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Guidelines

ESCMID guidelines on testing for SARS-CoV-2 in asymptomatic individuals to prevent transmission in the health care setting

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ABSTRACT

Scope: This guideline addresses the indications for direct testing of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in asymptomatic individuals in health care facilities, with the aim to prevent SARS-CoV-2 transmissions in these settings. The benefit of testing asymptomatic individuals to create a safe environment for patients and health care workers must be weighed against potential unintended consequences, including delaying necessary treatments owing to false positive results and lower quality of care owing to strict isolation measures.

Methods: A total of nine PICOs (population, intervention, comparison, outcome) on the topic of testing asymptomatic individuals was selected by the panel members. Subsequently, a literature search for existing guidelines and systematic reviews was performed on PubMed, Epistemonikos, and RecMap using relevant filters available in each database. Data on article/recommendation type, setting, target population, intervention, and quality of the evidence were extracted. Credibility of the systematic reviews was evaluated using the AMSTAR tool, and level of agreement with available recommendation was evaluated with the AGREE II score. Because the evidence available from systematic reviews was deemed insufficiently updated to formulate relevant recommendations, an additional search targeting relevant guidance documents from major public health institutions and original studies was performed. Provisional recommendations were discussed via web conferences until agreement was reached, and final recommendations were formulated according to the GRADE approach.

Recommendations: Recommendations were formulated regarding systematic testing in asymptomatic individuals upon admission to a health care setting, during hospital stay, before elective procedures, and before scheduled nonsurgical procedures. Moreover, recommendations regarding testing of asymptomatic visitors, personal caregivers, and health care workers in health care facilities were presented. Recommendations also were given on contact tracing in asymptomatic patients or health care workers and the possibility of a negative screening test to shorten the quarantine period. Furthermore, if applicable, recommendations were specified to transmission rate and vaccination coverage. **Elena Carrara, Clin Microbiol Infect 2022;28:672**
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Scope

Transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the health care setting can have devastating consequences for both patients and health care workers (HCWs) [1]. Additional infection prevention and control (IPC) practices have been universally recommended, along with standard measures to prevent the spread of SARS-CoV-2 in both acute care settings and long-term care facilities (LTCFs). Appropriate use of personal protective equipment (PPE), environmental cleaning, adequate room ventilation, social distancing, appropriate patient placement, controlled access to facilities, and a functioning testing strategy are all essential components of bundled interventions aimed at controlling health care transmission of SARS-CoV-2.

This guideline addresses the indications for direct testing of SARS-CoV-2 in asymptomatic individuals in acute care settings and LTCFs, with the aim to prevent transmission. This guideline does not include recommendations for the use of different testing methodologies for diagnosing SARS-CoV-2, which is addressed by an ESCMID (European Society of Clinical Microbiology and Infectious Diseases) dedicated guidance document (currently under development). Unless differently specified, positivity of testing refers to molecular detection of SARS-CoV-2–specific RNA in nasopharyngeal swabs.

Context

Although several documents provide recommendations for IPC measures to be implemented in hospitals and the community to reduce SARS-CoV-2 transmission [2–4], the present guidance is the first to specifically address management of testing procedures in asymptomatic individuals accessing health care settings (including LTCFs).

The WHO gives a strong recommendation to screen all patients for signs and symptoms at the first point of contact with the health care system to identify individuals with suspected or confirmed coronavirus disease 2019 (COVID-19) [5]. However, according to estimates from the US Centers for Disease Control and Prevention, 24% of infections are transmitted by the 30% of individuals who will never develop symptoms, and 35% is transmitted during the presymptomatic phase of the infection [6]. Thus, testing policies in asymptomatic individuals may play a key role in controlling transmission, in addition to only screening when there are signs and symptoms of suspected SARS-CoV-2 infection.

The present guidelines have attempted to balance the potential benefit of testing asymptomatic individuals in terms of creating a safe environment for patients and HCWs with potential unintended consequences such as the risk of delaying necessary treatments owing to false positive results and the risk of providing lower quality care owing to strict isolation measures. Although there is little to no evidence on the topic, the panel tried to address the issue of how testing policies should be adapted to different epidemiological settings and/or special patient populations. The definitions adopted to define these specific scenarios are detailed in Box 1.

BOX 1. Definitions used for epidemiological parameters and special populations.

Community transmission rate refers to the intensity of transmission of SARS-CoV-2 in the community. **Low transmission rate** refers to <40 cases per 100000 inhabitants in 14days and a test positivity rate <2%. Conversely, **high transmission rate** is determined by>300 cases per 100000 in 14 days and a >10% test positivity rate (Adapted from the ECDC thresholds and country classification [42]).

Vaccination coverage refers to the percentage of population with previous SARS-CoV-2 infection or vaccination. **High vaccination coverage** applies in a population with at least 60% who received full vaccination (includes those with past infection); low vaccination rate refers to a population with less than 60% of individuals who received full vaccination (includes those with past infection) [43].

Exposure risk: **High-risk exposure** refers to face-to-face or physical contact with an individual infected by SARS-CoV-2 within 2 m for more than 15 minutes or direct contact with excretions of a COVID-19 case, being in a closed area (i.e. the same hospital room, waiting room, or break room) or travelling with an individual infected by SARS-CoV-2 for more than 15 minutes, or giving care to a COVID-19 case without using proper PPE for HCWs. If the duration of the contact defined above is less than 15 minutes or if the health care professional who gives care to a COVID-19 case uses proper PPE, the risk is considered **low-risk exposure** [4].

Vulnerable populations refers to populations in which COVID-19 is known to be associated with worse clinical outcomes [2,44] and include people aged ≥60 years; those living in long-term care facilities; and people with underlying health conditions, such as hypertension, diabetes, cardiovascular disease, chronic respiratory disease, and weakened immune systems (patients undergoing immunosuppressive procedures as cytotoxic chemotherapy, solid organ or stem cell transplantation, biologic therapy, cellular immunotherapy, or high-dose corticosteroids).

Nonsurgical procedures refers to all procedures (invasive and not invasive) not involving surgery: physical examination; endoscopy; dental procedures; imaging; treatments to repair the effects of injury, disease, or malfunctions, including medicines, physical, and radiation therapies (therapeutic procedures); allied health treatments to improve, maintain, or restore a person's physical function (rehabilitative procedures); and cosmetic procedures to improve a person's physical appearance for aesthetic reasons.

Caregivers refers to individuals, including health professionals, family members, friends, social workers, or members of the clergy, providing care to hospitalized patients who need help taking care of themselves.

Consensus guideline development

The general principles and methodology applied have been described in the first paper of the ESCMID guidelines for COVID-19–related clinical topics [7]. A total of nine PICOs (population, intervention, comparison, outcome) on the topic of testing asymptomatic individuals in the health care setting were selected by the panel members via open discussion.

Literature search

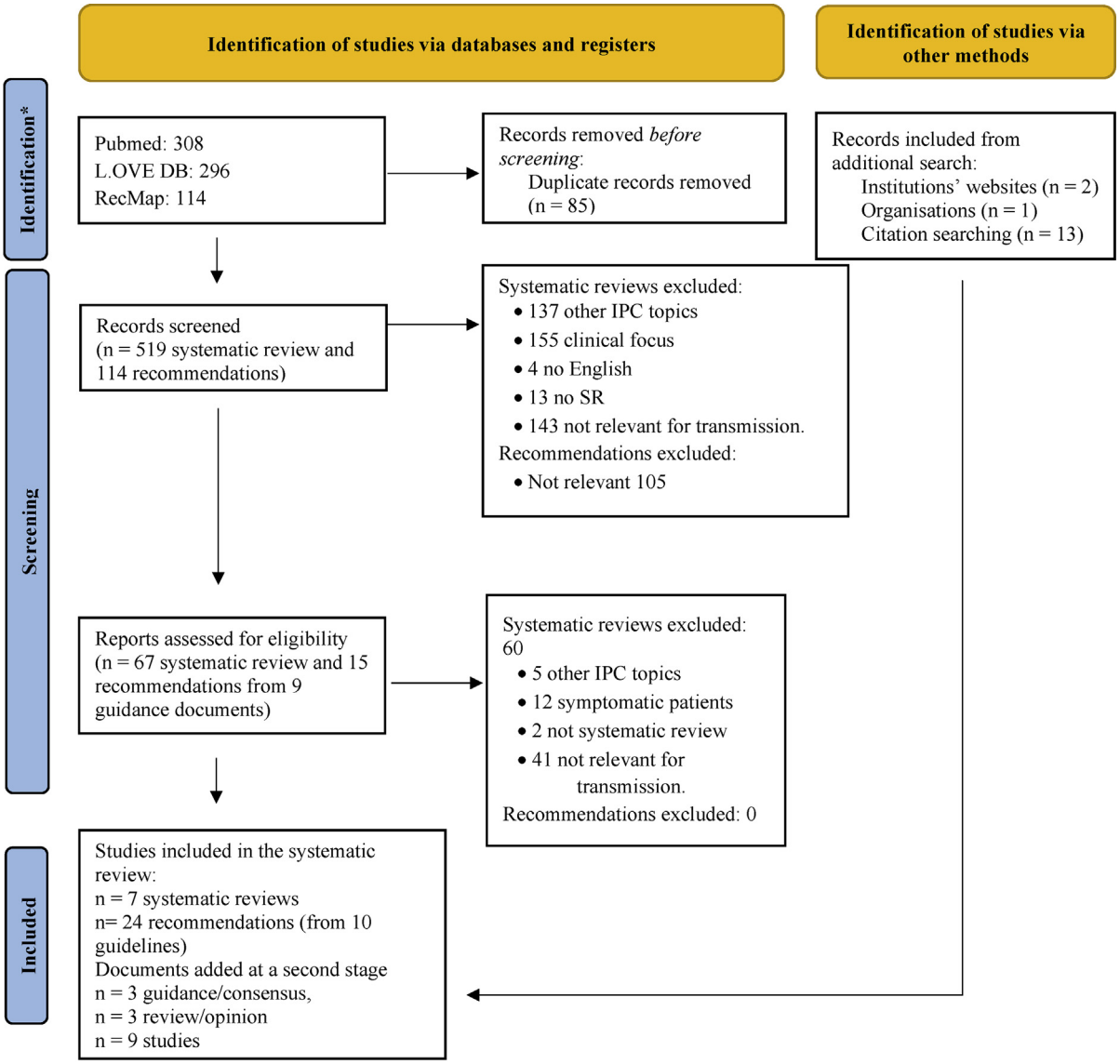
On May 7, 2021, a first broad search for systematic reviews was performed on PubMed, Epistemonikos DB, and RecMap using relevant filters available in each database. A first screening of abstracts and titles was performed by individual panellists, and a

second panellist verified a randomly selected set of articles to ensure consistency. Two reviewers independently assessed the full text of eligible papers for inclusion. A second systematic search targeting recommendations was conducted on December 27, 2021 to include the most updated versions in guideline development.

Systematic reviews assessing the efficacy of SARS-CoV-2 laboratory screenings in asymptomatic patients and HCWs for reducing transmission in the health care setting were included. Nonsystematic reviews, reviews in languages other than English, and systematic reviews dealing specifically with test accuracy, screening in symptomatic individuals, clinical issues, and public health interventions were excluded. There was no restriction on time of publication.

Data extraction

A single reviewer extracted data and recommendations from included papers to a predefined Excel file (Microsoft, Redmond, WA). A second reviewer was selected to double-check the data extracted for each paper and discuss any uncertainties. Relevant data on article/recommendation type, setting, target population, intervention, and quality of the evidence were extracted. Credibility of the systematic review was evaluated using the AMSTAR tool [8], and level of agreement with available recommendation was evaluated with the AGREE II score [9]. If recommendations were based on evidence and not only expert opinion, the evidence to which the



* The complete search was conducted on May 7th 2021 and recommendations updated on December 27th. Relevant documents were identified applying the following strategies to three databases:
1) Pubmed: ((SARS-CoV-2) AND LitCTRANSMISSION[filter]) filter by 'transmission' and SRs (MESH SARS-CoV-2)
2) L.OVE DB: search 'testing' (filter SRs)
3) RecMap: filter per recommendation intent: 'screening' AND 'diagnostic'

ABBREVIATIONS: DB database; SR systematic review; IPC Infection Prevention and Contro

Fig. 1. Search strategy and PRISMA flowchart.

recommendations refer to was also extracted and used in the process of adaptation (rather than accepting the individual recommendations).

Evidence adaptation, synthesis, and evidence update

After data extraction, each PICO was matched with available recommendations and systematic reviews. Because the evidence available from systematic reviews was deemed insufficiently updated to formulate relevant recommendations, a more extensive search targeting relevant guidance documents from major public health institutions and primary studies relative to specific emergent topics such as vaccination and variants of concern was performed.

A narrative synthesis of the evidence was drafted, and provisional recommendations made by each panellist were discussed via web conferences to reach agreement on final recommendations according to the GRADE approach [10].

A final set of seven systematic reviews and 15 recommendations (from nine guidance documents) were included in the systematic process. After screening of guidance documents, an additional 14 documents and one guideline document (with nine recommendations) were considered for the panel discussion. A schematic representation of the selection process is shown in Fig. 1.

The overall quality of the evidence was deemed low to very low. Only two systematic reviews were rated as high quality (i.e. the panel had high confidence in the results) on the AMSTAR scale, and the remaining five were all judged to be of low to critically low quality (i.e. the panel had low confidence in the results). Only 8 of the 23 included recommendations were formulated following the GRADE approach. The median and mean AGREE score for the recommendations were 55.3% (IQR 50.2%–70.2%) and 59.2% (±11.2%), respectively. Tables summarizing included documents and quality assessment are available as supplementary material (Tables S2 and S3).

Recommendations

Does systematic testing of asymptomatic patients on admission to a health care institution reduce transmission of SARS-CoV-2?

Evidence summary

Evidence was extracted from one systematic review [11] and the guidelines from the Infectious Diseases Society of America (IDSA) [12], the WHO interim guidance on IPC for LTCFs in the context of COVID-19 [5]. The systematic review included 61 studies. The data suggest that at least one-third of SARS-CoV-2 infections are asymptomatic and that nearly three-quarters of individuals who test positive for SARS-CoV-2 and have no symptoms at the time of testing remain asymptomatic [11]. Overall, the proportion of asymptomatic carriers of SARS-CoV-2 has been estimated to range from 30% to 85% according to the setting and case mix.

A clear understanding of the drivers of transmission is still lacking [11]. Several analyses have reported a very low level of detection (<1%) of asymptomatic patients infected by SARS-CoV-2 at hospital admission [13]. The number of patients to be screened to identify an asymptomatic carrier was estimated to be 425 in the first wave of the pandemic and 1218 in a low incidence phase [14]. According to the IDSA guidelines, testing of asymptomatic individuals should not be universally recommended when the community transmission rate is low [2]. An exception to this recommendation is immunocompromised patients admitted to dedicated wards, owing to the higher risk of severe COVID-19 compared with the general population. Along the same lines, the WHO recommends testing all residents admitted to LTCFs or after their transfer from other health care institutions. Following the US Centers for Disease Control and Prevention (CDC) recommendation for nursing homes, the panel agreed that 48 hours within transfer might be an acceptable time frame for testing [15].

Based on the evidence, the panel agreed that, except for these special populations, the efficacy of implementing systematic testing of asymptomatic patients at hospital admission is controversial within the setting of a low community transmission rate of SARS-CoV-2. Testing efficacy is highly dependent on the diagnostic test used and brings into question the cost–benefit ratio of such an intervention in a setting of low community transmission.

Recommendations

- The panel suggests universal testing of asymptomatic patients on hospital admission in areas with a high community transmission rate of SARS-CoV-2 and/or with low vaccination coverage (conditional recommendation, quality of evidence (QoE): low).
- The panel suggests universal testing of asymptomatic individuals who have been transferred between facilities in areas with a high community transmission rate of SARS-CoV-2 and/or with low vaccination coverage (conditional recommendation, QoE: low).
- The panel suggests universal testing of asymptomatic patients at admission in settings where immunocompromised individuals are hospitalized, regardless of the transmission rate of SARS-CoV-2 and extent of vaccination coverage (conditional recommendation, QoE: very low).
- The panel suggests testing of asymptomatic vulnerable individuals who have been transferred between facilities or residents before admission to an LTCF regardless of the community transmission rate of SARS-CoV-2 and extent of vaccination coverage (conditional recommendation, QoE: low).

Does systematic repetitive testing of asymptomatic patients during their hospital stay reduce transmission of SARS-CoV-2?

Evidence summary

No systematic review addressing this PICO question was retrieved. The IDSA guidelines [12] and the WHO interim guidance on IPC for LTCFs in the context of COVID-19 [5] were considered when formulating this recommendation, although both documents addressed repeated testing only in specific contexts (ongoing health care transmission in LTCFs) or in specific populations (transplant recipients, patients requiring major surgery).

As for testing on hospital admission, the panel concluded that in-hospital transmission is very likely dependent on the level of community transmission; thus, repetitive screening might help in reducing in-hospital spread of SARS-CoV-2. However, the risk of false positive results in settings with low transmission rates counterbalances the potential benefit of conducting systematic repetitive testing in the hospital setting. Additionally, the presence of other IPC measures (e.g. reduction of visitors, masking, high rate of vaccination) could also limit the utility of this measure.

Recommendations

- The panel suggests considering systematic repetitive testing (every 3–7 days) of asymptomatic, hospitalized individuals only in specific circumstances, including when there is a high level of community transmission or low vaccination rate, especially when other IPC measures are not appropriately in place (conditional recommendation, QoE: low).

- The panel suggests considering systematic repetitive screening in settings where immunocompromised individuals are admitted, regardless of community transmission, IPC measure, and vaccination coverage (conditional recommendation, QoE: very low).

Does systematic testing of asymptomatic patients prior to elective surgical procedures reduce transmission of SARS-CoV-2?

Evidence summary

Evidence was extracted from the guidelines of the IDSA [12], the National Institutes of Health COVID-19 Treatment [16], and the Interim IPC Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 Pandemic by the CDC [17]. No systematic review addressing this PICO question was identified. Preoperative testing has been reported to prevent on-site transmission of SARS-CoV-2 in patients with cancer [18]. Based on such considerations, the CDC recommends considering preprocedure screening by authorized nucleic acid or antigen detection assays to further reduce the risk of exposure in health care settings and to inform decisions about rescheduling elective procedures [19]. In line with this, the IDSA suggests performing SARS-CoV-2 RNA testing in asymptomatic patients undergoing major surgery (classified as a conditional recommendation based on a very low certainty of evidence), with the aim of deferring nonemergency surgeries in patients testing positive for SARS-CoV-2 and tailoring decisions about PPE use in aerosol-generating procedures when access to PPE is limited. However, it also points to the risk of false negative test results [2]. These recommendations were made both to prevent infections of HCWs during surgery and to reduce the risk of adverse outcomes for asymptomatic patients. According to the recommendations, testing should be performed as close to the scheduled surgery as possible (e.g. within 48–72 hours) [2]. The potential risk of poor clinical outcomes has also resulted in the National Institutes of Health recommendation to perform molecular diagnostic testing for SARS-CoV-2 before procedures that require anaesthesia in patients with cancer [16] and has led to a multidisciplinary consensus statement recommending that elective surgery not be performed within 7 weeks of a diagnosis of SARS-CoV-2 infection, unless the risks of deferring surgery outweigh the risk of postoperative morbidity and mortality [20].

Despite the very low level of evidence, the panel agreed to recommend preoperative testing of patients prior to elective surgery requiring anaesthesia, with the aim to prevent transmission in settings with high transmission and/or in which access to PPE is limited. The panel acknowledges the challenges around adherence to full PPE use during prolonged surgeries and the potentially heterogenous use of PPE, factors that would favour a recommendation to perform testing independent of local epidemiology. On the other hand, the panel agreed that HCWs should always consider patients as being potentially infected, given the potential for screening tests to not detect SARS-CoV-2, especially if extended time frames (i.e. more than 48 hours) are allowed between testing and surgery, as often is the case due to logistical issues.

Recommendations

- The panel suggests preoperative testing of asymptomatic patients 48–72 hours prior to elective surgery requiring anaesthesia to reduce exposure of HCWs in settings where there is a high transmission rate and/or low vaccination coverage rate and/or access to PPE is limited (conditional recommendation, QoE: very low).
- Preoperative testing of patients prior to elective surgery requiring anaesthesia might be considered in settings with a low transmission rate, high vaccination coverage, and proper access to PPE, to identify asymptomatic patients with SARS-CoV-2 who might be at increased risk of poor outcomes after surgery, independent of their vaccination status (good practice statement).

Does systematic testing of asymptomatic patients prior to scheduled nonsurgical procedures reduce transmission of SARS-CoV-2?

Evidence summary

No systematic review addressing testing of asymptomatic patients undergoing scheduled ambulatory care and/or invasive nonsurgical procedures was retrieved from the initial search. Some recommendations on specific procedures were extracted from the CDC interim ICP recommendations in the health care setting [17].

This group of patients can be highly heterogeneous, encompassing patients scheduled for aerosol-generating nonsurgical procedures [21], as well as those scheduled for (recurrent) medical consultation and/or treatment for underlying diseases (e.g. cancer, haematological diseases, organ transplant, chronic dialysis, or other chronic diseases) at a specialized health care facility.

According to some case series and retrospective studies, testing can be considered to protect vulnerable patients (e.g. patients with cancer or patients from LTCFs or psychiatric institutions). Testing may be considered especially in institutions or situations where PPE is not available and/or wearing appropriate PPE for all procedures is not possible [22–26]. However, apart from these special situations, universal testing must be carefully balanced against its potential drawbacks, such as intensity and logistics of hospital operations, type of patients, type of procedure, availability of testing and resources, and public intervention for containment of the pandemic. For patients undergoing aerosol-generating nonsurgical procedures, the CDC advises—in addition to the use of universal PPE and other measures of source control in the health care setting—that targeted SARS-CoV-2 testing of patients without signs or symptoms of COVID-19 might be used to identify those with asymptomatic or presymptomatic infection, for further risk reduction [17]. Depending on guidance from local and state health departments, testing availability, and how rapidly results are available, facilities can consider implementing preadmission or preprocedure diagnostic testing with authorized nucleic acid or antigen detection assays for SARS-CoV-2 [27].

Recommendations

- The panel advises careful assessment of the local infrastructure, logistics, organizational structure (availability and sufficient capacity of testing laboratories), staffing, and procedure-related risks before implementing testing of all patients prior to scheduled nonsurgical procedures (good practice statement)
- The panel discourages universal testing of patients prior to scheduled nonsurgical non–aerosol-generating procedures when vaccination coverage is high and/or during a period of low community transmission and when other IPC measures are in place and rigorously controlled (conditional recommendation, QoE: very low)
- The panel suggests considering testing asymptomatic patients before nonsurgical aerosol-generating procedures in settings with high community transmission and/or when other IPC measures cannot be rigorously implemented and controlled (conditional recommendation, QoE: very low)
- The panel suggests that when recurrent ambulatory care is delivered to vulnerable patients, testing might be considered to

support prevention of and/or control transmission (conditional recommendation, QoE: very low)

Does systematic testing of asymptomatic patients who have been in contact with SARS-CoV-2 cases reduce transmission of SARS-CoV-2 in the health care setting compared to quarantine only?

Evidence summary

The evidence was extracted from CDC Interim IPC Recommendations for HCWs to prevent SARS-CoV-2 spread in nursing homes [15] and from the ECDC report for contact tracing [4]. No systematic review on this topic was retrieved. The risk of transmission of SARS CoV-2 from an infected case to an individual mainly depends on the level of exposure risk. High- and low-risk exposures are usually defined based on the type (direct or indirect) and duration of contact, physical distance from the source, and area of exposure (closed or opened area). If the contact occurs in a health care setting, appropriate use of PPE in case of contact also affects the risk of transmission [4]. The decision of testing and applying IPC measures depends, therefore, on the level of exposure risk.

For high-risk exposure contacts, the CDC recommends implementing isolation in a separate room, testing immediately (at least 2 days after the contact), and active close follow-up for symptoms [28]. Whenever possible, isolation of high-risk contacts in single rooms is preferred, but cohort isolation according to exposure time might also be considered if not enough single rooms are available. If the first test is negative, the appropriate time for retesting is not clearly defined for this situation, although based on the evidence from contact tracing for HCWs the CDC suggests testing again on the fifth to seventh day of contact [17]. Further comprehensive testing of all residents and staff weekly or biweekly depending on testing capacity is recommended [17]. For low-risk exposure contacts, the ECDC suggests self-monitoring for development of symptoms; however, if the population is vulnerable or transmission is likely to occur, testing is recommended [4].

The CDC suggests testing residents of LTCFs who have had high-risk contact with a confirmed COVID-19 case regardless of vaccination status; testing is recommended immediately (at least 2 days after the contact), and if negative, retesting at 5–7 days after exposure [15].

Recommendations

- The panel suggests immediately testing asymptomatic hospitalized patients who have had high-risk-exposure contacts with SARS-CoV-2 cases, along with isolation in a separate room and close follow-up for symptoms. If negative, patients should be tested again at 5–7 days after contact, regardless of vaccination status (strong recommendation, QoE: very low)
- The panel suggests monitoring for the development of symptoms among low-risk exposure contacts, although if the hospitalized patient population is vulnerable or transmission is likely, testing is recommended (strong recommendation, QoE: very low); if low-risk exposure occurs, patients can be cohorted in the same room or discharged when possible (good practice recommendation)
- The panel suggests immediately testing residents of LTCFs who have had high-risk-exposure contact with SARS-CoV-2 cases, along with isolation in a separate room and close follow-up for symptoms, regardless of vaccination status. The panel suggests testing immediately (at least 2 days after the contact) and, if negative, testing again at 5–7 days after contact (strong recommendation, QoE: very low).

Does a negative screening test on a given day allow cessation of quarantine in asymptomatic patients who have been in contact with SARS-CoV-2 cases compared to a predefined quarantine period?

Evidence summary

The evidence was extracted from two international guidelines that provide recommendations regarding cessation of a predefined quarantine period for asymptomatic patients who have been in contact with a SARS-CoV-2–positive case when they are screened and tested negative for SARS-CoV-2 [4,29]. No systematic review addressing this topic was retrieved. Although not specified for hospitalized patients, the CDC guidelines allow reduced duration of post-exposure quarantine to 7 days after last exposure when an individual remains asymptomatic and has a negative test [29]. The specimen may be collected and tested within 48 hours before the time of planned quarantine discontinuation, but quarantine cannot be discontinued earlier than after day 7. The ECDC guidelines recommend that a negative RT-PCR test at day 10 can be used to discontinue quarantine earlier, but they also recommend that early release from quarantine be assessed on a case-by-case basis, such as contacts in high-risk settings [4]. Although there is an association between cycle threshold (Ct) values and virus transmissibility, there is no strong evidence supporting the use of a certain Ct-value threshold in guiding decisions about early release from isolation [27].

The panel members have had substantial experience with routine testing several days after the last exposure to a confirmed COVID-19 case and ending quarantine if the PCR test is negative; there was no experience of transmission or outbreaks after ending quarantine earlier. Most SARS-CoV-2 infections are detectable by PCR in the first week after infection. The probability of a false negative test may be lowest about 1 week after exposure [30]. Furthermore, multiple mathematical models show that appropriately timed testing can make shorter quarantines effective [31–33]. Earlier cessation of quarantine may reduce both costs and the burden on health care systems. In non–health care settings, negative testing of quarantined student contacts of confirmed cases after 9 days did not result in missed COVID-19 cases that became apparent thereafter [34]. With the emergence of variants of concern and the possibility of breakthrough infections in vaccinated individuals, testing should be considered in both vaccinated and unvaccinated individuals.

Recommendations

- The panel recommends that a negative PCR test in an asymptomatic individual at least 7 days after being exposed to a confirmed COVID-19 case can be used to shorten the quarantine period (strong recommendation, QoE: low).

Should systematic testing of asymptomatic visitors or personal caregivers be performed at first hospital visit and regularly thereafter?

Evidence summary

Evidence was extracted from the WHO interim guidance on recommendations for national SARS-CoV-2 testing strategies and diagnostic capacities [19], the WHO living guidance on COVID-19 clinical management [22–25]. We did not identify any systematic review that directly assessed SARS-CoV-2 testing of visitors or personal caregivers in home-like settings, and evidence was extracted from two systematic reviews evaluating indirect data from the general populations [11,35]. The systematic review by Oran and Topol found that the proportion of the general population who tested positive but had no symptoms at the time of testing

ranged from 6.3% to 100%, with a median of 65.9% (IQR, 42.8%–87.0%) [11]. Sah et al. found that at the time of testing, 42.8% (95% prediction interval: 5.2%–91.1%) of cases exhibited no symptoms [35]. According to both systematic reviews, the proportion of new infections caused by asymptomatic persons remains uncertain.

Widespread testing of asymptomatic individuals in the community is not currently recommended by the WHO owing to the significant costs and lack of data on its operational effectiveness [19]. The WHO recommends testing of asymptomatic individuals for specific groups only, including contacts of confirmed or probable COVID-19 cases and frequently exposed groups such as HCWs and those working at LTCFs [19]. Potential harms of testing include inefficient use of testing capacity and false positive results potentially adversely affecting patient care, especially when using rapid point-of-care tests [36]. On the other hand, testing might contribute to create a safer environment and could be considered as a strategy to attenuate restrictive policies, especially for patient populations who particularly suffer from isolation.

Based on the available indirect evidence, the panel agreed that the efficacy of systematic testing of asymptomatic visitors and caregivers at hospital visit remains highly controversial, especially in settings with a low prevalence of SARS-CoV-2. The panel also agreed that in specific settings with vulnerable patients, including those with a severely compromised immune system, testing visitors or caregivers might be considered. The panel acknowledged that visitor and personal caregiver settings and health care resources may be highly variable among countries and health care systems, implying that different choices will be appropriate for different settings; clinicians and local policymakers should thus be prepared to make a decision that is consistent with the setting.

Recommendations

- The panel suggests universal testing of asymptomatic visitors at first hospital visit and regularly thereafter (3–7 days) in special circumstances only, including when there is a high level of community transmission or low vaccination rate, especially in health care settings where vulnerable patients are admitted, independent of their vaccination status (conditional recommendation, QoE: very low).

Does systematic testing of asymptomatic health care workers reduce transmission of SARS-CoV-2?

Evidence summary

Evidence has been extracted from the WHO interim guidance on IPC for LTCFs in the context of COVID-19 [19], the CDC overview of testing for SARS-CoV-2 (COVID-19) [27], and two systematic reviews [37,38]. In the systematic review by Viswanathan et al., only one of the included studies addressed the issue of transmission reduction through testing of asymptomatic HCW in emergency departments via a mathematic model. The model showed that, regardless of transmission constants, both weekly and biweekly testing of HCWs in emergency departments can reduce infections in patients and HCWs, with no detected harms of testing [37]. The second systematic review focused on LTCFs and concluded that repeated and/or point prevalence (mass) testing of residents, with or without staff testing, contributed (along with other measures) to reduction of transmission in LTCFs [38]. According to the WHO interim guidance for LTCFs, frequency of HCW testing highly depends on the level of transmission within both the facility and the community [19]. In outbreak situations, frequent testing of all residents and HCWs is recommended (i.e. from two to three times to once weekly, depending on capacity and resources), until no new cases are detected. The same applies when a positive case is detected, and regular syndromic surveillance and/or laboratory testing among HCWs is recommended to ensure early detection of SARS-CoV-2 infection. The guidance concludes that surveillance is a prerequisite for the safety of both patients and HCWs and outbreak control. According to the CDC, there is evidence to recommend testing asymptomatic HCWs in LTCFs, regardless of their exposure to SARS-CoV-2 [27]. In accordance with the WHO, the CDC states that testing frequency is informed by the local epidemiology (level of transmission), facility characteristics, and incubation period. The latter point, in conjunction with the purported lower sensitivity of rapid antigen tests, supports the CDC recommendation for at least weekly RT-PCR testing when there is high risk of transmission. Finally, the CDC mentions that vaccination status should not affect either the results of SARS-CoV-2 viral tests or the recommendation for testing in health care settings experiencing a SARS-CoV-2 outbreak [17].

Recommendations

- The panel suggests considering repeated testing (every 3–7 days) of asymptomatic HCWs as a measure to reduce health-care-setting transmission of SARS-CoV-2, especially in situations with high community transmission and/or in settings where vulnerable patients are cared for, regardless of vaccination status (conditional recommendation, QoE: low).
- The panel suggests systematic testing of asymptomatic HCWs two to three times per week in settings where outbreaks are detected, regardless of vaccination status, until no new cases are detected (strong recommendation, QoE: low).

Does testing asymptomatic HCWs who have been exposed to SARS-CoV-2 cases reduce transmission of SARS-CoV-2 in the health care setting compared to no testing?

Evidence summary

The evidence was extracted from the ECDC technical report on contact tracing, the WHO guidance on infection prevention in LTCFs, and two systematic review addressing universal screening [3,4,38,39]. No systematic review specifically assessing the effectiveness of testing versus no testing of asymptomatic HCWs after high-risk exposure was retrieved from the initial search. The available guidelines, mainly based on expert opinion, agree on recommending immediate testing after high-risk contact with SARS-CoV-2–infected individuals to detect asymptomatic infection in HCWs employed in health care facilities [4] and nursing homes [3]. During the following 10 to 14 days, HCWs are generally required to self-monitor for symptoms while observing physical distancing and undergo repeat testing at different time points. Although quarantine of strict contacts of SARS-CoV-2 cases is a widely adopted measure to control transmission, HCWs might not always be required to self-isolate owing to their role as essential frontline workers. Different recommendations about the need for quarantine have been issued if exposure is at high risk [28] or if the staff is unvaccinated [40]. However, testing at baseline and after 5 to 7 days remains strongly advised by major available guidance documents, even in presence of low transmission or high vaccination rates [4,41].

Two systematic reviews have addressed the utility of mass testing in special settings such as cancer treatment institutions [39] and LTCFs [38], underlying the importance of testing patients and HCWs during outbreak situations, independent of the risk of exposure. This strategy is recommended in the presence of nosocomial transmission, either in a hospital ward or in an LTCF, by the WHO and the ECDC with the aim of detecting ongoing asymptomatic infections among patients or HCWs.

Recommendations

- Independent of vaccination status, the panel recommends testing asymptomatic HCWs immediately and at least 5 to 7 days after high-risk exposure to SARS-CoV-2 (strong recommendation, QoE: very low).
- Regardless of the degree of exposure, in the following 14 days, HCWs should continuously self-monitor for symptoms (good practice recommendation).
- In the presence of documented nosocomial transmission of SARS-CoV-2 within a circumscribed health care setting, all HCWs and patients attending the specific setting should undergo screening for SARS-CoV-2 regardless of the degree of exposure and individual vaccination status (good practice recommendation).

Future considerations

Of note, testing policies should always be implemented after careful consideration of resources, infrastructure capacity, and logistical issues. Health care facilities adopting testing policies regarding asymptomatic individuals should make appropriate plans for what test should be used and in what context (e.g. facility type and resources, patient risk factors). Moreover, when testing policies are implemented, adequate logistics and infrastructure should guarantee that asymptomatic patients who test positive continue to receive the best possible care. If testing capacity is limited, expert consensus from the WHO suggests that testing of symptomatic individuals should be prioritized over testing of asymptomatic individuals [19].

Lastly, all recommendations reported herein are based on limited evidence and must be reassessed periodically (at least every 6 months) in light of changes in the epidemiological scenario due to new viral variants, new emerging evidence on efficacy of IPC measures, vaccination coverage, efficacy among HCWs and the public, and the vulnerable population admitted to hospital.

Transparency declaration

All authors have no conflict of interest to declare. The project received a grant from ESCMID for medical writing assistance.

Author contributions

All authors contributed to the PICO selection, the literature search, the data extraction and the drafting of the recommendations. ET chaired the panel and supervised the work. EC and DYO drafted the manuscript. All authors have reviewed and approved the manuscript.

Updating

The panel will periodically assess the need for further update of the present document (at least every 6 months). The need for update will consider new PICOs or revision of prior PICOs. The methodology will be the same as the present document.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cmi.2022.01.007.

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