Swissnoso decision aid for the use of rapid antigen detection tests (RADTs) in acute care hospitals with limited access to PCR for diagnosing Covid-19 infections

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Introduction

For the detection of SARS-CoV-2 in nasopharyngeal samples, in addition to PCR-Testing the FOPH proposes the use of rapid antigen detection tests (RADTs) as part of its testing strategy for ambulatory care and contact tracing. In acute care hospitals PCR remains gold standard method to confirm Covid-19 infections, but rapid access to PCR-testing is often limited.

Recommendations

Where rapid access to PCR testing is limited, RADTs[1] may support rapid decision-making on patient management and isolation of symptomatic healthcare workers (HCWs). Clinicians considering RADT use need to be aware of their different sensitivity and specificity compared to PCR, how pretest probability[2] influences the interpretation of the result, and the risk of SARS-CoV-2 cases not being detected.

There are no exact data for RADT interpretation according to Covid-19 local prevalence/positivity rate. A recent evaluation of RADTs[3] proposed for use in Switzerland (Panbio, Abbott and SD Biosensor, Roche) showed high ability for RADTs to predict infection in a person with a positive test result (positive predictive value, PPV) of 99.4% and 100%, respectively), in a high-prevalence setting (positivity rates 23% and 36%, respectively). Another evaluation of RADTs, including the SD Biosensor estimated lower PPVs (more individuals testing falsely positive) for lower-prevalence setting, 92% (10% prevalence) and 53% (1% prev.), respectively. Conversely, the ability of RADTs (as of any test in general) to predict absence of infection (negative predictive value) is lower in high-prevalence setting (NPV Panbio 95.8%, SD Biosensor 94.1%), which may lead to undetected cases (due to false-negative results). It is recommended that for symptomatic individuals with negative RADT, PCR testing should be performed.

There are no specific values for local prevalence/positivity rates that would define high- or low prevalence setting. **The flow chart below provides a decision aid for the use of RADTs in acute care setting where rapid access to PCR testing is limited.**

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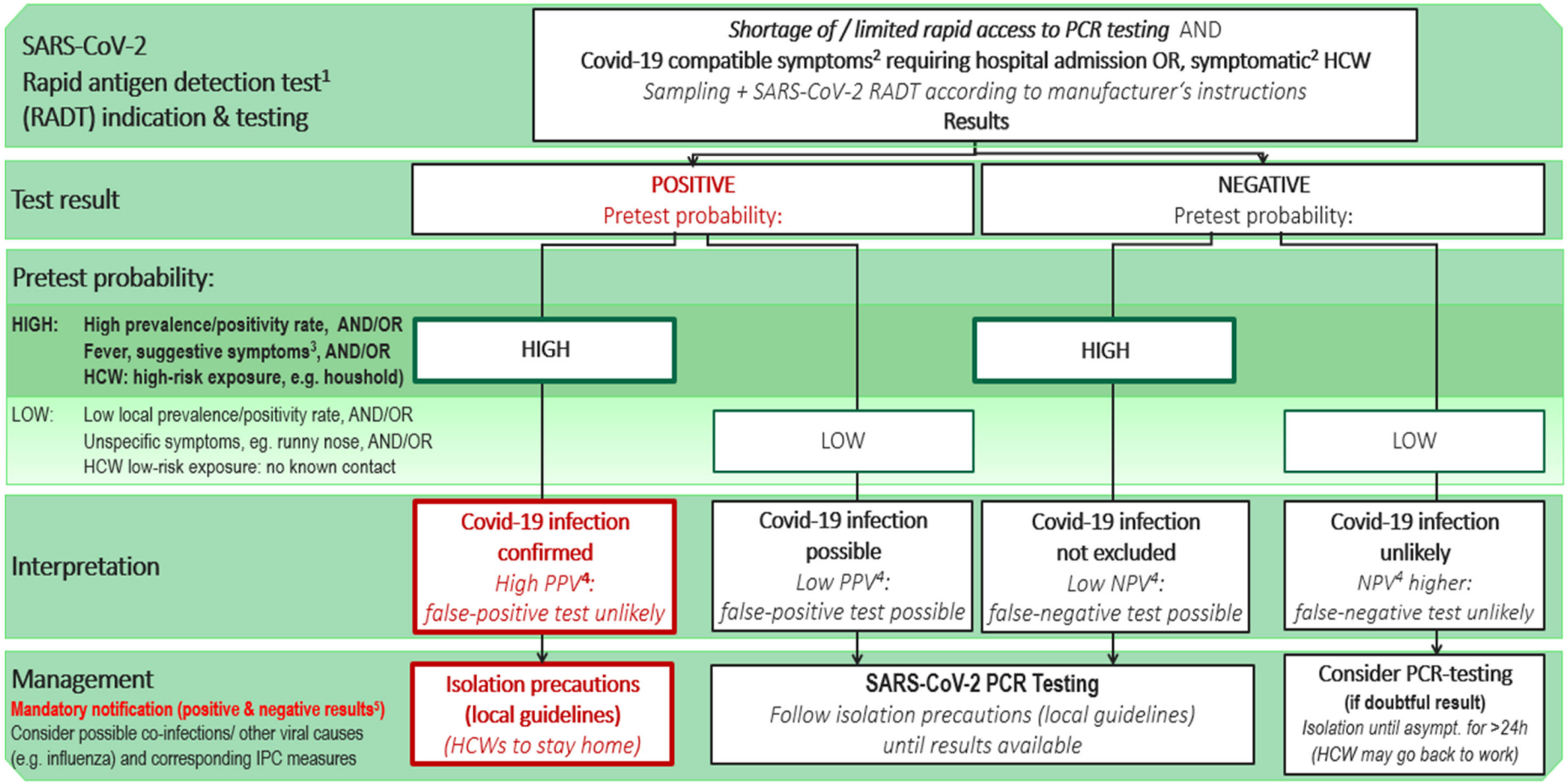
[1] RADTs meeting FOPH requirements see https://www.bag.admin.ch/bag/de/home/medizin-und-forschung/heilmittel/covid-testung.html#-1047800939

[2] Estimated probability of disease before test is performed, based on a local prevalence, clinical presentation (and in HCW if any known high-risk exposure, e.g. household/close contact positive), see also American Society for Microbiology: Why Pretest and Posttest Probability Matter in the Time of COVID-19, https://asm.org/Articles/2020/June/Why-Pretest-and-Posttest-Probability-Matter-in-the

[3] Of note is that in such evaluations different study methods and patient characteristics contribute to differences in observed test accuracy and performance. Evaluations: Geneva: largely symptomatic individuals, ≤4 days of onset and no comorbidities, accuracy: Sensitivity 85.5% (Panbio, Abbott) and 89% (SD Biosensor, Roche); Specificity 100% (Panbio, Abbott) and 99.7% (SD Biosensor, Roche), under: https://www.hug.ch/sites/interhug/files/structures/laboratoire_de_virologie/documents/Centre_maladies_virales_infectieuses/ofsp_rdt_report_gcevd_27.10.2020.pdf
Multi-center evaluation in Germany/UK on SD Biosensor in mostly symptomatic individuals, average of 3.7 days symptomatic, >70% with no comorbidities, accuracy: Sensitivity 76.6%; Specificity 99.3%, under: Krueger et al. medRxiv 2020. https://www.medrxiv.org/content/medrxiv/early/2020/10/04/2020.10.01.20203836.full.pdf

Flow chart: Decision aid on SARS-CoV-2 Rapid Antigen Detection Tests (RADT) use in acute care hospitals



[1] Antigen tests meeting FOPH recommendations, see https://www.bag.admin.ch/bag/de/home/medizin-und-forschung/heilmittel/covid-testung.html#-1047800939

[2] RADT sensitivity highest if symptom onset ≤ 4 days

[3] Suggestive symptoms include cough, sore throat, shortness of breath, chest pain and/or fever, sudden loss of sense of taste and smell, see also https://bag-coronavirus.ch/check/

[4] PPV Positive predictive value, NPV Negative predictive value

[5] See also https://www.bag.admin.ch/dam/bag/de/dokumente/mt/msys/covid-19-verdachts-meldekriterien.pdf.download.pdf/Verdachts_Beprobungs_und_Meldekriterien.pdf