

If a conflict arises between a Clinical Payment and Coding Policy 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. Blue Cross and Blue Shield of TX may use reasonable discretion interpreting and applying this policy to services being delivered in a particular case. Blue Cross and Blue Shield of TX 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 approved code sets. Claims should be coded appropriately according to industry standard coding guidelines including, but not limited to: Uniform Billing Editor, American Medical Association, Current Procedural Terminology, CPT® Assistant, Healthcare Common Procedure Coding System, ICD-10 CM and PCS, National Drug Codes, Diagnosis Related Group guidelines, Centers for Medicare and Medicaid Services National Correct Coding Initiative 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.

Testing for Vector-Borne Infections

Policy Number: CPCPLAB052

Version 1.0

Approval Date: Sept. 13, 2024

Plan Effective Date: Jan. 1, 2025 (Blue Cross and Blue Shield of Texas Only)

Description

The plan 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:

For Lyme disease and testing for *Borrelia burgdorferi*, please see CPCPLAB044 Lyme Disease Testing.

- 1) For individuals suspected of having babesiosis (see **Note 1**), the use of a Giemsa- or Wright-stain of a blood smear **or** NAAT **may be reimbursable**.
- 2) For individuals suspected of having babesiosis (see **Note 1**), the use of either an IgG or IgM indirect immunofluorescence antibody (IFA) assay for Babesia **is not reimbursable**.
- 3) For individuals suspected of having chikungunya virus (see **Note 2**), the use of viral culture for diagnosis, NAAT for the presence of chikungunya in a serum sample, **or** IFA assay for IgM antibodies during both the acute and convalescent phases **may be reimbursable**.
- 4) For individuals suspected of having Colorado tick fever (CTF) (see **Note 3**), the use of virus-specific IFA-stained blood smears **or** IFA for CTF-specific antibodies **may be reimbursable**.
- 5) For the detection of dengue virus (DENV), the use of NAAT, IgM antibody capture ELISA (MAC-ELISA), **or** NS1 ELISA, as well as a confirmatory plaque reduction neutralization test for DENV, **may be reimbursable** in the following individuals:
 - a) For individuals suspected of having DENV (see **Note 4**).
 - b) For non-pregnant individuals who are symptomatic for Zika virus infection (see **Note 5**).
- 6) For individuals suspected of having DENV (see **Note 4**), the use of IgG ELISA **or** hemagglutination testing **is not reimbursable**.
- 7) For individuals suspected of having ehrlichiosis and/or anaplasmosis (see **Note 6**), the use of NAAT of whole blood, IFA assay for IgG antibodies, **or** microscopy for morulae detection **may be reimbursable**.
- 8) For individuals suspected of having ehrlichiosis and/or anaplasmosis (see **Note 6**), the use of an IFA assay for IgM antibodies **or** standard blood culture **is not reimbursable**.

- 9) For individuals suspected of having malaria (see **Note 7**), the use of a rapid immunochromatographic diagnostic test **or** smear microscopy to diagnose malaria, determine the species of *Plasmodium*, identify the parasitic life-cycle stage, and/or quantify the parasitemia (can be repeated up to three times within three days if initial microscopy is negative in suspected cases of malaria) **may be reimbursable**.
- 10) For individuals suspected of having malaria (see **Note 7**), the use of NAAT **or** IFA for *Plasmodium* antibodies **is not reimbursable**.
- 11) For individuals suspected of having a rickettsial disease (see **Note 8**), the use of an IFA assay for IgG antibodies (limited to two units) **may be reimbursable**.
- 12) For individuals suspected of having a rickettsial disease (see **Note 8**), the use of standard blood culture, nucleic acid amplification testing (NAAT), **or** IFA assay for IgM antibodies **is not reimbursable**.
- 13) For individuals suspected of having a tick-borne relapsing fever (TBRF) (see **Note 9**), the use of dark-field microscopy of a peripheral blood smear, microscopy of a Wright- or Giemsa-stained blood smear, PCR testing, **or** serologic assays to detect *Borrelia* specific IgG antibodies **may be reimbursable**.
- 14) For individuals suspected of having a TBRF (see **Note 9**), the use of an IFA assay for IgM for *Borrelia* **or** culture testing for *Borrelia* **is not reimbursable**.
- 15) For individuals suspected of having West Nile virus (WNV) (see **Note 10**), the use of IFA for WNV-specific IgM antibodies in either serum or CSF and a confirmatory plaque reduction neutralization test for WNV **may be reimbursable**.
- 16) For individuals suspected of having WNV (see **Note 10**), the use of NAAT for WNV **or** IFA for WNV-specific IgG antibodies in either serum or CSF **is not reimbursable**.
- 17) For individuals suspected of having yellow fever virus (YFV) (see **Note 11**), the use of NAAT for YFV **or** serologic assays to detect virus-specific IgM and IgG antibodies, as well as a confirmatory plaque reduction neutralization test for YFV, **may be reimbursable**.
- 18) For the detection of Zika virus, the use of NAAT **may be reimbursable** in the following individuals:
 - a) Up to 12 weeks after the onset of symptom for symptomatic (see **Note 5**) pregnant individuals who have **either** recently traveled to areas with a risk of Zika (see **Note 12**) **or** who have had sex with someone who either lives in or has recently traveled to areas with a risk of Zika (see **Note 12**).
 - b) For infants born from individuals who, during pregnancy, tested positive for Zika virus.

- c) For infants born with signs and symptoms of congenital Zika syndrome (see **Note 13**) and who have a birthing parent who, during pregnancy, traveled to an area with a risk of Zika (see **Note 12**).
- 19) For pregnant individuals who have a fetus with prenatal ultrasound findings consistent with congenital Zika virus infection (see **Note 13**), Zika virus NAAT (maternal serum and maternal urine) and Zika virus IgM testing (maternal serum), as well as a confirmatory plaque reduction neutralization test for Zika, **may be reimbursable**.
- 20) For non-pregnant individuals symptomatic for Zika virus infection (see **Note 5**), NAAT and/or IgM testing for Zika detection **is not reimbursable**.
- 21) For asymptomatic individuals, testing for babesiosis, chikungunya virus, CTF, DENV, ehrlichiosis and/or anaplasmosis, malaria, rickettsial disease, TBRF, WNV, YFV, or Zika virus during a general exam without abnormal findings **is not reimbursable**.

NOTES:

Note 1: Typical signs and symptoms of babesiosis can include hemolytic anemia, splenomegaly, hepatomegaly, jaundice, and nonspecific flu-like symptoms such as fever, chills, body aches, weakness, and fatigue (CDC, 2019a).

Note 2: Typical signs and symptoms of chikungunya include high fever (>102°F or 39°C), joint pains (usually multiple joints, bilateral, and symmetric), headache, myalgia, arthritis, conjunctivitis, nausea, vomiting, and maculopapular rash (Staples et al., 2020).

Note 3: Typical signs and symptoms of CTF can include fever, chills, headache, myalgia, malaise, sore throat, vomiting, abdominal pain, and maculopapular or petechial rash (CDC, 2023a).

Note 4: Typical signs and symptoms of dengue can include fever, headache, retro-orbital eye pain, myalgia, arthralgia, erythematous maculopapular rash, petechiae, leukopenia, and nausea and/or vomiting (CDC, 2019b).

Note 5: Typical signs and symptoms of Zika virus infection can include fever, rash, headache, joint pain, conjunctivitis (red eyes), and muscle pain (CDC, 2019d).

Note 6: Typical signs and symptoms of ehrlichiosis and/or anaplasmosis usually begin 5-14 days after an infected tick bite, and they include fever, headache, malaise, myalgia, and shaking chills. Ehrlichiosis can also present with gastrointestinal issues, including nausea, vomiting, and diarrhea (Biggs et al., 2016).

Note 7: Typical signs and symptoms of malaria can include fever, influenza-like symptoms (e.g., chills, headache, body aches), anemia, jaundice, seizures, mental confusion, kidney failure, and acute respiratory distress syndrome (Arguin & Tan, 2019).

Note 8: Typical signs and symptoms of rickettsial diseases (including Rocky Mountain spotted fever, *Rickettsia parkeri* rickettsiosis, *Rickettsia* species 364D rickettsiosis, *Rickettsia* spp (mild spotted fever), and *R. akari* (rickettsialpox)) usually begin 3 – 12 days after initial bite and can include fever, headache, chills, malaise, myalgia, nausea, vomiting, abdominal pain, photophobia, anorexia, and skin rash. *Rickettsia* species 364d rickettsiosis can also present with an ulcerative lesion with regional lymphadenopathy (Biggs et al., 2016).

Note 9: Typical signs and symptoms of tick-borne relapsing fever (caused by *Borrelia hermsii*, *B. mazzottii*, *B. miyamotoi*, *B. parkeri*, or *B. turicatae*) include recurring febrile episodes that last approximately 3 days separated by approximately 7 days. Nonspecific symptoms that occur in at least 50% of cases include headache, myalgia, chills, nausea, arthralgia, and vomiting (CDC, 2022e).

Note 10: Typical signs and symptoms of West Nile Virus (WNV) include headache, myalgia, arthralgia, gastrointestinal symptoms, and maculopapular rash. Less than 1% of infected individuals develop neuroinvasive WNV with symptoms of meningitis, encephalitis, or acute flaccid paralysis (Nasci et al., 2013).

Note 11: Typical signs and symptoms of yellow fever include symptoms of the toxic form of the disease (jaundice, hemorrhagic symptoms, and multisystem organ failure), as well as nonspecific influenza symptoms (fever, chills, headache, backache, myalgia, prostration, nausea, and vomiting in initial illness) (Gershman & Staples, 2021).

Note 12: The CDC provides information on the risk of Zika in areas in the United States (<https://www.cdc.gov/zika/geo/index.html>) and outside of the United States and its territories (<https://wwwnc.cdc.gov/travel/page/zika-information>).

Note 13: Typical signs and symptoms of congenital Zika syndrome can include microcephaly, problems with brain development, feeding problems (e.g., difficulty swallowing), hearing loss, seizures, vision problems, decreased joint movement (i.e., contractures), and stiff muscles (making it difficult to move) (CDC, 2022b).

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

86280, 86382, 86619, 86666, 86750, 86753, 86757, 86788, 86789, 86790, 86794, 87040 87207, 87449, 87468, 87469, 87478, 87484, 87662, 87798, 87899, 0043U, 0044U

References:

AAP, A. A. o. P. (2021 a). Babesiosis. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021- 2024 Report of the Committee on Infectious Diseases* (pp. 235-237). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640045&bookid=2205>

AAP, A. A. o. P. (2021b). Borrelia Infections Other Than Lyme Disease. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021- 2021 Report of the Committee on Infectious Diseases* (pp. 252-255). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640055&bookid=2205>

AAP, A. A. o. P. (2021c). Chikungunya. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 271-272). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionId=189640062&bookId=2205>

AAP, A. A. o. P. (2021d). Dengue. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 317-319). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionId=189640081&bookId=2205>

AAP, A. A. o. P. (2021e). Ehrlichia, Anaplasma, and Related Infections. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 323-328). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640084&bookid=2205>

AAP, A. A. o. P. (2021f). Malaria. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 527-537). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionId=189640129&bookId=2205>

AAP, A. A. o. P. (2021g). Rickettsialpox. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 696-697). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionId=189640173&bookId=2205>

AAP, A. A. o. P. (2021h). Rocky Mountain Spotted Fever. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021-2024 Report of the Committee on Infectious Diseases* (pp. 697-700). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640174&bookid=2205>

AAP, A. A. o. P. (2021i). West Nile Virus. In D. Kimberlin, M. Brady, M. Jackson, & S. Long (Eds.), *Red Book: 2021 - 2024 Report of the Committee on Infectious Diseases* (pp. 888-891). American Academy of Pediatrics.

<https://redbook.solutions.aap.org/chapter.aspx?sectionId=189640220&bookId=2205>

Akoolo, L., Schlachter, S., Khan, R., Alter, L., Rojzman, A. D., Gedroic, K., Bhanot, P., & Parveen, N. (2017). A novel quantitative PCR detects Babesia infection in patients not identified by currently available non-nucleic acid amplification tests. *BMC Microbiol*, 17(1), 16. <https://doi.org/10.1186/s12866-017-0929-2>

Arguin, P., & Tan, K. (2019). Chapter 3 Infectious Diseases Related to Travel: Malaria. In G. Brunette (Ed.), *CDC Yellow Book 2018: Health Information for International Travel*. Oxford University Press. <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/malaria>

ASM. (2022, September 20, 2022). *Zika Virus: An Update on the Disease and Guidance for Laboratory Testing*. American Society of Microbiology. Retrieved March 31 from <https://asm.org/Guideline/Zika-virus-An-update-on-the-disease-and-guidance-f>

Barbour, A. G. (2020). *Clinical features, diagnosis, and management of relapsing fever*. Wolters Kluwer. Retrieved 06/01/2021 from <https://www.uptodate.com/contents/clinical-features-diagnosis-and-management-of-relapsing-fever>

Barbour, A. G. (2023, Feb. 2023). *Clinical features, diagnosis, and management of relapsing fever*. Wolters Kluwer. Retrieved 08/10/2018 from <https://www.uptodate.com/contents/clinical-features-diagnosis-and-management-of-relapsing-fever>

Biggs, H. M., Behravesh, C. B., Bradley, K. K., Dahlgren, F. S., Drexler, N. A., Dumler, J. S., Folk, S. M., Kato, C. Y., Lash, R. R., Levin, M. L., Massung, R. F., Nadelman, R. B., Nicholson, W. L., Paddock, C. D., Pritt, B. S., & Traeger, M. S. (2016). Diagnosis and Management of Tickborne Rickettsial Diseases: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichioses, and Anaplasmosis - United States. *MMWR Recomm Rep*, 65(2), 1-44. <https://doi.org/10.15585/mmwr.rr6502a1>

Burakoff, A., Lehman, J., Fischer, M., Staples, J. E., & Lindsey, N. P. (2018). West Nile Virus and Other Nationally Notifiable Arboviral Diseases - United States, 2016. *MMWR Morb Mortal Wkly Rep*, 67(1), 13-17. <https://doi.org/10.15585/mmwr.mm6701a3>

Calisher, C. H. (1994). Medically important arboviruses of the United States and Canada. *Clin Microbiol Rev*, 7(1), 89-116.

CDC. (2018a, 09/26/2018). *Collecting & Submitting Specimens At Time of Birth for Zika Virus Testing*. <https://www.cdc.gov/zika/hc-providers/test-specimens-at-time-of-birth.html>

CDC. (2018b). *Malaria Diagnosis and Treatment*. Centers for Disease Control and Prevention. Retrieved 07/20/2021 from https://www.cdc.gov/malaria/diagnosis_treatment/diagnosis.html

CDC. (2019a, 10/30/2019). *Babesiosis: Resources for Health Professionals*. Centers for Disease Control and Prevention. https://www.cdc.gov/parasites/babesiosis/health_professionals/index.html

CDC. (2019b, 05/03/2019). *Dengue: Clinical Guidance*. Centers for Disease Control and Prevention. Retrieved 07/20/2021 from <https://www.cdc.gov/dengue/clinicallab/clinical.html>

CDC. (2019c, 10/07/2019). *Overview (Zika Virus)*. <https://www.cdc.gov/zika/about/overview.html>

CDC. (2019d, 05/21/2019). *Symptoms (Zika Virus)*. <https://www.cdc.gov/zika/symptoms/symptoms.html>

CDC. (2020, 01/24/2020). *Testing Guidance (Dengue)*. Centers for Disease Control and Prevention. <https://www.cdc.gov/dengue/healthcare-providers/testing/testing-guidance.html>

CDC. (2022a, 2022). *About the Division of Vector-Borne Diseases*. CDC. Retrieved 07/20/2021 from <https://www.cdc.gov/ncezid/dvbd/index.html>

CDC. (2022b, 03/31/2022). *Care for Babies Affected by Zika*. <https://www.cdc.gov/pregnancy/zika/family/care-for-babies-with-congenital-zika.html>

CDC. (2022c). *Relapsing Fever*. Centers for Disease Control and Prevention. <https://www.cdc.gov/relapsing-fever/clinicians/index.html>

CDC. (2022d, Aug. 15, 2022). *Rocky Mountain Spotted Fever*. Centers for Disease Control and Prevention. <https://www.cdc.gov/rmsf/stats/index.html>

CDC. (2022e, 09/23/2022). *Tick-borne Relapsing Fever (TBRF): Information for Clinicians*. Centers for Disease Control and Prevention. <https://www.cdc.gov/relapsing-fever/clinicians/>

CDC. (2022f, 09/29/2022). *Zika and Dengue Testing Guidance (Updated November 2019)*. Retrieved 3/21/2023 from <https://www.cdc.gov/zika/hc-providers/testing-guidance.html>

CDC. (2023a, 2023). *Colorado Tick Fever Health Care Providers: Clinical & Laboratory Evaluation*. Centers for Disease Control and Prevention. Retrieved 07/20/2021 from <https://www.cdc.gov/coloradotickfever/clinicallabeval.html>

CDC. (2023b, January 26, 2023). *Colorado Tick Fever Health Care Providers: Diagnostic Testing*. Centers for Disease Control and Prevention. <https://www.cdc.gov/coloradotickfever/diagnostic-testing.html>

CDC. (2023c, 02/09/2023). *Dengue*. Centers for Disease Control and Prevention. Retrieved 07/20/2021 from <https://www.cdc.gov/dengue/about/inpuerto.html>

Cohee, L., & Seydel, K. (2023). *Clinical manifestations of malaria in nonpregnant adults and children*. Wolters Kluwer. <https://www.uptodate.com/contents/clinical-manifestations-of-malaria-in-nonpregnant-adults-and-children>

Denison, A. M., Amin, B. D., Nicholson, W. L., & Paddock, C. D. (2014). Detection of *Rickettsia rickettsii*, *Rickettsia parkeri*, and *Rickettsia akari* in skin biopsy specimens using a multiplex real-time polymerase chain reaction assay. *Clin Infect Dis*, 59(5), 635-642. <https://doi.org/10.1093/cid/ciu358>

Dimaio, M. A., Pereira, I. T., George, T. I., & Banaei, N. (2012). Performance of BinaxNOW for diagnosis of malaria in a U.S. hospital. *J Clin Microbiol*, 50(9), 2877-2880. <https://doi.org/10.1128/jcm.01013-12>

FDA. (2018). *Devices@FDA*. U.S. Department of Health & Human Services. Retrieved 08/06/2018 from <https://www.accessdata.fda.gov/scripts/cdrh/devicesatfda/index.cfm>

Gershman, M., & Staples, J. (2021). Chapter 3 Infectious Diseases Related to Travel: Yellow Fever. In G. Brunette (Ed.), *CDC Yellow Book 2018: Health Information for International Travel*. Oxford University Press. <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever>

Granger, D., & Theel, E. S. (2019). Evaluation of a Rapid Immunochromatographic Assay and Two Enzyme-Linked Immunosorbent Assays for Detection of IgM-Class Antibodies to Zika Virus. *J Clin Microbiol*, 57(3). <https://doi.org/10.1128/jcm.01413-18>

Hopkins, H. (2023, Feb. 2023). *Laboratory tools for the diagnosis of malaria*. Wolters Kluwer. <https://www.uptodate.com/contents/diagnosis-of-malaria>

Johnson, A. J., Martin, D. A., Karabatsos, N., & Roehrig, J. T. (2000). Detection of anti-arboviral immunoglobulin G by using a monoclonal antibody-based capture enzyme-linked immunosorbent assay. *J Clin Microbiol*, 38(5), 1827-1831.

Kalish, R. A., McHugh, G., Granquist, J., Shea, B., Ruthazer, R., & Steere, A. C. (2001). Persistence of immunoglobulin M or immunoglobulin G antibody responses to *Borrelia burgdorferi* 10-20 years after active Lyme disease. *Clin Infect Dis*, 33(6), 780-785. <https://doi.org/10.1086/322669>

Kato, C. Y., Chung, I. H., Robinson, L. K., Austin, A. L., Dasch, G. A., & Massung, R. F. (2013). Assessment of real-time PCR assay for detection of *Rickettsia* spp. and *Rickettsia rickettsii* in banked clinical samples. *J Clin Microbiol*, 51(1), 314-317. <https://doi.org/10.1128/jcm.01723-12>

Kim, Y. H., Lee, J., Kim, Y.-E., Chong, C.-K., Pinchemel, Y., Reisdörfer, F., Coelho, J. B., Dias, R. F., Bae, P. K., Gusmão, Z. P. M., Ahn, H.-J., & Nam, H.-W. (2018). Development of a Rapid Diagnostic Test Kit to Detect IgG/IgM Antibody against Zika Virus Using Monoclonal Antibodies to the Envelope and Non-structural Protein 1 of the Virus. *The Korean journal of parasitology*, 56(1), 61-70. <https://doi.org/10.3347/kjp.2018.56.1.61>

Krause, P. J., & Vannier, E. G. (2023, Feb. 2023). *Babesiosis: Clinical manifestations and diagnosis*. Wolters Kluwer. <https://www.uptodate.com/contents/babesiosis-clinical-manifestations-and-diagnosis>

LeBeaud, A. D. (2021, February 22). *Zika virus infection: An overview*. UpToDate. Retrieved March 31 from <https://www.uptodate.com/contents/zika-virus-infection-an-overview>

Leski, T. A., Taitt, C. R., Swaray, A. G., Bangura, U., Reynolds, N. D., Holtz, A., Yasuda, C., Lahai, J., Lamin, J. M., Baio, V., Jacobsen, K. H., Ansumana, R., & Stenger, D. A. (2020). Use of real-time multiplex PCR, malaria rapid diagnostic test and microscopy to investigate the prevalence of *Plasmodium* species among febrile hospital patients in Sierra Leone. *Malaria Journal*, 19(1), 84. <https://doi.org/10.1186/s12936-020-03163-2>

Mathison, B. A., & Pritt, B. S. (2017). Update on Malaria Diagnostics and Test Utilization. *J Clin Microbiol*, 55(7), 2009-2017. <https://doi.org/10.1128/jcm.02562-16>

McQuiston, J. H., Wiedeman, C., Singleton, J., Carpenter, L. R., McElroy, K., Mosites, E., Chung, I., Kato, C., Morris, K., Moncayo, A. C., Porter, S., & Dunn, J. (2014). Inadequacy of IgM antibody tests for diagnosis of Rocky Mountain Spotted Fever. *The American journal of tropical medicine and hygiene*, 91(4), 767-770. <https://doi.org/10.4269/ajtmh.14-0123>

Meatherall, B., Preston, K., & Pillai, D. R. (2014). False positive malaria rapid diagnostic test in returning traveler with typhoid fever. *BMC Infect Dis*, *14*, 377. <https://doi.org/10.1186/1471-2334-14-377>

Miller, J. M., Binnicker, M. J., Campbell, S., Carroll, K. C., Chapin, K. C., Gilligan, P. H., Gonzalez, M. D., Jerris, R. C., Kehl, S. C., Patel, R., Pritt, B. S., Richter, S. S., Robinson-Dunn, B., Schwartzman, J. D., Snyder, J. W., Telford, I. I. S., Theel, E. S., Thomson, J. R. B., Weinstein, M. P., & Yao, J. D. (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*, ciy381-ciy381. <https://doi.org/10.1093/cid/ciy381>

Nasci, R., Fischer, M., Lindsey, N., Lanciotti, R., Savage, H., Komar, N., McAllister, J., Mutebi, J.-P., Lavelle, J., Zielinski-Gutierrez, E., & Petersen, L. (2013). *West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control*. <https://www.cdc.gov/westnile/resources/pdfs/wnvguidelines.pdf>

Ota-Sullivan, K., & Blecker-Shelly, D. L. (2013). Use of the rapid BinaxNOW malaria test in a 24-hour laboratory associated with accurate detection and decreased malaria testing turnaround times in a pediatric setting where malaria is not endemic. *J Clin Microbiol*, *51*(5), 1567-1569. <https://doi.org/10.1128/jcm.00293-13>

Petersen, L. R. (2023, Feb. 2023). *Arthropod-borne encephalitides*. Wolters Kluwer. <https://www.uptodate.com/contents/arthropod-borne-encephalitides>

Petersen, L. R. (2023, Feb. 2023). *Clinical manifestations and diagnosis of West Nile virus infection*. Wolters Kluwer. <https://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-west-nile-virus-infection>

Reynolds, M. R., Jones, A. M., Petersen, E. E., Lee, E. H., Rice, M. E., Bingham, A., Ellington, S. R., Evert, N., Reagan-Steiner, S., Oduyebo, T., Brown, C. M., Martin, S., Ahmad, N., Bhatnagar, J., Macdonald, J., Gould, C., Fine, A. D., Polen, K. D., Lake-Burger, H., . . . Honein, M. A. (2017). Vital Signs: Update on Zika Virus-Associated Birth Defects and Evaluation of All U.S. Infants with Congenital Zika Virus Exposure - U.S. Zika Pregnancy Registry, 2016. *MMWR Morb Mortal Wkly Rep*, *66*(13), 366-373. <https://doi.org/10.15585/mmwr.mm6613e1>

Reynolds, M. R., Jones, A. M., Petersen, E. E., Lee, E. H., Rice, M. E., Bingham, A., Ellington, S. R., Evert, N., Reagan-Steiner, S., Oduyebo, T., Brown, C. M., Martin, S., Ahmad, N., Bhatnagar, J., Macdonald, J., Gould, C., Fine, A. D., Polen, K. D., Lake-Burger, H., . . . Honein, M. A. (2017). Vital Signs: Update on Zika Virus-Associated Birth Defects and Evaluation of All U.S. Infants with Congenital Zika Virus Exposure - U.S. Zika Pregnancy Registry, 2016. *MMWR Morb Mortal Wkly Rep*, *66*(13), 366-373. <https://doi.org/10.15585/mmwr.mm6613e1>

Rosenberg, R., Lindsey, N. P., Fischer, M., Gregory, C. J., Hinckley, A. F., Mead, P. S., Paz-Bailey, G., Waterman, S. H., Drexler, N. A., Kersh, G. J., Hooks, H., Partridge, S. K., Visser, S. N., Beard, C. B., & Petersen, L. R. (2018). Vital Signs: Trends in Reported Vectorborne Disease Cases - United States and Territories, 2004-2016. *MMWR Morb Mortal Wkly Rep*, 67(17), 496-501. <https://doi.org/10.15585/mmwr.mm6717e1>

Sexton, D. J., & McClain, M. T. (2022, 03/21/2022). *Human ehrlichiosis and anaplasmosis*. Wolters Kluwer. <https://www.uptodate.com/contents/human-ehrlichiosis-and-anaplasmosis>

Sexton, D. J., & McClain, M. T. (2023a, Feb. 2023). *Clinical manifestations and diagnosis of Rocky Mountain spotted fever*. Wolters Kluwer. Retrieved 08/10/2018 from <https://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-rocky-mountain-spotted-fever>

Sexton, D. J., & McClain, M. T. (2023b, Feb. 2023). *Human ehrlichiosis and anaplasmosis*. Wolters Kluwer. Retrieved 03/21/2022 from <https://www.uptodate.com/contents/human-ehrlichiosis-and-anaplasmosis>

Sexton, D. J., & McClain, M. T. (2023c, Feb. 2023). *Other spotted fever group rickettsial infections*. Wolters Kluwer. <https://www.uptodate.com/contents/other-spotted-fever-group-rickettsial-infections>

Shiu, C., Starker, R., Kwal, J., Bartlett, M., Crane, A., Greissman, S., Gunaratne, N., Lardy, M., Picon, M., Rodriguez, P., Gonzalez, I., & Curry, C. L. (2018). Zika Virus Testing and Outcomes during Pregnancy, Florida, USA, 2016. *Emerg Infect Dis*, 24(1), 1-8. <https://doi.org/10.3201/eid2401.170979>

Staples, J., Hills, S., & Powers, A. (2017). Chapter 3 Infectious Diseases Related to Travel: Chikungunya. In G. Brunette (Ed.), *CDC Yellow Book 2018: Health Information for International Travel*. Oxford University Press. <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/chikungunya>

Staples, J., Hills, S., & Powers, A. (2020). Chapter 3 Infectious Diseases Related to Travel: Chikungunya. In G. Brunette (Ed.), *CDC Yellow Book 2018: Health Information for International Travel*. Oxford University Press. <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/chikungunya>

Test ID: LCMAL Malaria, Molecular Detection, PCR, Varies. (2023). <https://www.mayocliniclabs.com/test-catalog/Clinical+and+Interpretive/87860>

Thomas, S., Rothman, A., Srikiatkachorn, A., & Kalayanarooj, S. (2023, feb. 2023). *Dengue virus infection: Clinical manifestations and diagnosis*. Wolters Kluwer. <https://www.uptodate.com/contents/dengue-virus-infection-clinical-manifestations-and-diagnosis>

van Bergen, K., Stuitje, T., Akkers, R., Vermeer, E., Castel, R., & Mank, T. (2021). Evaluation of a novel real-time PCR assay for the detection, identification and quantification of Plasmodium species causing malaria in humans. *Malar J*, 20(1), 314. <https://doi.org/10.1186/s12936-021-03842-8>

Venkatesan, A., Tunkel, A. R., Bloch, K. C., Laming, A. S., Sejvar, J., Bitnun, A., Stahl, J. P., Mailles, A., Drebot, M., Rupprecht, C. E., Yoder, J., Cope, J. R., Wilson, M. R., Whitley, R. J., Sullivan, J., Granerod, J., Jones, C., Eastwood, K., Ward, K. N., . . . International Encephalitis, C. (2013). Case definitions, diagnostic algorithms, and priorities in encephalitis: consensus statement of the international encephalitis consortium. *Clin Infect Dis*, 57(8), 1114-1128. <https://doi.org/10.1093/cid/cit458>

WHO. (2017, 10/31/2017). *Plague*. World Health Organization. Retrieved 08/10/2018 from <http://www.who.int/news-room/fact-sheets/detail/plague>

WHO. (2022). *Laboratory testing for Zika virus and dengue virus infections* https://www.who.int/publications/i/item/WHO-ZIKV_DENV-LAB-2022.1

Wilder-Smith, A. (2023, Feb. 2023). *Yellow fever: Epidemiology, clinical manifestations, and diagnosis*. Wolters Kluwer. <https://www.uptodate.com/contents/yellow-fever-epidemiology-clinical-manifestations-and-diagnosis>

Wilson, M. E., & Lenschow, D. J. (2023, Feb. 2023). *Chikungunya fever*. Wolters Kluwer. <https://www.uptodate.com/contents/chikungunya-fever-epidemiology-clinical-manifestations-and-diagnosis>

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Approval Date	Effective Date; Summary of Changes
09/13/2024	01/01/2025: New policy.