



Victorian Quality Council Hand Hygiene Project Literature Review

Alcohol/chlorhexidine hand hygiene products

References from Medline 2001-6

Authors

Kampf G. Kramer A.

Title

Efficacy of hand hygiene agents at short application times.[comment].

Source

American Journal of Infection Control. 33(7):429-31; author reply 436-7, 2005 Sep.

Authors

Seal LA. Rizer RL. Maas-Irslinger R.

Title

A unique water optional health care personnel handwash provides antimicrobial persistence and residual effects while decreasing the need for additional products.

Source

American Journal of Infection Control. 33(4):207-16, 2005 May.

Abstract

BACKGROUND: The Centers for Disease Control and Prevention (CDC) has published guidelines for hand hygiene practices, recommending a handwash regimen that alternates between waterless alcohol products and antimicrobial or nonantimicrobial soap and water. The advent of an alcohol-based product that can be used with or without water (ie, water optional) to decontaminate the hands while providing immediacy of kill and antimicrobial persistence could reduce the confusion associated with handwash guidelines. Such a product has been developed, is alcohol-based (61%), and zinc pyrithione (ZPT) preserved (61% alcohol-ZPT) and has proven to be fully compliant with the Food and Drug Administration (FDA) and CDC guidelines. **METHODS:** FDA-required testing of the 61% alcohol-ZPT product for the health care personnel handwash indication was performed as outlined in the Tentative Final Monograph (TFM) for Health-Care Antiseptic Drug Products, employing waterless and water-aided product applications. It was next assessed for antimicrobial persistence and residual effects by comparing it, in separate waterless and water-aided applications, with commonly available handwashes containing various antimicrobials in a 5-day study employing 49 subjects, in which samples were collected immediately and at 4 hours and 8 hours post application. The skin conditioning properties of this formulation were investigated via appropriate methods. **RESULTS:** The 61% alcohol-ZPT product easily produced >3.0 log₁₀ reduction in the indicator strain (*Serratia marcescens*) following the first wash, exceeding the 2.0 log₁₀ FDA requirement. This level of performance was maintained through the tenth wash, surpassing the 3.0 log₁₀ FDA requirement for the handwash indication.

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For the assessment of persistence and residual effect in the waterless mode, the water-optional, 61% alcohol-ZPT product consistently produced log 10 reductions of nearly 3.5 or greater at every point over the entire study period. In the water-aided configuration, similar results were obtained as log 10 reductions of 2.5 were observed. The formulation is nonirritating, actually contributing to hand skin condition.

CONCLUSIONS: The 61% alcohol-ZPT product exceeds all FDA criteria for the health care personnel handwash indication and is a significant advancement in the concept of skin antiseptics. It represents a single product suitable for use in all hand hygiene settings, demonstrating improved antimicrobial persistence and residual effects. The 61% alcohol-ZPT formulation contributes positively to overall hand conditioning, and a previously reported study has documented it to be virucidal for several DNA and RNA viruses.

Authors

Sickbert-Bennett EE. Weber DJ. Gergen-Teague MF. Sobsey MD. Samsa GP. Rutala WA.

Title

Comparative efficacy of hand hygiene agents in the reduction of bacteria and viruses. [see comment].

Source

American Journal of Infection Control. 33(2):67-77, 2005 Mar.

Abstract

BACKGROUND: Health care-associated infections most commonly result from person-to-person transmission via the hands of health care workers. **METHODS:** We studied the efficacy of hand hygiene agents (n = 14) following 10-second applications to reduce the level of challenge organisms (*Serratia marcescens* and MS2 bacteriophage) from the hands of healthy volunteers using the ASTM-E-1174-94 test method. **RESULTS:** The highest log 10 reductions of *S marcescens* were achieved with agents containing chlorhexidine gluconate (CHG), triclosan, benzethonium chloride, and the controls, tap water alone and nonantimicrobial soap and water (episode 1 of hand hygiene, 1.60-2.01; episode 10, 1.60-3.63). Handwipes but not alcohol-based handrubs were significantly inferior from these agents after a single episode of hand hygiene, but both groups were significantly inferior after 10 episodes. After a single episode of hand hygiene, alcohol/silver iodide, CHG, triclosan, and benzethonium chloride were similar to the controls in reduction of MS2, but, in general, handwipes and alcohol-based handrubs showed significantly lower efficacy. After 10 episodes, only benzethonium chloride (1.33) performed as well as the controls (1.59-1.89) in the reduction of MS2. **CONCLUSIONS:** Antimicrobial handwashing agents were the most efficacious in bacterial removal, whereas waterless agents showed variable efficacy. Alcohol-based handrubs compared with other products demonstrated better efficacy after a single episode of hand hygiene than after 10 episodes. Effective hand hygiene for high levels of viral contamination with a nonenveloped virus was best achieved by physical removal with a nonantimicrobial soap or tap water alone.

Authors

Sickbert-Bennett EE. Weber DJ. Gergen-Teague MF. Rutala WA.

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Title

The effects of test variables on the efficacy of hand hygiene agents.

Source

American Journal of Infection Control. 32(2):69-83, 2004 Apr.

Abstract

BACKGROUND: Hand hygiene is essential to interrupting disease transmission in health care facilities. Multiple hand hygiene agents are currently available for use in the health care setting. To evaluate the utility of these agents, both the user acceptability and the efficacy need to be evaluated. Different hand hygiene test methodologies have been used to measure the efficacy of these agents, but efficacy results vary depending on variations to key parameters in these methodologies. The purpose of this study was to evaluate the effect of test variables on the efficacy of hand hygiene agents. **METHODS:** Both a comprehensive literature review and original hand hygiene efficacy studies were undertaken. The literature review was conducted using a Medline search, and hand hygiene efficacy studies were conducted under the American Society for Testing and Materials (ASTM). E 1174 Standard Test Method for Evaluation of the Effectiveness of Health Care Personnel Handwash Formulation. **RESULTS:** The literature review and our original data showed that the following variables affected the hand hygiene efficacy measurements: hand jewelry, experimental contamination versus normal flora, method of application of test organism, hand hygiene agent, concentration of active ingredient, volume of hand hygiene agent, duration of application of hand hygiene agent, method of application of hand hygiene agent, and study method (human challenge trial versus in vitro suspension test). **CONCLUSIONS:** Although many methodological variables affect efficacy results, infection control professionals in their analysis of product information should always assess the results in light of the following key variables: concentration and type of active ingredient, duration of exposure to hand hygiene agent, volume of hand hygiene agent applied, test organism, and study method (ie, human challenge vs. in vitro suspension test).

Authors

Moureau NL.

Title

Is your skin-prep technique up-to-date?.

Source

Nursing. 33(11):17, 2003 Nov.

Authors

Marchetti MG. Kampf G. Finzi G. Salvatorelli G.

Title

Evaluation of the bactericidal effect of five products for surgical hand disinfection according to prEN 12054 and prEN 12791.[see comment].

Source

Journal of Hospital Infection. 54(1):63-7, 2003 May.

Abstract

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Surgical hand disinfection (with an alcohol-based hand rub) and surgical handwash (with an antiseptic-based liquid soap) are accepted measures to reduce the risk for surgical site infections. The new European Standards allow a comparison of their antimicrobial efficacy. The bactericidal activity of surgical hand rubs [Sterillium and Softaman, (active ingredient=alcohols)] and handwashes [Derman plus (triclosan), Hibiscrub (chlorhexidine) and Betadine (PVP-iodine)] was tested according to the prEN 12054 suspension test using *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Enterococcus hirae*, and to prEN 12791 for the effect on resident skin flora in comparison with 1-propanol, 60% (v/v). All five products achieved a reduction of test bacteria within 3 min of >10(5)-fold so fulfilling prEN 12054. However, only Hibiscrub, Sterillium and Softa Man met the requirements of prEN 12791, giving a mean reduction of resident micro-organisms (immediate and sustained effect) which was not significantly lower than the reference alcohol ($P>0.1$; Wilcoxon matched-pairs signed-rank test). Sterillium was significantly more effective than the reference alcohol (immediate and sustained affect). Products for surgical hand disinfection may have equal antimicrobial activity in suspension tests but show large differences under practical conditions. Healthcare workers should not rely on results from suspension tests when deciding on a product for surgical hand disinfection.

Authors

Ekizoglu MT. Ozalp M. Sultan N. Gur D.

Title

An investigation of the bactericidal effect of certain antiseptics and disinfectants on some hospital isolates of gram-negative bacteria.

Source

Infection Control & Hospital Epidemiology. 24(3):225-7, 2003 Mar.

Abstract

The effect of widely used antiseptics and disinfectants on some hospital isolates of gram-negative bacteria was assessed by the quantitative suspension test Chlorhexidine gluconate (4%), savlon (1:100), and 5.25% sodium hypochlorite were tested. Savlon and chlorhexidine gluconate were effective at in-use concentrations and sodium hypochlorite was effective at 1:50 dilution.

Authors

Weber DJ. Sickbert-Bennett E. Gergen MF. Rutala WA.

Title

Efficacy of selected hand hygiene agents used to remove *Bacillus atrophaeus* (a surrogate of *Bacillus anthracis*) from contaminated hands.

Source

JAMA. 289(10):1274-7, 2003 Mar 12.

Abstract

CONTEXT: The intentional use of *Bacillus anthracis* transmitted via the US mail in October-November 2001 resulted in 22 people developing inhalation or cutaneous anthrax. Glove use with handwashing prior to and after contact with potential

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contaminated environmental surfaces and cutaneous lesions has been recommended. However, only limited data are available on the susceptibility of B anthracis to antiseptics. **OBJECTIVE:** To evaluate the efficacy of several hand antiseptics (interventions) and soap and water (control) against *Bacillus atrophaeus*, a surrogate of B anthracis. **DESIGN, SETTING, AND PARTICIPANTS:** Challenge study conducted among healthy adult volunteers, using the Standard Test Method for Evaluation of the Effectiveness of Health Care Professional Handwash Formulations (American Society for Testing and Materials E 1174-94) to determine the efficacy of various hand hygiene products at wash times of 10, 30, and 60 seconds. Volunteers were excluded if they had eczema, psoriasis, or other chronic skin conditions; nonintact skin; or allergies to any study agent. Study agents were a waterless rub containing 61% ethyl alcohol, a 2% chlorhexidine gluconate preparation, and an antibacterial microfiber towel that releases hypochlorite. A nonantimicrobial soap was used as a control. **MAIN OUTCOME MEASURE:** Reduction of B atrophaeus spores (log₁₀ CFU/mL) on contaminated hands. **RESULTS:** Washes of 10, 30, and 60 seconds with either soap and water or 2% chlorhexidine gluconate eliminated 1.5 to 2.0 log₁₀ CFUs/mL of B atrophaeus spores at wash 3. Mean reductions (95% confidence intervals) with 10-, 30-, and 60-second washes with soap and water were 2.4 (2.2-2.5), 2.3 (2.2-2.4), and 2.1 (1.9-2.4) log₁₀ CFUs/mL, respectively; and with 2% chlorhexidine gluconate, 2.1 (2.0-2.3), 1.8 (1.5-2.0), and 1.7 (1.5-1.9) log₁₀ CFUs/mL, respectively. Handwashing with chlorine-containing towels was increasingly effective as the wipe time increased; reductions at 10, 30, and 60 seconds were 1.3 (1.1-1.5), 1.6 (1.2-2.0), and 2.2 (2.1-2.2) log₁₀ CFUs/mL, respectively. A waterless rub containing 61% ethyl alcohol was ineffective in eliminating B atrophaeus spores at all times tested (0 [-0.1 to 0.1], -0.2 [-0.3 to -0.1], and 0 [-0.2 to 0.2] log₁₀ CFUs/mL). **CONCLUSIONS:** In this evaluation of hand hygiene agents, handwashing with soap and water, 2% chlorhexidine gluconate, or chlorine-containing towels reduced the amount of B atrophaeus spore contamination, whereas use of a waterless rub containing ethyl alcohol was not effective in removing spores.

Authors

Marena C. Lodola L. Zecca M. Bulgheroni A. Carretto E. Maserati R. Zambianchi L.

Title

Assessment of handwashing practices with chemical and microbiologic methods: preliminary results from a prospective crossover study.

Source

American Journal of Infection Control. 30(6):334-40, 2002 Oct.

Abstract

BACKGROUND: Handwashing (HW) by clinical staff is the single most important measure for preventing transmission of nosocomial infection (NI). The primary objectives of this study were to improve the motivation and awareness of the importance of HW practices among health care workers (HCWs) and to assess the effectiveness of a new chemical system in checking HW compliance. In addition, we evaluated the efficacy and tolerability of 2 soap solutions used during regular working hours by HCWs at our institution. **METHOD:** A preliminary short training course was performed to promote HW compliance and awareness. We chose 2 surgical wards at

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our 1200-bed teaching hospital. Sampling of hands was conducted weekly during routine activities of HCWs without advance warning. We used the staff list as a sampling frame to select subjects. Data were collected anonymously. On the basis of a crossover study design, a plain soap and one containing 4% chlorhexidine gluconate (CHG) were used alternatively in each ward for 4 consecutive months. Hand samples were evaluated with microbiologic cultures and with a commercially available kit that measures adenosine triphosphate (ATP) bioluminescence. As additional process indicators, we examined the amount of hand soap and CHG solution distributed and rate of NIs. RESULTS: A total of 74 HCWs were evaluated for hand contamination. During the 4-month study, we found a significant reduction in colony-forming unit counts ($P < .008$) and ATP levels ($P < .002$) compared with baseline values. The results showed a positive correlation ($r = 0.68$, $P < .0001$) between the microbial counts detected by standard culture and ATP levels measured with the commercial kit. Plain soap ($P < .003$) was more effective than CHG in reducing colony-forming unit counts among HCWs in the vascular surgery ward. We documented a reduction in the NI rate and an increase in the consumption of soap and paper towels. CONCLUSION: HW compliance improved during the study period among HCWs. The method to measure ATP bioluminescence is simple and easy to perform and provides reliable results within a few minutes of sampling hands. It can be used extensively to test HW compliance among HCWs.

Authors

Mulberry G. Snyder AT. Heilman J. Pyrek J. Stahl J.

Title

Evaluation of a waterless, scrubless chlorhexidine gluconate/ethanol surgical scrub for antimicrobial efficacy.

Source

American Journal of Infection Control. 29(6):377-82, 2001 Dec.

Abstract

A new waterless surgical hand preparation containing 1% chlorhexidine gluconate (CHG) and 61% ethyl alcohol was evaluated for antimicrobial efficacy in comparison with a standard 4% CHG surgical scrub and a 61% ethyl alcohol control. Clinical studies were based on the Tentative Final Monograph for Health-Care Antiseptic Drug Products (TFM) (proposed rule) and the Standard Test Method for Evaluation of Surgical Hand Scrub Formulations (ASTM E1115-91). Two randomized, blinded, well-controlled clinical studies involving 137 healthy subjects were conducted to evaluate the antimicrobial effectiveness of the CHG/ethanol hand preparation in producing an immediate and persistent reduction in the normal bacterial flora of the hands. The CHG/ethanol hand preparation was applied without scrubbing or the use of water, and a standard 4% CHG reference product was applied with a scrub brush in 2 traditional 3-minute surgical scrubs. In 1 study, a 61% ethanol vehicle control treatment was applied without scrubbing or use of water. During a 5-day period, each study subject performed a series of 11 surgical scrubs with 1 of the test treatments. After the first treatment on days 1, 2, and 5, surgical gloves were worn for 3 or 6 hours. Bacterial samples were taken with the glove-juice technique at 1 minute, 3 hours, and 6 hours after treatment. The immediate bactericidal effect of the CHG/ethanol hand preparation after a single application resulted in a 2.5-log reduction in normal flora.

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This bactericidal effect persisted throughout the studies and eventually increased to a 3.6-log reduction after the 11th scrub on day 5. The log reductions of the CHG/ethanol hand preparation proved to be significantly better ($P < .05$) than that of the 4% CHG product at each sampling interval on days 1 and 2 and the sampling at 6 hours on day 5 and significantly better than the 61% ethanol vehicle at all times. The combination of 1% CHG and 61% ethanol had significantly greater microbial reduction than either the 4% CHG (without ethanol) or the 61% ethanol vehicle (without CHG).

Authors

Grove GL. Zerweck CR. Heilman JM. Pyrek JD.

Title

Methods for evaluating changes in skin condition due to the effects of antimicrobial hand cleansers: two studies comparing a new waterless chlorhexidine gluconate/ethanol-emollient antiseptic preparation with a conventional water-applied product.

Source

American Journal of Infection Control. 29(6):361-9, 2001 Dec.

Abstract

BACKGROUND: Hand-cleansing products that are milder to the skin of health care personnel are being developed, but the available methodologies to appropriately evaluate these products and quantify differences are not generally being applied in well-controlled studies. **METHODS:** Two randomized, blinded, bilateral comparison studies evaluated skin condition during use of 2 antiseptic hand preparation products: a new 1% chlorhexidine gluconate (CHG)/61% wt/wt ethanol antiseptic hand preparation in a unique emollient system for waterless/brushless application and a conventional 4% CHG antimicrobial product that is applied with water and a scrub brush. Trained technicians applied treatments 6 times (for a surgical scrub study) or 24 times (for a personnel handwash study) daily to the hands of healthy volunteers during 5 days of controlled washing. An expert grader evaluated skin for dryness, erythema, and roughness. Subjects completed a self-assessment questionnaire on skin condition. Transepidermal water loss was measured by an evaporimeter, and the skin surface hydration level was measured by an electrical conductance meter. **RESULTS:** Fifty-eight subjects were enrolled in the 2 studies and received both treatments. In general, skin treated with the waterless CHG/ethanol product scored significantly ($P < .004$) better on evaluations of visual dryness and erythema and showed greater improvement in the level of hydration ($P < .003$). In the health care personnel handwash study, transepidermal water loss was less than that for skin treated with the conventional CHG product ($P < .002$). Subject assessments showed similar results (total score, $P < .007$). **CONCLUSIONS:** All 3 approaches of expert grader evaluation, subject assessment, and instrumentation were in concordance, demonstrating that the waterless CHG/ethanol product was gentler to skin than the conventional CHG product.

Authors

Pietsch H.

Title

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Hand antiseptics: rubs versus scrubs, alcoholic solutions versus alcoholic gels. [Review] [10 refs]

Source

Journal of Hospital Infection. 48 Suppl A: S33-6, 2001 Aug.

Abstract

This report describes three different investigations undertaken to demonstrate the advantage of fluid alcoholic hand disinfectants. In the first study, the skin compatibility of Sterillium, a liquid alcoholic rub-in hand disinfectant was compared with that of Hibiscrub, a water-based handwashing antiseptic. Using various parameters such as image analysis of removed squames (D-squames), skin roughness or transepidermal water loss, Hibiscrub was found to be significantly inferior to Sterillium. Hibiscrub caused skin irritation in 15 volunteers who could not complete the test. In a second study, the microbicidal efficacy of Sterillium and Hibiscrub was tested in surgical hand disinfection. The microbial reduction by Sterillium was significantly greater than that of Hibiscrub, immediately after application as well as after the surgical procedure. In a third study, certain alcoholic gels were tested according to the EN 1500 'hygienic hand disinfection'. None of the gels tested passed the EN 1500 within 30s. However, Sterillium met the EN 1500 requirement within 30s. We conclude that Sterillium is superior to Hibiscrub in terms of skin tolerance and microbicidal efficacy in surgical hand disinfection. It is also superior to alcoholic gels. [References: 10]

Authors

Larson EL. Aiello AE. Bastyr J. Lyle C. Stahl J. Cronquist A. Lai L. Della-Latta P.

Title

Assessment of two hand hygiene regimens for intensive care unit personnel.[see comment].

Source

Critical Care Medicine. 29(5):944-51, 2001 May.

Abstract

OBJECTIVE: To compare skin condition and skin microbiology among intensive care unit personnel using one of two randomly assigned hand hygiene regimens: a 2% chlorhexidine gluconate (CHG)-containing traditional antiseptic wash and a waterless handrub containing 61% ethanol with emollients (ALC). **DESIGN:** Prospective, randomized clinical trial. **SETTING:** Two critical care units (medical and surgical) in a large, metropolitan academic health center in Manhattan. **SUBJECTS:** Fifty staff members (physicians, nurses, housekeepers, respiratory therapists) working full time in the intensive care unit. **INTERVENTIONS:** One of two hand hygiene regimens randomly assigned for four consecutive weeks. **MEASUREMENTS AND MAIN RESULTS:** The two outcomes were skin condition (measured by two tools: Hand Skin Assessment form and Visual Skin Scaling form) and skin microbiology. Samples were obtained at baseline, on day 1, and at the end of wks 2 and 4. Participants in the ALC group had significant improvements in the Hand Skin Assessment scores at wk 4 ($p = 0.04$) and in Visual Skin Scaling scores at wks 3 ($p = 0.01$) and 4 ($p = 0.0005$). There were no significant differences in numbers of colony-forming units between participants in the CHG or ALC group at any time period. The ALC regimen required significantly less time than the CHG regimen (mean: 12.7 secs and 21.1 secs,

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respectively; $p = 0.000$) and resulted in a 50% reduction in material costs.
CONCLUSIONS: Changes in hand hygiene practices in acute care settings from the traditional antiseptic wash to use of plain, mild soap and an alcohol-based product should be considered. Further research is needed to examine the association between use of antiseptic products for hand hygiene of staff and reductions in nosocomial infection rates among patients.

Authors

Goroncy-Bermes P. Schouten MA. Voss A.

Title

In vitro activity of a nonmedicated handwash product, chlorhexidine, and an alcohol-based hand disinfectant against multiply resistant gram-positive microorganisms.

Source

Infection Control & Hospital Epidemiology. 22(4):194-6, 2001 Apr.

Authors

Larson EL. Aiello AE. Heilman JM. Lyle CT. Cronquist A. Stahl JB. Della-Latta P.

Title

Comparison of different regimens for surgical hand preparation.

Source

AORN Journal. 73(2):412-4, 417-8, 420 passim, 2001 Feb.

Abstract

Twenty surgical staff members participated in a clinical trial to compare the microbiology and skin condition of hands when using a traditional surgical scrub (TSS) with a detergent-based antiseptic containing 4% chlorhexidine gluconate (CHG) and a short application without scrub of a waterless hand preparation (HP) containing 61% ethyl alcohol, 1% CHG, and emollients. The HP was associated with less skin damage ($P = .002$) and lower microbial counts postscrub at days five ($P = .002$) and 19 ($P = .02$). The HP protocol had shorter contact time (HP mean [M] = 80.7 seconds; TSS M = 144.9 seconds; $P < .0001$), and more subjects preferred the HP regimen ($P = .001$). The HP performed better than the TSS, was less costly, and should be evaluated in larger trials and considered for widespread implementation.

Authors

Larson EL. Cimiotti J. Haas J. Parides M. Negin M. Della-Latta P. Saiman L.

Title

Effect of antiseptic handwashing vs alcohol sanitizer on health care-associated infections in neonatal intensive care units.[see comment].

Source

Archives of Pediatrics & Adolescent Medicine. 159(4):377-83, 2005 Apr.

Abstract

BACKGROUND: The Centers for Disease Control and Prevention, Atlanta, Ga, recommend use of waterless alcohol hand products in lieu of traditional handwashing for patient care, but there are few data demonstrating the impact of this

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recommendation on health care-associated infections. **OBJECTIVE:** To compare the effect of 2 hand hygiene regimens on infection rates and skin condition and microbial counts of nurses' hands in neonatal intensive care units. **DESIGN, SETTING, AND PARTICIPANTS:** Clinical trial using a crossover design in 2 neonatal intensive care units in Manhattan, NY, from March 1, 2001, to January 31, 2003, including 2932 neonatal hospital admissions (51 760 patient days) and 119 nurse participants. **INTERVENTION:** Two hand hygiene products were tested: a traditional antiseptic handwash and an alcohol hand sanitizer. Each product was used for 11 consecutive months in each neonatal intensive care unit in random order. **RESULTS:** After adjusting for study site, birth weight, surgery, and follow-up time, there were no significant differences in neonatal infections between the 2 products; odds ratios for alcohol compared with handwashing were 0.98 (95% confidence interval [CI], 0.77-1.25) for any infection, 0.99 (95% CI, 0.77-1.33) for bloodstream infections, 1.61 (95% CI, 0.57-5.54) for pneumonia, 1.78 (95% CI, 0.94-3.37) for skin and soft tissue infections, and 1.26 (95% CI, 0.42-3.76) for central nervous system infections. The skin condition of participating nurses was significantly improved during the alcohol phase ($P = .02$ and $P = .049$ for observer and self-assessments, respectively), but there were no significant differences in mean microbial counts on nurses' hands (3.21 and 3.11 log(10) colony-forming units for handwashing and alcohol, respectively; $P = .38$). **CONCLUSIONS:** Infection rates and microbial counts on nurses' hands were equivalent during handwashing and alcohol phases, and nurses' skin condition was improved using alcohol. However, assessing the impact on infection rates of a single intervention is challenging because of multiple contributory factors such as patient risk, unit design, and staff behavior. Other practices such as frequency and quality of hand hygiene are likely to be as important as product in reducing risk of cross-transmission.

Authors

Grabsch EA. Mitchell DJ. Hooper J. Turnidge JD.

Title

In-use efficacy of a chlorhexidine in alcohol surgical rub: a comparative study.[see comment].

Source

ANZ Journal of Surgery. 74(9):769-72, 2004 Sep.

Abstract

BACKGROUND: Although full surgical scrubs are performed prior to each case on an operating list, optimum regimens for hand cleaning have yet to be determined, and in-use efficacy evaluations are very limited. **METHODS:** A crossover study was undertaken comparing a chlorhexidine in detergent/alcohol regimen with povidine-iodine detergent scrub, within an orthopaedic operating environment. Depending on the skin asepsis regimen used, five surgical team members scrubbed or rubbed prior to each case for a complete operating list. Bactericidal efficacy was measured using the 'glove-juice' technique before and after hand asepsis, and at the completion of each case. **RESULTS:** The chlorhexidine regimen caused substantial and sustained reductions in hand bacterial counts (>50-fold prior to case 1) during surgical cases. Application of alcoholic chlorhexidine prior to each subsequent case reduced bacterial counts to the same level as the original scrub. In contrast, the povidine-iodine scrub

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reduced counts <3-fold prior to the first case and <2-fold in subsequent cases. The chlorhexidine regimen also resulted in persistent bactericidal effects between cases, as counts prior to application of cases 2 and higher were significantly lower than prior to case 1 (>7-fold for case 2 vs case 1). CONCLUSIONS: The chlorhexidine regimen demonstrated excellent bactericidal efficacy throughout an operating list, and was superior to povidine-iodine scrubbing in all aspects. The alcoholic chlorhexidine regimen is simpler and should have wide surgical application.

Authors Pittet D.

Title Improving Compliance with Hand Hygiene in hospitals

Source

00-RVC-035. Pittet D. Improving compliance with hand hygiene in hospitals. Infect Control Hosp Epidemiol 2000;21:381-386.

ABSTRACT

Hand hygiene prevents cross-infection in hospitals, but compliance with recommended instructions often is poor among healthcare workers. Although some previous interventions to improve compliance have been successful, none has achieved lasting improvement. This article reviews reported barriers to appropriate hand hygiene and factors associated with poor compliance.

Easy access to hand hygiene in a timely fashion and the availability of skin-care lotion both appear to be necessary prerequisites for appropriate hand-hygiene behavior. In particular, in high-demand situations, hand rub with an alcohol-based solution appears to be the only alternative that allows a decent compliance. The hand-hygiene compliance level does not rely on individual factors alone, and the same can be said for its promotion. Because of the complexity of the process of change, it is not surprising that solo interventions often fail, and multimodal, multidisciplinary strategies are necessary. A framework that includes parameters to be considered for hand-hygiene promotion is proposed, based on epidemiologically driven evidence and review of the current knowledge. Strategies for promotion in hospitals should include reasons for noncompliance with recommendations at individual, group, and institutional levels. Potential tools for change should address each of these elements and consider their interactivity.

Authors

Paul D Johnson, Rhea Martin, Laurelle J Burrell, Elizabeth A Grabsch, Susan W Kirsa, Jason O'Keeffe, Barrie C Mayall, Deidre Edmonds, Wendy Barr, Christopher Bolger, Humsha Naidoo and Lindsay M Grayson

Title

Efficacy of an alcohol/chlorhexidine hand hygiene program in a hospital with high rates of nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) infection

Source

EMJA rapid on line publication 13 October 2005

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- (5) limit 4 to English

Abstract

To assess the effect of a multifaceted hand hygiene culture change program on health care worker behaviour, and to reduce the burden of nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

Conclusions: Introduction of ACHHRS and a detailed culture-change program was effective in improving compliance and reducing nosocomial MRSA infections, despite high-level MRSA endemicity.

SEARCH STRATEGY FOR MEDLINE (OVID) Years searched 2001-2006 (Previous studies are reviewed in the CDC Guidelines 2002)

- (1) exp Handwashing/ or exp Hand/
- (2) chlorhexidine and alcohol
- (3) 1 and 2
- (4) limit 3 to human
- (5) limit 4 to English