PG28 Guideline on infection prevention and control in anaesthesia 2025

Short title: Infection prevention and control

1. Purpose

The Australian and New Zealand College of Anaesthetists (ANZCA) aims to ensure that the practice of anaesthesia is as safe as possible for patients, anaesthetists and other healthcare workers. Infection prevention and control is focussed upon minimising risk of infection and is central to this aim. The goal of this guideline is to assist practitioners and facilities to implement strategies that will reduce risks of transmission of infection, based on current evidence. Such strategies should aim to minimise waste materials without compromising patient or staff safety.

In certain clinical situations there may be a need to adopt more stringent practices. This guideline should be considered within the context of recommendations by other authorities, and in particular local infection control policies.

2. Scope of this document

This document is intended to apply in all areas where anaesthesia, including regional analgesia, sedation, and interventional pain medicine procedures are administered, and covers all associated activities and equipment.

3. Definitions

Aseptic technique: Aseptic technique is an element of standard precautions. Aseptic technique is a set of practices that protects patients from healthcare-associated infections and protects healthcare workers from contact with blood, body fluid and body tissue.

Cleaning: Removal of contaminants to the extent necessary for further processing of intended use.

Contact precautions: are steps taken in addition to standard precautions, which are used for infectious agents that may be transmitted by direct or indirect contact with the patient or the patient's environment.

Contamination: presence of microorganisms or foreign matter.

Critical medical device: Instrument intended to be introduced into or have contact with the vascular system or normally sterile areas of the body (see also *non-critical* and *semi-critical* devices).

Disinfection: process to inactivate viable microorganisms to a level previously specified as being appropriate for a defined purpose.

High Level disinfection: Disinfection that kills all microbial pathogens, except large numbers of bacterial endospores.

Instrument grade disinfectant: Disinfectant that is used to reprocess reusable medical devices.

Invasive medical device: A medical device that penetrates inside the body, either through a body orifice or through the surface of the body.

Intermediate-level disinfectant: Disinfectant that kills all microbial pathogens except bacterial endospores (i.e. is bactericidal, tuberculocidal, fungicidal (against asexual spores but not necessarily dried chlamydospores or sexual spores), and virucidal).

Low level disinfection: Agent that destroys all vegetative bacteria (except tubercle bacilli), lipid viruses, some nonlipid viruses, and some fungi, but not bacterial spores.

Non-invasive medical device: A medical device that does not penetrate inside the body, either through a body orifice or through the surface of the body.

Non-critical medical device: A medical device that comes into contact with intact skin but not mucous membranes (see also *Critical* and *semi-critical* devices).

Non-health related facility: facility or clinic that provides skin penetration procedures to clients for non-medical purposes.

Reprocessing: All activities required to ensure that a reusable medical device is safe for its intended purpose.

Reusable medical device: A medical device designated or intended by the manufacturer as suitable for processing and reuse.

Semi-critical medical device: A medical device that comes into contact with mucous membranes or non-intact skin (see also *non-critical* and *Critical* devices).

Soil: natural or artificial contamination on a device or surface following its use or simulated use.

Spaulding Classification Scheme: system used to classify reusable medical devices and other devices as critical, semi-critical, or non-critical on the basis of risk to patient/client safety from device contamination, and to determine the level of microbicidal action required for reprocessing.

Standard precautions: the primary strategy for minimising the transmission of healthcare-associated infections. Implementation involves the full range of patient-care, equipment and relevant personal practices (as summarised in 4.1.1 below).

Sterilisation: Validate process used to render a product free from viable microorganisms.

Operating Room: A room designed to provide an aseptic environment in which to carry out surgical procedures under local, regional or general anaesthetic. Operating room design including air exchange rates and air filtration is subject to Australian and New Zealand Standards.

Operating Theatre Suite: The area in a healthcare facility which houses operating rooms, recovery areas, corridors and theatre-related equipment storage facilities. It may also house other areas including anaesthesia rooms or bays and other related service areas such as satellite pharmacies, sterile setup areas and sterile equipment preparation and storage facilities. Theatre suites usually have restricted access and various regions with specific requirements such as ventilation, dress codes and PPE in operating rooms and other aseptic areas.

Traceability: ability to trace the history, application, or location of a reusable medical device.

For technical aspects of these procedures consult the Australian standard *AS:5369:2023 Reprocessing of reusable medical devices and other devices in health and non-health related facilities* (also accepted by HealthCERT New Zealand).[1]

4. Prevention of infection

4.1 Healthcare associated infections

4.1.1 Standard precautions

Standard precautions are the primary strategy for minimising the transmission of healthcare-associated infections. Standard precautions must be used when providing care to all patients, regardless of whether they have an infection or not. Standard precautions involve:

- hand hygiene, as consistent with the 5 moments for hand hygiene (WHO)
- the use of appropriate personal protective equipment
- the safe use and disposal of sharps
- routine environmental cleaning
- reprocessing of reusable medical equipment and instruments
- respiratory hygiene and cough etiquette
- aseptic technique
- waste management
- appropriate handling of linen.

4.1.2 Hand hygiene

Hand hygiene is the most important infection control measure in healthcare settings. The term “hand hygiene” encompasses the application of soap/solution (non-antimicrobial or antimicrobial) and water, or a waterless antimicrobial agent to the surface of the hands.

General clinical environments
Following the World Health Organisation’s “5 Moments for Hand Hygiene,” healthcare workers should perform hand hygiene: 1) before touching a patient, 2) before a procedure, 3) after procedure or body fluid exposure risk, 4) after touching a patient, and 5) after touching patient’s surroundings. Hand washing with soap and water should always be performed after going to the toilet, when hands are visibly soiled (dirty or contaminated with blood or other body fluids), or if exposed to potential spore forming organisms (for example, *Clostridioides difficile*). While soap and water physically remove bacteria through mechanical action it is not effective at killing many organisms.

Anaesthesia procedure-related activities
It is recognised that providing anaesthesia in the OR is a complex ‘hands-on’ environment including a high level of task density. The whole room should be considered the ‘patient zone’ for the purpose of hand hygiene principles. The contamination of equipment with hands/gloves is particularly problematic (see section 4.1.3). In an anaesthesia environment, the frequent use of alcohol-based hand rubs for hand hygiene, including use as an alternative to using non-sterile disposable gloves in circumstances where body fluid exposure risk is low, has aided compliance.

Surgical/sterile procedures
Antiseptic hand rub solutions with an alcohol component or alcohol solutions alone provide superior disinfection when compared with non-alcoholic antiseptics (4 per cent chlorhexidine, povidone iodine) or non-antimicrobial soaps. Alcohol is rapidly germicidal but when combined with antiseptic compounds, bacterial re-growth occurs at a significantly slower rate. Extended antimicrobial activity appears to be most effective for alcohol solutions containing 2-4 per cent chlorhexidine gluconate. Products containing between 60-95 per cent alcohol appear to be the most effective with the higher concentrations being less effective because protein denaturisation requires water.

4.1.3 Gloves, gowns, facemasks/shields and theatre caps

Healthcare workers should protect themselves by wearing gloves, protective eyewear or face shields, masks, gowns and/or plastic aprons when there is the likelihood for splashing, splattering or spraying of blood or body fluids.

a. Single-use, non-sterile examination gloves should be worn when there is anticipated contact with blood, bodily fluids, mucous membranes, non-intact skin and potentially infectious body fluids. This includes droplets or aerosols originating from the respiratory system and contaminated equipment or surfaces. Hand hygiene, as per the '5 Moments of Hand Hygiene' should ideally be performed before donning and after removing gloves - while recognising that the operating theatre itself forms the 'patient zone'. Hand hygiene applies especially when having contacted body fluids or handling items that may be contaminated with body fluids (eg laryngoscopes, urine bags or burettes).

   Gloves (when they are required) must be removed or changed between procedures on the same patient, and when moving between contaminated and clean body sites and equipment. Specific care should be taken not to contaminate the patient care environment with gloves that have had previous patient contact.

   It should be noted that overuse of non-sterile gloves contributes to poor hand hygiene, and unnecessary use adds to financial and environmental waste. Guidance on sustainable use of gloves has been provided for healthcare workers.[2]

b. Fluid-resistant gowns must be worn during all procedures when there is a risk of blood or bodily fluid exposure, and for contact precautions. Sterile gowns should be considered where there is a need to protect the patient during an aseptic procedure. The level of protection should be appropriate to the procedure and risk assessment. A clean gown should be donned immediately before each procedure and changed if visibly soiled or between procedures. Careful doffing is essential to prevent contamination, and single-use gowns should be disposed of after each use. Hand hygiene should be performed prior to and after gown removal.

   Reusable sterile or non-sterile fluid-resistant gowns should be considered for use in the above circumstances wherever possible .[3]

c. Surgical masks should be worn by anaesthesia staff when carrying out sterile procedures under full aseptic conditions (see item 4.3.2). The use of masks for theatre personnel should also be in accordance with local hospital policy. It should be remembered that face masks protect the wearer from contamination during procedures as well as potentially limiting spray contamination of sterile fields when in range. Masks should be chosen based on the degree of fluid protection required. When masks are worn, they should cover the nose and mouth completely and be firmly secured. Masks should not be worn around the neck nor be touched while in use or taken down to speak. Single-use face masks should be removed immediately after use and replaced for fresh patient interaction and when contaminated, handle the straps only. Following removal and disposal, hand hygiene should be performed. Face masks providing a high degree of filtration (PFR – particulate filter respirators eg N95 designs) should be worn when required and users should be fit-tested regularly according to jurisdictional requirements. Face shields or protective eyewear should be worn in conjunction with masks when splash or spray risk exists.

d. Theatre caps should cover all hair and should be either a disposable theatre cap or a freshly laundered, lint-free reusable cap. Disposable caps are single-use only and

should be disposed of after each session. Reusable caps are preferred over single-use caps for their lower environmental impact and must be laundered daily if used. These head coverings should be made from appropriate materials lint free material such as polyviscose, gaberdine, or polycotton, with proper construction. Headwear worn for cultural or religious reasons must be cleaned daily and fully enclosed in a freshly laundered, lint-free reusable covering or disposable, non-woven headcover. All commercial cloth head coverings require proper labelling with care instructions. Hair accessories must be securely fastened and minimised. Facial hair should also be covered.

4.1.4 Theatre attire

All personnel entering a theatre suite should comply with theatre dress requirements. In specified areas this includes wearing freshly laundered theatre scrubs provided for use within the suite. Theatre attire should be changed at least daily. During the shift any visibly soiled attire should be changed as soon as possible. Scrubs worn outside the hospital should not be worn in the theatre suite.

Dedicated footwear is preferred for operating rooms and other specified areas within the operating suite. Footwear should meet occupational health and safety standards and be kept clean. Overshoes are not necessary for clean shoes (that are specially kept for use in theatre). Overshoes are generally not recommended on environmental and cost grounds but should be worn if there is any possibility that dirt may be on the shoes or there is a risk of contamination. If overshoes are used, hand hygiene should be performed after donning and removing them.

Sterile gowns worn for a particular procedure should not be worn outside of the room or area where that procedure was undertaken. The use of sterile gowns in regional anaesthesia and pain medicine procedures is discussed below (section 4.3.4).

4.1.5 Theatre ventilation and airflow

Opening operating room doors disrupts airflow within the room, which potentially increases the risk of wound contamination. General traffic and superfluous personnel within the operating room should be minimised and doors should remain closed.

It is a responsibility of theatre management to ensure that supply and exhaust systems meet minimum air exchange and filtration requirements. A minimum of 15 - 20 air exchanges per hour is recommended by international and Australian bodies. Air quality and air exchange rates should be checked regularly.

4.1.6 Sharps

Sharps (eg needles and scalpels) must be handled with care and disposed of safely immediately following use. Avoid resheathing needles, bending or breaking them, or manipulating used sharps. The use of needle-free injection systems and cannulae with needle protection systems (for example, needle retraction) is encouraged. Sharps must be disposed of in approved, clearly marked sharps containers that meet AS/NZS 4031:1992 standards, placed at the point of use, and never filled beyond the marked line. Full containers should be sealed and replaced.

Any person exposed to a needlestick, or other blood or body fluid incident should follow the protocol provided by the institution in which it occurs. This includes having a medical evaluation with particular reference to the risk of infection with human immunodeficiency

virus, hepatitis B virus or hepatitis C virus. The National Health and Medical Research Council has published extensive guidelines on the prevention and control of infection in healthcare including the management of exposure to blood and body fluids contaminated with blood, such as needlestick/sharp injuries.[4]

Clinicians should be wary of the risk of skin cuts associated with jagged edges on glass ampoules. Any skin cut must be cleaned and dressed appropriately to avoid local infection or blood exposure to patients. Broken glass ampoules must be disposed of in sharps containers.

4.1.7 Surgical antibiotic chemoprophylaxis

Antibiotic chemoprophylaxis is an important strategy to reduce surgical site infections for many procedures and is the responsibility of the whole surgical team. Indication, agent choice, dose, time, redosing and duration should be in accordance with local surgical prophylaxis guidelines and therapeutic guidelines.

4.1.8 Maintenance of normothermia

Perioperative hypothermia has been associated with adverse outcomes, including infectious complications.

4.1.9 Prophylactic steroids

Dexamethasone for nausea and vomiting prophylaxis (4 and 8mg IV intraoperatively) was shown to be no worse than placebo in the rate of surgical site infections.

4.1.10 Restrictive transfusion strategies

Restrictive transfusion strategies may be associated with less risk of health-care associated infection, especially in orthopaedic surgery. In elective cardiac surgery, restrictive transfusion practices were no worse than liberal practices with respect to infectious outcomes. Overall, the National Blood Authority advocates a "*precautionary approach to blood transfusion, balancing the potential harms of blood transfusion and anaemia*." Restrictive transfusion practices also have the benefit of reducing consumption of blood bank resources.

4.1.11 Vaccination of the healthcare worker

Healthcare facilities should provide a screening and vaccination program for their workers. It is the responsibility of individual practitioners to avail themselves of health resources and ensure their immunisation is up to date and compliant with healthcare regulatory requirements.

4.2 Anaesthetic apparatus

4.2.1 Disposable Items

Items manufactured and/or designed for single-use should not be reprocessed or re-used on other patients in keeping with the AS5369:2023 (also accepted by HealthCERT New Zealand). Disposable devices for critical or semi-critical indications should be sterile in unbreached packaging.

4.2.2 Devices instrumenting the upper airway

4.2.2.1 Anaesthetic face masks

Single use masks should be sterile before use or provided in appropriately clean sealed packaging. As they can be contaminated with microorganisms and secretions from the airway or upper gastrointestinal tract, if reusable, they should be reprocessed in accordance with manufacturer and AS5369:2023 recommendations as a semi-critical device between uses, in addition to tracking processes.

4.2.2.2 Laryngoscopes

Reusable laryngoscope blades are considered semi-critical medical devices owing to their contact with the mucous membranes of the oropharynx and require sterilisation or high-level disinfection between uses.

Reusable laryngoscope handles are non-critical devices and should be cleaned then undergo low-level disinfection, as a minimum, following use.

4.2.2.3 Bougies

Bougies should be sterile single use items. Re-use of these items (gum elastic bougies) has been associated with cross-infection risk.

4.2.3 Anaesthetic breathing systems

Disposable or reusable breathing circuits may be reused for up to 7 days provided appropriate precautions and processes are in place, including the use of bacterial filters and inspection after each use for contamination. This greatly reduces plastic waste and cost. Departments should comply with local policy. If visibly internally or externally contaminated, or used for known high-risk infectious cases, for example, open tuberculosis, the circuits should be changed between patients unless a heat moisture exchange bacterial filter is used. The breathing bag is easily contaminated by hand contact during induction and emergence from anaesthesia. Breathing bags should be cleaned according to manufacturers' instructions between each patient use (unless designated 'single use' only).

4.2.4 Sampling lines for side stream gas analysis

These are often not designated single-use and may be re-used provided that the gas is sampled via a bacterial/viral filter. They need not ordinarily be sterilised before reuse. Sampled gas should not be returned to the anaesthetic circuit unless it is first passed through a viral filter (0.2 µm mesh).

4.2.5 Anaesthetic machines

Routine daily sterilisation or disinfection of internal components of the anaesthetic machine is not necessary if a bacterial/viral filter is used between patient and circuit. However, local cleaning and maintenance policies should be followed, and bellows, unidirectional valves and carbon dioxide absorbers (if non-disposable) should be cleaned and disinfected periodically according to manufacturers' instructions.

4.2.6 Surfaces and monitors

The surface of the anaesthetic machine and monitoring equipment should be cleaned between each patient according to manufacturer instructions. This includes non-invasive

blood pressure cuffs and tubing, pulse oximeter probes and cables, stethoscopes, electrocardiographic cables, blood warmers and so on, and the exterior of anaesthetic machines and monitors. Items such as temperature probes should be single patient use. Touch screens and control knobs should also be cleaned.

4.2.7 Flexible laryngoscopes and bronchoscopes

Reusable airway devices are considered semi-critical and require careful cleaning, including of any open suction or biopsy channel, followed by high level disinfection or sterilisation. This reprocessing must occur in a dedicated reprocessing facility (e.g. central sterilisation service).

4.2.8 Ultrasound equipment

4.2.8.1 Ultrasound transducers

Ultrasound transducers (or probes) are reusable medical devices and require reprocessing between patient uses. Reprocessing starts immediately following ultrasound use and encompasses cleaning, inspection for damage, disinfection, storage, and tracing/tracking (where required).

Following use, all transducers must be thoroughly cleaned and have all organic (e.g. body fluid) and non-organic matter (e.g. gel) removed, leaving them free of all visible contamination. If the device cannot be cleaned effectively at the point of use it should be transported to a dedicated reprocessing area (e.g. central sterilisation service) for reprocessing. Cleaning products must be listed on the Australian Register of Therapeutic Goods or by Medsafe in New Zealand, and be approved for use by the ultrasound manufacturer. Once cleaning is completed ultrasound transducers must additionally undergo disinfection to eliminate the residual microorganism remaining on the device. Disinfection systems/wipes must be listed as a Class IIb medical device (instrument grade disinfectant) on the Australian Register of Therapeutic Goods and be approved for use by the ultrasound manufacturer.

In anaesthesia and pain medicine ultrasound transducers can be considered as either “non-invasive” and “invasive” based on their intended site of use. Non-invasive transducers are non-critical devices as they are not exposed to sterile tissue, open wounds, or mucous membranes in which case they should be considered invasive. Invasive transducers are semi-critical or critical devices, according to Spaulding’s classification. These systems are based on the risk posed to the patient the ultrasound equipment is next to be used upon, with invasive transducers carrying higher risk than non-invasive.

4.2.8.1.1 Non-invasive ultrasound transducers

Ultrasound transducers that are applied externally (e.g. onto the skin surface) are considered non-invasive medical devices. Examples of these in anaesthesia practice include transducers used for diagnostic purposes such as lung, gastric, and transthoracic cardiac ultrasound. Non-invasive ultrasound transducers must undergo cleaning and low-level disinfection between uses.[5] Non-invasive ultrasound transducers should be stored to minimise environmental contamination between uses.

In percutaneous procedures with ultrasound guidance there is a risk of

the transducer contacting a skin puncture site or the device being inserted (e.g. vascular access, or regional anaesthesia). In all cases a sterile transducer cover should be used to cover the transducer (see 4.2.8.3).[5] An uncovered transducer is considered a semi-critical device it must undergo high level disinfection or sterilisation before use.

4.2.8.1.2 Invasive ultrasound transducers (including Transoesophageal probes)

Invasive ultrasound transducers are those that are intended to penetrate the skin or are in contact with mucous membranes. The most common example of an invasive ultrasound transducer in anaesthetic practice is the Transoesophageal echocardiography (TOE) probe. For the purposes of reprocessing these ultrasound transducers are considered semi-critical and, following cleaning, must undergo high level disinfection owing to their heat sensitive nature. In addition, all semi-critical medical devices are required to comply with the tracking and traceability requirements outlined in AS5369:2023. Storage following reprocessing should prevent contamination and be in a designated storage system (e.g. cabinet).

4.2.8.2 Ultrasound machine, cables, screens, and user interface

All components of the ultrasound machine, cables, screen, and interface should be cleaned and low-level disinfected after use. Particular attention should be paid to high touch areas. A transducer cover, where used, should protect the transducer cable from contamination where it is in the procedural area and at risk of blood or body fluid contamination.

4.2.8.3 Ultrasound transducer covers

Ultrasound transducer covers should be used to minimise contamination of the ultrasound transducer and cable and/or prevent the transfer of microorganisms between the transducer and patient. Covers are recommended for ultrasound transducers intended to contact mucous membranes and for percutaneous procedures. Covers may also be considered even if the transducer and cable are to undergo high-level disinfection between uses. When sterile covers are used in percutaneous procedures, they can be considered a component of the aseptic approach.[5] A sterile transducer cover (preferably listed by the ARTG or Medsafe) must always be used if the skin puncture site or the device being inserted could possibly contact ultrasound transducer during the conduct of the procedure. The use of small adhesive dressings over the transducer is not recommended by ultrasound manufacturers and is discouraged as it may have gaps, does not protect the cable from contamination, and may generate ‘spray’ on removal which can contaminate the immediate environment.

4.2.8.4 Ultrasound gel

Contaminated ultrasound gel has been recognised as the source of multiple infectious outbreaks. Gel is available in single patient or multi patient use packs/bottles. Gel should be discarded if there are signs of contamination or in accordance with the manufacturers’ recommendations for safe use following opening. Sterile ultrasound gel should always be used for percutaneous procedures and in ultrasound examination involving mucous membranes and non-intact skin.

4.2.9 Resuscitation equipment should be managed as per the guidelines for anaesthetic apparatus. Reusable items must be wiped over, cleaned or sterilised between patients depending on their criticality.

4.3 Invasive procedures

Invasive procedures are to be performed with aseptic technique.

4.3.1 Peripheral vascular cannulation

The cannulation site is a potential portal of entry for micro-organisms into the subcutaneous tissues and circulation. Clinicians should observe strict adherence to aseptic technique principles including:

- hand hygiene
- protective gloves. Gloves should be sterile if there is to be contact with the skin puncture site, devices that can contact the skin puncture site, or if there is touching of components or devices being inserted (e.g. guidewires).
- skin should be disinfected with an appropriate antiseptic preparation (70 per cent alcohol, tincture of iodine, an iodophor or chlorhexidine gluconate) prior to cannulation being performed in a manner that ensures the tip and shaft of the cannula remain sterile. Seventy per cent alcohol solution alone is only suitable for short-term cannulation (ie expected cannula duration <24 hours).

There is no evidence for the routine replacement of peripheral intravenous cannulae, although local institutional guidelines should be followed.

If a guide-wire is used to aid cannulation, these must be handled in a surgical aseptic manner (ie kept sterile). If a guidewire is required, for example in arterial cannulation, then additional aseptic precautions are required, such as the use of sterile gloves.

4.3.2 Central vascular cannulation

A central line is defined as an intravascular device that terminates at or close to the heart or in one of the great vessels. The Australian and New Zealand Intensive Care Society guidelines for central line insertion and maintenance aim to assist in the prevention of central line associated bloodstream infections.[6] The guidelines stress the importance of aseptic technique and maximal barrier precautions, including full body draping and the wearing of hat, facemask, gown and sterile gloves. The skin should be disinfected with a minimum of 0.5 per cent chlorhexidine preparation with 70% alcohol. If there is a contraindication to chlorhexidine, iodine or an iodophor in 70 per cent alcohol can be used as alternatives. Use of surface ultrasound should not compromise the aseptic technique (see item 4.2.8.1 and 4.2.8.3). If real-time ultrasound guided central cannulation is used then a sterile transducer cover (sheath) and sterile ultrasound gel must be used.[5] The use of a checklist to confirm compliance with aseptic technique is recommended.

4.3.3 Vascular access ports

Injection ports of intravascular devices and attached lines and tubing are potential sources of introduction of bacterial contamination. Proper aseptic technique should be strictly followed when accessing injection ports. This includes wiping the outer surface of the rubber stopper and its injection site with antiseptic solution (eg 70% isopropyl alcohol wipe/swab or chlorhexidine) and allowing it to dry before inserting any injection device.

4.3.4 Regional anaesthesia and pain medicine

When ultrasound is used in regional anaesthesia procedures, the transducer and cable should be protected from contamination and be prepared in such a way as to maintain the aseptic requirements of the procedure by using a sterile sheath (see item 4.2.8.1 and 4.2.8.3).

When single-shot non-neuraxial regional blocks are performed, aseptic precautions should consist of surgical mask, skin preparation (ideally chlorhexidine-based), hand hygiene, sterile gloves, a single-use needle and syringe and, where considered necessary, sterile field draping.

When a single-shot spinal or epidural block is being performed, at a minimum an aseptic technique must be employed as for regional anaesthesia including a sterile field and sterile equipment area. A sterile gown is not necessarily required for single-shot neuraxial techniques but should be considered for the proceduralist when anticipating a technically difficult or prolonged procedure or the proceduralist is undergoing training.

When a neuraxial or perineural catheter is to be left indwelling, surgical aseptic technique with maximal barrier precautions (including sterile gown) should be used. Although catheter-related infection rates are low, the impact on patients can be significant, and furthermore it is not always possible to predict the duration of catheter placement.

For procedures related to pain medicine, similar guidance to that for regional anaesthesia techniques (single shot and catheter-based) applies. This should include surgical aseptic technique with maximal barrier precautions (including sterile gown and sterile field draping) for all neuromodulation, intradiscal, minimally invasive surgical procedures, procedures breaching the vertebrae and device implantation.[7] Many patients being considered for pain medicine-related procedures should be assessed for risk factors for infection including but not limited to co-morbidities, medication usage particularly disease modifying agents and likely planned further clinical management such as joint replacement.

All stimulation, intradiscal and pain medicine procedures breaching vertebra require preoperative intravenous antibiotics one-hour pre incision.

For skin preparation chlorhexidine in alcohol is recommended for regional techniques, including neuraxial techniques. Chlorhexidine 0.5% to 2% may be used, noting that very small quantities of neuraxial chlorhexidine have been implicated in cases of severe neurotoxicity. Therefore, skin surface alcohol/chlorhexidine must be allowed to dry, and introducer needles for spinal needles should be used. Contamination of the sterile setup with disinfectant solutions must be avoided and appropriate procedures must be in place to prevent cross-contamination of solutions intended for neuraxial injection with disinfectant preparations.

Detailed recommendations for infection prevention practices in regional anaesthesia and pain medicine have been published.[7]

4.3.5 Chlorhexidine gluconate

As the use of chlorhexidine has increased, so have reported incidences of allergic reactions. Indiscriminate use should be avoided. Adequate alternatives to chlorhexidine should be stocked such that a chlorhexidine-free procedure can be performed in patients with known or suspected allergy (see *PG69 Hypersensitivity reactions*). Patients that are

allergic to chlorhexidine could receive povidone-iodine in alcohol (at least 70%) as an alternative.[8]

4.4 Presentation of drugs for injection

Contamination of drugs for injection should be avoided, and contaminated or potentially contaminated drugs must not be used. Particular caution should be exercised with drugs that are free of preservatives. To minimise the risk of cross-infection between patients the contents of any one ampoule must be administered to only one patient[4] (see also ANZCA professional document *PG51(A) Guideline for the safe management and use of medications in anaesthesia*). Regulatory requirements also prohibit ampoule splitting of S8 or Controlled drugs. Exceptions to this may be made for non-controlled drugs where strict protocols are used and endorsed by the hospital pharmacy.

Use appropriate personal protective equipment when breaking glass ampoules and consider ampoule breakers or safety devices to minimise injury risk. Inspect ampoules for damage, contamination, or particulate matter before use.

The external surfaces of injection vials, including the outer surface of the 'rubber' stopper and the inner surface of the vial lid, are not required to be sterile and so might not be free from microbial contamination. Vial lids are intended to act as a shield for the rubber stopper and to keep dust and other physical contaminants away from it. For vial preparation, carefully remove the flip-off cap, clean the rubber stopper with an appropriate antiseptic, and allow it to dry completely before inserting a needle or spike.

Care should be taken to avoid contamination of drugs being drawn up into a sterile field from ampoules or vials which are not in sterile outer packs. It should be recognised that filter needles need to have a 0.2 micron filter grade to be effective in excluding micro-organisms.

Proper aseptic technique must be strictly followed when administering intravenous injections to a patient.

This document is accompanied by a background paper (PG28BP) which provides more detailed information regarding the rationale and interpretation of the Guideline.

References

1. Standards Australia. AS 5369:2023 Reprocessing of reusable medical devices and other devices in health and non-health related facilities 2023 [Available from: https://store.standards.org.au/product/as-5369-2023?utm_medium=referral&utm_source=standards.org.au&utm_campaign=spotlight-july-24-as-5369. Accessed: 24 March 2025
2. ACSQHC. Sustainable glove use for healthcare workers - fact sheet: ACSQHC; 2024 [Available from: https://www.safetyandquality.gov.au/sites/default/files/2024-09/sustainable_glove_use_for_healthcare_workers_fact_sheet_0.pdf. Accessed: 22 March 2025
3. Royal Australasian College of Surgeons. Reusable surgical gowns - position statement 2023 [Available from: https://www.surgeons.org/-/media/Project/RACS/surgeons-org/ESSPWP/2023-11-08_Reusable-Gowns-Position-Statement_Final.pdf. Accessed: 4 Nov 2024
4. NHMRC. Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019) 2019 [updated 2019. Available from: https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1. Accessed: 23 March 2025
5. ACSQHC. Cleaning and disinfection of ultrasound transducers 2025 [Available from: https://www.safetyandquality.gov.au/publications-and-resources/resource-library/cleaning-and-disinfection-ultrasound-transducers. Accessed: 11 March 2025

6. Australian and New Zealand Intensive Care Society Safety and Quality Committee. Central line insertion and maintenance guideline. Melbourne: ANZICS; 2012 [Available from: https://arthashastra101.files.wordpress.com/2012/06/anzics-central-line-insertion-maintenance-guidelines.pdf. Accessed: 12 March 2024
7. Provenzano DA, Hanes M, Hunt C, Benzon HT, Grider JS, Cawcutt K, et al. ASRA Pain Medicine consensus practice infection control guidelines for regional anesthesia and pain medicine. Reg Anesth Pain Med. 2025.
8. Te Tāhū Hauora Health Quality & Safety Commission. SSII Surgical skin antisepsis: New Zealand Government; 2023 [Available from: https://www.hqsc.govt.nz/resources/resource-library/ssiip-skin-antisepsis-guide/. Accessed: 27 March 2025

Related ANZCA Professional Documents

PG51(A) Guideline for the safe management and use of medications in anaesthesia
PG69 Guideline on the prevention, investigation and follow up of perioperative hypersensitivity reactions and anaphylaxis

Professional documents of the Australian and New Zealand College of Anaesthetists (ANZCA) are intended to apply wherever anaesthesia is administered and perioperative medicine practised within Australia and New Zealand. It is the responsibility of each practitioner to have express regard to the particular circumstances of each case, and the application of these ANZCA documents in each case. It is recognised that there may be exceptional situations (for example, some emergencies) in which the interests of patients override the requirement for compliance with some or all of these ANZCA documents. Each document is prepared in the context of the entire body of the college's professional documents, and should be interpreted in this way.

ANZCA professional documents are reviewed from time to time, and it is the responsibility of each practitioner to ensure that he or she has obtained the current version which is available from the college website (www.anzca.edu.au). The professional documents have been prepared having regard to the information available at the time of their preparation, and practitioners should therefore take into account any information that may have been published or has become available subsequently.

Whilst ANZCA endeavours to ensure that its professional documents are as current as possible at the time of their preparation, it takes no responsibility for matters arising from changed circumstances or information or material which may have become available subsequently.

Promulgated: 1995
Reviewed: 2005, 2013, 2015
Republished: Dec 2018, Jul 2019, Dec 2020, Aug 2021
Current document: Dec 2025
Links reviewed: Dec 2025

ANZCA website: www.anzca.edu.au