

Evidence Search Service

Results of your search request

PPE and infection/contamination

ID of request: 22646

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Sources searched

BNI (3)

CINAHL (5)

EMBASE (6)

Date range used (5 years, 10 years): Last 10 years

Limits used (gender, article/study type, etc.): English language

Search terms and notes (full search strategy for database searches below):

Let me know if I can get any of the articles for you.

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B. Search History

A. Original Research

1. Comparison of infection control practices in a Dutch and US hospital using the infection risk scan (IRIS) method.

Willemsen Ina American Journal of Infection Control 2020;48(4):391-397.

• Using the Infection Risk Scan (IRIS), transparency in practices was created. • Comparable prevalence of antibiotic use, but the type of antibiotics varied. • ATP measurements revealed more contamination in the Dutch, than US hospital. • In the Dutch hospital no jewelry was worn; "bare below the elbow" was the standard. • Using the IRIS for benchmarking, local guidelines and policies need to be assessed. The infection risk scan (IRIS) is a tool to measure the quality of infection control (IC) and antimicrobial use in a standardized way. We describe the feasibility of the IRIS in a Dutch hospital (the Netherlands, NL) and a hospital in the United States (US). Cross-sectional measurements were performed. Variables included a hand hygiene indicator, environmental contamination, IC preconditions, personal hygiene of health care workers, use of indwelling medical devices, and use of antimicrobials. IRIS was performed in 2 wards in a US hospital and 4 wards in a Dutch hospital. Unjustified use of medical devices: none in the US hospital, 2.2% in the Dutch hospital; inappropriate use of antibiotics: 11.7% (US), 19% (NL); items considered not clean: 10% (US); 36% (NL); shortcomings preconditions: 6 of 20 (US), 6 of 40 (NL); health care workers with rings, watches, or long sleeves: 34 of 43 (US), none in the NL hospital; and hand hygiene actions per patient/day: 41 (US) and 10 (NL). US data judged against the Dutch guidelines and vice versa revealed remarkable differences. We showed the feasibility of using the IRIS in a US hospital. The method provided insight in IC local performance. This method could be the first step to standardize the measurement of the quality of IC and antimicrobial use. However, if the IRIS is used for benchmarking between hospitals in different regions, this should be done in the context of regional guidelines and policies.

[Available online at this link](#)

2. Covid-19: PHE upgrades PPE advice for all patient contacts with risk of infection

Sayburn Anna BMJ : British Medical Journal (Online) 2020;369:No page numbers.

New guidelines on use of personal protective equipment (PPE) by healthcare workers significantly expands the potential use of eye protection and fluid resistant surgical masks, including to doctors carrying out face-to-face assessments where a patient's risk of covid-19 is unknown.¹ The updated guidance from Public Health England, which is in line with World Health Organization recommendations, allows for local risk assessment in hospitals and primary care.

Situation	Mask	respirator	Apron	or gown	Eye protection	Gloves
Performing AGPs on patient with suspected or confirmed covid-19	OR	all patients in context of sustained covid-19 transmission	FFP3 respirator	Long sleeved, disposable, fluid repellent gown	Full face shield or visor	Disposable gloves
Face-to-face assessment or direct care where risk of covid-19 cannot be established before the consultation	Fluid resistant surgical mask	Apron	Eye protection	Disposable gloves	Within higher risk acute inpatient care areas (where AGPs are regularly performed)	FFP3 respirator
Long sleeved, disposable, fluid repellent gown (with disposable plastic apron underneath if only a non-fluid resistant gown is available)	Eye protection	Disposable gloves	Inpatient area with suspected or confirmed covid-19 patients (not giving care)	Fluid resistant surgical mask	Not applicable	Not applicable
Inpatient area with suspected or confirmed covid-19 patients (giving direct care)	Fluid resistant surgical mask	Apron	Eye protection	Disposable gloves	Inpatient areas with no identified suspected or confirmed cases	Local risk assessment
Local risk assessment	Local risk assessment	Local risk assessment	Local risk assessment	Emergency or acute admissions, possible or confirmed cases (or all cases subject to local risk assessment)		

Fluid resistant surgical mask Apron Eye protection Disposable gloves Transfer of possible or confirmed cases Fluid resistant surgical mask Apron Local risk assessment Disposable gloves Operating theatres without AGPs, treatment of possible or confirmed cases (or all patients subject to local risk assessment) Fluid resistant surgical mask Local risk assessment Eye protection Standard IPC procedure Labour ward (not AGPs or surgery) for possible or confirmed cases (or all patients subject to local risk assessment) Fluid resistant surgical mask Long sleeved, disposable, fluid repellent gown, apron Eye protection Disposable gloves Primary care, direct care of possible or confirmed case (or all patients subject to local risk assessment) Fluid resistant surgical mask Apron Eye protection Disposable gloves AGPs=aerosol generating procedures This change "reflects the fact that coronavirus is now widespread in the community," and so doctors are more likely to see patients infected with the virus who may not have symptoms, Public Health England said in a statement.² The guidance emphasises, "Ultimately, where staff consider there is a risk to themselves or the individuals they are caring for they should wear a fluid repellent surgical mask with or without eye protection, as determined by the individual staff member for the episode of care or single session." The list of aerosol generating procedures has not changed from last week, although an evidence review of this is under way and may lead to changes in guidance.³ Types of personal protective equipment FFP3 (filtering facepiece) respirators filter at least 99% of airborne particles FFP2 and N95 respirators filter 94% and 95% of particles and may be used if FFP3 respirators are not available Fluid resistant surgical masks (type IIR) provide barrier protection against droplets Eye and face protection can be a fluid resistant surgical mask with integrated visor, full face shield or visor, or polycarbonate safety spectacles Long sleeved, disposable, fluid repellent gowns must be worn "when a disposable plastic apron provides inadequate cover of staff uniform or clothes for the procedure or task being performed" and when there is "a risk of splashing of body fluids" If non-fluid resistant gowns are used, a disposable plastic apron should be worn underneath ¹ Public Health England.

[Available online at this link](#)

3. **Bacterial Contamination of Military and Civilian Uniforms in an Emergency Department**

Anon. Journal of Emergency Nursing 2019;45(2):169.

IntroductionThe emergency department is a fast-paced, high-volume environment, serving patients with diverse and evolving acuities. Personnel providing direct care are continually exposed to pathogenic microorganisms from patients and everyday surfaces, to which the organisms may spread. Indeed, hospital items—such as electronic devices, stethoscopes, and staff clothing—have demonstrated high rates of contamination. Despite this, policies governing the use, disinfection, and wear of various environmental surfaces remain relaxed, vague, and/or difficult to enforce. This study aimed to examine the bacterial contamination on 2 hospital uniform types in a large military hospital within the emergency department.**Methods**Environmental sampling of military and civilian nursing staff uniforms was performed on 2 separate occasions. Emergency nurses wore hospital-provided freshly laundered scrubs on the first sampling day and home-laundered personally owned uniforms complicit with ED policy on the second sampling day. Samples were collected by impressing of contact blood agar growth medium at arrival (0 hour), 4 hours, and 8 hours of wear. Microbiological methods were used to enumerate and identify bacterial colonies.**Results**Bacterial contamination of personally owned uniforms was significantly higher than freshly laundered hospital-provided scrubs on 4 different sampling sites and across the span of an 8-hour workday. No significant differences were observed between military and civilian personally owned uniforms. However, several risk factors for nosocomial infection were increased in the military subgroup.**Discussion**Re-evaluating organizational factors (such as uniform policies) that increase the propensity for pathogenic contamination are critical for mitigating the spread and acquisition of multidrug-resistant organisms in the emergency department.

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4. **Long-sleeved medical workers' coats and their microbiota**

Berkold M. American Journal of Infection Control 2018;46(12):1408-1410.

In this study we aimed to assess the contamination rate of long-sleeved medical workers' coats (N = 100) in a point-prevalence study. Ninety-one percent of the coats were contaminated with normal human flora, but only the minority (9%) showed presence of pathogenic non-multiresistant bacteria. The data of this study may implicate that long-sleeved coats harbor low risk for the treated patients to be contaminated with pathogenic bacteria during medical consultation.
Copyright © 2018 Association for Professionals in Infection Control and Epidemiology, Inc.

5. **Do Long-sleeved Physician Coats Spread C. diff?**

Anon. Hospital Infection Control & Prevention 2017;44(12):9-9.

The article discusses a 2017 study on the bare below the elbow physician attire to control infection. Topics covered include the mechanics of the study which involved mannequins and healthcare workers, and the simulation results of patient care which showed that the sleeve cuff of long-sleeve white coats frequently transferred a viral deoxyribonucleic acid (DNA) marker for Clostridium difficile. Also noted is the absence of transmission when short sleeves were worn.

[Available online at this link](#)

6. **Seasonal Variation in Bare-Below-the-Elbow Compliance**

Masroor N. Infection Control and Hospital Epidemiology 2017;38(4):504-506.

[Available online at this link](#)

7. **A cross-sectional observational study about media and infection control practices: Are photographic portrayals of healthcare workers setting a bad example?**

Spierings E.J.W. Antimicrobial Resistance and Infection Control 2015;4(1):No page numbers.

Background: Attempts to increase compliance with infection control practices are complex and are - in part - based on attempts to change behaviour. In particular, the behaviour of significant peers (role models) has been shown to be a strong motivator. While role models within the working environment are obviously the most important, some experts suggest that media and public display cannot be ignored. The aim of this present study was to examine the display of technique recommended by current infection control guidelines including the "bare below the elbow" principle, which is considered a basic requirement for good infection control in many countries, in sets of professional stock photos.

Finding(s): From 20 random photo-stock websites we selected pictures with search terms "doctor and patient" and "nurse and patient". In all selected photos a doctor or nurse and a patient were presented, healthcare workers (HCWs) were wearing white coats or uniforms, and their arms were visible. Each photo was evaluated with regard to: closure of white coat, sleeve length, personal clothing covered, hairstyle and presence of a wristwatch, bracelet and/or ring. Overall, 1600 photos were evaluated. The most common mistakes were with regard to HCWs' white coats/uniforms. Eighty-nine percent of the

photos containing doctor's images were considered incorrect while 28 % of nurse-containing photos were incorrect.
Conclusion(s): The results seem to reflect the real world with only 40 % displaying correct behaviour with doctors being worse than nurses. It seems that the stereotypical image of a doctor does not agree with the current infection control guidelines. If we aim for higher compliance rates of HCWs, we need to change the social image of doctors and improve production, selection and display of stock photo images.
Copyright © 2015 Spierings et al.

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8. Newly cleaned physician uniforms and infrequently washed white coats have similar rates of bacterial contamination after an 8-hour workday: A randomized controlled trial

Burden M. Journal of Hospital Medicine 2011;6(4):177-182.

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(S):: 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.
RESULT(S):: 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.
CONCLUSION(S):: 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.
© 2011 Society of Hospital Medicine.

9. Short or long sleeves make no difference to bacterial contamination of doctors' wrists.

Mayor Susan BMJ: British Medical Journal (Overseas & Retired Doctors Edition) 2011;342(7794):405-405.

The article discusses research on doctors working at Denver Health, a university hospital in Colorado. It references a study by Marisha Burden and colleagues which showed that there is no greater risk of bacterial contamination among doctors wearing long sleeved outfits than those who wore short sleeves, refuting the guidelines of the National Health Service (NHS)

in Great Britain requiring doctors to be bare below the elbows. The study methodology is described. The study notes that there was no difference in bacterial or in meticillin resistant *Staphylococcus aureus* (MRSA) contamination between doctors who wore short or long sleeves. Additionally, bacterial contamination is observed in newly laundered uniforms within hours of wearing them.

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10. **Study fails to make the case for long-sleeved uniforms...news story (February 16)**
Brown Jane Nursing Standard 2011;25(25):33-33.

[Available online at this link](#)

11. **US research disputes long-sleeved uniform contamination claims.**
Anon. Nursing Standard 2011;25(24):8-8.

[Available online at this link](#)

12. **Infection control practices among hospital health and support workers in Hong Kong**
Chau J.P.C. Journal of Hospital Infection 2010;75(4):299-303.

A report by the Hong Kong government noted that hospital infection control standards were inadequate, requiring audit, development and implementation. In addition, hospital staff needed training in infection control measures. We investigated infection control practices among 162 hospital health workers (109 nurses, 45 doctors and 8 therapists) and 44 support workers in one acute hospital and two rehabilitation hospitals using a non-blinded, observational design. We examined compliance with isolation precautions and infection control guidelines, including proper wearing of a mask, goggles/face shield, or gown; handling patient care equipment, linen, and laundry; routine and terminal cleaning; and terminal cleaning of an isolation room. One major breakdown in compliance was use of sleeveless disposable plastic aprons instead of long-sleeved gowns during procedures likely to generate splashes or sprays of blood and body fluids. In more than half of the observed episodes, participants failed to disinfect medical devices, such as stethoscopes, before re-use. Thorough cleansing of commodes between patients was also lacking. Overall compliance with local and international infection control guidelines was satisfactory, but several aspects required improvement. © 2009 The Hospital Infection Society.

13. **Patients' perceptions of doctors' clothing: Should we really be bare below the elbow?**
Bond L. Journal of Laryngology and Otology 2010;124(9):963-966.

Introduction: In September 2007, the Department of Health published Uniforms and Workwear: an Evidence Base for Guiding Local Policy. Following this, most National Health Service trusts imposed a bare below the elbow dress code policy, with clinical staff asked to remove ties, wristwatches and hand jewellery and to wear short-sleeved tops. There is currently no evidence linking dress code to the transmission of hospital-acquired infection. We designed the current survey to assess patients' perceptions of doctors' appearance, with specific reference to the bare below the elbow policy. Materials and methods: A

questionnaire showing photographs of a doctor in three different types of attire (scrubs, formal attire and bare below the elbow) were used to gather responses from 80 in-patients and 80 out-patients in the ENT department. Patients were asked which outfit they felt was the most hygienic, the most professional and the easiest identification of the person as a doctor. They were also asked to indicate their overall preference. Results and analysis: Formal attire was considered most professional and the easiest identification that the person was a doctor. Scrubs were considered most hygienic. Respondents' overall preference was divided between scrubs and formal clothes. Bare below the elbow attire received the lowest votes in all categories. Discussion(s): This finding raises significant questions about the Department of Health policy in question. The authors suggest that an alternative policy should be considered, with scrubs worn for in-patient situations and formal attire during out-patient encounters. Copyright © JLO (1984) Limited 2010.

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14. **Reducing Clostridium difficile infection in acute care by using an improvement collaborative**

Power Maxine BMJ : British Medical Journal (Online) 2010;341:n.

Problem In 2006, despite a focus on infection control, Salford Royal had the fourth highest rate of Clostridium difficile infection in north west England. Design Interrupted time series in five collaborative wards (intervention group) and 35 non-collaborative wards (control group). Setting University teaching hospital with 850 acute beds. Key measures for improvement Number of cases of C difficile infection per 1000 occupied bed days. Strategies for change In February 2007, a newly formed antimicrobial team led the implementation of revised guidelines in all wards and departments. From March to December 2007, five wards participated in an improvement collaborative. Since December 2007, the changes from the collaborative have been collated and implemented throughout the organisation. Effects of change At baseline the non-collaborative wards had 1.15 (95% CI 1.03 to 1.29) cases per 1000 occupied bed days. In August 2007 cases reduced 56% from baseline (0.51, 0.44 to 0.60), which has been maintained since that time. In the collaborative wards, there were 2.60 (2.11 to 3.17) cases per 1000 occupied bed days at baseline. A shift occurred in April 2007 representing a reduction of 73% (0.69, 0.50 to 0.91) from baseline, which has been maintained. Lessons learnt Careful use of antimicrobial drugs is important in reducing the number of cases of C difficile infection. A collaborative learning model can enable teams to test and implement changes that can accelerate, amplify, and sustain control of C difficile.

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Word documents

Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

B. Search History

	Source	Criteria	Results
1.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment" OR "ppe") AND "long sleeve gowns").ti,ab	0
2.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment" OR "ppe") AND "long sleeve").ti,ab	12
3.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment" OR "ppe") AND "infection control").ti,ab	1504
4.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment").ti OR ("ppe").ti) AND "infection control"	479
5.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment").ti OR ("ppe").ti) AND "infection control") AND (apron OR gown)	60
6.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment").ti OR ("ppe").ti) AND "infection control") AND "bare below the elbow") AND (apron OR gown)	0
7.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("personal protective equipment").ti OR ("ppe").ti) AND "infection control") OR "bare below the elbow") AND (apron OR gown)	61
8.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	("bare below the elbow").ti,ab	42
9.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	("bare below the elbow" AND "infection control").ti,ab	10
10.	AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	("bare below the elbow").ti,ab	42

Source	Criteria	Results
11. AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	("bare below the elbow" AND (contamination OR infection)).ti,ab	21
12. AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO, PubMed	((("bare below the elbow" OR "long sleeved") AND (contamination OR infection)).ti,ab	122
13. AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO	((("bare below the elbow" OR "long sleeved") AND (contamination OR infection)).ti,ab [DT 2010-2020]	86
14. AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO	((("bare below the elbow").ti OR ("long sleeved").ti) AND (contamination OR infection)) [DT 2010-2020]	18
15. AMED, BNI, CINAHL, EMBASE, EMCARE, HMIC, Medline, PsycINFO	((("bare below the elbow" OR "long sleeved") AND (("contamination").ti OR ("infection").ti)) [DT 2010-2020]	35

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