

**Brush-Free Surgical Hand Asepsis**  
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# Brush-Free Surgical Hand Asepsis

Barbara J. Gruendemann, RN, MS, FAAN, CNOR

## Overview of Surgical Scrubbing

- Brief history
- Modern-day scrubbing trends
- Criteria for a surgical scrub
- BF (Brush-free) scrubbing
- FDA, CDC, & AORN
- Consider a change in practice
- Summary

Brush-free (BF) scrubbing is one of my favorite topics because I keep asking why we haven't done this before and what took so long for us to embrace the newer techniques of scrubbing. All of you probably have had or will have this on your "radar screen" at one time or another. It is a hot topic that deserves attention.

It also is a hot topic because there are many misconceptions about why and how it should be done. BF scrubbing seems to be a permanent trend that we just can't ignore.

### Brush-free scrubbing

- Is evolving – is a work in progress
- Some are just beginning
- Some are using it as an alternative
- Some are saying "NO" – at least at this time

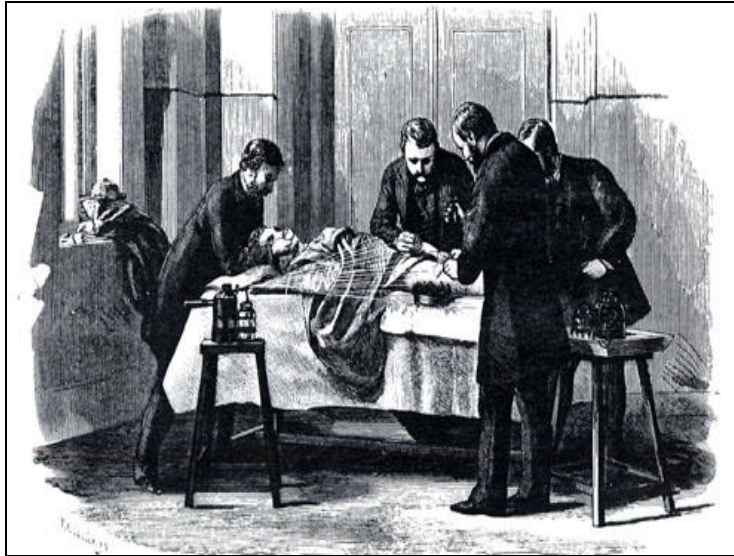
Perioperative nurses realize that we are just at the beginning of this trend. All of you are probably in some phase of implementing BF scrubbing and some of you are still rightfully asking questions and examining the evidence. We are certainly at the "work in progress" stage, and that's perfectly OK.

### Antecedents of Modern-Day Scrubbing

- Scrubbing represents a rite of passage into the OR and for access to the sterile field
- No one has access to sterile field without scrubbing
- Tradition remains today
- Techniques & agents: 1800s, 1900s, present

Scrubbing certainly is a hallowed ritual of OR practice. It is the "ticket" that gains access to the sterile field.

I have fond memories of spending 10 minutes at the scrub sink, listening to the gossip of the day (!?), but also having a chance during that time to discuss the upcoming patient and the procedure with the surgeon who was also scrubbing or was at least nearby. I hate to see this “hallowed” time disappear!



Courtesy of National Library of Medicine

This illustration shows preparation for surgery in the 1800s. Here we see “cleansing and purifying” the air with carbolic acid spray---a technique that was thought to enhance the outcome of a surgical procedure!

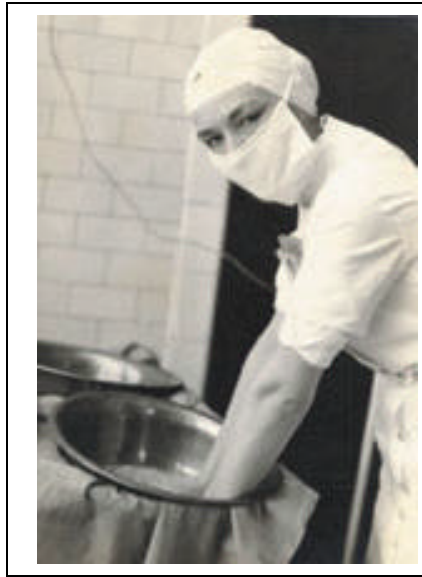
### Chlorinated Lime

From Vance (1895):

“Don’t do any operations with suspicious hands...potash soap penetrates skin deeply....After scrubbing, arms should be immersed in a solution of bichloride of mercury.”

Riall, Jnl OR Res Inst. 1:36-39, 1981

A quote from the 1890s---potash soap was believed to penetrate the skin more deeply than ordinary soap and therefore was the best for skin cleansing. Can you imagine immersing your arms, to the elbow, in bichloride of mercury!?



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This 1937 photo shows an OR nurse soaking her hands in bichloride of mercury and alcohol after scrubbing with green soap for 10 minutes! Ouch!!



Courtesy Center for The Study of the History of Nursing,  
School of Nursing, University of Pennsylvania

This is activity at the scrub sink in the 1950s. But, wait---notice that scrub brushes are not being used!! Does this mean that BF scrubbing was being tried during that time?

Also notice that the hexachlorophene container is taped shut, perhaps after topping off

the solution---a No-No today.

## Review of Antimicrobials

History of scrubbing is sketchy

- Early 1900s – Harsh reusable brushes
- 1950s to 1960s – HCP, alcohol; then iodophors
- 1960s – Disposable and impregnated sponge/brushes
- 1970s – CHG and others, such as triclosan and PCMX
- Today – iodophors, CHG, PCMX, triclosan, HCP, alcohol
- Today newer advanced agents and formulations; can be used for BF scrubbing

Note the introduction of disposable sponge/brushes in the 1960s and also the time-line for some of the antimicrobials. Most of these early antimicrobials are still being used today.

Note: the information that follows is a brief review of general antimicrobial agents, some being used today, and some not. The “grade” is my non-evidence-based overall evaluation of each of the agents.

### IODOPHORS

Grade: B-

- Wide range of activity
- Small sustained effect
- Skin irritation and toxicity possible
- Surgical scrub contain 7.5% iodofor

### CHG (chlorhexidine gluconate)

Grade: B+

- Wide range of activity
- Immediate effects: slow
- Persistence: very good
- Toxic to ears and eyes
- Incompatibility with some lotions

PCMX (para-chloro-meta-xyleneol)

Grade : C

- Broad spectrum
- Immediate effect: slow
- Some persistence
- Mild allergen
- Efficacy is highly formula-dependent
- Still used as the agent in some disposable sponge/brushes

Triclosan

Grade: B-

- Broad spectrum
- Bacteriostatic
- Speed: intermediate
- Persistence: good
- Used in commercial soaps to reduce odor

Note: Triclosan is the active agent in Dial and other soaps, as well as the antimicrobial in some “kitchen soaps,” toys, and even some clothing.

Quaternary ammonium compounds (“quats”)

Grade: C

- Benzalkonium chlorides-most common
- Primarily bacteriostatic and fungistatic
- Weak activity against Gram negative bacteria
- Activity adversely affected by organic matter
- Newer QACs have been introduced; need more study

We remember Zephiran, probably the most known “quat” in previous times. Quats have been implicated in studies that examined contaminated solutions used in hospitals.

There are several new quats on the market, some in BF agents. The CDC does mention them in their 2002 Hand Hygiene Guidelines but does say that the formulations require “further study” to determine efficacy in healthcare settings.



### HCP (hexachlorophene)

Grade: D-

- Toxicity and neurological effects
- Available by prescription – 3%

Note: HCP is infrequently used and rarely listed in textbooks today

### Alcohol

Grade: A-

- Broad range of activity (60-95%=best)
- Excellent immediate effects
- Persistence: some
- Without emollients, is drying to skin
- Can be flammable if not dried completely
- Non-toxic
- Lacks allergenic potential

Alcohol is an active ingredient in most of the BF products on the market today. It has been successfully used in European countries for many years and, in formulations with 60-90% alcohol, is a very effective antimicrobial.

Complete drying is critical to the success of an alcohol product.

As with all antimicrobials, it is very important that manufacturer's recommendations be CAREFULLY followed and that any LABEL WARNINGS be strictly heeded.

## Modern Day Scrubbing

When we consider scrubbing, whether traditional or BF, in today's OR environment, we have to consider the following questions that will influence the choice of BF scrubbing:

1. Will it do a better job? (science, improved products, quality mandates)
2. Will it work in less time? (workplace appreciates speed; time is money)
3. Will it result in cost efficiencies? (no brushes, less time, standardized procedures: better antimicrobials=reduced costs)

These questions are important to ask in today's environment with profound changes in technology used in the OR, edicts to do more in less time, budgetary restraints, and especially important, emphasis on evidence-based practice.

Scientific evidence favors BF scrubbing because:

- It provides an effective antiseptic cleaning of hands and arms before surgery.
- It reduces microbial counts.

- Use of hands instead of scrub brush protects skin from abrasion and damage.

Perhaps some of you will remember the belief that the longer we scrubbed our arms and hands, the cleaner they became!! I recall that the redness of our hands and arms at the end of a busy day were a “sign of valor” – an indication that we had worked hard and done a good job! It was disheartening to learn that the more we scrubbed, the more microbial contamination there was on the skin - a revelation that spurred a major change in thinking about the whole topic of scrubbing.

Now, of course, we are looking at reducing scrub times, without negative effects, and actually finding out that skin microbial counts can be greatly reduced with the use of newer and better antimicrobial agents, and in less time. This is a difficult pill to swallow for many of us and takes a while to digest and incorporate into our practice. But the truth lies in the many studies that draw similar conclusions.

#### Time needed for scrubbing

- “A major approach to decrease skin damage is to minimize scrubbing times”
- 10 minutes to 5 minutes, now 3 minutes
- 2-minute scrubs as effective as 3-& 5-minute scrubs
- “Shorter, less traumatic scrubbing regimens” well-supported

Pereira et al, *JHI*, 36:49-65, 1997; Wheelock, *AORN J* 65:1087-1098, 1997;  
Hingst et al, *JHI*, 20:79-86, 1992; Larson et al, *AORN J* 73:412-432, 2001

Scrubbing with a brush has been demonstrated to have a harmful effect upon the skin:

- Can remove epidermal layers
- Increases shedding of bacterial squames
- Increases (not decreases) microbial counts
- Changes microbial flora
- May precipitate dermatitis
- Can lead to skin abrasion
- Increases risk of infection

Galle et al, *Surg Gyn Ob* 147:215-218, 1978  
Loeb, *AJIC* 25:11-15, 1997  
Larson et al *AJIC* 26:513-52, 1998  
]Fortunato, *Berry & Kohn's OR Technique*, ed.9, 2000  
Meers & Yeo, *Jnl Hyg* 81:99-105, 1978

To me, the evidence from several journal articles was nothing short of overwhelming! Noteworthy is the comment that skin abrasions and changes in microbial flora can lead to an increased risk of infection. Damaged skin provides a favorable environment for increased bacterial growth which is already enhanced in the warm environment under gloves.

Recently, there have been significant enhancements in skin care products. Most of the newer scrubbing agents contain ingredients that are very skin-protective. These agents are actually stunningly skin-friendly, as many who use them will verify. Emollients, conditioners, and moisturizers have demonstrated their ability to

- prevent drying, discomfort, and dermatitis.
- reduce bacterial shedding.
- enhance antibacterial action.
- protect skin.

Larson et al, *AJIC* 26:513-521, 1998  
Pereira et al, *JHI* 36:49-65, 1997

It is so important to prevent skin damage because intact skin is the most effective barrier in maintaining hydration, pliability, and protection.

This literature further discusses the advantage of newer formulations of alcohol, in 60%-95% concentrations, for BF scrubbing. Alcohol has extraordinarily high bacteriocidal activity that increases persistence and emollients and moisturizers decrease the harmful effects on the skin.

Rotter in Mayhall (ed) *Hosp Epid & Inf Cntrl*, 1999, 1339-1355  
AORN RPs, 291-299, 2004  
Larson, *AJIC* 23:251-269, 1995

Comparisons of brush free scrubbing and scrubbing  
with a brush are very favorable.

- 5-minute BF scrubbing with alcohol and CHG is as effective as 5 minutes with a brush
- 2-4 minutes with a 60% ethyl alcohol hand rub is as effective as 6 minutes of 2% CHG scrub with brush
- 3 minutes of BF scrubbing with a formulation of 70% alcohol with additives more efficacious than 4% CHG or 7.5% PVP scrubs with a brush
- 3-minute BF scrubbing with a 1% CHG/61% alcohol agent more effective than a standard 3-minute 4% CHG scrub with a brush
- Study of agents; alcohol combinations most efficacious and showed excellent persistence

Loeb et al, *AJIC* 25:11-15, 1997  
Jones et al, *AORN J* 71:584-599, 2000  
Hobson, *AJIC* 26:507-512, 1998  
Mulberry et al, *AJIC* 29:377-382, 2001  
Paulson et al, *AJIC* 27:332-338, 1999

The bottom line from the literature is that BF formulations, most with an alcohol ingredient, and some in combination with other antimicrobials such as CHG, are very efficacious scrub agents and accomplish microbial reductions faster and with less skin irritation than traditional scrubbing with a brush.

As an aside, there are no studies at this time that I am aware of, that compare one BF

product with another BF product. I would hope that these types of studies would be forthcoming.

### *“Waterless” or “Water-Aided”*

Essentially, there are two types of agents formulated for BF scrubbing. There is a lot of confusion about this and it is important to know the difference. “Water-aided” preparations incorporate the use of water in their protocols. “Waterless” alcohol preparations and gels are used extensively on hospital clinical units and occasionally, one of these “migrates” to the OR and is used for BF scrubbing. Please note that formulations of products used on clinical units are usually different from those formulated for surgical scrubs and should not be used in the OR unless they are cleared for use as scrubbing agents.

Both AORN and the CDC recommend a pre-wash with an antimicrobial soap and water before beginning a surgical hand scrub. I like to compare this recommendation to what we know so well, and hear so frequently, about the importance of thoroughly cleaning instruments before sterilization.

Cleaning is always considered the most important step in effective disinfection or sterilization. When we think of where our hands might have been or what they have touched before scrubbing (e.g., charts, patients, food, cleaning rooms) it only makes sense that we must wash them before the surgical scrub to remove the gross debris and microbial contamination. Akin to preparation of instruments before sterilization, our hands should be as well prepared before the scrub.

In the absence of water, protein denaturation  
is not as effective as with water

Buck, *Inf Cntl Today* 1-9, 2001

Some manufacturers of BF scrubbing agents incorporate the pre-wash into the BF scrubbing procedure. But the pre-wash should always be done regardless of the manufacturer’s recommendations for use of their products. Mechanical cleaning and chemical antisepsis are both important parts of a surgical scrub. The prewash loosens debris and microorganisms.

### PRE-WASH IS NECESSARY

- When alcohol-based product is used, pre-wash hands and arms, dry, then apply agent
- Allow hand and forearms to dry thoroughly before donning sterile gloves
- FOLLOW MANUFACTURERS' INSTRUCTIONS!

Boyce et al. *MMWR*, 15(RR-16):1-45, 2002; AORN RPs, 291-299, 2004

### FDA Approval

An FDA regulatory document establishes conditions under which non-prescription (OTC) antiseptics, including surgical hand scrubs, are generally recognized as "safe and effective" (FDA terminology). Products either comply or don't comply with the testing requirements. FDA terms used that indicate compliance with requirements include "comply", "are cleared", "meet requirements".

### FDA defines SURGICAL HAND SCRUB

- An antiseptic
- Reduces microorganisms...
- Broad-spectrum, fast-acting, and persistent."

There are three categories of FDA approved healthcare antiseptics: healthcare personnel handwashes, surgical hand scrubs, and patient skin preparations. Each category has specific criteria for in-vitro and in-vivo effectiveness testing.

- *Healthcare personnel handwashes* are products used on clinical units for cleansing of hands at appropriate times.
- *Surgical hand scrub* have the most stringent testing requirements of the three categories
- *Patient skin preparations* are products used for patient prepping in the OR.

### FDA Categories

- Category 1: Safe and effective
- Category 2: Not generally safe and effective
- Category 3: Further testing required

Category I antimicrobials include 60-95% alcohol and 5-10% iodophor. If a product is

cleared by the FDA as a Category I antimicrobial, the product will not have an “FDA number” or “NDA (New Drug Approval) number” but will be marketed as “cleared by the FDA.” It is essential to note that **Category I antimicrobials do not require NDA approval or an NDA#.**

NDA#s are needed for those antimicrobials that do not meet Category I requirements and need further testing. If this process is done satisfactorily, the product then receives an NDA #. Categories II and III include all other antimicrobials including CHG and PCMX which **DO require approval and an NDA# prior to marketing.**

It is misleading for a manufacturer or its sales people to say that “Our products has an FDA #,” intimating that such a number is necessary for approval. An FDA # is not necessary, nor will it be given, when a product already meets the criteria of Category I. Sales representatives should be very clear about the exact “approval” that they tout for their product, and clinicians should know appropriate questions to ask to be sure that the product considered is indeed “cleared” by the FDA for use as a SURGICAL HAND SCRUB.

### **Available Guidelines and Recommended Practices**

The *2002 CDC Guideline for Hand Hygiene in Healthcare Settings*, developed and sponsored by the CDC, HICPAC, SHEA, APIC, and IDSA replace the *1995 APIC Guideline for Handwashing and Hand Antisepsis in Healthcare Settings*. This document has literally changed the way we look at hand washing and surgical scrubbing. These guidelines are frequently cited in the literature and have hundreds of references. A copy of these Guidelines should be available in every OR library. Website and printer-friendly versions of the Guideline are available at <http://www.cdc.gov/handhygiene/default.htm>

#### CDC Recommendations for surgical hand antisepsis

- “Surgical hand antisepsis, using either an antimicrobial or an alcohol-based hand rub with persistent activity is recommended before donning sterile gloves.”
- “Before applying the alcohol solution, prewash hands and forearms with soap, and dry completely. Allow hands to dry thoroughly before donning sterile gloves.”
- “Scrubbing with a disposable sponge or combination sponge-brush has reduced bacterial counts as effectively as scrubbing with a brush.”
- “However, several studies indicate that neither a brush nor a sponge is necessary to reduce bacterial counts especially when alcohol-based products are used.”

*Scrubs* is another valuable source of current information and should also be available in every OR. This RP follows, quite closely, the CDC Guideline in recommending the use of either an antiseptic hand wash or an antiseptic hand rub. “Hand rub” is generally defined as an (alcohol-based) gel, rinse, or foam. For the OR, this means either a water-aided or waterless product is acceptable as long as it is FDA-compliant. Note the reference to pre-wash for both methods and the notations on use of a brush. It is given in both of these guidelines that artificial or long nails are not to be worn.

#### AORN Recommended Practice for Surgical Hand Antisepsis/Hand Scrubs

- Purpose and characteristics of the surgical scrub:
  - Remove debris and transient microorganisms
  - Reduce resident microbial counts
  - Inhibit rapid re-growth
  - Be nonirritating, fast-acting, broad spectrum, and have a residual effect
- General hand hygiene section (nails, jewelry); if hands visibly soiled, wash with plain or antimicrobial soap and water
- Surgical hand antisepsis with an FDA-compliant and facility-approved antiseptic hand wash or antiseptic hand rub (pre-wash required for both)
- Use of brush is not necessary
- Some manufacturers may recommend a soft, nonabrasive sponge for performing a traditional scrub

AORN Recommended Practices for Surgical Hand  
Antisepsis/Hand Scrubs, pp. 291-299, 2004

From the *CDC Guideline for the Prevention of Surgical Site Infection, 1999*, another “must” document for your OR Library, come additional criteria for surgical scrubs:

- 1) reducing the release of bacteria from the skin
- 2) Use of appropriate antimicrobials
- 3) Staff acceptance

Note the inclusion of “staff acceptance” as a criterion. Several studies have examined staff acceptance and conclude that unless the staff accepts a new product and/or a new technique for scrubbing, the effort will be futile. Staff acceptance is a key factor in the success or failure of a trial or complete change in practice. The *CDC Guideline for the Prevention of Surgical Site Infection, 1999* is available both on-line and to print from [http://www.cdc.gov/ncidod/hip/SSI/SSI\\_guideline.htm](http://www.cdc.gov/ncidod/hip/SSI/SSI_guideline.htm)

The group or committee charged with deciding whether to change scrubbing agents or

techniques, or both, should include representatives from the following groups who have a stake in the decision:

- Staff who scrub – surgeons too
- Management
- Educators
- Role models, informal leaders; champions
- Infection control personnel
- Materials management, purchasing
- Manufacturing representatives

The working group's charge should be well-defined with definitive goals. They should investigate the products and practices in current use in various communities and review the scientific literature. They should explore the feasibility of implementing the change to BF scrubbing immediately vs offering BF scrubbing as an alternative to traditional scrubbing.

The group should choose products and practices carefully and without haste, using as many resources as possible. The entire Working Group and Staff must come to a consensus without allowing undue influence by one or two people.

#### Resources/Criteria for Choosing a Product

- AORN Recommended Practice for Surgical Hand Scrubs
- CDC Guideline for Hand Antisepsis
- FDA Tentative Final Monograph (TFM)
- Staff requirements
- Product information and studies; guidelines and recommendations from manufacturers
- Continuing educational activities on the topic
- Efficacy, safety
- Rapid action; persistence
- Non-irritating/sensitizing
- Skin effects
- Staff acceptance
- Cost

Note: For questions about choosing products, see reference #8 (Gruendemann & Bjerke AORN Journal, December 2001)

Manufacturers' sales representatives can be valuable assets in the exploration and selection of new products and practices. It is important to allocate time in the OR to meet with sales people. Following are a few of the qualities I personally like to see in a sales representative. (I hope!)

Qualities of a Valuable  
Manufacturer's Sales Representative

- Partnership
- Knowledge
- Reliability, timeliness
- Education and inservice
- Trial period and follow-up
- Professional behaviors

### Consider a Change in Practice

Always assume that if you are considering a change, your ultimate goal should be success and acceptance. Prepare for "bumps" in the road and deal with them, but also prepare for a positive change process. Many ORs have made the change to BF scrubbing, some did it in stages, others did it all at once. But all had success only when the process was well-thought-out and thorough.

Remember, surgical scrubbing is a time-honored tradition that we have been doing for a LONG time. Any change to this tradition can be painful and can result in rebellion and hostility. Therefore, I have included a few comments about CHANGE that I hope will stimulate some thinking about tradition in your OR and how you see the ability of your staff and physicians to change.

CHANGE must be viewed in both objective and subjective terms

Objectively, there is evidence for

- Getting rid of the brush
- Decreasing scrub times
- Excellent efficacy of alcohol-based products and other antimicrobials
- Skin-friendly ingredients in the available products
- The necessity of a pre-wash and for standardized scrub protocols
- The overall advantages of BF scrubbing
- Where data are lacking: do scrubbing practices affect ssi rates?

Subjectively

- Accept that habits and beliefs are difficult to alter
- Our willingness to change is influenced by how we were educated and mentored
- our colleagues

- whether we like/respect the leader of the change
- whether we like the sales people & the company
- How receptive we are to education (like this activity!)

Be aware of misconceptions and address them early in the process. A few are listed above, and you probably can list many more. Some see BF scrubbing as a “quick fix” to hasten turnover times, and some do not follow instructions carefully; for example, not allowing waterless alcohol agents to dry completely. Some also see BF scrubbing as a way to get rid of scrub sinks!!! -- fallacious thinking, to be sure! However, it is still prudent to consider what may come up as “disadvantages.” The advantages, though, totally override any disadvantages.

#### Misconceptions

- BF scrubbing does NOT include doing away with sinks and water!
- BF scrubbing requires a thorough pre-wash but does NOT require beginning the day with a traditional 5-minute scrub with a brush
- BF scrubbing is NOT a quick fix to hasten turnover times
- BF scrubbing is as precise a practice as traditional scrubbing requiring following the manufacturer’s recommendations.

#### Dilemmas

- What disadvantages might there be?
- What will we call the new practice?

### Summary

Although changes in traditional practices and products can be a difficult process, there is ample scientific evidence to support the efficacy of BF scrubbing in achieving hand antisepsis and maintaining skin integrity. BF scrubbing does NOT replace the scrub sink! Just as pre-cleaning is essential to the disinfection and sterilization of instruments, a pre-wash to remove debris is essential for effective BF scrubbing. Also important is following the manufacturer’s instructions, including allowing the alcohol product to dry thoroughly. It is important to di

"Brush-Free Surgical Hand Antisepsis"  
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#### Long and Artificial Nails References

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**Brush-Free Surgical Hand Asepsis**  
Barbara J. Gruendemann, RN, MS, FAAN, CNOR

**ACTIVITY EXAMINATION**

1. Which of the following is NOT an advantage of brush-free scrubbing?
  - a. skin-friendly
  - b. takes less time
  - c. does not require a pre-wash
  - d. is cost efficient
  
2. Which of the following statements about scrub time is TRUE?
  - a. Longer scrub times are required to remove an appropriate number of microorganisms.
  - b. Longer scrub times are more damaging to skin.
  - c. Studies document that 3- to 5-minute scrubs are superior to 2-minute scrubs.
  - d. Time doesn't matter if the antimicrobial used has persistence.
  
3. Iodophors are broad spectrum, have a wide range of activity, are potentially allergenic, and have good persistence.  
  
TRUE  
FALSE
  
4. CHG is broad spectrum, has a wide range of activity, is persistent, and is ototoxic.  
  
TRUE  
FALSE
  
5. PX has a narrow spectrum, a limited range of activity, is rapid-acting, persistent, and its efficacy is formula-dependent formula  
  
TRUE  
FALSE
  
6. Alcohol is rapid-acting, complete drying is essential, its persistence is related to excellent bacteriocidal activity, and the addition of moisturizers and emollients make alcohol preparations very skin-friendly.  
  
TRUE  
FALSE
  
7. Brush scrubbing is damaging to skin and increases the microbial count.  
  
TRUE  
FALSE
  
8. Brush scrubbing produces cleaner hands than brush-free scrubbing.  
  
TRUE  
FALSE
  
9. Waterless formulations used on the clinical floors are the same as those approved for brush-free scrubbing.  
  
TRUE  
FALSE

10. Waterless reparations are usually gels; water aids in the denaturing of protein.
- TRUE  
FALSE
11. Waterless agents appropriate for brush-free scrubbing must be labeled as such by the manufacturer.
- TRUE  
FALSE
12. A pre-wash is unnecessary when the manufacturer does not recommend it.
- TRUE  
FALSE
13. A pre-wash is essential only before the first brush-free scrub of the day.
14. Scrubbing with a brush is recommended by AORN and the CDC
- TRUE  
FALSE
15. Scrubbing with a brush may precipitate dermatitis
- TRUE  
FALSE
16. Brush-free scrubbing formulations are extraordinarily skin friendly due to emollients and moisturizers
- TRUE  
FALSE
17. Brush-free scrubbing formulations produce results more quickly with less skin irritation.
- TRUE  
FALSE
18. Which of the following statements about FDA approval is FALSE?
- An NDA number is required when a product does NOT meet Category I (“safe and effective”) approval.
  - FDA Category I (“safe and effective”) products are not issued an NDA (New Drug Approval) Number.
  - CHG requires an NDA number.
  - An NDA number is required for alcohol-based products such as brush-free scrubbing agents.
  - Brush-free scrub agents meet Category I criteria and do not require an NDA number.
19. The CDC *Recommendations for Surgical Hand Asepsis* and the AORN *Recommended Practices* both support the efficacy of brush-free scrubbing.
- TRUE  
FALSE
20. Both CDC and AORN recommend a standard 5 minute scrub for the first scrub of the day
- TRUE  
FALSE

21. Both CDC and AORN note the harmful effects of using a brush on the skin.

TRUE  
FALSE

22. Brush-free scrubbing eliminates the need for scrub sinks in the OR.

MISCONCEPTION  
TRUTH

23. Brush-free scrubbing is a quick fix designed to hasten turnover time.

MISCONCEPTION  
TRUTH

24. Brush-free scrubbing is a precise process just like traditional scrubbing.

MISCONCEPTION  
TRUTH

25. Brush-free scrubbing is not as effective as scrubbing with a brush.

MISCONCEPTION  
TRUTH

## ACTIVITY POST-TEST

### Brush-Free Surgical Hand Asepsis

Barbara J. Gruendemann, RN, MS, FAAN, CNOR

Write the correct response to each question and mail with evaluation form.

Item #	Correct Responses
1.	
2.	
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Brush-Free Surgical Hand Antisepsis  
ACTIVITY EVALUATION  
Location: [www.eChapter.org](http://www.eChapter.org)  
Approved for nursing contact hours until 12/05/06

Name \_\_\_\_\_ E-mail \_\_\_\_\_  
(required for certificate of successful completion)

Address \_\_\_\_\_ City, State \_\_\_\_\_

Purpose of this activity:

Brush-free scrubbing before a surgical procedure is a practice far more kindly to the skin than traditional scrubbing with a brush, and is adequately supported by scientific data. This activity will enable the learner to assess the scientific data supporting brush-free scrubbing, compare the results with the results of traditional scrubbing, and support a change in practice from the traditional approach to a cost-effective, time-saving, and much more skin-friendly approach to hand disinfection before surgical procedures.

Circle the number that best fits your evaluation of this activity.

1 = Not at all      2 = Somewhat      3 = Almost completely      4 = Completely

1. Rate achievement of each of the following objectives.
  - a. Compare the characteristics of the antiseptics that have traditionally been used for hand antisepsis.  
1                      2                      3                      4
  - b. Discuss scientific studies comparing various scrub times and different methods of scrubbing hands.  
1                      2                      3                      4
  - c. Explain the difference between FDA Category I antimicrobials and antimicrobials that require NDA approval and an NDA number.  
1                      2                      3                      4
  - d. Discuss the CDC and AORN recommendations related to preparation of hands for a surgical procedure.  
1                      2                      3                      4
2. Rate the effectiveness of the teaching/learning resources?      1      2      3      4
3. Were the objectives relevant to the overall purpose?      1      2      3      4
4. How long in minutes did it take the learner to complete the activity? \_\_\_\_\_

If you answered (1) to any of the above, please comment.

Your suggestions/comments/recommendations are valuable to us and will be considered as we plan future activities: