Hand Hygiene: Hand and Arm Drying following Surgical Scrub

What is Hand and Arm Drying following Surgical Scrub?
› Hand hygiene, also known as hand antisepsis, in the healthcare environment refers to a set of practices that are at the core of standard precautions; standard precautions are first-line infection control measures to reduce the risk of transmitting microorganisms to patients, healthcare workers, and others. Surgical scrubbing (also referred to as surgical hand antisepsis) is the procedure for systematically cleansing the hands, fingers, nails, wrists, and lower arms prior to entering the sterile operating room (OR) or surgical suite. Utilizing proper technique to dry the arms and hands after performing a surgical scrub procedure is crucial to avoid recontaminating the hands and subsequently contaminating the surgical field. For details on the steps involved in surgical scrubbing, see Nursing Practice & Skill ... Hand Hygiene: Surgical Scrub - Performing

• What: Hand and arm drying is performed immediately following surgical scrubbing to prevent contamination of the hands and arms or surgical field that could occur if water were allowed to run from the least clean area (i.e., the elbows) to the most clean area (i.e., the hands) or to drip onto the surgical field. Also, having wet hands interferes with putting on sterile gloves, which are required for any surgical procedure
• How: Hand and arm drying is performed using two sterile towels, one for each of the upper extremities. As during the surgical scrub procedure, hands must be held higher than elbows, above the waist, and away from the body during hand and arm drying in order to prevent water from running from the least clean area to the most clean area
• Where: In the OR, drying of hands and arms is performed away from the surgical equipment table and surgical field
• Who: Proper drying of the hands and arms is necessary for all surgical team members who scrub in, including surgeons, nurses, and surgical technicians

What is the Desired Outcome of Hand and Arm Drying following Surgical Scrub?
› The desired outcome of thorough drying of the hands and arms following surgical scrubbing is prevention of microorganism transfer to the patient and surgical field, thereby helping to prevent surgical site infection (SSI; i.e., infection that develops at or near a surgical incision within 30 days following a surgical procedure)

Why is Hand and Arm Drying following Surgical Scrub Important?
› Hands and arms that remain wet become a breeding ground for microorganisms; failure to utilize the correct technique to dry scrubbed hands and arms will recontaminate hands and arms, gown sleeves, and gloves, and increase the patient’s risk of developing an SSI
› The procedure of surgical scrubbing and drying of the hands and arms afterward is mandated by numerous professional and regulatory organizations, including the Centers for Disease Control and Prevention (CDC), Association of Surgical Technologists (AST), Infectious Diseases Society of America (IDSA), Society for Healthcare Epidemiology of America (SHEA), and Association of periOperative Registered Nurses (AORN)
Facts and Figures

› SSIs result in prolonged illness and hospitalization and substantially increased medical costs. In the U.S. in 2009, it was estimated that SSIs lengthened hospital stays by an average of 9.7 days and increased medical costs by over $20,000 per admission (Reichman et al., 2009)

• Surgical scrubbing is only one method of preventing SSIs. Additional standard practices include
  – administration of preoperative antibiotics
  – cleansing and/or applying antimicrobial solutions to the intended surgical site (i.e., surgical site preparation)
  – proper sterilization of surgical equipment
  – wearing appropriate surgical attire (e.g., personal protective equipment [PPE] and sterile surgical attire)
  – maintaining the sterility of the surgical suite
  – double-gloving if there is a high risk of tearing gloves

What You Need to Know Before Drying Hands and Arms following Surgical Scrub

› Prior to drying hands and arms following surgical scrub, the nurse clinician should be knowledgeable about the following:
  • The purpose of surgical scrubbing and proper drying of arms/hands, and the use of other standard practices to minimize risk for SSIs (see Facts and Figures, above, and the Nursing Practice & Skill ... Hand Hygiene: Surgical Scrub -Performing, referenced above, as well as the CINAHL series of papers on SSI prevention)
  – In recent years, professional practice organizations have recommended changes to the surgical scrubbing procedure based on research as to how best to achieve antisepsis (i.e., reduction of the number of microorganisms on the skin’s surface). Although the procedure for drying of the hands and arms following surgical scrubbing has remained unchanged, some facilities have begun using alcohol-based hand rubs (HRs; i.e., an alcohol-based antiseptic agent that does not require use of exogenous water) following drying of the hands and arms to promote antisepsis of the hands and provide additional protection against SSIs
    - HRs include liquid, gel, or foam solutions that generally contain one or more types of alcohol (e.g., ethanol, isopropanol, or N-propanol); in the U.S. most hand rubs are composed of 60–95% ethanol or isopropanol
    - The HR must be applied systematically and thoroughly to ensure all surfaces of the hands are treated, and must be permitted to air dry completely prior to donning gloves because the drying effect destroys surface microorganisms and alcohol can impair the integrity of gloves. (For details, see Nursing Practice & Skill ... Hand Hygiene: Antisepsis Using an Alcohol-Based Rub –Performing)
  • Standard precautions for infection control and the importance of strict adherence to facility policies regarding surgical aseptic technique
    – For general information about the use of surgical asepsis and the distinction between surgical asepsis and general aseptic non-touch technique (ANTT), see Nursing Practice & Skill ... Aseptic Technique and Infection Prevention: Applying Principles
    – The principle of “clean to dirty” is a basic principle of infection control, which, in the case of drying hands and arms refers to the following:
      - The fingertips are considered the cleanest area of the upper extremities, while the elbows are considered the least clean. Cleaning and drying of the hands and arms should proceed from most clean to least clean (i.e., from the fingertips toward the elbows)
      - Hands are held above the level of the elbows at all times so that water runs from the most clean area to the least clean area
      - Hands and arms are held
        - away from scrub clothes/gown at all times to avoid contaminating either the hands and arms or gown
        - above the level of the waist because area below the level of the waist is not considered sterile
  • Equipment and supplies necessary for hand and arm drying in the OR
    – Although some facilities permit use of a single towel to dry both sets of arms/hands (utilizing a separate area of the towel for each extremity), most healthcare facilities require the use of two towels, one for each extremity, to reduce the risk of contamination. Towels must be sterile and lint-free to avoid contamination
    – The hand and arm drying procedure may be performed independently or assisted by a second, sterile member of the surgical team. If performed independently, it is necessary to set up a workstation in the OR, away from the sterile field, on which you will position sterile towels on a sterile field. Packaging for the towels must be opened using aseptic technique.
    – If a second team member is assisting you, towels will be handed to you

› Preliminary steps that should be performed prior to drying hands and arms following surgical scrub include the following:
• Review facility policies for infection control and surgical aseptic technique, if available
• Become familiar with equipment and supplies used in your facility’s OR (e.g., sterile towel packs, alcohol-based hand rubs) and the manufacturer’s directions for use
• Follow facility protocol regarding appropriate activities to be performed prior to hand and arm drying following surgical scrub, including applying appropriate preliminary scrub attire and removing jewelry (e.g., rings, watches, bracelets)

› Verify availability of the following supplies/equipment (Figure 1):
  • Facemask and appropriate scrub attire
  • Flat surface within the OR located away from the main sterile field
  • Sterile pack containing gown and gloves
  • 1 or 2 sterile, lint-free towels (may be contained within sterile gown/glove pack)

![Figure 1: Sterile towels. Copyright©2014, EBSCO Information Services](image)

How to Dry Hands and Arms following Surgical Scrub

› Apply a facemask and other appropriate preliminary scrub attire prior to entering the surgical scrub area
› If hand and arm drying will be unassisted, prepare towels (and gown/gloves) on a sterile field within the OR prior to scrubbing
  • Locate a flat surface in an area of the OR away from the main sterile field. Note: the equipment table is considered part of the main sterile field
  • Using aseptic technique, open the wrapper of a sterile gown and glove pack to create a sterile field
  • Note the number of sterile towels within the pack. If you need additional towels, open a towel pack onto the sterile field
  • Return to the surgical scrub area and perform the surgical scrub
› After performing the surgical scrub, proceed through the OR doors backwards (i.e., lean against the door with your back, push open the door without using hands or arms) to the drying area, keeping hands above the level of the elbows and both hands and arms above the waist and away from clothing
  
› Stand a minimum of 12 inches away from the sterile field
› If hand and arm drying is unassisted, grasp one sterile, lint-free towel by the corner and lift it up and off the sterile field without allowing wet hands and arms to drip onto the sterile field (Figure 2)
Figure 2: Grasp one sterile, lint-free towel by the corner and lift it up and off the sterile field without allowing wet hands and arms to drip onto the sterile field. Copyright©2014, EBSCO Information Services

› If the procedure is assisted, a second, sterile team member will hand you the sterile towel. Do not reach for the towel; allow the team member to drape the towel over your hand
› Step back from the sterile field and lean slightly forward to avoid dripping water onto the sterile field or onto scrub clothes. Do not allow the towel to touch scrub clothes
› Allow the towel to completely unfold by gravity and drape over forearm; do not shake the towel to unfold it
› Use the top half of the towel to blot (*not rub*) dry the hand and arm, proceeding in the following order: fingertips and fingers, palm, back of hand, wrist, rotating down forearm to ~ 2 inches/5 cm above the elbow before discarding towel (*Figure 3*)

Figure 3: Dry the hand and arm, proceeding in the following order: fingertips and fingers, palm, back of hand, wrist, rotating down forearm to ~ 2 inches/5 cm above the elbow before discarding the towel. Copyright©2014, EBSCO Information Services

- Always move from the most clean area to the least clean area (e.g., finger tips to elbow)
- Do not return to an area of the skin once it has been blotted dry
• Do not use a rubbing motion to dry the hands and arms
  – Rubbing the skin dry after surgical scrubbing can shed skin cells and surface microorganisms into the air which could contaminate the surgical field

› Utilize the bottom half or opposite side of the same towel, or carefully discard the used towel and obtain a new sterile towel, to dry the opposite hand and forearm using the procedure described above
› If application of an alcohol-based HR is part of your facility’s protocol, apply the HR to the hands, maintaining asepsis and following the manufacturer’s directions for use (see Nursing Practice & Skill ... Hand Hygiene: Antisepsis Using an Alcohol-Based Rub -- Performing )
› Allow the HR to air-dry completely prior to donning gloves
› To avoid contaminating your hands, keep hands above the level of the elbows until sterile gown and gloves are donned
  (for more information on the use of sterile gloves, see Nursing Practice & Skill ... Gloves, Sterile: Using for Surgical Procedures )
› Do not touch anything non-sterile during or after drying hands and arms. Surgical scrubbing must be repeated if the hands become contaminated

Other Tests, Treatments, or Procedures That May be Necessary Before or After Hand and Arm Drying following Surgical Scrub
› Strict surgical aseptic technique will be maintained when donning sterile gown and gloves, and throughout the surgical procedure

What to Expect After Hand and Arm Drying following Surgical Scrub
› Hand and arm drying will have been performed systematically and in accordance with facility policies. Throughout the procedure, the hands and forearms will have remained protected from contamination; the surgical field will remain sterile; and risk for SSI will be reduced

Red Flags
› Frequent use of alcohol-based HRs can dry and irritate the skin on the hands, potentially leading to skin breakdown and increasing the number of microorganisms on the skin
› Surgical scrubbing must be repeated if the hands or arms become contaminated (e.g., by being lowered below the waist, being dried from least clean to most clean)

What Do I Need to Tell the Patient/Patient’s Family?
› The patient should be informed by the treating clinician about possible risks of surgery, including SSI
› Educate the patient/family about the steps taken before and during surgery to prevent infection
› Provide the patient/family with written information about the importance of standard precautions (e.g., hand hygiene, cough etiquette) in preventing infection during the patient’s hospital stay and on an ongoing basis

Note
› Recent review of the literature has found no updated research evidence on this topic since previous publication on March 21, 2014

References

