



**IFPN Guideline**  
**for**  
**Surgical Hand Scrubbing in the Perioperative Setting**

**PURPOSE:**

Skin is a major potential source of microbial contamination in the surgical environment. Although scrubbed members of the surgical team wear sterile gloves, the skin of their hands and forearms should be cleaned preoperatively to reduce the number of microorganisms in the event of glove tears. The purpose of the surgical hand scrub is to remove debris and transient microorganisms from the nails, hands, and forearms; reduce the resident microbial count to a minimum; and inhibit rapid rebound growth of microorganisms.

Each facility should have a policy and procedure for surgical hand scrubbing that considers the resources available in that facility. The following recommendations should be considered when drafting the policy and procedure for surgical hand scrubbing.

**RECOMMENDATIONS:**

A. Preparation for Surgical Hand Scrub:

1. Rings, watches, and bracelets should be removed before beginning the surgical hand scrub.

**Rationale:** During hand washing, rings, watches, and bracelets may harbor or protect microorganisms from removal. Allergic skin reactions may occur as a result of a scrub agent or a glove powder accumulating under the jewellery.

2. Fingernails must be kept short, clean, and healthy.

**Rationale:** The subungual region harbors the majority of microorganisms found on the hand. The risk of tearing gloves increases if fingernails extend past the fingertips.

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3. Artificial nails should not be worn.

**Rationale:** Artificial nails may harbor organisms and prevent effective hand washing.

4. Skin on hands and arms should be intact.

**Rationale:** Breaks in skin integrity and open lesions increase the risk of patient and surgical team member infection. Cuts, abrasions, exudative lesions, and hangnails tend to ooze serum, which may contain pathogens. Broken skin permits microorganisms to enter the various layers of skin, providing deeper microbial breeding grounds.

5. If timed scrub technique is used, a clock should be visible for the timed scrub.

**Rationale:** Standard timing is necessary for effective preparation of the surgical team's hands and arms.

6. An effective antimicrobial surgical hand scrub agent approved by the health care facility should be used for all surgical hand scrubs. The agent should be used according to the manufacturer's instructions.

**Rationale:** An antimicrobial agent kills microorganisms and reduces the level further by its residual effect, but can be inactivated by organic material. Efficacy of all agents depends on its proper use.

7. The selected antimicrobial hand scrub agent should:
  - Significantly reduce selected microorganisms on intact skin
  - Contain a non-irritating antimicrobial preparation
  - Be broad spectrum
  - Be fast acting

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- Have a residual effect

**Rationale:** Organisms reproduce in the moist environment of gloves, and gloves frequently become damaged during procedures; therefore, persistent chemical activity is desirable to suppress microbial growth. No agent is ideal in every situation. Agents should be selected based on these factors and their acceptability to the surgical team for their consistent use according to the manufacturer's direction.

8. A nonmedicated soap scrub followed by application of an alcohol-based hand cleanser may be used.

**Rationale:** The primary action of cleansing with soap is the mechanical removal of transient organisms. Vigorous rubbing with enough alcohol-based hand cleanser to cover the hands and forearms completely has been shown to be an effective method of antisepsis.

9. Surgical hand scrub agents should be stored in clean, closed containers. Reusable containers should be washed and dried thoroughly before refilling. Adding surgical hand scrub agents to partially filled reusable containers should be avoided. Disposable containers should be discarded when empty.

**Rationale:** Refilling before cleaning dispensers and adding surgical hand scrub agents to partially filled containers may cause contamination and contribute to the spread of potentially harmful microorganisms.

10. If brushes are used the selection of reusable or disposable brushes or sponges for scrubbing should be based on realistic considerations of effectiveness and economy.

**Rationale:** Studies show no significant difference in scrub effectiveness between reusable brushes and disposable brushes or sponges. Individually pre-packaged disposable brushes and sponges provide a cost-effective, labour-saving alternative to reusable brushes. If a reusable brush is desired, it

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should be easy to clean and maintain and should be durable enough to withstand repeated sterilization without bristles becoming soft or brittle.

## B. Surgical Hand Scrub:

1. The surgical hand scrub procedure should be standardized for all personnel according to the health care facility's policy and procedure.

**Rationale:** A standardised surgical hand scrub procedure establishes a single standard of care. Although the skin can never be rendered sterile, it can be made surgically clean by reducing the number of microorganisms.

2. The hands and forearms are thoroughly moistened and washed using an approved surgical scrub agent and rinsed before beginning the surgical scrub procedure.

**Rationale:** A short, pre-scrub wash loosens surface debris and transient microorganisms.

3. The water is of a comfortable temperature and steady flow.

**Rationale:** Setting the temperature and flow of the water before beginning the surgical hand scrub prevents cross-contamination.

4. The hands should be held higher than the elbows and away from surgical attire. Rinsing is performed from fingertips to elbows, using water flow and not hands. Vigorous shaking to dispel water from hands and arms is not sound practice.

**Rationale:** Hands and forearms are held higher than the elbows and out from the surgical attire to prevent contamination and to allow water to run from

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the cleanest area down the arm. Water droplets dispersed by shaking can contaminate surrounding attire or supplies.

5. Care should be taken to avoid splashing water onto surgical attire.

**Rationale:** A sterile gown cannot be put on over damp surgical attire without risk of resultant contamination of the gown by strike-through moisture.

6. An antimicrobial agent should be applied with friction to the wet hands and forearms.

**Rationale:** The principle action of hand washing is mechanical-vigorous rubbing that produces friction, which removes dirt, transient microorganisms, and some resident microorganisms.

7. Fingers, hands, and arms should be visualized as having four sides; each side must be scrubbed effectively.

**Rationale:** The surgical scrub is effective only if all surfaces are exposed to mechanical cleaning and chemical antisepsis.

8. Nails and subungual areas, and only nail and subungual areas, should be brushed

**Rationale:** The majority of flora on the hands is found under and around the fingernails. Brushing other areas of the hands and arms has been shown to abrade the skin surface detrimentally.

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9. If using the timed technique, the total time of the surgical hand scrub should be at least two minutes. It is useful to break the process into three stages: First, wash hands and arms as far as elbows; second, wash hands and arms but not as far as the elbow; third, wash hands and only two-thirds of forearm.

**Rationale:** Optimal length of scrub time is not known, but recent studies suggest scrubbing for at least two minutes is as effective at reducing bacterial colony counts as the traditional ten-minute scrub. Longer scrubs lead to a greater number of skin problems among staff and discourage compliance.

10. If using the counted stroke technique, the digits, hands, forearms, and arms are divided into four planes.

- Each plane requires 10 strokes with the scrub sponge.
- The digits have 4 planes, and each digit will have a total of 40 strokes.
- The dorsal and palm of the hand will have a total of 30 strokes.
- The forearm has 4 planes, and it will have a total of 40 strokes.
- The elbow has 4 planes, and it will have a total of 40 strokes.
- The arm 5 cm above the elbow has 4 planes and it will have a total of 40 strokes.
- The counted stroke technique will be completed on the right and left side.

11. Hands and forearms should be blotted dry starting with the fingertips and proceeding to elbows with a sterile cloth or disposable towel before donning sterile gown or gloves.

**Rationale:** Rubbing skin to dry it will further disturb skin cells. The fingertip to elbow process completed on one hand and using another portion of the sterile towel (or another sterile towel) to dry the other hand preserves the hands as the cleanest area.

12. Brushes or sponges used should be discarded appropriately.

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**Rationale:** Appropriate disposal of used items prevents cross-contamination of the surgical hand scrub area. Reusable brushes should be decontaminated and sterilised before reuse.

13. If a waterless microbial agent is selected, the agent must be used in strict accordance with the manufacturer's directions.

**Rationale:** If the traditional role of water is replaced by another mechanism, that mechanism must be efficacious.

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