###### Literature Search Results

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| **Research question or topic:**  “Any guidance on the cleaning of IT equipment during the pandemic, eLearning or training on the PPE required and information on how long the virus lives on different surfaces” |
| **Completed by:** HEE Knowledge Management Team (Katie Nicholas) |
| **Date:** 29th April 2020 |
| **Please acknowledge this work in any resulting paper or presentation as:**  Literature Search: Cleaning IT equipment and COVID-19. Katie Nicholas. (29 April 2020). UK: Health Education England Knowledge Management Team |

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# **Search headlines**

There are several elements to this question so I have organised the results retrieved into the different parts that may inform an answer:

* any advice or guidance on cleaning IT, and other similar equipment, during the pandemic
* COVID-19 infection on different surfaces
* what PPE is required in what circumstances and whether this impacts on the cleaning of IT equipment
* and finally, any relevant eLearning or videos for non-clinical staff on this topic

Advice/ guidance on cleaning IT, and other similar equipment

I did not find any specific guidance relating to cleaning of IT equipment and COVID-19, but I did find information from Public Health England (PHE) and the World Health Organization (WHO) that goes some way to answering the question. It should also be noted that a lot of the guidance refers to what to do when there are instances of suspected or confirmed infection. In March (pre-UK lockdown) the WHO issued guidance on getting workplaces ready for COVID-19 in which they advised “surfaces (e.g. desks and tables) and objects (e.g. telephones, keyboards) **need to be wiped with disinfectant regularly**.” [[1]](#_1) Public Health England have issued guidance on cleaning in non-health care settings which recommends that “**all surfaces that the symptomatic person has come into contact** with must be **cleaned and disinfected**, including […] all potentially contaminated high-contact areas such as bathrooms, door handles, **telephones**, grab-rails in corridors and stairwells.” [[2]](#_2) The WHO also advises on the recommended disinfectants for environmental cleaning in healthcare facilities or homes housing patients with suspected or confirmed 2019-n-CoV infection (70% Ethyl alcohol to disinfect reusable dedicated equipment (e.g., thermometers) between uses) and (Sodium hypochlorite at 0.5% (equivalent 5000ppm) for disinfection of frequently touched surfaces in homes or healthcare facilities) [[3]](#_3) but discourages chlorine solutions as they carry a higher risk of hand irritation and ill health effects from making and diluting the solutions. [[4]](#_4) They also emphasise the importance of following environmental cleaning and disinfection procedures consistently and correctly when COVID-19 is suspected. [[5]](#_5) One paper discusses considerations that could be made in “built environments” such as universities, places of worship, corporate entities and other building owners – it emphasises the importance of signage about the importance of handwashing and implementing routine surface cleaning protocols. [[6]](#_6)

There is of course the issue of damage that could be caused to devices during a cleaning process and some manufacturers (e.g. Dell, Lenovo and Apple) have issued cleaning advice specific to their products. [[7-14]](#_7) Consumer advice organisation Which have issued advice on effective home cleaning during the lockdown [[12]](#_12) and one Oxford based cleaning company shared tips for keeping IT equipment clean at home during the outbreak. [[14]](#_14) These should of course only be used in conjunction with the latest official government advice about infection prevention and the virus.

I received a couple of replies from colleagues in Trust libraries about how they are managing this issue. One Trust shared their Health and Safety Policy for Display Screen Equipment which said “the regular cleaning of screen, keyboard and telephone should be carried out by the operator using wipes provided by the Trust.” In that trust domestic staff have not been allowed to clean or wipe ICT for some time [[15]](#_15). Another colleague said that in the absence of official advice from their trust they had been “cleaning mice with a very-well-wrung-out damp cloth in hot soapy water (i.e. with a small squirt of washing up liquid in a bucket of hot water).” [[16]](#_16) I also found some guidance and advice published pre-COVID-19 around cleaning of shared desks and equipment when “hot desking”, which may be helpful. [[17-18]](#_17)

COVID-19 infection and different surfaces

Librarians at Derby & Burton NHS FT conducted a literature review of COVID-19 infection on different surfaces at the end of March and for a full picture of the timescales of the infection on different surfaces I would recommend reading this review. [[19]](#_19) One paper included in their review looked at the persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents – the analysis of 22 studies revealed 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.**” [[20]](#_20) The WHO advise that “the most important thing to know about coronavirus on surfaces is that they can easily be cleaned with common household disinfectants that will kill the virus. Studies have shown that the COVID-19 virus can survive for up to 72 hours on plastic and stainless steel, less than 4 hours on copper and less than 24 hours on cardboard” [[21]](#_21) and that “respiratory droplets expelled from an infected person can contaminate and persist on surfaces” so you should “wash your hands regularly and thoroughly after touching any frequently- touched surface or object” [[22]](#_22) and “avoid touching your eyes, mouth, or nose.” [[21]](#_21)

What PPE is required in what circumstances?

Public Health England have issued COVID-19 infection prevention and control guidance which gives details of cleaning procedures in environments that are contaminated, and the PPE required. [[23]](#_23) Tables 1-2 at the end of the document break down the PPE required by setting and activity [[23]](#_23) and there is a flowchart for routine decontamination of reusable non-invasive patient care equipment. [[24]](#_24) WHO advises that “PPE should be used based on the risk of exposure (e.g. type of activity) and the transmission dynamics of the pathogen (e.g. contact, droplet or aerosol)”. Table 1 in this document lists recommended PPE during the outbreak according to the setting, personnel and type of activity. The cleaning of IT equipment is not on the list of activities. [[25]](#_25)

Relevant eLearning and videos for non-clinical staff

There are a couple of visual guides and videos on how to wash your hands and how to hand rub which are useful for non-clinical staff. [[26-28]](#_26)

eLearning and resources on Personal Protective Equipment (PPE) are available without logging in on the eLearning for Healthcare website including videos on donning and doffing of PPE and proper removal and disposal. [[29]](#_29) The Health and Safety Executive also have video and poster guides on how to safely remove gloves without contaminating hands. [[30-31]](#_30)

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| Complete numbered list of results with links | | | |
|  | **Citation** | **Abstract/ key themes** | **Link** |
| IT equipment and the work environment | | | |
| 1 | Getting your workplace ready for COVID-19  19th March 2020  WHO | Employers should start doing these things now, even if COVID-19 has not arrived in the communities where they operate. These measures can reduce working days lost due to illness and stop or slow the spread of COVID-19 if it arrives at one of your workplaces.  –Make sure your workplaces are clean and hygienic  **–Surfaces (e.g. desks and tables) and objects (e.g. telephones, keyboards) need to be wiped with disinfectant regularly**  –Why? Because contamination on surfaces touched by employees and customers is one of the main ways that COVID-19 spreads | [Link](https://www.who.int/docs/default-source/coronaviruse/advice-for-workplace-clean-19-03-2020.pdf) |
| 2 | COVID-19: Cleaning in non-healthcare settings  26th March 2020  Public Health England | All surfaces that the symptomatic person has come into contact with must be cleaned and disinfected, including:   * objects which are visibly contaminated with body fluids * all potentially contaminated high-contact areas such as bathrooms, door handles, **telephones**, grab-rails in corridors and stairwells | [Link](https://www.gov.uk/government/publications/covid-19-decontamination-in-non-healthcare-settings/covid-19-decontamination-in-non-healthcare-settings) |
| 3 | What are the disinfectants recommended for environmental cleaning in healthcare facilities or homes housing patients with suspected or confirmed 2019-nCoV infection?  30th March 2020  WHO Q&As | Environmental cleaning in healthcare facilities or homes housing patients with suspected or confirmed 2019-nCoV infection should use disinfectants that are active against enveloped viruses, such as 2019-nCoV and other coronaviruses. There are many disinfectants, including commonly used hospital disinfectants, that are active against enveloped viruses. Currently WHO recommendations include the use of:   * 70% Ethyl alcohol to disinfect reusable dedicated equipment (e.g., thermometers) between uses * Sodium hypochlorite at 0.5% (equivalent 5000ppm) for disinfection of frequently touched surfaces in homes or healthcare facilities   [Click here](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected) for the guidance on clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected. [Click here](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125) for the guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. More information about environmental cleaning can be found [here](https://www.cdc.gov/hai/pdfs/resource-limited/environmental-cleaning-508.pdf). | [Link](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) |
| 4 | Can chlorine solutions be used?  31st March 2020  WHO FAQs | Chlorine solutions are strongly discouraged as they carry a higher risk of hand irritation and ill health effects from making and diluting chlorine solutions, including eye irritation and respiratory problems. In addition, there is a risk of loss of antimicrobial effect if exposed to sunlight or heat.  Preparing chlorine solutions requires training to reach the correct dose of 0.05% with varying strengths of bleach available in the private sector.  Even if stored at a cool dry place with a lid away from sunlight, they have to be renewed daily.  In comparison simple soapy water solution do not have any of the above-mentioned health risks and complications including loss of antiviral effect due to heat or sunlight.  The antiviral effect of soapy water is due to the oily surface membrane of the COVID-virus that is dissolved by soap, killing the virus. | [Link](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) |
| 5 | Infection prevention and control during health care when COVID-19 is suspected  19th March 2020  WHO | “It is important to ensure that environmental cleaning and disinfection procedures are followed consistently and correctly. Thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite) are effective  and sufficient procedures.8 Medical devices and equipment, laundry, food service utensils, and medical waste should be managed in accordance with safe routine procedures.2,9” | [Link](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125) |
| 6 | 2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission  7th April 2020  Msystems | “Within the BE, environmental precautions that can be taken to potentially prevent the spread of SARS-CoV-2 include chemical deactivation of viral particles on surfaces ([39](http://europepmc.org/article/MED/32265315?singleResult=true#B39)). It has been demonstrated that 62 to 71% ethanol is effective at eliminating MERS, SARS ([42](http://europepmc.org/article/MED/32265315?singleResult=true#B42)), and SARS-CoV-2 ([34](http://europepmc.org/article/MED/32265315?singleResult=true#B34)). This ethanol concentration is typical of most alcohol-based hand sanitizers, making properly applied hand sanitizer a valuable tool against the spread of SARS-CoV-2 in the BE. Items should be removed from sink areas to ensure aerosolized water droplets do not carry viral particles onto commonly used items, and countertops around sinks should be cleaned using a 10% bleach solution or an alcohol-based cleaner on a regular basis. Again, it is important to remember that the main and much more common spread mechanism of previous CoVs has been identified as droplets from talking, sneezing, coughing, and vomiting than by the fecal-oral pathway ([34](http://europepmc.org/article/MED/32265315?singleResult=true#B34), [38](http://europepmc.org/article/MED/32265315?singleResult=true#B38), [39](http://europepmc.org/article/MED/32265315?singleResult=true#B39)). **Administrators and building operators should post signage about the effectiveness of handwashing for at least 20s with soap and hot water, ensure soap dispensers are full, provide access to alcohol-based hand sanitizer, and implement routine surface cleaning protocols to high-touch surfaces where contamination risks are high, such as around sinks and toilets** ([39](http://europepmc.org/article/MED/32265315?singleResult=true#B39)). Most importantly, to prevent the transmission of microbes and thus, undesirable pathogens, it is important to exercise proper handwashing hygiene ([39](http://europepmc.org/article/MED/32265315?singleResult=true#B39), [61](http://europepmc.org/article/MED/32265315?singleResult=true#B61)).” | [Link](http://europepmc.org/article/MED/32265315?singleResult=true) |
| Consumer advice on cleaning devices and domestic cleaning | | | |
| 7 | [Guidance for keeping your dell technologies and equipment clean](https://www.dell.com/support/article/en-uk/sln308919/guidance-for-keeping-your-dell-technologies-equipment-clean?lang=en) 14th April 2020, Dell | | |
| 8 | [Clean and care for your Surface updated](https://support.microsoft.com/en-gb/help/4023504/surface-clean-and-care-for-your-surface) 12th March 2020, Microsoft | | |
| 9 | [How to clean your Apple products](https://support.apple.com/en-us/HT204172?mod=article_inline) 12th March 2020, Apple | | |
| 10 | [Keeping your computer clean – notebooks, all-in-one desktops, tiny-in-one, and monitors](https://support.lenovo.com/gb/en/solutions/ht035676) Modified 23/4/20, Lenovo | | |
| 11 | [Coronavirus: How to clean your smartphone safely](https://www.bbc.co.uk/news/video_and_audio/headlines/51863924/coronavirus-how-to-clean-your-smartphone-safely) 13th March 2020, BBC News | | |
| 12 | [Coronavirus: how to clean your home effectively](https://www.which.co.uk/news/2020/03/coronavirus-how-to-clean-your-home-effectively/) 21st March 2020, Which | | |
| 13 | [How to clean your smartphone the right way](https://www.wired.com/story/how-to-clean-your-smartphone-keyboard-mouse-safely/) Wired, 3rd April 2020 | | |
| 14 | [Keep your IT equipment clean at home during coronavirus lockdown](https://savvyfm.co.uk/keep-your-it-equipment-clean-at-home-during-coronavirus-lockdown/) 10th March 2020, Savvy (Oxford based Office cleaning company) | | |
| Responses from trusts | | | |
| 15 | One trust’s Health and Safety policy for Display Screen Equipment said **“The regular cleaning of screen, keyboard and telephone should be carried out by the operator using wipes provided by the Trust.”** They also commented that **“For some time now domestic staff have not been allowed to clean or wipe ICT equipment. If they did, I am sure they would be wearing gloves as essential.”** | | |
| 16 | One person said that in the absence of official advice they had been “cleaning mice etc with a very-well-wrung-out damp cloth in hot soapy water (ie with a small squirt of washing up liquid in a bucket of hot water).” Whilst wearing domestic washing up gloves and ensuring all equipment was turned off first | | |
| Advice offered when hot desking – shared use of equipment | | | |
| 17 | Cleaning requirement for Hot Desking  n.d.  APSE (Association of Public Service Excellence) | “Where hot-desking is in use, sanitising wipes should be made available and wash-room hand cleaning facilities enhanced.” | [Link](http://apse-archive.org.uk/briefings/13/13-20%20Hot-desk%20Cleaning.pdf) |
| 18 | How to manage hot desking  n.d.  MindTools | With hot desking, some people may feel less inclined to keep their workspace clean, because they know they won't be sitting there tomorrow! To combat this, make it clear that everyone must leave their desks spotless at the end of the day. Supply antibacterial wipes and hand sanitizers, and make it a policy that people eat lunch away from their desks | [Link](https://www.mindtools.com/pages/article/hot-desking.htm) |
| COVID and different surfaces | | | |
| 19 | 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 | Librarians at Derby & Burton NHS FT conducted a literature in March on the effects of COVID-19 on different surfaces. I’d recommend reading their results for more detailed information on the timescales for different surfaces. I have included one of the key papers from their results below. |  |
| 20 | Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents  6th February 2020  Journal of Hospital Infection | 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 0.05e0.2% 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. | [Link](https://www.journalofhospitalinfection.com/article/S0195-6701(20)30046-3/pdf) |
| 21 | How long does the virus survive on surfaces?  17th April 2020  WHO Q&A | The most important thing to know about coronavirus on surfaces is that they can easily be cleaned with common household disinfectants that will kill the virus. Studies have shown that the COVID-19 virus can survive for up to 72 hours on plastic and stainless steel, less than 4 hours on copper and less than 24 hours on cardboard.  As, always clean your hands with an alcohol-based hand rub or wash them with soap and water. Avoid touching your eyes, mouth, or nose. | [Link](https://www.who.int/news-room/q-a-detail/q-a-coronaviruses) |
| 22 | Myth buster: can COVID-19 be spread through coins and banknotes?  17th April 2020  WHO | “Respiratory droplets expelled from an infected person can contaminate and persist on surfaces. Wash your hands regularly and thoroughly after touching any frequently- touched surface or object” | [Link](https://www.who.int/images/default-source/health-topics/coronavirus/eng-mythbusting-ncov-(23).tmb-1920v.png) |
| What PPE is required? | | | |
| 23 | COVID-19: infection prevention and control guidance  27th April 2020  NHS | “An increased frequency of decontamination should be incorporated into the environmental decontamination schedules for areas where there may be higher environmental contamination rates such as:  •toilets/commodes, particularly if patients have diarrhoea  •‘frequently touched’ surfaces such as medical equipment, door/toilet handles and locker tops, patient call bells, over bed tables and bed rails should be cleaned at least twice daily and when known to be contaminated with secretions, excretions or body fluids  Domestic/cleaning staff performing environmental decontamination should:  •ideally be allocated to specific area(s) and not be moved between COVID-19 and non-COVID-19 care areas  •be trained in which personal protective equipment (PPE) to use and the correct methods of wearing, removing and disposing of PPE  The care environment should be kept clean and clutter free. All non-essential items including toys, books and magazines should be removed from reception and waiting areas, consulting and treatment rooms, emergency departments, day rooms and lounges. When made available, these items should not be shared. All toys must be cleanable and should be cleaned regularly (preferably at the same time as the environment).”  [Table 2. Recommended PPE for primary, outpatient, community and social care](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878750/T2_poster_Recommended_PPE_for_primary__outpatient__community_and_social_care_by_setting.pdf)  [Table 4. Additional considerations (any setting) for COVID-19](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879111/T4_poster_Recommended_PPE_additional_considerations_of_COVID-19.pdf) | [Link](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/881489/COVID-19_Infection_prevention_and_control_guidance_complete.pdf) |
| 24 | Routine decontamination of reusable non-invasive **patient care equipment**  PHE | **Flowchart:** If the equipment is not contaminated with blood, urine/vomit/ faeces or been used on a patient with known or suspected infection or colonisation:  Decontaminate equipment with disposable cloths/paper towel and a fresh solution of general-purpose detergent and water or detergent impregnated wipes.  •Rinse and thoroughly dry.  •Disinfect specific items of non-invasive, reusable, communal care equipment if recommended by the manufacturer e.g. 70% isopropyl alcohol on stethoscopes  •Follow manufacturer’s instructions for dilution, application and contact time.  •Clean the piece of equipment from the top or furthest away point  •Discard disposable cloths/paper roll immediately into the healthcare waste receptacle  •Discard detergent/disinfectant solution in the designated area  •Clean, dry and store re-usable decontamination equipment  •Remove and discard PPE  •Perform hand hygiene | [Link](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877533/Routine_decontamination_of_reusable_noninvasive_equipment.pdf) |
| 25 | Rational use of personal protective equipment (PPE) for coronavirus disease (COVID-19)  19th March 2020  WHO | “PPE should be used based on the risk of exposure (e.g. type of activity) and the transmission dynamics of the pathogen (e.g. contact, droplet or aerosol). The overuse of PPE will have a further impact on supply shortages. Observing the following recommendations will ensure rational use of PPE.  The type of PPE used when caring for COVID-19 patients will vary according to the setting and type of personnel and activity (Table 1).  •Health care workers involved in the direct care of patients should use the following PPE: gowns, gloves, medical mask, and eye protection (goggles or face shield). •Specifically, for aerosol-generating procedures (e.g. tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy) health care workers should use respirators, eye protection, gloves and gowns; aprons should also be used if gowns are not fluid resistant.1  •Respirators (e.g. N95, FFP2 or equivalent standard) have been used for an extended time during previous public health emergencies involving acute respiratory illness when PPE was in short supply.3 This refers to wearing the same respirator while caring for multiple patients who have the same diagnosis without removing it, and evidence indicates that respirators maintain their protection when used for extended periods. However, using one respirator for longer than 4 hours can lead to discomfort and should be avoided.4-6  •Among the general public, persons with respiratory symptoms or those caring for COVID-19 patients at home should receive medical masks. For additional information, see Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts.7  •For persons without symptoms, wearing a mask of any type is not recommended. Wearing medical masks when they are not indicated may cause unnecessary cost and a procurement burden and create a false sense of security that can lead to the neglect of other essential preventive measures. For additional information, see Advice on the use of masks in the community, during home care, and in health care settings in the context of COVID-19.8”  See also Table 1. Recommended personal PPE during the outbreak f CVID-19 outbreak, according to the setting, personnel, and type of activity | [Link](https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPPE_use-2020.2-eng.pdf) |
| Relevant eLearning and videos | | | |
| 26 | [Best Practice: how to hand wash](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877530/Best_Practice_hand_wash.pdf) Public Health England | | |
| 27 | [Best Practice: How to hand rub](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877529/Best_Practice_hand_rub.pdf) Public Health England | | |
| 28 | [Video: How to wash your hands](https://www.nhs.uk/live-well/healthy-body/best-way-to-wash-your-hands/) NHS | | |
| 29 | [eLearning and other resources on Personal Protective Equipment (PPE)](https://portal.e-lfh.org.uk/Catalogue/Index?HierarchyId=0_45016_45051&programmeId=45016) on HEE’s eLearning for Health website | | |
| 30 | [Video: Removing gloves without contaminating hands](https://www.hse.gov.uk/mvr/resources/videos/video9.htm) Health and Safety Executive | | |
| 31 | [Poster: Correct removal of gloves: singles use gloves (splash resistant)](https://www.hse.gov.uk/skin/posters/glovesingleuse.pdf) Health and Safety Executive | | |

# Appendix

## Sources and Databases Searched

The British Computer Society, World Health Organisation, Govuk (Public Health England), CIPD, Health and Safety Executive, People Management, Acas, NHS Employers, Google and NHS Evidence were searched. Healthcare Databases Advanced Search (HDAS) was used to search the following databases: Medline; CINAHL; EMBASE.

## Search Strategies

With thanks to [Derby and Burton Hospitals for sharing their list of key words](https://kfh.libraryservices.nhs.uk/wp-content/uploads/2020/04/LS394-COVID-19-infection-from-case-notes-strategy.docx) which I used to re-run the surfaces search for any articles published since their review.

Other key words and phrases used: computer\*; keyboard\*; “IT equipment”; laptop\*; tablet\*; “mobile phone\*”; “cell phone\*”.

Medline: exp "INFORMATION TECHNOLOGY"/ exp COMPUTERS/ exp "CELL PHONE"/

CINAHL: exp "INFORMATION TECHNOLOGY"/ exp KEYBOARDS/ OR exp "MOUSE (COMPUTER)"/ exp "COMPUTERS AND COMPUTERIZATION"/ exp "COMPUTERS, PORTABLE"/ exp "CELLULAR PHONE"/

EMBASE: exp "INFORMATION TECHNOLOGY"/ exp COMPUTER/ exp LAPTOP/ exp "MOBILE PHONE"/ exp TELEPHONE/

*Searching the literature retrieved the information provided. We recommend checking the relevance and critically appraising the information contained within when applying to your own decisions, as we cannot accept responsibility for actions taken based on it. Every effort has been made to ensure that the information supplied is accurate, current and complete, however for various reasons it may not represent the entire body of information available.*

# Help accessing articles or papers

Where a report/ journal article or resource is freely available the link or PDF has been provided. If an NHS OpenAthens account is required this has been indicated. If you do not have an OpenAthens account you can [self-register here](https://openathens.nice.org.uk/). If you need help accessing an article, or have any other questions, contact the Knowledge Management team for support (see below).

# HEE Knowledge Management team contact details

You can contact the HEE Knowledge Management team on [KnowledgeManagement@hee.nhs.uk](mailto:KnowledgeManagement@hee.nhs.uk)