



Risk behaviours for organism transmission in health care delivery—A two month unstructured observational study



Maria Lindberg^{a,b,*}, Magnus Lindberg^{b,c}, Bernice Skytt^{b,c}

^a Centre for Research and Development, Uppsala University/County Council of Gävleborg, SE 801 88 Gävle, Sweden

^b Department of Public Health and Caring Sciences, Uppsala University, Box 564, SE 751 22 Uppsala, Sweden

^c Faculty of Health and Occupational Studies, Department of Health and Caring Sciences, SE 801 76, Gävle, Sweden

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ABSTRACT

Background: Errors in infection control practices risk patient safety. The probability for errors can increase when care practices become more multifaceted. It is therefore fundamental to track risk behaviours and potential errors in various care situations.

Objective: The aim of this study was to describe care situations involving risk behaviours for organism transmission that could lead to subsequent healthcare-associated infections.

Design & setting: Unstructured nonparticipant observations were performed at three medical wards.

Participants & methods: Healthcare personnel (n = 27) were shadowed, in total 39 h, on randomly selected weekdays between 7:30 am and 12 noon. Content analysis was used to inductively categorize activities into tasks and based on the character into groups. Risk behaviours for organism transmission were deductively classified into types of errors. Multiple response crosstabs procedure was used to visualize the number and proportion of errors in tasks. One-Way ANOVA with Bonferroni post Hoc test was used to determine differences among the three groups of activities.

Results: The qualitative findings gives an understanding of that risk behaviours for organism transmission goes beyond the five moments of hand hygiene and also includes the handling and placement of materials and equipment. The tasks with the highest percentage of errors were; 'personal hygiene', 'elimination' and 'dressing/wound care'. The most common types of errors in all identified tasks were; 'hand disinfection', 'glove usage', and 'placement of materials'. Significantly more errors (p < 0.0001) were observed the more multifaceted (single, combined or interrupted) the activity was.

Conclusion: The numbers and types of errors as well as the character of activities performed in care situations described in this study confirm the need to improve current infection control practices. It is fundamental that healthcare personnel practice good hand hygiene however effective preventive hygiene is complex in healthcare activities due to the multifaceted care situations, especially when activities are interrupted. A deeper understanding of infection control practices that goes beyond the sense of security by means of hand disinfection and use of gloves as materials and surfaces in the care environment might be contaminated and thus pose a risk for organism transmission.

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What is already known about the topic?

- Healthcare associated infections are common adverse events in patient care worldwide, and have significant impact on patients.
- Many healthcare associated infections could be preventable if health care personnel applied to hand hygiene and use of personal protective equipment.

- Audit tools used to record adherence to hand hygiene and use of personal protective equipment do not cover all risks that could lead to subsequent healthcare associated infections.

What this paper adds

- Non-participant observation and field notes are new approaches to describe and quantify risk for organism transmission beyond hand-carriage.
- Risk behaviours for organism transmission occur frequently when health care personnel perform tasks related to patient care and are significantly more prevalent in multifaceted activities.

* Corresponding author at: Centre for Research and Development, Uppsala University/County Council of Gävleborg, SE 801 88 Gävle, Sweden.

E-mail addresses: maria.lindberg@regiongavleborg.se (M. Lindberg), magnus.lindberg@hig.se (M. Lindberg), bernice.skytt@hig.se (B. Skytt).

- Incorrect handling and placement of materials are important risk behaviours for organism transmission in health care delivery.

1. Introduction

Infection control is a key area in patient safety (Pittet and Donaldson, 2005) where errors of commission (doing something wrong) or errors of omission (failing to do the right thing) will complicate the delivery of safe patient care. Compelling evidence shows that healthcare personnel (HCP) have a low adherence to hand hygiene guidelines (Biddle and Shah, 2012; Megeus et al., 2015; Smiddy et al., 2015; Whitby et al., 2006) as well as difficulty in improving such adherence (Fuller et al., 2012; Gould et al., 2010; Huis et al., 2013; Mestre et al., 2012). The probability of making an error increases when patient care practices become more multifaceted (Wreathall and Nemeth, 2004). In the area of infection control, the risk factors for organism transmission by inadequate hand hygiene (Erasmus et al., 2010), incorrect use of gloves (Loveday et al., 2014a), and faulty surface and equipment disinfection (Kramer et al., 2006; Davis, 2009; Schabrun and Chipchase, 2006) have been reported, i.e. not only human–to–human transmission. By tracking potential errors in HCP's behaviours it might be possible to intervene in the common problems and improve patient safety (Pittet and Donaldson, 2005).

Evidence of five sequential steps for organism transmission from one patient to another via HCP's hands have been described by Pittet (Pittet et al., 2006). To hinder such transmission Sax (Sax et al., 2007) describes when HCP are required to perform hand hygiene, i.e. before patient contact, before aseptic tasks, after body fluid exposure, after patient contact and after contacts with patient surroundings. Some studies have however shown that aspects other than hand hygiene adherence might be of significance in organism transmission, and these include picking up materials from the floor and using them (Biddle and Shah, 2012), environmental disinfection (Cheng et al., 2015; FitzGerald et al., 2013), and the handling of objects (Clack et al., 2014). Moreover, Loveday et al. have in a comprehensive assessment and review provided recommendations and guidelines for preventing healthcare-associated infections based on the best current evidence (Loveday et al., 2014b). In order to gain a deeper understanding of the underlying risk for healthcare-associated infections and organism transmission in healthcare, it is essential to apply a wider approach regarding the HCP-induced errors in infection control practices. That is a wider approach that goes beyond a solely focus on hand hygiene (Sax et al., 2007). As little is known about HCPs infection prevention behaviour in daily care situations more precise knowledge about the occurrence of HCPs risk behaviours in their contact with patients, surfaces and equipment as potential vectors for organism transmission is needed. Thus, the aim of this study was to describe care situations involving risk behaviours for organism transmission that could lead to subsequent healthcare-associated infections.

2. Methods

2.1. Design

Unstructured observational study (Polit and Beck, 2012).

2.2. Setting

Three medical wards (infectious, pulmonary and cardiac diseases) located in two county hospitals were conveniently chosen. In the patient rooms, sinks and other equipment such as hand disinfectant, soap, paper towels, gloves and single-use aprons

were easily accessed. Waste bags were placed accessibly on the wards. All meals came on food trays delivered in trolleys from the central kitchen that were returned to central washing.

2.3. Data collection

All data collection was performed between January 8th 2013 and February 25th 2013 on three randomly selected weekdays for each ward, from approximately 7:30 am to 12 noon as this is generally the busiest time for patient care. In total, 39 h of unstructured nonparticipant observation (Polit and Beck, 2012; Mulhall, 2003) involving 27 HCP were sequentially performed on the three wards. All observations were performed by the first author, a registered nurse, with long experience in various positions of infection prevention and control at the present organization.

When arriving on the ward on observation days, the observer waited for the HCP, e.g. a registered nurse, a pair of nurses or a physician, to begin a patient related activity. The HCP were shadowed by the observer during the entire activity. Field notes comprising all observed behaviours, e.g. what was happening, were written during the observations. Thereafter the observer identified a new activity to observe, which involved the same or another constellation of HCP. This procedure continued for the entire morning, and at the end of each day's observation the field notes were read, additions were made for clarity, notes were reread, complemented and thereafter transcribed. Each transcription, from one day of observation, constitutes a unit of analysis. Reflective notes (Mulhall, 2003) covering the observer's personal experiences during fieldwork were documented in order to determine if preconceptions influenced the observation.

2.4. Analysis

The transcribed field notes were analysed in sequential steps using content analysis (Patton, 2002). Firstly, the transcribed units of analysis were divided into observation units. The HCP's performance in the observation units were thereafter inductively categorized into tasks. An observation unit could include more than one task, and when that was the case, the observation unit was categorized based on the main activity. To illustrate, when the task 'test taking and examining' is the main focus in an observation unit, the task 'waste management and surfaces' could also be involved. Based on differences in the character of the activity performed in the observation units, the next step was to inductively label respective observation unit.

Each observation unit was thereafter analysed again, this time with a focus on identifying behaviours involving a risk for contamination of HCP's clothing, hands as well as surfaces and materials that could subsequently lead to organism transmission. The evidence based standard principles as well as recommendations for preventing organism transmission (Loveday et al., 2014b; National Board of Health and Welfare, 2007) was used as a framework in the process of identifying these risk behaviours. The identified risk behaviours were thus deductively classified into types of errors. An error was defined as a deviation from the national guidelines regarding basic hygiene procedures in health care determined by the National Board of Health and Welfare (National Board of Health and Welfare, 2007) and includes the five reference points for hand hygiene (Sax et al., 2007). An error was also defined when the principles of asepsis was violated in procedures, and when shared equipment was not cleaned after use or placed on clean surfaces (Sax et al., 2007). All steps in the analysis were continuously discussed among the authors until full consensus was reached regarding the categorization of the tasks, their character, and the classification of errors. The authors have

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