

Use of gloves in healthcare and non-healthcare settings in the context of the COVID-19 pandemic

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Scope of this document

This document aims to provide scientific evidence and guidance for healthcare settings and the public on using gloves as a preventive measure during the COVID-19 pandemic. Wearing gloves outside the context of COVID-19 for personal protection and mandated by relevant regulations in occupational settings such as in industrial applications or in the food or pharmaceutical industry to avoid contamination of products is outside the scope of this document.

Target audience

Public health authorities in EU/EEA Member States and the United Kingdom.

Key messages

In the community

- There is currently insufficient evidence to recommend the regular use of gloves as a preventive measure in the context of COVID-19 to the public and to people in most occupations.
- Use of gloves in the community may lead to the misconception that hand hygiene practices can be neglected.
- Regular use of gloves may confer the risk of dermatological side effects.
- The generation of waste from unnecessary glove use causes environmental damage.

In healthcare settings

- The use of medical gloves is recommended as part of standard precautions to reduce the risk of contamination of healthcare workers' hands with blood and other body fluids including contact with non-intact skin and mucous membranes.
- When indicated, use of medical gloves is recommended as part of contact precautions, to reduce the risk of pathogen dissemination to the patient's environment, to other patients and for the protection of healthcare workers.
- Taking into consideration the currently available types of gloves for use in healthcare settings, extended use, decontamination and reuse of single-use medical gloves is discouraged.
- In the event of shortages, single-use medical gloves should be prioritised for use in healthcare settings.

Background

On 31 December 2019, a cluster of pneumonia cases of unknown aetiology was reported in Wuhan, Hubei Province, China. On 9 January 2020, China CDC reported a novel coronavirus as the causative agent of this outbreak. The virus is phylogenetically in the SARS-CoV clade and called 'severe acute respiratory syndrome coronavirus 2' (SARS-CoV-2). The disease associated with the virus is referred to as coronavirus disease 2019 (COVID-19).

As of 23 June 2020, 1 518 251 cases have been reported in the EU/EEA and the UK, including 174 968 deaths [1]. The majority (90%) of EU/EEA countries and the UK are currently observing much lower 14-day incidence rates compared to the peak which occurred from 2-23 April 2020, depending on the country. All countries are in the process of adjusting their containment measures, with the potential risk of increases in case numbers, depending on continued compliance with physical distancing, respiratory and hand hygiene as well as the intensity of testing and contact tracing. Detailed information on the COVID-19 cases reported so far are available on a dedicated ECDC webpage [1]. More up-to-date disease background information is available online (ECDC [1], WHO [2]) and from the latest ECDC Rapid Risk Assessment [3].

In most instances, coronaviruses, including SARS-CoV-2, are transmitted from person-to-person through large respiratory droplets produced during normal conversation or when coughing and sneezing, either by inhalation or deposition on mucosal surfaces. Other routes implicated in transmission of coronaviruses include contact with contaminated fomites (e.g. frequently touched surfaces) and inhalation of aerosols produced during aerosol generating procedures (AGPs). Viral RNA has also been detected in blood and faecal specimens, but there is no evidence of transmission through contact with blood and the role of faecal-oral route is still unclear [3,4]. The relative contribution of droplet, fomite and aerosol to the human-to-human SARS-CoV-2 transmission is still under investigation.

Types of gloves

There are many different types of gloves used to protect hands from occupational hazards and as a means of providing a sterile skin cover for specific tasks. They can be multiuse or disposable. Their material depends on the intended use.

This guidance does not discuss protective gloves that are used outside of the scope of protection from contamination by biological hazards, such as those for mechanical risks, thermal hazards, chemical hazards, food handling or in the pharmaceutical industry.

Figure 1. Different types of gloves (from left to right, light latex or nitrile gloves, intermediate thickness, heavy duty gloves) [5]



Medical gloves are used in healthcare settings during various procedures to prevent contamination between patients and healthcare providers. Medical gloves are either examination gloves that may or may not be sterile, and surgical gloves that are mostly used during various medical procedures and surgical operations and are sterile. Medical gloves in EU/EEA countries should comply with requirements defined in the [Council Directive 93/42/EEC](#) [6] concerning medical devices and the [Regulation \(EU\) 2016/425](#) [7] relating to personal protective equipment. The European Standard EN 455 on medical gloves for single use specifies requirements for the quality of medical gloves. Standards and specificities for the gloves used in microbiological and biochemical laboratories are described in the European Standard EN ISO 374.

Single-use medical gloves are made of different materials (including but not limited to latex, nitrile rubber, polyvinyl chloride (PVC), polyethylene and neoprene), and have different colours, thickness, sizes, and versions (e.g. long- and normal-cuffed, powdered or powder-free) (Figure 1) [5]. The choice of gloves balances tactility (e.g. for medical interventions) and the level of protection (defined by mechanical resistance). The choice of the glove size plays a crucial role in increasing the tactility. The most frequently used type of medical gloves include powder-free latex and nitrile gloves.

Gloves used for household activities in the community (e.g. gloves made from natural latex, nitrile, vinyl and polyethylene) most commonly do not meet the standards described for medical gloves that are used in healthcare.

Use of gloves by the public in the context of COVID-19 transmission

In the community, the recommended measures to mitigate the spread of COVID-19 are physical distancing, adherence to a respiratory etiquette and meticulous hand hygiene; and use of face masks in areas where there is community transmission and in settings where physical distancing cannot be guaranteed.

There is currently insufficient evidence to recommend that individuals in the community should wear medical gloves or gloves for household activities in the context of COVID-19 [8-13]. An exception is for those with a COVID-19 case within the same household, who provide them with direct care, or cleaning or directly handling potentially contaminated waste, such as used paper tissues.

Prior to COVID-19, people within several occupations have already worn gloves to protect themselves from infection, such as environmental cleaners and the police. Logically, their wearing of gloves could also protect them from COVID-19 infection. However, there is insufficient evidence to recommend the wearing of gloves to those occupations that did not already wear gloves for occupational reasons, e.g. cashiers in shops and supermarkets, bus and taxi drivers, office workers.

The use of gloves by the public in the community can lead to the misconception that handwashing/hand disinfection can be neglected, while it remains one of the important pillars of effective prevention of SARS-CoV-2 transmission. Every time gloves are removed there should be proper handwashing with water and soap or hand disinfection, e.g. with alcohol-based hand rub. The main problem of contaminated hands or gloves is that infection occurs by inadvertently touching the nose, mouth or eyes, and contaminated gloves increase this risk because regular disinfection is often not performed after touching potentially contaminated surfaces.

Prolonged glove use is associated with an increased risk of dermatological side effects, particularly if there is insufficient use of skin care products. Also, glove use has the potential to induce allergic reactions; e.g. for those with an allergy to latex.

Finally, the unnecessary use of gloves in the community by millions of people on a daily basis results in the generation of a massive amount of medical waste into the environment [14].

Regular use of gloves by the public as a protective prevention measure is currently not recommended for COVID-19, or other respiratory infections.

Table 1. Recommendations for the use of gloves to prevent SARS-CoV-2 transmission by community setting

Activity	Non-sterile gloves (without EN standards)	Non-sterile gloves ^a	Sterile gloves ^a	Gloves used in microbiological and biochemical laboratories ^b
Community				
Visiting busy closed spaces such as grocery stores, shopping centers.	no	no	no	no
Leisure activities.	no	no	no	no
Using public transport.	no	no	no	no
Workplaces and professions that involve physical proximity to many people, that did not wear gloves for occupational reasons prior to the COVID-19 pandemic, e.g. cashiers in shops and supermarkets.	no	no	no	no
People in occupations that wore gloves prior to COVID-19, such as environmental cleaners and the police.	yes/no ^c	yes/no ^c	no	no
Healthcare setting (e.g. acute care hospitals, general practices, long-term care facilities)				
Aseptic procedures, e.g. surgical operations, central venous catheter insertion.	n/a	n/a	yes	no
Activities with a risk of contamination of healthcare workers' hands, including contamination with body fluids, or contact with mucous membranes and non-intact skin, e.g. peripheral venous catheter insertion/removal, intubation, cleaning spills of body fluids, emptying emesis basins, handling/cleaning used instruments, handling waste.	yes	yes	no	no
Procedures not included in the two previous examples.	no	no	no	no
Specific laboratory work.	no	no	no	yes

^a — European Standard EN 455 on medical gloves for single use, as stipulated in the [Council Directive 93/42/EEC](#) [6]

^b — Standards and specifics for the gloves used in microbiological and biochemical laboratories are described in the European Standard EN ISO 374.

^c — Dependent on occupation-specific guidance applicable to the setting and/or applicable national guidelines/legislation.

n/a — not applicable

Use of gloves by health professionals to prevent COVID-19 transmission

In healthcare settings, the use of gloves is part of standard infection prevention and control (IPC) measures and is recommended as part of the standard precautions when there is a risk of contact with body fluids, including during surgical operations and as part of contact precautions for the risk of transmission of infectious organisms that are transmitted through direct contact [15]. Gloves are also used in biochemical and microbiological laboratories in healthcare settings.

In the context of the COVID-19 pandemic, gloves are recommended when taking care of COVID-19 patients, especially when there is risk of contact with body fluids. There is no direct evidence that the use of gloves increases protection against COVID-19, when compared with proper hand hygiene alone.

Meticulous hand hygiene using water and soap, or by alcohol-based hand rub solutions, is therefore strongly recommended before and after each patient contact, either with or without gloves, and when gloves are removed.

The extended use and disinfection of disposable medical gloves

There is limited evidence on the effects of alcohol-based disinfectant solution on medical gloves. These effects depend on many factors, e.g. the material and thickness of gloves, the concentration of the alcohol in the solution used and the number of times the cleaning procedure is performed. Some nitrile gloves protect against a wide variety of chemicals including caustics and alcohols, which may make them more resistant to the application of hand hygiene solutions [5]. Studies have shown that the use of ethanol to clean gloves does not affect their integrity when used for a limited number of times (depending on the variables mentioned above), please refer to the publications referenced here for more information [16-18].

However, the effect of the application of alcoholic solutions on gloves is not consistent across various brands even in the case of nitrile gloves that are more resistant to chemicals. In a review published in 2016 [19], the authors summarised the evidence on whether treatment of gloved hands with disinfectants impacts on gloves' perforation rates (expressed as leakage), tensile strength and ultimate elongation and permeability.

Studies on perforation were performed using different brands of gloves and gloves of different materials, and different disinfectants. Although clinically relevant damage to the gloves was not generally detected through these studies, in some cases an impact on the material was detected when combining specific material and disinfectant (e.g. nitrile gloves of a specific brand and 60% isopropanol for 60 seconds – which led to a number of gloves with leak of 3/20). Studies on the impact on tensile strength and ultimate elongation conducted on latex or nitrile gloves disinfected with commercially available products based on 70% ethanol or 63% isopropanol showed that tensile strength of latex and nitrile gloves was reduced after applying the disinfectant, with a higher impact on nitrile gloves. Ultimate elongation did not change much in latex gloves, while it was increased or reduced in nitrile gloves after application of disinfectants. Finally, studies on permeability showed that, after 10 minutes, alcohol can permeate any type of glove, and some type of gloves are permeated after only two minutes. Although hand disinfection in clinical practice lasts about 30 seconds, the review's authors report that it is unclear whether repeated exposure to disinfectants for reduced amount of time increases general permeability of the gloves.

Therefore, taking into consideration all the above, the decontamination of gloves is not recommended. ECDC discourages the application of alcohol-based solutions (including alcohol-based hand sanitizers, or other disinfectants) on single-use medical gloves or use of any disinfection method whatsoever, in line also with WHO [8], due to inconsistent tolerance of the different types of gloves and glove materials to such treatments [1].

Extended use of medical gloves is discouraged. It is strongly recommended to change medical gloves between patients: they need to be discarded immediately after each patient and a new pair of gloves applied for the next patient if the use of gloves is indicated. Use of the same pair of gloves for multiple patients can lead to transmission of pathogenic organisms such as bacteria resistant to antimicrobial agents and *Clostridioides difficile* from one patient to the next and is a practice that must be discouraged. Additionally, prolonged use of gloves may result in deterioration of the glove material with the occurrence of perforations that compromise the protective function of the glove.

Medical gloves that have exceeded the shelf life recommended by the manufacturer may be considered for use in training, if there is no risk of contact with potentially infectious sources. In case of severe shortages, the use of expired gloves for healthcare delivery should be carefully assessed for use in low-risk healthcare practices, on a case-by-case basis, particularly monitoring for signs of deterioration of the glove material. Expired sterile gloves should not be used to perform aseptic procedures.

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