

REVIEW OF LITERATURE

TEAM UNDERTAKING REVIEW : Parts A and B - Health Protection Scotland. Part C – Welsh Healthcare Associated Infection Programme (WHAIP)	
CONTACT PERSON: Dawn Hill	
TOPIC: Hand hygiene and jewellery.	
PRINCIPAL RESEARCH QUESTION/OBJECTIVE: To assess the evidence in relation to the effect of wearing jewellery on hand hygiene.	
METHODOLOGY	
i) Search strategy for identification of studies	
<i>Period of publication</i>	Part A: 1966 – 2004
	Part B: 2004 - 2006
	Part C: 2007-2008

<i>Specialist web sites / portals for Part C</i>	Bandolier, EPIC, JBI-connect, national Electronic Library – Infections, National Library of Guidelines, CDC, Welsh Assembly Government (WAG), Scottish Executive health Dept. (SEHD), health protection Agency (HPA), Health protection Scotland (HPS), Department of health (DH), National patient Safety Agency – Cleanyourhands, Healthcare Associated Infection research Network, Department of health & Social Services & Public Safety (DHSSPS-NI) Northern Ireland, health Information and Quality Authority (Republic of Ireland – health), National Resources Infection Control (NRIC), WHO, Hospital Infection Society, Infection Prevention Society, Society for Healthcare Epidemiology of America (SHEA), NPHS Knowledge Base
<i>Hand searching journals (2008 only)</i>	American Journal of Infection Control, British Journal of Infection Control, BMJ, Infection Control and Hospital Epidemiology, Journal of Hospital Infection
ii) Selection criteria for inclusion of studies	
<i>Sample</i>	All health and social care workers.
<i>Outcome measure(s)</i>	Bacterial count on hands following intervention.
<i>Other inclusion criteria</i>	N/A
<i>Language Limitations</i>	English language only.

iii) Quality assessment	
Study quality assessment	
Part A (1966 – 2004)	Identified articles were reviewed according to Roe’s model. Guidance documents, however, were unable to be subjected to all such criteria.
Part B (2004- 2006) and Part C (2007-2008)	Identified articles were reviewed according to either the ROE model for critical appraisal of scientific studies, Sign 50 methodology for systematic reviews and meta-analyses and the AGREE instrument for the evaluation of guidance documents as appropriate.
Data collation and analysis	Qualitative analysis of data performed on studies uncovered was undertaken using case study approach. Guidance documents reviewed for any relevant commentary.
RESULTS	
Part A (1966 – 2004)	<p>This review of the literature referring to the effect of wearing rings and wrist jewellery on hand hygiene has uncovered evidence to suggest that total bacterial counts on hands are higher when rings are worn (Jacobson et al., 1985; Hoffman et al., 1985). Furthermore, Hoffman et al. (1985) argue that bacteria could colonize the hands of staff who wear rings.</p> <p>Although Jacobson et al. (1985) found no significant difference following handwashing in the bacterial count on hands with or without rings, a study by Salisbury et al. (1999) showed a greater reduction in the number of colonies after handwashing by health care workers without rings. The limitations of the study, however, in terms of its non-randomised sample should be noted.</p> <p>Despite the fact that Jacobson et al. (1985) believe that the removal of bacteria is not affected by rings during handwashing, they do assert that rings might cause gloves to tear. Furthermore, the ICNA (1998) refer to anecdotal evidence and expert opinion when they suggest that rings do interfere with thorough handwashing.</p> <p>It should be noted that this review focuses primarily on the effect of ring wearing on hand hygiene while little research which considers the effect of wrist jewellery on hand hygiene was uncovered. Best practice and anecdotal evidence will dictate related infection control measures until further evidence is available.</p>

Part B (2004- 2006)

The annual review aims to identify, review and critique any scientific studies or guidance, which have been published in the intervening period since the original literature review, to determine if changes to guidance are required.

The literature search using the described strategies identified a study on the levels of bacterial load found present under jewellery, specifically finger rings (Kelsall *et al.*, 2006). This study demonstrated results of significantly higher bacterial colony counts on the skin under rings or on the skin adjacent to the ring. Interestingly this study also demonstrated a significantly lower number of bacterial colonies beneath silver rings than either, gold or platinum. If the ring had been removed before surgical scrub, then there was no difference between the bacterial load of that and the control. This study further strengthens the guidance in respect to removal of jewellery prior to carrying out hand hygiene.

<p>Part C (2007-2008)</p>	<p>This review aims to identify, review and critique any scientific studies or guidance, which have been published in the intervening period since the last literature review, to determine if changes to guidance are required.</p> <p>A study by <i>Fagernes et al. (2007)</i>, investigated the impact of a single plain ring on the bacterial load on the hands of healthcare workers (HCWs). A total of 121 HCWs wearing one plain ring and 113 HCWs wearing no rings had both hands sampled by the “glove juice” technique. Quantitative culture of the samples was performed and the microorganisms identified. Wearing a single plain ring did not increase the total bacterial load on the hands, nor was it associated with an increased rate of Enterobacteriaceae carriage. The study does not address quality of hand hygiene technique or whether the Enterobacteriaceae findings enhances the risk of transmission.</p> <p><i>Wongworawat et al. (2007)</i> carried out a randomized controlled study looking at the influence of rings on the efficacy of hand sanitization and residual bacterial contamination. They compared the impact of finger rings on the effectiveness of scrubless and water-aided alcohol-based hand sanitization methods with that of povidone-iodine scrub. The subjects were a pool of perioperative staff and medical students who knew how to carry out a pre-op surgical scrub. There was no significant difference in the number of bacteria between hands with and hands without rings (1 ring, >90% smooth) for the groups that used alcohol wash or alcohol-chlorhexidine lotion. In the povidone-iodine group, the number of bacteria on hands with rings was greater than the group without rings. The alcohol-chlorhexidine group had the lowest bacterial count, regardless of the presence of rings. The presence of 1 ring did not appear to negatively impact on the effectiveness of alcohol-based hand sanitizers in a group of HCWs who were familiar with surgical scrubbing procedures.</p>
<p>CONCLUSIONS</p>	
<p>Part A (1966 – 2004)</p>	<p>Evidence would suggest that hand bacterial load is greater when rings are worn.</p> <p>Evidence would suggest that removal of bacteria through handwashing is hampered by the wearing of rings.</p> <p>Wearing of rings may cause gloves to tear.</p> <p>Rings may interfere with thorough handwashing.</p> <p>Limited information available in relation to wrist jewellery and its effect on hand hygiene.</p>

<i>Part B (2004 – 2006)</i>	There are limited additional publications on this subject produced within the period of this annual review of the model policies. The only study, which has been published, further strengthens the guidance in respect to removal of jewellery prior to carrying out hand hygiene.
<i>Part C (2007-2008)</i>	One study identified showed that wearing one single band (ring) did not result in an increased bacterial load on hands of healthcare workers. A second study suggested that the presence of one plain ring did not appear to negatively impact on the effectiveness of alcohol-based hand sanitizers in a group of healthcare workers who knew how to use the correct hand hygiene techniques.
<u>RECOMMENDATIONS</u> <i>Part A (1966 – 2004)</i>	Rings or other wrist jewellery should not be worn when providing care to patients.
<i>Part B (2004 – 2006)</i>	No change to present guidance recommendations in literature review available 10/08/05.
<i>Part C (2007-2008)</i>	As a result of the literature review for Part C, nothing additional needs to be added to Infection Prevention Model Policy/Procedure 2 (version1).
PRACTICAL APPLICATION	As the hand hygiene measures described have been recommended for some time, no significant change to practice should be required; however, the standards set down must be achieved.
RESOURCE IMPLICATIONS	As per current policies. All resources required for dealing with hand hygiene should already be in place.

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