Operating Room Attire Policy and Healthcare Cost: Favoring Evidence over Action for Prevention of Surgical Site Infections

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BACKGROUND: The Association of Perioperative Registered Nurses (AORN) released new guidelines for operating room attire in 2015 in an attempt to reduce surgical site infections (SSIs). These guidelines have been adopted by the Centers for Medicare and Medicaid Services. We aimed to assess the relationships among operating room attire, SSIs, and healthcare costs.

STUDY DESIGN: In March 2016, our center introduced the AORN attire policy. National Health Safety Network data from our hospital were collected on general surgery, cardiac, neurosurgery, orthopaedic, and gynecology procedures from January 2014 to November 2017. The SSI rates and microbiological culture data for 30,493 procedures before and after policy implementation were compared using propensity score matching. The associated costs of the AORN policy were analyzed.

RESULTS: After 1:1 propensity score matching, 12,585 matched pairs spanning the policy change were included (25,170 patients total); before policy change (BC group) and after policy change (AC group). The rate of SSIs did not differ between groups (1.0% AC group vs 1.1% BC group; $p = 0.7$). There was no difference in the incidence of Staphylococcal species cultured from wounds (19.3% AC group vs 16.8% BC group; $p = 0.6$). Multivariable analyses demonstrated that wound classification and emergent procedures were the strongest independent predictors of SSIs. The cost of attire for 1 person entering the operating room increased from \$0.07 to \$0.12 before policy change to \$1.11 to \$1.38 after policy change. Use of the mandated operating room long-sleeved jackets alone in our institution was associated with an added cost of \$1,128,078 annually, which translates to an estimated \$540 million per year for all US hospitals combined.

CONCLUSIONS: Implementation of the AORN guidelines has not decreased SSIs and has increased healthcare costs. (J Am Coll Surg 2019;228:98−106. © 2018 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

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Hospital-acquired infections (HAIs) are responsible for a considerable proportion of adverse events associated with healthcare, and are associated with high rates of morbidity and mortality as well as increased costs.[1-6] Of the 440,000 HAIs that occur annually among US inpatients, their added annual costs are estimated at \$9.8 billion.[7] Surgical site infections (SSIs) account for approximately one-third of all HAIs and constitute the largest portion of HAI-related costs annually (>30%).[6] Surgical site infections are also associated with increased hospital length of stay, increased risk of readmission, and increased mortality.[3,8]

Because SSIs are associated with poor healthcare outcomes and represent a large proportion of HAIs, a number of quality improvement and policy efforts, including

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Abbreviations and Acronyms

AORN = Association of Perioperative Registered Nurses
ASA = American Society of Anesthesiologists
HAI = hospital-acquired infection
NHSN = National Health Safety Network

from the CDC, WHO, American College of Surgeons, and the Surgical Infection Society, have aimed to decrease SSIs through targeted interventions and enhanced surveillance programs.[9-12] These interventions take into account the evidence-based factors relating to the complex nature of SSIs, such as smoking cessation, glycemic control, bowel preparation, antimicrobial prophylaxis, proper operating room ventilation, and intraoperative normothermia.[9-12] None of these organizations found sufficient evidence to make recommendations about specific operating room attire as it relates to surgical infections.

In an attempt to further combat SSI, the Association of Perioperative Registered Nurses (AORN) released guidelines specifically addressing operating room attire in 2015; these guidelines were later enforced by regulatory and accrediting bodies including the Centers for Medicare and Medicaid Services.[13-15] The guidelines ban the traditional surgeon skull cap, mandate the use of a bouffant cap that "completely covers the ears, scalp, skin, sideburns, and the nape of the neck," and require coverage of all exposed skin on the arms with the use of clean reusable or disposable long-sleeved jackets by all non-scrubbed personnel[13-15] (Table 1).

These new guidelines have been met with controversy, the main criticism being that, although well intentioned, there is little evidence to support them, and they were promulgated without collaboration with the surgical community, especially in light of multiple studies showing no relationship between headgear and SSIs.[16-19]

We hypothesized that the implementation of the AORN guidelines did not effectively decrease the incidence of SSIs and increased healthcare costs. The current study aimed to compare the incidence of SSIs in a large, propensity score-matched cohort of patients undergoing operations before and after the mandatory operating room attire policy change in our hospital system, while accounting for the cost of implementing the new policy.

METHODS

Data source

Data were obtained from the January 2014 to November 2017 reports of 2 main campuses from our hospital system to the National Health Safety Network (NHSN). The NHSN integrates 3 surveillance systems at the CDC, National Nosocomial Infections Surveillance system, Dialysis Surveillance Network, and National Surveillance System for Healthcare Workers.[20] The NHSN facilities voluntarily report their HAI surveillance data for aggregation into a single national database to monitor trends in HAIs and assist facilities in developing surveillance and analysis methods that permit timely recognition of patient safety problems.[21] For the purposes of studying SSIs, data are collected on every patient undergoing an inpatient or outpatient procedure within selected procedure categories (colorectal, cardiac, craniotomy, spine, hip replacement, and hysterectomy), including information about risk factors for SSIs, such as procedure duration and American Society of Anesthesia (ASA) classification. All SSIs are categorized using standard CDC definitions that include clinical, laboratory, and microbiological criteria.[22]

Healthcare costs associated with the procurement and waste of disposable mandatory AORN policy operating room attire were calculated using annual data provided by our Strategic Sourcing Department for the 2 campuses included in this study. Although the AORN guidelines state that operating room jackets can be single-use or clean reusable jackets, our center's independent cost analysis demonstrated that disposable jackets would be less costly, and therefore disposable jackets were implemented.

Study population

Our hospital system started using the new AORN operating room attire policy on March 1, 2016. To compare the outcomes of patients who underwent operations before and after the policy change, all patients undergoing inpatient or outpatient procedures within the reported

Table 1. Partial List of Association of Perioperative Registered Nurses Recommendations for Operating Room Attire

Recommendation
Head, hair, ears, facial hair, and the nape of the neck should be covered when entering the semi-restricted and restricted areas
Arms should be covered with long-sleeved jackets in semi-restricted areas
Scrub attire should be worn that covers the arms when prepping the patients or when preparing packaging and sterile items in the clean assembly area of sterile processing
Non-disposable head coverings should be covered with a disposable head cover

NHSN categories (colorectal, cardiac, craniotomy, spine, hip replacement, and hysterectomy) from January 2014 to November 2017 at the 2 main campuses were included. Age, sex, BMI, diabetes history, ASA class, wound classification, type of procedure, and procedure characteristics were collected for all patients. Patients with SSIs were identified by hospital epidemiologists and infection preventionists, according to CDC definitions. The SSIs were further sub-categorized into superficial and deep SSI, intra-abdominal abscess, osteomyelitis, endocarditis, mediastinitis, intracranial and spinal abscess, and prosthetic joint infections.

Outcomes

The primary end point of interest was the incidence of SSI within 30 days of operation compared between patients undergoing operations before and after the mandatory operating room attire policy change. Other outcomes of interest included the contribution of individual bacterial species to the SSI microbiome. This was done by comparing the rate of wound cultures positive for potential skin contaminates (Staphylococcal species) in patients with SSIs to determine whether covering all exposed skin of operating room personnel reduced infections from these bacterial species. Data pertaining to the added hospital costs of purchasing, as well as disposing of the disposable full-sleeved jackets, were also analyzed.

Statistical analysis

Statistical analyses were performed using STATA, version 15 (Stata Corp). Continuous variables are described as mean ± SD. Categorical variables are described as percentages and were analyzed using the chi-square test. Continuous variables were assessed for normality using the Shapiro-Wilk test; Student's *t*-test was used to compare the means of parametric variables and the Wilcoxon rank sum was calculated to compare nonparametric continuous variables. A multivariable logistic regression was used to demonstrate independent patient and procedural predictors of SSIs.

To account for the nonrandom selection of patients for operations before and after the policy change, as well as differences in patient baseline characteristics between groups, we used propensity score matching. The propensity score was defined as the probability of undergoing operations under the new AORN operating room attire policy. To estimate these scores we used multivariable logistic regression conditioned on variables confounding SSI: patient BMI, diabetes, wound classification (clean, clean-contaminated, dirty, contaminated), and procedure type (colorectal, cardiac, craniotomy, spine, hip replacement, and hysterectomy). A 1:1 nearest-neighbor matching algorithm was used and the success of matching was examined by comparing standardized differences in the distribution of the covariates between the 2 treatment strategies; a difference of <10% between the 2 groups for confounding variables was considered acceptable (Fig. 1). All of the analyses were considered significant at a 2-tailed p value of <0.05. With 30,493 patients included for analysis, our study has a >97% power to detect an absolute difference of 0.5% in SSI between groups (ie 1% to 0.5%).

RESULTS

Study population

Of the 30,493 procedures in this study, 17,908 (58.7%) were performed before the policy change (BC group) and 12,585 (41.3%) were performed after the policy change (AC group). Unmatched patient demographics and procedural characteristics according to operating room attire appear in (Table 2). Compared with patients undergoing operations before the policy change, patients after the policy change had higher BMI, higher prevalence of diabetes mellitus, and lower ASA scores. Further, procedures before the policy change were shorter in duration, less frequently emergent, and had a significantly different makeup of procedure types (eg colorectal procedures, craniotomies, and spine procedures), as well as different proportions of wound classifications (Table 2).

These differences and others were negated after propensity score matching (Fig. 1). The propensity score-matched model did have a higher proportion of emergent procedures in the BC group when compared with the AC group (Table 3).

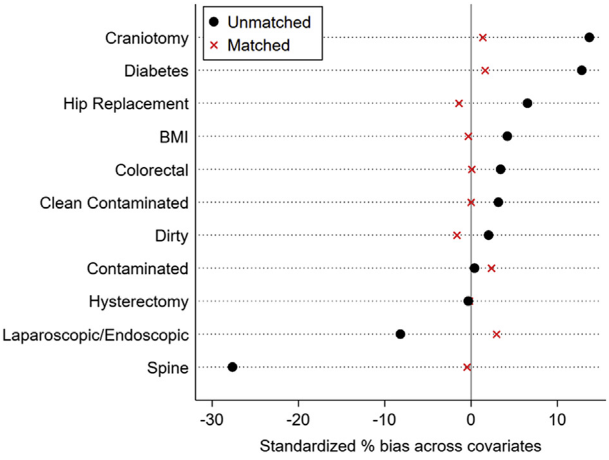

Figure 1. Standardized difference plot. Differences before and after propensity score matching comparing covariates confounding surgical site infection for patients undergoing operations before and after the policy change.

Table 2. Unmatched Baseline Characteristics

Baseline characteristic	Overall cohort (n = 30,493)	Before policy change (n = 17,908)	After policy change (n = 12,585)	p Value
Age, y, mean ± SD	59.1 ± 18	59.3 ± 18.1	58.8 ± 18	0.03
Female sex, n (%)	14,693 (48.2)	8,662 (48.4)	6,031 (47.9)	0.4
BMI, kg/m^2, median (IQR)	28.2 (23.4–30.6)	27.7 (23.5– 0.7)	29.0 (23.2–30.5)	0.03
Diabetes, n (%)	4,953 (16.3)	2,397 (19.1)	2,556 (14.3)	<0.001
American Society of Anesthesiologists class, n (%)				<0.001
I	529 (1.73)	405 (2.3)	124 (1.0)	—
II	7,498 (24.59)	5,627 (31.4)	1,871 (14.9)	—
III	18,355 (60.19)	9,124 (50.9)	9,231 (73.4)	—
IV	3,977 (13.04)	2,659 (14.9)	1,318 (10.5)	—
V	134 (0.44)	93 (0.52)	41 (0.3)	—
Wound class, n (%)				0.01
Clean	23,873 (78.3)	14,132 (78.9)	9,741 (77.4)	—
Clean-contaminated	5,619 (18.4)	3,209 (17.9)	2,410 (19.2)	—
Contaminated	627 (2.1)	364 (2.1)	263 (2.1)	—
Dirty	374 (1.2)	364 (1.1)	171 (1.4)	—
Procedure time, min, mean ± SD	212 ± 118	215 ± 114	206 ± 122	<0.001
Emergency procedure, n (%)	2,665 (8.7)	1,670 (9.3)	995 (7.9)	<0.001
Endoscopic procedure, n (%)	4,237 (13.9)	2,696 (15.1)	1,541 (12.2)	<0.001
Procedure type, n (%)				<0.001
Cardiac	9,911 (32.5)	5,618 (31.4)	4,293 (34.1)	—
Colorectal	3,816 (12.5)	2,157 (12.0)	1,659 (13.2)	—
Craniotomy	6,245 (20.5)	3,256 (18.2)	2,989 (23.8)	—
Spine procedure	6,548 (21.5)	4,663 (26.0)	1,885 (15.0)	—
Hip replacement	2,154 (7.1)	1,140 (6.4)	1,014 (8.1)	—
Hysterectomy	1,819 (5.9)	1,074 (6.0)	745 (5.9)	—

IQR, interquartile range.

Surgical site infection outcomes

The rate of SSIs in the overall unmatched cohort was 1.2%. In the propensity score-matched cohort, the incidence of SSIs did not differ between comparison groups (1% AC group vs 1.1% BC group; p = 0.7). In line with this, an analysis of all subcategorizations of infections available in the NHSN database demonstrated no statistically significant differences in the proportion of SSI subtypes contributing to the overall rate of SSI between groups (Table 4). There was a trend toward a lower rate of intra-abdominal abscesses before the policy change compared with after policy change (19.7% vs 29.4%; p = 0.07).

A multivariable logistic regression model demonstrated that age older than 75 years, procedure time longer than 3 hours, diabetes, emergency procedure, ASA higher than III, and wound classification, were independent predictors of SSI (Fig. 2). The new attire policy was not associated with a significant reduction in SSIs (odds ratio [OR], 0.9; 95% CI, 0.7-1.4).

Microbiome of surgical site infections

The AORN policy of covering all exposed skin, including the arms of non-scrubbed personnel in restricted areas is mainly driven by the assumption that these measures will decrease the shedding of skin micro-organisms, namely *Staphylococcal aureus.*[14,15,23] For this reason, we analyzed microbiological wound culture data available from the NHSN before and after the policy change to determine the proportion of Staphylococcal species that contributed to positive wound cultures in patients with SSIs. In the propensity score-matched cohort, *S aureus* contributed to 16.8% of positive wound cultures in the BC group vs 19.3% in the AC group (p = 0.6) (Fig. 3). Because patients with contaminated or dirty wounds are more likely to have SSIs related to pre-existing contamination, we performed a subgroup analysis of clean and clean-contaminated procedures to determine the incidence of any Staphylococcal species wound cultures. In this subset of procedures, the rate of any Staphylococcal species-positive wound culture also did

Table 3. Propensity Score-Matched Baseline Characteristics

Baseline characteristic	Before policy change (n = 12,585)	After policy change (n = 12,585)	p Value
Age, y, median (IQR)	62 (48–72)	62 (49–72)	0.3
Female sex, n (%)	6,031 (47.9)	6,357 (50.1)	<0.001
BMI, kg/m^2, median (IQR)	26.7 (23–30)	26.6 (23–30)	0.9
Diabetes, n (%)	2,321 (18.4)	2,397 (19.1)	0.2
American Society of Anesthesiologists classification >III, n (%)	2,100 (16.7)	1,359 (10.8)	0.3
Wound class, n (%)			0.2
Clean	9,760 (77.6)	9,741 (77.4)	0.8
Clean-contaminated	2,410 (19.2)	2,410 (19.2)	1
Contaminated	221 (1.8)	263 (2.1)	0.06
Dirty	194 (1.5)	171 (1.4)	0.2
Procedure time, min, mean ± SD	208.7 ± 109	206.7 ± 122	0.2
Emergency procedure, n (%)	1,239 (9.9)	995 (7.9)	<0.001
Endoscopic procedure, n (%)	1,541 (11.7)	1,414 (11.2)	0.1
Procedure type, n (%)			0.8
Cardiac	4,289 (34.1)	4,293 (34.1)	0.9
Colorectal	1,656 (13.2)	1,659 (13.2)	0.9
Craniotomy	2,920 (23.2)	2,989 (23.8)	0.3
Spine procedure	1,909 (15.2)	1,885 (15.0)	0.7
Hip replacement	1,060 (8.4)	1,014 (8.1)	0.3
Hysterectomy	751 (6.0)	745 (5.9)	0.8

IQR, interquartile range.

not differ between groups (28.2% BC group vs 28.4% AC group; p = 0.9) (Fig. 4).

Added cost of the Association of Perioperative Registered Nurses' operating room attire policy

Cost data pertaining to operating room attire were calculated using annual forecasted projections by our Strategic Sourcing Department. These data are available in aggregate for the 2 hospital campuses included in this study (1,869 beds in total). The necessary recurring cost for a single person to enter the operating room wearing the appropriate attire before and after the policy change was calculated according to the following prices provided: bouffant \$0.07, skull cap \$0.12, cap with beard cover \$0.34, disposable operating room jacket \$1.04. Before the policy change, wearing a bouffant or surgical cap to enter the operating room created a cost that ranged from \$0.07 to \$0.12 per person. After the policy change, taking into account the mandatory long-sleeved jackets and beard covers when appropriate, the cost ranged

Table 4. Surgical Site Infections

Outcome	Before policy change (n = 12,585)		After policy change (n = 12,585)		p Value
	n	%	n	%	
SSI	132	1.1	126	1	0.7
SSI type					0.5
Deep incisional	32	24.2	33	26.2	0.7
Superficial incisional	39	29.5	28	22.2	0.2
Intra-abdominal abscess	26	19.7	37	29.4	0.07
Osteomyelitis	12	9.1	12	9.1	1
Endocarditis	0	0	1	0.8	0.3
Intracranial/spinal abscess	13	9.9	9	7.2	0.4
Mediastinitis	8	6.1	5	3.9	0.4
Prosthetic joint infection	2	1.5	1	0.8	0.6

SSI, surgical site infection.

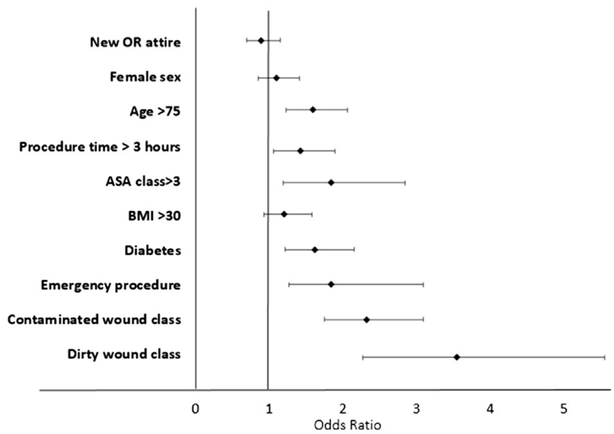

Figure 2. Multivariable model for predictors of surgical site infection. Forest plot of multivariable logistic regression model for the association of patient and procedural factors with postoperative surgical site infection. ASA, American Society of Anesthesiologists; OR, operating room.

from \$1.11 to \$1.38 per person, a 10- to 20-fold increase in cost per person.

We also evaluated the overall cost of the disposable jackets alone. The cost of procuring the necessary 1,076,728 jackets at the 2 centers in this study is \$1,110,851 annually. The cost of disposing of the jackets as solid waste, based on an estimated \$0.08 per pound,[24] is \$17,227. The total annual cost of the AORN policy-mandated jackets (procurement and waste) at these 2 hospital campuses is \$1,128,078. According to the 2018 American Hospital Association Annual Survey, there are 5,534 hospitals with 894,574 beds in the US.[25] Using our hospital center's 1,869 beds as a reference point, the estimated cost of supplying disposable jackets to all hospitals in the US is \$540,049,386.

DISCUSSION

The current large-scale propensity-score matched study comprising diverse surgical procedures demonstrates that the implementation of a new non-evidence-based operating room attire policy did not decrease the incidence of SSIs. Further, based on our microbiological analyses, efforts such as banning skullcaps in favor of bouffants and requiring long-sleeved jackets for all non-scrubbed personnel aimed at decreasing the bacterial shed of Staphylococcal species into the surgical site, have not proven to be effective, but have significantly increased healthcare costs. Our study reaffirmed important patient and procedural factors that do contribute to increasing the risk of SSIs; most importantly, wound classification and emergent procedures appear to be the strongest independent predictors of SSI. Our data suggest that the traditional operating room attire policy is equally as effective and less costly than the one required by the AORN policy, now adopted by regulatory and accrediting organizations.

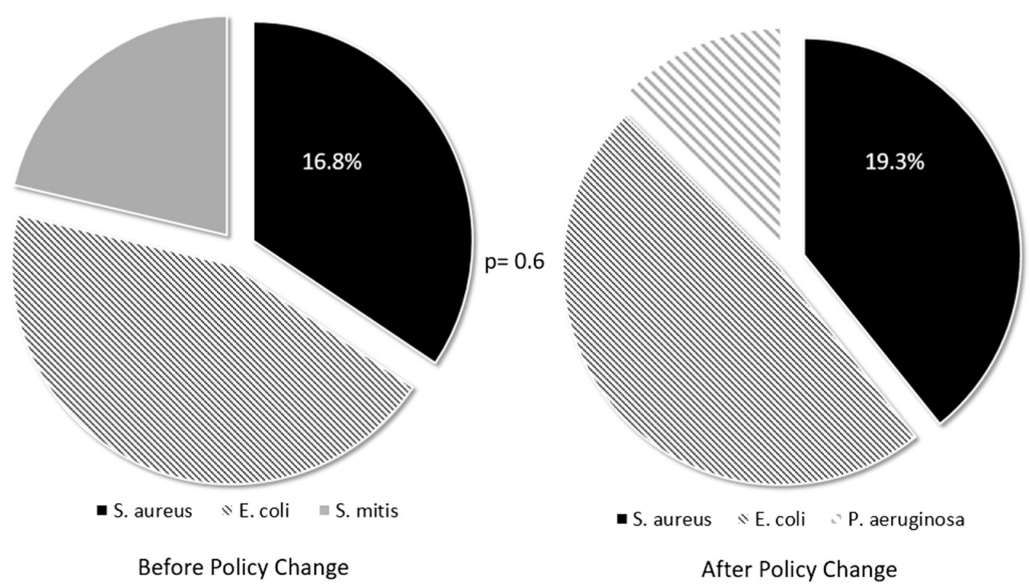

Figure 3. Microbiome of surgical site infection by attire policy. Pie charts represent the 3 most common microbiological isolates from positive wound cultures of patients with surgical site infection before and after the policy change. *Streptococcus mitis* was the third most common bacteria before the policy change vs *Pseudomonas aeruginosa* after the policy change; however, there was no difference in the proportion of *Staphylococcus aureus* isolates.

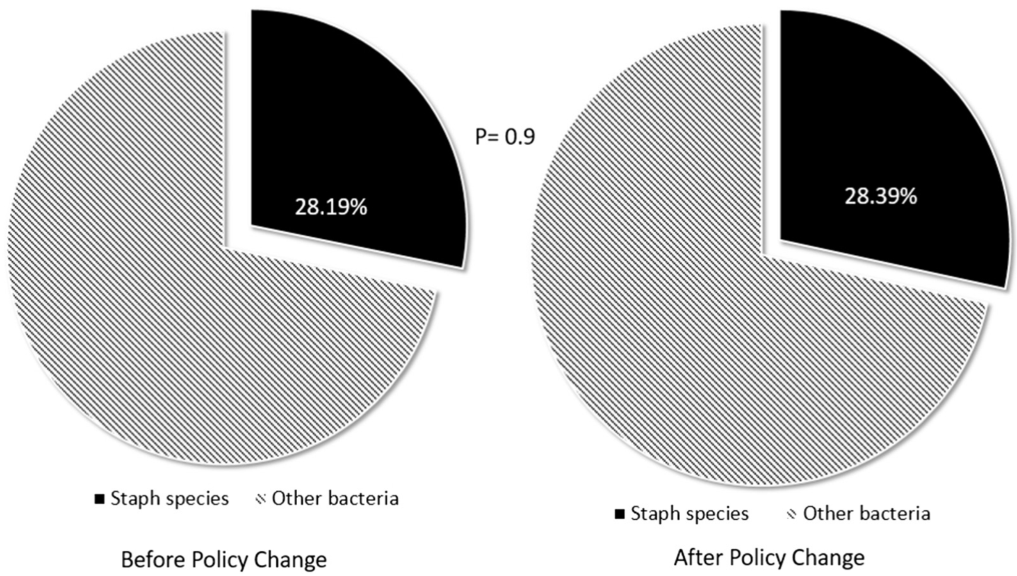

Figure 4. Proportion of Staphylococcal species in clean and clean-contaminated procedures.

With more than 30,000 patients available for analysis, our study had >97% power to detect a 50% reduction in SSI with the institution of the new operating room attire policy (from 1% to 0.5%). We demonstrated no reduction in SSIs, and in a subanalysis of every SSI subtype available from the NHSN, we showed no differences in deep SSIs, superficial SSIs, mediastinitis, osteomyelitis, endocarditis, spinal and intracranial abscesses, or prosthetic joint infections. Importantly, after the institution of the AORN policy, there was a strong trend toward increasing intra-abdominal abscesses ($p = 0.07$). This value should not be discounted because this is despite the fact that our propensity score-matched cohort had equivalent proportions of colorectal cases and wound classifications, as well as a higher rate of emergent procedures in the BC group. In addition, an oral antibiotic bowel preparation protocol for colon resections was in use during the entirety of the study period.

Our results are in line with a growing body of literature that demonstrates no difference in SSI rates with the institution of different operating room attire, specifically examining the use of the bouffant vs traditional surgeon skull cap.[16-19] One study of 15,000 class I neurosurgical procedures demonstrated that the use of bouffants did not significantly decrease SSIs during a 13-month period.[16] Two studies, one using American College of Surgeons NSQIP data and one using the Americas Hernia Society Quality Collaborative conducted multivariable logistic regressions of approximately 6,000 patients each and did not reveal an association between hat type worn in the operating room and SSIs.[17,18] In fact, one previous study used mock operating rooms to test the permeability and potential for microbial contamination and demonstrated that bouffant-style caps, as mandated by the new policy, have a significantly higher microbial shed to the sterile field.[19] As a results of these studies, the American College of Surgeons, ASA, AORN, Association of Professionals and Infection Control Epidemiology, Association of Surgical Technologists, Council on Surgical and Perioperative Safety, and the Joint Commission met in February 2018 and, after reviewing the current available evidence, released a consensus statement stating that "the requirement of ear coverage is not supported by sufficient evidence" and that "other issues regarding areas of surgical attire need further evaluation."[26]

When efforts to improve care are not chosen appropriately, initiatives aimed at quality improvement have the potential to consume resources, while conferring little to no benefit. This is also true when a benefit is falsely attributed to choosing action over the status quo without knowledge of the harms and opportunity costs of quality improvement, especially in the context of the net benefit to patients and healthcare systems.[26] Despite the well-intentioned goal of the AORN guidelines, they are the first to specifically implicate operating room attire as a causative factor for SSIs, while basing these assumptions on relatively low-level evidence.[27-29] The 1965 study cited by AORN was a retrospective study comparing bacterial isolates from the nares and hair of hospital employees and patients. This study identified hair as a reservoir for Staphylococcal species without identifying a causal relationship between this finding and postoperative wound infections.[28] The 1973 study was a single-institution case series of 11 patients describing an outbreak of postoperative infections that had the same bacteria isolated from the hair of a single general surgeon.[29] Not only do these studies not discuss the headgear worn by the operating surgeon to support the basis of banning the skull cap and mandating the bouffant, but relying on them to create a rigid set of guidelines circumvents the traditional models of evidence that drive quality improvement.

The investment of healthcare dollars for a quality improvement project in one hospital center is multiplied by thousands of hospitals in the US once a policy is mandated by regulatory and accrediting organizations. Our study evaluated the clinical and cost-effectiveness of the AORN policy and demonstrated an increased cost of 10- to 20-fold per operating room entry per person associated with the new policy. Purchasing and disposing of long-sleeved jackets for all personnel at our hospital system's main campuses was associated with a cost of more than $1 million annually. According to our estimation, this translated to $540 million of estimated added costs for all US hospitals. The change in policy was based on the hypothesis that covering all exposed skin on the arms of all non-scrub personnel would decrease the shed of microbial contaminants from the skin onto the operating field, namely Staphylococcal species.[13-15] However, our microbiological analysis demonstrated that the attire policy change was not associated with a change in the prevalence of *S aureus* in all surgical cases, nor was it associated with a change in the prevalence of any Staphylococcal species in clean or clean-contaminated cases. The AORN policy itself states that "the collective evidence does not support wearing cover apparel to protect scrub attire from contamination, and there is evidence that lab coats worn as cover apparel can be contaminated with large numbers of pathogenic microorganisms." A previous multi-institutional study of 22 hospitals is in line with this and demonstrated that adherence to infection-control practices in the operating room relating to coverage of arm hair and head hair did not correlate with SSI rates.[30] With no evidence of improvement in the rate of SSIs, and in view of the added cost created by the policy, the policy and its mandate should be re-evaluated.

The movement to improve quality and patient safety has gained substantial momentum in recent years, however, quality improvement should continue to be held to the same standards as the rest of medical practice.

Limitations

Several important limitations are noteworthy. First, despite propensity score matching, because our study was observational we cannot rule out potential residual bias or confounding. Second, although the new operating room attire policy was strictly enforced on all personnel at all campuses in our hospital system, we cannot ensure absolute compliance with every aspect of the policy (eg maintaining long-sleeved jackets at all times when not scrubbed or covering all exposed facial hair). In line with this, we cannot track the proportion of operating room personnel who used a bouffant, wore a long-sleeved jacket, or used a beard cover before the implementation of the new guidelines, and cannot truly measure the proportion of change that was enforced by the new policy. Further, although cultures were used for bacterial analysis, certainly not every patient with an SSI had cultures available to be analyzed. Finally, our cost data are available as an aggregate and not by patient; however, it remains a valid representation of the potentially unnecessary added healthcare costs of this policy in a large hospital center.

CONCLUSIONS

In a large, propensity score-matched analysis of a diverse cohort of patients undergoing a variety of procedures, we found that the mandatory use of bouffant caps covering the ears, coverage of all facial hair, and the use of long-sleeved jackets by all non-scrubbed personnel has resulted in no tangible benefit with regard to decreasing SSIs. More importantly, the added healthcare costs of using the AORN operating room policy in a large hospital system are substantial. The movement to improve quality and safety should continue to be evidence-based. A collaborative, multidisciplinary, consultative process when it comes to areas such as operating room attire, should be performed by a team representing surgery, anesthesia, nursing, and infection prevention, as mentioned in the consensus statement recently released by the American College of Surgeons, ASA, AORN, Association of Professionals and Infection Control Epidemiology, Associated of Surgical Technologists, Council on Surgical and Perioperative Safety, and the Joint Commission.

Author Contributions

Study conception and design: Elmously, Watkins, Pomp
Acquisition of data: Elmously
Analysis and interpretation of data: Elmously, Gray, Michelassi, Afaneh, Kluger, Salemi, Watkins, Pomp
Drafting of manuscript: Elmously
Critical revision: Gray, Michelassi, Afaneh, Kluger, Salemi, Watkins, Pomp

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