DECONTAMINATION, DISINFECTION AND STERILISATION OF CLINICAL ITEMS

Best Practice Statement:
Practices will ensure that all items requiring decontamination, disinfection or sterilisation are managed safely and appropriately to ensure that the risk of cross-infection is minimised. The purpose of this policy is to provide health care professionals with comprehensive guidelines for decontamination and sterilisation of reusable clinical items.

NZ Standards:
Practices will aim to achieve the standards documented in AS/NZS 4815:2001 or the most recent revision of this document (see references). This Standard is available for purchase and details the required standard of processes involved in cleaning, disinfecting and sterilising reusable medical and surgical instruments and equipment. These standards have been taken into account in the preparation of this document.

Definitions:

Decontamination
Decontamination is the cleaning of an item or surface of an item to remove visible / invisible soil and reduce the number of microorganisms present. Decontamination is performed manually or by washer sanitisers.

Disinfection
Disinfection is a process that kills micro organisms (except bacterial spores) with the use of chemical preparations. There are three levels of disinfection:

- **Low level disinfection** kills most vegetative bacteria, most fungi and some viruses, but may not kill resistant microorganisms e.g. mycobacteria, bacterial spores.

- **Intermediate level disinfection** kills vegetative bacteria, most fungi, tubercle bacilli and most viruses, but not resistant bacterial spores.

- **High level disinfection** kills vegetative bacteria, tubercle bacilli, fungi, lipid and non lipid viruses, but may not kill high numbers of bacterial spores.

Sterilisation
Sterilisation is a process that kills all types of microorganisms.
Choosing the appropriate level of cleaning:

Any item that has been used on a patient or used to clean that item needs to be decontaminated. Following that, depending on the item and what it is used for will determine the next step of whether disinfection or sterilisation applies.

Items that require low level disinfection are those which come into contact with intact skin but not mucous membranes e.g., stethoscopes, ECG leads, examination couches and bench tops. These are defined as non-critical items.

Items that require high level disinfection using chemical preparations (e.g. hydrogen peroxide and chlorine compounds) are those that come into contact with mucous membranes or non-intact skin. These items should be free of all microorganisms except bacterial spores. Examples include nebuliser bowls, oxygen masks, thermometers and ear speculae. These are defined as semi-critical items.

Sterilisation procedures are required for any reusable item or equipment that enters normally sterile tissue or the vascular system. Examples include surgical instruments and urinary catheters. These are defined as critical items.

Procedures:

1. Decontamination of clinical instruments

The process of decontamination is an extremely important one. If soil is not removed from clinical items prior to further cleaning, penetration by chemicals or heat becomes compromised and the remaining soil encases the microbes.

Any clinical item that is intended for reuse will be decontaminated before further cleaning processes are performed. Single use items such as oxygen masks, nebuliser bowls and ear pieces are also routinely decontaminated for reuse by practices (see 4.). It is also important to note that no single preparation will remove all types of soil.

1.1 Manual Decontamination

The following standard precautions will be applied when undertaking manual decontamination procedures:

- Disposable latex gloves, plastic apron and facial / eye protection will be worn to protect against contaminated splash back from soiled items.
- Decontamination is a dirty procedure and will therefore be carried out in a “dirty” area e.g. the sluice, or a designated space for decontaminating items within a clinical area.
- An appropriate detergent will be used as a decontaminating solution and the water used with it will be tepid. (NB Do not use the type normally purchased at the supermarket, but one that is suitable for a healthcare environment and always follow the manufacturer’s instructions for use).
- Instruments will be washed underneath the water line to minimize contaminated splash back.
• Instruments will be opened up where possible to reach hidden soil. A clean, firm bristled brush will be used to remove organic matter. Brushes are themselves a means of cross infection and will therefore be decontaminated daily by thorough cleaning and steam sterilisation and stored dry.
• At each manual decontamination procedure, the instrument will be examined for wear and tear and withdrawn if its surface is damaged or corroded.

NB: Alison Carter from Medlab South advises that single use items e.g. oxygen masks, nebuliser bowls and ear pieces should be washed and dried thoroughly before disinfection. Respiratory equipment such as masks/nebulisers could potentially be contaminated with *Mycobacterium tuberculosis* and require high-level disinfection in a solution that claims tuberculocidal activity. Ear pieces require manual drying with a clean paper towel while oxygen masks / nebuliser bowls will be air dried. The tubing should never be washed as it is impossible to get it dry and it therefore becomes an infection risk. The tubing should be changed at regular intervals or when there is obvious condensate or visible soiling. Practices are responsible for ensuring that policies stating how these items are to be reprocessed are in place.

1.2 Decontamination using mechanical appliances

Examples of mechanical decontaminators include washer sanitisers, ultrasonic cleaners and dishwashers. Washer sanitisers are recommended as they remove soil effectively and reduce the risk to health care professionals when handling soiled items.

It is important to note that these appliances will not be used in place of sterilisation equipment, rather as a decontamination aid prior to further disinfection or sterilisation procedures.

If mechanical decontaminators are in place, practices need to ensure the correct use of the equipment and maintain appropriate servicing schedules.

2. Disinfection of clinical instruments

Items that have been decontaminated either manually or by mechanical means are now ready for disinfection. Disinfection is a clean procedure and will therefore be carried out in a clean area such as the treatment room. To ensure successful disinfection processes health professionals will ensure that the correct contact time in the recommended dilution of disinfectant is achieved.
2.1 **Choosing the right disinfectant**

A wide variety of disinfectants are available and the following considerations will be made when choosing the appropriate preparation:

- The level and range of microorganisms that the disinfectant targets.
- The level of compatibility with the items to be disinfected e.g. is it non-corrosive?
- Ease of use.
- The type and kill ability of the disinfectant should be appropriate for the level of microbial exposure of the item to be disinfected.

2.2 **Examples of disinfectants**

- Alcohol (e.g. Ethyl) will be used to disinfect items like thermometers and stethoscopes. Important to note flammability.
- Sodium Hypochlorite may be used on items such as feeding equipment, thermometers or to decontaminate blood spills. Important to note that sodium hypochlorite is corrosive to metal.

2.3 **Points to consider relating to disinfection**

- Ensure the correct level of disinfection (low, intermediate or high) is selected
- Appropriate precautions (gloves, apron and face protection) will be taken to protect against irritant splashes
- Decontamination of items is an essential prerequisite to disinfection
- Items will be dry prior to immersing in disinfectant solution to prevent over dilution of the preparation to inactive levels
- Ensure the container used for disinfecting is appropriately labelled and has a tight fitting lid. Only use containers that are compatible with the disinfectant (see manufacturer’s recommendations)
- Items will be fully submerged in the disinfection solution
- Thoroughly rinse and dry items following disinfection

3. **Sterilisation**

Sterilisation is a process that attempts to ensure that reusable clinical items are free from all pathogenic organisms between uses. Methods that can achieve effective sterilisation include thermal or chemical processes. The two methods that are routinely used in General Practice environments are steam under pressure (steam autoclaving) and dry heat.

Instruments will be steam autoclaved in accordance with the AS/NZS 4815:2001 Standards (or the most recent revision).

4. **Reuse of items designated single-use only**
The reuse of items designated single use only is a controversial topic. It is recommended that the manufacturer’s recommendations regarding reprocessing of a device be strictly adhered to. The reuse of single-use nebuliser bowls in the same patient after simple washing and drying is regarded as acceptable practice. The Waikato DHB currently has a reuse policy that allows reuse under strictly controlled conditions (see references). The UK (and many European countries) bans the reuse of single use devices.

4.1 Points to consider relating to reuse of devices designated single-use

- Inadequate cleaning/decontamination with risk of cross-contamination
- Alteration of construction materials during reprocessing
- Residues from chemical decontamination agents e.g. absorption by plastics
- Mechanical failure of device
- Medicolegal implications of not following manufacturer’s recommendations
- Patient should be informed that the device has been reprocessed and documented verbal consent for use obtained (The HDC Code of Health and Disability Services Consumers’ Rights Regulation 1996)

5. Infection Control Advice

Infection control advice can be obtained as required from the infection control unit at Gisborne Hospital.

References:


Available for purchase from www.standards.co.nz. Pinnacle will hold a copy of the Standard for temporary reference by members on request.

Carter A (2005) Email correspondence to Pinnacle 22/04/05


McCulloch D, Meed P, Morris A Disinfection and Sterilisation of reusable medical devices in General Practice, 2002 Diagnostic Medlab, Auckland


QIP Quality in Practice (2004). Precleaning of Instruments Prior to Sterilisation QIP Pty Ltd: Queensland, Australia
Waikato DHB Policy©: Re-use of Manufacturer-Recommended Single-Use Patient Care Items – issued October 2003. Intranet copy downloaded 5/12/05 from:
http://www.waikatodhb.govt.nz/Media/docs/Policy_Procedure/Infection_Control/Re-use%20of%20single%20use%20items%201003.pdf

Signature:……………………… Date: …………………
Resource Diagrams:
a. Instrument washing procedure

1. Dirty instruments
2. Wash hands and wear gloves
3. Rinse off excess soil from instruments
4. If immediate washing cannot take place soak in detergent and tepid water
5. Apply mechanical or physical agitation (wipe or soft cloth scrub or nylon or brass bristle brush) to instruments
6. Discard dirty water
7. Rinse thoroughly in hot potable water
8. Remove contaminated gloves and wash hands
9. Use lint free material to dry instruments
10. Package for sterilisation
11. Sterilise and store

Unwrap immediately prior to re-use

b. Sterilisation process

Dirty → Sterile

Dirty Sink → Clean Sink → Ultrasound cleaner if used → Clean area for washed and dried instruments → Packing area → Steriliser → Storage

Suggested layout of sterilisation processing area

Appendix F

NB Practices that have less space than the ideal set-up above should still follow the principle of dirty to clean within their allocated space.