



Brief Report

Minimizing hair dispersal: Is this an opportunity for improvement in health care–acquired infection prevention?



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We performed a study to understand common practices in surgical site hair removal and barriers to guideline compliance in surgical site hair removal. We found most health care providers in the United States do not remove hair outside of the operating room. Our findings reveal minimizing hair dispersal in the operating room, including improved and innovative ways for collecting clipped loose hair, is a significant area for improvement in surgical quality and health care–acquired infection prevention.

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In the United States, health care–acquired infections (HAIs) affect at least 1.7 million patients, with nearly 100,000 associated deaths each year.¹ Although the removal of surgical site hair (SSH) reduces colonization of bacteria, it can increase surgical risk of HAI if done improperly.^{2–5} The Centers for Disease Control and Prevention, the Association of periOperative Registered Nurses (AORN), and the Society for Healthcare Epidemiology of America guidelines recommend SSH removal only when necessary, to clip instead of shave, and to clip outside of the operating room (OR).^{6–8} Compliance with such processes has been demonstrated as a key component of implementation. However, the compliance rate with the recommendations for hair dispersal minimization and SSH removal practices across U.S. health care facilities has not been well studied. The objectives of this study were to understand practices and barriers to guideline compliance in SSH removal.

METHODS

An online, anonymous, national survey of 2,500 randomly selected members from the >40,000 AORN member database was conducted in April 2015. We obtained information from the first 250 respondents who had at least 2 years of OR experience and had performed at least 2 procedures requiring SSH removal in the 10 days prior to the survey. The survey collected respondent demographics, compliance rates for following guidelines for clipping outside the OR, and practices on how SSH and loose hair was removed, including completeness of hair removal.

To assess the impact on SSH removal practices, we assessed independent differences for institution sizes of <150 beds versus >150 beds, rural versus nonrural locations, and private versus nonprivate hospitals (Wilcoxon rank-sum test; $P < .05$). Modeling was also performed to determine if any interaction between the variables existed. All statistical analyses were conducted in JMP v11 (SAS Institute, Cary, NC).

RESULTS

Two hundred and fifty respondents in 44 states responded to the survey. The demographics of respondents were representative of the overall AORN membership: 74% had >10 years of OR experience, and 51% had a Bachelor's degree in nursing. Facilities where the respondents worked were located in urban (47%), suburban (35%), and rural (18%) areas and included community (35%) and public (35%) teaching hospitals, private hospitals (20%), and ambulatory surgical centers (10%).

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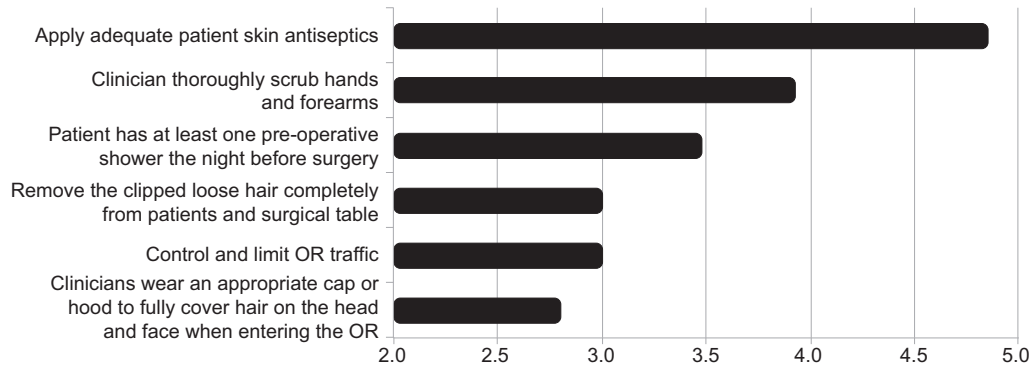


Fig 1. Importance of preoperative processes for improving surgical outcome and quality. Scale is based on survey respondents' perceived importance for which 1 was least important and 5 was most important. OR, operating room.

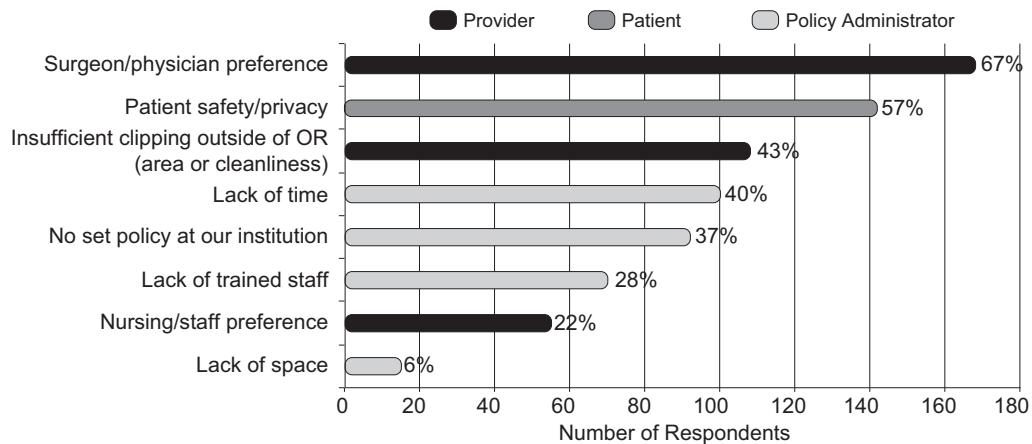


Fig 2. Changes in clipping outside the OR require policy administrator, patient, and provider involvement. The survey question was as follows: Please choose the top 3 reasons why the patient's hair was removed inside the OR. OR, operating room.

A total of 37% of respondents reported that 3-5 patients per week had SSH removed, and 52% of respondents said that >40% of patients needed SSH removal. The most common surgeries for SSH removal were for orthopedic-lower extremity (60.0%), cardiovascular (37.2%), and obstetrics-gynecologic surgeries (35.2%). On average, respondents reported 4.2 minutes taken to remove and collect hair when outside of the OR versus 3.2 minutes to remove and collect hair when inside the OR. Almost 70% of respondents reported noticing contamination of the tape roll used for hair removal (8% always, 34% sometimes, 28% often, 20% rarely, and 10% never). Respondents reported that 28% of the time they sometimes, often, or always noticed skin irritation, redness, scratches, or minor cuts in the OR when tape and sticky gloves were used to remove clipped hair. Almost half (46%) of the respondents were somewhat or very satisfied with their method of collecting loose hair. When SSH was removed inside the OR, 88.4% of respondents reported using sticky tape and 26.4% used a sticky glove to clean up loose hair; wet gauze or cloth (6.0%) and a vacuum suction device (1.6%) were also used. Half of respondents thought that complete removal (>90%) of the clipped loose hair was achieved inside the OR. Additionally, the complete removal of clipped loose hair was viewed to be equally as important as the control and limit of OR traffic in improving surgical outcomes (Fig 1).

The compliance rate for clipping in SSH removal was 98%. The compliance rate for use of a single-use clipper head was 96%. However, 60% of SSH removals were done inside the OR, and on average, 14.4% of patients who had hair removed outside the OR required a repeat hair removal inside the OR because of incompleteness or other factors.

The top 3 reasons for clipping inside the OR were surgeon or physician preference (67%), patient safety or privacy (57%), and insufficient clipping outside the OR (area or cleanliness) (43%) (Fig 2). Other reasons for removing hair inside the OR included lack of time (40%), no set policy at the institution (37%), and a lack of trained staff (28%).

A significantly greater percentage of institutions with >150 beds performed SSH removal in the OR compared with institutions with <150 beds (medians, 80% and 35% for >150 beds and <150 beds, respectively; $P = .006$). Additionally, a significantly greater percentage of nonrural institutions performed SSH removal in the OR compared with institutions in the rural setting (medians, 80% and 50% for nonrural and rural, respectively; $P = .043$). Modeling for an interaction between institution size, location, and type revealed no significant influence of these variables on each other.

Barriers to adhering to guidelines for removal and collection of hair outside the OR included lack of resources or understaffing; patients requesting not to have hair removed outside the OR because of patient privacy or embarrassment; hospital policy; delay in time from hair removal to actual surgery; and the idea that clipping hair while the patient is awake may be too emotional (eg, neurosurgeries).

DISCUSSION

Compliance with SSH removal recommendations is critical to HAI prevention and is variable among U.S. hospitals. Successful implementation depends on several components depending on whether it is the nurse's, patient's, physician's, or administrator's

perspective. Therefore, practices such as moving the clippings of hair outside the OR require a comprehensive approach with agreement from multiple stakeholders (ie, patients, clinicians, hospital administrators and policymakers). Each of these stakeholders is key to facilitating adherence to guidelines. The link between SSH removal and the risk of infection has not been well established; hence, SSH removal is not a high priority for many stakeholders. The decision about how SSH removal is handled and where it takes place is commonly made based on convenience instead of clinical needs.

There are differences in approaches to SSH removal in a hospital-based OR versus smaller centers and in rural versus nonrural centers, but these appear to be independent practices and not correlated. Likewise, hair removal is more common in nonrural institutions regardless of whether they are large institutions or small (<150 beds). Although complete cleanup of clipped hair was perceived to be as equally important as the control or limit of OR traffic for environment control, and although the control and limit of OR traffic has been shown to improve surgical outcomes,⁹ few studies have explored the benefit of minimizing hair dispersal as part of the intervention. It is possible that the role of adhesive tape used to clean up hair may pose the risk of cross-contamination.¹⁰

There are known limitations to this study. The study population was a small sample and included only nurses; therefore, the survey findings are reliant on and limited by the accurate estimation and assessment on current practices by the nurses surveyed. Although it is true that SSH removal is mostly done by nurses and nurse practitioners, perspectives from surgeons or hospital administrators would complement and expand the importance of the results. Finally, the study design was a survey and could not assess the impact of noncompliance to proper hair removal guidelines on the infection rate.

Although guidelines provide the content for best practice, hospital or health system policy changes, implementation, and monitoring of staff require compliance with each individual process. The most effective and efficient method to assure proper hair clipping in the preoperative setting is to establish specific infection prevention bundles that address all aspects of perioperative care. Once established, these bundles require diligence in monitoring their compliance. Electronic medical records can be easily modified to include check boxes to assure that proper compliance (eg, type, appropriateness, and location of hair clippings) is performed. Resolving issues of adherence to guidelines is complicated and requires a systematic, collaborative approach between patients, surgeons, and hospital administration. Measurement of individual processes and evaluating their impact will further enhance the relative importance of these practices. Furthermore, education will increase

awareness of the advantages and disadvantages to removing and collecting hair outside of the OR with the goal of enhancing patient safety.

CONCLUSIONS

Our findings reveal areas for potential improvement in surgical quality and HAI prevention by minimizing dispersal of clipped loose hair with better cleanup or removing SSH outside the OR. Based on this survey of practices in the United States, there is a need to educate health care providers on the risks associated with removing hair inside the OR and on the recommendations for how to minimize hair dispersal in the OR, including improved, innovative ways for collecting clipped loose hair.

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