Literature Search Results

Requester:
Topic: Cross contamination via clothing vs “bare below the elbow” in the perioperative setting
Date: 17 January 2017

Search Undertaken by: Jane Orbell-Smith, AFALIA (CP) Health Librarian

Resources Interrogated: Medline, Cinahl, QUT Federated Databases, Cochrane, Embase, AustHealth

Search Strategy (Including Limits): see attached search strategy

Also within QUT & Cochrane:- “bare below the elbow” OR “perioperative clothing”

The following are results of your requested literature search. An EndNote library of references was also supplied separately including many full-text papers. Unless specifically requested, this cannot be considered an exhaustive search. If you require further work on the topic, please contact the Librarian who will be happy to assist you.

Search Results:


(2010). “’Bare below the elbow’ advice revised following Muslim concerns.” Nursing Times 106(12): 3-3.


(2016). "Bare below elbows: Common sense or nonsense?" Hospital Infection Control & Prevention 43(1): 6-8.


Background: Historically, the preoperative and postoperative care of patients with gastrointestinal cancer was provided by surgeons. Contemporary perioperative care is a truly multidisciplinary endeavour with implications for cancer-specific outcomes. Methods: A literature review was performed querying PubMed and the Cochrane Library for articles published between 1966 to 2012 on specific perioperative interventions with the potential to improve the outcomes of surgical oncology patients. Keywords used were: fast-track, enhanced recovery, accelerated rehabilitation, multimodal and perioperative care. Specific interventions included normothermia, hyperoxygenation, surgical-site infection, skin preparation, transfusion, non-steroidal anti-inflammatory drugs, thromboembolism and antibiotic prophylaxis,
laparoscopy, radiotherapy, perioperative steroids and monoclonal antibodies. Included articles had to be randomized controlled trials, prospective or nationwide series, or systematic reviews/meta-analyses, published in English, French or German. Results: Important elements of modern perioperative care that improve recovery of patients and outcomes in surgical oncology include accelerated recovery pathways, thromboembolism and antibiotic prophylaxis, hyperoxygenation, maintenance of normothermia, avoidance of blood transfusion and cautious use of non-steroidal anti-inflammatory drugs, promotion of laparoscopic surgery, chlorhexidine-alcohol skin preparation and multidisciplinary meetings to determine multimodal therapy. Conclusion: Multidisciplinary management of perioperative patient care has improved outcomes. Copyright © 2012 British Journal of Surgery Society Ltd. Published by John Wiley & Sons, Ltd. Defines optimal management [PUBLICATION ABSTRACT]; Defines optimal management. Background: Historically, the preoperative and postoperative care of patients with gastrointestinal cancer was provided by surgeons. Contemporary perioperative care is a truly multidisciplinary endeavour with implications for cancer-specific outcomes. Methods: A literature review was performed querying PubMed and the Cochrane Library for articles published between 1966 to 2012 on specific perioperative interventions with the potential to improve the outcomes of surgical oncology patients. Keywords used were: fast-track, enhanced recovery, accelerated rehabilitation, multimodal and perioperative care. Specific interventions included normothermia, hyperoxygenation, surgical-site infection, skin preparation, transfusion, non-steroidal anti-inflammatory drugs, thromboembolism and antibiotic prophylaxis, laparoscopy, radiotherapy, perioperative steroids and monoclonal antibodies. Included articles had to be randomized controlled trials, prospective or nationwide series, or systematic reviews/meta-analyses, published in English, French or German. Results: Important elements of modern perioperative care that improve recovery of patients and outcomes in surgical oncology include accelerated recovery pathways, thromboembolism and antibiotic prophylaxis, hyperoxygenation, maintenance of normothermia, avoidance of blood transfusion and cautious use of non-steroidal anti-inflammatory drugs, promotion of laparoscopic surgery, chlorhexidine-alcohol skin preparation and multidisciplinary meetings to determine multimodal therapy. Conclusion: Multidisciplinary management of perioperative patient care has improved outcomes. Alderson, P., et al. (2014). "Thermal insulation for preventing inadvertent perioperative hypothermia." The Cochrane Database Of Systematic Reviews(6): CD009908. Background: Inadvertent perioperative hypothermia occurs because of interference with normal temperature regulation by anaesthetic drugs and exposure of skin for prolonged periods. A number of different interventions have been proposed to maintain body temperature by reducing heat loss. Thermal insulation, such as extra layers of insulating material or reflective blankets, should reduce heat loss through convection and radiation and potentially help avoid hypothermia.; Objectives: To assess the effects of pre- or intraoperative thermal insulation, or both, in preventing perioperative hypothermia and its complications during surgery in adults.; Search Methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2014, Issue 2), MEDLINE, OvidSP (1956 to 4 February 2014), EMBASE, OvidSP (1982 to 4 February 2014), ISI Web of Science (1950 to 4 February 2014), and CINAHL, EBSCOhost (1980 to 4 February 2014), and reference lists of articles. We also searched Current Controlled Trials and ClinicalTrials.gov.; Selection Criteria: Randomized controlled trials of thermal insulation compared to standard care or other interventions aiming to maintain normothermia.; Data Collection and Analysis: Two authors extracted data and assessed risk of bias for each included study, with a third author checking details. We contacted some authors to ask for additional details. We only collected adverse events if reported in the trials.; Main Results: We included 22 trials, with 16 trials providing data for some analyses. The trials varied widely in the type of patients and operations, the timing and measurement of temperature, and particularly in the types of co-interventions used. The risk of bias was largely unclear, but with a high risk of performance bias in most studies and a low risk of attrition bias. The largest comparison of extra insulation versus standard care had five trials with 353 patients at the end of surgery and showed a weighted mean difference (WMD) of 0.12 ⁰C (95% CI -0.07 to 0.31; low quality evidence). Comparing extra insulation with forced air warming at the end of surgery gave a WMD of -0.67 ⁰C (95% CI -0.95 to -0.39; very low quality evidence) indicating a higher temperature with forced air warming. Major cardiovascular outcomes were not reported and so were not analysed. There were no clear effects on bleeding, shivering or
length of stay in post-anaesthetic care for either comparison. No other adverse effects were reported. Authors' Conclusions: There is no clear benefit of extra thermal insulation compared with standard care. Forced air warming does seem to maintain core temperature better than extra thermal insulation, by between 0.5 °C and 1 °C, but the clinical importance of this difference is unclear.


Healthcare personnel (HCP) attire is an aspect of the medical profession steeped in culture and tradition. The role of attire in cross-transmission remains poorly established, and until more definitive information exists priority should be placed on evidence-based measures to prevent healthcare-associated infections (HAIs). This article aims to provide general guidance to the medical community regarding HCP attire outside the operating room. In addition to the initial guidance statement, the article has 3 major components: (1) a review and interpretation of the medical literature regarding (a) perceptions of HCP attire (from both HCP and patients) and (b) evidence for contamination of attire and its potential contribution to cross-transmission; (2) a review of hospital policies related to HCP attire, as submitted by members of the Society for Healthcare Epidemiology of America (SHEA) Guidelines Committee; and (3) a survey of SHEA and SHEA Research Network members that assessed both institutional HCP attire policies and perceptions of HCP attire in the cross-transmission of pathogens. Recommendations for HCP attire should attempt to balance professional appearance, comfort, and practicality with the potential role of apparel in the cross-transmission of pathogens. Although the optimal choice of HCP attire for inpatient care remains undefined, we provide recommendations on the use of white coats, neckties, footwear, the bare-below-the-elbows strategy, and laundering. Institutions considering these optional measures should introduce them with a well-organized communication and education effort directed at both HCP and patients. Appropriately designed studies are needed to better define the relationship between HCP attire and HAIs.


Surgical attire is intended to protect both patients and perioperative personnel. AORN published the "Recommended practices for surgical attire" to guide perioperative RNs in establishing protocols for selecting, wearing, and laundering surgical attire. Perioperative RNs should work with vendors and managers to ensure appropriate surgical attire is available, model the correct practices for donning and wearing surgical attire, and teach team members about evidence-based practices. The recommendation that surgical attire not be home laundered is supported by evidence that perioperative nurses can share with their colleagues and managers to help support appropriate practices. Hospital and ambulatory surgery center scenarios have been included as examples of appropriate execution of these recommended practices. Surgical attire is intended to protect both patients and perioperative personnel. AORN published the "Recommended practices for surgical attire" to guide perioperative RNs in establishing protocols for selecting, wearing, and laundering surgical attire. Perioperative RNs should work with vendors and managers to ensure appropriate surgical attire is available, model the correct practices for donning and wearing surgical attire, and teach team members about evidence-based practices. The recommendation that surgical attire not be home laundered is supported by evidence that perioperative nurses can share with their colleagues and managers to help support appropriate practices. Hospital and ambulatory surgery center scenarios have been included as examples of appropriate execution of these recommended practices. Surgical attire is intended to protect both patients and perioperative personnel. AORN published the "Recommended practices for surgical attire" to guide perioperative RNs in establishing protocols for selecting, wearing, and laundering surgical attire. Perioperative RNs should work with vendors and managers to ensure appropriate surgical attire is available, model the correct practices for donning and wearing surgical attire, and teach team members about evidence-based practices. The recommendation that surgical attire not be home laundered is supported by evidence that perioperative nurses can share with their colleagues and managers to help support appropriate practices. Hospital and ambulatory surgery center scenarios have been included as examples of appropriate execution of these recommended practices. © 2013 AORN, Inc.
recommended practices. To link to full-text access for this article, visit this link: http://dx.doi.org/10.1016/j.aorn.2013.09.012

Byline: Melanie L. Braswell, Lisa Spruce Abstract: Surgical attire is intended to protect both patients and perioperative personnel. AORN published the "Recommended practices for surgical attire" to guide perioperative RNs in establishing protocols for selecting, wearing, and laundering surgical attire. Perioperative RNs should work with vendors and managers to ensure appropriate surgical attire is available, model the correct practices for donning and wearing surgical attire, and teach team members about evidence-based practices. The recommendation that surgical attire not be home laundered is supported by evidence that perioperative nurses can share with their colleagues and managers to help support appropriate practices. Hospital and ambulatory surgery center scenarios have been included as examples of appropriate execution of these recommended practices. Article Note: (footnote) Excerpt from "Implementing AORN recommended practices for surgical attire," originally published in the AORN Journal. 2012;95(1):122-137. View the full article at http://www.aornjournal.org/article/S0001-2992(11)01112-4/fulltext. The following is an excerpt from "Implementing AORN recommended practices for surgical attire," originally published in AORN Journal. 2012;95(1):122-137;


BACKGROUND: Governmental agencies in the United Kingdom and Scotland have recently instituted guidelines banning physicians' white coats and the wearing of long-sleeved garments to decrease nosocomial transmission of bacteria.

OBJECTIVE: Our aim was to compare the degree of bacterial and methicillin-resistant Staphylococcus aureus contamination of physicians' white coats with that of newly laundered, standardized short-sleeved uniforms after an 8-hour workday and to determine the rate at which bacterial contamination of the uniform ensued.

DESIGN: The design was a prospective, randomized controlled trial. SETTING: The setting was a university-affiliated public safety-net hospital. PARTICIPANTS: One hundred residents and hospitalists on an internal medicine service participated. INTERVENTION: Subjects wore either a physician's white coat or a newly laundered short-sleeved uniform.

MEASUREMENTS: Bacterial colony count and the frequency with which methicillin-resistant Staphylococcus aureus was cultured from both garments over time were measured.

RESULTS: No statistically significant differences were found in bacterial or methicillin-resistant Staphylococcus aureus contamination of physicians' white coats compared with newly laundered short-sleeved uniforms or in contamination of the skin at the wrists of physicians wearing either garment. Colony counts of newly laundered uniforms were essentially zero, but after 3 hours of wear they were nearly 50% of those counted at 8 hours.

CONCLUSIONS: Bacterial contamination occurs within hours after donning newly laundered short-sleeved uniforms. After 8 hours of wear, no difference was observed in the degree of contamination of uniforms versus infrequently laundered white coats. Our data do not support discarding long-sleeved white coats for short-sleeved uniforms that are changed on a daily basis. Journal of Hospital Medicine 2011;6:177-182. (C) 2011 Society of Hospital Medicine. Governmental agencies in the United Kingdom and Scotland have recently instituted guidelines banning physicians' white coats and the wearing of long-sleeved garments to decrease nosocomial transmission of bacteria. Our aim was to compare the degree of bacterial and methicillin-resistant Staphylococcus aureus contamination of physicians' white coats with that of newly laundered, standardized short-sleeved uniforms after an 8-hour workday and to determine the rate at which bacterial contamination of the uniform ensued. The design was a prospective, randomized controlled trial. The setting was a university-affiliated public safety-net hospital. One hundred residents and hospitalists on an internal medicine service participated. Subjects wore either a physician's white coat or a newly laundered short-sleeved uniform. Bacterial colony count and the frequency with which methicillin-resistant Staphylococcus aureus was cultured from both garments over time were measured. No statistically significant differences were found in bacterial or methicillin-resistant Staphylococcus aureus contamination of physicians' white coats compared with newly laundered short-sleeved uniforms or in contamination of the skin at the wrists of physicians wearing either garment. Colony counts of newly laundered uniforms were essentially zero, but after 3 hours of wear they were nearly 50% of those counted at 8 hours. Bacterial contamination occurs within hours after donning newly laundered short-sleeved uniforms. After 8 hours of wear, no difference was observed in the degree of contamination of uniforms versus infrequently laundered white coats. Our data do not support discarding long-sleeved white coats for short-sleeved uniforms that are changed on a daily basis;


Introduction: UK Department of Health guidelines recommend that clinical staff are 'bare below the elbows'. There is a paucity of evidence to support this policy. One may hypothesise that absence of clothing around wrists facilitates more effective handwashing: this study aims to establish whether dress code affects bacterial colonisation before and after handwashing. Subjects and Methods: Sixty-six clinical staff volunteered to take part in the study, noting whether they were bare below the elbows (BBE) or not bare (NB). Using a standardised technique, imprints of left and right fingers, palms, wrists and forearms were taken onto mini agar plates. Imprints were repeated after handwashing. After incubation, colonies per plate were counted, and subcultures taken. Results: Thirty-eight staff were BBE and 28 were not. A total of 1112 plates were cultured. Before handwashing there was no significant difference in number of colonies between BBE and NB groups (Mann-Whitney, P < 0.05). Handwashing reduced the colony count, with greatest effect on fingers, palms and dominant wrists (t-test, P < 0.05). Comparing the two groups again after handwashing revealed no significant difference (Mann-

Surgical-site infections (SSIs) due to intra-operative contamination are chiefly ascribable to airborne particles carrying microorganisms, mainly Staphylococcus aureus, which settle on the surgeon's hands and instruments. SSI prevention therefore rests on minimisation of airborne contaminated particle counts, although these have not been demonstrated to correlate significantly with SSI rates. Maintaining clear air in the operating room classically involves the use of ultra clean ventilation systems combining laminar airflow and high-efficiency particulate air filters to create a physical barrier around the surgical table; in addition to a stringent patient preparation protocol, appropriate equipment, and strict operating room discipline on the part of the surgeon and other staff members. SSI rates in clean surgery, although influenced by the type of procedure and by patient-related factors, are consistently very low, of about 1% to 2%. These low rates, together with the effectiveness of prophylactic antibiotic therapy and the multiplicity of parameters influencing the SSI risk, are major obstacles to the demonstration that a specific measure is effective in decreasing SSIs. As a result, controversy surrounds the usefulness of many measures, including laminar airflow, body exhaust suits, patient preparation techniques, and specific surgical instruments. Impeccable surgical technique and operating room behaviour, in contrast, are clearly essential.; Copyright © 2015. Published by Elsevier Masson SAS.


BACKGROUND: On July 1st, 2012, the University of Minnesota Medical Centers adopted a policy requiring all personnel to wear cover jackets in perioperative areas. This policy is based on the Association of Perioperative Registered Nurses recommended practice for cover jacket usage. We hypothesized that the cover jacket policy had no effect on the surgical site infection rate. METHODS: We compared surgical site infection data from 1 year before the policy and 1 year after the policy. Twenty six thousand three hundred procedures were included: 13,302 before the policy and 12,998 after the policy. Rates between periods were compared using the z-test for proportions. RESULTS: The SSI rate precover and postcover jacket policy was 2.42% and 2.76% respectively. The P value was .1998. Our hypothesis was rejected because the change in rate was not statistically significant. CONCLUSIONS: This study demonstrates that there was not a decrease in SSI rates with this cover jacket policy; in fact, the data show a trend toward an increase in SSI rate thus making the argument for the abandonment of the cover up jackets. (C) 2016 Elsevier Inc. All rights reserved.; On July 1st, 2012, the University of Minnesota Medical Centers adopted a policy requiring all personnel to wear cover jackets in perioperative areas. This policy is based on the Association of Perioperative Registered Nurses recommended practice for cover jacket usage. We hypothesized that the cover jacket policy had no effect on the surgical site infection rate. Author. Background On July 1st, 2012, the University of Minnesota Medical Centers adopted a policy requiring all personnel to wear cover jackets in perioperative areas. This policy is based on the Association of Perioperative Registered Nurses recommended practice for cover jacket usage. We hypothesized that the cover jacket policy had no effect on the surgical site infection rate. Methods We compared surgical site infection data from 1 year before the policy and 1 year after the policy. Twenty six thousand three hundred procedures were included: 13,302 before the policy and 12,998 after the policy. Rates between periods were compared using the z-test for proportions. Results The SSI rate precover and postcover jacket policy was 2.42% and 2.76% respectively. The P value was .1998. Our hypothesis was rejected because the change in rate was not statistically significant. Conclusions This study demonstrates that there was not a decrease in SSI rates with this cover jacket policy; in fact, the data show a trend toward an increase in SSI rate thus making the argument for the abandonment of the cover up jackets. To link to full-text access for this article, visit this link: http://dx.doi.org/10.1016/j.amjsurg.2016.02.015 Byline: Christopher J. Chow, Lisa M. Hayes, Daniel A. Saltzman Abstract: On July 1st, 2012, the University of Minnesota Medical Centers adopted a policy requiring all personnel to wear cover jackets in perioperative areas. This policy is based on the Association of Perioperative Registered Nurses recommended practice for cover jacket usage. We hypothesized that the cover jacket policy had no effect on the surgical site infection rate. Author Affiliation: (a) Department of Surgery, University of Minnesota, Minneapolis, MN, USA (b) University of Minnesota Medical
Risk of infection from bloodborne pathogens makes it imperative for surgical team members to detect surgical glove punctures before skin contact with pathogens occurs. The use of a second, colored pair of gloves worn by scrubbed team members during surgical procedures provides an early indicator of an outer glove puncture while the primary glove or underglove remains intact. This practice reduces the risk of occupational exposures for health care workers and the risk of surgical site infections for patients. We conducted a quality improvement project during which we randomly observed staff members for compliance with double gloving in the OR at the Veterans Affairs Medical Center, Pittsburgh, Pennsylvania, during a 12-month period, and we conducted a review of sharps injuries for a 45-month period after intensive education about sharps injuries and use of a hands-free neutral zone technique. We found that when staff members were compliant with double-gloving techniques, there was a decrease in skin contact breaches, and the use of a hands-free neutral zone technique decreased the rate of sharps injuries; Copyright © 2010 AORN, Inc. Published by Elsevier Inc. All rights reserved.

Daeschlein, G., et al. (2011). "Evaluation of an innovative antimicrobial surgical glove technology to reduce the risk of microbial passage after glove puncture in a model of wound contamination.; Copyright © 2011 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Mosby, Inc. All rights reserved.


A 'Bare Below the Elbows' (BBTE) dress code policy has been introduced by the majority of NHS trusts in the UK. The aim of this Irish study was to evaluate the impact of an educational intervention on perception of medical attire. The study was carried out in two centres: a tertiary referral centre (Beaumont Hospital) and a district hospital (MRH, Portlaoise). Two questionnaires, incorporating photographic evaluation of appropriate attire for consultants and junior doctors, were completed pre and post BBTE education. One hundred and five patients participated. Analysis pre BBTE education indicated patients considered formal attire and white coats most appropriate for consultants and junior doctors respectively. Post-intervention analysis revealed a significant reduction in the popularity of both (p <0.001), with scrubs and smart casual attire gaining significant support in both cohorts (p <0.001). Our findings demonstrated that patient opinion on medical attire is malleable. The support of such a policy may be achieved if patients are informed that the aim is to reduce the spread of healthcare-associated infections.;


Background: Surgical gloves provide a protective barrier for patients and members of the surgical team. Although glove integrity is important in an era of blood-borne pathogens, little data exist on bacterial passage after glove perforation. This study evaluated the impact of antimicrobial surgical gloves in reducing microbial passage after glove puncture in a model of wound contamination. Methods: Staphylococcus aureus (ATCC 6538) and Brevundimonas diminuta (DSM 1639) were used to prepare a standardized suspension for testing bacterial passage after glove puncture in volunteers wearing single-layer gloves (group A), double-layer gloves (group B), or antimicrobial trilayer gloves (group C). After exposure periods of 5, 10, 30 and 45 minutes, the outer test gloves were removed and microbial passage was measured on the inner surface of the base gloves. Multiple repetitions (5 or 6) were performed at each sampling time.; Results: Microbial passage at 5, 10, 30 and 45 minutes, the outer test gloves were removed and microbial passage was measured on the inner surface of the base gloves. Multiple repetitions (5 or 6) were performed at each sampling time.; No difference was observed in microbial passage between group A and group B at the 10-, 30-, and 45-minute exposures for S aureus, whereas a significant reduction in microbial passage was observed in group C compared with group A (P ≤ .05 to < .005) at the 5-, 30-, and 45-minute exposures for S aureus and B diminuta. When timed groups were combined (5 and 10 minutes and 30 and 45 minutes), a significant reduction (P ≤ .01 to ≤ .005) in microbial passage of S aureus and B diminuta was observed in group C compared with both group A and group B. Conclusion: These findings represent the first evidence that microbial passage across surgical gloves can be reduced significantly using an innovative antimicrobial glove technology.; Copyright © 2011 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Mosby, Inc. All rights reserved.


The introduction of 'bare below the elbows' policies to facilitate handwashing led to the disappearance of the white coat from medical and surgical wards. While rates of key healthcare acquired infections in hospitals, e.g. Clostridium difficile and methicillin-resistant Staphylococcus aureus bacteraemia, have fallen, argument continues around the contribution of hand hygiene and dress codes to these changes. Conversely, the number of complaints against clinicians continues to rise, and respect for medical staff is falling. Are these phenomena linked to the disappearance of the white coat? Here, we debate the effects of these changes to clinician attire and ask whether the putative benefits in terms of infection control are outweighed by the possible harms to the doctor-patient relationship alleged to be caused by the loss of the white coat.;

In response to the rising tide of hospital-acquired infections (HAIs) in UK hospitals, governmental health departments have introduced dress codes for healthcare staff. These include measures such as the use of short sleeves, no wristwatches or jewellery, and avoidance of ties and white coats. Although hospital pathogens have been found on such items, there is no evidence that they play a major role in transmitting HAIs and these policies have received much criticism. This Leader examines the evidence underpinning the new dress codes and concludes that there is insufficient evidence to justify recent policies. Dress codes appear to have been imposed more for political purposes than in deference to effective infection control. In addition, the UK 'zero tolerance' mandate towards HAI does not balance personal accountability against a failing healthcare system. These policies may try to impose good practice but over-reliance on cheap, short-term solutions will not adequately address longer-term problems with HAI. In response to the rising tide of hospital-acquired infections (HAIs) in UK hospitals, governmental health departments have introduced dress codes for healthcare staff. These include measures such as the use of short sleeves, no wristwatches or jewellery, and avoidance of ties and white coats. Although hospital pathogens have been found on such items, there is no evidence that they play a major role in transmitting HAIs and these policies have received much criticism. This Leader examines the evidence underpinning the new dress codes and concludes that there is insufficient evidence to justify recent policies. Dress codes appear to have been imposed more for political purposes than in deference to effective infection control. In addition, the UK 'zero tolerance' mandate towards HAI does not balance personal accountability against a failing healthcare system. These policies may try to impose good practice but over-reliance on cheap, short-term solutions will not adequately address longer-term problems with HAI. © 2009 The Hospital Infection Society. In response to the rising tide of hospital-acquired infections (HAIs) in UK hospitals, governmental health departments have introduced dress codes for healthcare staff. These include measures such as the use of short sleeves, no wristwatches or jewellery, and avoidance of ties and white coats. Although hospital pathogens have been found on such items, there is no evidence that they play a major role in transmitting HAIs and these policies have received much criticism. This Leader examines the evidence underpinning the new dress codes and concludes that there is insufficient evidence to justify recent policies. Dress codes appear to have been imposed more for political purposes than in deference to effective infection control. In addition, the UK 'zero tolerance' mandate towards HAI does not balance personal accountability against a failing healthcare system. These policies may try to impose good practice but over-reliance on cheap, short-term solutions will not adequately address longer-term problems with HAI. (C) 2009 The Hospital Infection Society. Published by Elsevier Ltd. All rights reserved.


This presentation will summarize the relevant data for two of the most controversial interventions to reduce healthcare associated infections. The first half of the presentation will lay out the arguments for why elimination of white coats and adoption of a bare below the elbows approach should be considered for implementation. The second half of the presentation will review problems associated with a MRSA search and destroy strategy and demonstrate that horizontal strategies for infection prevention are cheaper, pose less risks to patients, and offer greater benefit by reducing infections due to many pathogens, not just those due to MRSA.


Background: A gap exists between the best evidence and practice with regards to surgical site infection (SSI) prevention. Awareness of evidence is the first step in knowledge translation. Methods: A web-based survey was distributed to 59 general surgeons and 68 residents at University of Toronto teaching hospitals. Five domains pertaining to SSI prevention with questions addressing knowledge of prevention strategies, efficacy of antibiotics, strategies for changing practice and barriers to implementation of SSI prevention strategies were investigated. Results: Seventy-six individuals (60%) responded. More than 90% of respondents stated there was evidence for antibiotic prophylaxis and perioperative normothermia and reported use of these strategies. There was a discrepancy in the perceived evidence for and the self-reported use of perioperative hyperoxia, omission of hair removal and bowel preparation. Eighty-three percent of respondents felt that consulting published guidelines is important in making decisions regarding antibiotics. There was also a discrepancy between what respondents felt were important strategies to ensure timely administration of antibiotics and what strategies were in place. Checklists, standardized orders, protocols and formal surveillance programs were rated most highly by 75%-90% of respondents, but less than 50% stated that these strategies were in place at their institutions. Conclusion: Broad-reaching initiatives that increase surgeon and trainee awareness and implementation of multifaceted hospital strategies that engage residents and attending surgeons are needed to change practice. © 2012 Association médicale canadienne.


The study objectives were to evaluate self-reported compliance with personal protective equipment (PPE) use among surgical nurses and factors associated with both compliance and non-compliance. A total of 601 surgical nurses, from 18 randomly selected hospitals (seven urban and 11 rural) in the Pomeranian region of Poland, were surveyed using a confidential questionnaire. The survey indicated that compliance with PPE varied considerably. Compliance was high for glove use (83%), but much lower for protective eyewear (9%). Only 5% of respondents routinely used gloves, masks, protective eyewear and gowns when in contact with potentially infective material. Adherence to PPE use was highest in the municipal hospitals and in the operating rooms. Nurses who had a high or moderate level of fear of acquiring human immunodeficiency virus (HIV) at work were more likely (P<0.005 and P<0.04, respectively) than staff with no fear to be compliant. Significantly higher compliance was found among nurses with previous training in infection control or experience of caring for an HIV patient; the combined effect of training and experience exceeded that for either alone. The most commonly stated reasons for non-compliance were non-availability of PPE (37%), the conviction that the source patient was not infected (33%) and staff concern that following locally recommended practices actually interfered with providing good patient care (32%). We recommend wider implementation, evaluation and improvement of training in infection control, preferably combined with practical experience with HIV patients and easier access and improved comfort of PPE.


Preventing infection in surgical patients begins with cleaning, disinfecting, and sterilizing the medical instruments used during surgical and nonsurgical procedures. An estimated 71.9 million procedures are performed each year in the United States, so processing the instruments correctly is essential to minimize infection risk. The Joint Commission considers the following as infection prevention and control activities: Cleaning and performing low-level disinfection of medical supplies and devices and performing intermediate- and high-level disinfection and sterilization of medical equipment, devices, and supplies. Ongoing education about disinfection and sterilization techniques will improve your understanding of the implications of improper instrument handling. This article reviews the AORN practice recommendations for disinfection and sterilization so that you can better care for your patients during the perioperative and intraoperative periods.


Superficial surgical site infection (SSI) usually resolves quickly causing only short-term discomfort. However, SSI involving deeper tissues is a leading cause of morbidity and mortality and increases the overall cost of care. Although SSI commonly originates in the operating theatre, signs and symptoms of infection often do not appear until patients have been
discharged from hospital. Nurses in a range of clinical settings are involved in the care of patients who either develop or are at risk of developing SSI and therefore need to know how to advise and manage these patients.


Purpose: We performed a prospective study of sneezes from orthopaedic registrars to assess the potential for intra-operative contamination from a masked surgeon, and to determine if head position can alter the potential for contamination. Type Of Study: Prospective controlled trial. Methods: Four orthopaedic registrars from the Gold Coast Hospital each inhaled pepper to precipitate a sneeze. Cultures were taken with and without standard Smith & Nephew surgical masks, in positions directly in front and to the sides of a masked registrar. The process was repeated three times for each registrar. A control plate was left exposed to the atmosphere. A control plate and sneeze plate was cultured on blood agar. Three masks were subsequently swabbed to exclude contamination from the masks. Results: 2/24 (8.33%) of the side with mask cultures returned significant bacterial growths. Also, 1/12 (8.33%) of the front with mask cultures returned significant growths. In addition, 9/12 (75%) of the direct sneezes resulted in significant bacterial counts. The control plate failed to return any growth. Subsequent culture of the exterior of three surgical masks failed to yield significant growth. There was a statistically significant odds ratio of 0.03 comparing the front and side group with the unmasked direct group. There was no statistically significant difference comparing front and side sneeze growth. Conclusions: While the use of surgical face masks significantly reduces bacterial counts following a sneeze, it fails to eliminate the potential for surgical field contamination completely. The fact that significant bacterial counts can be returned from direct culture through a mask and to the sides of a mask suggests that head position is irrelevant and contamination is possible in any direction. It is, therefore, suggested that, if possible, a sneezing surgeon distances himself/herself as much as possible from the sterile field. We also recommend following a sneeze; surgeons should regown and glove, given the risk of contamination of the sterile field. Level Of Evidence: Level II.


Clinical staff’s reluctance to remove clothing and jewellery from below the elbows in order to adequately wash their hands before patient contact is discussed. The author stresses the need to educate healthcare staff in the importance of improving hand hygiene.


Introduction: Surgical site infections (SSI) are the most common hospital-acquired infections among surgical patients, with significant impact on patient morbidity and health care costs. The Basel SSI Cohort Study was performed to evaluate risk factors and validate current preventive measures for SSI. The objective of the present article was to review the main results of this study and its implications for clinical practice and future research. Summary Of Methods Of The Basel SSI Cohort Study: The prospective observational cohort study included 6,283 consecutive general surgery procedures closely monitored for evidence of SSI up to 1 year after surgery. The dataset was analysed for the influence of various potential SSI risk factors, including timing of surgical antimicrobial prophylaxis (SAP), glove perforation, anaemia, transfusion and tutorial assistance, using multiple logistic regression analyses. In addition, post hoc analyses were performed to assess the economic burden of SSI, the efficiency of the clinical SSI surveillance system, and the spectrum of SSI-causing pathogens. Review Of Main Results Of The Basel SSI Cohort Study: The overall SSI rate was 4.7% (293/6,283). While SAP was administered in most patients between 44 and 0 minutes before surgical incision, the lowest risk of SSI was recorded when the antibiotics were administered between 74 and 30 minutes before surgery. Glove perforation in the absence of SAP increased the risk of SSI (OR 2.0; CI 1.4-2.8; p <0.001). No significant association was found for anaemia, transfusion and tutorial assistance with the risk of SSI. The mean additional hospital cost in the event of SSI was CHF 19,638 (95% CI, 8,492-30,784). The surgical staff documented only 49% of in-hospital SSI; the infection control team registered the remaining 51%. Staphylococcus aureus was the most common SSI-causing pathogen (29% of all SSI with documented microbiology). No case of an antimicrobial-resistant pathogen was identified in this series. Conclusions: The Basel SSI Cohort Study suggested that SAP should be administered between 74 and 30 minutes before surgery. Due to the observational nature of these data, corroboration is planned in a randomized controlled trial, which is supported by the Swiss National Science Foundation. Routine change of gloves or double gloving is recommended in the absence of SAP. Anaemia, transfusion and tutorial assistance do not increase the risk of SSI. The substantial economic burden of in-hospital SSI has been confirmed.
SSI surveillance by the surgical staff detected only half of all in-hospital SSI, which prompted the introduction of an electronic SSI surveillance system at the University Hospital of Basel and the Cantonal Hospital of Aarau. Due to the absence of multiresistant SSI-causing pathogens, the continuous use of single-shot single-drug SAP with cefuroxime (plus metronidazole in colorectal surgery) has been validated.

Lenski, M. and M. A. Scherer (2016). "Contamination of workwear in medical doctors and nursing stuff." ORTHOPÄDE 45(3): 249-255. The hands of medical stuff are the most important vectors for the transmission of pathogens in the hospital. Furthermore a "bare below the elbows dress code" has been introduced in Great Britain. Aim of this study was to investigate whether workwear contamination of the medical stuff by pathogens is similar to the contamination of their hands and whether wearing workwear is associated with increased transmission risk. In total 54 swabs were collected from nursing stuff, medical doctors, patients and hospital work material. Patients had a statistically significant more dense colonization with bacteria (median = 73 colony-forming units (CFU)), than the sleeves of the doctor’s coat (median = 36 CFU, p = 0.005), followed by workwear of the nursing stuff at the end of a shift (median = 23 CFU, p < 0.001) and the hospital work material (median = 15 CFU, p < 0.001). Isolated pathogens were coagulase-negative staphylococci, Staphylococcus aureus, Enterobacter cloacae and Acinetobacter species. Contaminated work wear presents a relevant risk for the transmission of pathogens. A "bare below the elbow dress-code" or the daily change of the doctor’s coat appear both to represent reasonable measures to reduce the transmission risk of pathogens in hospitals.


Loftus, R. W., et al. (2012). "Multiple reservoirs contribute to intraoperative bacterial transmission." Anesthesia And Analgesia 114(6): 1236-1248. Background: Intraoperative stopcock contamination is a frequent event associated with increased patient mortality. In the current study we examined the relative contributions of anesthesia provider hands, the patient, and the patient environment to stopcock contamination. Our secondary aims were to identify risk factors for stopcock contamination and to examine the prior association of stopcock contamination with 30-day postoperative infection and mortality. Additional microbiological analyses were completed to determine the prevalence of bacterial pathogens within intraoperative bacterial reservoirs. Pulsed-field gel electrophoresis was used to assess the contribution of reservoir bacterial pathogens to 30-day postoperative infections.; Methods: In a multicenter study, stopcock transmission events were observed in 274 operating rooms, with the first and second cases of the day in each operating room studied in series to identify within- and between-case transmission events. Reservoir bacterial cultures were obtained and compared with stopcock set isolates to determine the origin of stopcock contamination. Between-case transmission was defined by the isolation of 1 or more bacterial isolates from the stopcock set of a subsequent case (case 2) that were identical to reservoir isolates from the preceding case (case 1). Within-case transmission was defined by the isolation of 1 or more bacterial isolates from a stopcock set that were identical to bacterial reservoirs from the same case. Bacterial pathogens within these reservoirs were identified, and their potential contribution to postoperative infections was evaluated. All patients were followed for 30 days postoperatively for the development of infection and all-cause mortality.; Results: Stopcock contamination was detected in 23% (126 out of 548) of cases with 14 between-case and 30 within-case transmission events confirmed. All 3 reservoirs contributed to between-case (64% environment, 14% patient, and 21% provider) and within-case (47% environment, 23% patient, and 30% provider) stopcock transmission. The environment was a more likely source of stopcock contamination than provider hands (relative risk [RR] 1.91, confidence interval [CI] 1.09 to 3.35, P = 0.029) or patients (RR 2.56, CI 1.34 to 4.89, P = 0.002). Hospital site (odds ratio [OR] 5.09, CI 2.02 to 12.86, P = 0.001) and case 2 (OR 6.82, CI 4.03 to 11.5, P < 0.001) were significant predictors of stopcock contamination. Stopcock contamination was associated with increased mortality (OR 58.5, CI 2.32 to 1477, P = 0.014). Intraoperative bacterial contamination of patients and provider hands was linked to 30-day postoperative infections.; Conclusions: Bacterial contamination of patients, provider hands, and the environment contributes to stopcock transmission events, but the surrounding patient environment is the most likely source. Stopcock contamination is associated with increased patient mortality. Patient and provider bacterial reservoirs contribute to 30-day postoperative infections. Multimodal programs designed to target each of these reservoirs in parallel should be studied intensely as a comprehensive approach to reducing intraoperative bacterial transmission.;


Meredith, S. J. and G. Sjorgen (2008). "Decontamination: back to basics." Journal Of Perioperative Practice 18(7): 285-288. My invitation from this Journal's Editor, Felicia Cox, to provide a paper for this themed issue, included the sentence 'I was wondering if you or a colleague would like to contribute a back to basics article on the relevant standards and guidelines
for decontamination, including what is compliance?”. The reason it is so interesting to me is that the term ‘back to basics’ implies reverting to a simpler time in life - when by just sticking to the rules, life became easier. However, with decontamination this is not actually true;


The creation of an optimal environment, whenever major joints are opened or metal is implanted into bone, is important to reduce infection following orthopaedic surgery. Following normal hand washing protocols, it is possible that pathogenic bacteria can remain on the skin. These bacteria may inadvertently be transferred to the surgical gown during the glove donning procedure and therefore contamination of the surgical wound could follow. We aimed to determine whether there is a difference between three differing glove donning techniques, open, closed and scrub staff assisted, in terms of accidental gown contamination, as the optimum method is unknown. Three differing glove donning techniques were assessed using ultra-violet (UV) lotion, applied to the hands after the scrub, to demonstrate patches of contamination on the surgical gowns. Two studies were carried out. An initial pilot study with theatre personnel and the main study by a single surgeon rehearsed in the various techniques. The region and size of contamination patches were documented. In the pilot study 12 out of 13 individuals were seen to have patches of UV fluorescent gown contamination following an observed scrub. In the main study, both the open and closed technique had a 100% gown contamination rate. This was concentrated around the cuff region. There were no contamination patches in the scrub staff assisted technique. Glove donning, using the scrub staff assisted technique can minimise the possibility of gown contamination. This is important in surgical procedures where the results of infection can be devastating;


Surgical gowning and gloving is an essential element of perioperative practice and is undertaken by the members of the anaesthetic and surgical teams involved in a perioperative intervention or procedure. Gowning and gloving will take place immediately after surgical hand antisepsis and the whole process is often referred to as scrubbing, gowning and gloving. Surgical hand antisepsis is defined as ‘an extension of hand washing’ (AFPP 2007), and ‘the antiseptic surgical scrub or antiseptic hand rubs performed before donning sterile attire preoperatively’ (AORN 2008). The aim of these processes is to improve the perioperative outcome of interventions and procedures by enhancing and further promoting aseptic techniques (ACORN 2006, AFPP 2007).


Operative sterility is a critical factor with regard to infection in the postoperative period. In recent years, techniques and devices have been developed to reduce the potential for exposure to pathogens. This brief review details the SteriCup, a unique product that has the potential to reduce the risk of healthcare-acquired infections. The SteriCup provides a designated sterile area to store suction catheters and removed endotracheal tubes and allows for their simple and safe disposal. Devices such as the SteriCup have the potential to improve operating room systems and minimize potential for operative infection.


Surgical site infections are one of the most important causes of healthcare associated infections (HCAI), accounting for 20% of all HCAIs. Surgical site infections affect 1% of joint replacement operations. Surgical site infections are one of the most important causes of healthcare associated infections (HCAI), accounting for 20% of all HCAIs. Surgical site infections affect 1% of joint replacement operations. This study was designed to assess whether theatre clothing is contaminated more inside or outside the theatre suite. Petri dishes filled with horse blood agar were pressed on theatre clothes at 0, 2, 4, 6 and 8 hours to sample bacterial contamination in 20 doctors whilst working in and outside the theatre suite. The results showed that there was greater bacterial contamination when outside the theatre suite at 2 hours. There were no differences in the amount of contamination at 4, 6 and 8 hours. This study suggests that the level of contamination of theatre clothes is similar both inside and outside the theatre setting;
Spruce, L. (2013). "Back to basics: Hand hygiene and surgical hand antisepsis." AORN Journal 98(5): 449-460. Health care-associated infections (HAIs) are a significant issue in the United States and throughout the world, but following proper hand hygiene practices is the most effective and least expensive way to prevent HAIs. Hand hygiene is inexpensive and protects patients and health care personnel alike. The four general types of hand hygiene that should be performed in the perioperative environment are washing hands that are visibly soiled, hand hygiene using alcohol-based products, surgical hand scrubs, and surgical hand scrubs using an alcohol-based surgical hand rub product. Barriers to proper hand hygiene may include not thinking about it, forgetting, skin irritation, a lack of role models, or a lack of safety culture. One strategy for improving hand hygiene practices is monitoring hand hygiene as part of quality improvement project, but the most important aspect for perioperative team members is to set an example for other team members by following proper hand hygiene practices and reminding each other to perform hand hygiene. © 2013 AORN, Inc.

Spruce, L. (2014). "Back to Basics: Surgical Attire and Cleanliness." AORN Journal 99(1): 138-146. A clean perioperative environment is beneficial for both patients and perioperative team members, and surgical attire is the foundation of cleanliness. Perioperative personnel should adhere to general hygiene and wear clean, facility-laundered surgical attire in the health care facility. Implementing a surgical attire policy can be challenging because attire is linked to personal preference and image. There are ways to achieve compliance with attire recommendations as well as to implement an attire policy. To help ensure success, perioperative nurses should be prepared to help educate other team members and participate in monitoring and compliance efforts. © 2013 AORN, Inc.

Tse, G., et al. (2015). "Bare below the elbows: was the target the white coat?" The Journal Of Hospital Infection 91(4): 299-301.

Walcott, B. P., et al. (2012). "Infection following operations on the central nervous system: deconstructing the myth of the sterile field." Neurosurgical Focus 33(5): E8-E8. Neurosurgical patients are at a high risk for infectious sequelae following operations. For neurosurgery in particular, the risk of surgical site infection has a unique implication given the proximity of the CSF and the CNS. Patient factors contribute to some degree; for example, cancer and trauma are often associated with impaired nutritional status, known risk factors for infection. Additionally, care-based factors for infection must also be considered, such as the length of surgery, the administration of steroids, and tissue devascularization (such as a craniotomy bone flap). When postoperative infection does occur, attention is commonly focused on potential lapses in surgical "sterility." Evidence suggests that the surgical field is not free of microorganisms. The authors propose a paradigm shift in the nomenclature of the surgical field from "sterile" to "clean." Continued efforts aimed at optimizing immune capacity and host defenses to combat potential infection are warranted.

Williams, M. (2008). "Infection control and prevention in perioperative practice." Journal Of Perioperative Practice 18(7): 274-278. The personal and financial consequences of avoidable infection are enormous in personal and global terms (DH 2003, Stone, Larson & Kawar 2002). Patients expect to be treated and cared for in clean conditions, and not be exposed to the risks of acquiring an infection by poor practice on the part of healthcare workers (DH 2005, Health Care Commission 2005). Infection control and prevention in perioperative settings assumes an even greater significance because of the vulnerability of patients who are already ill or injured, and because surgery, anaesthesia and immediate postoperative recovery may expose them to invasive procedures, allowing more portals of entry for infection. There is ample evidence, widely available, to support best practice in all healthcare settings. The methods are cheap, easy to apply and very effective (Wright 2004, Pratt et al 2007). This article will examine a range of evidence applicable to perioperative infection control and prevention, including an assessment of current practice and how it may be improved, with a particular emphasis on surgical site infection associated with Meticillin Resistant Staphylococcus Aureus (MRSA) and Clostridium Difficile (C.diff);

Willis-Owen, C. A., et al. (2010). "Effects of 'bare below the elbows' policy on hand contamination of 92 hospital doctors in a district general hospital." The Journal Of Hospital Infection 75(2): 116-119. Despite a lack of evidence the UK’s Department of Health introduced a policy of 'bare below the elbows' attire in order to try to reduce the incidence of nosocomial infection. This study investigates the link between this state of dress and hand contamination. A prospective observational study of doctors working in a district general hospital was carried out. The fingertips of each hand were imprinted onto culture medium, and resultant growth assessed for number of colony-forming units and presence of clinically significant pathogens or multiply resistant organisms. These findings were correlated with attire, grade, sex and specialty. Ninety-two doctors were recruited of whom 49 were 'bare below the elbows' compliant and 43 were not. There was no statistically significant difference between those doctors who were 'bare below the elbows' and those that were not, either for the number of colony-forming units or for the presence of clinically significant organisms. No multiply resistant organisms were cultured from doctors' hands. 'Bare below the elbows' attire is not related to the degree of contamination on doctors' fingertips or the presence of clinically significant pathogens. Further studies are required to establish whether investment in doctors' uniforms and patient education campaigns are worthwhile.; (c) 2009 The Hospital Infection Society. Published by Elsevier Ltd. All rights reserved.