Prevention & control of healthcare-associated COVID-19 outbreaks

(Version 1.0, May 15, 2020)

Introduction:

SARS-CoV-2 can spread widely and rapidly in the community but also in healthcare institutions. Early reports from China and the US suggest that healthcare-associated COVID-19 transmissions relatively frequently involve not only patients but also healthcare workers (HCW). Breaches in infection control measures such as low adherence with hand hygiene, errors in handling or not wearing adequate personnel protective equipment, as well as lack of HCW distancing in offices and commonly used hospital places seem to be related with increased risk of transmission. In Switzerland, hospital-based surveillance data estimate the proportion of infections acquired in hospital to be approximately 10%. The proportion of HCW with work-related exposure, however, is ill-defined. An informal survey among hospitals in the German speaking part of Switzerland estimates the proportion of COVID-19 positive HCW with work-related exposure as most likely transmission risk < 1%, with a higher risk for HCW involved in cardiopulmonary resuscitation. The prolonged incubation period, which may be up to 14 days, the infectiousness 2 to 3 days before symptom onset, the variable and often non-specific clinical presentation and the variable sensitivity of molecular assays carry the risk that patients and HCW introduce the virus into hospitals unnoticed, potentially leading to nosocomial infections. In addition, data from a seroprevalence study in Geneva demonstrate, that only around 5% of the general population have antibodies against SARS-CoV-2, in the northeastern part of Switzerland it is even lower. Moreover, whether these antibodies protect the carrier from re-infection is still unknown. In view of the stepwise relaxation of containment strategies at the federal level, it is likely that the COVID-19 prevalence in communities increases due to a concomitant reduction in the adherence with general hygiene measures. In addition, broader testing will result in more cases diagnosed.

Aims and target group of this guidance document:

This document provides guidance on how to prevent transmissions (not only COVID-19), to better identify potential COVID-19 cases in hospitals and what action should be taken if a COVID 19 case is detected during a hospital stay. We primarily address clinicians and colleagues working in infection prevention and control of Swiss acute care hospitals. This document complements the series of guidance documents already published by Swissnoso (www.swissnoso.ch).

Important notes beforehand:

- The term "**extended standard precautions**" refers to universal masking that has been recommended for healthcare settings as additional element of the standard precaution measures if maintaining a minimum distance of 2m over maximal 15 minutes between people is not possible. Many Swiss hospitals have adopted this policy for HCW as well as for patients and visitors.
- For patients, we strongly recommend syndromic based surveillance to rapidly identify suspected COVID-cases following the clinical and epidemiological criteria issued by the Federal Office of Public Health (FOPH).

- **Universal admission screening** of asymptomatic patients with PCR or other rapid point of care tests, however, is not considered efficient in settings with low COVID-19 prevalence in the community. It can be considered in the following situations (with frequent evaluation of the cost-benefit of such universal screening policy):
    - If prevalence is getting higher to prevent unnoticed entry of COVID-19 in the institution
    - In special care units (e.g. transplant units) if epidemiologically indicated
- **KEY TO CONTROL** an imminent nosocomial outbreak of COVID-19 is: rapid **Detection, Isolation, Testing and Contact Tracing!**

Definitions:

Nosocomial COVID-19 case	• Patient with new onset of COVID-19 compatible signs and symptoms* at least 5 days after hospital admission and a positive PCR result and/or thorax CT scan suggestive of COVID-19 • For hospitals with universal admission screening: Patient with negative PCR on admission and new onset of COVID-19 compatible symptoms and/or a positive PCR result at least 5 days after hospital admission
Nosocomial COVID-19 outbreak	• Detection of ≥ 3 nosocomial COVID-19 cases with a possible epidemiological (temporal and local) link
Unprotected COVID-19 contact	• Please refer to the definition issued by the FOPH (Appendix)

* Important note: In elderly and frail patients, symptoms and signs may be subtle. COVID-19 testing is therefore recommended in any frail or elderly patient presenting with acute onset of confusion or any other change in clinical status without an obvious cause.

Recommended measures in case of suspected nosocomial COVID-19 transmission

First measures upon detection of an accidental nosocomial COVID-19 case	• Inform affected ward(s) and reinforce extended standard precautions • Implement droplet and contact precautions in the COVID-19 case according to local policy • Identify COVID-19 contacts (patients and HCW) using a standardized case report form for all contacts during the last 2 days (if possible 1-2 days before symptom onset in the index case) • Ideally, designate one person to coordinate activities related to contact tracing, interviewing, evaluation, and monitoring • All unprotected COVID-19 contacts should be entered in a list along with the data collected on the CRF and communicated to occupational health
Enhance compliance with extended standard precaution measures	• Identify potential barriers for optimal adherence, e.g. through on-site visits, provision of observation, feedback and education • Assure adequate stocks and availability of PPE, require regular written updates on stock • Offer teaching and training of HCW in optimal implementation of standard precautions, proper use of PPE, and environmental decontamination

Re-emphasize social distancing measures	• Regularly remind HCW and patients through various channels (posters, public screens etc.) to keep a distance of ≥ 2m whenever possible with a special focus on multi-bedrooms, shared areas such as nurse/doctor offices or recreational rooms and to wear a face mask if social distancing is not possible
Management of unprotected COVID-19 contacts	**Unprotected asymptomatic patients:** • Closely monitor (if feasible twice daily assessment) patients for at least 10 days after last exposure for new onset of symptoms suggestive for COVID-19 • Use preemptive contact/droplet isolation in single rooms for at least 10 days or, if single rooms are not available, carry out preventive "isolation at the patient's bed-site" in multi-bed rooms • In case of transfer during observation period, inform receiving hospital **Unprotected asymptomatic HCW:** • For the management of exposed HCW refer to Empfehlungen für Mitarbeitende im Gesundheitswesen, die ungeschützten (ohne Maske) Kontakt mit COVID-19-Fällen hatten
Management of suspected and confirmed COVID-19 cases	• For patients, please refer to Swissnoso - Vorsorgemassnahmen für hospitalisierte Patienten mit Verdacht oder mit einer bestätigten COVID-19 Infektion) • For HCW, please refer to Swissnoso - Management of COVID-19 positive or suspect employees
Reinforce environmental cleaning and disinfection	• Refer to Swissnoso - Vorsorgemassnahmen für hospitalisierte Patienten mit Verdacht oder mit einer bestätigten COVID-19 Infektion

Confirmed nosocomial COVID-19 outbreak – overview of additional possible containment measures

Form an outbreak management team (e.g. "COVID-19 Task Force")	• If not already in place because of the ongoing pandemic, form a multidisciplinary team which consists at least of a specialist in infectious diseases or infection prevention and control (IPC) , an IPC practitioner, a clinical microbiologist, occupational health, a representative of the hospital management, and medical and nursing leadership from involved wards • Inform the laboratory to keep the samples of involved patients in the freezer for optional sequencing. • Collaborate with the cantonal physician
Reinforce adherence with contact and droplet precautions	• Repeat teaching and training of HCW in optimal implementation of contact and droplet precaution according to local policy, proper use of PPE, with emphasis on excellent compliance with hand hygiene and correct handling of PPE • In case of ongoing transmission, implement droplet and contact precautions for all patients with respiratory syndrome irrespective of test result

	• Consider extending the minimum duration of isolation precautions and/or consider requiring negative PCR before discontinuing isolation precautions
Consider extending indication of surgical masks to patients	• Consider offering a surgical mask to all patients in situations in which prolonged care is required within 1 meter of the face provided the patient tolerates wearing a mask. (

Enhance systematic case finding	• Enhance systematic case finding among hospitalized patients and HCWs
	  • If numbers of contacts are becoming very high, contact tracing and follow-up can be prioritized to the highest-risk exposure contacts (e.g. patients with longer exposure) or those with higher impact in case of transmission (e.g. those HCW involved in direct patient care or working with most vulnerable patients)
	  • In addition:
	  ○ Consider introducing periodical testing of hospitalized patients (incl. asymptomatic or pre-symptomatic patients), e.g. weekly screening surveys in affected wards
	  ○ Consider introducing periodical testing of HCW, e.g. weekly screening of HCWs working in high-risk areas (intensive care units)
	  ○ If transmission is ongoing, consider point-prevalence screening in other non-affected wards

Ward organization	• Create cohorts for COVID-positive cases and, if feasible, cohort them in a separate floor or building with dedicated staff • Whenever possible, assign COVID suspected cases to single or double bedrooms • If presumed COVID-cases are grouped in multi-bedrooms, assure excellent adherence to standard precautions, respiratory hygiene, and social distancing • If transmission is ongoing, relocate all COVID-19 contacts to a designated quarantine area • Consider ward closure for new admissions
General considerations in the context of ongoing transmission	• Prohibit visitors with very few exceptions for special circumstances (e.g. dying patient, during delivery, children) • Suspend outpatient clinics • Restrict hospital admissions for non-urgent interventions and consultations to the concerned hospital sector • Declare the outbreak to the local public health authorities

Literature:

- Zhou Qi, Yelei Gao, Xingmei Wang et al. Nosocomial Infections Among Patients with COVID-19, SARS and MERS: A Rapid Review and Meta-Analysis. medRxiv preprint doi: https://doi.org/10.1101/2020.04.14.20065730. Posted April 17, 2020
- Heinzerling A, Stuckey MJ, Scheuer T, et al. Transmission of COVID-19 to Health Care Personnel During Exposures to a Hospitalized Patient — Solano County, California, February 2020. MMWR Morb Mortal Wkly Rep 2020;69:472–476. DOI: http://dx.doi.org/10.15585/mmwr.mm6915e5
- Wang J et al., Reasons for healthcare workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China, Journal of Hospital Infection, https://doi.org/10.1016/j.jhin.2020.03.002
- https://www.thelocal.ch/20200423/blood-study-shows-five-percent-of-genevans-have-contracted-coronavirus (last accessed April 30, 2020)
- https://www.hug-ge.ch/medias/communique-presse/seroprevalence-covid-19-premiere-estimation (last accessed April 30, 2020)
- Klompas M. Coronavirus Disease 2019 (COVID-19): Protecting Hospitals from the Invisible. Ann Intern Med. 2020 Mar 11. doi: 10.7326/M20-0751. [Epub ahead of print]
- Frieden TR, Lee CT. Identifying and interrupting superspreading events—implications for control of severe acute respiratory syndrome coronavirus 2. Emerg Infect Dis. 2020 Jun [date cited: April 24, 2020]. https://doi.org/10.3201/eid2606.200495
- Black James R M, Bailey Chris, Przewrocka Joanna, Dijkstra Krijn K, Swanton Charles. COVID-19: the case for health-care worker screening to prevent hospital transmission. The Lancet. Published Online April 15, 2020 https://doi.org/10.1016/S0140-6736(20)30917-X (accessed April 24, 2020).
- Wee LE, Conceicao; EP, Sim XYJ, Aung MK, Tan; KY, Wong HM, Wijaya L, Tan BH, Ling ML, Venkatachalam I, Minimising intra-hospital transmission of COVID-19: the role of social distancing, Journal of Hospital Infection, https://doi.org/10.1016/j.jhin.2020.04.016.
- Gopalakrishna G, Choo P, Leo Yee S, et al. SARS Transmission and Hospital Containment. Emerging Infectious Diseases. Vol 10, No. 3, March 2004
- Wilder-Smith A, Chiew CJ, Lee VJ. Can we contain the COVID-19 outbreak with the same measures as for SARS? Lancet Infect Dis. 2020 Mar 5. pii: S1473-3099(20)30129-8. doi: 10.1016/S1473-3099(20)30129-8. [Epub ahead of print]
- Kabesch M, Roth S, Brandstetter S, Häusler S, et al. Successful containment of COVID-19 outbreak in a large maternity and perinatal center while continuing clinical service. Pediatr Allergy Immunol. 2020 Apr 22. doi: 10.1111/pai.13265. [Epub ahead of print]
- Sutton D, Fuchs K, D'Alton M, et al. Universal Screening for SARS-CoV-2 in Women Admitted for Delivery. New Engl J Med. April 13, 2020, doi: 10.1056/NEJMc2009316
- Bi Q, Wu Y, Mei* S, et al. Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study. Lancet Inf Dis, April 27, 2020. https://doi.org/10.1016/S1473-3099(20)30287-5
- European Centre for Disease Prevention and Control. Resource estimation for contact tracing, quarantine and monitoring activities for COVID-19 cases in the EU/EEA. ECDC: Stockholm; 2020. https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-resources-for-contact-tracing-2-March-2020.pdf (last accessed May 1, 2020)

Appendix: Proposed FOPH definitions for unprotected COVID-19 contact and definition of close contact (requiring further control measures)

Unprotected COVID-19 contact	• Refers to individuals with a close contact to a confirmed or probable** case of COVID-19 as defined below: - when the index case was symptomatic, OR - in the 48 hours preceding the onset of symptoms, OR - during the isolation period • Special circumstances: - If the person tested positive had no symptoms (e.g. person tested in an outbreak in a collective housing facility), the period to be considered for contact tracing starts 48 hours before sampling and continues until the tested person is isolated.
Definition of close contact	• Individuals in the same household with > 15 minutes contacts of less than 2m with a case • Contact of less than 2m and for more than 15 minutes without protection (e.g. without a visible barrier such as plexiglass or without a surgical mask worn by the case and/or the contact person) • Care or medical examination or professional activity involving physical contact (less than 2m), without the use of appropriate protective equipment • Direct contact with respiratory secretions, body fluids without the use of protective equipment • For individuals travelling by airplane: - passengers who had sat in the same row as the case or in the two rows in front or behind it, regardless of the flight time - Crew members or other passengers, if any of the above criteria apply (e.g. more than 15 minutes of conversation with the case)

**Hospitalized or deceased persons with a COVID-19 compatible X-ray (CT scan) or an epidemiological link to a confirmed case, a negative PCR and no other etiology