**Clinical Librarian Service Search Results**

**Request:** The use of alcohol sanitiser on non-sterile procedure gloves

**Summary**

I have searched the databases listed at the end of this document and have found a number of evidence-based articles which I hope will be useful for you.

Greeson et al. (2019)2 discuss ‘Quality Control: Hand and Glove Sanitizing in Sterile Compounding’. They state that *“Glove sanitizing…as part of the hand-sanitizing process…the mechanism of action and composition of alcohol-based sanitizers and presented a protocol for their application to hands and gloves.”*

Gao et al. (2016)6 looked at the ‘Effect of multiple alcohol-based hand rub applications on the tensile properties of thirteen brands of medical exam nitrile and latex gloves.’, in relation to Ebola. Their abstract states:

*“In general, tensile strength decreased with each ABHR application. ABHRs had more effect on the tensile strength of the tested nitrile than latex gloves, while ethanol-based ABHR (EBHR) resulted in lesser changes in tensile strength compared to isopropanol-based ABHR (IBHR). The results show that multiple EBHR applications on the latex gloves and some of the nitrile gloves tested should be safe for Ebola PPE doffing based on the CDC guidance.”*

(ABHR = alcohol-based hand rub)

Capron et al. (2012)10’s study on the ‘Permeability of gloves to selected chemotherapeutic agents after treatment with alcohol or isopropyl alcohol’ states the following*:*

*“Gloves evaluated with a dynamic permeation testing device at 37 °C after pretreatment with alcohol or isopropyl alcohol showed permeation rates by selected cytotoxic drugs of <100 ng/cm2·min after 30 or 60 minutes of drug exposure. Undergloves alone and glove- glove and glove-underglove combinations showed no detectable permeation in tests performed at 43 °C.”*

Jones et al. (2000)’s article on ‘Moisturizing alcohol hand gels for surgical hand preparation’ states the following in relation to alcohol and latex gloves:

*“The latex glove physical compatibility test results are presented in Figure 5. Although the alcohol hand gel exhibited minor effects (i.e. -1.9% tear resistance, -3.8% tensile strength) as compared to untreated gloves, the response was not a statistically significant difference from the untreated control for tear resistance or tensile strength, as compared to deionized water and saline treatment. As expected, petrolatum and mineral oil demonstrated significant detrimental effects on the integrity of the latex surgical gloves.”*

Häggström, Spira, & Edelstam (2015)’s article on ‘Transducer hygiene: comparison of procedures for decontamination of ultrasound transducers and their use in clinical practice’ states the following: *“After exposure to ethanol, which can easily happen by handling the gloves after having disinfected one’s hands, a virus penetration rate of at least 50% has been shown.”*

An article from 1998 (Doebbeling et al.)20 considered the ‘Removal of nosocomial pathogens from the contaminated glove: Implications for glove reuse and handwashing’. The article concludes: *“In the era of universal precautions these data suggest that it may not be prudent to wash and reuse gloves between patients.”*

A 2nd article from 1988 (Grinnell)19 considered ‘Disinfection of latex gloves with ethyl alcohol’. Their abstract states *“The ability to disinfect latex gloves successfully between procedures would save time and be cost-effective. An in vitro study examined the efficacy of using an ethyl alcohol/bactericide compound to disinfect latex gloves contaminated with five common bacteria.”*

Trissel et al. (2007)12’s study on the ‘Effect of two work practice changes on the microbial contamination rates of pharmacy-compounded sterile preparations’ found that *“The use of protective chemotherapy gloves that were repeatedly disinfected with IPA decreased the contamination rate of pharmacy-compounded sterile preparations.”* (IPA = 70% isopropyl alcohol)

Phalen, Le & Wong (2014)8’s study on ‘Changes in Chemical Permeation of Disposable Latex, Nitrile, and Vinyl Gloves Exposed to Simulated Movement’ found that *“Even though the nitrile glove provided optimum chemical resistance against ethyl alcohol, it was most affected by movement.”*

I hope that I have interpreted your request correctly. Please let me know if you would like me 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/>

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**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

Training Librarian (Chartered)

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

Ext. 88148

**Current at:** 31 March 2020

**Time taken for search:** 4.5 hours.

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

Evidence Search: The use of alcohol sanitizer on non-sterile procedure gloves. Suzanne 00 Derby, UK: University Hospitals of Derby & Burton NHS Foundation Trust Library and Knowledge Service.

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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. **Recommended practices for surgical hand antisepsis**

**Author(s):** Croke, Lisa

**Source:** AORN Journal; May 2019; vol. 109 (no. 5); p. P8

**Publication Date:** May 2019

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

Available at [AORN Journal](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%3D10.1002%2Faorn.12705) - from ClinicalKey

Available at [AORN Journal](https://www.clinicalkey.com/content/playBy/doi/?v=10.1002/aorn.12705) - from ClinicalKey

Available at [AORN Journal](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=0001-2092&volume=109&issue=5&spage=P8) - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** Surgical site infections (SSIs) are a common and costly complication linked to such adverse outcomes as an extended length of hospitalization and up to an 11 times greater risk of mortality compared with patients without SSIs.1 Risk factors for SSIs exist throughout the perioperative care continuum; however, data have shown that more than half of SSIs can be prevented by following appropriate evidence-based recommendations.2 For operative and other invasive procedures, Amber Wood, MSN, RN, CNOR, CIC, FAPIC, AORN Guidelines editor-in-chief, indicated that surgical hand antisepsis is the first line of defense to protect patients from SSIs, followed by the use of sterile gloves. In a recent study, researchers confirmed that the hands of personnel were key sources of Staphylococcus aureus pathogen transmission intraoperatively and determined that greater adherence with appropriate surgical hand antisepsis could help control its spread.3 Products Two methods are commonly used for surgical hand antisepsis: water-based hand scrub, typically with 2% chlorhexidine gluconate or 10% povidone-iodine, and alcohol-based hand rub, which contains additional active ingredients.4,5 There is no conclusive evidence to indicate that one method is superior to another for reducing SSIs, although alcohol-based hand rub may be better for reducing bacteria on hands compared with water-based scrub.5 Alcohol-based hand rub also has been shown to require less time to perform and to possibly improve compliance with all appropriate steps in hand antisepsis.4,6 A multidisciplinary team should select products for surgical hand antisepsis that meet U.S. Food and Drug Administration requirements.7 "Purchasing teams should consider product effectiveness, user acceptance, and cost in their evaluation," Wood said. [...]if performing a water-based hand scrub or an alcohol-based hand rub, personnel should begin their surgical hand antisepsis by removing jewelry from their hands and wrists, donning a surgical mask, washing their hands with soap and water if they are visibly soiled, and removing debris from underneath fingernails using a disposable nail cleaner under running water.7 Additional steps when using an alcohol-based hand rub include first drying the hands and arms thoroughly with a disposable paper towel, and then applying the product to the hands and arms according to the manufacturer's instructions for use and allowing it to dry completely.7 Additional steps when using a water-based hand scrub include applying the product to the hands and forearms using a soft, nonabrasive sponge; scrubbing all four sides of each finger, hands, and arms with the hands elevated; discarding the sponge; rinsing the hands and arms under running water in one direction from fingertips to elbows; holding the hands higher than the elbows and away from surgical attire; and in the OR or procedure room, drying hands and arms with a sterile towel.7 Video auditing and music Authors of one study implemented the use of remote video auditing to monitor personnel compliance with performing surgical hand antisepsis for at least two minutes.9 For the first four weeks, staff members were simply observed via video.

**Database:** BNI

1. **Quality Control: Hand and Glove Sanitizing in Sterile Compounding, Part 2.**

**Author(s):** Greeson, Nicole MH; Mixon, William; Huslage, Kirk; Stiegel, Matthew A; Thomann, Wayne R

**Source:** International Journal of Pharmaceutical Compounding; 2019; vol. 23 (no. 6); p. 467-471

**Publication Date:** 2019

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

**PubMedID:** 31751943

**Abstract:** Selecting an appropriate sanitizer (i.e. "rub") for application to hands and gloves before and, if necessary, during sterile compounding is as important as is its consistent and judicious use. Alcohols and chlorhexidine gluconate, which have long been recognized as safe and powerful biocides, are often essential ingredients in such sanitizing products. In this second article in a 2-part series on alcohol-based hand and glove sanitizers, we review the selection of and need for those rubs in sterile compounding, present considerations for their safe storage, compare the features of several appropriate sanitizing agents, and answer compounders' frequently asked questions about their use. Glove sanitizing is discussed as part of the hand-sanitizing process. In part 1 of this series, we explained, among other topics, the mechanism of action and composition of alcohol-based sanitizers and presented a protocol for their application to hands and gloves.

**Database:** Medline

1. **Quality Control: Hand and Glove Sanitizing in Sterile Compounding, Part 1.**

**Author(s):** Greeson, Nicole Mh; Mixon, William; Huslage, Kirk; Stiegel, Matthew A; Thomann, Wayne R

**Source:** International Journal of Pharmaceutical Compounding; 2019; vol. 23 (no. 5); p. 387-391

**Publication Date:** 2019

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

**PubMedID:** 31513537

**Abstract:** In pharmaceutical compounding, strict adherence to a protocol for hand hygiene and glove sanitizing is essential to ensure the purity, safety, and effectiveness of sterile preparations; reduce patient morbidity and mortality; and decrease the cost of health care. Alcohols and chlorhexidine gluconate are among the most effective bactericides, virucides, and fungicides, and acquired resistance to those agents has not been shown in clinical practice. This article, which is part 1 in a series of 2, pertains primarily to alcohol-based hand rubs that are appropriate for use in sterile compounding (glove sanitizing is discussed as part of the handsanitizing process). In a brief overview of those products, we define pertinent terminology, examine the necessity of and requirements for the use of sanitizers, review their mechanism of action and composition, consider factors pertinent to their selection, and present a protocol for their application. In part 2 of this series, the topics examined include a comparison of various alcohol-based sanitizers and answers to compounders' frequently asked questions about their use.

**Database:** Medline

1. **Infection control influence of Middle East respiratory syndrome coronavirus: A hospital-based analysis.**

**Author(s):** Al-Tawfiq, Jaffar A.; Abdrabalnabi, Rana; Taher, Alla; Mathew, Shantymole; Rahman, Kamal Abdul

**Source:** American Journal of Infection Control; Apr 2019; vol. 47 (no. 4); p. 431-434

**Publication Date:** Apr 2019

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

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.2018.09.015) - from ClinicalKey

Available at [American Journal of Infection Control](http://www.ajicjournal.org/article/S0196655318309441/pdf) - from Unpaywall

**Abstract:** Background: Middle East respiratory syndrome coronavirus (MERS-CoV) caused multiple outbreaks. Such outbreaks increase economic and infection control burdens. We studied the infection control influence of MERS-CoV using a hospital-based analysis. Methods: Our hospital had 17 positive and 82 negative cases of MERS-CoV between April 1, 2013, and June 3, 2013. The study evaluated the impact of these cases on the use of gloves, surgical masks, N95 respirators, alcohol-based hand sanitizer, and soap, as well as hand hygiene compliance rates. Results: During the study, the use of personal protective equipment during MERS-CoV compared with theperiod before MERS-CoV increased dramatically from 2,947.4 to 10,283.9 per 1,000 patient-days (P <.0000001) for surgical masks and from 22 to 232 per 1,000 patient-days (P <.0000001) for N95 masks. The use of alcohol-based hand sanitizer and soap showed a significant increase in utilized amount (P <.0000001). Hand hygiene compliance rates increased from 73% just before the occurrence of the first MERS case to 88% during MERS cases (P =.0001). The monthly added cost was $16,400 for included infection control items. Conclusions: There was a significant increase in the utilization of surgical masks, respirators, soap and alcohol-based hand sanitizers. Such an increase is a challenge and adds cost to the healthcare system.

**Database:** CINAHL

1. **Preventing Viral Contamination: Effects of Wipe and Spray-based Decontamination of Gloves and Gowns.**

**Author(s):** Robinson, Gwen L; Hitchcock, Stephanie; Kpadeh-Rogers, Zegbeh; Karikari, Nicole; Johnson, J Kristie; Blanco, Natalia; Morgan, Daniel J; Harris, Anthony D; Leekha, Surbhi

**Source:** Clinical Infectious Diseases; Oct 2019; vol. 69

**Publication Date:** Oct 2019

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

Available at [Clinical infectious diseases: an official publication of the Infectious Diseases Society of America](https://academic.oup.com/cid/article-pdf/69/Supplement_3/S228/30055111/ciz622.pdf) - from Unpaywall

**Abstract:** We conducted a laboratory simulation to evaluate the contamination of environmental surfaces when using wipe vs spray methods of personal protective equipment (PPE) decontamination. We did not observe any environmental contamination with the bacteriophage MS-2 when bleach solution spray or wipes were used for PPE disinfection.

**Database:** CINAHL

1. **Safe removal of gloves from contact precautions: The role of hand hygiene.**

**Author(s):** Jain, Susan; Clezy, Kate; McLaws, Mary-Louise

**Source:** American Journal of Infection Control; Jul 2018; vol. 46 (no. 7); p. 764-767

**Publication Date:** Jul 2018

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

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.2018.01.013) - from ClinicalKey

**Abstract:** Background Routine hand hygiene effectively removes methicillin-resistant Staphylococcus aureus (MRSA) and/or vancomycin resistant Enterococcus (VRE) from the ungloved hands of healthcare workers (HCWs) who are caring for patients under contact precautions, when exposure to bodily fluids is not expected. Methods HCWs' ungloved hands were cultured after hand hygiene with alcohol-based hand rub (ABHR) or soap-and-water wash after routine clinical care of patients known to be colonized or infected with MRSA or VRE. Results Two hundred forty samples from 40 HCWs were tested and found to be culture negative for either MRSA or VRE after contact with patients when 3 pumps of ABHR (0/80) or plain soap-and-water wash (0/80) were used. No VRE was observed in any of the 120 samples collected. Two plates (2/40) grew 1 colony-forming unit of MRSA after 2 pumps of ABHR. Two HCWs with positive plates were cultured negative on retesting. Conclusion We showed that appropriate hand hygiene was effective in removing MRSA and VRE even when gloves were not used for routine clinical care, despite contact with patients known to be colonized with MRSA or VRE. A modified approach to glove use for dry contact with patients on contact precautions might improve patient safety within healthcare settings.

**Database:** CINAHL

1. **Disinfection of gloved hands for multiple activities with indicated glove use on the same patient.**

**Author(s):** Kampf, G.; Lemmen, S.

**Source:** Journal of Hospital Infection; Sep 2017; vol. 97 (no. 1); p. 3-10

**Publication Date:** Sep 2017

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

**PubMedID:** NLM28648454

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.2017.06.021) - from ClinicalKey

**Abstract:** Most hand hygiene guidelines recommend that gloves should be changed during patient care when an indication for hand disinfection occurs. Observational studies indicate that the majority of healthcare workers (HCWs) do not disinfect their hands at all during continued glove wear. The aim of this narrative review is to assess the potential benefits and risks for disinfecting gloved hands during patient care for multiple activities with indicated glove use on the same patient. Continued glove wear for multiple activities on the same patient often results in performing procedures, including aseptic procedures with contaminated gloves, especially in a setting where there are many indications in a short time, e.g. anaesthetics or accident and emergency departments. Of further note is that hand hygiene compliance is often lower when gloves are worn. To date, three independent studies have shown that decontamination is at least as effective on gloved hands as on bare hands and that puncture rates are usually not higher after up to 10 disinfections. One study on a neonatal intensive care unit showed that promotion of disinfecting gloved hands during care on the same patient resulted in a significant reduction in the incidence of late-onset infections and of necrotizing enterocolitis. We conclude that disinfection of gloved hands by HCWs may substantially reduce the risk of transmission when gloves are indicated for the entire episode of patient care and when performed during multiple activities on the same patient.

**Database:** CINAHL

1. **Effect of multiple alcohol-based hand rub applications on the tensile properties of thirteen brands of medical exam nitrile and latex gloves.**

**Author(s):** Gao, Pengfei; Horvatin, Matthew; Niezgoda, George; Weible, Robyn; Shaffer, Ronald

**Source:** Journal of Occupational & Environmental Hygiene; Dec 2016; vol. 13 (no. 12); p. 905-914

**Publication Date:** Dec 2016

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

**Abstract:** Current CDC guidance for the disinfection of gloved hands during the doffing of personal protective equipment (PPE) following the care of a patient with Ebola recommends for multiple applications of alcohol-based hand rub (ABHR) on medical exam gloves. To evaluate possible effects of ABHR applications on glove integrity, thirteen brands of nitrile and latex medical exam gloves from five manufacturers and two different ABHRs were included in this study. A pair of gloves were worn by a test operator and the outside surfaces of the gloves were separately treated with an ABHR for 1–6 applications. Tensile strength and ultimate elongation of the gloves without any ABHR treatments (control gloves) and gloves after 1–6 ABHR applications were measured based on the ASTM D412 standard method. In general, tensile strength decreased with each ABHR application. ABHRs had more effect on the tensile strength of the tested nitrile than latex gloves, while ethanol-based ABHR (EBHR) resulted in lesser changes in tensile strength compared to isopropanol-based ABHR (IBHR). The results show that multiple EBHR applications on the latex gloves and some of the nitrile gloves tested should be safe for Ebola PPE doffing based on the CDC guidance. Appropriate hospital staff practice using ABHR treatment and doffing gloves is recommended to become more familiar with changes in glove properties.

**Database:** CINAHL

1. **Disinfection of gloves: feasible, but pay attention to the disinfectant/glove combination**

**Author(s):** Scheithauer S.; Hafner H.; Lemmen S.; Seef R.; Seef S.; Hilgers R.D.

**Source:** Journal of Hospital Infection; Nov 2016; vol. 94 (no. 3); p. 268-272

**Publication Date:** Nov 2016

**Publication Type(s):** Article

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.2016.08.007) - from ClinicalKey

**Abstract:** Background Compliance with hand hygiene is complicated by indications for hand disinfection in rapid succession during the care of one patient. In such situations, disinfection of gloves could facilitate better workflow and optimize compliance rates. Aim We analysed the efficacy of disinfecting gloves by comparing an individual effect of five different hand disinfectant solutions in combination with three different glove types. Methods The investigation was performed in accordance with DIN EN 1500:2013. For all combinations, ten analyses were performed, including (1) right/left-hand examination disinfection efficacy after the first and fifth contamination with E. coli K12 NCTC 10538, (2) recovery rates after contamination, (3) reduction efficacy, (4) fingertip immersion culture, and (5) check for tightness. Disinfection of the ungloved hands was taken as an additional benchmark. Findings The disinfection efficacy for all disinfectant/glove combinations was better with rather than without gloves. For eight combinations, the disinfection efficacy was always >5.0 log10. There were significant differences within the gloves (P = 0.0021) and within the disinfectant product (P = 0.0023), respectively. In detail, Nitril Blue Eco-Plus performed significantly better than Vasco Braun (P = 0.0017) and Latex Med Comfort (P = 0.0493). Descoderm showed a significantly worse performance than Promanum pure (P = 0.043). In the check for tightness, only the Vasco Braun gloves showed no leaks in all samples. There were relevant qualitative differences pertaining to the comfort of disinfecting gloves. Conclusion The disinfection efficacy for the different disinfectant/glove combinations was greater than for the ungloved hands. However, various disinfectant/glove combinations produce relevant differences as regards disinfection efficacy. Copyright © 2016 The Healthcare Infection Society

**Database:** EMCARE

1. **Transducer hygiene: comparison of procedures for decontamination of ultrasound transducers and their use in clinical practice.**

**Author(s):** Häggström, Mikael; Spira, Jack; Edelstam, Greta

**Source:** Journal of Clinical Ultrasound; Feb 2015; vol. 43 (no. 2); p. 81-88

**Publication Date:** Feb 2015

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

**PubMedID:** NLM25042449

Available at [Journal of clinical ultrasound: JCU](https://go.openathens.net/redirector/nhs?url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Ffull%2F10.1002%2Fjcu.22213) - from Wiley Online Library Medicine and Nursing Collection 2019 - NHS

Available at [Journal of clinical ultrasound: JCU](http://search.ebscohost.com/login.aspx?direct=true&scope=site&site=ehost-live&db=mdc&AN=25042449) - from EBSCO (MEDLINE Complete)

**Abstract:** Background: To determine whether current hygiene practices are appropriate during sonographic examinations. Methods: Five major hospitals in Sweden were investigated with a survey. At each hospital, the departments corresponding to the main types of sonographic examination were chosen. Personnel who were responsible for or acquainted with the local hygiene procedures completed a standardardized questionnaire. Results: The surveys were completed by 25 departments, where the total number of sonographic examinations was approximately 20,000 per month. For transvaginal and transrectal sonographic examinations, the most common method for decontamination of the transducer was barrier protection during the procedure followed by cleansing with alcohol. Latex was the predominant cover material, but one department used polyethylene gloves, and another department used nitrile gloves. Both of these involved transvaginal ultrasonography. In transcutaneous examinations, all hospitals were using alcohol and paper or cloth for decontamination at a minimum. Transesophageal examinations were carried out without barrier protection, and decontamination was performed with an alkylating substance. Conclusions: The hygiene practices appear to be appropriate at most hospitals, but there is a prevalence of transducer cover materials of unacceptable permeability, as well as use of gloves on transducers despite insufficient evidence of safety.

**Database:** CINAHL

1. **Changes in Chemical Permeation of Disposable Latex, Nitrile, and Vinyl Gloves Exposed to Simulated Movement.**

**Author(s):** Phalen, Robert N.; Le, Thi; Wong, Weng Kee

**Source:** Journal of Occupational & Environmental Hygiene; Nov 2014; vol. 11 (no. 11); p. 716-721

**Publication Date:** Nov 2014

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

**PubMedID:** NLM24689368

Available at [Journal of Occupational and Environmental Hygiene](http://europepmc.org/articles/pmc4177299?pdf=render) - from Unpaywall

**Abstract:** Glove movement can affect chemical permeation of organic compounds through polymer glove products. However, conflicting reports make it difficult to compare the effects of movement on chemical permeation through commonly available glove types. The aim of this study was to evaluate the effect of movement on chemical permeation of an organic solvent through disposable latex, nitrile, and vinyl gloves. Simulated whole-glove permeation testing was conducted using ethyl alcohol and a previously designed permeation test system. With exposure to movement, a significant decrease (p≤ 0.001) in breakthrough time (BT) was observed for the latex (−23%) and nitrile gloves (−31%). With exposure to movement, only the nitrile glove exhibited a significant increase (p≤ 0.001) in steady-state permeation rate (+47%) and cumulative permeation at 30 min (+111%). Even though the nitrile glove provided optimum chemical resistance against ethyl alcohol, it was most affected by movement. With exposure to movement, the latex glove was an equivalent option for overall worker protection, because it was less affected by movement and the permeation rate was lower than that of the nitrile glove. In contrast, the vinyl glove was the least affected by movement, but did not provide adequate chemical resistance to ethyl alcohol in comparison with the nitrile and latex gloves. Glove selection should take movement and polymer type into account. Some glove polymer types are less affected by movement, most notably the latex glove in this test. With nitrile gloves, at least a factor of three should be used when attempting to assign a protection factor when repetitive hand motions are anticipated. Ultimately, the latex gloves outperformed nitrile and vinyl in these tests, which evaluated the effect of movement on chemical permeation. Future research should aim to resolve some of the observed discrepancies in test results with latex and vinyl gloves.

**Database:** CINAHL

1. **Hand hygiene with alcohol hand rub and gloves reduces the incidence of late onset sepsis in preterm neonates.**

**Author(s):** Janota, Jan; Sebková, Sylva; Visovská, Magda; Kudlácková, Jana; Hamplová, Drahomíra; Zach, Jií

**Source:** Acta Paediatrica; Oct 2014; vol. 103 (no. 10); p. 1053-1056

**Publication Date:** Oct 2014

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

**PubMedID:** NLM24974740

Available at [Acta paediatrica (Oslo, Norway: 1992)](https://go.openathens.net/redirector/nhs?url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Ffull%2F10.1111%2Fapa.12731) - from Wiley Online Library Medicine and Nursing Collection 2019 - NHS

**Abstract:** Aim To assess the impact of a hand hygiene protocol, using hand washing, alcohol hand rub and gloves when caring for preterm infants born after 31 weeks of gestation, on the incidence of neonatal late onset sepsis (LOS). Methods All babies delivered between 32 + 0 and 36 + 6 weeks gestation and admitted to the neonatal intensive care unit during a 14‐month period were included. We followed a hand hygiene protocol with hand washing and alcohol hand rub (hand rub period) for the first 7 months and a protocol of hand washing, alcohol hand rub and gloves (gloves period) for the second 7 months. The hand rub and gloves groups consisted of 111 and 89 patients, respectively. Results Five patients were diagnosed with a total of six episodes of LOS in the hand rub group, and the incidence of LOS during the hand rub period was 2.99/1000 hospital days and 54.1/1000 admissions. There were no patients diagnosed with LOS during the gloves period (significant decrease, p = 0.028). Conclusion Using a hand hygiene protocol with hand washing, hand rub and gloves significantly reduced the incidence of LOS in preterm newborns, and the results suggest that it may produce a sustained improvement in the infection rate.

**Database:** CINAHL

1. **Permeability of gloves to selected chemotherapeutic agents after treatment with alcohol or isopropyl alcohol.**

**Author(s):** Capron, Arnaud; Destree, Jennifer; Jacobs, Philippe; Wallemacq, Pierre

**Source:** American Journal of Health-System Pharmacy; Oct 2012; vol. 69 (no. 19); p. 1665-1670

**Publication Date:** Oct 2012

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

Available at [American Journal of Health-System Pharmacy](http://openurl.ebscohost.com/linksvc/linking.aspx?genre=article&issn=1535-2900&volume=69&issue=19&spage=1665&title=American%20Journal%20of%20Health-System%20Pharmacy) - from EBSCO (MEDLINE Complete)

Available at [American Journal of Health-System Pharmacy](http://pdfs.semanticscholar.org/6b6a/d90dc21a097617bde96fccad1566f1d52bb5.pdf) - from Unpaywall

**Abstract:** Purpose. The results of a study to help identify the best glove protection for health care professionals frequently exposed to cytotoxic agents are reported. Methods. The permeation of 17 cytotoxic drugs through different glove materials and glove combinations was studied under the conditions of simulated dynamic contact (e.g., friction, stretching), a temperature of 37 °C (normal body temperature), different exposure times (30 and 60 minutes), and a 15-minute pretreatment with 70% alcohol or isopropyl alcohol. For 6 drugs, permeability was further evaluated at a temperature of 43 °C with different double-gloving combinations in order to assess the risk of health care worker exposure during the administration of hyperthermic intraperitoneal chemotherapy (HIPEC). All evaluated glove products were provided by one manufacturer. Analytical measurements were performed in triplicate using chromatographic and spectrometric techniques. Results. None of the gloves exhibited permeation exceeding European standard EN 374-3 (1000 ng/cm2·min) or American standard ASTM F739-07 (100 ng/cm2·min); for a few drugs, glove permeation exceeded ASTM D6978-05 (10 ng/cm2·min). The highest permeation rates (66.5 and 36.3 ng/ cm2·min) were observed with two natural rubber latex products exposed for 60 minutes to carmustine. None of the evaluated double-gloving combinations displayed any detected permeation at 43 °C, confirming that they can be used safely during HIPEC. Conclusion. Gloves evaluated with a dynamic permeation testing device at 37 °C after pretreatment with alcohol or isopropyl alcohol showed permeation rates by selected cytotoxic drugs of <100 ng/cm2·min after 30 or 60 minutes of drug exposure. Undergloves alone and glove- glove and glove-underglove combinations showed no detectable permeation in tests performed at 43 °C.

**Database:** CINAHL

1. **Taiwan's traffic control bundle and the elimination of nosocomial severe acute respiratory syndrome among healthcare workers.**

**Author(s):** Yen MY; Lin YE; Lee CH; Ho MS; Huang FY; Chang SC; Liu YC

**Source:** Journal of Hospital Infection; Apr 2011; vol. 77 (no. 4); p. 332-337

**Publication Date:** Apr 2011

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

**PubMedID:** NLM21316802

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.2010.12.002) - from ClinicalKey

Available at [Journal of Hospital Infection](http://www.journalofhospitalinfection.com/article/S019567011000530X/pdf) - from Unpaywall

**Abstract:** The traffic control bundle consists of procedures designed to help prevent epidemic nosocomial infection. We retrospectively studied the serial infection control measures to determine factors most effective in preventing nosocomial infections of healthcare workers (HCWs) during the 2003 Taiwanese severe acute respiratory syndrome (SARS) epidemic. Fever screening stations, triage of fever patients, separating SARS patients from other patients, separation of entrances and passageways between patients and HCWs, and increasing hand-washing facilities all demonstrated a protective effect for HCWs (univariate analysis; P<0.05). By multiple logistic regression: (i) checkpoint alcohol dispensers for glove-on hand rubbing between zones of risk, and (ii) fever screening at the fever screen station outside the emergency department, were the significant methods effectively minimising nosocomial SARS infection of HCWs (P<0.05). The traffic control bundle should be implemented in future epidemics as a tool to achieve strict infection control measures.

**Database:** CINAHL

1. **Effect of two work practice changes on the microbial contamination rates of pharmacy-compounded sterile preparations.**

**Author(s):** Trissel LA; Gentempo JA; Saenz LM; Woodard MY; Angeles CH

**Source:** American Journal of Health-System Pharmacy; Apr 2007; vol. 64 (no. 8); p. 837-841

**Publication Date:** Apr 2007

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

**PubMedID:** NLM17420200

Available at [American Journal of Health-System Pharmacy](http://search.ebscohost.com/login.aspx?direct=true&scope=site&site=ehost-live&db=mdc&AN=NLM17420200) - from EBSCO (MEDLINE Complete)

Available at [American Journal of Health-System Pharmacy](http://pdfs.semanticscholar.org/e5d1/014368725ee099872cbb09adcbd0a436de2a.pdf) - from Unpaywall

**Abstract:** PURPOSE: Using a multiple-step testing medium-risk-level compounding test procedure, the evaluation of two work-practice changes to determine if the changes could effectively reduce the potential for contamination occurrence was conducted. SUMMARY: Along with training and evaluation of aseptic sterile compounding techniques, each individual pharmacist and pharmacy technician at M. D. Anderson Cancer Center must successfully demonstrate aseptic preparation competency annually by performing the complicated multistep aseptic transfers of growth medium with no resulting growth of microorganisms. The multistep aseptic transfers are designed to simulate manual compounding of the most complicated medium-risk-level preparations anticipated as specified in the United States Pharmacopeia's chapter 797. An evaluation of two modest and simple work-practice changes was conducted: The use of bare hands and nonsterile gloves with only initial disinfection with 70% isopropyl alcohol (IPA) during years 1 and 2 (group A) was compared with the use of nonsterile chemotherapy gloves with initial and repeated disinfection with IPA for year 3 (group B) and the use of sterile gloves with initial and repeated disinfection with IPA for year 4 (group C). The process involved multiple discrete manipulations, including reconstitution of dry-growth medium; transfers of growth medium from vials and ampules using syringes, needles, a dispensing pin, and a filter straw; and transfers to an empty plastic i.v. bag. For groups B and C, significant reductions in contaminated samples were found compared with group A. CONCLUSION: The use of protective chemotherapy gloves that were repeatedly disinfected with IPA decreased the contamination rate of pharmacy-compounded sterile preparations.

**Database:** CINAHL

1. **Using an integrated infection control strategy during outbreak control to minimize nosocomial infection of severe acute respiratory syndrome among healthcare workers.**

**Author(s):** Yen M; Lin YE; Su I; Huang F; Ho M; Chang S; Tan K; Chen K; Chang H; Liu Y; Loh C; Wang L; Lee C

**Source:** Journal of Hospital Infection; Feb 2006; vol. 62 (no. 2); p. 195-199

**Publication Date:** Feb 2006

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

**PubMedID:** NLM16153744

Available at [Journal of Hospital Infection](http://www.journalofhospitalinfection.com/article/S0195670105001258/pdf) - from Unpaywall

**Abstract:** Healthcare workers (HCWs) are at risk of acquiring severe acute respiratory syndrome (SARS) while caring for SARS patients. Personal protective equipment and negative pressure isolation rooms (NPIRs) have not been completely successful in protecting HCWs. We introduced an innovative, integrated infection control strategy involving triaging patients using barriers, zones of risk, and extensive installation of alcohol dispensers for glove-on hand rubbing. This integrated infection control approach was implemented at a SARS designated hospital ('study hospital') where NPIRs were not available. The number of HCWs who contracted SARS in the study hospital was compared with the number of HCWs who contracted SARS in 86 Taiwan hospitals that did not use the integrated infection control strategy. Two HCWs contracted SARS in the study hospital (0.03 cases/bed) compared with 93 HCWs in the other hospitals (0.13 cases/bed) during the same three-week period. Our strategy appeared to be effective in reducing the incidence of HCWs contracting SARS. The advantages included rapid implementation without NPIRs, flexibility to transfer patients, and reinforcement for HCWs to comply with infection control procedures, especially handwashing. The efficacy and low cost are major advantages, especially in countries with large populations at risk and fewer economic resources. Copyright © 2006 The Hospital Infection Society

**Database:** CINAHL

1. **Aseptic technique: evidence-based approach for patient safety.**

**Author(s):** Preston, R

**Source:** British Journal of Nursing; May 2005; vol. 14 (no. 10); p. 540-546

**Publication Date:** May 2005

**Publication Type(s):** Review

Available at [British journal of nursing (Mark Allen Publishing)](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=0966-0461&volume=14&issue=10&spage=540) - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** Literature review on aseptic technique for infection control. Principles of aseptic technique and contrasts with clean technique, acceptable standards of cleanliness and effective hand-washing are discussed. The use of alcohol gels and selection of appropriate gloves using a risk assessment protocol is explained.

**Database:** BNI

1. **Combined use of alcohol hand rub and gloves reduces the incidence of late onset infection in very low birthweight infants.**

**Author(s):** Ng, P; Wong, H; Lyon, D

**Source:** Archives of Disease in Childhood. Fetal and Neonatal Edition; Jul 2004; vol. 89 (no. 4); p. F336

**Publication Date:** Jul 2004

**Publication Type(s):** Article

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](https://go.openathens.net/redirector/nhs?url=https%3A%2F%2Ffn.bmj.com%2Flookup%2Fdoi%2F10.1136%2Fadc.2003.031104) - from BMJ Journals - NHS

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](http://europepmc.org/search?query=(DOI:10.1136/adc.2003.031104)) - from Europe PubMed Central - Open Access

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](http://fn.bmj.com/cgi/doi/10.1136/adc.2003.031104) - from HighWire - Free Full Text

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](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=1359-2998&volume=89&issue=4&spage=F336) - from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](https://www.ncbi.nlm.nih.gov/pubmed/15210670) - from PubMed

**Abstract:** Research in Hong Kong to evaluate the effects of changing from a conventional handwashing programme to use of an alcohol hand rub and gloves in a NICU. The outcomes measured were incidence of necrotising enterocolitis and systematic infections during the 2 infection control regimes.

**Database:** BNI

1. **Hand hygiene: a frequently missed lifesaving opportunity during patient care.**

**Author(s):** Trampuz A; Widmer AF

**Source:** Mayo Clinic Proceedings; Jan 2004; vol. 79 (no. 1); p. 109-116

**Publication Date:** Jan 2004

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

**PubMedID:** NLM14708954

Available at [Mayo Clinic Proceedings](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=0025-6196&volume=79&issue=1&spage=109) - from ProQuest (Health Research Premium) - NHS Version

Available at [Mayo Clinic Proceedings](https://www.ncbi.nlm.nih.gov/pubmed/14708954) - from PubMed

Available at [Mayo Clinic Proceedings](https://doi.org/10.4065/79.1.109) - from doi.org

Available at [Mayo Clinic Proceedings](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7094481/) - from PubMed Central

Available at [Mayo Clinic Proceedings](http://www.mayoclinicproceedings.org/article/S0025619611632631/pdf) - from Unpaywall

**Abstract:** Health care-associated infections constitute one of the greatest challenges of modern medicine. Despite compelling evidence that proper hand washing can reduce the transmission of pathogens to patients and the spread of antimicrobial resistance, the adherence of health care workers to recommended hand-hygiene practices has remained unacceptably low. One of the key elements in improving hand-hygiene practice is the use of an alcohol-based hand rub instead of washing with soap and water. An alcohol-based hand rub requires less time, is microbiologically more effective, and is less irritating to skin than traditional hand washing with soap and water. Therefore, alcohol-based hand rubs should replace hand washing as the standard for hand hygiene in health care settings in all situations in which the hands are not visibly soiled. It is also important to change gloves between each patient contact and to use hand-hygiene procedures after glove removal. Reducing health care-associated infections requires that health care workers take responsibility for ensuring that hand hygiene becomes an everyday part of patient care.

**Database:** CINAHL

1. **Effect of two types of latex gloves and surfactants on polymerization inhibition of three polyvinylsiloxane impression materials.**

**Author(s):** Peregrina A; Land MF; Feil P; Price C

**Source:** Journal of Prosthetic Dentistry; Sep 2003; vol. 90 (no. 3); p. 289-292

**Publication Date:** Sep 2003

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

**PubMedID:** NLM12942064

**Abstract:** STATEMENT OF PROBLEM: Polymerization inhibition of polyvinylsiloxane impression materials has been reported when in sustained contact with some types of latex gloves. PURPOSE: This study examined the polymerization inhibition of 3 polyvinylsiloxane impression materials placed in contact with surfaces subjected to prior contact with gloves or commonly used surfactants. MATERIAL AND METHODS: A 2 x 3 x 4 x 2 design was used (n = 20), with 2 types of gloves (powdered and unpowdered), 3 types of polyvinylsiloxane impression materials (Aquasil, Extrude, and Affinis), 4 surfactant conditions (water, soap/water-rinse, alcohol, and unexposed), and 2 ambient temperatures of 22 degrees C and 36 degrees C. After glove exposure to surfactants, a glass surface was subjected to rubbing contact with the treated glove for a standardized time. After drying, automixed polyvinylsiloxane impression materials were dispensed onto the treated surface. Specimens were removed and evaluated for polymerization inhibition at the manufacturer's recommended polymerization time (36 degrees C), or after 15 minutes at 22 degrees C. Specimens were rated as polymerized, or as inhibited if any polyvinylsiloxane residue remained on the slab. A chi-square analysis was used to evaluate the results (alpha=.05). RESULTS: Setting inhibition was found only with one of the polyvinylsiloxane materials when alcohol was used as a surfactant. At 22 degrees C, the inhibition rate ranged from 95% to 100% for both glove types; at 36 degrees C inhibition ranged from 40% (unpowdered gloves) to 75% (powdered gloves), respectively. CONCLUSION: Under these in vitro conditions, glove exposure to alcohol resulted in polymerization inhibition of 1 of 3 tested polyvinylsiloxane impression materials (Extrude).

**Database:** CINAHL

1. **Moisturizing alcohol hand gels for surgical hand preparation**

**Author(s):** Jones, Rhonda D; Januman Jampani; Mulberry, Gayle; Rizer, Ronald L

**Source:** AORN Journal; Mar 2000; vol. 71 (no. 3); p. 584-593

**Publication Date:** Mar 2000

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

Available at [AORN journal](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=0001-2092&volume=71&issue=3&spage=584) - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** Moisturizing hand gels have been developed that offer significant advantages in perioperative and other health care settings. Advantages include the time-saving capabilities of a waterless formula, the persistence and effectiveness of a surgical scrub, and the protective properties of a lotion. With the use of novel formulary technology, unique moisturizing hand gels have been developed that offer significant advantages in perioperative and other health care settings. These advantages include the time-saving capabilities of a waterless formulation, the persistence and effectiveness of a surgical scrub, and the moisturization and protective properties of a lotion. Extensive laboratory and clinical studies, involving in vivo antimicrobial activity against resident and transient flora, skin moisturization on normal and dry skin, and compatibility with latex gloves, have supported these advantages. Nondrying alcohol hand gels can be used for antiseptic hand washing, hand scrubs between procedures (i.e. reentry scrubs), brushless surgical scrubs, moisturizers, and glove-donning aids.

**Database:** BNI

1. **Disinfection of latex gloves with ethyl alcohol.**

**Author(s):** Grinnell F

**Source:** Professional Nurse; May 1998; vol. 13 (no. 8); p. 504-507

**Publication Date:** May 1998

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

**PubMedID:** NLM9653291

**Abstract:** The ability to disinfect latex gloves successfully between procedures would save time and be cost-effective. An in vitro study examined the efficacy of using an ethyl alcohol/bactericide compound to disinfect latex gloves contaminated with five common bacteria.

**Database:** CINAHL

1. **Removal of nosocomial pathogens from the contaminated glove. Implications for glove reuse and handwashing.**

**Author(s):** Doebbeling, B N; Pfaller, M A; Houston, A K; Wenzel, R P

**Source:** Annals of Internal Medicine; Sep 1988; vol. 109 (no. 5); p. 394-398

**Publication Date:** Sep 1988

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

**PubMedID:** NLM3136685

Available at [Annals of internal medicine](http://search.ebscohost.com/login.aspx?direct=true&scope=site&site=ehost-live&db=mdc&AN=3136685) - from EBSCO (MEDLINE Complete)

**Abstract:** Study Objective: To evaluate the effectiveness of three different types of handcleansing agents in decontaminating gloved hands that were inoculated with a series of four nosocomial pathogens. Design: A controlled, experimental trial.Setting: Tertiary care referral center. Patients or Other Participants: Five healthy volunteers participated in all portions of the study. Interventions: A standard concentration of one of four representative nosocomial pathogens was placed on the gloved hand, spread, and allowed to dry. One of three different handcleansing agents--a nonmedicated soap, a 60% isopropyl alcohol preparation, or 4% chlorhexidine gluconate--was used to cleanse the gloves, which were cultured using a broth-bag technique. The gloves were then removed and the hands were cultured in a similar manner. Measurements and Main Results: The handwashing agents reduced the median log10 counts of organisms to 2.1 to 3.9 after an inoculation of 10(7) colony forming units. The proportion of positive glove cultures for Staphylococcus aureus, 8% to 100%; Serratia marcescens, 16% to 100%; and Candida albicans, 4% to 60% varied greatly after use of the different handcleansers (P less than 0.001), and varied considerably for Pseudomonas aeruginosa, 20% to 48% (P = 0.085). After the gloves were removed, the differences among the observed proportions of hands contaminated with the test organisms varied from 5% to 50%, depending on the handcleansing agent used (P less than 0.001). Conclusions: In the era of universal precautions these data suggest that it may not be prudent to wash and reuse gloves between patients. Further, handwashing is strongly encouraged after removal of gloves.

**Database:** CINAHL

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**Databases searched:**

* + **Evidence-Based Reviews:** The Cochrane Library
  + **Guidance:** NICE Guidance.
  + **Healthcare Databases:** MEDLINE, CINAHL, EMCARE, BNI, NICE Evidence Search.

**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.

**Search Terms:**

|  |  |
| --- | --- |
| ***Subject Headings*** | ***Free Text Words*** |
| ALCOHOL/ | alcohol |
| GLOVE/ | alcohol sanitiser |
| "GLOVE, SURGICAL"/ | alcohol sanitizer |
| GLOVES/ | glove sanitizing |
| "GLOVES, PROTECTIVE"/ | gloves |
| \*"GLOVES STANDARDS"/ | non-sterile |
| "GLOVES, SURGICAL"/ | non-sterile procedure gloves |
| "HAND SANITIZER"/ | re-use |
| \*"INFECTION CONTROL STANDARDS"/ |  |
| "STERILIZATION AND DISINFECTION"/ |  |

**Search Date:** 31/03/2020

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