



NATIONAL GUIDELINES FOR INFECTION CONTROL IN HEALTH FACILITIES 2008

Foreword

The Ministry of Health and Family (MOHF) places great emphasis on ensuring that health care services provided to Maldivians are safe and of high quality. This can be achieved through well developed standards of care including necessary protocols, practice guideline and relevant training to health staff. Given the high risk to patients from potential infections, through the funding assistance from World Health Organization (WHO), in June 2008 we are publishing this national guideline for Infection Control practices.

I am pleased that we are publishing the first national guideline for infection control practices in the Maldives. I would like to congratulate all those who have made this publication a reality. I take this opportunity to profoundly thank WHO for their continuous commitment to support initiatives to improve and develop our health care system. This project was developed by a team of health professionals at MOHF and I would like to congratulate them for their valuable input and dedication to developing this guideline. I convey my sincere gratitude to the senior management of MOHF and the relevant staff from Planning & Policy Division of MOHF for their dedicated efforts in facilitating the compilation of this publication. This national guideline is planned to be reviewed every 3 years and published with amendments.

I hope that health care professionals and health care administrators will use this national guideline in their areas of work to improve infection control practices in the private and public health care services in the Maldives.

Dr. Ibrahim Yasir Ahmed

Director General of Health Services

Ministry of Health and Family

Acknowledgements

This guideline was made possible through the valuable contributions of several concerned authorities and stakeholders. First and foremost, I would like to thank the Minister of Health and Family, Dr.Aminath Jameel for her continuous guidance and support throughout the compilation of this guideline.

I wish to express my gratitude to Dr.Sheena Moosa and Dr.Ibrahim Yasir Ahmed for their valuable insights and support in facilitating the development of this guideline. I greatly acknowledge the continued assistance from the World Health Organization (WHO) in funding this project and providing their expert guidance in implementing this activity.

The overall project management and coordination was carried out by the project team for 'Health Services Policy, planning and development/HSP' at the Policy Planning Division of the Ministry of Health and Family (MOHF). I wish to convey special thanks to Ms. Aishath Shirna Shafeeq for acting as the MOHF focal point in communicating and coordinating project work with all the stakeholders.

This guideline was developed by the knowledgeable and expert team of health professionals at MOHF. We greatly appreciate this team for their interest and special commitment to developing this important national guideline.

I hope that this national guideline will act as a useful guide for health professionals in standardizing infection control practices and making health care services safer for patients in the Maldives.

Infection Control Guidelines

June 11, 2009

Ms.Aishath Samiya

Policy Planning Division

Ministry of Health and Family

Appendix 5: Infection control guideline

NATIONAL GUIDELINES FOR INFECTION CONTROL IN HEALTH CARE FACILITIES

1. INFECTION CONTROL PRACTICES

Infection control practices can be grouped in two categories

1. standard precautions;
2. additional (transmission-based) precautions.

Transmission of infections in health care facilities can be prevented and controlled through the application of basic infection control precautions which can be grouped into standard precautions, which must be applied to **all** patients at **all** times, regardless of diagnosis or infectious status, and additional (transmission-based) precautions which are specific to modes of transmission (airborne, droplet and contact).

2. STANDARD PRECAUTIONS

Treating all patients in the health care facility with the same basic level of "standard" precautions involves work practices that are essential to provide a high level of protection to patients, health care workers and visitors.

These include the following: -

- ③ hand washing and antisepsis (hand hygiene);
- ③ use of personal protective equipment when handling blood, body substances, excretions and secretions
- ③ appropriate handling of patient care equipment and soiled linen;
- ③ prevention of needlestick/sharp injuries.
- ③ environmental cleaning and spills-management and appropriate handling of waste.

3. HAND WASHING AND ANTISEPSIS (HAND HYGIENE)

Appropriate hand hygiene can minimize micro-organisms acquired on the hands during daily duties and when there is contact with blood, body fluids, secretions, excretions and known and unknown contaminated equipment or surfaces

Wash or decontaminate hands:

- ③ after handling any blood, body fluids, secretions excretions and contaminated items;
- ③ between contact with different patients;
- ③ between tasks and procedures on the same patient to prevent close contamination between different body sites;
- ③ immediate after removing gloves; and
- ③ using a plain soap, antimicrobial agent or waterless antiseptic agent

The hospital setting is a good setting for communication about personal hygiene, such as informing visitors and — general public about hygiene rules such as washing hands.

4. USE OF PERSONAL PROTECTIVE EQUIPMENT

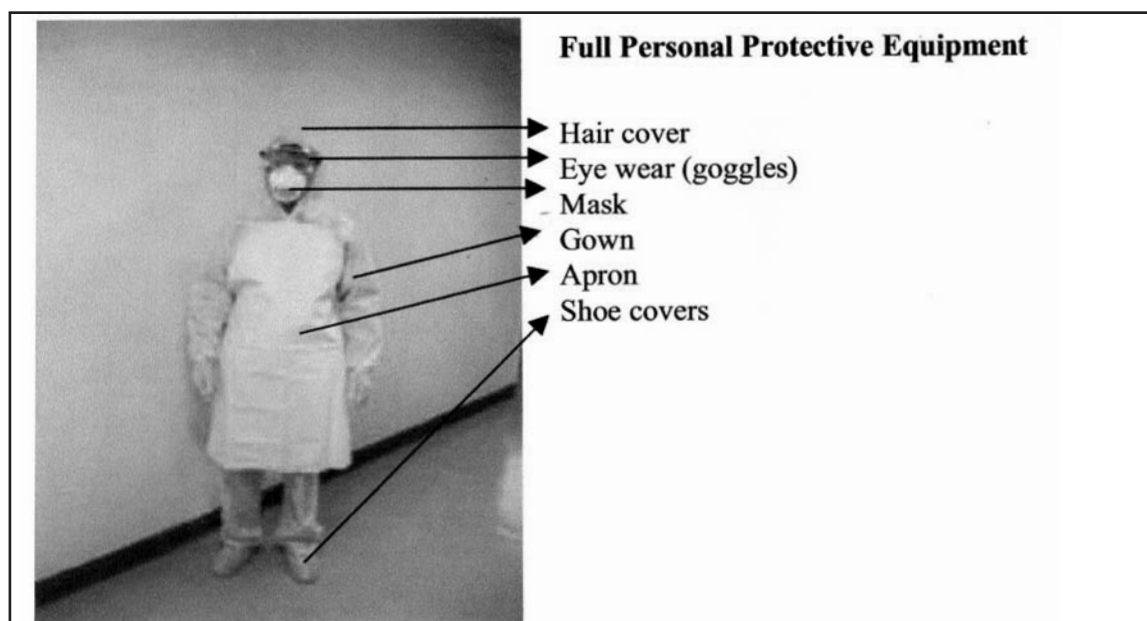
Using personal protective equipment provides a physical barrier between micro-organisms and the wearer. It offers protection by helping to prevent microorganisms from:

- contaminating hands, eyes, clothing, hair and shoes;
- being transmitted to other patients and staff

Personal protective equipment includes:

- ⑩ gloves;
- ⑩ protective eye wear (goggles);
- ⑩ mask;
- ⑩ apron;
- ⑩ gown;
- ⑩ boots/shoe covers; and
- ⑩ Cap/hair cover.

Examples of personal protective equipment



Personal protective equipment should be used by:

- ⑩ health care workers who provide direct care to patients and who work in situations where they may have contact with blood, body fluids, excretions or secretions;
- ⑩ support staff including medical aides, cleaners, and laundry staff in situations where they may have contact with blood, body fluids, secretions and excretions;
- ⑩ laboratory staff who handle patient specimens; and
- ⑩ family members who provide care to patients and are in a situation where they may have contact with blood, body fluids, secretions and excretions.

5. PRINCIPLES FOR USE OF PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment reduces but does not completely eliminate the risk of acquiring an infection. It is important that it is used effectively, correctly, and at all times where contact with blood and body fluids of all patients may occur. Continuous availability of personal protective equipment and adequate training for its proper use are essential. Staff must also be aware that use of personal protective equipment does not replace the need to follow basic infection control measures such as hand hygiene.

The following principles guide the use of personal protective equipment

- Personal protective equipment should be chosen according to the risk of exposure. Health care workers should assess whether they are at risk of exposure to blood, body fluids excretions or secretions and choose their items of personal protective equipment according to this risk.
- Avoid any contact between contaminated (used) personal protective equipment and surfaces, clothing or people outside the patient care area.
- Discard used personal protective equipment in appropriate disposal bags, and dispose of according to the health care f protocol.
- Do not share personal protective equipment.
- Change personal protective equipment completely and thoroughly wash hands each time you leave a patient to attend to another patient or another duty.

It is Important to use personal protective equipment effectively, correctly, and at all times where contact with patient's blood, body fluids, excretions and secretions may occur.

GLOVES

Wear gloves (clean, non-sterile) when touching blood, body fluids, secretions, excretions or mucous membranes.

Change gloves between contacts with different patients.

Change gloves between tasks/procedures on the same patient to prevent cross contamination between different body sites.

Remove gloves immediately after use and before attending to another patient.

Wash hands immediately after removing gloves.

Use a plain soap, antimicrobial agent or waterless antiseptic agent.

Disposable gloves should not be reused but should be disposed of according to the health care facility protocol.

Choosing protective gloves

Independent trials using typical solvents found in agrochemical products suggest that nitrile gloves offer suitable protection. Whichever nitrile glove type is chosen, ensure it has a minimum thickness of 0.5mm and 300mm length to protect wrists.

Other thicker materials may offer satisfactory protection but are not so easy to use. Remember that glove specifications can change from time to time. For up-to-date information, contact your glove supplier or manufacturer direct.

Glove use and maintenance

1. Before use check your gloves for any visible weakness such as lumps, pinholes and thin patches. You should also test for leaks. The illustration below shows how to test for leaks without contaminating your mouth.



Trap air in the glove by rolling up and squeeze inflated glove to test for leaks. Do not blow into gloves.

If in doubt, do not use the gloves, get a new pair.

2. Minimise contact between your glove and the chemical, and avoid total immersion if possible.
3. Contaminated gloves should be washed as soon as possible in water. Always wash gloves before removal. Washings should be added to the spray tank.
4. Do not keep used gloves for long periods as chemicals can be absorbed into the glove and eventually permeate through to the inner surface whether the glove is being worn or not.
5. If the glove is contaminated, looks dirty, smells of chemical, or if you are unsure about its protective qualities, then dispose of it safely via a reputable waste disposal contractor. If in doubt get a new pair.
6. Ensure that chemicals do not contaminate wrists via the cuff. Armlets help to prevent this. Contamination on the inside of the glove can readily be absorbed by the skin.

Removal of gloves

Gloves should be washed whilst still on your hands and dried on a disposable towel before removal. Take care not to contaminate your hands when removing your gloves.



1. Pull one glove off half way



2. With hand still in first glove pull the other glove off the hand as far as the wrist.



3. Put ungloved thumb inside top of second glove



4. Lift hand out and hold gloves by inside surfaces only

After removal place gloves in a clean area

Storage and disposal of gloves

When gloves have been removed, in all cases your hands should be washed again with soap and water and dried well. Hand cream should be applied.

Gloves should not be stored where they are likely to become contaminated. During fieldwork gloves should be kept in a PPE locker or a suitable container on the vehicle. An extra pair may be kept on the tractor for handling blocked nozzles.

Do not wear gloves used for handling chemicals when driving a vehicle; they may spread contamination onto equipment and could be punctured by the machinery.

REMEMBER *Gloves are to protect your hands from accidental contamination; wearing gloves does not mean you should allow your gloved hands to become contaminated.*

MASKS

Wear a mask to protect mucous membranes of the mouth and nose when undertaking procedures that are likely to generate splashes of blood, body fluids, secretions or excretions.

Wear surgical masks rather than cotton, material or gauze masks. Surgical masks have been designed to resist fluids to varying degrees depending on the design of the material in the mask.

Do not reuse disposable masks. They should be disposed of according to the health care facility protocol.

PROTECTIVE EYEWEAR/GOGGLES/VISORS/FACE SHIELD

Wear protective eyewear/goggles/visors/face shields to protect the mucous membranes of the eyes when conducting procedures that are likely to generate splashes of blood, body fluids, secretions or excretions. If disposable, discard appropriately. If they are reusable, decontaminate them according to the manufacturer's instructions.

GOWNS AND PLASTIC APRONS

Wear a gown (clean, non-sterile) to protect the skin and prevent soiling of clothing during procedures that are likely to generate splashes of blood, body fluids secretions or excretions. Impermeable gowns are preferable.

Remove a soiled or wet gown as soon as possible.

A plastic apron may be worn on top of the gown to protect exposure to blood, body fluids, secretions and excretions.

Launder gowns and aprons appropriately if they are reusable, according to the hospital guidelines.

Do not reuse disposable gowns and aprons. They should be disposed of according to the health care facility protocol.

CAPS AND BOOTS/SHOE COVERS

Wear disposable caps and boots where there is a likelihood the patient's blood, body fluids, secretions or excretions may splash, spill or leak onto the hair or shoes.

Do not reuse disposable caps. They should be discarded according to the health care facility protocol.

Decontaminate reusable boots.

Discard boots/shoe covers after use according to the health care facility protocol.

6. HANDLING OF PATIENT CARE EQUIPMENT AND SOILED LINEN

PATIENT CARE EQUIPMENT

Handle patient care equipment soiled with blood, body fluids secretions or excretions with care in order to prevent exposure to skin and mucus membranes, clothing and the environment.

Ensure all reusable equipment is cleaned and reprocessed appropriately before being used on another patient.

LINEN

Handle, transport and process used linen that is soiled with blood, body fluids, secretions or excretions with care to ensure that there is no leaking of fluid.

PREVENTION OF NEEDLE STICK/SHARPS INJURIES

Take care to prevent injuries when using needles, scalpels and other sharp instruments or equipment.

Place used disposable syringes and needles, scalpel blades and other sharp items in a puncture-resistant container with a lid that closes and is located close to the area in which the item is used.

Take extra care when cleaning sharp reusable instruments or equipment

Never recap or bend needles.

Sharps must be appropriately decontaminated and/or destroyed as per the national standards or guidelines.

7. ADDITIONAL (TRANSMISSION-BASED) PRECAUTIONS

Additional (transmission-based) precautions are taken while still ensuring standard precautions are maintained. Additional precautions include:

- airborne precautions;
- droplet precautions; and
- contact precautions.

AIRBORNE PRECAUTIONS

Airborne precautions are designed to reduce the transmission of diseases spread by the airborne route. Airborne transmission occurs when droplet nuclei (evaporated droplets) <5 micron in size are disseminated in the air droplet nuclei can remain suspended in the air for long periods of time. Droplet nuclei are the residuals of droplets and when suspended in the air, dry and produce particles ranging in size from 1-5 micron. These particles can remain suspended indefinitely in the air. Diseases which spread by this mode include open/active pulmonary tuberculosis (TB), measles, chicken pox; pulmonary plague and haemorrhagic fever with pneumonia, SARS, AI.

The following precautions need to be taken:

Implement standard precautions.

Place patient in a single room that has a monitored negative airflow pressure, and is often referred to as a "negative pressure room" The air should be discharged to the outdoors or specially filtered before it is circulated to other areas of health care facility.

Keep doors closed.

Anyone who enters the room must wear a special, high filtration, particulate respirator (e.g. N 95) mask

Limit the movement and transport of the patient from the room for essential purposes only. If transport is necessary, minimize dispersal of droplet nuclei by masking the patient.

It is important to gain the support of engineering services to ensure the negative airflow pressure is maintained.

DROPLET PRECAUTIONS

Diseases, which are transmitted by this route, include pneumonia, pertussis, diphtheria, influenza type B, mumps, and meningitis. Droplet transmission occurs when there is adequate contact between the mucous membranes of the nose and mouth or conjunctivae of a susceptible person and large particle, droplets (>5 microns). Droplets are usually generated from the infected person during coughing, sneezing, talking or when health care workers undertake procedures such as suctioning.

The following precautions need to be taken:

Implement standard precautions.

Place patient in a single room (or in a room with another similarly infected patient).

Wear a mask

Place a mask on the patient if transport is necessary.

Special air handling and ventilation are not required to prevent droplet transmission of infection.

CONTACT PRECAUTIONS

Diseases which are transmitted by this route include colonization or infection with multiple antibiotic resistant organisms, enteric infections and skin infections.

The following precautions need to be taken:

Implement standard precautions.

Place patient in a single room (or in a room with another similarly infected patient). Consider the epidemiology of the disease and the patient population when determining patient placement.

Wear clean, non-sterile gloves when entering the room.

Wear a clean, non-sterile gown when entering the room if substantial contact with the patient, environmental surfaces or items in the patient's room is anticipated.

Limit the movement and transport of the patient from the room; patients should be moved for essential purposes only. If transportation is required, use precautions to minimize the risk of transmission.

8. PATIENT PLACEMENT AND TRANSPORTATION OF PATIENTS

PATIENT PLACEMENT

Appropriate or selective placement of patients is important in preventing the transmission of infections in the hospital setting. General principles in relation to the placement of patients include the following.

SPACING BETWEEN BEDS

In open plan wards there should be adequate spacing between each bed to reduce the risk of cross contamination/infection occurring from direct or indirect contact or droplet transmission. Optimum spacing between beds is 1-2 meters.

SINGLE ROOM

Single rooms reduce the risk of transmission of infection from the source patient to others by reducing direct or indirect contact transmission. Where possible, single rooms should have the following facilities:

hand washing facilities;

toilet and bathroom facilities.

ANTEROOMS

Single rooms used for isolation purposes should include an anteroom to support the use of personal protective equipment.

COHORTING

For infection control purposes, if single rooms are not available, or if there is a shortage of single rooms, patients infected or colonized by the same organism can be cohorted (sharing of room/s).

When cohorting is used during outbreaks, these room/s should be in a well-defined area (a designated room or designated ward), which can be clearly segregated from other patient care areas in the healthcare facility used for non-infected/colonized patients.

TRANSPORTATION OF PATIENTS

Limiting the movement and transport of patients from the isolation room/area for essential purposes only will reduce the opportunities for transmission of micro-organisms in other areas of hospital.

If transportation is required, suitable precautions should be taken to reduce the risk of transmission of micro-organisms to other patients, health care workers or the hospital environment (surfaces or equipment). For example: when transporting a patient with pulmonary tuberculosis (open/active) placing a mask on the patient while in transit is an appropriate precaution.

9. THE HOSPITAL ENVIRONMENT AND HOSPITAL ASSOCIATED INFECTIONS

ENVIRONMENT

The environment in the hospital plays an important role in the occurrence of hospital associated infections. The hospital environment consists of many components. Many have a direct bearing upon HAI including design of ward and operating theatre facilities, air quality, water supply, food and handling of medical waste and laundry.

Premises/buildings

An infection control team member should be involved in the planning of any new facility or renovation. The role of infection control in this process is to minimize hospital associated infections. These include items such as:

- Ensuring appropriate hand washing facilities;
- A safe water supply;
- Adequate isolation facilities for the hospital;
- Adequate ventilation for isolation rooms and high risk areas like operation theatres, transplant units and intensive care units;
- Recommending traffic flow to minimize exposure of high risk patients and facilitate patient transport;
- Preventing exposure of patients to fungal spores during renovations., and
- Outlining precautions to be taken to control rodents, pests and other vectors responsible for transmission of infection.

AIR

Airborne droplet nuclei generated during coughing or sneezing are a potential source of transmission of infection either by direct inhalation or indirectly through contaminated medical devices. Droplets generated from infected respiratory tracts can remain airborne for long periods of time and transmit infections like tuberculosis, respiratory viral illnesses and antibiotic-resistant hospital bacteria.

Some housekeeping activities (such as sweeping, using dry mops or cloths or shaking linen) can aerosolize dust particles that may contain micro-organisms. Therefore, wet mopping is preferred. The number of organisms present in room air will depend on number of people occupying the room, the amount of activity, and the rate of air exchange. Skin squames and lint are important sources of contamination.

VENTILATION:

Some serious infection such as HAI are caused by airborne pathogens and appropriate ventilation is necessary. Some laboratory monitoring may be needed in high-risk areas such as operation theatres for cardiac surgery, neurosurgery and transplant surgery after major building works in the unit.

Circulation of fresh filtered air dilutes and removes airborne bacterial contamination, in addition to removing odour. All hospital areas and in particular the high-risk areas, should be well ventilated as far as possible. Ventilation systems should be designed and maintained to minimize microbial contamination. The air conditioning filters should be cleaned periodically and fans that can spread airborne pathogens should be avoided in high-risk areas.

Good housekeeping should ensure that unnecessary items like empty boxes do not clutter and impede ventilation in high-risk areas. Positive air pressure is recommended for high-risk areas that must be kept clean. Negative air pressure vented to the air is recommended for contaminated areas and is required also for isolation of patients with Infections spread by the airborne route. Filtration systems (air handling units) designed to provide clean air should have HEPA filters in high-risk areas. Unidirectional laminar airflow systems should be available in appropriate areas in the hospital construction. Ultraclean air is valuable in some types of cardiac surgery / neurosurgery I implant surgery theatres and transplant units.

Critical parameters for air quality include:

- Maintenance / validation of efficacy of filters
- Pressure gradient across the filter bed and in the operation theatre
- Air changes per hour (minimum 15 air changes per hour)
- Temperature and humidity should be maintained between 20-22°C and 30- 60%, respectively to inhibit bacterial, multiplication.

WATER

Water is used in hospitals for many different uses. The purpose for which the water is to be used determines the criteria for water quality. The criteria for drinking water are usually not adequate for the medical uses of water.

Drinking water should be safe for oral intake and fit the National standards for drinking water of Maldives Water and Sanitation Authority.

The water supply system should ensure the provision of safe water. The overhead storage tanks should be cleaned regularly, and the quality of water should be sampled periodically to check for faecal contamination. Some micro-organisms in the hospital have caused infection of wounds, respiratory tract and other areas where equipment such as endoscopes were rinsed with tap water after disinfection.

Infection control teams should have written valid policies for water quality to minimize risk of infections due to water in hospitals.

Safe drinking water

Where safe water is not available, water should be boiled for five minutes to render it safe. Alternatively, water purification units can also be used.

The storage of water should be as hygienic as possible. Insects/rodents and animals should not enter the storage container. Water should be dispensed from the storage container by an outlet fitted with a closure device or tap.

Storage containers and water coolers should be cleaned regularly.

KITCHENS AND FOOD HANDLING

Ensuring safe food is an important service in health care facilities - inappropriate food handling practices permit contamination, survival and growth of infecting bacteria. All food handling areas should conform to the national standards and regulation of Maldives Food and Drug Authority.

The common errors contributing to outbreaks of food poisoning include:

- Using contaminated, uncooked food;
- Advance preparation of food, i.e. more than a half day, should be avoided
- Undercooked food;
- Cross-contamination of cooked food by raw food during preparation or storage;
- Contamination by food handlers;
- Storing food at room temperature or inadequate refrigeration;
- Inadequate reheating, and
- Unhygienic preparation of enteral or baby feeds.

Food contamination should be prevented by using reliable supplies of food; providing adequate storage facilities; separation of raw and cooked food to prevent cross- contamination; preparation of food taking all hygienic precautions; use of appropriate cooking methods to prevent microbial growth in food, and adequate refrigeration of uncooked and prepared food; kitchen staff should change work clothes at least once a day and keep hair covered.

Food handlers must carefully wash their hands before preparing food and maintain scrupulous personal hygiene.

They should avoid handling food when suffering from an infectious disease (enteric, respiratory or skin infection) and report all infections.

The Kitchen

Foodborne diseases are important, particularly in immuno-compromised patients. As the community incidence of enteric infections may be high in some countries, it becomes all the more important that special attention is given to food preparation and handling in order to avoid contamination.

The kitchen must have adequate supply of clean and potable water. All work surfaces and food storage areas must be kept clean and sanitary.

Food should be served as soon as possible after preparation.

Food storage refrigerators and freezers should be properly maintained and the temperature checked daily by provided thermometers.

Left-over food should be discarded.

In regions where enteric infections are common, food handlers should undergo pre-employment faecal examination for the presence of Shigella Salmonella and parasites such as Entamoeba, Giardia, etc

Dishwashing machines should be preferably used for crockery and utensils.

CLEANING OF THE HOSPITAL ENVIRONMENT

Routine cleaning is important to ensure a clean and dust-free hospital environment.

There are usually many micro-organisms present in "visible dirt", and routine cleaning helps to eliminate this dirt. Soap or detergents do not have antimicrobial activity, and the cleaning process depends essentially on mechanical action.

Methods must be appropriate for the likelihood of contamination, and necessary level of asepsis. This may be achieved by classifying areas into the following zones:

- Administrative and office areas with no patient contact require normal domestic cleaning.
- Most patient care areas should be cleaned by wet mopping with detergent. Dry sweeping is not recommended.
- Any areas with visible contamination with blood or body fluids must be disinfected.
- High risk areas like the isolation rooms and other areas with infected patients should be cleaned with disinfectant solution.
- All horizontal surfaces and all toilet areas should be cleaned daily.

Bacteriological testing of the environment is not recommended unless indicated on epidemiological grounds when seeking a potential source of an outbreak.

WASTE

Hospital waste is a potential reservoir of pathogenic micro-organisms and requires appropriate handling. The commonest documented transmission of infection from waste to health care workers is through contaminated metallic wastes. National Health Care Waste Management Standards should be followed at each step of managing waste at health care facilities.

LAUNDRY

Two categories of used linen are recognized. Where there is visible contamination by blood, body fluids, secretions and excretions, this may be called "contaminated". Other used linen is termed "used or soiled". These two categories should be segregated and treated separately.

General instructions

Handle all linen with minimum agitation to avoid aerosolisation of pathogenic micro-organisms.

Place soiled/ contaminated linen in impervious bags for transportation to avoid any spills of drips of blood, body fluids, secretions and excretions.

Disinfect by using hot water and/or bleach (use heavy-duty gloves eye protection and masks to protect against splashes).

Autoclave linen before being supplied to the operating rooms/ theatres and high risk areas, eg: burns unit and transplant units.

Wash linen (sheets, cotton blankets) in hot water (70°C to 80° C) and detergent, rinse and dry preferably in a dryer or in the sun. (Heavy-duty washer/ dryers are recommended for the hospital laundry).

Wash woolen blankets in warm water and dry in the sun, in dryers at cool temperatures or dry-clean.

When laundering linen from an isolation room do not sort, shake or handle excessively.

Bedding

Mattresses and pillows with plastic covers should be wiped over with a neutral detergent.

Mattresses without plastic covers should ideally be steamed cleaned if they have been contaminated with body fluids

Wash pillows either using standard laundering procedure described above, or dry clean if contaminated with body fluids.

10. REPROCESSING OF INSTRUMENT AND EQUIPMENTS

The classification of risk of transmission of infection by instruments and equipments has been called the "Spalding Classification". The risk of transmission is classified according to the site where the instrument is to be used. Contact sites for instruments may be classified as critical, semi critical or non-critical. Table 1 shows these classification.

The level of reprocessing required is based on the classification and level of risk. Any instrument or equipment entering into the sterile part of the body must be sterilized. Where the instrument or equipment will be in contact with the mucous membrane or non-intact skin, it must have undergone high-level disinfection, and where there will be contact with intact skin, a low level disinfection or cleaning should be used.

Table I. Level of disinfection required for patient care equipment

Application	Classification	Level of risk	Level of reprocessing required	Example	Storage of the reprocessed equipment
<p>Entry or penetration into sterile tissue, cavity or bloodstream</p> <p>Eg.</p> <p>Into vascular system</p> <p>Into sterile cavity</p> <p>Into sterile tissue</p>	Critical	High	<p>Sterile</p> <p>Sterilization by steam under pressure or an automated low temp chemical sterilant system, other liquid chemical sterilant or ethylene oxide sterilization</p>	<p>Surgical procedure</p> <p>Entry into sterile tissue</p> <p>arthroscopes</p> <p>biopsies</p> <p>Intravascular cannulation</p>	<p>Sterility must be maintained.</p> <p>packaged items must be allowed to dry before removes from the sterilizer</p> <p>the integrity of the wrap must be maintained</p> <p>wraps should act as effective biobarrier during storage</p> <p>store away from potential environmental contaminants</p> <p>unpackaged sterile items must be used immediately</p>
<p>Contact with intact nonsterile mucosa or nonintact skin</p>	Semi-critical	Medium	<p>High level disinfection</p> <p>Heat tolerant items</p> <ul style="list-style-type: none"> • Steam sterilize where possible • if unable to steam sterilize- use thermal disinfection <p>Heat-sensitive items</p> <ul style="list-style-type: none"> • low temperature automated chemical sterilant systems • high level chemical disinfectant 	<p>Respiratory therapy</p> <p>gastroscopy</p>	<p>Store to protect from environmental contaminants</p>
<p>Intact skin</p> <p>No contact with the patient</p>	Noncritical	Low	<p>Items must be clean</p> <ul style="list-style-type: none"> • Clean after each use with detergent and water. • if disinfection is required follow with appropriate disinfectant, eg 70% alcohol. 	<p>Beds, sinks, etc</p>	<p>Store in a clean dry place</p>

Table 2 - Cleaning and Disinfection of Patient care Equipments and Healthcare Facility

Equipment	Standard procedure	Comments
<p>Instruments :</p> <p>a) Instruments contaminated with body fluids.</p> <p>b) Instruments used for procedures but not contaminated with body fluids.</p> <p>c) Used kidney trays, sponge basins, cleaning bowls, sputum mugs.</p> <p>d) Used Bedpans and urinals.</p>	<p>Soak in 0.5% sodium hypochlorite for 5-10 mts . Wash with soap detergents, dry with a towel.</p> <p>Sterilize by autoclaving. Wash with detergent, dry with towel.</p> <p>Sterilize by autoclaving.</p> <p>Soak in hypochlorite solution (0.5%) for 5-10 mts. Wash with detergent and water, and dry. Disinfect in bed pan washer.</p>	<p>Sterile equipments should be stored in a clean dry place.</p> <p>Enter date of autoclaving and signature on sterile packs.</p> <p>Sterile instruments once opened cannot be kept for use at a later time.</p> <p>Re autoclave unused sterile instruments after 2 weeks.</p>
Laryngoscopes, ambu bag and mask.	<p>Disinfect the laryngoscope with 70% alcohol.</p> <p>Wash the mask with detergent and water, clean with 70% alcohol.</p>	<p>Disinfection should be done immediately after use.</p> <p>Emergency trolley equipments must be ready for use at all times.</p>
<p>Thermometer, stethoscope and BP apparatus, autoscope, ophthalmoscope, knee hammer, tuning fork.</p> <p>Rubber / silicone Tubes</p>	<p>Disinfect with 70% alcohol.</p> <p>Wash the BP cuff cloth cover with detergent and water and dry.</p> <p>Disinfect with 0.05% sodium hypochlorite after each use.</p>	<p>Disinfect the instruments after each use.</p> <p>Wash the BP cuff cover weekly and /or whenever soiled.</p> <p>Discard the tubing and mask when patient is discharged.</p>
Ventilator/Phototherapy unit Suction machine/Nebulizer and other patient care machines.	Disinfect the machine with 0.05% hypochlorite solution, or 70% alcohol.	Discard single use disposable items after use.
Patient bed, couch, bedside locker, cardiac tables, wheel chair, stretcher ,baby cots etc.	Disinfect with 1% sodium hypochlorite solution daily. Clean with detergent and water after patient is discharge and disinfect with 1% sodium hypochlorite solution and leave for ½ hour before drying.	
Mattress /pillows	Disinfect with 1% sodium hypochlorite solution and leave for ½ hour before drying. when patient is discharged.	<p>Plastic or PVC Pillow covers should be used to protect pillows from soakage.</p> <p>Mattresses should be covered with rubber whenever there is tendency for soakage.</p>
Nurses counter and other workstation counters/ Patient unit walls	Disinfect with 1% sodium hypochlorite solution daily. Wash with detergent water Disinfect with 1% sodium hypochlorite solution when patient is discharged.	If patients are admitted for long periods, the units need to be cleaned before discharge.
Bed linen / patient linen	Laundered daily If soiled soak in 0.5% sodium hypochlorite solution for 20 mts before washing.	See linen management
Mops and brooms	Should wash with detergent and water and kept for drying after use. After use in soiled areas soak in 0.5% hypochlorite solution for 10 mts and wash with detergent and water and dry.	<p>Mops should be kept dry when not in use.</p> <p>Use separate mops for soiled and clean places.</p>

11. CARE AND DISPOSAL OF DEAD BODIES

All bodies of patients who have died of infectious diseases should be placed in water proof bag before transport to the mortuary or undertakers.

Plastic aprons and disposable gowns should be worn by those who handle these bodies.

Exceptional care must be taken to avoid splashing of body fluids when removing urinary or intravenous catheters and also when redressing wounds.

Eye or face protection is recommended when splashing is likely.

If a post mortem is required it should be arranged by the medical staff and carried out in a suitable equipped post mortem room.

It is the duty of the doctor to inform the mortuary staff and morticians about the infectious state of the patient prior to death. If a patient has died of an infectious disease where the communicability is high the relatives should wear personal protective equipment before viewing the body.

12. BARRIER NURSING

Nursing procedures designed to prevent transmission of pathogenic micro-organisms to other patients and health care workers in known as barrier nursing. Barrier nursing uses infection control measures aimed at controlling the spread and destroying pathogenic organisms. Use of isolation procedures and mechanical barriers to contain pathogenic organisms within a specific area and there by breaking the chain of infection transmission.

Objectives of barrier nursing

- To protect the environment of healthcare setting from contamination with dangerous pathogens
- To prevent transmission of infection from
 - patient to health care worker
 - patient to patient
 - health care worker to patient

Barrier nursing is indicated for any patient

- with an infectious disease e.g. tuberculosis (respiratory), shigellosis (gastrointestinal)
- methicillin resistant *Staphylococcus aureus* wound infection who is severely immunocompromised e.g. AIDS patient with CD4 count less than 500, bone marrow transplant patient (reverse barrier nursing)

13. ISOLATION

Isolation precautions

Isolation precautions are recommended to reduce the risk of transmission of micro-organisms from the source of infection. The guidelines include two tiers of precautions.

1) Standard precautions

Standard precautions (combination of universal precautions and body substance isolation) are used for the care of all patients and at all times regardless of diagnosis or infection status.

- Wash hands before and after all procedures (after contact with blood, body fluids, secretions, excretions, and contaminated objects) whether or not gloves are worn,
- Wear clean gloves when touching blood, body fluids, secretions, excretions, and contaminated objects (such as soiled gowns).
- Wear a mask, eye protection, or a face shield, and clean non —sterile gown if splashes or spray of blood, body fluids, secretions, and excretions can be expected.
- Handle patient care equipment that is soiled with blood, body fluids, secretions, and excretions carefully to prevent the transfer of microorganisms to others and to the environment.
- Handle, transport, and process linen that is soiled with blood, body fluids, secretions, and excretions to prevent contamination of clothing and the transfer of microorganisms to others and to the environment.
- Prevent injuries from used scalpels, needles, or other equipment, and place in puncture-proof containers.
- Dispose waste contaminated with blood or body fluids by chemical treatment and/or incineration.

2) Transmission Based Precautions

Transmission based precautions are implemented when caring for patients with specific infections or diagnosis based on the route of transmission. These precautions are designed to interrupt the transmission of epidemiologically important pathogens in health care facilities.

Transmission based precautions are grouped in three types: airborne, droplet, and contact precautions.

Table 3. Transmission based precautions

Airborne precautions	Droplet precautions	Contact precautions
<ul style="list-style-type: none"> • Implement standard precautions. • Place patient in a private room that has monitored negative airflow pressure with 6-12 air changes /hour, the air being discharged to the outdoors or specially filtered before circulating to other areas of health care facility. • Keep doors closed. • Wear a special, high filtration, particulate respirator (e.g. N 95) 	<ul style="list-style-type: none"> • Implement standard precautions. • Place patient in a private room: Or in a room with another similarly infected patient; Or in a room in which there is at least 3 feet between the infected patient and other patients and visitors. • The room door may remain open. • Wear a mask when working within 3 feet of the patient. 	<ul style="list-style-type: none"> • Implement standard precautions. • Place patient in a private room; Or in a room with another similarly infected patient: consider the epidemiology of the microorganisms and the patient population when determining patient placement • Wear clean, non- sterile gloves when entering the room. • Wear a clean, non-sterile gown when entering the room if substantial contact

<p>mask.</p> <ul style="list-style-type: none"> Limit the movement and transport of the patient from the room for essential purposes only. If transport is necessary, minimize dispersal of droplet nuclei by masking the patient. 	<ul style="list-style-type: none"> Place a mask on the patient if transport is necessary to minimize dispersal of droplets. 	<p>with the patient, environmental surfaces or items in the patients' room is anticipated.</p> <ul style="list-style-type: none"> Limit the movement and transport of the patient from the room for essential purposes only. If transportation is required! use precautions to minimize the risk of transmission of microorganisms to other patients and contamination of environmental surfaces or equipment. Use equipment exclusively for the infected patient and terminally disinfect when not needed. If use of common equipment is unavoidable then adequately clean and disinfect them before use for another patient
---	--	---

14. CARE OF THE HEALTH CARE WORKERS

Health care workers (HCW) are at risk of acquiring infection through occupational exposure. Hospital employees can also transmit infection to patients and also to other employees. Thus, an employees' health program must be in place to prevent and manage infections in hospital staff.

employees' health should be reviewed at recruitment, including immunization history and previous exposure to communicable disease (eg: tuberculosis) and immune status.

Immunization recommended for staff includes: hepatitis B, influenza, measles, mumps, rubella, tetanus and diphtheria. The Mantoux skin test will document a previous tuberculosis (TB) exposure. No vaccine is 100% effective in preventing disease in an individual. Therefore, immunization dose not imply that the other precautions to prevent infection can be relaxed.

Specific post-exposure policies must be developed, and compliance ensured for a number of infectious disease for example: human immunodeficiency virus (HIV), viral hepatitis, severe acute respiratory syndrome (SARS), varicella, rubella, and tuberculosis.

Health care workers with infection should report their illness/incident to staff and to the infection control nurse or chief medical officer for further evaluation and management.

EXPOSURE TO THE HUMAN IMMUNODEFICIENCY VIRUS (HIV)

The route of transmission for HIV is person to person via: sexual contact, sharing of needles contaminated with HIV, infusions that are contaminated with HIV, transplantations of organs or tissues that are infected with HIV. The risk of a health care worker acquiring HIV after a needlestick

or other sharp injury is less than 0.5%. Risk reduction must be undertaken for all bloodborne pathogens, including: adherence to standard precautions using personal protective equipment and appropriate use of safety devices and a needle disposal system to limit sharp exposure. Training of health care workers in safe sharp practice should be ongoing.

Information on preventive measures must be provided to all staff with potential exposure to blood and blood products. Policies which are in keeping with the local and national guidelines must include screening of patients, disposal of sharps and wastes, protective clothing, managing inoculation accidents, sterilization and disinfections.

Health facility policies should include measures to obtain serological testing of source patients promptly where necessary, usually with the patient's informed consent. Exposure should be reported to the infection control nurse or chief medical officer according to the health facility protocol and post exposure prophylaxis should be started as per local or national guidelines of Department of Public Health.

EXPOSURE TO HEPATITIS B & C VIRUS

The route of transmission for Hepatitis B & C virus is through body substances such as blood and blood products, saliva, cerebrospinal fluid, peritoneal, pleural, pericardial and synovial fluid, amniotic fluid, semen and vaginal secretions and any other body fluids containing blood. Following standard precautions is important, but immunization is the best way of preventing transmission to health care staff.

All HCW at risk must be vaccinated.

Staff infection with blood borne pathogens may transmit these infections to patients and require careful evaluation with respect to their duties. This status should not be used as a cause for discrimination.

TUBERCULOSIS

Health care workers have varying risk for exposure to tuberculosis (TB). Health care workers at the greatest risk of exposure are those working in TB risk areas such as medical wards, chest clinics, broncoscopy units, radiology units, TB laboratories, HIV wards and autopsy rooms. Exposure should be reported to the infection control nurse or chief medical officer according to the health facility protocol and post exposure prophylaxis should be started as per local or national guidelines of Department of Public Health.

SHARPS INJURIES

Needlestick injuries are the commonest of sharps injuries, although other contaminated sharp instruments may also cause injuries. All health care workers with potential exposure should be vaccinated. For other personnel, the risk of hepatitis B, hepatitis C, and HIV infection should be assessed and appropriate immunization or chemoprophylactic steps taken.

Immediate treatment of such injuries should encourage bleeding and washing thoroughly with running water and an antiseptic solution. Consult the infection control team for further advice.

An incident reporting system should be in place. It should not be seen as punitive; active support by managers should encourage prompt and accurate reporting.

MENINGOCOCCAL MENINGITIS

Transmission of meningococci to health care staff is most likely within 24 hours of admission of the patient, prior to the patient receiving appropriate antibiotic/chemoprophylaxis. Health care workers in close respiratory contact with such cases should receive chemoprophylaxis with ciprofloxacin or an effective alternative agent. Close respiratory contact with patient includes mouth-to-mouth contact, share of drink containers or cigarettes.

SEVERE ACUTE RESPIRATORY SYNDROME & AVIAN INFLUENZA

The health care facility should have a clear set of guidelines for preventing staff exposure to SARS and AI. Health care workers in contact with patients with suspected or probable SARS/AI should be monitored daily for signs and symptoms of SARS/AI, particularly for the changes in temperature and respiratory distress. If staff member indicate any signs and symptoms of SARS/AI, they should be assessed by the infection control practitioner or the infection control team as to the appropriateness of isolation.

OTHER INFECTIONS: VARICELLA, PERTUSIS, DIPHTHERIA, RABIES

Transmission of these micro-organisms may be uncommon, but policies to manage staff exposure should be developed.

DECONTAMINATION OF AMBULANCE FOLLOWING TRANSFER OF AN INFECTION PATIENT

On plastic surface spillages (eg. Mackintosh) use hypochlorite solution, household bleach 10000 ppm (10g/litre) Tropical Chloride of Lime (TCL) 25 – 28 grms per litre would give an adequate disinfecting concentration. Per-acetic acid also could be used.

On a surface which is likely to corrode (eg. side wall of ambulance) an alcohol rub (70% alcohol soaked cotton wool or gauze) followed by a wet mop with a detergent (eg.'teepol' or soapy water) is suggested. Per-acetic acid can also be used.

15. DISINFECTANTS AND ANTISEPTICS

DISINFECTION

Disinfection is a process which either reduces the number of vegetative bacteria, viruses and fungi or inactivates them. Disinfection is usually ineffective against sporing organisms and slow viruses/prions. When a disinfecting substance is used on living tissue it is called an antiseptic.

CLEANING

Cleaning is the physical removal of most micro-organisms and protein material (eg. blood and tissue) using detergents and hot water. Cleaning is essential prior to sterilization or disinfection. This may be achieved manually or by a mechanical washer or an ultra sonic washer. The effectiveness of all disinfectants are affected by:

- temperature
- concentration
- immersion time
- the presence of inactivating substances such as blood and other organic materials, certain plastics and incompatible detergents.

STERILIZATION

Sterilization is the complete destruction of all micro-organisms, including spores such as those of *Clostridium tetani*.

Methods of sterilization

1. Heat Sterilization

- Moist heat sterilization - exposure to saturated steam at 121° C for 30 minutes or 134° C for 4 minutes in an autoclave (under pressure).
- Dry sterilization exposure to 160° C for 120 minutes, or 170° C for 60 minutes or 180° C for 30 minutes in a hot air oven.

2. Chemical Sterilization

- Ethylene oxide and formaldehyde are being replaced because of safety concerns

3. Low temperature sterilization

- Plasma systems using peracetic acid or hydrogen peroxide.

DISINFECTANTS

- **2 % Glutaraldehyde** eg. CIDEX
used in operating theatres, special care units
- **Phenolic compounds.** eg: Lysol
General purpose disinfectant to be used in:
 - operating theatres
 - special units
 - wards
- **Tropical chloride of lime – TCL powder**
General purpose disinfectant used on floors of operating theatres, Intensive Care Units, Wards.
13.5 grams TCL powder per litre gives a 35 % solution and has 1% available chlorine.

ANTISEPTICS

1. Chlorhexidine Compounds

Chlorhexidine gluconate. e.g: Hibitane
Chlorhexidine gluconate + cetrimide. e.g: Savlon

- Used diluted 1 in 10 (0.5%) with 70 % alcohol for pre-op skin preparation and as a hand disinfectant.
- Used diluted 1 in 100 (0.05%) in water as a general skin disinfectant in the wards

2. Alcohols

Available as surgical spirit composed of
Methyl salicylate 0.5 %
Diethyl pthalate 2 %
Castor oil 2.5 %
In industrial methylated spirit

- 70 % ethyl alcohol
- 60 % isopropyl alcohol

3. Iodine compounds

e.g: Iodophors

- Povidone Iodine 10 % aqueous solution
- Povidone Iodine 10 % ethanolic solution

4. Peroxides

Hydrogen Peroxide solution (BP), available at a concentration of 6%
could be diluted to 3 % - used in theatres and wards.

5. Ethers

diethyl ether

6. Potassium permanganate solution

Available as 0.1 % solution. Should be diluted 1 in 10 to obtain "in use" concentration

Table 4. Common disinfectants and their uses

Agent	Uses	Advice and Precautions
<p>Glutaraldehyde (needs to be activated before use – activation involves addition of powder or liquid buffer supplied with the solution, this renders the solution alkaline) For best benefit requires at least 20°C</p>	<p>Disinfection of heat labile instruments (high level disinfection)</p>	<ol style="list-style-type: none"> 1. avoid contact with skin and eyes 2. dermatitis & photo sensitivity are side effects 3. potentially carcinogenic. 4. aeration needed 5. use protective attire <ul style="list-style-type: none"> – gloves – aprons / coat when preparing solution - eye protection. <p>After immersion, all equipment should be thoroughly rinsed with sterile water to remove glutaraldehyde residue. Once activated the solution should not be kept for more than two weeks, although some solutions remain stable for a longer period. Restrict to 20 immersion per cycle</p> <p>Avoid splashing</p>
<p>Phenolic compound e.g: Lysol</p> <p>TCL – (13.5 grams per litre gives a 35 % solution with 1 % available chlorine.)</p>	<p>General purpose disinfectant- used in wards, theatres and special care units.</p> <p>general purpose decontamination of environmental surfaces.</p>	<p>use with correct dilutions. The disinfectant power of all chlorine – releasing compounds is expressed as available chlorine (% for solid compounds; % or parts per million (ppm) for solution according to concentration level</p>

16. SAFETY IN LABORATORY

Clinical laboratories receive specimens with requests for diagnostic purposes. The infectious nature may not be known. Also, the specimen may be submitted with a broad request for microbiological examination for multiple agents e.g. routine culture, acid fast stains, mycobacterial culture, fungal culture etc. This requires the use of universal precautions with all samples and also specific precautions, if the organism referred to are in risk group 3, where the individual risk to the laboratory workers is high, although the community risk is low, e.g. SARS corona virus. In this instance, biosafety level 3 recommendations need to be adhered to which includes personal protective equipment like gloves, laboratory gowns, mask and eye shields.

The term containment is used to describe safe methods for managing infectious material in the laboratory, where they are being handled. This reduces or eliminates exposure of the laboratory worker to potentially hazardous agents.

Safety level 2 recommendations are directed to the prevention of percutaneous and mucous membrane exposures to clinical material. Gloves, laboratory gown, and if needed mask, eye shield should be used. A biological safety cabinet (BSC) should be used when performing procedures that cause splashing or spraying, or when a test is performed on a sample likely to contain an agent transmissible by infectious aerosols (e.g. *Mycobacterium tuberculosis*). Good microbiological techniques (GMT) must be followed strictly.

Universal Precautions are based on the assumption that all blood, secretions, and body fluids are potentially infectious, regardless of whether they are from a patient or a health care worker. The principles of universal precautions include

- the use of protective barriers
- prevention of accidents and
- the proper use of disinfectants and sterilizing techniques.

LABORATORY ACQUIRED INFECTION

Of major concern is the infected specimen from a patient whose infection is not diagnosed or not recognized. Good laboratory practices are required to minimize the risk of acquisition and universal precautions need to be taken. Assume that the specimen is potentially infectious. The important organisms posing risk are :

Salmonellae
Shigellae
Bacillus anthracis
Yersinia pestis
Mycobacterium tuberculosis
Leptospirosis
Brucellae

Any clinical specimen that contains or might contain an infectious agent or a culture or subculture of any microorganism constitutes a microbiological hazard. These specimens must be handled with care, using appropriate methods.

Table 6: Classification of Infective Organisms by risk groups

Group	Individual risk	Community risk
1	low	low
2	moderate	low
3	high	low
4	high	high

Table 7: Relationship of risk groups to Biosafety levels

Group	Biosafety	Laboratory practice	Safety Equipment
1	i	GMT	Open bench
2	ii	GMT <i>plus</i> Protective clothing	Safety cabinet -For aerosols
3	iii	GMT <i>plus</i> PPE (personal protective equipment)	BSC+ Containment
4	iv	Add airlock entry & shower exit to GMT plus PPE	BSC iii + pressure suits & filtered air

GOOD MICROBIOLOGICAL TECHNIQUE (GMT)

1. Access to the laboratory should be restricted to the staff only.
2. Personnel must wash their hands after handling samples and completion of work and before leaving the laboratory.
3. Eating, drinking, smoking are not permitted in work areas.
4. Mouth pipetting is forbidden. Safe pipetting aids should be used.
5. Care is essential when handling sharp objects.
6. Procedures should be performed carefully to minimize creation of aerosols.
7. All cultures must be decontaminated before disposal.
8. Work surfaces must be cleaned properly after the work is completed.

BASIC PRACTICES

Most laboratory acquired infections occur as a result of penetrating injuries caused by sharp objects, spilling or splashing of clinical materials. The basic practices are designed to minimize such accidents.

1. Prevention of puncture wounds, cuts abrasions and protection of existing wounds, skin lesions and mucosal surfaces.
2. Application of simple protective measures to prevent contamination of the person e.g. wearing gloves when handling infectious material that is potentially infected with HIV, HBV, HCV etc.
3. Do not leave laboratory or walk around while wearing gloves.
4. Wear a laboratory coat when working in the laboratory.

SHARPS

1. Always dispose of your own sharps.
2. Never pass used sharps directly from one person to another.
3. Protect fingers from injury by using forceps.
4. Do not recap used needles of syringes.
5. Used needles and syringes must be placed in the puncture resistant container, until it is disposed of by incinerator.
6. Never place used sharps in any other container.

Laboratory safety is a part of the total quality control programme. There is a potential risk of infection to workers who come in contact with pathogenic organisms. Laboratory associated infections are preventable only if safety policies are adhered to. Apart from practicing good microbiological techniques described, they need to be aware of other hazards such as electrical hazards and various other physical and radio isotopic hazards.

17. METHICLLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA)

- MRSA is not more virulent than sensitive strains
- Culture of MRSA reflects colonization and by itself does not need Vancomycin therapy, unless there is evidence of infection (fever, signs of inflammation at site of infection, discharge from wounds, polymorphonuclear leucocytosis)
- As MRSA is endemic in most hospitals following are useful guidelines.
- In 'high risk' areas control is recommended.

Isolation

1. Separate room or 'cohort' isolation is recommended.(containment isolation)
2. Separate nurse for colonized or infected group.
3. Restrict visitors.
4. Gloves and aprons to be worn by attending staff
5. Dispose gloves and aprons
6. Wash hands before and after attending on patient

Staff - (if 3 or more cases of MRSA are detected in the unit)

1. Check MRSA carriage status by swabbing nose (axilla, perineum also beneficial)
2. Nasal carriage – Mupirocin (Nasal) applied to anterior nares tds for five days. 0.1% chlorhexidine or Neomycin/Chloehexidine containing cream (Naseptin) or Povidone Iodine cream are alternatives.
3. Skin Carriage – soap and water or antiseptic detergent bath should suffice. Povidone Iodine or Chlorhexidine can be used.
4. Hand washing – with soap and running water or with an antiseptic before and after attending on a patient. Dry with paper towel or clean hand towel.

Ward

1. Ward rounds to be restricted to attending doctors only and after seeing other patients. Teaching should be away from MRSA patients.
2. Endeavor to transfer patients from high dependency units and areas to less risk areas.

Closure of Wards

1. Not necessary to close ward completely unless the consultant decides in consultation with microbiology.
2. Consider vulnerability of patient for admission in the light of risk posed by the MRSA versus the risk of postponing admission.
3. Closure required if spread of MRSA is uncontrolled.

Terminal cleaning

1. Responsibility is with nursing staff to remove all linen and send for autoclaving.
2. Examine pillows for splits or defective seams and have them attended.
3. Clinical waste should be sealed and preferably incinerated.
4. Equipment used on patient should be decontaminated with an alcoholic or aqueous disinfectant before another patient uses them.

Treatment of Clinical infection

Some strains of MRSA could be multiresistant which makes vancomycin the drug of choice. Other antibiotics include:

Teicoplanin (which is also a glycopeptide)

Fusidic acid (resistance develops fast)

Rifampicin (best not used in TB endemic areas)