

Swissnoso recommendations on COVID-19 preventive measures in acute care hospitals

v3, 12th May 2022.

Changes since v2: Sections/questions with significant content updates (including considerations for the pediatric setting) are highlighted in BLUE color

This document provides recommendations for maintaining preventive measures in acute care hospitals while precaution measures in the community have been lifted. It contains minimum recommendations to prevent nosocomial transmissions and protect vulnerable patientsⁱ and healthcare workers (HCWs) while restoring routine health care functioning to pre-pandemic levels (e.g., full elective surgery program) and focusing on general IPC issues.

The recommendations cover (1) general preventive measures; (2) measures related to patients with suspected or confirmed COVID-19; (3) further measures concerning HCWs; (4) large nosocomial outbreaks; and (5) diagnostic aspects. They may be adapted to local epidemiology and setting.

Any cantonal regulations need to be followed. Swissnoso will continue to monitor the situation and issue periodic updates.

1. General preventive measures in hospitals regarding COVID-19	
Situation/Question	Measures
Wearing (surgical) masksⁱⁱ	<ul style="list-style-type: none"> – Patients (including outpatients) <ul style="list-style-type: none"> ○ mandatory for those with symptoms of a respiratory infection (also see section 2 below) when outside the bed or in direct contact with other patients, HCWs, or visitors – Staffⁱⁱⁱ <ul style="list-style-type: none"> ○ mandatory for those with symptoms of a respiratory infection or for asymptomatic individuals confirmed to have a respiratory virus infection by laboratory testing (see also section 3 below) ○ when in contact with patients at high riskⁱ (e.g., severely immunosuppressed/transplant patients) <p><i>Evaluate transmission risk according to local epidemiology and other situations/factors (e.g., new variants of concern, autumn/winter season, the severity of disease, or staff shortage) when enhanced IPC measures need to be considered: → see also section 4 (below)</i></p>

ⁱ according to the FOPH definition (persons with chronic diseases with the highest risk, COVID-19 mRNA-Impfempfehlung, 07.01.2022), under <https://www.bag.admin.ch/dam/bag/de/dokumente/mt/k-und-i/aktuelle-ausbrueche-pandemien/2019-nCoV/covid-19-tabelle-2-impfempfehlung.pdf.download.pdf/Krankheitsdefinitionen%20f%C3%BCr%20Personen%20mit%20chronischen%20Krankheiten%20mit%20dem%20h%C3%B6chsten%20Risiko%20-%20Tabelle%20%20der%20Covid-19%20mRNA-Impfempfehlung.pdf>

ⁱⁱ the term surgical (protective) mask refers to high-quality surgical masks of type II/IR, according to EN 14683; beware of any medical contraindications for wearing masks; at-risk individualsⁱ may continue using masks/FFP-2 respirators for self-protection (e.g., patients with high-risk due to immunosuppression, etc.)

ⁱⁱⁱ FFP2 respirators and goggles for HCWs performing aerosol-generating procedures when there is high population incidence of COVID-19 (AGPs, see also note below, section 2) ^{iv} exceptions may be granted for specific situations (e.g., caregivers of hospitalized children; emergencies, childbirth, or dying patients)

<p>Further preventive measures</p>	<ul style="list-style-type: none"> - Patients (including outpatients) and accompanying caregivers (for pediatric patients) <ul style="list-style-type: none"> o promote a complete vaccination status for COVID-19, including booster(s) and influenza in all patient groups (as per national guidelines) o follow basic hygiene measures wherever possible (especially correct hand hygiene) - HCWs <ul style="list-style-type: none"> o promote a complete vaccination status for COVID-19, including booster(s) and influenza as per national guidelines - Visitors <ul style="list-style-type: none"> o should not visit the hospital if they have symptoms of a respiratory infection (or if they are known to be infected by laboratory tests)^{iv,v} o instruct visitors to thoroughly disinfect their hands before and after contact with the patient <p>Important: <i>continue to enforce the 'respiratory etiquette'</i> ^{vi} <i>(independently from COVID-19), which includes to</i> - <i>cover mouth and nose with a tissue when coughing or sneezing (or, if not available, to cough/sneeze into the upper sleeve or elbow);</i> - <i>dispose of the tissue after use into the nearest waste bin; and,</i> - <i>thoroughly disinfect the hands after having contact with respiratory secretions and contaminated objects/materials</i></p>
<p>Testing symptomatic individuals^v</p>	<ul style="list-style-type: none"> - Immediate testing (ideally by PCR) if COVID-compatible symptoms in patients/any accompanying caregivers or HCWs <p><i>Important: provide easy access to adequate testing options</i></p>
<p>Screening of asymptomatic patients</p>	<p>Consider for hospital wards with high transmission risk or in specific situations (elective admissions, e.g., patients undergoing surgery or immunosuppressive therapy; or in nosocomial outbreaks, if ≥ 3 positive patients within five days on the same ward)^{vii}:</p> <ul style="list-style-type: none"> - screening on admission to the ward - repetitive screening during the stay (at least 1x/week) <p><i>Regardless of vaccination status, evaluate transmission risk by considering local epidemiology, ward structure/design (multi-bedrooms, shared bathrooms, etc.) or high-incidence populations (risk-based or "targeted" screening approach). In addition to IPC reasons, asymptomatic patients might also be screened for medical reasons (e.g., severe immunosuppression; before surgery and elective procedures)</i></p>
<p>Screening of (asymptomatic) HCWs</p>	<ul style="list-style-type: none"> - as part of nosocomial outbreak investigations (if ≥ 3 positive patients within five days in the same unit/ward) <p><i>Regardless of vaccination status, consider local epidemiology/risk; any cantonal regulations for routine screening to be followed</i></p>

^{iv} exceptions may be granted for specific situations (e.g., caregivers of hospitalized children; emergencies, childbirth, or dying patients)

^v for SARS-CoV-2/other pathogens as indicated (syndromic surveillance), as per FOPH criteria https://www.bag.admin.ch/dam/bag/de/dokumente/mt/msys/covid-19-verdachts-meldekriterien.pdf.download.pdf/Verdachts_Beprobungs_und_Meldekriterien.pdf

^{vi} Adapted from Centers for Disease Control and Prevention. Respiratory Hygiene/Cough Etiquette, 2021, available online under <https://www.cdc.gov/oralhealth/infectioncontrol/faqs/respiratory-hygiene.html>

^{vii} count only patients (not HCWs); more detailed explanation of nosocomial outbreaks can be found in this recent publication <https://doi.org/10.1186/s13756-020-00875-7>

2. Preventive measures concerning patients with suspected or confirmed COVID-19 (and any accompanying caregivers, e.g., in pediatric patients)	
On admission to hospital (emergency department or wards)	<p>According to local infection control guidelines</p> <ul style="list-style-type: none"> – the patient must wear a surgical mask until he/she is in the isolation room – employees must protect themselves (see below: protective measures) – the hospital hygiene/IPC team should be informed timely about each case
Isolation precautions for suspected cases irrespective of symptoms ^{v, viii}	<p>According to local infection control guidelines</p> <ul style="list-style-type: none"> – contact and droplet precautions; whenever possible, isolation in a single room – isolation at the patient bedside is permitted for cooperative patients but should be kept as short as possible (spatial separation, for example, by marking on the floor or employing folding screens)
Isolation precautions for confirmed cases	<p>According to local infection control guidelines</p> <ul style="list-style-type: none"> – contact and droplet isolation in single rooms or cohort rooms <li style="background-color: #00ffff; padding-left: 20px;">o in pediatric setting: consider that cohorting of patients may lead to exposure of accompanying caregivers – mandatory declaration of confirmed cases to the cantonal physician's office according to cantonal or the FOPH directives
Protective measures when providing care for patients with suspected or confirmed COVID-19	<p>According to local infection control guidelines</p> <ul style="list-style-type: none"> – surgical mask for routine care – FFP2^{ix} or equivalent respirators as indicated (for defined situations^x and aerosol-generating procedures AGPs^{xi}) – standard precaution measures (incl. respiratory etiquette and avoiding touching eyes, nose, and mouth) <p style="background-color: #d3d3d3;"><i>Eye protection/goggles: for nasopharyngeal swabs and any other possible exposures to respiratory secretions (e.g., if the distance to the patient is less than 1.5m, high flow oxygen supply, etc.)</i></p> <p style="background-color: #d3d3d3;"><i>Gown: if contact with respiratory secretions, (potential) contact with other body fluids/substances, and/or close physical contact with patient.</i></p> <p style="background-color: #d3d3d3;"><i>Gloves: in case of contact with respiratory secretions and (potential) contact with other body fluids/substances</i></p>
AGPs Aerosol-generating procedures	<ul style="list-style-type: none"> – FFP2 respirators (wear until 30 min after the AGP has been completed) and goggles

^{viii} probability of SARS-CoV-2 reinfection may increase with time after recovery. Further, in some patients, SARS-CoV-2 RNA is detectable in PCR over a longer period; therefore clinical-epidemiological correlation is necessary. Cycle threshold (Ct) values and/or alternative diagnoses to be considered. CDC. Duration of Isolation and Precautions for Adults with COVID-19, 14th Jan 2022 <https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html>

^{ix} further information FAQ on respirators as PPE in the context of COVID-19: https://www.seco.admin.ch/seco/de/home/Arbeit/Arbeitsbedingungen/Produktsicherheit/produktesicherheit_faq_covid19.html

^x in case of: close, prolonged contact (especially if close to the patient's airways); enhanced patient respiratory activity other than quiet breathing; patient unable to wear a mask; poor room ventilation. See also: Swissnoso recommendations on the use of FFP2 respirators for healthcare workers with direct contact to COVID-19 patients in acute care hospitals <https://www.swissnoso.ch/forschung-entwicklung/aktuelle-ereignisse>

^{xi} Evidence-based AGPs include intubation; tracheotomy or tracheostomy procedures; non-invasive ventilation; bronchoscopy. Aerosol formation possible, but no clear evidence: e.g., induced sputum; high-frequency ventilation/high-flow (Optiflow); laryngoscopy; endoscopy of the upper gastrointestinal tract; cardiopulmonary resuscitation; open suction system; invasive ventilation via tracheostomy (w. single-tube system, Stellar). Bronchoscopy: indication as per consultation with chest medicine, ID, and/or hospital infection control staff (intensive care staff if patient in intensive care). Rooms for aerosol-generating activities: AGPs should take place in the most appropriate hospital space for this purpose (possible criteria: negative pressure room, HEPA filter device in the room, UV disinfecting recirculating air devices, frequent air circulation, regular window opening)

Inpatient isolation duration	<ul style="list-style-type: none"> – at least 7 days from symptom onset or first positive test (in the absence of symptoms) <ul style="list-style-type: none"> o OR five days if the patient has at least ONE PCR test negative (or high Ct value, e.g., >30) or a negative RADT o OR no further isolation after the patient has been discharged home – if severe immunosuppression: <ul style="list-style-type: none"> o at least 14 days from symptom onset or first positive test (in the absence of symptoms) o consider repeat testing and/or infectious disease/IPC team consultation <p><i>Remark: end isolation only if clear clinical improvement and no fever for 48h. If in doubt, consider repeating tests to determine infectiousness</i></p>
Inpatient quarantine duration	<ul style="list-style-type: none"> – after unprotected face-to-face contact^{xii} with a confirmed COVID-19 case in or outside the hospital – at least 5 days from the last contact with a positive case <ul style="list-style-type: none"> o monitor for symptoms, test if symptoms develop o in case of high community incidence: testing on day 5 to exclude asymptomatic infection – isolation precautions: same as for suspected cases (see above)
Environmental cleaning and disinfection	<ul style="list-style-type: none"> – according to local guidelines, e.g., daily cleaning and disinfection of high-touch surfaces and toilets in hospital areas with confirmed and suspected Covid-19 patients
Handling of patient samples (incl. laboratory)	<ul style="list-style-type: none"> – according to P2 safety measures – for external transport, according to standard category B (UN 3373) regulations
Laundry, instruments, dishes, waste	<ul style="list-style-type: none"> – according to local guidelines <p><i>Remark: dishes and laundry are not common sources of infection</i></p>
Procedure in case of death	<ul style="list-style-type: none"> – standard precaution and burial measures – for autopsies: in addition to standard hygiene measures, FFP2 respirators should be worn during AGPs

^{xii} spending more than 15 minutes (cumulative: in case of repeated contact, exposure times add up) within 1.5 metres of someone who tested positive for COVID-19 with neither the exposed person nor the source wearing a mask (± goggles see above)

3. Further measures concerning HCWs	
Symptomatic HCWs	<ul style="list-style-type: none"> – Immediate testing ^v and decision as per PCR result: – <u>SARS-CoV-2 negative and:</u> <ul style="list-style-type: none"> ○ <u>mild respiratory symptoms only and no fever:</u> may continue to work <i>Important: excellent adherence to standard precautions</i> ○ <u>more severe symptoms or fever:</u> as per local staff sickness policy or occupational health review if needed – <u>SARS-CoV-2 positive and:</u> <ul style="list-style-type: none"> ○ mild respiratory symptoms only and no fever: stay off work for a minimum of 48h ○ more severe symptoms or fever: return to work only after a substantial decrease of symptoms and if no fever for the past 48h ○ <i>After returning to work, HCW to follow additional measures ^{xiii} (for a total of 7 days from symptom onset)</i> <p style="background-color: #e0e0e0; padding: 5px;"><i>Remark: This recommendation applies regardless of vaccination status</i></p>
Asymptomatic HCWs with confirmed COVID-19	<ul style="list-style-type: none"> – Stay off work for a minimum of 48h <i>After returning to work, follow additional measures ^{xiii} (for a total of 7 days from the first positive test)</i> <p style="background-color: #e0e0e0; padding: 5px;"><i>Remark: This recommendation applies regardless of vaccination status</i></p>
Exposed HCWs after close contact ^{xii} with a positive case	<ul style="list-style-type: none"> – consider following additional measures ^{xiii} at work for five days from the last close contact to a positive case – careful self-monitoring for symptoms for five days (refrain from work and test immediately if symptoms develop, even if mild) <p style="background-color: #e0e0e0; padding: 5px;"><i>Remark: This recommendation applies regardless of vaccination status and regardless of whether exposure inside vs outside the hospital</i></p>

^{xiii} Measures (in addition to excellent adherence to standard precautions): The HCW in question should 1. avoid crowded areas and, preferably take meals/breaks alone in a ventilated room; 2. **encourage high risk persons ⁱ in close proximity (patients, staff) to wear a mask during direct contact** 3. the HCW in question to consider wearing an FFP2 mask (instead of a surgical mask). 4. for HCWs working in high-risk units (e.g., bone marrow transplant, severely immunosuppressed patients) or those with prolonged symptoms (e.g., five days or more): consider reassignment to other duties (not involving high-risk interactions) and/or occupational health review before return to direct patient care

4. Enhanced IPC measures to consider in case of large nosocomial outbreaks of COVID-19 ^{vii}	
On the affected wards	<ul style="list-style-type: none"> - broader testing of asymptomatic patients and HCWs, if ≥ 3 nosocomial cases within 5 days in the same unit/ward <ul style="list-style-type: none"> o important: easy access to individual PCR testing - frequent testing every 1-3 days (independent of vaccination status) until no new cases are identified for at least 14 days (or, if high population incidence: no new cases identified in 1-2 screening rounds)
In uncontrolled outbreaks	<ul style="list-style-type: none"> - if population incidence is high and/or there is severe staff shortage: universal masking (incl. in non-clinical areas) may be necessary to lower transmission risk - introducing mandatory FFP2 masks for all HCWs working with patients on the affected wards (or in the entire hospital) - increased interspacing and closing of beds on the affected wards - implement measures to improve room ventilation (no clear evidence for benefit but unlikely to harm) <p><i>If ongoing transmission occurs despite all preventive measures being in place: an outbreak team to be put into place to evaluate adherence to all recommended precautions and/or the need for further/general measures according to Swissnoso outbreak recommendations^{xiv} under consideration of local epidemiology</i></p>

^{xiv} <https://www.swissnoso.ch/forschung-entwicklung/mdro-richtlinien>

5. Diagnostic aspects regarding COVID-19	
<p>Different diagnostic methods (listed below^{xv}) may detect SARS-CoV-2 infection in symptomatic or asymptomatic individuals. In addition, chest imaging (e.g., via computed tomography, CT) may identify COVID-19 disease manifestations. For the interpretation of test results and to determine patient infectiousness, the type, quality, and timing of samples, as well as diagnostic methods used (in relation to the disease course), need to be taken into account. Combining different diagnostic methods may help to improve diagnostic yield and guide further management.</p>	
<p>SARS-CoV-2 RNA (viral nucleic acid detection via molecular testing), e.g., via Polymerase Chain Reaction (PCR)</p>	<p>Remains the gold standard for detecting or excluding SARS-CoV-2 infection in adequate respiratory tract samples or saliva. Cycle threshold (Ct) values (an indirect measure of viral load: lower Ct values correspond to higher viral load) can help determine infectiousness. In general, Ct values >35 indicate a very low viral load/extremely low risk of infectiousness.</p> <p>For confirmed positive samples, further molecular testing might be indicated (e.g., for the detection of significant SARS-CoV-2 variants, if suspected, via mutation-specific targeted PCR or genome sequencing^{xvi}).</p>
<p>SARS-CoV-2 viral antigen (protein) detection via Rapid Antigen Detection Test (RADT)</p>	<p>May help the decision-making on management and isolation of patients with no rapid access to PCR testing.</p> <p>The highest yield for RADTs is in symptomatic individuals and during the early infection phase (from an adequate sample as per manufacturer's instructions, usually nasopharyngeal or nasal swabs).</p> <p>RADTs are more specific regarding infectiousness (i.e., a positive RADT usually correctly identifies infectious individuals), but overall, less sensitive and specific compared to PCR tests.</p> <p>Caution: Interpretation of RADT results is very dependent on the pretest probability</p> <ul style="list-style-type: none"> ○ High population disease rates are associated with a higher risk of a false-negative RADT, due to a lower negative predictive value ○ Vice-versa, low population disease rates are associated with a higher risk of false-positive RADT (lower posit. predictive value)^{xvii} <p>Confirmatory PCR testing is recommended in case of doubtful results</p> <ul style="list-style-type: none"> ○ already when taking a sample for the RADT, a second sample may be taken and sent off for routine PCR (SARS-CoV-2 confirmation) or further testing as required (e.g., more comprehensive respiratory pathogen panel) ○ see also Flow chart 1 Decision aid on the use of RADTs, where rapid access to PCR testing limited <p>Beware of differences in different manufacturers/test kit quality affecting performance (sensitivity and specificity)^{xvi}</p> <p>Further, variable/reduced RADT detection rates have been reported for different kits used in Omicron infections^{xvi}</p>
<p>Viral antibody detection</p>	<p>Blood serology on its own is not routinely used for diagnosing acute SARS-CoV-2 infection</p>

^{xv} Adapted from Peeling RW, Heymann DL, Teo YY, Garcia PJ. Diagnostics for COVID-19: moving from pandemic response to control. The Lancet. 2021 Dec 20, [https://doi.org/10.1016/S0140-6736\(21\)02346-1](https://doi.org/10.1016/S0140-6736(21)02346-1) and Osterman et al. Impaired detection of omicron by SARS-CoV-2 rapid antigen tests. Medical Microbiology and Immunology, 20 Feb 2022. <https://doi.org/10.1007/s00430-022-00730-z>

^{xvi} Upon decision by the cantonal physician (on a case-by-case basis) <https://www.bag.admin.ch/bag/de/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/information-fuer-die-aerzteschaft/covid-testung.html>

^{xvii} ECDC guidelines suggest high disease rates >10% vs. low <=2%. ECDC, 19 Nov 2020 https://www.ecdc.europa.eu/sites/default/files/documents/Options-use-of-rapid-antigen-tests-for-COVID-19_0.pdf

Flow chart 1 Decision aid on the indication, use and interpretation of RADTs in the acute care setting where rapid access to PCR testing is limited

	low clinical risk			medium clinical risk		high clinical risk	
Patients <i>Examples:</i>	No COVID-19 compatible signs or symptoms <i>Admission or repetitive screening of asymptomatic patient (e.g., long-term stay)</i>			Signs/symptoms <i>might</i> suggest COVID-19 but alternative diagnosis is likely <i>Investigation of healthcare-associated outbreak</i>		COVID-19-compatible signs/symptoms ≤ 5 Known unprotected exposure to positive COVID-19 case(s)	
HCWs <i>Examples:</i>	<i>Repetitive institutional staff screening</i>			<i>As part of outbreak screening (lower exposure risk)</i>		<i>Having had close contact with a positive case (e.g., household); during self-monitoring for symptoms</i>	
Local positivity rate* < 2%	unlikely			possible		possible	
Local positivity rate 2-10%	possible			possible		probable	
Local positivity rate >10%	possible			probable		probable	
	likelihood matrix			likelihood matrix			
Likelihood SARS-CoV-2 <i>(as per likelihood matrix above)</i>	unlikely			possible		probable	
SARS-CoV-2 RADT test result <i>(nasal/NP swab)</i>	negative	indet.	positive	negative <i>(or indeterminate)</i>	positive	negative <i>(or indeterminate)</i>	positive
Interpretation <i>Positive (PPV) or negative (NPV) predictive values</i>	COVID-19 excluded <i>High NPV: false-negative result unlikely</i>		COVID-19 <u>not</u> excluded <i>Low NPV (false-negative result is possible) or, low PPV (false-positive result is possible), respectively</i>				COVID-19 confirmed <i>High PPV: false-positive result unlikely</i>
Further testing <i>also consider testing for other pathogens/co-infections & follow corresponding IPC measures</i>	Consider PCR-testing (if doubtful result)		SARS-CoV-2 PCR Testing				If indicated: consider targeted PCR/genome sequencing to test for virus mutations **
Management	Mandatory notification		Await PCR results				Mandatory notification
	Isolate patient until asymptomatic for >24h		If symptomatic: follow isolation precautions (local guidelines) until further results available				follow patient isolation measures (above)
	HCW (see above)						HCWs (see above)

FOPH links to a) list of compatible symptoms <https://bag-coronavirus.ch/check/> and b) RADTs meeting FOPH recommendations, see under also https://www.bag.admin.ch/dam/bag/de/dokumente/mt/msys/covid-19-verdachts-meldeverfahren.pdf.download.pdf/Verdachts_Beprobungs_und_Meldeverfahren.pdf and under <https://www.bag.admin.ch/bag/de/home/medizin-und-forschung/heilmittel/covid-testung.html#-1047800939>

RADT sensitivity highest if symptom onset ≤ 5 days, as per ECDC, 19th November 2020 https://www.ecdc.europa.eu/sites/default/files/documents/Options-use-of-rapid-antigen-tests-for-COVID-19_0.pdf

* an estimate for local Covid-19 population prevalence rates, see FOPH dashboard, the share of positive tests (%), per canton, under <https://www.covid19.admin.ch/en/epidemiologic/test>

** upon decision by the cantonal physician (on a case-by-case basis): <https://www.bag.admin.ch/bag/de/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/information-fuer-die-aerzteschaft/covid-testung.html>

Already when sampling for RADT: Consider taking a further sample for routine PCR to confirm SARS-CoV-2 or test for further respiratory pathogens