

SSCSIP

Strengthening Specialised Clinical Services in the Pacific

An Australian Aid initiative

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Pacific Perioperative Practice Bundle

Infection Prevention

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Background

The patient's surgical outcome can be adversely affected by the development of surgical site infection (SSI) leading to increased mortality and morbidity, increased length of stay and financial implications.¹ Effective infection prevention and control practices in the perioperative environment require a range of strategies that are based on current available evidence. These strategies are central to reducing SSI and in providing high quality health care for patients and a safe working environment for staff.^{2, 3-6}

Understanding rationales for practice as well as how and when to apply the basic principles of infection prevention and control are critical to the success of an infection prevention program and can directly influence outcomes for perioperative patients undergoing procedures.⁷

The 'bundle' approach to infection prevention was first described in 2005 and defined as 'a structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices— generally three to five— that, when performed collectively and reliably, have been proven to improve patient outcomes'.⁸ The bundle approach has been widely adopted and shown to be an effective way of reducing hospital acquired infections (HAI).²

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Introduction

Healthcare workers are a major source of bacteria in the perioperative environment and each person must take effective measures to minimise risks of transferring micro organisms to patients and other staff. Skin and hair shed from the body and from the wearing of outdoor clothing contain bacteria that can be potential causes of contamination. To reduce the risk of contamination all healthcare workers entering the semi restricted and restricted areas of the perioperative environment should change into clean, facility-laundered, surgical attire made of nonwoven material.⁷

The skin of the surgical team is a potential source of microbial contamination. Effective hand hygiene practices, incorporating World Health Organisation (WHO) '5 Moments of Hand Hygiene' is an essential strategy in the prevention and control of healthcare associated infections.^{2,3,9-12} Although scrubbed members of the surgical team wear sterile gloves, the skin of their hands and forearms should be cleaned preoperatively to significantly reduce the number of resident and transient microorganisms and leave an antimicrobial residue which will inhibit microbial growth for several hours.

The skin, mucous membranes and hollow viscera of the patient are also a major sources of endogenous flora which may contribute to SSI. Preoperative skin preparation aims to remove soil and transient microorganisms from the skin, thus reducing the resident microbial count to sub-pathogenic levels with the least amount of tissue irritation and inhibiting the rebound growth of microorganisms. Risks are minimised by the wearing of protective apparel and the implementation of standard precautions for all patients receiving care in the healthcare facility (HCF) regardless of their diagnosis or presumed infection status, including blood (including dried blood), all body substances, secretion and excretions, non-intact skin and mucous membranes, including eyes.

The Pacific Perioperative Practice Bundle (PPPB) - Infection Prevention comprises:

- | | |
|-------------------|--|
| Standard 1 | PPPB 1 Hand Hygiene |
| Standard 2 | PPPB 2 Perioperative Attire |
| Standard 3 | PPPB 3 Aseptic Technique |
| Standard 4 | PPPB 4 Protective Apparel |
| Standard 5 | PPPB 5 Scrubbing, Gowning and Gloving |
| Standard 6 | PPPB 6 Skin Preparation of the Surgical Patient |

Standard 1 PPPB 1: Hand Hygiene

Rationale

Hand to skin contact is a common source of transmission for micro-organisms. Effective hand hygiene is the single most important strategy in preventing healthcare associated infections¹⁰. It is part of Standard Precautions and applies to all patients receiving care in healthcare facilities regardless of their diagnosis and infectious status⁷. Healthcare workers hands can become contaminated by personal contamination and by contact with the environment and equipment, the patient, the patient's surroundings and belongings or other healthcare workers.^{3,9,10, 14-16}

Standard 2 PPPB 2: Perioperative Attire

Rationale

A clean perioperative environment is beneficial for both patients and perioperative team members.¹⁶ The wearing of perioperative attire assists in reducing contamination within the perioperative environment. This assists in providing safe patient care by reducing the risk of hospital acquired infections (HAI).

Standard 3 PPPB 3: Aseptic Technique

Rationale

Aseptic technique, as practised by perioperative nurses, can reduce the risk to the patient of exposure to microorganisms that may lead to the SSI. Application of the principles of aseptic technique depends primarily on the nurse's understanding and surgical conscience. All members of the surgical team must share the responsibility for monitoring aseptic practice and initiating corrective action when a sterile field is compromised.¹⁷

Standard 4 PPPB 4: Protective Apparel

Rationale

The use of protective apparel, including personal protective equipment (PPE) has proven effective against transmission of pathogens in the OR. The implementation of Standard Precautions, including the use of protective apparel will protect the caregiver and the patient against transmission of micro organisms and reduce the specific risk of contamination by blood borne pathogens. ¹⁶

Standard 5 PPPB 5: Scrubbing, Gowning and Gloving

Rationale

The surgical scrub, when properly performed, has been shown to remove transient flora from the fingernails, hands and forearms, reduce the resident microbial population and slow the growth of bacteria in order to reduce the risk of a SSI. ⁷ A standardised surgical scrub procedure ensures the surgical team consistently follow a surgical scrub procedure designed to achieve effective reduction of resident and transient microorganisms on the hands and arms. ¹⁷

Standard 6 PPPB 6: Skin Preparation of the Surgical Patient

Rationale

Preoperative washing removes gross contaminants and oils that may block penetration of the antiseptic agent used during skin preparation and reduce the presence of pathogens on the skin. Performing preoperative skin preparation immediately prior to surgery using an antimicrobial agent reduces the risk of postoperative SSI by removing soil, resident and transient microorganisms from the skin. ⁷

Glossary

Term	Definition
<i>5 moments of Hand Hygiene</i>	Based on a World Health Organisation initiative launched on 5th May 2009 'Save Lives: Clean Your Hands'. The 5 moments have been identified as the critical times during patient care, that hand hygiene should be performed.
<i>Alcohol-based hand rub (ABHR)</i>	Is considered the gold standard (best practice) for hand hygiene in health care. Alcohol has been found to be more effective against bacteria and viruses than medicated and non-medicated soaps.
<i>Adornments</i>	An adornment is generally an accessory or ornament worn to enhance the beauty or status of the wearer. Fingernail adornments range from studs to chains placed through the fingernail(s).
<i>Aerosolised contaminants</i>	Contaminants that may be in microscopic particles dispersed in air or gas. These contaminants may be generated during debridement of wounds (such as trauma or gas gangrene). Healthcare equipment may also aerosolise contaminants such as surgical plume, bone cement vapours, bone saw dust, plaster dust or chemical vapours ie. formalin, Cidex etc.
<i>Antimicrobial agent</i>	Agents capable of preventing or inhibiting the growth of resident or transient microorganisms.
<i>Asepsis</i>	The prevention of microbial contamination of living tissues or sterile materials by removal, exclusion or destruction of microorganisms.
<i>Aseptic field</i>	Previously termed 'sterile field'. Terminology has changed to aseptic technique because items are only 'sterile' whilst they remain within an intact package that has been sterilised. Once a sterile package is opened and inner items are exposed to the atmosphere, the items can no longer be considered 'sterile'; they are considered 'aseptic'.
<i>Aseptic techniques</i>	Techniques that protect patients during invasive clinical procedures by employing infection control measures that minimise, as far as practical, the presence of microorganisms. In perioperative environments this applies to the handling of instruments, the draped patient, draped trolleys as well as the clothing and gloves of the surgical team.

<i>Contaminated</i>	The presence of potentially infectious pathogenic microorganisms.
<i>Contamination</i>	The introduction of microorganisms and/or foreign matter to sterile or non-sterile materials or living tissue.
<i>Event-related sterility</i>	The sterility of an item is event-related rather than time-related. It may depend on the events occurring during storage and handling of the item eg. damage to packaging materials, soiling, becoming wet, prolonged exposure to sunlight, exposure to vermin etc.
<i>Facility laundered</i>	Onsite hospital run laundry used for washing patient linen and clothing and in some facilities, perioperative attire.
<i>Fenestration</i> <i>eg. fenestrated drape</i>	Drape with a central window that permits access to a small area beneath the drape.
<i>Impervious</i>	Item which does not permit the passage of liquid.
<i>Must</i>	Indicates a mandatory action requiring compliance.
<i>Non-woven material</i>	Cotton and polyester combination, recommended for use in healthcare textiles.
<i>Perioperative environment</i>	The service area where the provision of an anaesthetic, surgical or other procedure may be undertaken.
<i>Receptacles</i>	Containers to receive items on the aseptic field eg. gallipots, kidney dishes, or rubbish bags to dispose or reprocess items eg. linen bags.
<i>Restricted areas</i>	Restricted areas are limited to authorised personnel wearing perioperative attire and include operating or procedural rooms, sterile stock rooms and areas for the processing of sterile items.
<i>Semi restricted area</i>	Semi-restricted areas are limited to personnel usually wearing perioperative attire although some hospitals may allow staff wearing uniforms access to these areas e.g. recovery staff, ward staff accessing recovery. Semi-restricted areas include peripheral support areas, such as reception, holding bays and corridors leading to restricted areas.
<i>Should</i>	An obligation, duty or correctness. An action that should be followed unless there are sound reasons for taking a different course of action.

<i>Skin integrity</i>	Intact skin is the first line of defense against infection. When the skin shows signs of damage such as scratches, cuts, rashes etc the skin integrity is compromised.
<i>Squames</i>	Dead skin cells which are constantly being shed from skin surfaces.
<i>Standard precautions</i>	The primary strategy for nosocomial infection control and prevention of worker exposure. Standard precautions are used for all patients, regardless of their diagnosis or presumed infectious status. They include good hygiene practices and the use of protective barriers such as gloves, gowns, plastic aprons, masks and eye shields/goggles. Standard precautions also encompass the appropriate handling and disposal of sharps and other contaminated or infectious waste. The use of aseptic technique is essential.
<i>Sterile field</i>	See 'aseptic field'
<i>Sterilisation</i>	Complete destruction of microorganisms including spores.
<i>Surgical conscience</i>	An individual's professional honesty and inner morality system, which allows no compromise in practice whether a breach occurs within the team or when working alone.
<i>Unrestricted</i>	In the unrestricted areas there is unlimited access to all personnel, who may wear either perioperative attire or street clothes. These unrestricted areas are the entry points for patients, personnel, stock and supplies, e.g. staff changing rooms.

References

1. Wilson, J. (2015). How to reduce the risk of surgical site infections. *Nursing Times* 111, 38, 12 – 16.
Available at: <http://www.nursingtimes.net/download?ac=1310036>.
2. National Health and Medical Research Council (NHMRC) (2010). *Australian guidelines for the prevention and control of infection in health care*. Canberra: NHMRC.
Available at:
http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/cd33_infection_control_healthcare.pdf
3. Australian Commission on Safety and Quality in Health Care (ACSQHC) (2012). *National safety and quality health service standards, standard 3, preventing and controlling healthcare associated infections*, pp. 26–33. Sydney: ACSQHC.
4. Australian Safety and Compensation Council (ASCC) (2008). *Occupational exposures of Australian nurses*. Canberra: ASCC. Available at:
http://www.safeworkaustralia.gov.au/sites/swa/about/publications/Documents/331/OccupationalExposures_AustralianNurses_2008_PDF.pdf.
5. Centers for Disease Control and Prevention (CDC) (2005). *Guidelines for preventing the transmission of mycobacterium tuberculosis in health-care settings*. Available at:
<http://www.cdc.gov/tb/publications/guidelines/infectioncontrol.htm>.
6. Centers for Disease Control and Prevention (CDC) (2002). *Guidelines for hand hygiene in healthcare settings*. United States Department of Health and Human Services. Available at:
<http://www.cdc.gov/handhygiene/>
7. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing. Asepsis and Clinical Care*. Adelaide: ACORN.
8. Resar, R., Pronovost, P., Haraden, C., Simmonds, T. et al. (2005). Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. *Joint Commission Journal on Quality and Patient Safety* 31, 5, 243-248.8.
9. NSW Health (2010) *PD2010_058: Hand hygiene policy*. Sydney: NSW Health.
10. World Health Organisation (WHO) (2009). *WHO guidelines on hand hygiene in healthcare*. Geneva: WHO Press. Available at: <http://www.who.int/gpsc/5may/en/>

11. Hand Hygiene Australia (HHA) (2013). *5 moments for hand hygiene manual*. Available at: www.hha.org.au
12. Garbutt, S. J. (2011). Hand hygiene in the OR: Using evidence-based practices. *OR Nurse* 5, 2, 10-12.
13. Patrick, M. & Van Wicklin, S. (2012). Implementing AORN recommended practices for hand hygiene. *AORN Journal* 95, 94, 492 – 507.
14. World Health Organisation (WHO) (2010). *Guide to local production: WHO recommended handrub formulations*. Geneva: WHO Press.
15. NSW Health. (2007). *PD2007_036: Infection control policy*. Sydney: NSW Health.
16. Spruce, L. (2014). Back to basics: Surgical attire and cleanliness. *AORN Journal* 99, 1, 140 -143.
17. Spry, C. (2015). Infection prevention and control. In J. Rothrock, & D. McEwen (Eds.). *Alexander's care of the patient in surgery* (15th ed.) (pp. 69-123). St Louis: Mosby.

FURTHER READINGS AND RESOURCES

Association of perioperative Registered Nurses (AORN). (2011). *Recommended practices for surgical attire. In perioperative standards and recommended practices*. Denver: AORN.

Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.

Haraden, C. (2015). *What is a bundle?* Available at:

<http://www.ihi.org/resources/Pages/ImprovementStories/WhatsaBundle.aspx>

Infection Prevention: Hand Hygiene

Scope of Standard

All areas of the healthcare facility.

Scope of Responsibility

All perioperative nurses.

This standard may also apply to other perioperative personnel (ie surgical ward interns, nurses, orderlies, ward assistants, doctors (anaesthetists and surgeons) anaesthetic technicians etc).

Principles

1. THE NURSE'S HANDS ARE INSPECTED FOR ANY DAMAGE TO SKIN INTEGRITY
2. THE NURSE OBSERVES HAND HYGIENE IN ALL AREAS OF THE HEALTHCARE FACILITY
3. THE NURSE OBSERVES THE 5 MOMENTS OF HAND HYGIENE CONSISTENTLY IN CLINICAL SITUATIONS
4. HAND HYGIENE IS SUPPORTED BY THE USE OF GLOVES WHEN DIRECT CONTACT IS REQUIRED
5. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

PRINCIPLE 1: THE NURSE'S HANDS ARE INSPECTED FOR ANY DAMAGE TO SKIN INTEGRITY

Rationale

Intact skin is the first line of defense against infection. Damaged skin can not only lead to infection in the host, but can also harbour higher numbers of microorganisms than intact skin and hence increase the risk of transmission to others ¹.

Criteria

Correct hand hygiene practices include:

- 1.1 maintenance of healthy nails and skin
- 1.2 taking timely action in the event of skin irritation/allergies
- 1.3 using hand lotion/moisturiser that is compatible with hand hygiene products (Note. Care should be taken by personnel experiencing skin irritation or allergies).
- 1.4 keeping finger nails short and clean
- 1.5 not wearing nail polish, artificial or acrylic nails, devices or other adornments
- 1.6 not wearing jewellery on the hands or wrist ^{2,3,4,5}

PRINCIPLE 2: THE NURSE OBSERVES HAND HYGIENE IN ALL AREAS OF THE HEALTHCARE FACILITY

Rationale

Hands can become contaminated with infectious agents through contact with the environment, equipment and by personal contamination. Healthcare facilities must ensure that hand hygiene products, equipment and facilities are available for healthcare workers and positioned as close to the point of patient care.³

Criteria

2.1 The nurse should perform hand hygiene consistently while at work, including :

- on arrival at the healthcare facility
- prior to leaving the healthcare facility^{2,3,4,5}

2.2 The nurse should perform hand hygiene consistently when attending to personal hygiene, including:

- before and after using the bathroom
- after touching or blowing one's nose
- before and after eating^{2,3,4,5}

PRINCIPLE 3: THE NURSE OBSERVES THE 5 MOMENTS OF HAND HYGIENE CONSISTENTLY IN CLINICAL SITUATIONS

Rationale

Hands can become contaminated with infectious agents through contact with the patient's blood (including dried blood), all body substances, secretions and excretions, non-intact skin and mucous membranes (including eyes). Hand hygiene procedures apply to all surfaces of the hands including the wrists.

Criteria

The 5 Moments of hand hygiene should be performed in clinical situations, including:

- | | | |
|-----|----------|--|
| 3.1 | Moment 1 | Before touching the patient
eg. transferring patient to the operating table, applying BP cuff |
| 3.2 | Moment 2 | Before a procedure
eg. inserting a urinary catheter or applying a dressing |
| 3.3 | Moment 3 | After a procedure or exposure to body fluids
eg. removing a dressing, preparing to collect a specimen |
| 3.4 | Moment 4 | After touching a patient
eg. feeling for the patient's pulse |
| 3.5 | Moment 5 | After touching a patient's surroundings
eg. cleaning the operating table, handling the patient's linen ⁶ |

(Note. When gloves are donned to undertake the above actions, hand hygiene should be performed before donning gloves, and also after removing gloves and PPE

PRINCIPLE 4: HAND HYGIENE IS SUPPORTED BY THE USE OF GLOVES WHEN DIRECT CONTACT IS REQUIRED

Rationale

Wearing gloves provides a level of protection from direct contact with blood, body fluids and other workplace contaminants (see also PPPB 4 Protective Apparel).

Criteria

- 4.1 Gloves should be single use
- 4.2 Gloves should be worn whenever there is direct contact with blood, body fluids, non-intact skin, mucous membranes and environmental surfaces ⁷
- 4.3 Gloves should be discarded IMMEDIATELY after use
- 4.4 Gloves do not replace the need for hand hygiene. Prolonged or inappropriate use of gloves undermines efforts to sustain correct hand hygiene ¹
- 4.5 Hand hygiene should be performed before donning and after removal of the gloves.
(Note. Gloves do not provide complete protection against hand contamination. Pathogens may contaminate the hands through glove defects or by contamination of the hands during removal).

PRINCIPLE 5: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning ^{8,9}.

Criteria

- 5.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.
- 5.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.

See following pages for recommended procedures.

Recommended procedure for hand hygiene: Hand washing ¹⁰

Wash hands to the wrists with soap and clean water or hand wash when visibly soiled.

Duration of procedure should be 40-60 seconds.

1. Wet hands to the wrists with water
2. Apply enough soap to cover all hand surfaces to the wrists - If using an antimicrobial hand washing agent, the manufacturer's recommendations must be followed.
3. Rub hands palm to palm
4. Rub right palm over left dorsum with interlaced fingers and vice versa
5. Rub palm to palm with fingers interlaced
6. Rub backs of fingers to opposing palms with fingers interlocked
7. Perform rotational rubbing of left thumb clasped in right palm and vice versa
8. Perform rotational rubbing backwards and forwards with clasped fingers of right hand in left palm and vice versa
9. Rinse thoroughly with water as this reduces the number of microorganisms and prevents skin irritation
10. Dry hands thoroughly with single use towel to prevent skin irritation
11. Use elbows, sensor or knees to turn off the tap to prevent contamination of the hands from the tap

In addition:

12. Antimicrobial agents kill or inhibit microorganisms and are more effective against microorganisms than plain soap ³.
13. Antimicrobial agents further reduce microbial levels by their residual effect, but are quickly inactivated by organic material.
14. If cakes of soap are used, they should be small in size and changed daily. Soap racks that allow for drainage of water should also be used. These practices minimise the risk of contamination and minimise the risk of transferring microorganisms between users.
15. If liquid soap is used, the dispenser should be replaced or cleaned and filled with a fresh handwashing agent when empty. Liquid soap should not be added to a partially full dispenser as this will increase the microorganism count.

Recommended procedure for hand hygiene: Alcohol-based handrub (ABHR) ¹¹

Duration of the procedure should be 20-30 seconds.

1. Apply palmful of alcohol-based handrub into a cupped hand
2. Rub hands palm to palm – mechanical friction is an important component of handwashing
3. Rub right palm over left dorsum with interlaced fingers and vice versa
4. Rub palm to palm with fingers interlaced
5. Rub backs of fingers to opposing palms with fingers interlocked
6. Perform rotational rubbing of left thumb clasped in right palm and vice versa
7. Perform rotational rubbing backwards and forwards with clasped fingers of right hand in left palm and vice versa
8. Allow alcohol-based handrub to dry prior to using hands

In addition:

9. Alcohol kills bacteria more effectively than most other handwashing agents and if available alcohol-based handrubs should be used when the hands are not visibly soiled
10. Hand lotions should be available to prevent skin dryness. Bacterial counts increase when the skin is damaged. Preventing skin dryness on health-care workers hands will increase handwashing compliance. Care must be taken to prevent cross-contamination from multiple use bottles.

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REFERENCES

1. Hand Hygiene Australia (HHA) (2015). Hand care issues [web page]. Retrieved from <http://hha.org.au/About/ABHRS/abhr-limitations/hand-care-issues.aspx>
2. World Health Organisation (WHO) (2009). *WHO guidelines on hand hygiene in healthcare*. Geneva: WHO Press. Retrieved from <http://www.who.int/gpsc/5may/en/>
3. National Health & Medical Research Council (2010). *Australian guidelines for the prevention and control of infection in healthcare*. Retrieved from: <https://www.nhmrc.gov.au/guidelines-publications/cd33>
4. Patrick, M & Van Wicklin, S. (2012). Implementing AORN recommended practices for hand hygiene. *AORN Journal* 95, 94, 492 – 507.
5. NSW Health (2007) *Alcohol based hand cleansers and fire*. NSW Health Safety Information S1:001/07. Sydney: NSW Health.
6. Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.
7. Association of perioperative Registered Nurses (AORN). (2011). *Recommended practices for surgical attire*. In *perioperative standards and recommended practices*. Denver: AORN.
8. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841 – 846.
9. Anderson, I. (2012). Documentation: Impact on quality care. Nursing Documentation. www.nursetogether.com
10. World Health Organisation (WHO) (2009). *WHO guidelines on hand hygiene in healthcare*. How to hand wash poster. Geneva: WHO Press. Retrieved from http://www.who.int/gpsc/5may/How_To_HandWash_Poster.pdf
11. World Health Organisation (WHO) (2009). *WHO guidelines on hand hygiene in healthcare*. How to handrub poster. Geneva: WHO Press. Retrieved from http://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf
12. International Perioperative Nurses Federation. (IFPN). (2011). *Guideline: General handwashing in the perioperative setting*. Retrieved from: <http://www.asiorna.org>

13. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing. Infection Prevention* Adelaide: ACORN.

FURTHER READING AND RESOURCES

Australian Commission on Quality and Safety in Healthcare (ACSQHS) (2012). National Safety and Quality Health Service Standards, Standard 3 Preventing and controlling healthcare associated infections, 26-33. Sydney: ACSQHS

Garbutt, S. J. (2011). Hand hygiene in the OR: Using evidence-based practices. *OR Nurse* 5, 2, 10-12.

Infection Prevention: Perioperative Attire

Scope of Standard

All perioperative environments where the surgical patient is treated.

Scope of Responsibility

All perioperative nurses.

This standard may also apply to other perioperative personnel (ie surgical ward interns, nurses, orderlies, ward assistants, doctors (anaesthetists and surgeons) anaesthetic technicians etc).

Principles

1. NURSES SHOULD CHANGE INTO PERIOPERATIVE ATTIRE WHEN ENTERING THE PERIOPERATIVE ENVIRONMENT
2. PERIOPERATIVE ATTIRE SHOULD BE PROVIDED AND LAUNDERED BY THE HEALTHCARE FACILITY
3. THE HEAD AND ALL FACIAL HAIR SHOULD BE COMPLETELY COVERED
4. DESIGNATED PROTECTIVE FOOTWEAR SHOULD BE WORN
5. NAIL POLISH AND ARTIFICIAL NAILS SHOULD NOT BE WORN
6. THE WEARING OF JEWELLERY SHOULD BE KEPT TO A MINIMUM
7. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

PRINCIPLE 1: NURSES SHOULD CHANGE INTO PERIOPERATIVE ATTIRE PRIOR TO ENTERING THE PERIOPERATIVE ENVIRONMENT

Rationale

Outdoor/street clothes harbour potential harmful bacteria that may cause contamination if transmitted to the patient and the perioperative environment.

Criteria

Perioperative attire should

- 1.1 consist of either a two-piece scrub suit, one-piece overalls or a dress (pantyhose optional depending on climate). (Note: Whilst it is preferable for pantyhose to be worn with a dress to reduce the dispersal of skin squames, this may be decided by individual facilities based on climatic conditions. Similarly, the use of long sleeve warm up jackets to reduce the dispersal

of skin squames from the arms may be decided by individual facilities based on climatic conditions.

Nurses should:

- 1.2. replace all outer clothing with designated perioperative attire prior to entering the perioperative environment
- 1.3 ensure that all undergarments are covered by perioperative attire
- 1.4 not wear perioperative attire outside the healthcare facility (HCF)^{1,2}
- 1.5 change perioperative attire daily or when wet or soiled
 - 1.5.1 Perioperative attire may be contaminated during the provision of clinical care or in non-clinical areas such as change rooms, bathrooms and kitchens during meal breaks. Perioperative attire that has been in contact with soiled surfaces, such as wet sinks or the floor should not be worn.

PRINCIPLE 2: PERIOPERATIVE ATTIRE SHOULD BE PROVIDED AND LAUNDERED BY THE HEALTHCARE FACILITY

Rationale

Laundrying of perioperative attire by the HCF ensures that the attire meets a consistent standard of cleanliness. Evidence suggests that home washing machines do not meet required standards in relation to attaining water temperature that is high enough to kill bacteria. There is also evidence that bacteria on perioperative attire can be transmitted to the home environment placing family members at risk.^{1,2}

Criteria

- 2.1 perioperative attire is supplied to healthcare workers and is made from a non-woven material
- 2.2 receptacles such as linen bags are supplied to collect used perioperative attire
- 2.3 perioperative attire is laundered within the HCF.
- 2.4 when the HCF linen supplies are inadequate, home laundrying of used perioperative attire may be performed. The potential risks are minimised by strict adherence to all of the following practices:
 - 2.4.1 separate all used perioperative attire from other personal belongings and place into a bag to minimise the transmission of bacteria to the home environment
 - 2.4.2 seal the bag for transport home
 - 2.4.3 promptly laundry preferably at high temperature all used perioperative attire (and the transporting bag) separately from all other laundry

- 2.4.4 dry the perioperative attire (and the transporting bag) and re-pack for next day of work. (Note. Laundry that is dried outside should be protected by distance or by screening from contamination by dirt and dust from heavy traffic areas).

PRINCIPLE 3: THE HEAD AND ALL FACIAL HAIR SHOULD BE COMPLETELY COVERED

Rationale

Hair attracts, harbors, and sheds bacteria, acting as a filter when left uncovered allowing bacteria to be released onto perioperative attire and into the air within the perioperative environment. Confining the hair with appropriate headwear eliminates the possibility of bacteria being shed and reduces the risk to patient safety by contamination of the aseptic fields.^{1,4}

Criteria

Nurses should:

- 3.1 ensure that all hair, including facial hair is completely covered ¹
- 3.2 change headwear daily or when soiled
- 3.3 preferably wear disposable headwear
 - 3.3.1 if wearing reusable headwear such as cloth scarves, these should be worn over disposable headwear
 - 3.3.2 reusable headwear should be laundered by the HCF between use (see also criteria 2.4 above) (Note: the open weave of material from which reusable headwear is generally made allows for shedding of bacteria. Covering the head with disposable headwear first reduces this risk.⁵

PRINCIPLE 4: DESIGNATED PROTECTIVE FOOTWEAR SHOULD BE WORN

Rationale

Footwear that complies with local work health and safety will provide protection of the nurse against sharps injury and from contamination by blood and body fluids.

Criteria

Nurses should:

- 4.1 wear footwear with a strong sole in the perioperative environment.
- 4.2 wear footwear that is made of a material that is easily cleaned on a regular basis and when soiled. (Note: Wearing fully enclosed shoes/clogs is best practice, however, this may be impractical due to local climatic or environmental conditions).
- 4.3 perform hand hygiene when footwear is donned or removed ⁶

- 4.4 not wear reusable shoe covers unless as part of protective apparel (see PPPB 4 Protective Apparel). (Note: shoe covers have been shown to increase floor bacterial counts and contamination on the wearers' hands when footwear is donned or removed.⁶

PRINCIPLE 5: NAIL POLISH AND ARTIFICIAL NAILS SHOULD NOT BE WORN

Rationale

Research evidence suggests that artificial nails can harbour bacteria and fungi that may cause a HAI. Higher levels of gram-negative microorganisms have been cultivated under artificial nails and on nail polish, before and after hand hygiene.^{2,7-9}

Criteria

Nurses should:

- 5.1 keep fingernails short, clean and free from nail polish and/or artificial nails, devices or other adornments
- 5.2 check the health of nails on a regular basis and particularly prior to performing a surgical scrub

PRINCIPLE 6: THE WEARING OF JEWELLERY SHOULD BE KEPT TO A MINIMUM

Rationale

Jewellery, including rings, bracelet, wrist watches, and necklaces (including those made from metal, shells or beads) can harbour microorganisms that may contaminate a surgical wound leading to HAI. Body piercings eg. nose studs have the potential to cause friction against a surgical face masks, increasing the risk of bacterial shedding. In addition, there is a risk that items such as nose studs and necklaces could fall into the open surgical wound or onto aseptic fields.¹⁻³

Criteria

Nurses should:

- 6.1 remove wrist watches, bracelets and rings (wedding bands may remain unless performing the surgical scrub)
- 6.2 only wear metal necklaces if they are single strand and can be confined within the perioperative attire (Note. necklaces that are multi-strand or made from beads, shells, wood or leather thongs should not be worn in perioperative settings)
- 6.3 only wear earrings that are stud or sleeper design and confined within headwear
- 6.4 remove all facial body piercing eg. nose studs etc
- 6.5 if present, remove wedding band prior to performing a surgical scrub^{3,9,10}

PRINCIPLE 7: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning ^{11, 12}.

Criteria

- 7.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.
- 7.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.

ACKNOWLEDGEMENTS

We wish to acknowledge that this standard has been developed with reference to the Australian College of Operating Room Nurses (ACORN) Standard 'Perioperative Attire' ¹³.

REFERENCES

- 1. Spry, C. (2015). Infection prevention and control. In J. Rothrock, & D. McEwen (Eds.). *Alexander's care of the patient in surgery* (15th ed.) (69-123). St Louis: Mosby.
- 2. Mangram, A.J., Horan, T.C, Pearson, M.L., Silver, L.C. and Jarvis, W.R. (1999). Guideline for prevention of surgical site infection. *Inf Control Hosp Epidemiol* 20, 4, 247-280.
- 3. Fogg, D. (2003). Clinical issues: body piercings in the OR: table top sterilizers; Joint Commission Initiative; West Nile virus; home laundering. *AORN J* 77, 2, 426 – 8, 430, 433.
- 4. Peterson, C. (2002). Clinical Issues: specialty surgical attire: sharps safety program; surgical attire-OR visitors; OR medication administration. *AORN J* 75, 3, 615.
- 5. Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.
- 6. Beesley, J. (2001). Open forum answers supplied. *British Journal of Perioperative Nursing* 14, 12, 524 - 525.
- 7. Arrowsmith, V.A., Maunder, J.A., Sargent, R.J. & Taylor, R. (2002). Removal of nail polish and finger rings to prevent surgical infection. *Cochrane Review*. Victoria: The Cochrane Library.
- 8. Centers for Disease Control & Prevention (CD). (2002). *Guideline for hand hygiene in healthcare setting. Morbidity and mortality weekly report* 51.

9. Salisbury, D.M., Hutfilz, P., Treen, L.M., Bollin, G.E. & Gautam, S. (1997). The effect of rings on microbial load of health care worker's hands. *Am J Infect Control* 25, 1, 24 – 27.
10. Pratt, R.J et al (2001). Standard principles for preventing hospital acquired infections. *J Hosp Infect* 47 (supplement): S21 – 37.
11. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841 – 846.
12. Anderson, I. (2012). Documentation: Impact on quality care. Nursing Documentation.
www.nursetogether.com
13. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing. Perioperative attire*. Adelaide: ACORN.

Infection Prevention: Aseptic Technique

Scope of Standard

Clinical environments where surgical procedures are undertaken.

Scope of Responsibility

All perioperative nurses.

Principles

1. ITEMS USED WITHIN THE ASEPTIC FIELD HAVE BEEN STERILISED
2. STERILITY OF ITEMS IS MAINTAINED DURING OPENING AND DISPENSING ONTO ASEPTIC FIELDS
3. PERSONNEL WITHIN THE ASEPTIC FIELD MUST WEAR STERILE GOWN AND GLOVES
4. ASEPTIC FIELDS ARE CREATED AND MAINTAINED USING DRAPES
5. THE ASEPTIC FIELDS ARE CONSTANTLY MONITORED
6. MOVEMENT OF PERSONNEL AND EQUIPMENT IN AND AROUND THE ASEPTIC FIELD IS KEPT TO A MINIMUM
7. STERILE SUPPLIES ARE KEPT SEPARATE FROM CONTAMINATED ITEMS AND WASTE
8. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

PRINCIPLE 1: ITEMS USED WITHIN THE ASEPTIC FIELD HAVE BEEN STERILISED

Rationale

The use of items which have been sterilised will minimise the risk to the patient of exposure to microorganism that may cause SSI.

Criteria

When managing sterile items:

- 1.1 apply the principles of event-related sterility to sterile items within the operating room and during transport to and from the operating room and between facilities, supply, handling and opening^{1,2}
- 1.2 check the integrity of the packaging prior to opening eg. holes, signs of moisture
- 1.3 check the chemical indicators for evidence that a sterilising process has been undertaken
- 1.4 consider an item unsterile if it drops below the horizontal surface of the aseptic field²
- 1.5 discard any sterile packages that have been dropped on the floor

(Note. Where expiry dates are provided by the manufacturer, care must be taken to check the expiry date to ensure expired items are not introduced onto the aseptic field ³⁾)

PRINCIPLE 2: STERILITY OF ITEMS IS MAINTAINED DURING OPENING AND DISPENSING ONTO ASEPTIC FIELDS

Rationale

Maintaining aseptic principles and practices during opening and dispensing sterile items will minimise contamination risk to patient and potential development of SSI.

Criteria

The circulating nurse, when opening sterile items, should:

- 2.1 check integrity of the sterile item
- 2.2 verify that the item has been through the appropriate sterilisation process
- 2.3 present the sterile item in a manner that the instrument nurse can take the item without contamination
- 2.4 not lean over the aseptic field when dispensing the sterile item or pouring fluids onto the aseptic field
- 2.5 when opening a wrapped item, open the fold furthest away first, then side folds and the nearest fold last. If the item is hand held for opening, ensure that all wrapper folds are secured to avoid contamination when presenting the item to the instrument nurse.
- 2.6 place large items eg instrument trays or rigid containers onto an appropriate surface whilst opening
- 2.7 consider the edges of sterile packaging as non-sterile once the package is opened
- 2.8 pull open and not tear peel back packages
- 2.9 not 'flip' items onto aseptic fields, unless in an emergency, as contamination can occur during the transfer of the sterile item.

The instrument nurse should:

- 2.10 lift sterile items out from packaging presented by the circulating nurse using eg a sponge holding forceps to avoid contamination of the gloved hand

PRINCIPLE 3: PERSONNEL WITHIN THE ASEPTIC FIELD MUST WEAR STERILE GOWN AND GLOVES

Rationale

The wearing of sterile gown and gloves by the surgical team minimises the risk of SSI for the patient and protects the team from contamination by blood and body fluids. See also PPB 4 Protective Apparel.

Criteria

The surgical team should:

- 3.1 complete the scrubbing, gowning and gloving procedure according to standards (PPB5 Scrubbing, Gowning and Gloving)
- 3.2 immediately change gown and/or gloves if contamination has occurred

PRINCIPLE 4: ASEPTIC FIELDS ARE CREATED AND MAINTAINED USING DRAPES

Rationale

Sterilised drapes are used to create an aseptic field by forming a barrier that minimises microbial contamination of the surgical site. ^{4,5}

Criteria

The instrument nurse should ensure that:

- 4.1 there is minimal handling of drapes during the draping procedure
- 4.2 drapes are held above waist level when being carried to the operative site to avoid contamination
- 4.3 drapes are unfolded from the operative site to the periphery
- 4.4 a cuff is formed with the sterile drape over gloved hands when positioning the drape to prevent contamination
- 4.5 drapes are correctly positioned on instrument trolleys, furniture and the patient to form an aseptic field
- 4.6 drapes are not repositioned once placed and are secured to prevent movement
- 4.7 contamination of drapes by fluids or strikethrough is prevented by the use of impervious drapes
- 4.8 drapes are secured using non perforating devices, when available
 - 4.8.1 when perforating devices are used (such as sharp towel clips) to secure drapes, once positioned, they should not be moved because the tips will be contaminated once they perforate the drapes
- 4.9 drapes are discarded using standard precautions, into a suitable receptacle (ie. linen bag) positioned close to the aseptic field.

PRINCIPLE 5: THE ASEPTIC FIELDS ARE CONSTANTLY MONITORED

Rationale

Monitoring of the aseptic field for possible contamination will alert the surgical team to take corrective actions to minimise the risk of contamination of the patient.

Criteria

The nurse should:

- 5.1 ensure that aseptic sites are prepared as close to the time of use ⁶
- 5.2 maintain constant observation of the aseptic site for possible contamination and never leave it unattended ⁴
 - 5.2.1 Covering aseptic trolleys is not considered best practice. It may be acceptable, however, to cover aseptic trolleys in the event of unanticipated delays, or due to environmental conditions that may compromise the aseptic field, such as flying insects or excessive dust in the operating room. **See Appendix 1** for the recommended procedure for safely covering the aseptic field. ⁷

PRINCIPLE 6: MOVEMENT OF PERSONNEL AND EQUIPMENT IN AND AROUND THE ASEPTIC FIELD IS KEPT TO A MINIMUM

Rationale

Excessive movement, including opening and closing of doors, can cause increased air turbulence and microbial shedding which can be a potential source of contamination of the aseptic field. Similarly, scrubbed and unscrubbed members of the surgical team should adhere to correct traffic patterns whilst moving around the aseptic fields to avoid contamination. Limiting the number of personnel within the operating room minimises the amount of air turbulence and shedding.

Criteria

The circulating nurse should:

- 6.1 monitor activity within the operating room and limit numbers to essential personnel such as those delivering direct patient care.
 - 6.1.1 It may be appropriate for one or two students to be present as part of an education and training program
 - 6.1.2 It is not appropriate for non-essential staff in the procedure to be present in the operating room for social reasons
- 6.2 ensure that external doors to the operating room remain closed during the surgical procedure

- 6.3 face the aseptic field when moving around the operating room and remain at least 30cms from the aseptic field
- 6.4 not touch or lean across the aseptic field
- 6.5 not move between two aseptic fields
- 6.6 move draped trolleys by holding the trolley legs below the drapes, avoiding all aseptic surfaces.

The instrument nurse should:

- 6.7 remain close to and face the aseptic field at all times
- 6.8 be aware that the draped trolleys are aseptic on the horizontal surface only
- 6.9 touch only aseptic surfaces and when repositioning draped trolleys, do so by placing hands on the horizontal surface only
- 6.10 avoid altering the level of the aseptic field and be seated only when required by the surgical procedure
- 6.11 consider the surgical gown aseptic only mid chest to waist level in the front; from gloved finger tips to elbows
- 6.12 keep gloved hands above waist level and within the levels of the aseptic fields

PRINCIPLE 7: STERILE SUPPLIES ARE KEPT SEPARATE FROM CONTAMINATED ITEMS AND WASTE

Rationale

The use of appropriate procedures to transport sterile items to and contaminated waste items away from the operating room will minimise the risk of contamination occurring.

Criteria

The nurse should:

- 7.1 ensure the flow of supplies moves through predetermined route from clean to decontamination areas
- 7.2 ensure that soiled items are not moved back into clean areas
- 7.3 place soiled items within covered containers or vehicles to the designated decontamination area
- 7.4 ensure that soiled linen and rubbish areas are separated from personnel and patient traffic areas ^{8,9}

PRINCIPLE 8: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning

Criteria

- 5.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.
- 5.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.^{10,11}

ACKNOWLEDGEMENTS:

We wish to acknowledge that this standard has been developed with reference to the Australian College of Operating Room Nurses (ACORN) Standard 'Infection Prevention: Asepsis' ¹².

REFERENCES

- 1. Standards Australia. AS/NZS 4187: 2014 *Reprocessing of reusable medical devices in health service organisations*. Standards Australia: Canberra.
- 2. Spry, C. (2015). Infection prevention and control. In J. Rothrock, & D. McEwen (Eds.). *Alexander's care of the patient in surgery* (15th ed.) (pp. 69-123). St Louis: Mosby.
- 3. Yang, TY, Henry L, Dellinger M, Yonish K, Emerson B, Seifert PC. The circulating nurse's role in error recovery in the cardiovascular OR. *AORN J*; 2012, 95 (6): 755-762. doi: 10.1016/j.aorn.2011.09.022.
- 4. Standards Australia (1996).AS3789.6:1996. *Textiles for healthcare facilities and institutions- fabric specifications*. Sydney: Standards Australia.
- 5. Standards Australia (1991).AS3789:1991.*Textiles for healthcare facilities – theatre linen and pre-packs*. Sydney: Standards Australia.
- 6. Harder, E. E., Gaies, M. G., Yu, S., Donohue, J. E., Hanauer, D. A., Goldberg, C. S., & Hirsch, J. C. (2013). Risk factors for surgical site infection in pediatric cardiac surgery patients undergoing delayed sternal closure. *The Journal of Thoracic and Cardiovascular Surgery*, 146(2), 326–333. [
- 7. Kennedy, L. (2013). Implementing AORN recommended practices for sterile technique. *AORN Journal* 98, 1, 15-23. <http://dx.doi.org/10.1016/j.aorn.2013.05.009>

8. Otter, J. A., Yezli, S., Salkeld, J. A. G., & French, G. L. (2013). Evidence that contaminated surfaces contribute to the transmission of hospital pathogens and an overview of strategies to address contaminated surfaces in hospital settings. *American Journal of Infection Control*, 41 (5, Supplement), S6–S11.
9. Rutala, W. A., & Weber, D. J. (2013). Disinfectants used for environmental disinfection and new room decontamination technology. *American Journal of Infection Control*, 41 (5 Supplement), S36–41.
10. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841 – 846.
11. Anderson, I. (2012). Documentation: Impact on quality care. *Nursing Documentation*.
12. Australian College of Operating Room Nurses (ACORN). (in press). *Standards for perioperative nursing. Infection Prevention: Asepsis*. Adelaide: ACORN.

FURTHER READINGS AND RESOURCES

- Adams, J. S., Korniewicz, D. M., & El-Masri, M. M. (2011). A descriptive study exploring the principles of asepsis techniques among perioperative personnel during surgery. *Canadian Operating Room Nursing Journal*, 29 (4), 6–8, 14–6, 21–4.
- Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.
- Phillips, N. (2012). *Berry & Kohn's operating theatre technique* (12th ed.). St Louis: Mosby.

APPENDIX 1

Recommended procedure for covering an aseptic trolley ⁷

1. the nurse must be dressed in sterile gown, gloves and mask
2. two sterile drapes must be used to cover the aseptic trolley
3. one drape is placed horizontally over the aseptic trolley at the midpoint, or slightly beyond the midpoint of the aseptic trolley (see Figure 3.1)
4. the second drape should be placed from the opposite side of the trolley to completely cover (overlap) the cuff of the first drape
5. the covered aseptic trolley should not be left unattended

Recommended procedure for removing the cover from the aseptic trolley

1. the covers should be removed by an unscrubbed person wearing a mask (the protective covers may have been contaminated)
2. the top drape should be removed by placing hands beneath the cuff and pulling the drape up and back towards the nurse
3. from the opposite side of the trolley, the second drape is removed in the same way
4. care must be taken to ensure that no portion of the drapes hanging below the level of the trolley surface are brought up and across the trolley as this may contaminate the aseptic field. ⁷



Figure 3.1

One drape is placed horizontally over the aseptic trolley at the midpoint, or slightly beyond the midpoint of the aseptic trolley the first drape is placed with the cuff at the halfway point. ⁷

Infection Prevention: Protective Apparel

Scope of Standard

Clinical environments where surgical procedures are undertaken.

Scope of Responsibility

All perioperative nurses.

This standard may also apply to other perioperative personnel (ie surgical ward interns, nurses, orderlies, ward assistants, doctors (anaesthetists and surgeons) anaesthetic technicians etc).

Principles

1. PROTECTIVE APPAREL SHOULD BE PROVIDED BY THE HEALTHCARE FACILITY
2. NURSES SHOULD WEAR PROTECTIVE EYEWEAR
3. NURSES SHOULD WEAR A SURGICAL FACE MASK
4. NURSES SHOULD WEAR GLOVES
5. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

PRINCIPLE 1: PROTECTIVE APPAREL SHOULD BE PROVIDED BY THE HEALTHCARE FACILITY

Rationale:

Healthcare workers have a right to be protected in the workplace environment from risks of contamination posed by blood, body fluid sprays, burns and splashes, from other aerosolised contaminants and hazardous substances. Protective apparel, including personal protective equipment (PPE), can minimise the risk of surgical site infection and protect the staff from exposure to microorganisms. Protective apparel may also protect personnel from injuries such as burns and undue exposure to toxic substances.

Criteria:

- 1.1 Protective apparel includes, but may not be limited to the wearing of:
 - eye protection (goggles, eye shields or visors)
 - masks
 - gloves (nitrile, latex, hypoallergenic, heat resistant gloves and sterile gloves)
 - gowns (unsterile cover gowns or sterile surgical gowns)
 - lead aprons (x ray protection)

- plastic aprons (worn by unscrubbed personnel or beneath a sterile gown for procedures where there is likelihood of excessive blood loss eg. trauma)
- shoe covers (procedures where there is likelihood of excessive blood loss eg. trauma)

PRINCIPLE 2: NURSES SHOULD WEAR PROTECTIVE EYEWEAR

Rationale:

The wearing of protective eyewear reduces the risk to the wearer of splashes and sprays from blood, body fluids and other aerosolised contaminants in the perioperative environment.

Criteria

Protective eyewear should:

- 2.1 be worn when there is risk of exposure to mucous membranes of the eyes from splashes / sprays of blood, body fluids or aerosolised contaminants
- 2.2 be worn by the instrument and circulating nurses whilst delivering care
- 2.3 consist of protective goggles which are breathable, fog free, waterproof and durable, eye shields or a visor attached to a surgical face mask
- 2.4 meet basic safety requirements and be used according to manufacturer's instruction
- 2.5 be made of material that is scratch free, resistant to puncturing, non-fogging and have a lens that shapes to the contours of the face
- 2.6 be easily decontaminated and preferably reusable
- 2.7 be free of sharp edges fitting as tightly as possible to the forehead/ brow, nose and side of the eyes
- 2.8 extend down and over the mask to prevent splashes going up under the eyewear

PRINCIPLE 3: NURSES SHOULD WEAR A SURGICAL FACE MASK

Rationale:

There has been debate in recent years about the efficacy of surgical face masks to protect the patients and aseptic fields (eg. surgical attire, drapes and instruments etc) from droplet contamination by healthcare workers. However, there is sufficient evidence to support the continued use of face masks to not only protect the patient, but as an integral component of protective apparel to protect healthcare workers from blood and body fluid splashes, sprays and aerosolised contaminants.^{1,2}

Criteria:

Surgical face masks should:

- 3.1 be worn in conjunction with protective, safe and adequate eyewear

PPPB 4 Infection Prevention: Protective Apparel

- 3.2 be worn by the instrument and circulating nurses whilst delivering care
- 3.3 be single use, made of a repellent material that offers protection against potential blood and body fluids sprays, splashing and aerosol contamination. Single-use paper (cellulose) masks are not suitable in the perioperative environment, neither are reusable cotton masks as they become moist with expired air reducing their effectiveness
- 3.4 be close fitting, securely tied and cover both the mouth and nose
- 3.5 consist of a new mask being worn at the start of the day and changed regularly, between procedures – dependent on availability
- 3.6 discourage the wearer from excessive talking to reduce the moisture being exhaled and loses its effectiveness
- 3.7 be pointed towards the surgical site if the wearer coughs or sneezes, and not away from it. Air escaping is sent backwards from the sides of the masks and away from the aseptic field
- 3.8 not be left to hang around the neck or placed in the pocket when not in use as this can cause contamination
- 3.9 be disposed of by handling THE TIES ONLY, with the nurse facing away from the aseptic field while the mask is being removed to prevent contamination. Hand hygiene should be performed following removal of the mask.

In addition:

- 3.10 In situations of emerging epidemic disease (e.g. SARS, H₅N₁, Ebola virus) and when managing diseases eg TB - the World Health Organisation (WHO) and national governments will make recommendations for appropriate practice with regard to airborne transmission based precautions. It will be necessary to wear a surgical face mask/respirator with special filters that provides protection against the submicron bacteria and viruses responsible for such diseases.
- 3.11 surgical face masks offer **limited** protection **only** against laser, toxic substances and electrosurgery plume and additional plume evacuation equipment will be required to provide adequate protection.

PRINCIPLE 4: NURSES SHOULD WEAR GLOVES

Rationale:

Unsterile gloves can protect the nurse during any activity that has been assessed as carrying a risk of exposure to blood, body substances, secretions and excretions. They can also protect the nurse from burns when in contact with hot surfaces eg. sterilisers or hot fluids. (see also PPPB 1 Hand Hygiene).

Criteria:

Unsterile gloves should:

- 4.1 be single use only
- 4.2 be worn for direct contact with blood or body fluids
- 4.3 be worn when in contact with non-intact skin or mucous membranes
- 4.4 be worn when in contact with contaminated environmental surfaces eg. trolleys, operating table
- 4.5 be discarded immediately after use and hand hygiene performed
- 4.6 not be worn when opening sterile supplies

PRINCIPLE 5: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning^{3,4}.

Criteria

- 5.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.
- 5.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.

ACKNOWLEDGEMENTS

We wish to acknowledge that this standard has been developed with reference to the International Perioperative Nurses Federation (IFPN) Guidelines 'Use of protective eyewear'⁵, 'Masks in the perioperative environment'⁶ and the Australian College of Operating Room Nurses (ACORN) Standard 'Infection Prevention'⁷

REFERENCES

1. Spry, C. (2015). Infection prevention and control. In J. Rothrock, & D. McEwen (Eds.). *Alexander's care of the patient in surgery* (15th ed.) (69-123). St Louis: Mosby.
2. Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.
3. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841 – 846.
4. Anderson, I. (2012). Documentation: Impact on quality care. Nursing Documentation. www.nursetogether.com
5. International Perioperative Nurses Federation. (IFPN). (2011). *Guideline: use of protective eyewear*. Retrieved from: <http://www.asiorna.org>
6. International Perioperative Nurses Federation. (IFPN). (2011). *Guideline: masks in the perioperative environment*. Retrieved from: <http://www.asiorna.org>
7. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing. Infection Prevention*. Adelaide: ACORN.

Infection Prevention: Scrubbing, Gowning & Gloving

Scope of Standard

Clinical environments where surgical procedures are undertaken

Scope of Responsibility

All perioperative nurses.

PRINCIPLES

1. THE NURSE SHOULD BE APPROPRIATELY ATTIRED PRIOR TO COMMENCEMENT OF THE SURGICAL SCRUB
2. THE APPROPRIATE ANTIMICROBIAL SOLUTION IS USED FOR THE SCRUBBING PROCEDURE
3. THE NURSE SHOULD FOLLOW A STANDARDISED SCRUB PROCEDURE
4. THE NURSE SHOULD DON STERILE GOWN AND GLOVES USING ASEPTIC TECHNIQUE
5. THE NURSE SHOULD REMOVE GOWN AND GLOVES IN A MANNER THAT PROTECTS THE WEARER FROM CONTAMINATION
6. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE

PRINCIPLE 1: THE NURSE SHOULD BE APPROPRIATELY ATTIRED PRIOR TO COMMENCEMENT OF THE SURGICAL SCRUB

Rationale

The covering of hair, including facial hair, removal of rings and wrist jewellery reduces the risk of transmitting microorganisms to the patient¹⁻⁴. The use of protective apparel ie mask, eye protection, apron reduces the risk of exposure to infectious agents through splashes/spray of blood, body fluids and other aerosolised contaminants⁵

Criteria

- 1.1 Prior to commencement of the surgical scrub, the nurse:
 - should wear clean perioperative attire (see Standard on PPPB 2 Perioperative Attire)
 - ensures that all hair, including facial hair is covered
 - removes wrist watches, bracelets and rings
 - checks skin integrity and keeps fingernails short, clean and free from nail polish and/or artificial nails, devices or other adornments

- dons protective apparel ie mask, eye protection, protective apron (see Standard on PPPB 4 Protective Apparel)

PRINCIPLE 2: THE APPROPRIATE ANTIMICROBIAL SOLUTION IS USED FOR THE SCRUBBING PROCEDURE

Rationale

An effective antimicrobial scrub solution kills resident and transient microorganisms and has a residual effect to further decrease the presence of microorganisms on the skin of the hands and arms.

Criteria

- 2.1 The selected antimicrobial scrub solution should:
- be used according to manufacturer's instructions
 - be broad spectrum
 - be fast acting and persistent
 - have a residual and cumulative effect
 - be non irritating and have minimal detrimental effects on the skin
 - antimicrobial scrub solutions should be stored in clean, closed containers.

PRINCIPLE 3: THE NURSE SHOULD FOLLOW A STANDARDISED SCRUB PROCEDURE

Rationale

A standardised surgical 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.

Criteria

3.1 Duration of the surgical scrub

ACORN states that the efficacy of the surgical scrub is influenced by the choice of antiseptic solution and the duration of the scrub¹⁷. Research indicates that scrub duration of less than the traditional five minutes can be effective when using chlorhexidine gluconate 4% followed by alcohol formulation (isopropanol 70% and chlorhexidine gluconate 0.5% or ethanol 70% and chlorhexidine gluconate 0.5%). Whilst there is limited research to link length of surgical scrub to surgical site infection (SSI) there is supporting evidence that a five minute scrub reduces bacterial count to an acceptable level.^{4,6}

See Appendix 1 for recommended procedure for a 5 minute surgical scrub

See Appendix 2 for recommended procedure for a 3 minute surgical scrub

PRINCIPLE 4: THE NURSE SHOULD DON STERILE GOWN AND GLOVES USING ASEPTIC TECHNIQUE

Rationale

Sterile gown and gloves are essential in maintaining an aseptic field. Both items are made of materials that provide a barrier to microorganisms and are packaged in a manner that allows donning without contaminating the sterile field ^{1,2, 8-11}

Criteria

- 4.1 sterile gowns maybe reusable or disposable
 - 4.1.2 reusable gowns must be free of holes, tears and must have tapes to allow securing of the gown
- 4.2 the nurse follows recommended procedure for donning gown and gloves – See Appendix 3
- 4.3 the nurse may be required to assist other members of the surgical team don gown and gloves – See Appendix 6

PRINCIPLE 5: THE NURSE SHOULD REMOVE GOWN AND GLOVES IN A MANNER THAT PROTECTS THE WEARER FROM CONTAMINATION

Rationale:

Gown and gloves worn during a surgical procedure are considered contaminated and must be removed in a manner that protects the wearer from coming into contact with blood and body fluids.

Criteria

- 5.1 gown and gloves are removed within the operating room to prevent transmission of microorganisms to other areas of the perioperative environment
- 5.2 both are disposed of in the appropriate receptacles according to local policy

See Appendices 4 and 5 for recommended procedures for removing gown and gloves

PRINCIPLE 6: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning ^{14,15}.

Criteria

- 6.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.

- 6.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.

ACKNOWLEDGEMENTS:

We wish to acknowledge that this standard has been developed with reference to the IFPN Guidelines 'Surgical hand scrubbing in the perioperative setting'¹⁶ and the ACORN Standard 'Surgical scrubbing, gowning & gloving'¹⁷

REFERENCES:

1. Spry, C. (2015). Infection prevention and control. In J. Rothrock, & D. McEwen (Eds.). *Alexander's care of the patient in surgery*. (15th ed.) (69-123). St Louis: Mosby.
2. Phillips, N.H. (2006). *Berry & Kohn's operating room technique*. (11th Ed). St Louis: Mosby.
3. Centers for Disease Control & Prevention (CD). (2002). Guideline for hand hygiene in healthcare setting. *Morbidity and mortality weekly report* 51.
4. Tivolacci, M.P., Pitrou, I., Merle, V. Haghghat, S. et al. (2006). Surgical hand rubbing compared with surgical hand scrubbing: comparison of efficacy and costs. *J Hosp Infect* 63, 55-59.
5. Castella, A. (2006). Surgical site infection surveillance: analysis of adherence to recommendations for routine infection control policies. *Infect Control Hosp Epidemiol* 27, 8, 835-840.
6. Parienti, J.J., Thibon, P., Heller, R. et al. (2002). Hand-rubbing with an aqueous alcoholic solution vs traditional surgical hand-scrubbing and 30 day surgical site infection rates: a randomised equivalence study. *J Am Med Assoc* 288, 6, 722-727.
7. World Health Organisation (WHO) (2009). *WHO guidelines on hand hygiene in healthcare*. Geneva: WHO.
8. Standards Australia (1996). AS3789.6:1996. *Textiles for healthcare facilities and institutions- fabric specifications*. Sydney: Standards Australia.
9. Standards Australia (1994). AS3789.3:1994. *Textiles for healthcare facilities and institutions- apparel for operating theatre staff*. Sydney: Standards Australia.
10. Wheelock, S. M. & Lookinland, S. (1997). Effect of surgical hand scrub time on subsequent bacterial growth. *AORN J* 65, 6, 1087-1098.
11. Hsieh, H-F., Chiu, H-H. & Lee, F-P. (2006). Surgical hand scrubs in relation to microbial counts: systematic literature review. *J Adv Nurs* 55, 1, 68-78.
12. Standards Australia (1997). AS3789.8:1997. *Textiles for healthcare facilities and institutions- recyclable barrier fabrics*. Sydney: Standards Australia.

13. Tanner, J. & Parkinson, H. (2005). Double gloving to reduce surgical cross infection. *Cochrane Review*. The Cochrane Library: John Wiley & Sons Ltd.
14. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841-846.
15. Anderson, I. (2012). Documentation: Impact on quality care. Nursing Documentation. www.nursetogether.com
16. International Perioperative Nurses Federation. (IFPN). (2011). *Guideline: Surgical hand scrubbing in the perioperative setting*. Retrieved from: <http://www.asiorna.org>
17. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing. Surgical scrubbing, gowning & gloving*. Adelaide: ACORN.

FURTHER READINGS AND RESOURCES

Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.

Phillips, N. (2012). *Berry & Kohn's operating theatre technique* (12th ed.). St Louis: Mosby.

The Newcastle upon Tyne Hospitals NHS Foundation Trust (2013) *Surgical scrub, gown and glove procedure*. Retrieved from: <http://www.newcastle-hospitals.org.uk/downloads/policies/Infection%20Control/SurgicalScrubGownandGloveProceduresPolicy201310.pdf>

Widmer, A.F., Rotter, M., Voss, A., Nthumba, P., Allegranzi, B., Boyce, J. & Pittet, D. (2010). Surgical hand preparation: state-of-the-art. *Journal of Hospital Infection* 74, ,2, 112-22. doi: 10.1016/j.jhin.2009.06.020

APPENDIX 1

5 MINUTE SURGICAL SCRUB TECHNIQUE

The following is a recommended procedure for a 5 minute scrub ¹⁷

1. open and prepare nail cleaner and scrub sponge for use later in the scrub
2. turn on the water to a comfortable temperature and even flow
3. complete pre scrub wash using antiseptic solution to loosen debris on the skin
4. apply antiseptic solution to hands, wash hands before proceeding to wash arms using a circular hand motion, working in one direction from hands to 2.5 cms above the elbow
5. leave the solution in contact with the skin whilst nails are cleaned using nail cleaner – dispose of nail cleaner in a safe manner
6. rinse hands and arms keeping hands higher than elbows to allow water to run in one direction only
7. avoid splashing water onto perioperative attire as this will cause ‘strike through’ when donning a sterile gown, rendering it unsterile
8. apply antiseptic solution to scrub sponge (unless they are already impregnated)
9. wash all surfaces of the hands and fingers, then wash the forearms to elbow level – discard the scrub sponge safely
10. rinse hands and arms thoroughly
11. apply antiseptic solution to hands and repeat previous step, but stopping at mid forearm
12. rinse thoroughly
13. apply antiseptic solution to hands and wash hands only
14. rinse for the final time – if taps are elbow operated, turn taps off using elbows to avoid contamination of the hands

In addition:

- if scrub sponge and nail cleaners are unavailable – greater attention must be paid to the first hand wash of the procedure to ensure nail beds are thoroughly cleaned by dipping fingertips of each hand into the solution
- 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.
- If a reusable brush is desired, it should be easy to clean and maintain and should be durable enough to withstand repeated sterilization without bristles becoming soft or brittle.

APPENDIX 2

3 MINUTE SURGICAL SCRUB TECHNIQUE

The following is a recommended procedure for a 3 minute scrub – used for subsequent scrubs ¹⁷

1. turn on the water to a comfortable temperature and even flow
2. apply antiseptic solution to hands, wash hands before proceeding to wash arms using a circular hand motion, working in one direction from hands to 2.5 cms above the elbow
3. leave the solution in contact with the skin
4. without rinsing, apply additional solution and wash all surfaces of the hands and then proceed from forearms using a circular motion to the level of the elbow
5. rinse hands and arms thoroughly
6. apply solution and wash hands and forearms, stopping at mid forearm
7. rinse hands and arms thoroughly
8. apply solution and wash hands only
9. rinse for the final time.

APPENDIX 3

DRYING HANDS AND DONNING GOWN AND GLOVES ¹⁷

Drying hands

1. approach the gown trolley which should be prepared in an aseptic manner, with gown and gloves opened
2. grasp the sterile towel by one corner, taking care not to contaminate the sterile field by drips of water from the arms
3. step back and with arms outstretched, keeping elbows bent and above the waist, use one half of the towel to pat one hand dry, paying attention to in between fingers before moving from forearm to the elbow drying the area using a circular motion
4. grasp the opposite end of the towel and repeat the process using the unused portion of the towel
5. dispose of the towel appropriately
6. keep hands higher than elbows at all times

Donning gown

The sterile gown should be folded and presented in a manner that enables the inner surface to be handled with surgically clean hands ^{10, 12-17}

1. grasp the sterile gown by the collar portion and unfolded until both arms can be extended into the sleeves
2. keep the hands inside the cuffs of the gown – this will facilitate the closed gloving method and minimise the risk of contamination
3. keep the arms above waist level at all times
4. allow a colleague to tie the back tapes

Donning gloves

1. prepare two pairs of gloves to comply with recommendation of double gloving. Double gloving minimises the risk of sharps injury
2. don the first pair of gloves using the closed method of gloving ensuring that the fingers do not contaminate the outer surfaces of the gloves
3. don the second pair of gloves by sliding over the first pair to complete the gloving procedure

Completing the gowning and gloving procedure:

1. untie the tapes at the front of the gown and present to another scrubbed person to turn
2. secure the ties at the side of the gown.
 - 2.1 Depending on the type of gown, the procedure for turning may be completed with the assistance of an unscrubbed person.
3. Keep the arms above waist level and the nurse aware that areas of the gown considered sterile are the front of the gown from nipple line to waist/table level; from finger tips to elbow^{12, 15-17}

Note. Assisted gloving is recommended when members of the team have contaminated gloves, refer to Appendix 6

Appendix 4

REMOVING GOWN AND GLOVES DURING A PROCEDURE ¹

Changing gown and gloves during a procedure:

- 1 the person requiring a change of gown and gloves should step away from the aseptic field
- 2 the removal of the contaminated gown and gloves should be carried out by an unscrubbed person wearing unsterile gloves to protect themselves from contamination
- 3 all tapes at the front and back of the gown should be untied
- 4 the gown should be grasped by the shoulders and pulled it from the person, turning it inside out and discarded appropriately
- 5 the gloves should be grasped and pulled off and discarded appropriately
- 6 the person may be required to re scrub if contamination of the hands has occurred eg. a glove tear
- 7 re gowning and gloving is carried out using the procedure described in Appendix 3

If re gloving is required without re gowning, this should be accomplished using the assisted gloving method described in Appendix 6.

- 1 the contaminated gloves should be removed by an unscrubbed person wearing unsterile gloves, pulling the gloves off, taking care not to contaminate the sterile gown of the wearer

Appendix 5

REMOVING GOWN AND GLOVES AT END OF A PROCEDURE ¹

Removal of gown:

- 1 as the gown is contaminated, it must be removed *before* the gloves to prevent bare hands coming into contact with the gown
- 2 untie tape on from the gown
- 3 an unscrubbed person should untie the tapes at the back of the gown
- 4 grasp the shoulder seams and pull the gown forward and over the gloved hands, turning the gown inside out
- 5 keep the gown away from the body whilst removing to reduce the risk of contamination
- 6 dispose of the gown in the appropriate receptacle

Removal of gloves:

1. using the gloved fingers of one hand pull off one glove (glove to glove), turning it inside out and discard appropriately
2. using the ungloved hand, place the fingers or thumb inside the glove (skin to skin) and pull off, turning it inside out and discard appropriately

The mask can be removed if appropriate by touching only the ties and discarded

Hand hygiene should be performed following removal of protective apparel (see PPPB 1 Hand Hygiene) ¹

Appendix 6

ASSISTED GOWNING AND GLOVING OF TEAM MEMBERS ¹

Assisted gowning procedure:

- 1 the nurse assisting with gowning procedure must be dressed in sterile gown and gloves
- 2 the nurse opens the gown and holds the inner surface towards the person to be gowned
- 3 a cuff is formed in the neck and shoulder area of the gown to protect the nurse's gloved hands
- 4 the person being gowned places their hands and arms into the sleeves – hands should not advance through the cuffs so that closed gloving can be accomplished
- 5 if assisted gloving is being performed, the hands should be pushed through the cuffs of the gown
- 6 an unscrubbed person can assist with pulling the gown on and tying the tapes on the back of the gown¹

Assisted gloving procedure:

- 1 the nurse assisting with gloving procedure must be dressed in sterile gown and gloves
- 2 the nurse grasps the glove under the folded cuff to protect their fingers from contact with the bare hands of the ungloved person
- 3 using the fingers stretch the cuff of the glove open
- 4 position the glove to allow the hand of the ungloved person to be inserted
- 5 repeat the procedure with the other hand

Double gloving is recommended and achieved by sliding the second pair of gloves by over the first pair to complete the gloving procedure. ¹

Infection Prevention: Skin Preparation of the Surgical Patient

Scope of Standard

Clinical environments where surgical procedures are undertaken.

Scope of Responsibility

Nurses performing skin preparation of the surgical patient, when applicable.

Principles

1. THE SURGICAL SITE AND SURROUNDING AREAS ARE CLEAN
2. THE SURGICAL SITE IS PREPARED WITH AN ANTIMICROBIAL AGENT
3. SKIN PREPARATION IS PERFORMED BY SKILLED PERSONNEL
4. SKIN PREPARATION IS DOCUMENTED IN THE PATIENTS RECORD
5. THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

PRINCIPLE 1: THE SURGICAL SITE AND SURROUNDING AREAS ARE CLEAN

Rationale

Preoperative skin antisepsis is performed to reduce the risk of postoperative surgical site infections (SSIs) by removing soil and transient organisms from the skin.

Criteria

- 1.1 Dirt and debris are removed before the patient enters the operating room. Appropriate methods include:
 - the patient washing or showering
 - cleansing the surgical site
- 1.2 Hair is removed from surgical site only if necessary. Determining factors include:
 - amount of hair
 - location of wound or incision
 - type of surgical procedure to be performed
 - 1.2.1 If hair removal is indicated, it should be performed:
 - according to the surgeon's orders or facility policy
 - by skilled personnel

- as close to the time of surgery as is practical ^{1,2,3,4} to minimise the time available for wound colonisation by micro-organisms at the surgical site
 - outside the operating room where the surgery is to be performed ³
 - in a manner that preserves skin integrity such as with the use of hair clippers with disposable blades ^{3,4,5} or depilatory agents (skin testing is required before using depilatory agents)
 - shaving is undertaken only when other methods not available - wet shaving is preferable
- 1.3 The surgical site should be assessed before skin preparation, with consideration given to:
- patients with comorbidities, eg. Diabetes, skin ulcerations, sensitivity to antimicrobial solutions, obesity, smoking, steroid use, malnutrition and renal failure ^{1,6}
 - surgical site characteristics, eg. Burns ¹
 - sites which include mucous membrane and delicate, compromised tissue
 - areas with high microbial counts eg. umbilicus, traumatic wounds
 - the isolation of stoma sites by covering with an antiseptic-soaked sponge ⁷.
 - skin integrity and presence of lesions, moles, warts, rashes etc

PRINCIPLE 2: THE SURGICAL SITE IS PREPARED WITH AN ANTIMICROBIAL AGENT

Rationale

An effective antimicrobial agent that is active against endogenous organisms and exogenous organisms ¹ and which has a sustained effect may reduce the patient's skin flora.

Criteria

- 2.1 The antimicrobial agent should have a broad spectrum, be non-toxic and provide residual protection.
- 2.2 Selection of the antimicrobial agent is based on:
- Patient allergies or sensitivity
 - The surgical site (see examples in Principle 1)
 - The surgeon's preference
- 2.3 The use of antimicrobial agents should be consistent with manufacturer's guidelines and the infection control guidelines of the health care facility (HCF)
- 2.4 The same antimicrobial agent shall be used for all applications of the patient's skin preparation, to ensure full residual benefit and consistent action

PRINCIPLE 3: SKIN PREPARATION IS PERFORMED BY SKILLED PERSONNEL

Rationale

The effectiveness of skin preparation is dependent on the antimicrobial agent used, the method of application and the knowledge of the personnel. Personnel require knowledge of the following areas:

- ✓ the surgical site and operative procedure
- ✓ the antimicrobial agent properties and application technique
- ✓ risk of harm to the patient from the interaction of the agent with other surgical equipment which may result in skin reactions, burns, shock or fire.

Criteria

- 3.1 Skin preparation requires consideration of:
- maintenance of aseptic technique
 - length of initial incision
 - requirement to extend initial incision and/or make additional incisions
 - more than one surgical site eg. prepping the abdominal before prepping the perineal areas⁸
 - drain sites required
 - drape fenestration/window size
 - preservation of skin integrity
 - prevention of pooling/reduction of hazards

PRINCIPLE 4: SKIN PREPARATION IS DOCUMENTED IN THE PATIENT'S MEDICAL RECORD

Rationale

Documentation is an integral part of providing safe quality care to patients and perioperative documentation has a legal implication as a record of the care delivered.

Criteria

- 4.1 The record of skin preparation may include but is not limited to:
- skin condition and integrity at the surgical site⁹
 - hair removal (if performed) including method of removal and area
 - the type of antimicrobial agent used
 - name and role of the person performing the skin preparation
 - onset and details of any hypersensitivity reactions

PRINCIPLE 5: THE STANDARD IS REVIEWED EVERY THREE YEARS AND WHEN NEW EVIDENCE IS AVAILABLE.

Rationale

Documentation of procedural steps is a foundation for best practice, ensures consistency of practice and provides a tool for care planning^{9,10}.

Criteria

- 5.1 The standard should be stored in the unit practice manual and easily accessible for staff reference.
- 5.2 A SIGN-OFF SHEET should be provided in the unit practice manual for staff to indicate when they have read the standard and any related local policies.

See next page for recommended procedure.

Recommended procedure for skin preparation ('prepping')

Aseptic technique should be maintained throughout the prepping procedure.

1. Prepare sterile swabs, sterile galipot/bowl, kidney dish and sponge holding forcep
2. Pour recommended antimicrobial agent into galipot/bowl
3. Place absorbent materials beneath surgical site to collect run-off of the antimicrobial agent to avoid pooling, as this can result in skin damage
4. Using one swab attached to the sponge holding forcep, apply the antimicrobial agent starting at the proposed incision site (clean) and continue in a circular/square motion outwards to the least clean area
5. Prep an area large enough to permit extension of the incision, potential drape shift and placement of drains
6. Place the used swab in the kidney dish away from the remaining sterile swabs
7. Repeat the prepping procedure as required, using a new swab each time
8. On completion of the prepping procedure, remove any damp material, inspect the surrounding areas, ensure the diathermy return electrode plate remains in contact and ensure the patient is clean and dry.

Note: special care must be taken when using fluids such as skin prep (especially alcoholic skin prep) near diathermy return electrode plates because of the risk of significant patient injury eg. burns and electrocution.

ACKNOWLEDGEMENTS:

We wish to acknowledge that this standard has been developed with reference to the International Federation of Perioperative Nurses (IFPN) Guideline 'Skin preparation of the surgical patient'¹¹ and the Australian College of Operating Room Nurses (ACORN) Standard 'Skin preparation of the patient'¹².

REFERENCES

1. Mangram, A.J., Horan, T.C, Pearson, M.L., Silver, L.C. and Jarvis, W.R. (1999). Guideline for prevention of surgical site infection. *Inf Control Hosp Epidemiol* 20, 4, 247-280.
2. Johanna Briggs Institute. (2007). Preoperative hair removal to reduce surgical site infection. Best practice. 11, 4, 1-4.
3. Tanner, J., Woodings, D. & Moncaster, K. (2006). Preoperative hair removal to reduce surgical site infection. *Cochrane database of systematic reviews* 3.
4. Kjonniksen, I., Anderson, B.M., Sondenaa, V.G. & Segadal, L. (2002). Preoperative hair removal – a systematic literature review. *AORN J* 75, 5, 928-938.
5. Edlich, R.F., Jackson, E.M., Neal, J.G. & Kron, I.L. (2000). A scientific basis for choosing the technique of hair removal used prior to wound closure. *J Emerg Nurs* 26, 2, 134-139.
6. Edwards, P.S., Lipp, A. & Holmes, A. (2007). Preoperative skin antiseptics for preventing surgical wound infection after clean surgery. *Cochrane database of systematic reviews* 1.
7. Johanna Briggs Institute. (2011). *Johanna Briggs Institute evidence review*.
8. Burlingame, B. (2005). Implant documentation; brow wiping; fluids for endoscopic distention; dual procedure prep; cleaning after tuberculosis patients. *AORN J* 82, 1, 109 -113.
9. Frank-Stromborg, M., Christensen, A. & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way – part II. *Oncol Nurs Forum* 28, 5, 841-846.
10. Anderson, I. (2012). Documentation: Impact on quality care. *Nursing Documentation*.
www.nursetogether.com
11. International Federation of Perioperative Nurses (IFPN). (2011). *IFPN Guideline – Skin preparation of the surgical patient*. Retrieved from <http://www.asiorna.org/>
12. Australian College of Operating Room Nurses (ACORN). (2014). *Standards for perioperative nursing 2014–2015*. Adelaide: Author.

FURTHER READING AND RESOURCES

Hamlin, L., Davies, M., Richardson-Tench, M. & Sutherland-Fraser, S. (in press). *Perioperative nursing: An introduction*. Sydney: Elsevier.