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SourcesHorowitz HW, Agüero-Rosenfeld ME, Holmgren D, McKenna D, Schwartz I, Cox ME, Wormser GP. Lyme disease and human granulocytic anaplasmosis coinfection: impact of case definition on coinfection rates and illness severity. *Clin Infect Dis*. 2013 Jan;56(1):93-9. Krause PJ, McKay K, Thompson CA, Sikand VK, et al. Disease-specific diagnosis of coinfecting tickborne zoonoses: babesiosis, human granulocytic ehrlichiosis, and Lyme disease. *Clin Infect Dis*. 2002 May 1;34(9):1184-91. Belongia EA, Reed KD, Mitchell PD, et al. Clinical and epidemiological features of early Lyme disease and human granulocytic ehrlichiosis in Wisconsin. *Clin Infect Dis*. 1999 Dec;29(6):1472-7. Steere AC1, McHugh G, Suarez C, Hoi1t J, Damle N, Sikand VK. Prospective study of coinfection in patients with erythema migrans. *Clin Infect Dis*. 2003 Apr 15;36(8):1078-81. Lantos PM, Wormser GP. Chronic coinfections in patients diagnosed with chronic Lyme disease: a systematic review. *Am J Med*. 2014 Nov;127(11):1105-10. Telford SR, Wormser GP. Bartonella transmission by ticks not established.*Emerg Infect Dis*. 2010 Mar;16(3):379-84. COVID-19 testing can help you know if you have COVID-19 so you can decide what to do next, like getting treatment to reduce your risk of severe illness and taking steps to lower your chances of spreading the virus to others. Viral tests look for a current infection with SARS-CoV-2, the virus that causes COVID-19, by testing specimens from your nose or mouth. There are two main types of viral tests. A healthcare professional administering a NAAT test. Nucleic acid amplification tests (NAATs), including PCR tests, are more likely to detect the virus than antigen tests. NAATs tests are the gold standard for COVID-19 tests. Your sample will usually be taken by a healthcare provider and transported to a laboratory for testing and may take up to 3 days to receive results. Some NAATs may be performed at the point-of-care and provide results more quickly. Antigen Test results reflecting a positive result. Antigen tests* are rapid tests that usually produce results in 15-30 minutes. Positive results are accurate and reliable. However, in general, antigen tests are less likely to detect the virus than NAAT tests, especially when symptoms are not present. Therefore, a single negative antigen test cannot rule out infection. To be confident you do not have COVID-19, FDA recommends 2 negative antigen tests for individuals with symptoms or 3 antigen tests for those without symptoms, performed 48 hours apart. A single NAAT test can be used to confirm an antigen test result. *Self-tests, or at-home tests, are antigen tests that can be taken anywhere without having to go to a specific testing site. Read self-test package inserts thoroughly and follow the instructions closely when performing the test. Choose the right type of test for your circumstance.When using an antigen test, follow the recommendations provided by FDA and the test's manufacturer.If you do not, your results may be less likely to correctly indicate whether you have COVID-19 or not. I have not had COVID-19 or I have not had a positive test within the past 90 days. You may choose a NAAT, including PCR, or antigen test. If you use an antigen test and your result is negative, repeat testing following FDA recommendations. I tested positive for COVID-19 in the last 90 days. I have symptoms: Use an antigen test. Repeat negative tests following FDA recommendations. I do not have symptoms: Testing is not recommended to detect a new infection. After a positive test result, you may continue to test positive for some time. Some tests, especially NAAT tests, may continue to show a positive result for up to 90 days. Reinfections can occur within 90 days, which can make it hard to know if a positive test indicates a new infection. Consider consulting a healthcare provider if you have any questions or concerns about your circumstances. Buy self-tests (at-home tests) online or in pharmacies and retail stores. If you have health insurance, it may reimburse the cost of purchasing self-tests. Visit FDA's website for a list of authorized tests. A positive COVID-19 test means the virus was detected and you have or recently had an infection. Take steps to prevent spreading COVID-19.Monitor your symptoms. If you have any emergency warning signs, seek emergency care immediately.Seek health care right away for treatment if you have risk factors for severe illness. Treatment may be an option to make your symptoms less severe and shorten the time you are sick. Treatment needs to be started within a few days of when your symptoms begin. A negative COVID-19 test means the test did not detect the virus, but this doesn't rule out that you could have an infection. If you used an antigen test, follow FDA recommendations for repeat testing. If you have symptoms.You may have COVID-19 but tested before the virus was detectable.You may have another viral infection or illness.Take actions to help protect yourself and others from health risks caused by respiratory viruses.Contact a healthcare provider if you have any questions about your test result. This overview describes current information on the types of tests used to detect SARS-CoV-2 infection and their intended uses. This information is intended for use by healthcare providers, public health professionals, and those organizing and implementing testing in non-healthcare settings. Information for the general public on COVID-19 testing is also available. Viral tests, including nucleic acid amplification tests (NAATs) and PCR tests, as well as antigen tests, are used as diagnostic tests to detect current infection with SARS-CoV-2, determine the need for prevention measures, and inform a person's medical care. Nucleic acid amplification tests (NAATs) are highly sensitive and highly specific tests that detect one or more viral ribonucleic acid (RNA) genes. PCR tests are the most common type of NAAT used for COVID-19 testing. Viral RNA may stay in a person's body for up to 90 days after they test positive. Therefore, NAATs should not be used to test someone who has tested positive in the last 90 days. Most NAATs need to be performed in a laboratory, although some are performed at the point-of-care. Most NAATs produce qualitative (positive/negative) results. Antigen tests are immunoassays that detect the presence of specific viral proteins, called antigens. A positive test indicates current infection. Antigen tests generally have high specificity, similar to NAATs, but are less sensitive than most NAATs. Because antigen tests have lower sensitivity, FDA recommends that negative antigen tests be repeated up to three times, with each test 48 hours apart to confirm a negative result. Most antigen tests are less expensive than NAATs and can provide results in minutes. Antigen tests are available for at-home testing (self-testing), at the point of care, or in a laboratory.As noted in the labeling for authorized over-the-counter antigen tests: Negative results should be treated as presumptive (meaning that they are preliminary results). Negative results do not rule out SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Please see FDA guidance on the use of at-home COVID-19 antigen tests.Other diagnostic tests may be used to detect SARS-CoV-2 from non-traditional respiratory specimens, such as breath. These tests' results may be presumptive and require confirmation by NAAT. Please refer to each test's Instructions for Use (IFU) for specific interpretation.Positive viral test results indicate current infection and the person with COVID-19 should take steps to prevent spreading COVID-19 to others. Negative viral test results mean the test did not detect the virus, but this doesn't rule out that the person could have an infection. These results represent a snapshot of the time around specimen collection and could change if the same test was performed again in one or more days. Negative antigen test results should be repeated following FDA guidance. Antibody (or serology) tests are used to test for the presence of antibodies from previous infection or vaccination and can aid in fulfilling the case definition for multisystem inflammatory syndrome in children (MIS-C) and adults (MIS-A). 1 Antibody testing does not diagnose current infection. Antibody testing is primarily used for public health surveillance and epidemiologic purposes. Antibody tests detect specific antibodies that target different parts (nucleocapsid or spike protein) of the virus. Detection of anti-nucleocapsid antibody indicates SARS-CoV-2 infection, while anti-spike protein antibody may be induced by COVID-19 vaccination or by SARS-CoV-2 infection. This should be considered when choosing whether to test for antibodies originating from past infection versus those from vaccination. FDA continually monitors the accuracy of COVID-19 tests. Their website provides up-to-date information on the impact of viral mutations on COVID-19 tests. See FDA's list of In Vitro Diagnostics Emergency Use Authorizations for more information about the performance and interpretation of specific authorized tests. Testing individuals with signs or symptoms consistent with COVID-19 Positive test results using a viral test (NAAT, antigen or other tests) in individuals with signs or symptoms consistent with COVID-19 indicate that the person has COVID-19. A negative antigen test in individuals with signs or symptoms of COVID-19 should be repeated following FDA recommendations or confirmed by NAAT. Additionally, consider other illnesses with similar symptoms that may require testing. For many diseases, including flu, early diagnosis and prompt treatment can be important for preventing severe illness. Anyone who tests positive should take steps to prevent spreading COVID-19 to others or, if in a healthcare setting, be placed on appropriate precautions. Some people should receive treatment. Most people with COVID-19 have mild illness and can recover at home. Vaccination does not affect the results of someone's SARS-CoV-2 NAAT, antigen, or other diagnostic tests. The main effect of vaccination on SARS-CoV-2 testing is related to antibody testing. Because mRNA COVID-19 vaccines use the SARS-CoV-2 spike protein to generate an immune response, a positive serologic (antibody) test for spike protein IgM/IgG could indicate either previous infection or vaccination. Antibody testing is not currently recommended to assess a person's protection against SARS-CoV-2 infection or severe COVID-19 following COVID-19 vaccination or prior infection, or to assess the need for vaccination in an unvaccinated person. Antibody testing can be used in the diagnosis of Multisystem Inflammatory Syndrome in Children (MIS-C) or Multisystem Inflammatory Syndrome in Adults (MIS-A). To evaluate for evidence of previous infection in a vaccinated individual, use an antibody test specifically evaluating IgM/IgG to the nucleocapsid protein. For example, specific antibody tests can be used for public health surveillance. * As noted in the labeling for authorized over-the-counter antigen tests: negative results should be treated as presumptive (meaning that they are preliminary results). Negative results do not rule out SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Please see FDA guidance on the use of at-home COVID-19 antigen tests. The decreased sensitivity of antigen tests might be offset if the POC antigen tests are repeated more frequently. Refers to point-of-care antigen tests only. Social determinants of health may influence access to testing. For example, travel time may limit access to, and use of, testing services for those with limited transportation and who live in areas with fewer testing services and schedules. Racial and ethnic disparities in test site distribution have been found.2 Other factors that may affect test access to, and use of, testing services include:Lack of health insuranceConcern about the costs of co-paysOccupational factors such as not being able to take time off work and lack of paid leaveLack of accessible options for people with disabilities, andDistrust of the government and healthcare systems3,4,5,6Delays in testing may also delay seeking care and treatment (when sick) as well as delays in prevention measures that could reduce the spread of the virus to others. One component to move toward greater health equity is ensuring availability of resources, including access to testing for populations who have experienced longstanding, systemic health and social inequities. All population groups, including racial and ethnic minority groups, should have equal access to affordable, quality, and timely SARS-CoV-2 testingwith fast turnaround time for results. Efforts should be made to address barriers that might overtly or inadvertently create inequalities in testing. In addition, completeness of race and ethnicity data is an important factor in understanding the impact the virus has on racial and ethnic minority populations. When possible, healthcare providers and public health professionals should ask and record race and ethnicity for anyone receiving a reportable test result and ensure these data are reported with the persons test results to facilitate understanding the impact of COVID-19 on racial and ethnic minority populations. Some strategies to achieve health equity in testing access and availability include: Use a social vulnerability index to assist in selecting testing sites.Increase the availability of free testing sites in communities. Employers, community-based, and faith-based organizations can be important partners to increase the number of free, community-based testing sites. This expansion ensures that wait times both for testing and reporting of results are decreased.Increase accessible and culturally appropriate public messaging about the importance of testing and communicate these messages in multiple accessible formats, languages, and venues, particularly in communities at higher risk and disproportionately impacted by the virus.3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000,1001,1002,1003,1004,1005,1006,1007,1008,1009,1010,1011,1012,1013,1014,1015,1016,1017,1018,1019,1020,1021,1022,1023,1024,1025,1026,1027,1028,1029,1030,1031,1032,1033,1034,1035,1036,1037,1038,1039,1040,1041,1042,1043,1044,1045,1046,1047,1048,1049,1050,1051,1052,1053,1054,1055,1056,1057,1058,1059,1060,1061,1062,1063,1064,1065,1066,1067,1068,1069,1070,1071,1072,1073,1074,1075,1076,1077,1078,1079,1080,1081,1082,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1109,1110,1111,1112,1113,1114,1115,1116,1117,1118,1119,1120,1121,1122,1123,1124,1125,1126,1127,1128,1129,1130,1131,1132,1133,1134,1135,1136,1137,1138,1139,1140,1141,1142,1143,1144,1145,1146,1147,1148,1149,1150,1151,1152,1153,1154,1155,1156,1157,1158,1159,1160,1161,1162,1163,1164,1165,1166,1167,1168,1169,1170,1171,1172,1173,1174,1175,1176,1177,1178,1179,1180,1181,1182,1183,1184,1185,1186,1187,1188,1189,1190,1191,1192,1193,1194,1195,1196,1197,1198,1199,1200,1201,1202,1203,1204,1205,1206,1207,1208,1209,1210,1211,1212,1213,1214,1215,1216,1217,1218,1219,1220,1221,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