

**Literature search results**

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| **Please find enclosed the results for your literature search request.**  **Please feel free to contact me if you need any further help or if you would like to order any of the articles in full text.** |

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| **Search reference number** | 5162 | **Search completed on** | 23/09/2020 |
| **Search completed for** |  | | |
| **Search completed by** | Eva Thackeray (extension 4763, email [eva.thackeray@lthtr.nhs.uk](mailto:eva.thackeray@lthtr.nhs.uk)) | | |

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| **Search question** |
| What difference/impact does the method of hand drying have on the spread of infection?  Is there evidence to support the PHE recommendation to replace the hand dryers with paper towels in staff rest facilities? |

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| **Search strategy** |
| Resources used: Google, PubMed, CINAHL, Embase, Emcare, NICE Evidence Search, Gov.uk, WHO, CDC, HSE, WHO Covid-19 database |
| Search terms: hand drying, hand, hands, hand[mh:noexp], hand hygiene/methods[mh], hand disinfection/methods[mh], dryer\*, paper towel\*, paper hand towel\*, paper[mh], drying method\*, infecti\*, contaminat\*, hygien\*, cross infection/prevention and control[mh], infection control[mh], air microbiology[mh |
| Limits: English |

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| **Summary** |
| See below (page 3 onwards) for a list of guidance. Journal articles are listed separately in the PubMed and CINAHL Embase attachments.  Most of the available guidance, particularly in relation to healthcare settings, states that hands should be dried with a paper towel. A lot of the guidance is older, however, and the cited evidence is therefore even older. Also, the rationale for the recommendation is not always given.  The journal articles provide a more conflicting picture. Some things to keep in mind when you are looking through the article results are how old the study is, whether it is experimental or real-world, the overall setting of the study (healthcare facility or other setting), as well as the transferability of the study results.  I hope these results are useful – please feel free to contact me if you have any questions or need further help with this topic. |

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| **Literature search results**  See also the attached list(s) of journal articles | | | |
| **Source** | **Study type** | **Date** | **Details** |
| Public Health England | Guidance | 2020 | **Best Practice: How to hand wash step by step images**  <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886217/Best_practice_hand_wash.pdf>  See step 10: “Dry thoroughly with towel”.  This is part of the Public Health England’s COVID-19: infection prevention and control (IPC) guidance at <https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control> |
| World Health Organization | Guidance | 2020 | **Recommendations to Member States to improve hand hygiene practices to help prevent the transmission of the COVID-19 virus**  <https://www.who.int/publications/i/item/recommendations-to-member-states-to-improve-hand-hygiene-practices-to-help-prevent-the-transmission-of-the-covid-19-virus>  See recommendation 7:  “Local health authorities should ensure the continuous presence of functional hand hygiene stations (either alcohol-based hand rub dispensers or soap, water, and disposable towels) for all health care workers at all points of care, in areas where personal protective equipment (PPE) is put on or taken off, and where health care waste is handled.” |
| Royal College of Nursing | Guidance | 2020 | **Safe staffing handwashing guide**  <https://www.rcn.org.uk/professional-development/publications/pub-009177>  See step 8:  “Dry palms and backs of hands using a paper towel to help remove remaining bacteria.” |
| Health and Safety Executive | Guidance | 2020 | **Cleaning, hygiene and handwashing to make your workplace COVID-secure - 2. Handwashing and using hand sanitiser**  <https://www.hse.gov.uk/coronavirus/cleaning/handwashing-using-hand-sanitiser.htm>  “Provide:   * handwashing facilities with running water, soap and paper towels.” |
| Health and Safety Executive | Guidance | 2020 | **Cleaning, hygiene and handwashing to make your workplace COVID-secure - 4. Bathrooms, toilets and washbasins**  <https://www.hse.gov.uk/coronavirus/cleaning/bathrooms-toilets-washbasins.htm>  “Provide hand drying facilities – paper towels or hand dryers.” |
| NHS Improvement | Policy | 2019 | **Standard infection control precautions: national hand hygiene and personal protective equipment policy**  <https://improvement.nhs.uk/resources/national-hand-hygiene-and-personal-protective-equipment-policy/>  See page 8 of the PDF (<https://improvement.nhs.uk/documents/4957/National_policy_on_hand_hygiene_and_PPE_2.pdf>):  “Dry hands thoroughly after hand washing, using disposable paper towels.” |
| H.P. Loveday et al | Guideline | 2014 | **epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England**  <https://improvement.nhs.uk/documents/847/epic3_National_Evidence-Based_Guidelines_for_Preventing_HCAI_in_NHSE.pdf>  See page S19:  “A number of laboratory-based studies that investigated methods of hand drying suggested that there is no significant difference in the efficacy of different methods of drying hands, but that good-quality paper towels dry hands efficiently and remove bacteria effectively.88,89 Current guidance on infection control in the built environment suggests that air and jet driers are not appropriate for use in clinical areas.90 We identified one systematic review of studies on hand drying that failed to meet the quality criteria for inclusion.91”  See recommendation SP9 on page 20:  “SP9 Effective handwashing technique involves three stages: preparation, washing and rinsing, and drying.  […]  • Drying: use good-quality paper towels to dry the hands thoroughly.  Class D/GPP” |
| NICE | Guideline | 2012 | **Healthcare-associated infections: prevention and control in primary and community care**  <https://www.nice.org.uk/guidance/cg139>  NICE guideline: <https://www.nice.org.uk/guidance/cg139/resources/healthcareassociated-infections-prevention-and-control-in-primary-and-community-care-pdf-35109518767045>  See page 16:  “1.1.2.4 An effective handwashing technique involves three stages: preparation, washing and rinsing, and drying. […] Hands should be rinsed thoroughly before drying with good quality paper towels. [2003]” |
| World Health Organization | Guideline | 2009 | **WHO Guidelines on hand hygiene in health care**  <https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf?sequence=1>  See page 31:  “11.1.5 Hand drying  […]  Paper towels, cloth towels, and warm air dryers are commonly used to dry washed hands. One study compared four methods of hand drying: cloth towels from a roller; paper towels left on a sink; warm air dryer; and letting hands dry by evaporation;256 no significant difference in the efficacy of the methods was reported. Reusing or sharing towels should be avoided because of the risk of cross-infection.257 In a comparison of methods to test the efficiency of hand drying for the removal of bacteria from washed hands, warm air drying performed worse than drying with paper towels.258 This is in contrast to another study, which found warm air dryers to be the most efficient when compared with paper and cloth towels.257 However, air dryers may be less practical because of the longer time needed to achieve dry hands,258 with a possible negative impact on hand hygiene compliance. Furthermore, one study suggested that some air driers may lead to the aerosolization of waterborne pathogens.259 Further studies are needed to issue recommendations on this aspect. Ideally, hands should be dried using either individual paper towels or hand driers which can dry hands effectively and as quickly as it can be done with paper towels, and have been proven not to be associated with the aerosolization of pathogens.”  See also the recommendation on page 152:  “When washing hands with soap and water, wet hands with water and apply the amount of product necessary to cover all surfaces. Rinse hands with water and dry thoroughly with a single-use towel. Use clean, running water whenever possible. Avoid using hot water, as repeated exposure to hot water may increase the risk of dermatitis (IB).255,586,587 Use towel to turn off tap/faucet (IB).151,220,222,1010,1011 Dry hands thoroughly using a method that does not recontaminate hands. Make sure towels are not used multiple times or by multiple people (IB).75,115,257,671” |
| Centers for Disease Control and Prevention | Guideline | 2002 | **Guideline for hand hygiene in health-care settings**  <https://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf>  See recommendation 2B on page 32:  “When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet (IB) (90-92,94,411).” |



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| **Disclaimer** |
| Searching the literature retrieved the information provided. We recommend checking the relevance and critically appraising the information contained within when applying to clinical decisions.  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 as we have only searched information resources which are available to Lancashire Teaching Hospital NHS Foundation Trust. No responsibility can be accepted for any action taken on the basis of this information. |

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