

Infection Prevention and Control for the safe management of a dead body in the context of COVID-19

Interim guidance
24 March 2020



Background

This interim guidance is for all those, including managers of health care facilities and mortuaries, religious and public health authorities, and families, who tend to the bodies of persons who have died of suspected or confirmed COVID-19.

These recommendations are subject to revision as new evidence becomes available. Please refer to the WHO website for [updates on the virus](#) and [technical guidance](#).

Key considerations

- COVID-19 is an acute respiratory illness caused by COVID-19 virus that predominantly affects the lungs;
- Based on current evidence, the COVID-19 virus is transmitted between people through droplets, fomites and close contact, with possible spread through faeces. It is not airborne. As this is a new virus whose source and disease progression are not yet entirely clear, more precautions may be used until further information becomes available;
- Except in cases of hemorrhagic fevers (such as Ebola, Marburg) and cholera, dead bodies are generally not infectious. Only the lungs of patients with pandemic influenza, if handled improperly during an autopsy, can be infectious. Otherwise, cadavers do not transmit disease. It is a common myth that persons who have died of a communicable disease should be cremated, but this is not true. Cremation is a matter of cultural choice and available resources;¹
- To date there is no evidence of persons having become infected from exposure to the bodies of persons who died from COVID-19;
- People may die of COVID-19 in the health care facilities, home or in other locations;
- The safety and well-being of everyone who tends to bodies should be the first priority. Before attending to a body, people should ensure that the necessary hand hygiene and personal protective equipment (PPE) supplies are available (see Annex I);
- The dignity of the dead, their cultural and religious traditions, and their families should be respected and protected throughout;
- Hasty disposal of a dead from COVID-19 should be avoided;
- Authorities should manage each situation on a case-by-case basis, balancing the rights of the family, the need to investigate the cause of death, and the risks of exposure to infection.

Preparing and packing the body for transfer from a patient room to an autopsy unit, mortuary, crematorium, or burial site

- Ensure that personnel who interact with the body (health care or mortuary staff, or the burial team) apply standard precautions,^{2,3} including hand hygiene before and after interaction with the body, and the environment; and use appropriate PPE according to the level of interaction with the body, including a gown and gloves. If there is a risk of splashes from the body fluids or secretions, personnel should use facial protection, including the use of face shield or goggles and medical mask;
- Prepare the body for transfer including removal of all lines, catheters and other tubes;
- Ensure that any body fluids leaking from orifices are contained;
- Keep both the movement and handling of the body to a minimum;
- Wrap body in cloth and transfer it as soon as possible to the mortuary area;
 - There is no need to disinfect the body before transfer to the mortuary area;
 - Body bags are not necessary, although they may be used for other reasons (e.g. excessive body fluid leakage); and
- No special transport equipment or vehicle is required.

Funeral home/ mortuary care

- Health care workers or mortuary staff preparing the body (e.g. washing the body, tidying hair, trimming nails, or shaving) should wear appropriate PPE according to standard precautions (gloves, impermeable disposable gown [or disposable gown with impermeable apron], medical mask, eye protection);
- If the family wishes only to view the body and not touch it, they may do so, using standard precautions at all times including hand hygiene. Give the family clear instructions not to touch or kiss the body;
- Embalming is not recommended to avoid excessive manipulation of the body;
- Adults >60 years and immunosuppressed persons should not directly interact with the body.

Autopsy, including engineering and environmental controls

- Safety procedures for deceased persons infected with COVID-19 should be consistent with those used for any autopsies of people who have died from an acute respiratory illness. If a person died during the infectious period of COVID-19, the lungs and other organs may still contain live virus, and additional respiratory protection is needed during aerosol-generating procedures (e.g. procedures that generate small-particle aerosols, such as the use of power saws or washing of intestines);
- If a body with suspected or confirmed COVID-19 is selected for autopsy, health care facilities must ensure that safety measures are in place to protect those performing the autopsy;⁴
- Perform autopsies in an adequately ventilated room, i.e. at least natural ventilation with at least 160L/s/patient air flow or negative pressure rooms with at least 12 air changes per hour (ACH) and controlled direction of air flow when using mechanical ventilation;⁵
- Only a minimum number of staff should be involved in the autopsy;
- Appropriate PPE must be available, including a scrub suit, long sleeved fluid-resistant gown, gloves (either two pairs or one pair autopsy gloves), and face shield (preferably) or goggles, and boots. A particulate respirator (N95 mask or FFP2 or FFP3 or its equivalent) should be used in the case of aerosol-generating procedures.⁶

Environmental cleaning and control

Human coronaviruses can remain infectious on surfaces for up to 9 days.⁷ COVID-19 virus has been detected after up to 72 hours in experimental conditions.⁸ Therefore, cleaning the environment is paramount.

- The mortuary must be kept clean and properly ventilated at all times;
- Lighting must be adequate. Surfaces and instruments should be made of materials that can be easily disinfected and maintained between autopsies;
- Instruments used during the autopsy should be cleaned and disinfected immediately after the autopsy, as part of the routine procedure;
- Environmental surfaces, where the body was prepared, should first be cleaned with soap and water, or a commercially prepared detergent solution;
- After cleaning, a disinfectant with a minimum concentration of 0.1% (1000 ppm) sodium hypochlorite (bleach), or 70% ethanol should be

placed on a surface for at least 1 minute.⁹ Hospital-grade disinfectants may also be used as long as they have a label claim against emerging viruses and they remain on the surface according to manufacturer's recommendations;

- Personnel should use appropriate PPE, including respiratory and eye protection, when preparing and using the disinfecting solutions; and
- Items classified as clinical waste must be handled and disposed of properly according to legal requirements.

Burial

People who have died from COVID-19 can be buried or cremated.

- Confirm national and local requirements that may dictate the handling and disposition of the remains.
- Family and friends may view the body after it has been prepared for burial, in accordance with customs. They should not touch or kiss the body and should wash hands thoroughly with soap and water after the viewing;
- Those tasked with placing the body in the grave, on the funeral pyre, etc., should wear gloves and wash hands with soap and water after removal of the gloves once the burial is complete.

Burial by family members or for deaths at home

In contexts where mortuary services are not standard or reliably available, or where it is usual for ill people to die at home, families and traditional burial attendants can be equipped and educated to bury people under supervision.

- Any person (e.g. family member, religious leader) preparing the deceased (e.g. washing, cleaning or dressing body, tidying hair, trimming nails or shaving) in a community setting should wear gloves for any contact with the body. For any activity that may involve splashing of bodily fluids, eye and mouth protection (face shield or goggles and medical mask) should be worn. Clothing worn to prepare the body should be immediately removed and washed after the procedure, or an apron or gown should be worn;
- The person preparing the body should not kiss the deceased. Anyone who has assisted in preparing the body should thoroughly wash their hands with soap and water when finished;
- Apply principles of cultural sensitivity and ensure that family members reduce their exposure as much as possible. Children, older people (>60 years old), and anyone with underlying illnesses (such as respiratory illness, heart disease, diabetes, or compromised immune systems) should not be involved in preparing the body. A minimum number of people should be involved in preparations. Others may observe without touching the body at a minimum distance of 1 m;

- Family and friends may view the body after it has been prepared for burial, in accordance with customs. They should not touch or kiss the body and should wash their hands thoroughly with soap and water following the viewing; physical distancing measures should be strictly applied (at least 1 m between people).
- People with respiratory symptoms should not participate in the viewing or at least wear a medical mask to prevent contamination of the place and further transmission of the disease to others;
- Those tasked with placing the body in the grave, on the funeral pyre, etc. should wear gloves and wash hands with soap and water once the burial is complete;
- Cleaning of reusable PPE should be conducted in accordance with manufacturer’s instructions for all cleaning and disinfection products (e.g. concentration, application method and contact time, etc.);
- Children, adults > 60 years, and immunosuppressed persons should not directly interact with the body;
- Although burials should take place in a timely manner, in accordance with local practices, funeral ceremonies not involving the burial should be postponed, as much as possible, until the end of the epidemic. If a ceremony is held, the number of participants should be limited. Participants should observe physical distancing at all times, plus respiratory etiquette and hand hygiene;
- The belongings of the deceased person do not need to be burned or otherwise disposed of. However, they should be handled with gloves and cleaned with a detergent followed by disinfection with a solution of at least 70% ethanol or 0.1% (1000 ppm) bleach, and
- Clothing and other fabric belonging to the deceased should be machine washed with warm water at 60–90°C (140–194°F) and laundry detergent. If machine washing is not possible, linens can be soaked in hot water and soap in a large drum using a stick to stir and being careful to avoid splashing. The drum should then be emptied, and the linens soaked in 0.05% chlorine for approximately 30 minutes. Finally, the laundry should be rinsed with clean water and the linens allowed to dry fully in sunlight.¹⁰

2. World Health Organization. (2007). Standard precautions in healthcare. <https://www.who.int/publications-detail/standard-precautions-in-health-care> (accessed March 22, 2020).
3. World Health Organization. (2020). Infection prevention and control during health care when COVID-19 is suspected: interim guidance, 25 January 2020. [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125). (accessed March 22, 2020).
4. Royal College of Pathologists (UK). (2020). Autopsy practice relating to possible cases of COVID-19 (2019 nCov, novel coronavirus from China 2019/2020). <https://www.rcpath.org/uploads/assets/d5e28baf-5789-4b0f-acecfe370eee6223/fe8fa85a-f004-4a0c-81ee4b2b9cd12cbf/Briefing-on-COVID-19-autopsy-Feb-2020.pdf> (accessed March 22, 2020).
5. World Health Organization. (2009). Natural ventilation for infection control in health care settings. World Health Organization. <https://apps.who.int/iris/handle/10665/44167> (accessed March 22, 2020).
6. Centers for Disease Control and Prevention. (2020). Interim guidance for collection and submission of post-mortem specimens from deceased persons under investigation (PU) for COVID-19, February 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html> (accessed March 22, 2020).
7. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *Journal of Hospital Infection.* 2020;104(3):246-51. <https://doi.org/10.1016/j.jhin.2020.01.022> (accessed March 22, 2020).
8. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1 <https://www.nejm.org/doi/full/10.1056/NEJMc2004973>
9. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *Journal of Hospital Infection.* 2020;104(3):246-51. <https://doi.org/10.1016/j.jhin.2020.01.022> (accessed March 22, 2020).
10. World Health Organization. (2020). Water, sanitation, hygiene, and waste management for the COVID-19 virus. Interim guidance: 19 March 2020. https://apps.who.int/iris/bitstream/handle/10665/31499/WHO-2019-nCoV-IPC_WASH-2020.2-eng.pdf?sequence=1&isAllowed=y (Accessed March 22, 2020).

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Further references related to the management of dead bodies in an influenza pandemic

New South Wales Government (Australia). (2013). Handling of bodies by funeral directors during an influenza pandemic. <https://www.health.nsw.gov.au/environment/factsheets/Pages/bodies-influenza.aspx> (accessed March 22, 2020).

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Centers for Disease Control and Prevention (USA). (2009). Post-mortem care and safe autopsy procedures for Novel H1N1 Influenza. https://www.cdc.gov/h1n1flu/post_mortem.htm (accessed March 22, 2020).

Annex I: Summary of personal protective equipment

Table 1. Use of personal protective equipment in the mortuary management of COVID-19 bodies

Procedure	Hand hygiene	Disposable gloves	Medical mask	Respirator (N-95 or similar)	Long sleeved gown	Face shield (preferred) or anti-fog goggles	Rubber gloves	Apron
Packing and transport of the body	Yes	Yes			Yes			
Mortuary care	Yes	Yes	Yes		Yes	Yes		
Autopsy	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Religious observation – care of body by family members	Yes	Yes			Yes OR Apron			Yes

For the technical specifications of PPE, please refer to Technical specifications of medical devices for the case management of COVID-19 in healthcare settings.

Annex II: Equipment for management of dead bodies in the context of COVID-19

Table 2. Equipment for procedures in mortuary management of COVID-19 bodies

Equipment	Details
Hand hygiene	<ul style="list-style-type: none"> • Alcohol-based hand rub • Running water • Soap • Disposable towel for hand drying (paper or tissue)
Personal protective equipment	<ul style="list-style-type: none"> • Gloves (single use, heavy duty gloves) • Boots • Waterproof plastic apron • Long sleeve gowns • Anti-fog goggles • Face shield • Medical mask • N95 or similar level respirator (for aerosol-generating procedures only)
Waste management and environmental cleaning	<ul style="list-style-type: none"> • Disposal bag for bio-hazardous waste • Soap and water, or detergent • Disinfectant for surfaces – hypochlorite solution 0.1% (1000 ppm), 70% ethanol, or hospital-grade disinfectant.

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