Guidelines on Infection Control Practice

in Outpatient Clinics

Infection Control Committee
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Content

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Introduction

Large numbers of patients are seen in outpatient settings daily. Most patients are seeking care for relatively minor illnesses or injuries that have not compromised their host defences. Very few patients are exposed to invasive devices or procedures that are known to pose significant infection risk. In addition, the duration of contact with the facilities is generally brief. Infection risk associated with care in clinics is probably quite low. Most nosocomial infections in these settings are largely preventable by the combination of simple good hygienic practice and appropriate decontamination of instruments.

The following guidelines are written for staff in outpatient clinics. Advices are given on the standard infection control practice to be observed whilst on duty. They should be read in conjunction with other infection control guidelines/recommendations promulgated by the Department.

Preventive Measures

I Hand washing

Many infections are spread by contact. Handwashing is the most important method of preventing spread by this route.

- Hands must be washed before and after direct contact with patients, or with items in contact with patients' blood or body fluids.
- Use surgical scrub solution only prior to invasive procedures. Ordinary soap and water are sufficient for non-invasive procedures.
- Liquid soap is preferable. If bar soap is used, it must be placed on soap rack that permits water drainage.
- Good handwashing should involve thorough lathering of all hand surfaces and rinsing under running water. The whole procedure needs to take no more than 15-20 sec.
- Dry hands thoroughly with paper towel or air hand dryer.
- Do not use nailbrush routinely.

II Decontamination of instruments

Disinfection and sterilization are necessary to prevent cross infection from equipment, surfaces and skin. Disinfection is used to reduce the number of microorganisms, while sterilization is used to remove all living microorganisms.

A Precleaning

Before decontamination by any of the methods outlined below, instruments must undergo preliminary cleaning. Blood or any other substance should be rinsed off gently under running water. The instruments should then be soaked in a solution of lukewarm water and detergent and washed thoroughly.

Household gloves and plastic apron should be worn when cleaning instruments and care should be taken not to produce splashes. Goggles or face shields should be worn if splashing is likely.

B Choice of decontamination methods

Instruments should be categorized according to the risks they pose for patients. Devices that penetrate skin, enter normally sterile body areas or come into contact with non intact mucous membranes require sterilization; devices that come into contact with intact mucous membranes require disinfection; while cleaning is generally sufficient for devices that come into contact with intact skin.

C Methods of decontamination

The most common decontamination methods used in the patient care areas are heat and chemical disinfectants. Heat is usually less selective, more penetrative and easier to control than chemicals. Heat is, therefore, the preferred method of decontamination.

(For decontamination method of selected items, see appendix I.)

a Sterilization

(i) Autoclaves

Instruments which are not heat sensitive can be sterilized reliably by steam under pressure using autoclaves. Please observe the followings when using autoclaves :

- Autoclaves must be located in treatment rooms away from traffic and they must not discharge steam/vapour into waiting area.
- Autoclaves must be operated only by staff who have been adequately instructed in their use.

- When using small table top autoclaves without vacuum extraction cycle, instruments should go in unwrapped, should be properly loaded so that surfaces of all instruments are accessible and exposed to the steam.

- Small table top autoclaves are not suitable for treating porous loads such as dressings and towels. These items, together with wrapped instruments, should be placed in sterilization drums and sent to the designated central sterilization centres.

- The "shelf-life" of sterilized wrapped items from central sterilization centres is suggested as follows :

  - Single wrapped sterilized items to be used within 2 weeks.

  - Double wrapped sterilized items to be used within 4 weeks.

  - Single wrapped sterilized items kept in unopened drum to be used within 1 month.

  - Double wrapped sterilized items kept in sealed plastic bag to be used within 3 months.

- Instruments can be sterilized in autoclave under the following minimal conditions : at a temperature of 121°C for 15 min. holding time, at 132º C for 4 min. holding time or for a holding time of 3 min. at 134°C.

- Instruments should be removed from the autoclave when a cycle is completed. They should be placed on a trolley laid with sterile paper/cloth and covered with a sterile paper/cloth. The instruments must be used within a session.

- Persons operating the autoclave should record for each cycle the readings on the autoclave gauges in a log book specifically kept for this purpose. The temperature and pressure should be within the ranges specified.

- Autoclaves must be checked monthly with spore strips placed on the bottom shelf in the area above the chamber drain. The results of spore strip test should be entered into a record.

- In case of unsatisfactory spore test result, EMSD should be notified. Autoclave should only be reused when spore test indicates satisfactory performance.

- Autoclaves should be serviced regularly at yearly intervals and as necessary.

(N.B. When purchasing autoclaves, please note the requirements of BS 3970 : the autoclave should have a preset automatic cycle, both temperature and pressure gauges and a thermocouple entry port.)

(ii) Hot air ovens

Instruments and materials which are heat stable and which cannot be sterilized by steam because of deleterious effects or failure to penetrate could be sterilized by the use of hot air in ovens. The transfer of heat by air is less efficient than by steam. Hot air ovens use higher temperature and longer times to sterilize than do autoclaves.

When using hot air ovens, please observe the followings :

- Hot air ovens must be located in a suitable area away from traffic.
- Hot air ovens must be operated only by staff who have been adequately instructed in their use.
- Non-perforated closed containers such as solid metal trays could be used in hot air ovens.
- Load should be packed in such a way that sufficient space remains between articles to allow hot air circulation.
- Instruments and materials can be sterilized in a hot air oven at a temperature of 160°C for 120 min. holding time or 180°C for 30 min. holding time.
- Persons operating the hot air oven should record for each cycle the reading on the indicating thermometer.
- Hot air ovens must be checked monthly with spore strips.
- Hot air ovens should be serviced regularly at yearly intervals and as necessary.

(N.B. When purchasing hot air oven, please note the requirements of BS 3421 : hot air oven should be fan-assisted; it should have a thermocouple entry port and safety device which will keep the door locked until chamber temperature is below 60°C.)

b Disinfection

(i) Hot water disinfectors

Hot water disinfectors are often referred to as 'sterilizers'. This is a misnomer. Boiling water, although being able to effectively disinfect instruments, cannot sterilize since some bacterial spores can withstand boiling.

The followings must be observed when using a hot water disinfector :

- The hot water disinfector must be located in treatment rooms.
- The hot water disinfector must be operated only by staff who have been adequately instructed in their use.
- Instruments must be fully immersed in water.
- Disinfectors should not be overloaded.
- Leave instruments for a minimum of 10 minutes after water returns to the boil. Use a timer with each process.
- Disinfected instruments should be removed with disinfected forceps and left on a clean disinfected surface to cool down and covered with a sterile paper/cloth. The instruments should be used within a session.
- Water in the disinfector should be changed daily.

(ii) Chemical disinfectants

Chemical disinfectants could be alternatives for heat labile instruments. However, they have many drawbacks such as corrosive properties, variability in their effect on different microorganisms, easy inactivation and different rates of microbicidal action (see appendix II for properties of various chemical disinfectants).

When using chemical disinfectants, please observe the followings :

- The disinfectant containers must be thoroughly cleaned and dried.
- Do not refill disinfectant containers without sterilizing the container between each use. Do not top up.
- The containers should be clearly labelled with contents, in-use dilution and expiry date.
- Ensure that optimum dilution is used.

- Open containers of disinfectant (over 24 hours) should not be tolerated, as they could easily be contaminated and microbes can grow in the disinfectant solution.

- Where indicated, surfaces should be wiped with disinfectants. Do not flood.

- Use appropriate disinfectants according to instruction (see appendix I).

III Protective clothing

The use of protective clothing serves as barrier to exposure.

A Gloves

- All staff should wear gloves when contact with blood or body fluids is likely.

- Sterile latex surgical gloves should be used for procedures involving penetration of skin or contact with non intact mucous membrane.

- The gloves must be readily available and well fitting.

- Gloves should be changed after contact with each patient.

- Gloves should be removed before handling telephones or performing office work.

- Hands should be washed whenever gloves are removed.

B Other protection

Staff should wear mask/face shield/goggles and gown when there is a risk of splashing or spraying of blood or body fluids.

IV Sharps

- Sharps must be handled with extreme caution.

- Avoid recapping of needles as far as possible.

- If needles need to be recapped, use devices or methods which eliminate the risk of percutaneous injury.

- Needles and sharps must be discarded into puncture-resistant containers.

- Do not overfill sharps box. Dispose the box when it is ¾full.

- Keep sharps box dry.

- Seal up sharps box and discard into red plastic waste bag for proper disposal. Mark "**小心利器**" on the outside of plastic waste bag.

V Spillage

- Spills of blood and body fluids should be cleaned up as soon as possible.

- Wear gloves and remove blood or body fluids with absorbent material.

- Wipe down the spill site with paper towel soaked in 1:5 hypochlorite solution and leave for 10 min.

- Clean the spill site thoroughly using detergent solution.

- Dispose of all contaminated waste material into a RED plastic waste bag.

- Wash skin thoroughly with soap and water if accidentally contaminated with blood or body fluids.

VI Specimens for pathological test

- Samples should be taken correctly and placed in a leak-proof container.

- The outside of specimen containers should be clean and the top fitted securely in place after use.

- Specimens should be kept upright as far as possible during transport to the laboratory.

- Specimens should be transported in individual plastic bags. Request slips should be placed outside the plastic bag.

- Hands must be washed after taking any specimens.

VII Waste disposal

- Medical waste such as sharps boxes, dressings and swabs contaminated with blood and body fluids, human and animal tissues, drugs or other pharmaceutical products, and other potentially infected waste should be placed in red plastic waste bags.

- The red plastic waste bags should be securely fastened when ¾ full. They should be stored in a designated location with a visibly clear warning sign, and protected from water, rain and rodents. They should be secure from unauthorized persons.

- Wrapping paper, office paper and other items which have not been in contact with patients' blood or body fluids should be placed in black plastic waste bags and disposed of in the same manner as domestic waste.

- Waste should be disposed of with minimal handling.

VIII Environment

A Air

A substantial proportion of the infections seen in the outpatient clinics are viral respiratory infections and probably carry with them risks of transmission similar to the risks of transmission in the community. The droplets that are potentially infectious to the susceptible person do not remain suspended in the air for extended periods of time, it is therefore unnecessary to restrict subsequent use of examination rooms after patients with these infections are seen.

Susceptible persons may come in contact with tuberculous patients in outpatient clinic, most probably in TB and chest clinics. Droplet nuclei containing *Mycobacterium tuberculosis* may persist in the air for extended periods. Susceptible persons may get infection if they are in contact with a large enough dose of droplet nuclei for a sufficiently extended time. To minimize the risk of infections, it is advisable that :

a Plenty of fresh air should be continuously introduced into all the rooms in the clinics.

b If the rooms are mechanically ventilated, proper air control should be instituted. Direction of air flow should be adjusted such that air flows from clean areas to less clean areas.

c Patients should be advised to cover their mouth and nose when coughing or sneezing.

B Furnitures and other fixtures

- Chairs in the waiting rooms should be cleaned regularly or when visibly dirty. They virtually present no infection risk.

- Examination tables should be cleaned daily or when there is soilage. Disinfection between patients is not necessary.

- Other structural surfaces, fixtures and fittings require regular cleaning.

C Floor

Accumulation of dirt in cracks, joints and corners is unpleasant but there is little evidence that this is a cause of infection.

- Clean the floor daily or more frequently consistent with the need in the facilities.
- Damp cleaning is recommended. Use only water and detergent.
- Cleaning should start in the clean areas and progress to the dirty areas (including the toilets, which should be the last).
- Wash the bucket after use and store dry.
- Mops should be cleaned after use in very hot water and detergent.

IX Personal hygiene

- Wear uniform properly fastened and keep it apart from outdoor clothing.
- Wash hands often and always before leaving the clinics.
- Always wash hands before eating and drinking.
- Never eat, drink, smoke or apply cosmetics in examination or treatment rooms.
- Never lick labels.
- Avoid hand or implement contact with eyes, nose or mouth.
- Cover cuts or grazes with water proof dressings.
- Report any accidents to supervisor.
- Make sure to receive necessary vaccines.

X Accidents and dangerous occurrences

- All staff should be instructed to notify accidents and dangerous occurrences, especially needle stick injury, to a designated staff in the clinic.
- All notified accidents should be recorded in a log book specifically kept for this purpose. They should be monitored so that preventive actions can be taken.
- Staff who sustained sharps injury should be managed as stipulated in the document "Procedure for Management of Needle Stick Injury or Mucosal Contact with Blood or Body Fluids – General Guidelines for Hepatitis B, C and HIV Prevention".

XI Immunization and other health advice

- All staff who are likely to come into contact with blood and body fluids should be screened against hepatitis B and when indicated, vaccination should be offered.

- All female staff should be screened against rubella and when indicated, vaccination should be offered.

- All staff, particularly those who have frequent contact with tuberculous patients, should be instructed to seek medical evaluation promptly whenever they develop symptoms which may be suggestive of tuberculosis.

XII Infection Control Officer

Each outpatient clinic should have a designated Infection Control Officer to be responsible for the followings :

- Oversee and monitor implementation of this guideline.

- Educate new staff and update existing staff on proper infection control practices.

- Maintain/monitor various records, e.g. autoclave cycle records, spore strip testing records, accident records.

Appendix I

Recommended methods of decontamination for commonly used items :

Item	Recommended method	Alternative method*
Auriscope nozzle	Clean with detergent and water. Immerse in alcoholic Savlon for 10 minutes. Rinse and store dry.	
Bottle, suction	Clean with detergent and water. Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Bowl, plastic	Clean with detergent and water. Store dry.	
Bowl, surgical	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Cheatle forceps and holders	Autoclave at the beginning of each session. Store dry.	Boil for 20 minutes.
Curette	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Dissecting forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
ECG electrodes	Clean with detergent and water. Store dry.	
Face-shield or goggles	Clean with detergent and water. Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Gallipots	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Iris scissors	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Knife handle	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Laryngoscope - Blade - Bulb	 Clean with detergent and water. Boil for 10 minutes. Store dry. Clean. Swab with 70% alcohol.	
Magill' s forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.

Mosquito artery forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.

Mouth gag	Clean with detergent and water. Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Nebulizer mask	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Nebulizer tubings	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Needle holder	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Oxygen cannula	Disposable.	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.
Oxygen mask	Disposable.	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.
Oxygen tubings	Disposable.	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.
Proctoscope	Clean with detergent and water. Boil for 10 minutes or autoclave. Store dry.	
Pulmonary function system - Absorber container	Immerse in 2% glutaraldehyde for 10 minutes. Rinse and store dry.	
- Breathing tubing	Immerse in 2% glutaraldehyde for at least 45 minutes. Rinse and store dry.	
- Expirator bag, Inspirator bag	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
- Mouth pieces, Mouth piece adaptor	Disposable.	Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.
- Nasal clips	Wipe with 70% alcohol. Store dry.	
- Support arms with clamps	Clean with detergent and water. Wipe dry.	

- Valve box, clamps, column & bolt	Clean with detergent and water. Wipe dry.	
Pulmonary items - T-shape connector of the smokeryzer	Clean with detergent and water. Wipe dry. Rinse with 70% alcohol before use.	
- Oxygen concentrator/oxygen humidifier filter	Clean with detergent and water. Wipe dry. Change when required.	
Resuscitator - Mouth piece, Mask	Clean with detergent and water. Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
Scalpel blades	Disposable.	
Sponge holding forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Stitch scissors	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Thermometer	Rinse. Immerse in 70% alcohol for 10 minutes. Store dry.	
Tongue depressor	Disposable.	Clean with detergent and water. Boil for 10 minutes. Store dry.
Toothed fixation forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Towel forceps	Disposable.	
Uterine forceps	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Uterine sound	Clean with detergent and water. Autoclave.	Boil for 20 minutes after cleaning.
Vaginal speculum	Clean with detergent and water. Boil for 10 minutes or autoclave. Store dry.	Disposable.
Vitalograph - Breathing tubes, Glass bottles	Clean with detergent and water. Immerse in 0.1% hypochlorite for 10 minutes. Rinse and store dry.	
- Peak flow meter	Clean with detergent and water. Wipe dry. Swab with 70%	

	alcohol.	

* Only for those clinics where the recommended method is not feasible.

Appendix II

Properties of commonly used chemical disinfectants :

1. Phenolics (e.g. Printol) :
   - Usual concentration - 1%
   - Spectrum of activity - Bacteria : Good
     - Tubercle bacilli : Good
     - Spores : Poor
     - Fungi : Good
     - Viruses : Good for some viruses only
   - Other properties - Absorbed by rubber and plastics
     - Should not be used in food preparation areas or on equipment that may come into contact with skin or mucous membranes
   - Recommended uses - Environmental or instrumental disinfection for selected items

2. Hypochlorites (e.g. Clorox – 5.25% available chlorine) :

   - Usual concentration - 1% (1:5 dilution) for blood and body fluid spill
     - 0.1% (1:50 dilution) for general disinfection
   - Spectrum of activity - Bacteria : Good
     - Tubercle bacilli : Good
     - Spores : Good
     - Fungi : Good
     - Viruses : Good
   - Other properties - Inactivated by organic matter
     - Corrosive to metals
     - Diluted solutions decay rapidly and should be made up daily
     - Addition of acids causes release of toxic chlorine gas
   - Recommended uses - Environmental or instrumental disinfection for selected items

3. Glutaraldehyde (e.g. Cidex) :
   - Usual concentration – 2%
   - Spectrum of activity - Bacteria : Good
     - Tubercle bacilli : Good
     - Spores : Good but slow
     - Fungi : Good
     - Viruses : Good
   - Other properties - Slow penetration of organic matter
     - Irritate eyes, skin and respiratory mucosa
     - Alkaline solution requires activation and has a limited useful life (14-28 days)
   - Recommended uses - Disinfection of selected instruments which cannot be heat sterilized
     - Use only closed containers to reduce the escape of irritant vapours

4. Alcohol (e.g. ethanol) :
   - Usual concentration - 70%
   - Spectrum of activity - Bacteria : Good
     - Tubercle bacilli : Doubtful
     - Spores : Poor
     - Fungi : Good
     - Viruses : Good
   - Other properties - Rapid action but volatile
     - Poor penetration into organic matter
     - Inflammable
   - Recommended uses - Disinfection of physically clean surfaces and skin

5. Diguanides (e.g. Hibitane - chlorhexidine,
   Savlon - chlorhexidine + cetavlon) :
   - Usual concentration - Hibitane - aqueous 1:1000
     0.5% in 70% ethanol
     Savlon - aqueous 1:100, 1:30
     1:30 in 70% ethanol
   - Spectrum of activity - Bacteria : Good for Gram + organisms
     - Tubercle bacilli : Poor
     - Spores : Poor
     - Fungi : Good
     - Viruses : Poor
   - Other properties - Inactivated by organic matter, soap and anionic detergents
   - Recommended uses - Skin and mucous membrane disinfection

GLOSSARY

Antisepsis :

The application of compounds to skin or mucous membranes to reduce microorganism content substantially.

Cleaning :

The removal of all visible debris on surfaces.

Decontamination :

A general term to cover all methods of cleaning, disinfection or sterilization to remove microbial contamination from medical equipment such as to render it safe.

The equipment is classified with respect to the choice of decontamination method.

(1) Critical – Comes into contact with tissue or the vascular space. Requires sterilization.
(2) Semi-critical – Comes into contact with mucous membranes or non-intact skin. Requires high-level disinfection.
(3) Non-critical – Comes into contact with intact skin. Requires intermediate or low-level disinfection.

Disinfectant :

A chemical that inactivates virtually all recognized pathogenic microorganisms but not necessarily all microbial forms, e.g. spores on inanimate objects.

Disinfection :

The killing of pathogenic organisms, but not usually of spores. It is classified into three levels.

(1) High-level – The elimination of all viruses and vegetative microorganisms and most but not necessarily all bacterial or fungal spores. E.g. glutaraldehyde, hypochlorite.
(2) Intermediate-level – The elimination of all vegetative pathogenic bacteria, including *Mycobacterium tuberculosis*, but not necessarily all viruses. E.g. alcohol.
(3) Low-level – The elimination of most pathogenic bacteria. E.g. diguanides.

Sterilization :

The complete elimination of all viable microorganisms including all spores.