**Clinical Librarian Service Search Results**

**Request:** COVID-19 infection from case notes

**Summary**

We have searched the databases listed at the end of the document and have retrieved a small number of potentially useful documents. However, there is not much known on the subject.

The following information has been elicited:

* *“It is unknown how long SARS-CoV-2 can persist on surfaces [14,99,101]; other coronaviruses have been tested and may survive on inanimate surfaces for up to six to nine days without disinfection. In a study evaluating the survival of viruses dried on a plastic surface at room temperature, a specimen containing SARS-CoV (a virus closely related to SARS-CoV-2) had detectable infectivity at six but not nine days [101]. However, in a systematic review of similar studies, various disinfectants (including ethanol at concentrations between 62 and 71 percent) inactivated a number of coronaviruses related to SARS-CoV-2 within one minute [99].”* (UpToDate 2020)3
* *“The virus that causes coronavirus disease 2019 (COVID-19) is stable for several hours to days in aerosols and on surfaces, according to a new study from National Institutes of Health, CDC, UCLA and Princeton University scientists in*The New England Journal of Medicine*.* ***The scientists found that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was detectable in aerosols for up to three hours, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel.*** *The results provide key information about the stability of SARS-CoV-2, which causes COVID-19 disease, and suggests that people may acquire the virus through the air and after touching contaminated objects. The study information was widely shared during the past two weeks after the researchers placed the contents on a preprint server to quickly share their data with colleagues.”* (National Institute of Allergy and Infectious Diseases 2020)
* *“CLINICIANS' PRACTICE POINT Measures to secure the safety of all, including the general public, patients, and healthcare providers, is a fluid process. Decisions regarding home quarantine, supervised quarantine, voluntary furlough, and mandatory furlough must be based upon the most current information for a given area. Healthcare Systems should meet regularly with representation from administration, healthcare providers, infection control, environmental services, laboratory, security, human resources, information systems, etc., to review their situation. Agenda items may include local disease activity (including number of hospitalized patients), surge capacity, staffing issues (including furlough decisions), supply issues, and current recommendations from public health organizations. Open communication and ability to adjust to rapidly changing circumstances is paramount.”*

(DynaMed 2020)4

* *“…clean and disinfect patient-contact surfaces routinely…limit number of healthcare workers, family members, and visitors in contact with patient with suspected COVID-19…administrative controls establish sustainable infection prevention and control infrastructures and activities”* (DynaMed 2020)4
* *“Are books in libraries and archives safe?*

*Books carry similar risks to any other surface when / if they come into contact with the COVID-19 virus. Libraries, archives and museums should be thinking about the issues regarding circulating and handling of materials during the pandemic.”* (Giustini)1

* *“Human coronaviruses can survive on inanimate objects and can remain viable for up to 5 days at temperatures of 22-25°C and relative humidity of 40-50% (which is typical of air-conditioned indoor environments).1 Survival on environmental surfaces is also dependent on the surface type.1 Extensive environmental contamination may occur following an aerosol generating procedure (AGP). The rate of clearance of aerosols in an enclosed space is dependent on the extent of any mechanical/natural ventilation – the greater the number of air changes per hour (ventilation rate), the sooner any aerosol will be cleared.5 The time required for clearance of aerosols, and thus the time after which the room can be entered without a filtering face piece (class 3) (FFP3) respirator, can be determined by the number of air changes per hour (ACH) as outlined in WHO guidance; in general wards and single rooms there should be a minimum of 6 air changes per hour, in negative-pressure isolation rooms there should be a minimum of 12 air changes per hour.6 Where feasible, environmental decontamination should be performed when it is considered appropriate to enter the room/area without an FFP3 respirator. A single air change is estimated to remove 63% of airborne contaminants, after 5 air changes less than 1% of airborne contamination is thought to remain.7 A minimum of 20 minutes i.e. 2 air changes, in hospital settings where the majority of these procedures occur is considered pragmatic. The precautions described in section 5.2: Hand hygiene and section 6.6: Management of patient care environment and equipment should be followed….Interrupting transmission of COVID-19 requires both droplet and contact precautions”* (Public Health England 2020)2
* ***“How long the 2019-nCoV can survive on a dry surface?*** *There is currently no data available on stability of 2019-nCoV on surfaces.  Data from laboratory studies on SARS-CoV and MERS-CoV have shown that stability in the environment depends on several factors including relative temperature, humidity, and surface type. WHO continues to monitor existing evidence around nCoV and will update when such evidence is available.”* (WHO 2020)8
* ***“How long does the virus survive on surfaces?*** *It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems to behave like other coronaviruses. Studies suggest that coronaviruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment). If you think a surface may be infected, clean it with simple disinfectant to kill the virus and protect yourself and others. Clean your hands with an alcohol-based hand rub or wash them with soap and water. Avoid touching your eyes, mouth, or nose.”* (WHO 2020)8
* *“Significant environmental contamination by patients with SARS-CoV-2 through respiratory droplets and fecal shedding suggests the environment as a potential medium of transmission and supports the need for strict adherence to environmental and hand hygiene.”* (Ong et al. 2020)5

Also, the following email was received:

*28 March 2020*

*Dear colleagues,*

*During the COVID-19 emergency every person - including library staff, those using library books and those working in, or visiting, the library space - is advised to wash their hands more frequently to protect themselves from any contaminated surfaces.*

*Please note guidance from the COVID-19 Guidance Cell of Public Health England’s National Infection Service, as advised to the Department of Digital, Culture, Media and Sport on 27 March 2020: -*

* *The risk from books covered in a plastic cover handled by someone who is a possible COVID-19 case is negligible after 72 hours.*
* *The risk from books with a cardboard/paper cover is negligible after 24 hours.*

*Yours faithfully,*

*Sue*

***Sue Lacey Bryant***

***National Lead for NHS Library and Knowledge Services***

***Directorate of Innovation and Transformation***

***Health Education England***

We hope that we have interpreted your request correctly. Please let is know if you would like us to search further.

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**Accessing Articles**

Links are provided where online access to the full text is available. An OpenAthens username and password may be required for online access to articles. You can register for one here: <https://openathens.nice.org.uk/>

Unfortunately there may occasionally be some problems accessing the links provided. In this case the items can be accessed via the Library Journals link: <http://journals.nice.org.uk/>. [Log in to OpenAthens via the link in the top tight-hand corner].

If the full text is not available, you can request an Inter-Library Loan freely and directly via our Inter-Library Loans system: CLIO. Register for CLIO (using your library membership number) at: [https://derbyill.cliohosting.co.uk](https://derbyill.cliohosting.co.uk/). Further information can be found at: <http://www.uhdblibrary.co.uk/ills>.

**Feedback**

Once you have read this report, I would appreciate it if you would complete our online literature search feedback form at:

<https://www.smartsurvey.co.uk/s/LiteratureSearchFeedback20192020/>

This relates to this specific search and will help us to monitor and improve our service. Many Thanks.

Suzanne Toft Lisa Lawrence

Training Librarian (Chartered) Clinical Librarian

[suzanne.toft@nhs.net](mailto:suzanne.toft@nhs.net) [lisa.lawrence4@nhs.net](mailto:lisa.lawrence4@nhs.net)

**Current at:** 28th March 2020

**Time taken for search:** 5 hours.

**Please acknowledge this work in any resulting paper or presentation as:**

Evidence Search: COVID-19 infection from case notes. Suzanne Toft and Lisa Lawrence. (28 March 2020). Derby, UK: University Hospitals of Derby & Burton NHS Foundation Trust Library and Knowledge Service.

**Disclaimer:** Please note that the information supplied by the Library and Knowledge Service in response to a literature search is for information purposes only.  Every reasonable effort will be made to ensure that this information is accurate, up-to-date and complete. However, it is possible that it may not be representative of the whole body of evidence. No responsibility can be accepted by the Library for any action taken on the basis of this information.

Guidance or information relating to specific drug queries or procedures should be referred to Medicines Information on RDH ext. 85379 or Burton ext. 5168 or 5101. For local UHDB guidelines and policies please refer to the red button on the Trust intranet, or [**https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-main.pl**](https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-main.pl)

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**Results**

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1. **COVID-19 Book Handling Protocol Information**

**Author:** Dean Giustini, University of British Columbia, Canada.

Are books in libraries and archives safe?

Books carry similar risks to any other surface when / if they come into contact with the COVID-19 virus. Libraries, archives and museums should be thinking about the issues regarding circulating and handling of materials during the pandemic.

<https://docs.google.com/document/d/1nqAmCFT2RZHKvpC5evLtfBiZ4EFFLEXx_3Pq6OldBN4/edit>

1. **COVID-19 Guidance for infection prevention and control in healthcare settings** Version 1.0.

*Adapted from Pandemic Influenza: Guidance for Infection prevention and control in healthcare settings 2020*

**Author:** Public Health England

**Extract:** 2.3 Survival in the environment

Human coronaviruses can survive on inanimate objects and can remain viable for up to 5 days at temperatures of 22-25°C and relative humidity of 40-50% (which is typical of air-conditioned indoor environments).1 Survival on environmental surfaces is also dependent on the surface type.1 Extensive environmental contamination may occur following an aerosol generating procedure (AGP). The rate of clearance of aerosols in an enclosed space is dependent on the extent of any mechanical/natural ventilation – the greater the number of air changes per hour (ventilation rate), the sooner any aerosol will be cleared.5 The time required for clearance of aerosols, and thus the time after which the room can be entered without a filtering face piece (class 3) (FFP3) respirator, can be determined by the number of air changes per hour (ACH) as outlined in WHO guidance; in general wards and single rooms there should be a minimum of 6 air changes per hour, in negative-pressure isolation rooms there should be a minimum of 12 air changes per hour.6 Where feasible, environmental decontamination should be performed when it is considered appropriate to enter the room/area without an FFP3 respirator. A single air change is estimated to remove 63% of airborne contaminants, after 5 air changes less than 1% of airborne contamination is thought to remain.7 A minimum of 20 minutes i.e. 2 air changes, in hospital settings where the majority of these procedures occur is considered pragmatic. The precautions described in section 5.2: Hand hygiene and section 6.6: Management of patient care environment and equipment should be followed…..

….Interrupting transmission of COVID-19 requires both droplet and contact precautions….

**Source:** Public Health England Library

1. **Coronavirus disease 2019 (COVID-19)**

**Author:** Kenneth McIntosh, MD

**Section Editor:** Martin S Hirsch, MD

**Deputy Editor:** Allyson Bloom, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: Feb 2020. | This topic last updated: Mar 19, 2020.

**Extract: Environmental disinfection** — To help reduce the spread of COVID-19 virus, environmental infection control procedures should also be implemented [71,75,95,96,99]. In United States health care settings, the CDC states routine cleaning and disinfection procedures are appropriate for COVID-19 virus [95]….

It is unknown how long SARS-CoV-2 can persist on surfaces [14,99,101]; other coronaviruses have been tested and may survive on inanimate surfaces for up to six to nine days without disinfection. In a study evaluating the survival of viruses dried on a plastic surface at room temperature, a specimen containing SARS-CoV (a virus closely related to SARS-CoV-2) had detectable infectivity at six but not nine days [101]. However, in a systematic review of similar studies, various disinfectants (including ethanol at concentrations between 62 and 71 percent) inactivated a number of coronaviruses related to SARS-CoV-2 within one minute [99]…..

**Preventing exposure in the community** — The following general measures are recommended to reduce transmission of infection:

●Diligent hand washing, particularly after touching surfaces in public. Use of hand sanitizer that contains at least 60 percent alcohol is a reasonable alternative if the hands are not visibly dirty.

●Respiratory hygiene (e.g. covering the cough or sneeze).

●Avoiding touching the face (in particular eyes, nose, and mouth).

●Avoiding crowds (particularly in poorly ventilated spaces) if possible and avoiding close contact with ill individuals.

●Cleaning and disinfecting objects and surfaces that are frequently touched. The CDC has issued guidance on disinfection in the home setting; a list of EPA-registered products can be found here.

**Source:** UpToDate

1. **COVID-19 (Novel Coronavirus)**

**Deputy Editor:** Vito Iacoviello MD, FIDSA

**Updated:** 2020 Jan 27

**Extract:** CLINICIANS' PRACTICE POINTMeasures to secure the safety of all, including the general public, patients, and healthcare providers, is a fluid process. Decisions regarding home quarantine, supervised quarantine, voluntary furlough, and mandatory furlough must be based upon the most current information for a given area. Healthcare Systems should meet regularly with representation from administration, healthcare providers, infection control, environmental services, laboratory, security, human resources, information systems, etc., to review their situation. Agenda items may include local disease activity (including number of hospitalized patients), surge capacity, staffing issues (including furlough decisions), supply issues, and current recommendations from public health organizations. Open communication and ability to adjust to rapidly changing circumstances is paramount.

additional precautions for suspected COVID-19

* contact and droplet precautions
  + apply to all patients, family members, visitors, and healthcare workers in addition to standard precautions
  + continue until patient is asymptomatic
  + place patients in adequately ventilated single rooms (air flow ≥ 160 L/second/patient for naturally ventilated general ward rooms)
  + group patients suspected of COVID-19 together if single room unavailable, with patient beds ≥ 1 meter apart
  + group healthcare workers to exclusively care for suspected COVID-19 cases if possible
* clean and disinfect patient-contact surfaces routinely
* limit number of healthcare workers, family members, and visitors in contact with patient with suspected COVID-19

administrative controls

* establish sustainable infection prevention and control infrastructures and activities

**Source:** DynaMed

<https://www.dynamed.com/condition/covid-19-novel-coronavirus#GUID-B58DE137-8112-48BB-8030-53D75494B6DD>

1. **Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient.**

**Author(s):** Ong, Sean Wei Xiang; Tan, Yian Kim; Chia, Po Ying; Lee, Tau Hong; Ng, Oon Tek; Wong, Michelle Su Yen; Marimuthu, Kalisvar

**Source:** JAMA; Mar 2020

**Publication Date:** Mar 2020

**Publication Type(s):** Journal Article

**PubMedID:** 32129805

Available at [JAMA](https://jamanetwork.com/journals/jama/articlepdf/2762692/jama_ong_2020_ld_200016.pdf) - from Unpaywall

**Extract:** Coronaviruses have been implicated in nosocomial outbreaks with environmental contamination as a route of transmission. Similarly, nosocomial transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been reported. However, the mode of transmission and extent of environmental contamination are unknown.

**Database:** Medline

1. **Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents.**

**Author(s):** Kampf, G; Todt, D; Pfaender, S; Steinmann, E

**Source:** The Journal of Hospital Infection; Mar 2020; vol. 104 (no. 3); p. 246-251

**Publication Date:** Mar 2020

**Publication Type(s):** Journal Article Review

**PubMedID:** 32035997

Available at [Journal of Hospital Infection](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.jhin.2020.01.022) - from ClinicalKey

Available at [Journal of Hospital Infection](http://www.journalofhospitalinfection.com/article/S0195670120300463/pdf) - from Unpaywall

**Abstract:** Currently, the emergence of a novel human coronavirus, SARS-CoV-2, has become a global health concern causing severe respiratory tract infections in humans. Human-to-human transmissions have been described with incubation times between 2-10 days, facilitating its spread via droplets, contaminated hands or surfaces. We therefore reviewed the literature on all available information about the persistence of human and veterinary coronaviruses on inanimate surfaces as well as inactivation strategies with biocidal agents used for chemical disinfection, e.g. in healthcare facilities. The analysis of 22 studies reveals that human coronaviruses such as Severe Acute Respiratory Syndrome (SARS) coronavirus, Middle East Respiratory Syndrome (MERS) coronavirus or endemic human coronaviruses (HCoV) can persist on inanimate surfaces like metal, glass or plastic for up to 9 days, but can be efficiently inactivated by surface disinfection procedures with 62-71% ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite within 1 minute. Other biocidal agents such as 0.05-0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate are less effective. As no specific therapies are available for SARS-CoV-2, early containment and prevention of further spread will be crucial to stop the ongoing outbreak and to control this novel infectious thread.

**Database:** Medline

1. **Guidance**

# COVID-19: cleaning in non-healthcare settings

**Updated:** 19 March 2020

1. if an area can be kept closed and secure for 72 hours, wait until this time has passed for cleaning as the amount of virus living on surfaces will have reduced significantly by 72 hours

The infection risk from coronavirus (COVID-19) following contamination of the environment decreases over time. It is not yet clear at what point there is no risk. However, studies of other viruses in the same family suggest that, in most circumstances, the risk is likely to be reduced significantly after 72 hours.

**Source:** Public Health England

<https://www.gov.uk/government/publications/covid-19-decontamination-in-non-healthcare-settings/covid-19-decontamination-in-non-healthcare-settings>

1. **World Health Organization Q&As on COVID-19**

[**How long the 2019-nCoV can survive on a dry surface?**](https://www.who.int/news-room/q-a-detail/q-a-on-infection-prevention-and-control-for-health-care-workers-caring-for-patients-with-suspected-or-confirmed-2019-ncov)

There is currently no data available on stability of 2019-nCoV on surfaces.  Data from laboratory studies on SARS-CoV and MERS-CoV have shown that stability in the environment depends on several factors including relative temperature, humidity, and surface type. WHO continues to monitor existing evidence around nCoV and will update when such evidence is available.

[**How long does the virus survive on surfaces?**](https://www.who.int/news-room/q-a-detail/q-a-coronaviruses)

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems to behave like other coronaviruses. Studies suggest that coronaviruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment).

If you think a surface may be infected, clean it with simple disinfectant to kill the virus and protect yourself and others. Clean your hands with an alcohol-based hand rub or wash them with soap and water. Avoid touching your eyes, mouth, or nose.

<https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>

[**Is it safe to receive a package from any area where COVID-19 has been reported?**](https://www.who.int/news-room/q-a-detail/q-a-coronaviruses)

Yes. The likelihood of an infected person contaminating commercial goods is low and the risk of catching the virus that causes COVID-19 from a package that has been moved, travelled, and exposed to different conditions and temperature is also low.

# Q&A on infection prevention and control for health care workers caring for patients with suspected or confirmed 2019-nCoV

1 March 2020 | Q&A

<https://www.who.int/news-room/q-a-detail/q-a-on-infection-prevention-and-control-for-health-care-workers-caring-for-patients-with-suspected-or-confirmed-2019-ncov>

# Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings

**Authors**: Centers for Disease Control and Prevention

**Hand Hygiene**

* HCP should perform hand hygiene before and after all patient contact, contact with potentially infectious material, and before putting on and after removing PPE, including gloves. Hand hygiene after removing PPE is particularly important to remove any pathogens that might have been transferred to bare hands during the removal process.
* HCP should perform hand hygiene by using ABHR with 60-95% alcohol or washing hands with soap and water for at least 20 seconds. If hands are visibly soiled, use soap and water before returning to ABHR.
* Healthcare facilities should ensure that hand hygiene supplies are readily available to all personnel in every care location.

### 10. Implement Environmental Infection Control

* Dedicated medical equipment should be used when caring for patients with known or suspected COVID-19.
  + All non-dedicated, non-disposable medical equipment used for patient care should be cleaned and disinfected according to manufacturer’s instructions and facility policies.
* Ensure that environmental cleaning and disinfection procedures are followed consistently and correctly.
* Routine cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces prior to applying an EPA-registered, hospital-grade disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product’s label) are appropriate for SARS-CoV-2 in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.
  + Refer to [List N external icon](https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2) on the EPA website for EPA-registered disinfectants that have qualified under EPA’s emerging viral pathogens program for use against SARS-CoV-2.
* Management of laundry, food service utensils, and medical waste should also be performed in accordance with routine procedures.
* Additional information about recommended practices for terminal cleaning of rooms and PPE to be worn by environmental services personnel is available in the [Healthcare Infection Prevention and Control FAQs for COVID-19](https://www.cdc.gov/coronavirus/2019-ncov/infection-control/infection-prevention-control-faq.html)

<https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html#infection_control>

1. **Getting your workplace ready for COVID-19**

**Date:** 3 March 2020

**Author:** World Health Organization (WHO)

**Extract:** Why? Because contamination on surfaces touched by employees and customers is one of the main ways that COVID-19 spreads

<https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf?sfvrsn=359a81e7_6>

# Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1

**Author(s):** van Doremalen, Neeltje; Bushmaker, Trenton; Morris, Dylan H; Holbrook, Myndi G; Gamble, Amandine; Williamson, Brandi N; Tamin, Azaibi; Harcourt, Jennifer L; Thornburg, Natalie J; Gerber, Susan I; Lloyd-Smith, James O; de Wit, Emmie; Munster, Vincent J

**Source:** The New England Journal of Medicine; Mar 2020

**Publication Date:** Mar 2020

**Publication Type(s):** Letter

**PubMedID:** 32182409

Available at [The New England journal of medicine](http://www.nejm.org/doi/full/10.1056/NEJMc2004973) - from Massachusetts Medical Society

Available at [The New England journal of medicine](https://doi.org/10.1056/nejmc2004973) - from Unpaywall

Available from  <https://www.nejm.org/doi/full/10.1056/NEJMc2004973>

**Database:** Medline

# New Coronavirus Stable for Hours on Surfaces: SARS-CoV-2 Stability Similar to Original SARS Virus

# Date: March 17, 2020

# Source: National Institute of Allergy and Infectious Diseases (NIH)

The virus that causes coronavirus disease 2019 (COVID-19) is stable for several hours to days in aerosols and on surfaces, according to a new study from National Institutes of Health, CDC, UCLA and Princeton University scientists *in*The New England Journal of Medicine*.*

Available from  <https://www.niaid.nih.gov/news-events/new-coronavirus-stable-hours-surfaces>

# New Coronavirus Study Shows How Long It Survives On Different Surfaces

**Date:** Mar 15, 2020

**Author:** Eric Mack

**Source:** Forbes

Available from  <https://www.forbes.com/sites/ericmack/2020/03/15/new-coronavirus-study-shows-how-long-hcov-19-can-live-on-different-surfaces/#1b9d3ed9412f>

# Coronavirus can stay in the air for hours and surfaces for days – how to disinfect?

**Author:** Angela Betsaida B. Laguipo, BSN Mar 19, 2020

**Source:** News Medical

<https://www.news-medical.net/news/20200319/Coronavirus-can-stay-in-the-air-for-hours-and-surfaces-for-days-e28093-how-to-disinfect.aspx>

Citing:

* Bushmaker, T., van Doremalen, N.,Morris, D., Holbrook, M., Gamble, A. et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. The New England Journal of Medicine.

<https://www.nejm.org/doi/10.1056/NEJMc2004973>

* U.S. Centers for Disease Control and Prevention (CDC). (2020). Clean & Disinfect: Interim Recommendations for U.S. Households with Suspected/Confirmed Coronavirus Disease 2019.

<https://www.cdc.gov/coronavirus/2019-ncov/prepare/cleaning-disinfection.html>

* World Health Organization (WHO). (2020). Statement on the meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV).

<https://www.who.int/news-room/detail/23-01-2020-statement-on-the-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)>

1. **Deposition of respiratory virus pathogens on frequently touched surfaces at airports.**

**Author(s):** Ikonen, Niina; Savolainen-Kopra, Carita; Enstone, Joanne E; Kulmala, Ilpo; Pasanen, Pertti; Salmela, Anniina; Salo, Satu; Nguyen-Van-Tam, Jonathan S; Ruutu, Petri; PANDHUB consortium

**Source:** BMC Infectious Diseases; Aug 2018; vol. 18 (no. 1); p. 437

**Publication Date:** Aug 2018

**Publication Type(s):** Journal Article

**PubMedID:** 30157776

Available at [BMC infectious diseases](https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3150-5) - from BioMed Central

Available at [BMC infectious diseases](http://europepmc.org/search?query=(DOI:10.1186/s12879-018-3150-5)) - from Europe PubMed Central - Open Access

Available at [BMC infectious diseases](http://search.ebscohost.com/login.aspx?direct=true&scope=site&site=ehost-live&db=mdc&AN=30157776) - from EBSCO (MEDLINE Complete)

Available at [BMC infectious diseases](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145298&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=1471-2334&volume=18&issue=1&spage=437) - from ProQuest (Health Research Premium) - NHS Version

Available at [BMC infectious diseases](https://bmcinfectdis.biomedcentral.com/track/pdf/10.1186/s12879-018-3150-5) - from Unpaywall

**Abstract:** BACKGROUND International and national travelling has made the rapid spread of infectious diseases possible. Little information is available on the role of major traffic hubs, such as airports, in the transmission of respiratory infections, including seasonal influenza and a pandemic threat. We investigated the presence of respiratory viruses in the passenger environment of a major airport in order to identify risk points and guide measures to minimize transmission. METHODS Surface and air samples were collected weekly at three different time points during the peak period of seasonal influenza in 2015-16 in Finland. Swabs from surface samples, and air samples were tested by real-time PCR for influenza A and B viruses, respiratory syncytial virus, adenovirus, rhinovirus and coronaviruses (229E, HKU1, NL63 and OC43). RESULTS Nucleic acid of at least one respiratory virus was detected in 9 out of 90 (10%) surface samples, including: a plastic toy dog in the children's playground (2/3 swabs, 67%); hand-carried luggage trays at the security check area (4/8, 50%); the buttons of the payment terminal at the pharmacy (1/2, 50%); the handrails of stairs (1/7, 14%); and the passenger side desk and divider glass at a passport control point (1/3, 33%). Among the 10 respiratory virus findings at various sites, the viruses identified were: rhinovirus (4/10, 40%, from surfaces); coronavirus (3/10, 30%, from surfaces); adenovirus (2/10, 20%, 1 air sample, 1 surface sample); influenza A (1/10, 10%, surface sample). CONCLUSIONS Detection of pathogen viral nucleic acids indicates respiratory viral surface contamination at multiple sites associated with high touch rates, and suggests a potential risk in the identified airport sites. Of the surfaces tested, plastic security screening trays appeared to pose the highest potential risk, and handling these is almost inevitable for all embarking passengers.

**Database:** Medline

1. **Extensive Viable Middle East Respiratory Syndrome (MERS) Coronavirus Contamination in Air and Surrounding Environment in MERS Isolation Wards.**

**Author(s):** Kim, Sung-Han; Chang, So Young; Sung, Minki; Park, Ji Hoon; Bin Kim, Hong; Lee, Heeyoung; Choi, Jae-Phil; Choi, Won Suk; Min, Ji-Young

**Source:** Clinical Infectious Diseases: an official publication of the Infectious Diseases Society of America; Aug 2016; vol. 63 (no. 3); p. 363-369

**Publication Date:** Aug 2016

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 27090992

Available at [Clinical infectious diseases : an official publication of the Infectious Diseases Society of America](https://academic.oup.com/cid/article-pdf/63/3/363/25633838/ciw239.pdf) - from Unpaywall

**Abstract:** BACKGROUND The largest outbreak of Middle East respiratory syndrome coronavirus (MERS-CoV) outside the Middle East occurred in South Korea in 2015 and resulted in 186 laboratory-confirmed infections, including 36 (19%) deaths. Some hospitals were considered epicenters of infection and voluntarily shut down most of their operations after nearly half of all transmissions occurred in hospital settings. However, the ways that MERS-CoV is transmitted in healthcare settings are not well defined. METHODS We explored the possible contribution of contaminated hospital air and surfaces to MERS transmission by collecting air and swabbing environmental surfaces in 2 hospitals treating MERS-CoV patients. The samples were tested by viral culture with reverse transcription polymerase chain reaction (RT-PCR) and immunofluorescence assay (IFA) using MERS-CoV Spike antibody, and electron microscopy (EM). RESULTS The presence of MERS-CoV was confirmed by RT-PCR of viral cultures of 4 of 7 air samples from 2 patients' rooms, 1 patient's restroom, and 1 common corridor. In addition, MERS-CoV was detected in 15 of 68 surface swabs by viral cultures. IFA on the cultures of the air and swab samples revealed the presence of MERS-CoV. EM images also revealed intact particles of MERS-CoV in viral cultures of the air and swab samples. CONCLUSIONS These data provide experimental evidence for extensive viable MERS-CoV contamination of the air and surrounding materials in MERS outbreak units. Thus, our findings call for epidemiologic investigation of the possible scenarios for contact and airborne transmission and raise concern regarding the adequacy of current infection control procedures.

**Database:** Medline

1. **Transmission of SARS and MERS coronaviruses and influenza virus in healthcare settings: the possible role of dry surface contamination.**

**Author(s):** Otter, J.A.; Donskey, C.; Yezli, S.; Douthwaite, S.; Goldenberg, S.D.; Weber, D.J.

**Source:** Journal of Hospital Infection; Mar 2016; vol. 92 (no. 3); p. 235-250

**Publication Date:** Mar 2016

**Publication Type(s):** Academic Journal

**PubMedID:** NLM26597631

Available at [Journal of Hospital Infection](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.jhin.2015.08.027) - from ClinicalKey

**Abstract:** Viruses with pandemic potential including H1N1, H5N1, and H5N7 influenza viruses, and severe acute respiratory syndrome (SARS)/Middle East respiratory syndrome (MERS) coronaviruses (CoV) have emerged in recent years. SARS-CoV, MERS-CoV, and influenza virus can survive on surfaces for extended periods, sometimes up to months. Factors influencing the survival of these viruses on surfaces include: strain variation, titre, surface type, suspending medium, mode of deposition, temperature and relative humidity, and the method used to determine the viability of the virus. Environmental sampling has identified contamination in field-settings with SARS-CoV and influenza virus, although the frequent use of molecular detection methods may not necessarily represent the presence of viable virus. The importance of indirect contact transmission (involving contamination of inanimate surfaces) is uncertain compared with other transmission routes, principally direct contact transmission (independent of surface contamination), droplet, and airborne routes. However, influenza virus and SARS-CoV may be shed into the environment and be transferred from environmental surfaces to hands of patients and healthcare providers. Emerging data suggest that MERS-CoV also shares these properties. Once contaminated from the environment, hands can then initiate self-inoculation of mucous membranes of the nose, eyes or mouth. Mathematical and animal models, and intervention studies suggest that contact transmission is the most important route in some scenarios. Infection prevention and control implications include the need for hand hygiene and personal protective equipment to minimize self-contamination and to protect against inoculation of mucosal surfaces and the respiratory tract, and enhanced surface cleaning and disinfection in healthcare settings.

**Database:** CINAHL

1. **Middle East respiratory syndrome coronavirus on inanimate surfaces: A risk for health care transmission**

**Author(s):** Khan R.M.; Al-Dorzi H.M.; Baharoon S.; Arabi Y.M.; Al Johani S.; Balkhy H.H.; Alenazi T.H.

**Source:** American Journal of Infection Control; Nov 2016; vol. 44 (no. 11); p. 1387-1389

**Publication Date:** Nov 2016

**Publication Type(s):** Article

**PubMedID:** 27339792

Available at [American journal of infection control](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.ajic.2016.05.006) - from ClinicalKey

**Abstract:** The Middle East Respiratory syndrome coronavirus (MERS-CoV) has been responsible for multiple health care-associated outbreaks. We investigated whether high-touch surfaces in 3 rooms of laboratory-confirmed MERS-CoV patients were contaminated with MERS-CoV RNA. We found 2 out of 51 surfaces were contaminated with MERS-CoV viral genetic material. Hence, environmental contamination may be a potential source of health care transmission and outbreaks. Meticulous environmental cleaning may be important in preventing transmission within the health care setting. Copyright © 2016 Association for Professionals in Infection Control and Epidemiology, Inc.

**Database:** EMBASE

1. **Environmental Contamination and Viral Shedding in MERS Patients During MERS-CoV Outbreak in South Korea.**

**Author(s):** Bin, Seo Yu; Heo, Jung Yeon; Song, Min-Suk; Lee, Jacob; Kim, Eun-Ha; Park, Su-Jin; Kwon, Hyeok-Il; Kim, Se Mi; Kim, Young-Il; Si, Young-Jae; Lee, In-Won; Baek, Yun Hee; Choi, Won-Suk; Min, Jinsoo; Jeong, Hye Won; Choi, Young Ki

**Source:** Clinical infectious diseases: an official publication of the Infectious Diseases Society of America; Mar 2016; vol. 62 (no. 6); p. 755-760

**Publication Date:** Mar 2016

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 26679623

Available at [Clinical infectious diseases : an official publication of the Infectious Diseases Society of America](https://academic.oup.com/cid/article-pdf/62/6/755/7452273/civ1020.pdf) - from Unpaywall

**Abstract:** BACKGROUND Although Middle East Respiratory Syndrome coronavirus (MERS-CoV) is characterized by a risk of nosocomial transmission, the detailed mode of transmission and period of virus shedding from infected patients are poorly understood. The aims of this study were to investigate the potential role of environmental contamination by MERS-CoV in healthcare settings and to define the period of viable virus shedding from MERS patients. METHODS We investigated environmental contamination from 4 patients in MERS-CoV units of 2 hospitals. MERS-CoV was detected by reverse transcription polymerase chain reaction (PCR) and viable virus was isolated by cultures. RESULTS Many environmental surfaces of MERS patient rooms, including points frequently touched by patients or healthcare workers, were contaminated by MERS-CoV. Viral RNA was detected up to five days from environmental surfaces following the last positive PCR from patients' respiratory specimens. MERS-CoV RNA was detected in samples from anterooms, medical devices, and air-ventilating equipment. In addition, MERS-CoV was isolated from environmental objects such as bed sheets, bedrails, IV fluid hangers, and X-ray devices. During the late clinical phase of MERS, viable virus could be isolated in 3 of the 4 enrolled patients on day 18 to day 25 after symptom onset. CONCLUSIONS Most of touchable surfaces in MERS units were contaminated by patients and health care workers and the viable virus could shed through respiratory secretion from clinically fully recovered patients. These results emphasize the need for strict environmental surface hygiene practices, and sufficient isolation period based on laboratory results rather than solely on clinical symptoms.

**Database:** Medline

1. **Human Coronavirus 229E Remains Infectious on Common Touch Surface Materials.**

**Author(s):** Warnes, Sarah L; Little, Zoë R; Keevil, C William

**Source:** mBio; Nov 2015; vol. 6 (no. 6); p. e01697

**Publication Date:** Nov 2015

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 26556276

Available at [mBio](http://europepmc.org/search?query=(DOI:10.1128/mBio.01697-15)) - from Europe PubMed Central - Open Access

Available at [mBio](https://mbio.asm.org/lookup/doi/10.1128/mBio.01697-15) - from HighWire - Free Full Text

Available at [mBio](https://mbio.asm.org/content/mbio/6/6/e01697-15.full.pdf) - from Unpaywall

**Abstract:** The evolution of new and reemerging historic virulent strains of respiratory viruses from animal reservoirs is a significant threat to human health. Inefficient human-to-human transmission of zoonotic strains may initially limit the spread of transmission, but an infection may be contracted by touching contaminated surfaces. Enveloped viruses are often susceptible to environmental stresses, but the human coronaviruses responsible for severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) have recently caused increasing concern of contact transmission during outbreaks. We report here that pathogenic human coronavirus 229E remained infectious in a human lung cell culture model following at least 5 days of persistence on a range of common nonbiocidal surface materials, including polytetrafluoroethylene (Teflon; PTFE), polyvinyl chloride (PVC), ceramic tiles, glass, silicone rubber, and stainless steel. We have shown previously that noroviruses are destroyed on copper alloy surfaces. In this new study, human coronavirus 229E was rapidly inactivated on a range of copper alloys (within a few minutes for simulated fingertip contamination) and Cu/Zn brasses were very effective at lower copper concentration. Exposure to copper destroyed the viral genomes and irreversibly affected virus morphology, including disintegration of envelope and dispersal of surface spikes. Cu(I) and Cu(II) moieties were responsible for the inactivation, which was enhanced by reactive oxygen species generation on alloy surfaces, resulting in even faster inactivation than was seen with nonenveloped viruses on copper. Consequently, copper alloy surfaces could be employed in communal areas and at any mass gatherings to help reduce transmission of respiratory viruses from contaminated surfaces and protect the public health. IMPORTANCE Respiratory viruses are responsible for more deaths globally than any other infectious agent. Animal coronaviruses that "host jump" to humans result in severe infections with high mortality, such as severe acute respiratory syndrome (SARS) and, more recently, Middle East respiratory syndrome (MERS). We show here that a closely related human coronavirus, 229E, which causes upper respiratory tract infection in healthy individuals and serious disease in patients with comorbidities, remained infectious on surface materials common to public and domestic areas for several days. The low infectious dose means that this is a significant infection risk to anyone touching a contaminated surface. However, rapid inactivation, irreversible destruction of viral RNA, and massive structural damage were observed in coronavirus exposed to copper and copper alloy surfaces. Incorporation of copper alloy surfaces in conjunction with effective cleaning regimens and good clinical practice could help to control transmission of respiratory coronaviruses, including MERS and SARS.

**Database:** Medline

1. **Evaluating the virucidal efficacy of hydrogen peroxide vapour.**

**Author(s):** Goyal, S M; Chander, Y; Yezli, S; Otter, J A

**Source:** The Journal of Hospital Infection; Apr 2014; vol. 86 (no. 4); p. 255-259

**Publication Date:** Apr 2014

**Publication Type(s):** Journal Article

**PubMedID:** 24656442

Available at [The Journal of hospital infection](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.jhin.2014.02.003) - from ClinicalKey

**Abstract:** BACKGROUND Surface contamination has been implicated in the transmission of certain viruses, and surface disinfection can be an effective measure to interrupt the spread of these agents. AIM To evaluate the in-vitro efficacy of hydrogen peroxide vapour (HPV), a vapour-phase disinfection method, for the inactivation of a number of structurally distinct viruses of importance in the healthcare, veterinary and public sectors. The viruses studied were: feline calicivirus (FCV, a norovirus surrogate); human adenovirus type 1; transmissible gastroenteritis coronavirus of pigs (TGEV, a severe acute respiratory syndrome coronavirus [SARS-CoV] surrogate); avian influenza virus (AIV); and swine influenza virus (SwIV). METHODS The viruses were dried on stainless steel discs in 20- or 40-μL aliquots and exposed to HPV produced by a Clarus L generator (Bioquell, Horsham, PA, USA) in a 0.2-m(3) environmental chamber. Three vaporized volumes of hydrogen peroxide were tested in triplicate for each virus: 25, 27 and 33 mL. FINDINGS No viable viruses were identified after HPV exposure at any of the vaporized volumes tested. HPV was virucidal (>4-log reduction) against FCV, adenovirus, TGEV and AIV at the lowest vaporized volume tested (25 mL). For SwIV, due to low virus titre on the control discs, >3.8-log reduction was shown for the 25-mL vaporized volume and >4-log reduction was shown for the 27-mL and 33-mL vaporized volumes. CONCLUSION HPV was virucidal for structurally distinct viruses dried on surfaces, suggesting that HPV can be considered for the disinfection of virus-contaminated surfaces.

**Database:** Medline

1. **Inactivation of surrogate coronaviruses on hard surfaces by health care germicides.**

**Author(s):** Hulkower, Rachel L; Casanova, Lisa M; Rutala, William A; Weber, David J; Sobsey, Mark D

**Source:** American Journal of Infection Control; Jun 2011; vol. 39 (no. 5); p. 401-407

**Publication Date:** Jun 2011

**Publication Type(s):** Journal Article Research Support, U.s. Gov't, P.h.s.

**PubMedID:** 21256627

Available at [American journal of infection control](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.ajic.2010.08.011) - from ClinicalKey

Available at [American journal of infection control](http://cdr.lib.unc.edu/downloads/g445cf879) - from Unpaywall

**Abstract:** BACKGROUND In the 2003 severe acute respiratory syndrome outbreak, finding viral nucleic acids on hospital surfaces suggested surfaces could play a role in spread in health care environments. Surface disinfection may interrupt transmission, but few data exist on the effectiveness of health care germicides against coronaviruses on surfaces. METHODS The efficacy of health care germicides against 2 surrogate coronaviruses, mouse hepatitis virus (MHV) and transmissible gastroenteritis virus (TGEV), was tested using the quantitative carrier method on stainless steel surfaces. Germicides were o-phenylphenol/p-tertiary amylphenol) (a phenolic), 70% ethanol, 1:100 sodium hypochlorite, ortho-phthalaldehyde (OPA), instant hand sanitizer (62% ethanol), and hand sanitizing spray (71% ethanol). RESULTS After 1-minute contact time, for TGEV, there was a log(10) reduction factor of 3.2 for 70% ethanol, 2.0 for phenolic, 2.3 for OPA, 0.35 for 1:100 hypochlorite, 4.0 for 62% ethanol, and 3.5 for 71% ethanol. For MHV, log(10) reduction factors were 3.9 for 70% ethanol, 1.3 for phenolic, 1.7 for OPA, 0.62 for 1:100 hypochlorite, 2.7 for 62% ethanol, and 2.0 for 71% ethanol. CONCLUSION Only ethanol reduced infectivity of the 2 coronaviruses by >3-log(10) after 1 minute. Germicides must be chosen carefully to ensure they are effective against viruses such as severe acute respiratory syndrome coronavirus.

**Database:** Medline

1. **Effects of air temperature and relative humidity on coronavirus survival on surfaces.**

**Author(s):** Casanova, Lisa M; Jeon, Soyoung; Rutala, William A; Weber, David J; Sobsey, Mark D

**Source:** Applied and Environmental Microbiology; May 2010; vol. 76 (no. 9); p. 2712-2717

**Publication Date:** May 2010

**Publication Type(s):** Journal Article Research Support, U.s. Gov't, P.h.s.

**PubMedID:** 20228108

Available at [Applied and environmental microbiology](http://europepmc.org/search?query=(DOI:10.1128/AEM.02291-09)) - from Europe PubMed Central - Open Access

Available at [Applied and environmental microbiology](http://aem.asm.org/cgi/doi/10.1128/AEM.02291-09) - from HighWire - Free Full Text

Available at [Applied and environmental microbiology](https://aem.asm.org/content/aem/76/9/2712.full.pdf) - from Unpaywall

**Abstract:** Assessment of the risks posed by severe acute respiratory syndrome (SARS) coronavirus (SARS-CoV) on surfaces requires data on survival of this virus on environmental surfaces and on how survival is affected by environmental variables, such as air temperature (AT) and relative humidity (RH). The use of surrogate viruses has the potential to overcome the challenges of working with SARS-CoV and to increase the available data on coronavirus survival on surfaces. Two potential surrogates were evaluated in this study; transmissible gastroenteritis virus (TGEV) and mouse hepatitis virus (MHV) were used to determine effects of AT and RH on the survival of coronaviruses on stainless steel. At 4 degrees C, infectious virus persisted for as long as 28 days, and the lowest level of inactivation occurred at 20% RH. Inactivation was more rapid at 20 degrees C than at 4 degrees C at all humidity levels; the viruses persisted for 5 to 28 days, and the slowest inactivation occurred at low RH. Both viruses were inactivated more rapidly at 40 degrees C than at 20 degrees C. The relationship between inactivation and RH was not monotonic, and there was greater survival or a greater protective effect at low RH (20%) and high RH (80%) than at moderate RH (50%). There was also evidence of an interaction between AT and RH. The results show that when high numbers of viruses are deposited, TGEV and MHV may survive for days on surfaces at ATs and RHs typical of indoor environments. TGEV and MHV could serve as conservative surrogates for modeling exposure, the risk of transmission, and control measures for pathogenic enveloped viruses, such as SARS-CoV and influenza virus, on health care surfaces.

**Database:** Medline

1. **The antiviral action of common household disinfectants and antiseptics against murine hepatitis virus, a potential surrogate for SARS coronavirus.**

**Author(s):** Dellanno, Christine; Vega, Quinn; Boesenberg, Diane

**Source:** American journal of infection control; Oct 2009; vol. 37 (no. 8); p. 649-652

**Publication Date:** Oct 2009

**Publication Type(s):** Journal Article

**PubMedID:** 19692148

Available at [American journal of infection control](https://auth.elsevier.com/ShibAuth/institutionLogin?entityID=https://idp.eng.nhs.uk/openathens&appReturnURL=https%3A%2F%2Fwww.clinicalkey.com%2Fcontent%2FplayBy%2Fdoi%2F%3Fv%3D10.1016%2Fj.ajic.2009.03.012) - from ClinicalKey

Available at [American journal of infection control](http://www.ajicjournal.org/article/S019665530900594X/pdf) - from Unpaywall

**Abstract:** BACKGROUND The 2003 outbreak of severe acute respiratory syndrome (SARS) infected over 8000 people and killed 774. Transmission of SARS occurred through direct and indirect contact and large droplet nuclei. The World Health Organization recommended the use of household disinfectants, which have not been previously tested against SARS coronavirus (SARS-CoV), to disinfect potentially contaminated environmental surfaces. There is a need for a surrogate test system given the limited availability of the SARS-CoV for testing and biosafety requirements necessary to safely handle it. In this study, the antiviral activity of standard household products was assayed against murine hepatitis virus (MHV), as a potential surrogate for SARS-CoV. METHODS A surface test method, which involves drying an amount of virus on a surface and then applying the product for a specific contact time, was used to determine the virucidal activity. The virus titers and log reductions were determined by the Reed and Muench tissue culture infective dose (TCID)50 end point method. RESULTS When tested as directed, common household disinfectants or antiseptics, containing either 0.050% of triclosan, 0.12% of PCMX, 0.21% of sodium hypochlorite, 0.23% of pine oil, or 0.10% of a quaternary compound with 79% of ethanol, demonstrated a 3-log reduction or better against MHV without any virus recovered in a 30-second contact time. CONCLUSION Common household disinfectants and antiseptics were effective at inactivating MHV, a possible surrogate for SARS-CoV, from surfaces when used as directed. In an outbreak caused by novel agents, it is important to know the effectiveness of disinfectants and antiseptics to prevent or reduce the possibility of human-to-human transmission via surfaces.

**Database:** Medline

1. **Detection of airborne severe acute respiratory syndrome (SARS) coronavirus and environmental contamination in SARS outbreak units.**

**Author(s):** Booth, Timothy F; Kournikakis, Bill; Bastien, Nathalie; Ho, Jim; Kobasa, Darwyn; Stadnyk, Laurie; Li, Yan; Spence, Mel; Paton, Shirley; Henry, Bonnie; Mederski, Barbara; White, Diane; Low, Donald E; McGeer, Allison; Simor, Andrew; Vearncombe, Mary; Downey, James; Jamieson, Frances B; Tang, Patrick; Plummer, Frank

**Source:** The Journal of infectious diseases; May 2005; vol. 191 (no. 9); p. 1472-1477

**Publication Date:** May 2005

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 15809906

Available at [The Journal of infectious diseases](https://academic.oup.com/jid/article-pdf/191/9/1472/2562690/191-9-1472.pdf) - from Unpaywall

**Abstract:** Severe acute respiratory syndrome (SARS) is characterized by a risk of nosocomial transmission; however, the risk of airborne transmission of SARS is unknown. During the Toronto outbreaks of SARS, we investigated environmental contamination in SARS units, by employing novel air sampling and conventional surface swabbing. Two polymerase chain reaction (PCR)-positive air samples were obtained from a room occupied by a patient with SARS, indicating the presence of the virus in the air of the room. In addition, several PCR-positive swab samples were recovered from frequently touched surfaces in rooms occupied by patients with SARS (a bed table and a television remote control) and in a nurses' station used by staff (a medication refrigerator door). These data provide the first experimental confirmation of viral aerosol generation by a patient with SARS, indicating the possibility of airborne droplet transmission, which emphasizes the need for adequate respiratory protection, as well as for strict surface hygiene practices.

**Database:** Medline

1. **Efficacy of various disinfectants against SARS coronavirus.**

**Author(s):** Rabenau, H F; Kampf, G; Cinatl, J; Doerr, H W

**Source:** The Journal of hospital infection; Oct 2005; vol. 61 (no. 2); p. 107-111

**Publication Date:** Oct 2005

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 15923059

**Abstract:** The recent severe acute respiratory syndrome (SARS) epidemic in Asia and Northern America led to broad use of various types of disinfectant in order to control the public spread of the highly contagious virus. However, only limited data were available to demonstrate their efficacy against SARS coronavirus (SARS-CoV). We therefore investigated eight disinfectants for their activity against SARS-CoV according to prEN 14476. Four hand rubs were tested at 30s (Sterillium, based on 45% iso-propanol, 30% n-propanol and 0.2% mecetronium etilsulphate; Sterillium Rub, based on 80% ethanol; Sterillium Gel, based on 85% ethanol; Sterillium Virugard, based on 95% ethanol). Three surface disinfectants were investigated at 0.5% for 30 min and 60 min (Mikrobac forte, based on benzalkonium chloride and laurylamine; Kohrsolin FF, based on benzalkonium chloride, glutaraldehyde and didecyldimonium chloride; Dismozon pur, based on magnesium monoperphthalate), and one instrument disinfectant was investigated at 4% for 15 min, 3% for 30 min and 2% for 60 min [Korsolex basic, based on glutaraldehyde and (ethylenedioxy)dimethanol]. Three types of organic load were used: 0.3% albumin, 10% fetal calf serum, and 0.3% albumin with 0.3% sheep erythrocytes. Virus titres were determined by a quantitative test (endpoint titration) in 96-well microtitre plates. With all tested preparations, SARS-CoV was inactivated to below the limit of detection (reduction factor mostly > or =4), regardless of the type of organic load. In summary, SARS-CoV can be inactivated quite easily with many commonly used disinfectants.

**Database:** Medline

1. **Survival of severe acute respiratory syndrome coronavirus**

**Author(s):** Lai M.Y.; Cheng P.K.; Lim W.W.

**Source:** Clinical infectious diseases: an official publication of the Infectious Diseases Society of America; Oct 2005; vol. 41 (no. 7)

**Publication Date:** Oct 2005

**Publication Type(s):** Article

**PubMedID:** 16142653

Available at [Clinical infectious diseases : an official publication of the Infectious Diseases Society of America](https://academic.oup.com/cid/article-pdf/41/7/e67/881171/41-7-e67.pdf) - from Unpaywall

**Abstract:** BACKGROUND: The primary modes of transmission of severe acute respiratory syndrome (SARS) coronavirus (SARS-CoV) appear to be direct mucus membrane contact with infectious droplets and through exposure to formites. Knowledge of the survival characteristics of the virus is essential for formulating appropriate infection-control measures. METHOD(S): Survival of SARS-CoV strain GVU6109 was studied in stool and respiratory specimens. Survival of the virus on different environmental surfaces, including a laboratory request form, an impervious disposable gown, and a cotton nondisposable gown, was investigated. The virucidal effects of sodium hypochlorite, house detergent, and a peroxygen compound (Virkon S; Antec International) on the virus were also studied. RESULT(S): SARS-CoV GVU6109 can survive for 4 days in diarrheal stool samples with an alkaline pH, and it can remain infectious in respiratory specimens for >7 days at room temperature. Even at a relatively high concentration (10(4) tissue culture infective doses/mL), the virus could not be recovered after drying of a paper request form, and its infectivity was shown to last longer on the disposable gown than on the cotton gown. All disinfectants tested were shown to be able to reduce the virus load by >3 log within 5 min. CONCLUSION(S): Fecal and respiratory samples can remain infectious for a long period of time at room temperature. The risk of infection via contact with droplet-contaminated paper is small. Absorbent material, such as cotton, is preferred to nonabsorptive material for personal protective clothing for routine patient care where risk of large spillage is unlikely. The virus is easily inactivated by commonly used disinfectants.

**Database:** EMBASE

1. **Severe acute respiratory syndrome coronavirus on hospital surfaces.**

**Author(s):** Dowell, Scott F; Simmerman, James M; Erdman, Dean D; Wu, Jiunn-Shyan Julian; Chaovavanich, Achara; Javadi, Massoud; Yang, Jyh-Yuan; Anderson, Larry J; Tong, Suxiang; Ho, Mei Shang

**Source:** Clinical infectious diseases: an official publication of the Infectious Diseases Society of America; Sep 2004; vol. 39 (no. 5); p. 652-657

**Publication Date:** Sep 2004

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article Research Support, U.s. Gov't, P.h.s.

**PubMedID:** 15356778

Available at [Clinical infectious diseases : an official publication of the Infectious Diseases Society of America](https://academic.oup.com/cid/article-pdf/39/5/652/5926112/39-5-652.pdf) - from Unpaywall

**Abstract:** BACKGROUND Health care workers continued to contract severe acute respiratory syndrome (SARS), even after barrier precautions were widely implemented. METHODS We explored the possible contribution of contaminated hospital surfaces to SARS transmission by swabbing surfaces in 2 hospitals and testing the swab samples by reverse-transcriptase polymerase chain reaction (RT-PCR) and viral culture. RESULTS Twenty-six of 94 swab samples tested positive for viral RNA. Swab samples of respiratory secretions from each of the 4 patients examined tested positive by RT-PCR, as were 12 of 43 swabs from patient rooms and 10 of 47 swabs from other parts of the hospital, including the computer mouses at 2 nursing stations and the handrail of the public elevator. Specimens from areas with patients with SARS in the most infectious phase of illness (days 5-15 after onset) were more likely to be RNA positive than were swab specimens from elsewhere (24 of 63 samples vs. 2 of 31 samples; P=.001). All cultures showed no growth. CONCLUSIONS Although the viruses identified may have been noninfectious, health care workers should be aware that SARS coronavirus can contaminate environmental surfaces in the hospital, and fomites should be considered to be a possible mode of transmission of SARS.

**Database:** Medline

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**Local Guidance:** Local guidance has not been searched as part of this literature search. However, local guidelines, policies and procedures are available via the red button on the intranet.

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| exp "CORONAVIRUS INFECTIONS"/ | aerosol surface stability |
| exp "CORONAVIRUS INFECTIONS -- TRANSMISSION"/ | Aerosol AND surface stability of HCoV-1 compared to SARS-CoV-1). |
| exp "DISEASE TRANSMISSION, INFECTIOUS"/ | Aerosol surface stability of HCoV-1 compared to SARS-CoV-1). |
| exp "DISINFECTANTS "/ | air environmental |
| exp "ENVIRONMENTAL MICROBIOLOGY"/ | case notes |
| exp "MEDICAL RECORDS"/ | covid-19 OR coronavirus |
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