



BlueCross BlueShield of Oklahoma

If a conflict arises between a Clinical Payment and Coding Policy (“CPCP”) and any plan document under which a member is entitled to Covered Services, the plan document will govern. If a conflict arises between a CPCP and any provider contract pursuant to which a provider participates in and/or provides Covered Services to eligible member(s) and/or plans, the provider contract will govern. “Plan documents” include, but are not limited to, Certificates of Health Care Benefits, benefit booklets, Summary Plan Descriptions, and other coverage documents. BCBSOK may use reasonable discretion interpreting and applying this policy to services being delivered in a particular case. BCBSOK has full and final discretionary authority for their interpretation and application to the extent provided under any applicable plan documents.

Providers are responsible for submission of accurate documentation of services performed. Providers are expected to submit claims for services rendered using valid code combinations from Health Insurance Portability and Accountability Act (“HIPAA”) approved code sets. Claims should be coded appropriately according to industry standard coding guidelines including, but not limited to: Uniform Billing (“UB”) Editor, American Medical Association (“AMA”), Current Procedural Terminology (“CPT®”), CPT® Assistant, Healthcare Common Procedure Coding System (“HCPCS”), ICD-10 CM and PCS, National Drug Codes (“NDC”), Diagnosis Related Group (“DRG”) guidelines, Centers for Medicare and Medicaid Services (“CMS”) National Correct Coding Initiative (“NCCI”) Policy Manual, CCI table edits and other CMS guidelines.

Claims are subject to the code edit protocols for services/procedures billed. Claim submissions are subject to claim review including but not limited to, any terms of benefit coverage, provider contract language, medical policies, clinical payment and coding policies as well as coding software logic. Upon request, the provider is urged to submit any additional documentation.

Pathogen Panel Testing

Policy Number: CPCPLAB045

Version 1.0

Enterprise Clinical Payment and Coding Policy Committee Approval Date: July 17, 2023

Plan Effective Date: November 1, 2023

Description

BCBSOK has implemented certain lab management reimbursement criteria. Not all requirements apply to each product. Providers are urged to review Plan documents for eligible coverage for services rendered.

Reimbursement Information:

1. In the outpatient setting, multiplex PCR-based panel testing (up to **5** respiratory pathogens) **may be reimbursable** for individuals who are displaying signs and symptoms of a respiratory tract infection, including at least one of the following:
 - a. A temperature $\geq 102^{\circ}$ F;
 - b. Pronounced dyspnea;
 - c. Tachypnea;
 - d. Tachycardia.
2. In the outpatient setting, multiplex PCR-based panel testing of **6 or more** respiratory pathogens is **not reimbursable**.
3. In the outpatient setting, multiplex PCR-based panel testing of pathogens in cerebral spinal fluid (CSF) is **not reimbursable**.
4. In the outpatient setting, molecular detection-based panel testing of pathogens in the blood is **not reimbursable**.
5. In the outpatient setting, molecular detection-based panel testing of urine pathogens for the diagnosis of urinary tract infections (e.g., GENETWORx Molecular PCR UTI Test) is **not reimbursable**.
6. In the outpatient setting, molecular-based panel testing to screen for or diagnose wound infections (e.g., GENETWORx PCR Wound Testing) is **not reimbursable**.
7. Molecular-based panel testing for general screening of microorganisms (e.g., MicroGenDX qPCR+NGS) is **not reimbursable**.

Procedure Codes

The following is not an all-encompassing code list. The inclusion of a code does not guarantee it is a covered service or eligible for reimbursement.

Codes
87154, 87483, 87631, 87632, 87633, 87636, 87637, 0068U, 0086U, 0109U, 0112U, 0115U, 0140U, 0141U, 0142U, 0151U, 0152U, 0240U, 0241U, 0321U, 0323U, 0370U, 0371U, 0373U, 0374U

References:

American Society for Microbiology. (2017). *MoIDX: Multiplex Nucleic Acid Amplified Tests for Respiratory Viral Panels (DL37301)*. <https://www.amp.org/AMP/assets/File/position-statements/2017/JointCommentLettertoNoridioanJEforMultiplexViralPanelTests-Respiratory-DL37301.pdf>

Anger, J. T., Bixler, B. R., Holmes, R. S., Lee, U. J., Santiago-Lastra, Y., & Selph, S. S. (2022). Updates to Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline. *J Urol*, 208(3), 536-541. <https://doi.org/10.1097/ju.0000000000002860>

Armstrong, D., & Meyr, A. (2023, January 12). *Basic principles of wound management*. <https://www.uptodate.com/contents/basic-principles-of-wound-management>

ASCP. (2019). *Do not routinely order broad respiratory pathogen panels unless the result will affect patient management*. <https://www.choosingwisely.org/clinician-lists/ascp-broad-respiratory-pathogen-panels/>

Babady, N. E., England, M. R., Jurcic Smith, K. L., He, T., Wijetunge, D. S., Tang, Y. W., Chamberland, R. R., Menegus, M., Swierkosz, E. M., Jerris, R. C., & Greene, W. (2018). Multicenter Evaluation of the ePlex Respiratory Pathogen Panel for the Detection of Viral and Bacterial Respiratory Tract Pathogens in Nasopharyngeal Swabs. *J Clin Microbiol*, 56(2). <https://doi.org/10.1128/jcm.01658-17>

Banerjee, R., Teng, C. B., Cunningham, S. A., Ihde, S. M., Steckelberg, J. M., Moriarty, J. P., Shah, N. D., Mandrekar, J. N., & Patel, R. (2015). Randomized Trial of Rapid Multiplex Polymerase Chain Reaction-Based Blood Culture Identification and Susceptibility Testing. *Clin Infect Dis*, 61(7), 1071-1080. <https://doi.org/10.1093/cid/civ447>

BioCode. (2023b). *FDA-Cleared Respiratory Pathogen Panel (RPP)*. https://apbiocode.com/rpp_panel.htm

BioFire. (2023a). *The BioFire® FilmArray® Blood Culture Identification (BCID) Panel*. <https://www.biofire.com/products/the-filmarray-panels/filmarraybcid/>

BioFire. (2023c). *The BioFire® FilmArray® Meningitis/Encephalitis (ME) Panel*. <https://www.biofire.com/products/the-filmarray-panels/filmarrayme/>

BioFire. (2023d). *The BioFire® FilmArray® Respiratory 2.1 (RP2.1) Panel*. <https://www.biofire.com/products/the-filmarray-panels/filmarrayrp/>

Bonkat, G., Bartoletti, R., Bruyere, F., Cai, T., Geerlings, S. E., Koves, B., Schubert, F., Wagenlehner, F., Devlies, W., Horvath, J., Mantica, G., Mezei, T., Pilatz, A., Pradere, B., & Veeratterapillay, R. (2023, March). *European Association of Urology (EAU) Guidelines on Urological Infections*. <http://uroweb.org/guideline/urological-infections/#3>

Bonnin, P., Mischczak, F., Kin, N., Resa, C., Dina, J., Gouarin, S., Viron, F., Morello, R., & Vabret, A. J. B. I. D. (2016). Study and interest of cellular load in respiratory samples for the optimization of molecular virological diagnosis in clinical practice [journal article]. 16(1), 384. <https://doi.org/10.1186/s12879-016-1730-9>

Caliendo, A. M. (2011). Multiplex PCR and Emerging Technologies for the Detection of Respiratory Pathogens. *Clinical Infectious Diseases*, 52(suppl_4), S326-S330. <https://doi.org/10.1093/cid/cir047>

Caliendo, A. M., Gilbert, D. N., Ginocchio, C. C., Hanson, K. E., May, L., Quinn, T. C., Tenover, F. C., Alland, D., Blaschke, A. J., Bonomo, R. A., Carroll, K. C., Ferraro, M. J., Hirschhorn, L. R., Joseph, W. P., Karchmer, T., MacIntyre, A. T., Reller, L. B., Jackson, A. F., & for the Infectious Diseases Society of, A. (2013). Better

- Tests, Better Care: Improved Diagnostics for Infectious Diseases. *Clinical Infectious Diseases*, 57(suppl_3), S139-S170. <https://doi.org/10.1093/cid/cit578>
- Cardwell, S. M., Crandon, J. L., Nicolau, D. P., McClure, M. H., & Nailor, M. D. (2016). Epidemiology and economics of adult patients hospitalized with urinary tract infections. *Hosp Pract (1995)*, 44(1), 33-40. <https://doi.org/10.1080/21548331.2016.1133214>
- CDC. (2021a). *Bacterial Meningitis*. <https://www.cdc.gov/meningitis/bacterial.html>
- CDC. (2021b). *Fungal Meningitis*. <https://www.cdc.gov/meningitis/fungal.html>
- CDC. (2021c). *What is sepsis?* <https://www.cdc.gov/sepsis/what-is-sepsis.html>
- CDC. (2022b). *Meningococcal Disease*. <https://www.cdc.gov/meningococcal/index.html>
- Chang, S.-S., Hsieh, W.-H., Liu, T.-S., Lee, S.-H., Wang, C.-H., Chou, H.-C., Yeo, Y. H., Tseng, C.-P., & Lee, C.-C. (2013). Multiplex PCR System for Rapid Detection of Pathogens in Patients with Presumed Sepsis – A Systemic Review and Meta-Analysis. *PLOS ONE*, 8(5), e62323. <https://doi.org/10.1371/journal.pone.0062323>
- Dando, S. J., Mackay-Sim, A., Norton, R., Currie, B. J., St John, J. A., Ekberg, J. A., Batzloff, M., Ulett, G. C., & Beacham, I. R. (2014). Pathogens penetrating the central nervous system: infection pathways and the cellular and molecular mechanisms of invasion. *Clin Microbiol Rev*, 27(4), 691-726. <https://doi.org/10.1128/cmr.00118-13>
- Diagnostics, M. (2015a). *OneSwab*. <https://www.mdlab.com/>
- Diagnostics, M. (2015b). *UroSwab*. <https://www.mdlab.com/>
- Fernandez-Soto, P., Sanchez-Hernandez, A., Gandasegui, J., Bajo Santos, C., Lopez-Aban, J., Saugar, J. M., Rodriguez, E., Vicente, B., & Muro, A. (2016). Strong-LAMP: A LAMP Assay for Strongyloides spp. Detection in Stool and Urine Samples. Towards the Diagnosis of Human Strongyloidiasis Starting from a Rodent Model. *PLoS Negl Trop Dis*, 10(7), e0004836. <https://doi.org/10.1371/journal.pntd.0004836>
- GenetWorx. (2023). *Wounds Pathogen Panel*. <https://www.genetworx.com/services/wound-pathogen-panel>
- GenMark. (2023a). *Blood Culture Identification (BCID) Panels*. <https://www.genmarkdx.com/solutions/panels/eplex-panels/blood-culture-identification-panels/>
- GenMark. (2023b). *Respiratory Pathogen (RP) Panel and NEW Respiratory Pathogen Panel 2 (RP2)*. <https://www.genmarkdx.com/solutions/panels/eplex-panels/respiratory-pathogen-panel/>
- Ginocchio, C. C. (2007). Detection of respiratory viruses using non-molecular based methods. *J Clin Virol*, 40 Suppl 1, S11-14. [https://doi.org/10.1016/s1386-6532\(07\)70004-5](https://doi.org/10.1016/s1386-6532(07)70004-5)
- Ginocchio, C. C., Zhang, F., Manji, R., Arora, S., Bornfreund, M., Falk, L., Lotlikar, M., Kowerska, M., Becker, G., Korologos, D., de Geronimo, M., & Crawford, J. M. (2009). Evaluation of multiple test methods for the detection of the novel 2009 influenza A (H1N1) during the New York City outbreak. *J Clin Virol*, 45(3), 191-195. <https://doi.org/10.1016/j.jcv.2009.06.005>

- Gyawali, B., Ramakrishna, K., & Dhamoon, A. S. (2019). Sepsis: The evolution in definition, pathophysiology, and management. *SAGE Open Med*, 7, 2050312119835043. <https://doi.org/10.1177/2050312119835043>
- Hansen, L. S., Lykkegaard, J., Thomsen, J. L., & Hansen, M. P. (2020). Acute lower respiratory tract infections: Symptoms, findings and management in Danish general practice. *Eur J Gen Pract*, 26(1), 14-20. <https://doi.org/10.1080/13814788.2019.1674279>
- Hill, A. T., Gold, P. M., El Solh, A. A., Metlay, J. P., Ireland, B., & Irwin, R. S. (2019). Adult Outpatients With Acute Cough Due to Suspected Pneumonia or Influenza: CHEST Guideline and Expert Panel Report. *Chest*, 155(1), 155-167. <https://doi.org/10.1016/j.chest.2018.09.016>
- Hooton, T. M., & Gupta, K. (2023, March 19). *Acute complicated urinary tract infection (including pyelonephritis) in adults*. Wolters Kluwer. <https://www.uptodate.com/contents/acute-complicated-urinary-tract-infection-including-pyelonephritis-in-adults>
- Lamy, B., Sundqvist, M., & Idelevich, E. A. (2020). Bloodstream infections - Standard and progress in pathogen diagnostics. *Clin Microbiol Infect*, 26(2), 142-150. <https://doi.org/10.1016/j.cmi.2019.11.017>
- Leber, A. L., Everhart, K., Balada-Llasat, J. M., Cullison, J., Daly, J., Holt, S., Lephart, P., Salimnia, H., Schreckenberger, P. C., DesJarlais, S., Reed, S. L., Chapin, K. C., LeBlanc, L., Johnson, J. K., Soliven, N. L., Carroll, K. C., Miller, J. A., Dien Bard, J., Mestas, J., . . . Bourzac, K. M. (2016). Multicenter Evaluation of BioFire FilmArray Meningitis/Encephalitis Panel for Detection of Bacteria, Viruses, and Yeast in Cerebrospinal Fluid Specimens. *J Clin Microbiol*, 54(9), 2251-2261. <https://doi.org/10.1128/jcm.00730-16>
- Liesenfeld, O., Lehman, L., Hunfeld, K. P., & Kost, G. (2014). Molecular diagnosis of sepsis: New aspects and recent developments. *European journal of microbiology & immunology*, 4(1), 1-25. <https://doi.org/10.1556/EuJMI.4.2014.1.1>
- Liesman, R. M., Strasburg, A. P., Heitman, A. K., Theel, E. S., Patel, R., & Binnicker, M. J. (2018). Evaluation of a Commercial Multiplex Molecular Panel for Diagnosis of Infectious Meningitis and Encephalitis. *J Clin Microbiol*, 56(4). <https://doi.org/10.1128/jcm.01927-17>
- Luminex. (2023a). *NxTAG® Respiratory Pathogen Panel*. <https://www.luminexcorp.com/nxtag-respiratory-pathogen-panel/>
- Mahony, J. B., Blackhouse, G., Babwah, J., Smieja, M., Buracond, S., Chong, S., Ciccotelli, W., Shea, T., Alnakhli, D., Griffiths-Turner, M., & Goeree, R. (2009). Cost Analysis of Multiplex PCR Testing for Diagnosing Respiratory Virus Infections [10.1128/JCM.00556-09]. *Journal of Clinical Microbiology*, 47(9), 2812. <http://jcm.asm.org/content/47/9/2812.abstract>
- McCarty, T. P., Cumagun, P., Meeder, J., Moates, D., Edwards, W. S., Hutchinson, J., Lee, R. A., & Leal, S. M., Jr. (2023). Test Performance and Potential Clinical Utility of the GenMark Dx ePlex Blood Culture Identification Gram-Negative Panel. *Microbiol Spectr*, 11(1), e0409222. <https://doi.org/10.1128/spectrum.04092-22>

- McDonald, Gagliardo, C., Chiu, S., & Di Pentima, M. C. (2020). Impact of a Rapid Diagnostic Meningitis/Encephalitis Panel on Antimicrobial Use and Clinical Outcomes in Children. *Antibiotics (Basel)*, 9(11). <https://doi.org/10.3390/antibiotics9110822>
- Medina, M., & Castillo-Pino, E. (2019). An introduction to the epidemiology and burden of urinary tract infections. *Ther Adv Urol*, 11, 1756287219832172. <https://doi.org/10.1177/1756287219832172>
- Meyrier, A. (2023, July 1). *Sampling and evaluation of voided urine in the diagnosis of urinary tract infection in adults*. Wolters Kluwer. <https://www.uptodate.com/contents/sampling-and-evaluation-of-voided-urine-in-the-diagnosis-of-urinary-tract-infection-in-adults>
- MicroGenDX. (2019a). *Urology*. <https://microgendx.com/urology/>
- MicroGenDX. (2019b). *Wound Care* <https://microgendx.com/wound-care/>
- Miller, J. M., Pritt, B. S., Theel, E. S., Yao, J. D., Binnicker, M. J., Patel, R., Campbell, S., Carroll, K. C., Chapin, K. C., Gilligan, P. H., Gonzalez, M. D., Jerris, R. C., Kehl, S. C., Richter, S. S., Robinson-Dunn, B., Schwartzman, J. D., Snyder, J. W., Telford, S., III, Thomson, R. B., Jr., & Weinstein, M. P. (2018). A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology. *Clinical Infectious Diseases*, 67(6), e1-e94. <https://doi.org/10.1093/cid/ciy381>
- Nijhuis, R. H. T., Guerendiain, D., Claas, E. C. J., & Templeton, K. E. (2017). Comparison of ePlex Respiratory Pathogen Panel with Laboratory-Developed Real-Time PCR Assays for Detection of Respiratory Pathogens. *J Clin Microbiol*, 55(6), 1938-1945. <https://doi.org/10.1128/jcm.00221-17>
- NovaDX. (2023). *NOVADX ABX DIAGNOSIS*. <https://www.novadx.com/abx-uti-testing-menu>
- Palavecino, E. (2015). *One Sample, Multiple Results The Use of Multiplex PCR for Diagnosis of Infectious Syndromes*. Retrieved 11/1 from <https://www.aacc.org/publications/cln/articles/2015/april/one-sample-multiple-results>
- Pammi, M. (2023, April 4). *Clinical features and diagnosis of bacterial sepsis in the preterm infant (<34 weeks gestation)*. Wolters Kluwer. <https://www.uptodate.com/contents/clinical-features-and-diagnosis-of-bacterial-sepsis-in-the-preterm-infant-less-than34-weeks-gestation>
- Petti, C. A., & Polage, C. R. (2023, June 21). *Molecular diagnosis of central nervous system infections*. Wolters Kluwer. Retrieved 4/5 from <https://www.uptodate.com/contents/molecular-diagnosis-of-central-nervous-system-infections>
- QIAGEN. (2023). *QIAstat-Dx Respiratory SARS-CoV-2 Panel*. <https://www.qiagen.com/us/products/diagnostics-and-clinical-research/infectious-disease/qiastat-dx-syndromic-testing/qiastat-dx-eua-us/>
- Ramers, C., Billman, G., Hartin, M., Ho, S., & Sawyer, M. H. (2000). Impact of a diagnostic cerebrospinal fluid enterovirus polymerase chain reaction test on patient management. *Jama*, 283(20), 2680-2685.
- Ray, G. T., Suaya, J. A., & Baxter, R. (2013). Incidence, microbiology, and patient characteristics of skin and soft-tissue infections in a U.S. population: a retrospective population-based study. *BMC Infect Dis*, 13, 252. <https://doi.org/10.1186/1471-2334-13-252>

Rhodes, A., Evans, L. E., Alhazzani, W., Levy, M. M., Antonelli, M., Ferrer, R., Kumar, A., Sevransky, J. E., Sprung, C. L., Nunnally, M. E., Rochweg, B., Rubinfeld, G. D., Angus, D. C., Annane, D., Beale, R. J., Bellinghan, G. J., Bernard, G. R., Chiche, J. D., Coopersmith, C., . . . Dellinger, R. P. (2017). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Crit Care Med*, 45(3), 486-552. <https://doi.org/10.1097/ccm.0000000000002255>

Robinson, C. C., Willis, M., Meagher, A., Giesecker, K. E., Rotbart, H., & Glode, M. P. (2002). Impact of rapid polymerase chain reaction results on management of pediatric patients with enteroviral meningitis. *Pediatr Infect Dis J*, 21(4), 283-286.

Schultz, G., Bjarnsholt, T., James, G. A., Leaper, D. J., McBain, A. J., Malone, M., Stoodley, P., Swanson, T., Tachi, M., & Wolcott, R. D. (2017). Consensus guidelines for the identification and treatment of biofilms in chronic nonhealing wounds. *Wound Repair Regen*, 25(5), 744-757. <https://doi.org/10.1111/wrr.12590>

Seegene. (2020). *Sepsis*. <http://www.arrowdiagnostics.it/download/microbiologia/sepsi/Magicplex-Sepsis-Real-time-Test.pdf>

Seegene. (2023). *Magicplex™ Sepsis Real-time Test*. https://www.seegene.com/assays/magicplex_sepsis_realttime_test

Stellrecht, K. A., Harding, I., Woron, A. M., Lepow, M. L., & Venezia, R. A. (2002). The impact of an enteroviral RT-PCR assay on the diagnosis of aseptic meningitis and patient management. *J Clin Virol*, 25 Suppl 1, S19-26.

Subramony, A., Zachariah, P., Krones, A., Whittier, S., & Saiman, L. (2016). Impact of Multiplex Polymerase Chain Reaction Testing for Respiratory Pathogens on Healthcare Resource Utilization for Pediatric Inpatients. *J Pediatr*, 173, 196-201.e192. <https://doi.org/10.1016/j.jpeds.2016.02.050>

T2Biosystems. (2023). *T2Bacteria Panel*. <https://www.t2biosystems.com/products-technology/t2bacteria-panel/>

Thomas, M., & Bomar, P. A. (2020). Upper Respiratory Tract Infection. In *StatPearls*. StatPearls Publishing LLC. [https://www.ncbi.nlm.nih.gov/pubmed?term=\(\(Upper%20Respiratory%20Tract%20Infection\)%20AND%20Micah%20Thomas%5BAuthor%5D\)%20AND%20Paul%20A.%20Bomar](https://www.ncbi.nlm.nih.gov/pubmed?term=((Upper%20Respiratory%20Tract%20Infection)%20AND%20Micah%20Thomas%5BAuthor%5D)%20AND%20Paul%20A.%20Bomar)

Trujillo-Gómez, J., Tsokani, S., Arango-Ferreira, C., Atehortúa-Muñoz, S., Jimenez-Villegas, M. J., Serrano-Tabares, C., Veroniki, A. A., & Florez, I. D. (2022). Biofire FilmArray Meningitis/Encephalitis panel for the aetiological diagnosis of central nervous system infections: A systematic review and diagnostic test accuracy meta-analysis. *EClinicalMedicine*, 44, 101275. <https://doi.org/10.1016/j.eclinm.2022.101275>

Tunkel, A. R., Glaser, C. A., Bloch, K. C., Sejvar, J. J., Marra, C. M., Roos, K. L., Hartman, B. J., Kaplan, S. L., Scheld, W. M., & Whitley, R. J. (2008). The Management of Encephalitis: Clinical Practice Guidelines by the Infectious Diseases Society of America. *Clinical Infectious Diseases*, 47(3), 303-327. <https://doi.org/10.1086/589747>

Tzanakaki, G., Tsopanomalou, M., Kesanopoulos, K., Matzourani, R., Sioumalas, M., Tabaki, A., & Kremastinou, J. (2005). Simultaneous single-tube PCR assay for the detection of Neisseria meningitidis,

Haemophilus influenzae type b and Streptococcus pneumoniae. *Clin Microbiol Infect*, 11(5), 386-390. <https://doi.org/10.1111/j.1469-0691.2005.01109.x>

Uyeki, T. M., Bernstein, H. H., Bradley, J. S., Englund, J. A., File, T. M., Jr., Fry, A. M., Gravenstein, S., Hayden, F. G., Harper, S. A., Hirshon, J. M., Ison, M. G., Johnston, B. L., Knight, S. L., McGeer, A., Riley, L. E., Wolfe, C. R., Alexander, P. E., & Pavia, A. T. (2018). Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza. <https://doi.org/10.1093/cid/ciy866>

V. Wintzingerode, F., Göbel, U. B., & Stackebrandt, E. (1997). Determination of microbial diversity in environmental samples: pitfalls of PCR-based rRNA analysis. 21(3), 213-229. <https://doi.org/doi:10.1111/j.1574-6976.1997.tb00351.x>

van Asten, S. A. V., Boers, S. A., de Groot, J. D. F., Schuurman, R., & Claas, E. C. J. (2021). Evaluation of the Genmark ePlex® and QIAstat-Dx® respiratory pathogen panels in detecting bacterial targets in lower respiratory tract specimens. *BMC Microbiol*, 21(1), 236. <https://doi.org/10.1186/s12866-021-02289-w>

van Rijn, A. L., Nijhuis, R. H. T., Bekker, V., Groeneveld, G. H., Wessels, E., Feltkamp, M. C. W., & Claas, E. C. J. (2018). Clinical implications of rapid ePlex(R) Respiratory Pathogen Panel testing compared to laboratory-developed real-time PCR. *Eur J Clin Microbiol Infect Dis*, 37(3), 571-577. <https://doi.org/10.1007/s10096-017-3151-0>

Viracor. (2023). *Skin and Soft Tissue Infection Panel TEM-PCR™*. <https://www.viracor-eurofins.com/test-menu/220798p-skin-and-soft-tissue-infection-panel-tem-pcr/>

Visseaux, B., Le Hingrat, Q., Collin, G., Bouzid, D., Lebourgeois, S., Le Pluart, D., Deconinck, L., Lescure, F.-X., Lucet, J.-C., Bouadma, L., Timsit, J.-F., Descamps, D., Yazdanpanah, Y., Casalino, E., & Houhou-Fidouh, N. (2020). Evaluation of the QIAstat-Dx Respiratory SARS-CoV-2 Panel, the First Rapid Multiplex PCR Commercial Assay for SARS-CoV-2 Detection. *Journal of Clinical Microbiology*, 58(8), e00630-00620. <https://doi.org/10.1128/JCM.00630-20>

Ward, C., Stocker, K., Begum, J., Wade, P., Ebrahimsa, U., & Goldenberg, S. D. (2015). Performance evaluation of the Verigene(R) (Nanosphere) and FilmArray(R) (BioFire(R)) molecular assays for identification of causative organisms in bacterial bloodstream infections. *Eur J Clin Microbiol Infect Dis*, 34(3), 487-496. <https://doi.org/10.1007/s10096-014-2252-2>

Watts, G. S., Youens-Clark, K., Slepian, M. J., Wolk, D. M., Oshiro, M. M., Metzger, G. S., Dhingra, D., Cranmer, L. D., & Hurwitz, B. L. (2017). 16S rRNA gene sequencing on a benchtop sequencer: accuracy for identification of clinically important bacteria. *Journal of applied microbiology*, 123(6), 1584-1596. <https://doi.org/10.1111/jam.13590>

Weiss, S. L., Peters, M. J., Alhazzani, W., Agus, M. S. D., Flori, H. R., Inwald, D. P., Nadel, S., Schlapbach, L. J., Tasker, R. C., Argent, A. C., Brierley, J., Carcillo, J., Carrol, E. D., Carroll, C. L., Cheifetz, I. M., Choong, K., Cies, J. J., Cruz, A. T., De Luca, D., . . . Tissieres, P. (2020). Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children. *Pediatr Crit Care Med*, 21(2), e52-e106. <https://doi.org/10.1097/pcc.0000000000002198>

Yan, Y., Zhang, S., & Tang, Y. W. (2011). Molecular assays for the detection and characterization of respiratory viruses. *Semin Respir Crit Care Med*, 32(4), 512-526. <https://doi.org/10.1055/s-0031-1283288>

Policy Update History:

7/17/2023	Document updated with literature review. The following changes were made to the Reimbursement Information section: Removed 5. Using molecular-based panel testing for general screening of microorganisms is not reimbursable. These tests include, but are not limited to the following: Molecular-based panel testing of vaginal swabs, such as SmartJane™; Molecular-based panel testing on urine samples, such as UroSwab®. Added GENETWORx Molecular PCR UTI Test as an example to the new #5; added GENETWORx PCR Wound Testing to #6; added 7: Molecular-based panel testing for general screening of microorganisms (e.g., MicroGenDX qPCR+NGS) is not reimbursable. Other changes made for clarity. References revised.
11/1/2022	New policy