Updated November 8, 2023. <https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas>
64. Wulff NH, Tzatzaris M, Young PJ. Monte Carlo simulation of the Spearman-Kaerber TCID50. *J Clin Bioinforma.* Feb 13 2012;2(1):5. doi:10.1186/2043-9113-2-5
65. Diao B, Wen K, Chen J, et al. Diagnosis of Acute Respiratory Syndrome Coronavirus 2 Infection by Detection of Nucleocapsid Protein. *medRxiv.* 2020:2020.03.07.20032524. doi:10.1101/2020.03.07.20032524
66. Seo G, Lee G, Kim MJ, et al. Rapid Detection of COVID-19 Causative Virus (SARS-CoV-2) in Human Nasopharyngeal Swab Specimens Using Field-Effect Transistor-Based Biosensor. *ACS Nano.* Apr 28 2020;14(4):5135-5142. doi:10.1021/acsnano.0c02823
67. WHO. Antigen-detection in the diagnosis of SARS-CoV-2 infection. World Health Organization. Updated October 6, 2021. <https://www.who.int/publications/i/item/antigen-detection-in-the-diagnosis-of-sars-cov-2infection-using-rapid-immunoassays>
68. Scohy A, Anantharajah A, Bodéus M, Kabamba-Mukadi B, Verroken A, Rodriguez-Villalobos H. Low performance of rapid antigen detection test as frontline testing for COVID-19 diagnosis. *J Clin Virol.* Aug 2020;129:104455. doi:10.1016/j.jcv.2020.104455
69. Mak GC, Cheng PK, Lau SS, et al. Evaluation of rapid antigen test for detection of SARS-CoV-2 virus. *J Clin Virol.* Aug 2020;129:104500. doi:10.1016/j.jcv.2020.104500

## Reimbursement Policy

70. Lambert-Niclot S, Cuffel A, Le Pape S, et al. Evaluation of a Rapid Diagnostic Assay for Detection of SARS-CoV-2 Antigen in Nasopharyngeal Swabs. *J Clin Microbiol*. Jul 23 2020;58(8)doi:10.1128/jcm.00977-20
71. Hirotsu Y, Maejima M, Shibusawa M, et al. Comparison of Automated SARS-CoV-2 Antigen Test for COVID-19 Infection with Quantitative RT-PCR using 313 Nasopharyngeal Swabs Including from 7 Serially Followed Patients. *Int J Infect Dis*. Aug 12 2020;doi:10.1016/j.ijid.2020.08.029
72. Villaverde S, Domínguez-Rodríguez S, Sabrido G, et al. Diagnostic Accuracy of the Panbio Severe Acute Respiratory Syndrome Coronavirus 2 Antigen Rapid Test Compared with Reverse-Transcriptase Polymerase Chain Reaction Testing of Nasopharyngeal Samples in the Pediatric Population. *The Journal of pediatrics*. 2021;232:287-289.e4. doi:10.1016/j.jpeds.2021.01.027
73. Peacock WF, Soto-Ruiz KM, House SL, et al. Utility of COVID-19 antigen testing in the emergency department. *Journal of the American College of Emergency Physicians Open*. 2022;3(1):e12605. doi:10.1002/emp2.12605
74. BioFire. BioFire® Respiratory Panel 2.1 (RP2.1). FDA. <https://www.fda.gov/media/137583/download>
75. Qiagen GmbH. QIAstat-Dx® Respiratory SARS-CoV2 Panel Instructions for Use (Handbook). <https://www.fda.gov/media/136571/download>
76. GenMark Diagnostics. ePlex Respiratory Pathogen Panel 2. <https://www.fda.gov/media/142902/download>
77. FDA. Influenza SARS-CoV-2 (Flu SC2) Multiplex Assay. Updated August 5, 2021. <https://www.fda.gov/media/139744/download>
78. FDA. CDC Influenza SARS-CoV-2 (Flu SC2) Multiplex Assay. Updated August 6, 2024. <https://www.fda.gov/media/139743/download>
79. Poljak M, Korva M, Gašper NK, et al. Clinical Evaluation of the cobas SARS-CoV-2 Test and a Diagnostic Platform Switch during 48 Hours in the Midst of the COVID-19 Pandemic. *Journal of Clinical Microbiology*. 2020;58(6):e00599-20. doi:doi:10.1128/JCM.00599-20
80. Mboumba Bouassa R-S, Tonen-Wolyec S, Veyer D, Péré H, Bélec L. Analytical performances of the AMPLIQUICK® Respiratory Triplex assay for simultaneous detection and differentiation of SARS-CoV-2, influenza A/B and respiratory syncytial viruses in respiratory specimens. *PloS one*. 2022;17(1):e0262258. doi:10.1371/journal.pone.0262258
81. Dao Thi VL, Herbst K, Boerner K, et al. A colorimetric RT-LAMP assay and LAMP-sequencing for detecting SARS-CoV-2 RNA in clinical samples. *Science Translational Medicine*. 2020;12(556):eabc7075. doi:10.1126/scitranslmed.abc7075
82. Nagura-Ikeda M, Imai K, Tabata S, et al. Clinical evaluation of self-collected saliva by RT-qPCR, direct RT-qPCR, RT-LAMP, and a rapid antigen test to diagnose COVID-19. *J Clin Microbiol*. Jul 7 2020;doi:10.1128/jcm.01438-20
83. Wang R, Qian C, Pang Y, et al. opvCRISPR: One-pot visual RT-LAMP-CRISPR platform for SARS-cov-2 detection. *Biosensors and Bioelectronics*. 10/26/2020 2020;172:112766. doi:10.1016/j.bios.2020.112766

## Reimbursement Policy

84. Hulick P. Next-generation DNA sequencing (NGS): Principles and clinical applications. Wolters Kluwer. Updated October 25 2024. <https://www.uptodate.com/contents/next-generation-dna-sequencing-ngs-principles-and-clinical-applications>
85. FDA. Illumina COVIDSeq Test. Updated April 22, 2021. <https://www.fda.gov/media/138778/download>
86. Helix. Helix COVID-19 NGS Test. <https://www.fda.gov/media/140917/download>
87. CDC. About Whole Genome Sequencing. Updated January 8, 2024. <https://www.cdc.gov/pulsenet/php/wgs/>
88. Chau NVV, Hong NTT, Ngoc NM, et al. Rapid whole-genome sequencing to inform COVID-19 outbreak response in Vietnam. *The Journal of infection*. 2021;82(6):276-316. doi:10.1016/j.jinf.2021.03.017
89. Oude Munnink BB, Nieuwenhuijse DF, Stein M, et al. Rapid SARS-CoV-2 whole-genome sequencing and analysis for informed public health decision-making in the Netherlands. *Nature Medicine*. 2020/09/01 2020;26(9):1405-1410. doi:10.1038/s41591-020-0997-y
90. Taylor J, Carter RJ, Lehnertz N, et al. Serial Testing for SARS-CoV-2 and Virus Whole Genome Sequencing Inform Infection Risk at Two Skilled Nursing Facilities with COVID-19 Outbreaks - Minnesota, April-June 2020. *MMWR Morb Mortal Wkly Rep*. Sep 18 2020;69(37):1288-1295. doi:10.15585/mmwr.mm6937a3
91. Wang F, Huang S, Gao R, et al. Initial whole-genome sequencing and analysis of the host genetic contribution to COVID-19 severity and susceptibility. *Cell Discovery*. 2020/11/10 2020;6(1):83. doi:10.1038/s41421-020-00231-4
92. Bezerra MF, Machado LC, De Carvalho V, et al. A Sanger-based approach for scaling up screening of SARS-CoV-2 variants of interest and concern. *Infect Genet Evol*. May 8 2021;92:104910. doi:10.1016/j.meegid.2021.104910
93. Sri Santosh T, Parmar R, Anand H, Srikanth K, Saritha M. A Review of Salivary Diagnostics and Its Potential Implication in Detection of Covid-19. *Cureus*. Apr 17 2020;12(4):e7708. doi:10.7759/cureus.7708
94. To KKW, Yip CCY, Lai CYW, et al. Saliva as a diagnostic specimen for testing respiratory virus by a point-of-care molecular assay: a diagnostic validity study. *Clin Microbiol Infect*. Mar 2019;25(3):372-378. doi:10.1016/j.cmi.2018.06.009
95. FDA. Accelerated Emergency Use Authorization (EUA) Summary SARS-CoV-2 RT-PCR Assay. <https://www.fda.gov/media/141192/download>
96. Yelin I, Aharony N, Shaer Tamar E, et al. Evaluation of COVID-19 RT-qPCR test in multi-sample pools. *Clin Infect Dis*. May 2 2020;doi:10.1093/cid/ciaa531
97. FDA. Emergency Use Authorization (EUA) Summary of the Poplar SARS-COV-2 TMA Pooling Assay. <https://www.fda.gov/media/140792/download>
98. UCSD. UCSD RC SARS-CoV-2 Assay <https://www.fda.gov/media/140712/download>
99. Hogan CA, Sahoo MK, Pinsky BA. Sample Pooling as a Strategy to Detect Community Transmission of SARS-CoV-2. *Jama*. Apr 6 2020;323(19):1967-9. doi:10.1001/jama.2020.5445

## Reimbursement Policy

100. WHO. Diagnostic testing for SARS-CoV-2. Updated September 11, 2020. <https://www.who.int/publications/i/item/diagnostic-testing-for-sars-cov-2>
101. WHO. "Immunity passports" in the context of COVID-19. World Health Organization. Updated April 24, 2020. <https://www.who.int/news-room/commentaries/detail/immunity-passports-in-the-context-of-covid-19>
102. WHO. COVID-19 natural immunity. Updated May 10, 2021. <https://iris.who.int/bitstream/handle/10665/341241/WHO-2019-nCoV-Sci-Brief-Natural-immunity-2021.1-eng.pdf>
103. WHO. Use of SARS-CoV-2 antigen-detection rapid diagnostic tests for COVID-19 self-testing. Updated March 9, 2022. [https://www.who.int/publications/i/item/WHO-2019-nCoV-Ag-RDTs-Self\\_testing-2022.1](https://www.who.int/publications/i/item/WHO-2019-nCoV-Ag-RDTs-Self_testing-2022.1)
104. CDC. Overview of Testing for SARS-CoV-2. Updated August 29, 2024. <https://www.cdc.gov/covid/hcp/clinical-care/overview-testing-sars-cov-2.html>
105. CDC. Testing for COVID-19. Updated March 10, 2025. <https://www.cdc.gov/covid/testing/index.html>
106. CDC. Long COVID Basics. Updated February 3, 2025. <https://www.cdc.gov/covid/long-term-effects/>
107. AMA. Serological testing for SARS-CoV-2 antibodies. American Medical Association. Updated May 14, 2020. <https://www.ama-assn.org/delivering-care/public-health/serological-testing-sars-cov-2-antibodies>
108. IDSA. Infectious Diseases Society of America Guidelines on the Diagnosis of COVID-19: Molecular Diagnostic Testing. Updated May 1, 2020. <https://www.idsociety.org/practice-guideline/covid-19-guideline-diagnostics/>
109. IDSA. Infectious Diseases Society of America Guidelines on the Diagnosis of COVID-19: Serologic Testing. Updated August 10, 2020. <https://www.idsociety.org/practice-guideline/covid-19-guideline-serology/>
110. Greninger AL, Dien Bard J, Colgrove RC, et al. Clinical and Infection Prevention Applications of Severe Acute Respiratory Syndrome Coronavirus 2 Genotyping: An Infectious Diseases Society of America/American Society for Microbiology Consensus Review Document. *Clin Infect Dis*. Apr 28 2022;74(8):1496-1502. doi:10.1093/cid/ciab761
111. Talbot TR, Hayden MK, Yokoe DS, et al. Asymptomatic screening for severe acute respiratory coronavirus virus 2 (SARS-CoV-2) as an infection prevention measure in healthcare facilities: Challenges and considerations. *Infect Control Hosp Epidemiol*. Jan 2023;44(1):2-7. doi:10.1017/ice.2022.295
112. ASA, APSF. ASA and APSF Updated Statement on Perioperative Testing for SARS-CoV-2 in the Asymptomatic Patient. Updated December 21, 2022. <https://www.apsf.org/news-updates/asa-and-apsf-updated-statement-on-perioperative-testing-for-sars-cov-2-in-the-asymptomatic-patient/>
113. Zhang YV, Wiencek J, Meng QH, et al. AACC Practical Recommendations for Implementing and Interpreting SARS-CoV-2 EUA and LDT Serologic Testing in Clinical Laboratories. *Clinical Chemistry*. 2021;doi:10.1093/clinchem/hvab051

## Reimbursement Policy

114. ECDC. Diagnostic testing and screening for SARS-CoV-2. European Centre for Disease Prevention and Control. Updated May 30, 2023. <https://www.ecdc.europa.eu/en/covid-19/latest-evidence/diagnostic-testing>
115. ECDC. Testing strategies for SARS-CoV-2. Updated December 15, 2022. <https://www.ecdc.europa.eu/en/covid-19/surveillance/testing-strategies>
116. ECDC. Guidance for representative and targeted genomic SARS-CoV-2 monitoring. Updated May 3, 2021. <https://www.ecdc.europa.eu/en/publications-data/guidance-representative-and-targeted-genomic-sars-cov-2-monitoring>
117. ECDC. Considerations for the use of antibody tests for SARS-CoV-2 – first update. <https://www.ecdc.europa.eu/en/publications-data/use-antibody-tests-sars-cov-2>
118. AAP. COVID-19 Testing Guidance. Updated December 1, 2022. <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-testing-guidance/>
119. AAP. Multisystem Inflammatory Syndrome in Children (MIS-C) Interim Guidance Updated February 8, 2023. <https://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/multisystem-inflammatory-syndrome-in-children-mis-c-interim-guidance/>
120. Henderson LA, Canna SW, Friedman KG, et al. American College of Rheumatology Clinical Guidance for Multisystem Inflammatory Syndrome in Children Associated With SARS-CoV-2 and Hyperinflammation in Pediatric COVID-19: Version 1. *Arthritis Rheumatol.* Jul 23 2020;doi:10.1002/art.41454
121. Henderson LA, Canna SW, Friedman KG, et al. American College of Rheumatology Clinical Guidance for Pediatric Patients with Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with SARS-CoV-2 and Hyperinflammation in COVID-19. Version 2. *Arthritis Rheumatol.* Dec 5 2020;doi:10.1002/art.41616
122. Henderson LA, Canna SW, Friedman KG, et al. American College of Rheumatology Clinical Guidance for Multisystem Inflammatory Syndrome in Children Associated With SARS-CoV-2 and Hyperinflammation in Pediatric COVID-19: Version 3. *Arthritis & Rheumatology.* 2022;74(4):e1-e20. doi:10.1002/art.42062
123. FDA. Transition Plan for Medical Devices That Fall Within Enforcement Policies Issued During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency. Updated March 2023. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/transition-plan-medical-devices-fall-within-enforcement-policies-issued-during-coronavirus-disease>
124. FDA. Transition Plan for Medical Devices Issued Emergency Use Authorizations (EUAs) Related to Coronavirus Disease 2019 (COVID-19). Updated March 2023. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/transition-plan-medical-devices-issued-emergency-use-authorizations-euas-related-coronavirus-disease>

## Reimbursement Policy

### VI. Revision History

Revision Date	Summary of Changes
06/04/2025	<p>Reviewed and Updated: Updated the background, guidelines and recommendations, and evidence-based scientific references. Literature review did not necessitate any modifications to coverage criteria. The following changes were made for clarity and consistency:</p> <ul style="list-style-type: none"><li>Removed CC6 and CC8, antigen panel testing for respiratory pathogens moved to the more appropriate policy of G2149-Pathogen Panel Testing.</li><li>Results in removal of Note 4 describing broad signs/symptoms of a respiratory infection</li><li>Removed CPT code 86318, 87428</li></ul>