



Ministry of Health and Sports  
Department of Medical Services

# **Instruction for Laboratory aspect of Infection Prevention and Control (IPC)**

National Health Laboratory  
June, 2016

# **Instruction for Laboratory aspect of Infection Prevention and Control (IPC)**

## **Introduction**

Each laboratory should have its own strategies to prevent accidents while handling infectious materials. Each laboratory worker must be familiar with risk grades of different microbes, four biosafety levels of laboratory and different biological safety cabinets. Individual worker can prevent accidents by following safety rules while handling infected materials in working in a laboratory. Irrespective of the level of the laboratory, universal precautions must be taken everywhere while handling infectious materials. Each laboratory should have surveillance program including antimicrobial resistance (AMR) influenza like illness (ILI) etc.

## **Aim**

To reduce the risks of cross-contamination in the laboratory

## **Standard precautions in medical laboratories**

1. Hand washing
2. Housekeeping practices and general sanitation
3. Cough etiquettes
4. Use of PPE
5. Laboratory water quality monitoring
6. Biomedical waste management
7. Health checkup and screening of all laboratory staff and vaccination for Hepatitis B, etc.
8. Use of Post-exposure prophylaxis (PEP) by health staff in case of potential exposure to infected blood and other body fluids
9. Collaboration and communication with hospital infection control committee

# How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

⌚ Duration of the handwash (steps 2-7): 15-20 seconds

⌚ Duration of the entire procedure: 40-60 seconds



Wet hands with water;



Apply enough soap to cover all hand surfaces;



Rub hands palm to palm;



Right palm over left dorsum with interlaced fingers and vice versa;



Palm to palm with fingers interlaced;



Backs of fingers to opposing palms with fingers interlocked;



Rotational rubbing of left thumb clasped in right palm and vice versa;



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Rinse hands with water;



Dry hands thoroughly with a single use towel;



Use towel to turn off faucet;



Your hands are now safe.



World Health Organization

Patient Safety

A World Alliance for Safer Health Care

SAVE LIVES

Clean Your Hands

May 2009

## **Components of Universal Precaution**

1. Use of protective barriers, PPE (gloves, gowns, aprons, face-mask, goggles, etc.)
2. Prevention of accidents particularly injuries by sharps
3. Proper use of disinfection and sterilization techniques to render contaminated material, instruments and surfaces safe
4. Safe discard and disposal of contaminated waste

## **Biosafety**

Biosafety aims to protect all those who are exposed, directly or indirectly to infectious agents while handling laboratory specimens

## **Biosafety level of risks with organisms**

It depends on the basis of risks to laboratory staff, spread in the community, pathogenicity and availability of effective prophylaxis and treatment.

## **Risk group (1) organisms**

Risk group (1) organisms are harmless or pose a minimal hazard to laboratory staff and community.

## **Risk group (2) organisms**

Risk group (2) organisms pose moderate potential hazard for laboratory staff but limited risk for community. Effective preventive measures and treatment are available.

## **Risk group (3) organisms**

Risk group (3) organisms cause serious human disease and pose serious hazards to laboratory staff. These organisms are transmitted through aerosol but do not readily spread from one infective individual to another. They are low risk for the community. Effective prophylaxis and treatment are normally available.

## **Risk group (4) organisms**

Risk group (4) organisms pose severe human disease and are high risk for laboratory personnel. These organisms readily spread from one infected individual to another in the community. There is no effective treatment or prophylaxis, and maximum containment facilities during handling are required.

## **Biosafety level**

Biosafety level is divided into four levels depending on risk of organisms.

### **Biosafety level (1)**

- Organisms which are not known to cause disease in healthy adult humans
- Conducted on open benches with no special containment equipment

### **Biosafety level (2)**

- Work involving agents of moderate potential hazard to staff and environment
- Staff take universal precaution and follow good microbiological techniques
- Procedure which create infectious aerosols are performed in biological safety cabinets

### **Biosafety level (3)**

- Work with agents that may cause serious or potentially lethal disease as a result of exposure by inhalation
- All procedures are conducted within biological safety cabinets by wearing protective clothing

### **Biosafety level (4)**

- Organisms that cause life-threatening disease
- Apart from level (3), include airlock entry, shower exit and special waste disposal facilities, class III biosafety safety cabinets, positive pressure suits, double-ended autoclaves and filtered air are essential safety requirement

**Laboratory Procedures and mode of transmission of  
HIV, HBV, HCV and other blood born agents**

<b>Procedure</b>	<b>Mode of transmission</b>
Collection of blood sample	<ul style="list-style-type: none"> <li>- skin puncture by needle or broken specimen container</li> <li>- contamination of hand by blood</li> </ul>
Transfer of specimen (within laboratory)	<ul style="list-style-type: none"> <li>- contaminated exterior of specimens container</li> <li>- broken specimen container</li> <li>- spill or splash of specimen</li> </ul>
HIV serology	<ul style="list-style-type: none"> <li>- skin puncture or contamination of mucous membrane</li> <li>- contaminated exterior of specimens container</li> <li>- contaminated work surface</li> <li>- broken specimen container</li> <li>- perforated gloves</li> </ul>
Cleaning and maintenance	<ul style="list-style-type: none"> <li>- skin puncture or skin contamination</li> <li>- spill or splash</li> <li>- contaminated work surface</li> </ul>
Waste disposal	<ul style="list-style-type: none"> <li>- Contact with contaminated waste</li> <li>- Puncture wounds and cuts</li> </ul>
Shipment of specimens (to other centres)	<ul style="list-style-type: none"> <li>- broken or leaking specimen containers</li> </ul>

### **Guidelines for collection of blood sample**

- Gloves should always be worn while taking blood
- If blood spills on the gloves, they should be discarded
- Care should be taken to avoid contamination of hands while taking blood
- Hands should be washed with soaps and water immediately after any contamination with blood and after work is completed
- Laboratory gowns should be worn
- Used needle and syringes should be placed in puncture resistant container, used needles should not be recapped, nor should they be removed from syringes
- Specimen containers should be sealed securely, and outside of the container should be wiped clean of blood contamination with disinfectant

### **Dos and Don'ts**

#### **Dos**

- Do keep your hair tied
- Do wash your hands after completing your work
- Do wear protective clothing including gloves
- Do disinfect the workplace after completion of every activity as well as at the end of every working day
- Do keep your nails trimmed all the times

#### **Don'ts**

- Do not eat or smoke or apply cosmetics in the laboratory
- Do not lick labels, but instead use gum or adhesive
- Do not touch your eyes, nose or other exposed parts while working with infected material
- Do not pipette by mouth
- Do not wear loose clothes while in the laboratory or while engaged in handling infectious material anywhere

### **Basic requirements for laboratories**

- For handling of infectious material, clearly identified working area should be provided in the laboratory
- Walls, ceilings and floor of the laboratory should be smooth, easy to clean, impermeable and resistant to the chemicals and disinfectants normally used in the laboratory
- Floors should be non-slippery
- The bench tops should be impervious and resistant to disinfectants, acids, alkalis, organic solvents and moderate heat and laboratory furniture should be sturdy and easy to clean
- Wash basins should be provided in each laboratory, preferably near the exit
- Doors to the laboratory should be self-closing and have vision panels and windows should be fitted with fly screens
- Autoclave for decontamination of infectious laboratory material and waste should be available in the same building
- Facilities for storing outer clothing and personnel items and space for eating and drinking should be provided outside the workroom

### **How to do when exposed by HIV specimens**

#### **1. Management system**

- Post-exposure prophylaxis manual

#### **2. Procedure for exposure**

- Use soap and water to wash any wound or skin contact with infected blood or fluid
- Flush exposed mucous membrane with water
- Irrigate an open wound with sterile saline or disinfectants
- Eye should be irrigated with water, saline or sterile eye irrigants
- Counseling and HIV antibody testing to rule out pre-existing seropositivity
- Use anti-retroviral therapy

#### **3. Follow up**

- HIV antibody testing is repeated 3 month, 6 month, 1 year after exposure

#### **4. Information flow**

- Responsible person / biosafety officer
- Laboratory supervisor
- Laboratory In-charge
- Hospital infection control committee

#### **5. Preventive measures for exposure to HIV specimens**

- Use of universal precaution
- Use of gloves, face mask, gowns, shoe cover and goggle (PPE)
- Avoiding recapping of needle
- Use of impervious needle-disposal container
- Transport of samples in triple container
- Availability of ART on side or easily
- Training personnel for post-exposure

#### **Decontamination of spills**

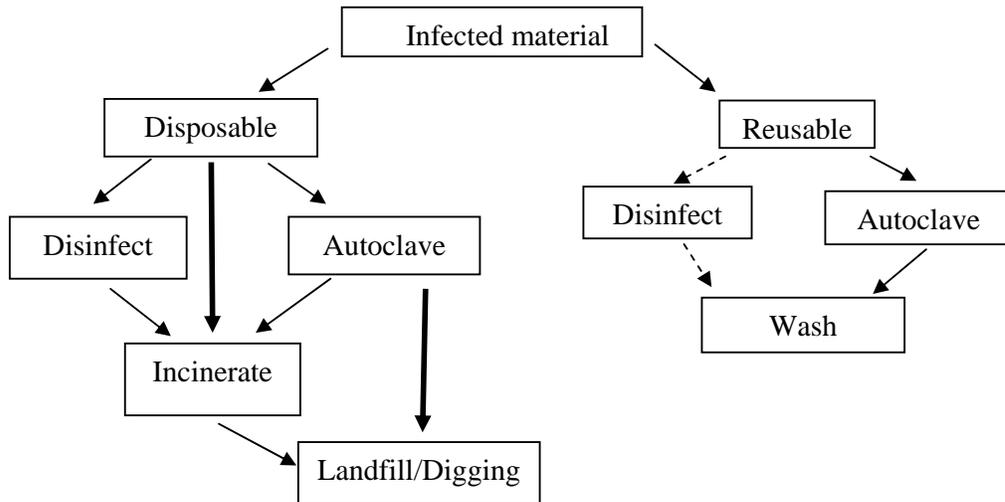
- Wear PPE
- The affected area is covered with absorbent paper towels and flooded with an appropriate disinfectant (5-10% sodium hydrochloride or available chlorine) and leave it for 30 minutes
- Other workers are warned to avoid this area
- Autoclavable dustpan and forceps are used to pick up absorbent paper towels and any solid materials with gloved hands and put in a bag. This area is swabbed with fresh disinfectant
- Absorbent Paper towels, dustpan and forceps are decontaminated by autoclaving

#### **Decontamination**

- Autoclave
- If not available, pressure cooker should be used the highest possible pressure
- Use of boiling water for 30 minutes is also effective for decontamination
- Appropriate concentration of sodium hypochlorite, formaldehyde or glutaraldehyde is desirable for disinfection
- Sodium hypochlorite is used universally as a disinfectant for disinfection of blood spillages and organic matter

## Disposal of waste and contaminated material and

- Specimens, cultures, gloves, gowns, needles, syringes, used pipettes, slides, tissues, paper towels, tissue used to wipe benches, equipment and surfaces
- Different for disposables and reusables



### Remark

Instruction for Laboratory aspect of Infection Prevention and Control (IPC) will be updated and distributed occasionally.

Please contact us on any inconveniences and suggestions on IPC :

### National Health Laboratory, Yangon

Phone - 01-371957

Fax - 01-371925

Email - [nationalhealthlaboratory@gmail.com](mailto:nationalhealthlaboratory@gmail.com)

### Dr. Ohn Mar Lwin

Biosafety Officer, National Health Laboratory, Yangon

Phone - 09 5013592

Email - [ohnmarlwin501@gmail.com](mailto:ohnmarlwin501@gmail.com)