

Allergic Contact Dermatitis to Operating Room Scrubs and Disinfectants

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Background: Both surgical personnel and patients undergoing procedures are exposed regularly to different antiseptic chemicals in various forms. Little is known about the ingredients in these antiseptics and the risk these products may provoke allergic contact dermatitis.

Objective: The aim of the study was to identify and characterize common allergens in surgical scrubs and patient surgical cleansers that health care workers and surgical patients may encounter in the perioperative period.

Methods: DailyMed website was searched using numerous terms for surgical disinfectants. Products used for health care worker handwashing/scrubbing or patient surgical cleansing/disinfecting were included. Each product's ingredients were recorded; those found on the 2017 American Contact Dermatitis Society (ACDS) Core Allergen Series were noted from each product.

Conclusions: A total of 1940 products were identified, of which 267 were included in the analysis. A total of 66.3% contained iodine, 25.8% contained chlorhexidine digluconate, and 2.6% contained chloroxynol. Within the group analyzed, 1586 ingredients were identified. Of these, 241 were ACDS Core Series allergens. Most products contained a single ACDS allergen. There were significant differences in allergens based on product type and active ingredient, with iodine-containing products having the fewest number of allergens. The most common ACDS allergens found were cocamide diethanolamide (22.5%), fragrance (21.7%), lanolin (19.5%), propylene glycol (6.7%), alkyl glucosides (6.0%), and sorbic acid derivatives (5.6%).

Handwashing is a foundational practice for all health care workers (HCWs). Although this may seem obvious today, the need for antimicrobial control was not always so undeniable. Physician handwashing and scrubbing have a fascinating history beginning with Ignaz Semmelweis, known as the “father of hand hygiene.” He was a Hungarian doctor working at Vienna General Hospital in the 1840s who implemented handwashing with chlorine in his maternity ward (because soap and water had been ineffective) and achieved a dramatic fall in deaths among new mothers from puerperal fever. Despite his tireless advocacy for handwashing, not all physicians were convinced, and the practice was not widely adopted.¹ As Louis Pasteur's germ theory of disease began to be accepted, however, it was Joseph Lister, a British surgeon, who began to promote the use of sterile techniques, such as the sterilization of instruments and cleansing of wounds in the operating theater.² Today, scrubbing before entering the operating room is a mandatory ritual, and the preparation of the surgical site with an antiseptic wash is considered the standard of care.

Although scrubbing and patient preparation are essential parts of patient care, these practices do have potential adverse effects, notably skin irritation (irritant contact dermatitis [ICD]) or even the development of allergic contact dermatitis (ACD). Occupational skin disease has been well described among HCWs. A 1998–2004 analysis of 1255 patch-tested HCWs identified that 54.7% had hand involvement, whereas 12.2% had arm involvement. The most common allergens were rubber related, but notable handwashing ingredients, such as chloroxynol (PCMX) (0.9%), cocamide diethanolamide (DEA) (0.9%), quaternium-15 (0.9%), and formaldehyde (0.8%), were also observed.³ Other analyses of HCWs have identified these allergens as well as fragrance, topical antibiotics, and other preservatives as relevant occupational hand allergens.^{3–6} Similarly, a 2017 review identified other potential surgical irritants and allergens relevant to both HCWs and patients.⁷ Furthermore, there have been a variety of case reports of contact dermatitis in perioperative patients to Hibiscrub,⁸ topical antibiotics,⁹ wound dressings,¹⁰ and other disinfectants.^{11–14}

Many of these reports highlight the risk of allergy to an active ingredient in a surgical product.⁷ What is less well documented in the literature is an analysis of all ingredients (active and inactive) among surgical scrubs and patient cleansers and whether they contain other documented contact allergens. Characterizing this information is important for both HCWs and patients alike who may encounter these products during the operative period. As HCWs often are using gloves when sanitizing patients, product exposures of providers and patients differ and likely translate to distinct risks to each group.

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We sought to identify the ingredients in a variety of surgical solutions used in the hospital setting to which both HCWs and patients may be exposed.

METHODS

The National Institutes of Health and US National Library of Medicine's DailyMed website (<http://www.dailymed.nlm.nih.gov>) was searched in January–February 2019. Only human drugs were included. Multiple searched terms included “surgery,” “surgical,” “surgical solution,” “surgical scrub,” “scrub,” “PCMX,” “chlorhexidine,” “povidone-iodine,” “swabstick,” and “swab.” Inclusion criteria included products used for preoperative patient preparation and surgical hand scrubs/washes. Products that included these antiseptics in kits (eg, in surgical or first aid supply kits) or were duplicates (eg, the same active ingredient but at varying concentrations) were excluded. A total of 1940 products were examined; 267 products were included in the analysis. Brand, product name, indications, active ingredient (as listed on product), and inactive ingredients were recorded for each product. Data were entered and analyzed in Excel (Excel 2010; Microsoft Corp, Redmond, WA). Ingredients were compared with the 2017 American Contact Dermatitis Society (ACDS) Core Series (a list of 80 allergens).¹⁵ Equivalent and cross-reacting ingredients were included per the ACDS Contact Allergen Management Program's Cross-reactor Listing (<http://www.contactderm.org>) and Ingredient Database of the Personal Care Products Council.¹⁶ Data were presented as percentages and counts based on the recommended product use (patient perioperative germicidal or provider hand scrub) and active ingredient (povidone-iodine, chlorhexidine digluconate, PCMX, and other).

RESULTS

Product Characteristics

One hundred fifty products (56.2%) were identified exclusively for patient preparation during the perioperative period, 66 (24.7%) were exclusively for surgical hand scrubbing/washing, and 51 (19.1%) were for both uses. Of the 201 products used for patient preparation, 152 (75.6%) contained iodine and 41 (20.3%) contained chlorhexidine. Among the 117 hand scrubs, 60 products (51.2%) contained chlorhexidine, 43 (36.8%) contained iodine, and 7 (6.0%) contained PCMX.

Ingredient and Allergen Frequencies

A total of 1586 ingredients were evaluated among the 267 products; products had an average of 5.9 ingredients each (range = 1–24). Of these ingredients, 241 of the 2017 ACDS Core Series allergens were counted. Table 1 displays the frequencies of these allergens in all products as well as this information stratified per product use and active ingredient. On average, products had 1.0 ACDS Core Series allergen (range = 0–6). Patient antiseptics contained 0.9 ACDS (SD = 1.4) allergen per product, whereas hand scrubs contained

more (2.4 ACDS allergens, SD = 2.0). There were also significant variations among products with different active ingredients: 79.7% of iodine-containing products contained no ACDS allergens, whereas 87.0% of chlorhexidine-containing products and 85.7% of PCMX-containing products included an ACDS allergen other than the chlorhexidine or PCMX themselves. Most chlorhexidine-containing products (52.2%) had 4 allergens, whereas most PCMX-containing products (57.1%) contained 3 allergens.

Identified Allergens

A total of 17 of the 80 2017 ACDS Core Series allergens were identified in the hand scrub and patient preparation products (including PCMX and chlorhexidine digluconate). Table 2 shows these allergens stratified by product use and product active ingredient. The allergens identified were cocamide DEA (22.5% of products), fragrance (21.7%), lanolin (19.5%), propylene glycol (6.7%), alkyl glucosides (6.0%), sorbic acid derivatives (5.6%), benzalkonium chloride (2.6%), phenoxyethanol (1.9%), and polyacrylates (1.1%). Cetyl stearyl alcohol, ethylhexylglycerin, methylchloroisothiazolinone/methylisothiazolinone (MCI/MI), propolis, oleamidopropyl dimethylamine, and tocopherol were each identified once. In both patient perioperative antiseptics and hand scrubs, the most common allergens were cocamide DEA (preparations = 15.9%, scrubs = 50.4%), fragrance (preparations = 15.9%, scrubs = 47.9%), and lanolin (preparations = 14.4%, scrubs = 53.0%). Alkyl glucosides and sorbic acid derivatives were more prevalent in patient preparation products than in hand scrubs (preparations = 8.0%, scrubs = 0.9%, and preparations = 7.0%, scrubs = 3.4%, respectively). Allergens also varied significantly based on stated active ingredients. The most common allergens in iodine-containing products were alkyl glucosides (9.0%) and sorbic acid derivatives (7.9%), whereas the most common allergens in chlorhexidine-containing products were cocamide DEA (78.3%), fragrance (73.9%), lanolin (68.1%), and propylene glycol (17.4%). The most common allergens in PCMX-containing products were propylene glycol (85.4%), phenoxyethanol (57.1%), fragrance (28.6%), and lanolin (28.6%). The most common allergens in other products were fragrance (33.3%), benzalkonium chloride (20.0%), and cocamide DEA (20.0%).

Table 3 lists the products that contain fragrance, lanolin, propylene glycol, or alkyl glucosides.

DISCUSSION

This analysis has several important findings. First, allergens were commonly found in both the surgical hand scrubs and patient preparation scrubs. Approximately 40% of products surveyed contained a known allergen in their inactive ingredient list, with cocamide DEA, fragrance, and lanolin being found most commonly in both product types. Second, significant differences were observed in allergens depending on the products' active ingredients and/or whether the product was used as a hand scrub or patient preparation product; for example, alkyl glucosides were much more prevalent in

TABLE 1. Number of 2017 ACDS Core Allergen Series Allergens Found in Respective Products

No. ACDS Allergens	Use			Active Ingredient			
	All Products, n = 267, n (%)	Patient Perioperative Preparation, n = 201, n (%)	Hand Scrubs, n = 117, n (%)	Iodine Based, n = 177, n (%)	Chlorhexidine Based, n = 69, n (%)	PCMX Based, n = 7, n (%)	Other, n = 15, n (%)
0	147 (55.1)	125 (62.2)	34 (29.1)	141 (79.7)	0	0	6 (40.0)
1	47 (17.6)	40 (19.9)	14 (12.0)	33 (18.6)	9 (13.0)	1 (14.3)	4 (26.7)
2	14 (5.2)	6 (3.0)	12 (10.3)	0	10 (14.5)	0	4 (26.7)
3	7 (2.6)	2 (1.0)	6 (5.1)	1 (0.6)	1 (1.4)	4 (57.1)	1 (6.7)
4	38 (14.2)	26 (12.9)	38 (32.5)	2 (1.1)	36 (52.2)	1 (14.3)	0
5	2 (0.7)	1 (0.5)	1 (0.9)	0	2 (2.9)	0	0
6+	12 (4.5)	1 (0.5)	12 (10.3)	0	11 (15.9)	1 (14.3)	0
Mean (SD)	1.0 (1.4)	0.9 (1.4)	2.4 (2.0)	0.2 (0.6)	2.7 (1.5)	2.3 (1.5)	1.0 (1.0)

One product contained both iodine and chlorhexidine. Fifty-one products were listed as both provider (hand) and patient (perioperative) antiseptics.

SD indicates standard deviation.

patient-based products than hand scrubs. This would likely present risks to providers different from those for patients.

Active Ingredients

Allergic contact dermatitis to povidone-iodine, chlorhexidine digluconate, and PCMX is well described. These are the 3 most common antiseptics used in surgical settings for their antimicrobial properties. Povidone-iodine is used both as a hand scrub (risk to HCWs) and as a surgical site wash (risk to patients); it was identified in three-fourths of patient preparation solutions and one-third of hand scrubs in this analysis. Povidone-iodine is the most common cause of antiseptic-induced ACD.¹⁷ A 2016 review found that 13 cases of ACD to povidone-iodine in the site of surgical procedures have

been reported with numerous instances of irritation from povidone-iodine scrubs.¹¹ In cases of ACD to povidone-iodine, most cases demonstrate sensitization to the noniodine component.¹⁸

Chlorhexidine digluconate was identified in a quarter of products. It is both used as a hand scrub (one-half of products) and as a surgical site wash (one-fifth of products). It has a faster onset of action, is longer acting than other antimicrobials, can be left on, and cannot be rinsed off. These desirable properties have led to its increasing usage among surgeons. With this rise in use, though, there has been a rise in reports of ACD and ICD to chlorhexidine since 1990.¹⁹ From 2015 to 2016, 0.8% of 5594 patch-tested patients tested positive to chlorhexidine digluconate²⁰; however, reported rates range from 0.5%²¹ to 13.1%.²² Allergic contact dermatitis to chlorhexidine

TABLE 2. 2017 ACDS Core Allergen Series Ingredients and Cross-reactors Identified in Provider Hand and Patient Body Antiseptics

ACDS Ingredient	Use			Active Ingredient			
	All Products, n = 267, n (%)	Patient Perioperative Prep, n = 201, n (%)	Hand Scrubs, n = 117, n (%)	Iodine Based, n = 177, n (%)	Chlorhexidine Based, n = 69, n (%)	PCMX Based, n = 7, n (%)	Other, n = 15, n (%)
Cocamide DEA	60 (22.5)	32 (15.9)	59 (50.4)	3 (1.7)	54 (78.3)	1 (14.3)	3 (20.0)
Fragrance	58 (21.7)	32 (15.9)	56 (47.9)	2 (1.1)	51 (73.9)	2 (28.6)	5 (33.3)
Lanolin	52 (19.5)	29 (14.4)	62 (53.0)	2 (1.1)	47 (68.1)	2 (28.6)	1 (6.7)
Propylene glycol	18 (6.7)	2 (1.0)	17 (14.5)	0	12 (17.4)	6 (85.7)	0
Alkyl glucosides	16 (6.0)	16 (8.0)	1 (0.9)	16 (9.0)	0	0	0
Sorbic acid	15 (5.6)	14 (7.0)	4 (3.4)	14 (7.9)	1 (1.4)	0	0
Benzalkonium chloride	7 (2.6)	4 (2.0)	5 (4.3)	2 (1.1)	2 (2.9)	0	3 (20.0)
Phenoxyethanol	5 (1.9)	0	5 (4.3)	0	1 (1.4)	4 (57.1)	0
Polyacrylates	3 (1.1)	2 (1.0)	2 (1.7)	3 (1.7)	0	0	0
Cetyl stearyl alcohol	1 (0.4)	0	1 (0.9)	0	1 (1.4)	0	0
Ethylhexylglycerin	1 (0.4)	0	1 (0.9)	0	1 (1.4)	0	0
MI/MCI	1 (0.4)	0	1 (0.9)	0	0	0	1 (6.7)
Propolis/beeswax	1 (0.4)	1 (0.5)	1 (0.9)	1 (0.6)	0	0	0
Oleamidopropyl dimethylamine	1 (0.4)	0	1 (0.9)	0	1 (1.4)	0	0
Tocopherol	1 (0.4)	0	1 (0.9)	0	0	0	1 (6.7)

One product contained both iodine and chlorhexidine. Fifty-one products were listed as both provider (hand) and patient (perioperative) antiseptics.

TABLE 3. Products That Contain Fragrance, Lanolin, Propylene Glycol, or Alkyl Glucosides

Product	Use			Active Ingredient			ACDS Core Series Allergen			
	Patient			Povidone-Iodine	Chlorhexidine digluconate	PCMX	Fragrance	Lanolin	Propylene glycol	Alkyl glucosides
	Hand Scrub	Preoperative Prep	Scrub/Preparation							
Amsino International AMSure	X			X			X	X		
Povidone-Iodine Swab Sticks										
Becton Dickinson & Company	X			X		X	X	X	X	
BD EZ Scrub Solution										
Apicare Inc Skin Cleansing Kit	X			X			X	X		
AVA Inc Scrub-Stat	X			X			X	X	X	
Avrio Health LP Betasept Antiseptic	X			X			X	X		
Surgical Scrub Solution										
Avrio Health LP Betasept	X			X			X	X		
Bajaj Medical Scrub Solution	X			X			X			
Bajaj Medical Scrub-Stat	X			X			X	X	X	
BioMed Systems Inc Pre-Scrub	X			X			X	X		
Surgical Hand Scrub										
BioMed Systems Inc Pre-Scrub	X			X			X	X		
Surgical Solution										
Deb USA Inc Bactoshield Solution	X			X			X	X		
Deb USA Inc Bactoshield Sponge Solution	X			X			X	X		
Bocchi Laboratories Inc Zylast	X						X			
Antiseptic Surgical Scrub										
Bode Chemie Hamburg Surgical	X						X	X		
Hand Antiseptic										
Dynarex Corporation Alcohol Swabstick	X						X			
Ecolab Endure 400 Scrub-Stat 4		X			X		X	X	X	
Ecolab Scrub-Stat		X			X		X	X	X	
Ecolab Endure 420 CIDA-Stat		X			X		X	X	X	
Henry Schein Inc Antiseptic Skin Cleanser		X			X		X	X		
Kinray Inc Antiseptic Skin Cleanser		X			X		X	X		
Knart Corporation Smart Sense		X			X		X	X		
Antiseptic Skin Cleanser										
McKesson Antimicrobial Skin Cleanser		X			X		X	X		
McKesson Antiseptic Skin Cleanser		X			X		X	X		
McKesson Chlorhexidine Gluconate Gel		X			X		X	X		
Meijer Distribution Inc Antiseptic		X			X		X			
Skin Cleanser										
Mohnycke Health Care Hibiclens		X			X		X			

TABLE 3. (Continued)

Product	Use			Active Ingredient			ACDS Core Series Allergen			
	Hand Scrub	Perioperative Prep	Scrub/Preparation	Povidone-Iodine	Chlorhexidine digluconate	PCMX	Fragrance	Lanolin	Propylene glycol	Alkyl glucosides
Sage Products LLC Chlorhexidine Cloth			X		X		X			
Topco Associates LLC Antiseptic Skin Cleanser			X		X		X	X		
Walgreens Co Antiseptic Skin Cleanser			X		X		X	X		
Xttrium Laboratories Scrub Care Exidine Liquid			X		X		X	X		
Xttrium Laboratories Antiseptic Skin Cleanser			X		X		X	X		
Bocchi Lab Inc Zylast Antiseptic Surgical Solution			X				X			

is often relevant, and its rash is particularly troublesome because it may complicate surgical wound evaluation and healing.

Chloroxylenol (PCMX) is a phenol-derived antiseptic. It was found in less than 5% of study products and has decreased in popularity for the last decade. In the 1998–2004 analysis of HCWs, PCMX was the second most common biocide identified as an allergen (0.9%).³ It was identified as positive in 0.6% of 5594 patch-tested patients from 2015 to 2016.²⁰ It is most commonly found in scrubs/hand cleansers, fitting with reports of hand dermatitis in HCWs.

Inactive Ingredients

Cocamide DEA

Cocamide DEA is a common surfactant that develops suds and bubbles in products. It is commonly used in disinfectants, scrubs, and liquid soaps. Cocamide DEA was the most common inactive ingredient identified in this analysis, found in nearly 80% of chlorhexidine digluconate-containing products. It was found in half of hand scrubs and was the most common ACDS allergen identified in patient preparation products as well. In general, cocamide DEA is thought to be of lower allergenic potential than other surfactants, such as the alkyl glucosides and cocamidopropyl betaine derivatives; it does not show cross-reactivity with cocamidopropyl betaine or oleamidopropyl dimethylamine. From 2015 to 2016, 0.9% of 5594 patch-tested patients were positive.²⁰ However, cocamide DEA allergy, although rare, has been reported in HCWs. In an analysis of HCWs from 1998 to 2004, cocamide DEA was positive in 7 (0.9%) of 788 patch-tested HCWs. It was identified in liquid, lotion, and bar soaps/cleansers, as well as skin antiseptics.³ A 1993 analysis of 8 patients with suspected occupational-related cocamide DEA allergy found that 4 had used hand soaps and 2 had used hand foams containing the ingredient.²³ Many of these findings have suggested that repeated handwashing leads to sensitization.^{24,25} Although many of these reports are in HCWs, there are also reports of cocamide DEA causing allergic reactions when used in wound cleansers/antiseptics on patients. A 2015 review of 6 patients identified that 3 had used an antiseptic that caused a periwound dermatitis and that cocamide DEA was the likely offender.²⁶ Although the rates of cocamide DEA allergy are low, it is important to recognize that cocamide DEA may cause significant allergy in HCWs and postoperative patients given its widespread use in both wash-off and leave-on hospital products.

Fragrance

Fragrance was the second most common allergenic ingredient, identified in 20% of surveyed products and nearly three-quarters of chlorhexidine-containing products. Fragrance was prevalent in 50% of hand scrubs and 16% of patient skin prep products. Fragrance is one of the most common allergens identified in patch-tested patients. It was the third most common allergen among patch-tested patients in 2015–2016.²⁰ Among 1235 patch-tested HCWs, 0.4% reacted to balsam of Peru, a fragrance marker.³ In addition to fragrance allergy from soaps/scrubs and perioperative germicides,²⁷ there are reports of both HCWs and patients reacting to compound tincture of benzoin (includes balsams

and fragrance)²⁸ and topical antibiotics containing fragrance.^{9,29} It is especially important to avoid exposure to fragrance in both patients and HCWs who have an established fragrance allergy.

Lanolin

Lanolin is an emulsifier derived from sheep sebaceous glands and is a mixture of esters and polyesters of high-molecular-weight alcohols and acids; its composition can change based on sheep breed and habitat.³⁰ Allergic contact dermatitis to lanolin is quite common with 4.1% of 5591 patch-tested patients reacting to lanolin in 1 study.²⁰ Lanolin was identified in roughly one-fifth of the hospital products reviewed in this study; it was the most common allergen in hand scrubs (53%) and third most common in patient antiseptics (14.4%). Comparatively, only 4 of 380 household soaps/cleansers in the Contact Allergen Management Program (<http://www.contactderm.org>) were found to contain lanolin (May 2019).

Overall, the most common sources of lanolin are moisturizers and creams, which were the causative source of lanolin allergy in 40% of lanolin-sensitive patients in a study by Warshaw et al³¹; this same study identified soaps and cleansers as the lanolin source in only 1.5% of cases.³¹ The postoperative development of ACD to lanolin-containing topical creams is well described,¹⁴ and lanolin ACD has also been implicated as a common contributor to nonhealing wounds.^{30,32} Among HCWs, though, lanolin was implicated as a relevant allergen in only 1 to 2 cases from 1998 to 2004,³ which is surprising given its reputation for causing ACD in patients postoperatively. This may be explained by the “lanolin paradox” wherein it has been observed that lanolin-containing topical medications tend to be more sensitizing than lanolin-containing cosmetics or, in relation to this study, perhaps lanolin-containing hand soaps/scrubs. This paradox is thought to result from the fact that topical medications are applied to damaged or ulcerated skin, which may increase the rates of sensitization as opposed to cosmetics (or soaps), which are applied to normal or unaffected skin.³⁰

Propylene Glycol

Propylene glycol is an emulsifier and smoothening agent that was found in less than 10% of products in this study. Overall, it is commonly found in personal care products, such as moisturizers and home soaps/cleansers: 78 of 380 personal care soaps in the Contact Allergen Management Program declared propylene glycol in May 2019 (<http://www.contactderm.org>). In a 1996–2006 North American Contact Dermatitis Group analysis of propylene glycol allergy, 3.5% of 23,359 patients had allergic reactions to 30% propylene glycol. More than half of sources were creams, lotions, and cosmetics, whereas none seemed to be occupationally related in HCWs.³³ Similar to lanolin, propylene glycol sensitization has been suspected to increase in areas of application where there is broken skin (such as a leg ulcer³⁴ or surgical incision). It is important for patients with known allergy to propylene glycol to avoid this ingredient in the operative setting.

Alkyl Glucosides

Alkyl glucosides are a relatively new group of plant-derived surfactants commonly used in soaps, disinfectants, and body washes.³⁵

They were named as the 2017 Contact Allergen of the Year because of their increasing prevalence among personal care products and increasing rates of allergy³⁶: ACD to decyl glucoside, tested by the North American Contact Dermatitis Group screening series, increased from 1.5% in 2009–2010 to 2.1% in 2015–2016.²⁰ Because glucosides are relatively new, there have been few reports of glucosides causing dermatitis in HCWs. Alkyl glucosides were found in fewer than 10% of products in this study; however, just as their rate of usage in personal care cleansers has risen, the prevalence of glucosides in surgical soaps and cleansers may rise as well. All but 1 of the alkyl glucosides were identified in products specifically for patient disinfectant.

In the postoperative setting, there have been reports of glucosides causing ACD in patients due to Medihoney on chronic wounds and from pooling of surgical scrubs.¹⁴ There has also been a report of glucoside allergy in a patient using a chlorhexidine antiseptic on a piercing³⁷ and in wound foam dressings.³⁸ Of the allergens identified, glucoside prevalence is the most different between provider and patient products, reflecting a much higher risk to the patient.

Other Ingredients

There were a variety of other ingredients that were less commonly identified in products from this analysis. Sorbic acid derivatives are relatively rare allergens. In a study by Tosti et al³⁹ of 737 patients patch tested to 6 different emulsifiers, only 7 reacted to sorbitans. Although there have been no reports of sorbitan allergy causing reactions in HCWs, a case series of 3 patients reacting to a wound dressing containing sorbitans has been reported.¹⁰

It is reassuring that MCI/MI was identified in only 1 product. Given the rising rates of allergy to MCI/MI⁴⁰ and its persistent prevalence in household liquid soaps,⁴¹ we are hopeful that future hospital hand scrubs and skin preps will not contain this notorious allergen.

Limitations

This analysis has several limitations. Products were searched using only the DailyMed website; although we trust it is up to date, product formulations and products in supply at hospitals may routinely change. Products of the same brand but different types (swabstick, pad, solution) were included in analysis and may have had the same composition; this may have influenced our statistics. Furthermore, we used the 2017 ACDS Core Series allergens to address allergenicity. Although these are the most common allergens, other relevant allergens exist and must be considered in the setting of ACD.

SUMMARY

Preoperative hand scrubs and patient surgical site preparations may contain several allergens that may be clinically relevant to both HCWs and patients. Although hand dermatitis in HCWs is commonly suspected to be due to chemicals in rubber gloves, allergens in hospital antiseptics may be overlooked. Furthermore, these risks to HCWs also apply to patients undergoing procedures where these

products are applied. The allergens encountered by providers and patients are quite similar; however, hand scrubs contain more allergens than patient germicidal preps. In both groups, avoidance of these allergens may be difficult in a hospital setting. It is hoped this survey will raise awareness of easily overlooked exposure to allergens present in widely used antiseptic products. Alertness to allergen presence and knowledge of alternate “safe” products could reduce complications from perioperative exposures in both medical personnel and patients.

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