Standard Operating Procedures for Infection prevention and control practices in COVID-19 testing laboratories

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BACKGROUND

SUMMARY

This document is collection of SOPs that are set up to maintain infection prevention practices at COVID-19 testing laboratories. It covers topics as Proper use of PPE, handwashing practices, decontamination of equipment and surfaces in laboratories, waste management and spillage management.

SAFETY

All staff should be familiar with Risk Assessments and have undertaken specific training

All sentences written in red bold text and denoted with ⚠, indicate a Safety Critical step or comment and as such extra attention must be given when undertaking them.

TRAINING

All staff should have undertaken specific training to be able to demonstrate competency before performing this task alone.

1. Donning and Doffing of PPE

1.0 Summary:

This document relates to procedures to don and doff personal protective equipment while handling infectious samples of Risk group 3 categories (eg. SARS COV-2)

2.0 Introduction

- **The personal protective equipments** (PPE) are the equipments that are intended to be worn or held by a person at work and which protects them against one or more risks to their health or safety. PPE for infection prevention and control requires the user to assess the risks associated with the activities to determine the level of PPE required.

- **Standard precautions** are the basic infection prevention and control measures necessary to reduce the risk of transmission of infectious agents from both recognised and unrecognised sources. It should be used by all laboratory staff, at all times while handling clinical samples.

- **Transmission Based Precautions** are additional infection control precautions required when handling samples of known or suspected infectious agent. These are categorised by the route of transmission of the infectious agent:

  Contact precautions
  Used to prevent and control infection transmission via direct contact or indirectly from the immediate environment or equipmen.

  Droplet precautions
  Used to prevent and control infection transmission over short distances via droplets (>5μm) from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual.

  Airborne precautions
  Used to prevent and control infection transmission without necessarily having close contact via aerosols (=5μm) from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual.
  Interrupting transmission of COVID-19 requires both droplet and contact precautions; if an aerosol generating procedure (AGP) is being undertaken then airborne precautions are required in addition to contact precautions.

3.0 Purpose

This SOP is designed to prevent COVID-19 infection to the laboratory personnel while collecting and handling samples from cases of COVID-19 by the proper use and removal of PPE.

4.0 Risk assessment

4.1 Perform Hazard Assessment:

The laboratory supervisor or Biosafety officer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE) in different laboratory activities. Each supervisor shall verify that the required workplace hazard assessment has been performed through a written certification using the Risk assessment checklist.

4.1.1 Identify Required PPE:

Each supervisor/ biosafety officer, based upon the hazard assessment, shall ensure that the appropriate personal protective equipment has been identified. The PPE must be the proper fit and design for the user and not interfere with the ability of the worker to work safely. The PPE will be provided to the worker at no cost.

4.1.2 Training:

Each supervisor/ Biosafety officer will assure workers know how to properly wear, adjust and maintain assigned PPE. Workers will demonstrate understanding of the proper use of assigned PPE. Training will be documented

4.1.3 Maintenance and Replacement:

Each worker is responsible for properly wearing required PPE. Each worker is responsible for informing their supervisor when worn or damaged PPE needs to be replaced.

4.1.4 Evaluating the Appropriateness of Identified PPE:

Each supervisor/ Biosafety officer is responsible for periodically re-evaluating the selection and use of PPE in work areas under their control. The hazard assessment should be repeated when new hazards are identified or introduced into the workplace annually.

5. REQUISITES and REAGENTS

- Soap and water
- Alcohol based hand rubs
- 70% ethanol
- Closed shoes
- Shoe cover

- Disposable gown
- N95 mask
- Surgical mask
- Head cover
- Goggles
- Face shield
- Gloves- (Nitrile gloves for molecular testing)
- Boots/ Shoe cover
- Chair

6.0 Procedure for donning PPE

Before proceeding to donning area

- Remove all jewelleries, danglers, wrist watch, wrist bands, bangles, rings and mobile phones and keep them safely in lockers.
- Trim nails; remove nail products.
- Tie or knot hair into bun. Do not use clips which may tear/damage PPE
- Cover all cuts, abrasions and grazes over hands with the medicated tape. (eg. Bandaid)
- Drink water and use rest room.
- Wash hands with soap and water.

In the donning area

- Ensure all the items of PPE are available and inspect all the PPE for their integrity.
- Sit on the chair and put on closed shoes or boots. Put shoe cover over shoes.
- Use alcohol based hand rub (ABHR) to sanitize hands.
- Put on inner gloves. Take the gloves from the dispense box. Hold the wrist end of the glove open and ease the fingers of the other hand inside. Gently pull the wrist end of the glove easing the hand into it. Apply the next glove into the other hand following the same procedure. Ensure not to touch skin with the gloved hand. Cover the hand cuff area with adhesive tape to seal open glove end.
- Put on the gown/suit. Choose a size bigger. This will allow for easier movement. Secure all ties and zip. Take assistance if required.

  For gown, insert both hands. Wrap the flaps at the back. Pull ties and secure.

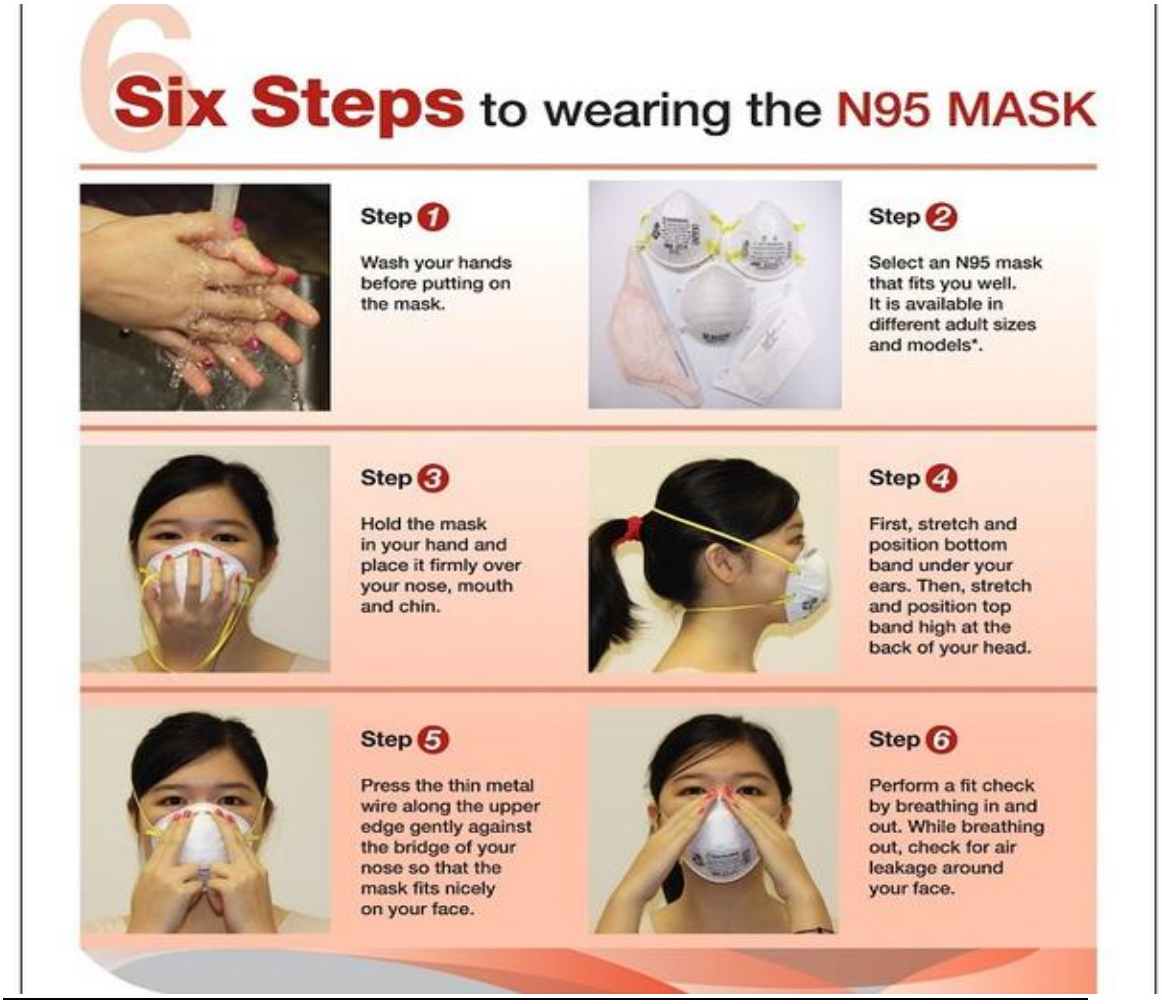
  For suits, sit on the chair. First insert the legs. Pull the suit up. Stand and insert the hand into sleeves. Fasten up the zip.

- Put on the N95 mask. Check for fit.

  Determine the top of the mask. The stiff bendable edge which allows molding into the shape of the nose is usually the top. Hold the mask over nose and

mouth. Take the lower band over the head and secure under the ears. Take the upper band over the head and fix above the ear. Mold the mask against the bridge of nose. Inhale and exhale. Check for air leakage from edges of the mask while exhaling to check the exact fit.

A surgical mask may be worn over the N95 mask where extended use or reuse of N95 mask is practiced



- Put on the hair cover/hood of the suit. Make sure that no stray strands of hair have escaped out of the cap. Cover the forehead.
- Put on goggles and/or face shield. For goggles, position as for glasses. Secure using ear pieces or head band. For faceshield, position over brow and secure with head band. Adjust to fit comfortably
- Put on the external gloves. Pull them over the sleeves of the gown.
- Stretch hands and bend to check comfort.
- Take help from observer to confirm all body surfaces are well covered.
- The assistant/observer ticks off the checklist for Donning PPE simultaneously.

7.0 Procedure for doffing PPE after use

⚠Always assume the outside of the gloves, gown, mask, face shield and goggles are contaminated.

⚠ Perform all the steps of doffing deliberately and slowly

Once in the designated doffing area,

- Decontaminate outer gloves using ABHR
- Remove outer glove. Grab outside of glove of one hand with the other hand. Peel off glove turning inside out. Hold this glove in the palm of the hand removing the glove. Slide thumb/two fingers of the hand with only the inner glove under the outer glove at the wrist of the other hand. Peel glove off over the first glove held in palm.

- Discard in labelled bin.
- Decontaminate the inner gloves using ABHR

<u>Removal of face shield and/or goggles</u>

Outside of goggles or face shield are contaminated⚠!

Tilt head forward

• Remove goggles or face shield from the back by lifting head band or ear pieces

• If the item is reusable, spray and wipe the surfaces with 70% alcohol; place in designated receptacle for reprocessing. Otherwise, discard in a waste container (red bin)

- Decontaminate hands using ABHR
- Remove the head cover and discard in labeled dustbin

Removal of gown/suit

Gown front and sleeves are contaminated⚠!

• Unfasten gown ties, taking care that sleeves don't contact body when reaching for ties

• Pull gown away from neck and shoulders, touching inside of gown only

• Turn gown inside out

• Fold or roll into a bundle and discard in a labeled waste bin.

- Decontaminate hands using ABHR

Removal of Shoe cover

- Sit on the clean chair with the feet still inside the dirty zone. Remove the shoe covers. Do not step on the floor of the dirty zone after the shoe covers are taken off. Step on the clean zone floor. Discard the shoe cover in the bin placed in the clean zone.

- Remove the inner gloves following the procedure of removing gloves as described above.
- Decontaminate hands using ABHR
- Remove surgical mask in case is has been worn.
- Exit from the laboratory.

Remove the N95 mask.

Front of mask/respirator is contaminated — DO NOT TOUCH⚠!

• If hands get contaminated during mask/respirator removal, immediately wash hands or use an ABHR.

- Tilt head forward

• Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front

• Discard in labelled waste container

- Wash hands with soap and water

PERFORM HAND HYGIENE BETWEEN EACH STEP IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE⚠

8.0 Waste handling /disposal

- Place all contaminated disposable items of PPE into a labelled plastic lined discard bin.
- When two thirds full, close the dry waste sack in a swan-neck and secure with a cable tie. Repeat with a second, outer bag. The double-bagged waste is ready to be taken for autoclaving.
- All waste should be processed in accordance with standard protocol for waste management.

9.0 RESPONSIBILITIES

The Director has overall responsibility for compliance with health and safety requirements at all facilities and programs under her/his control.

Supervisors

- Each supervisor has the responsibility to protect his/her employees from injury.
- Hazards should be evaluated, controlled or eliminated if possible, prior to the start of any work where hazards have been identified. If hazards may not be eliminated, then protective equipment should be utilized to ensure the safety of workers/employees. Each supervisor should complete a Laboratory Personal Protective Equipment Assessment Tool, (LPPEAT) for the activities in his/her area to identify potential hazards and methods for their elimination. Hazard assessments for PPE will be conducted initially or when work practices change, reviewed annually, and maintained in the "Laboratory Safety Manuel"

Based on the LPPEAT the supervisor must train his/her employees regarding

- When PPE is necessary
- The correct type of PPE necessary to perform work activities in a safe manner.
- How to properly wear and adjust the PPE
- How to properly remove the PPE and its proper disposal
- The limitations of the PPE
- The proper care, maintenance and useful life of the PPE.

Laboratory staff and Visitors

- Each individual is responsible for wearing his/her required PPE as identified by the supervisor, as a result of conducting a hazard assessment.
- Each individual is responsible for maintaining and storing his/her PPE in a clean and sanitary condition.
- Each individual must ensure that his/her PPE is in good operating condition before wearing
- Each individual needs to communicate to his/her supervisor any unforeseen hazards requiring additional PPE.
- Each individual needs to report to his/her supervisor any defective PPE or need for replacement.

10. Appendix

1. Checklist for donning PPE
2. Checklist for doffing PPE
3. Checklist of minimal PPE for different activities

Appendix 1: Check list for Donning PPE

SN	Steps	YES	NO
1	Ensure all the equipments are available (boots, shoe cover, N95 respirator, goggles, faceshield, impermeable gown, 2 pairs of gloves, alcohol based hand rub and soap and water)		
2	Wear first layer clothes. Accessories removed; hair secured		
3	Wash hands with soap and water (complete 6 steps)		
4	Inspect PPE items for integrity prior to putting on		
7	Wear plastic or rubber boots/covered shoes.		
8	Put on shoe covers		
9	Decontaminate hands		
10	Put on inner gloves.		
11	Put on gown. The sleeves pulled over inner gloves. Tape the gloves over the gown.		
12	Put on N95 mask		
13	Check fit of mask		
14	Put goggles		
15	Put on head cover		
16	Put on hood		
17	Put on face shield		
18	Put on the outer pair of gloves. Pull over the sleeves		

	of gown		
19	Check comfort by stretching		
20	Check proper fit of the complete PPE		
21	Check all body surface is well covered		

Appendix 2: Checklist for Doffing PPE

SN	Steps	YES	NO
1	PPE should be taken off in a designated doffing area Ensure all the requisites are available (dust bin with lid and lined with leak proof plastic bag, alcohol based hand rub)		
2	Disinfect outer gloves by using ABHR		
3	Inspect PPE for visible contamination or tears		
4	Disinfect outer gloves and remove it without contaminating inner gloves		
5	Inspect and disinfect inner gloves		
6	Remove face shield		
7	Put off hood by grasping at the back		
8	Disinfect inner gloves		
9	Remove head cover; discard		
10	Remove goggles. Spray alcohol;Drop in receptacle		

11	Remove gown or suit without touching the outer surface		
12	Roll out gown from inner to outer; discard		
13	Take off shoe cover		
14	Step into clean zone		
15	Discard shoe cover		
16	Take off surgical mask, if used.		
17	Take off inner gloves		
18	Disinfect hands		
19	Move out of the laboratory and remove N95 mask		
20	Wash hands		

Appendix 3: Checklist of minimal PPE required for different activities

	Sample collection	Help desk	Sample reception	Sample transport	Sample processing	Floor cleaning	Waste disposal
Gloves	✓	✓	✓	✓	✓	✓	✓
Gown	✓		✓	✓	✓	✓	✓
Apron	✓	✓		✓			✓
N95 respirator	✓		✓		✓	✓	
Surgical mask	✓	✓		✓		✓	✓
Face shield/goggles	✓		✓		✓		
Shoe cover	✓		✓		✓	✓	✓

2. Hand Hygiene

1.0 SUMMARY:

This document relates to procedures to decontaminate hands while working in COVID-19 laboratory

2.0 INTRODUCTION

- Hand hygiene performed correctly in appropriate time remains the most important intervention in prevention and control of infections including COVID-19.
- There are two types of microorganisms present on the surface of the hand. The transient flora is lightly attached to the skin. They are easily acquired on hands by touch and can be transferred from hands to other surfaces, individuals, equipment and environment. These are important source of cross infection. However, they can be easily removed by washing with soap and water.
  The resident flora are constituted by microorganisms that are part of the host's innate defence. They are not easily removed by soap and water.
- There is no defined frequency for hand hygiene. It is guided by the activity performed and about to be performed.
- Hand sanitization is not a replacement for hand washing. ⚠ Hands when visibly soiled must be washed with soap and water.

3.0 HAND DECONTAMINATION PRODUCTS

3.1.1 70% alcohol hand rub or gel

It is recommended for routine hand decontamination because it is quick and easy to use. It is highly effective in reducing the microbial load quickly. It can be made available near work stations and does not require additional facilities like wash basin and towels. However, alcohol gets inactivated in the presence of dirt or organic material. It does not have a residual effect, so has to be applied frequently.

3.1.2 Liquid soap and water

- Hand washing with liquid soap and water is the most thorough method of hand decontamination. It removes dirt, organic matter and transient flora. It should be used when hands are visibly soiled or dirty and to remove deposits of hand rub (after every 4-6 application of hand rubs).
- ⚠**Dirty and visibly soiled hands must be cleaned with soap and water.**

Soap and alcohol-based handrub should not be used concomitantly (Ref: WHO guidelines)

3.2 Skin care

Regular and frequent hand hygiene may lead to dryness and may lead to chronic changes and damage to skin's microflora. Care of hands is necessary to avoid skin getting dry and chapped. If you have sore skin,reduce the frequency of hand hygiene. Moreover, microorganisms lodged in broken skin is difficult to remove and can be a source of cross infection. Hand cream should be regularly applied to maintain skin health.

3.3 Jewellery

Wrist watches, bangles, bracelets, wrist bands, rings, false nails, nail products should be removed prior to hand washing. These items must not be worn while working in the laboratory. They can be contaminated and can become the means of transmission of infection. Do not use nail polish. Keep nails short and trimmed smooth.

Pre-requisites for Hand hygiene:

Dedicated hand wash basins with soap dispenser, paper towel and a foot operated non healthcare risk waste bin.

Access to alcohol based hand rubs (ABHRs) at the point of care.

Hand wash/alcohol hand rub signage displaying the approved hand hygiene technique.

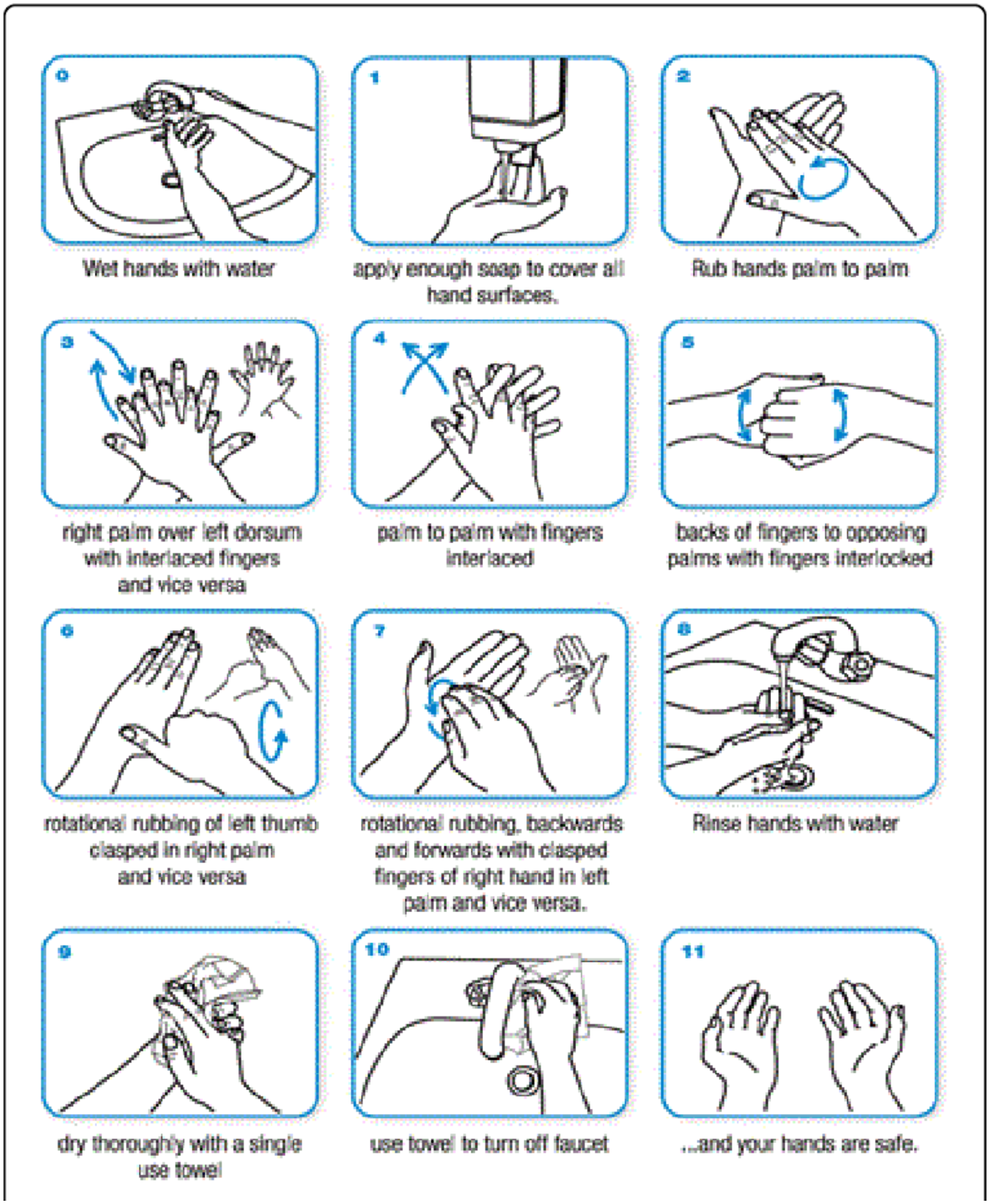
Access to hand creams/moisturisers. Staff should regularly use hand moisturising agents to reduce irritation and maintain the integrity of the skin.

4.0 HAND DECONTAMINATION TECHNIQUES

4.1 Hand decontamination technique using soap and water

⚠ All the steps must be performed, taking at least 20-30 seconds

Liquid, bar, leaf or powdered forms of soap are acceptable. When bar soap is used, small bars of soap in racks that facilitate drainage should be used to allow the bars to dry. Sinks should be designed to reduce the risk of splashes


0
Wet hands with water
1
apply enough soap to cover all hand surfaces.
2
Rub hands palm to palm
3
right palm over left dorsum with interlaced fingers and vice versa
4
palm to palm with fingers interlaced
5
backs of fingers to opposing palms with fingers interlocked
6
rotational rubbing of left thumb clasped in right palm and vice versa
7
rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.
8
Rinse hands with water
9
dry thoroughly with a single use towel
10
use towel to turn off faucet
11
...and your hands are safe.

4.2 Hand decontamination using alcohol based hand sanitizer

After application of the alcohol-based handrub as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves.

- **Indications for hand hygiene:**Before donning the PPE to start work.
- After doffing.
- After using the restroom.
- After touching contaminated equipment or surfaces.
- After contact with body fluids or excretions or mucous membranes

5.0 Waste handling / disposal

- Throw used paper towels into labelled plastic lined discard bin for domestic waste.
- When two thirds full, close the dry waste sack in a swan-neck and secure with a cable tie. Repeat with a second, outer bag. The double-bagged waste is ready to be taken for disposal
- All waste should be processed in accordance with standard protocol for waste management.

6.0 RESPONSIBILITIES

Laboratory supervisor or biosafety officer or infection control officer must ensure all staff have undergone training on hand hygiene and have understood the importance and steps of hand hygiene.

All trained staff or new staff undergoing training must adhere to this SOP. Any proposed deviation from stated protocols should be discussed with the laboratory lead, who will determine the necessary action and liaise with clinical staff in the treatment centres to ensure appropriate corrective action is taken. Any change from stated protocols should be recorded and justified by the team leader.

3. General Decontamination

1.0 Summary:

This document relates to procedures to decontaminate equipment/consumables/ clothings/ surfaces used in processing laboratory samples

2.0 REQUISITES and REAGENTS

- Daily prepared 0.5% sodium hypochlorite
- 70% ethanol
- Absorbent cloths

3.0 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

3.1 Personal possessions must not be taken into the laboratory area. Jewellery must be removed and kept in a a safe place (locker).

3.2 Any staff with fresh cuts, grazes or abrasions on the hands must not carry out **isolator/cabinet** decontamination.

3.3 Ensure all cuts, grazes or abrasions are covered prior to donning PPE.

3.4 Staff carrying out decontamination isolators/cabinets should wear a disposable laboratory gown and suitable footwear with closed toes e.g. clogs. While working in the isolator, 3 layers of gloves must be worn; wear one layer of laboratory gloves (an additional pair of vinyl gloves must be worn on the outside of the isolator gloves to improve dexterity).

3.5 Staff carrying out decontamination outside the isolator/cabinet must wear a disposable laboratory gown and suitable footwear with closed toes e.g. clogs, together with 2 layers of gloves and safety glasses as a minimum (face shields/goggles can be worn for additional protection from hypochlorite fumes)

⚠Strict adherence to PPE rules are required to help mitigate the risk of accidental exposure to pathogenic material and potentially toxic/harmful cleaning products.

3.6 For decontamination of electrical items, ensure power is off and equipment is disconnected from power source prior to cleaning.

⚠Laboratory users must ensure electrical items are switched off and unplugged prior to commencing any decontamination – risk of electrical shock if this is not done!

4.0 DECLARATION OF DECONTAMINATION OF EQUIPMENT FORM

4.1 The Declaration of decontamination form (NPHL/COVID-19/FORM/004) must be filled out for each item.

4.2 This form must accompany all items that are removed from the laboratory.

4.3 In the equipment description section, record which laboratory area the equipment was used in and for what purpose.

4.4 The Decontamination Form may be signed by any member of the laboratory staff.

5.0 DECONTAMINATION OF EQUIPMENT

⚠ **Strict adherence to prescribed chemical concentrations and indicated waiting times is essential to ensure adequate inactivation of infectious materials and dispersal of potentially toxic airborne chemicals. This applies to all the steps listed below.**

5.1 Racks, spill tray and other items

5.1.1 Surface decontaminate racks, tip boxes spill tray and other movable items (excluding centrifuge and Gilson pipettes) with 0.5% hypochlorite, making sure items that are cleaned are placed onto a clean area of the isolator work surface. Leave for 10 minutes contact time.

5.1.2 Items to be removed from the laboratory should be labelled with declaration of decontamination form - *keep a copy of the form for laboratory records*.

5.2 Items destined for autoclaving may be surface decontaminated and bagged in the isolator/cabinet and marked for autoclaving prior to disposal.

5.3 Small equipment including Microcentrifuges, Gilson pipettes etc

5.3.1 For safe removal from isolator/cabinet, wipe equipment with either 70% ethanol solution or with 0.5% hypochlorite solution (after 10 min, then wipe off hypochlorite solution with detergent).

5.3.2 If cleaned equipment is to be discarded, label decontaminated equipment for discard with declaration of decontamination form, keep a copy of the form for laboratory records.

6.0 FULL ISOLATOR/CABINET DECONTAMINATION

6.1 Wipe down all isolator surfaces (base, screen/shield, canopy, pass box door and handle, sleeves and gloves – as appropriate) with 0.5% hypochlorite, then with 70% ethanol. Use sponges on sticks or large sponges to ensure that all corners are reached.

6.2 Wipe outside surfaces of isolator with detergent. When dry, wipe with 70% ethanol.

6.3 Run in-built UV decontamination programme

7.0 DECONTAMINATION OF EQUIPMENT IN LAB

7.1 Equipment and materials in the laboratory should **not** have been in direct contact with live agents or biological substances and only require minimal decontamination.

7.2 Electronic equipment and other hypochlorite sensitive items (e.g. Automated extraction platforms, Thermocyclers, printers, laptops) or PPE equipment (e.g face masks) that have not knowingly been in contact with live agents, should be surface cleaned by wiping all exposed areas with detergent then 70% ethanol (in the event of non-enveloped viruses, consult Biosafety officer/ Senior Microbiologist regarding effective approaches that may be employed) .

7.3 Gilson pipettes should be surface wiped with 70% ethanol to remove surface contamination. Allow to dry completely.

7.4 Racks and other durable plastics etc. should be immersed for 30 minutes in hypochlorite. Allow to dry completely.

8.0 REMOVAL OF EQUIPMENT FROM LABORATORY

8.1 Decontaminated items of equipment, accompanied by a declaration of decontamination form, may be removed from the laboratory location (see section 13.0).

8.2 Where required by instrument manuals, transport locks should be reattached to equipment to prevent damage in transit. Transport locks are likely to be required for EZ1, Roche LC96 and blood analysers, refer to relevant operator manual.

9.0 LABORATORY CLOTHING

9.1 Laboratory clothing for reuse (e.g. scrubs) should be washed with water/ detergent solution. – soaked in 0.5% hypochlorite for 30mins (preferably overnight) for decontamination

OR

Autoclave at 121 ◦C, 15psi for 15 minutes and then washed through laundry

9.2 Laboratory clothing for discard must be disinfected as above using 0.5%

Hypochlorite, double-bag and sent for autoclaving.

9.3 If clothing is to be discarded, Label clothing with declaration of decontamination form; keep a copy of the form for laboratory records.

9.4 Bagged decontaminated clothing items may be transported to new location.

10.0 LABORATORY RECORDS

10.1 Any kinds of documents accompanying samples are sprayed with 70% alcohol before proceeding in sample reception area

10.2 All documents before being dispatched from the testing laboratory (for data entry purpose and documentation) must be sprayed with 70% alcohol.

10.3 Sample tracking forms and other laboratory records that have not been in contact with clinical samples, should be packed into bags for transport /storage to new location. They can be kept in an office or storage space.

10.4 Sample referral forms and other records that may have been in contact with clinical samples, should be sprayed with 70% alcohol as they arrived in the laboratory (Note: ensure key information is captured on laboratory tracking forms/in database prior to spraying).

11.0 RECORDS OF EQUIPMENT DECONTAMINATION AND REMOVAL

11.1 The laboratory should keep a copy of any declaration of decontamination forms, and the original form should accompany any equipment.

11.2 The laboratory should record in a single master spreadsheet and or logbook all equipment and items removed and the destination (whether it is for destruction or transport location, storage, etc).

11.3 Suggested headers are:

Date Decontaminated	Date Removed	Item reference/serial no	Item description	Destination	Person authorising removal

11.4 Item/Equipment for destruction should be tracked to ensure they are destroyed. A certificate of destruction should be kept locally and should follow the items for disposal and the form returned by the disposal staff once destroyed.

12.0 FRIDGES AND FREEZERS CONTAINING NON-INACTIVATED SAMPLES

12.1 Consult senior microbiologists/biosafety officer for instructions regarding transport or storage of samples.

13.0 FILTERS IN AIRCON UNITS

13.1 AWAIT CONFIRMATION but prior to laboratory decommissioning these should be removed and filters double bagged and immerse in 0.5% hypochlorite for 60 minutes

14.0 DECONTAMINATION OF SURFACES AND FLOORS

14.1 Floor surfaces should be cleaned with 0.5-1% hypochlorite solution. If required, cleaning with detergent should precede hypochlorite cleaning. (Lab areas with high inflow of staff)

14.2 Other surfaces and door handles should be cleaned with detergent and 70% ethanol.

14.3 For final decommissioning prior to removal of equipment, clean surfaces and floors with 0.1% hypochlorite solution ensuring sufficient ventilation. After treatment, residue hypochlorite should be removed via water ± detergent.

14.4 Post removal of equipment, clean surfaces, floor, walls, door handles, windows etc. with 0.1% hypochlorite solution ensuring sufficient ventilation during process.

15.0 RESPONSIBILITIES

It is the responsibility of Biosafety officer/ Senior Microbiologist to ensure that members of each laboratory team are designated responsible for the decontamination equipment. It is the responsibility of all staff to ensure they have read and understood this SOP and all relevant Risk Assessments.

16.0 ANNEXES:

16.1 Declaration of Decontamination form

16.2 BSC decontamination log

Annex I: Declaration of decontamination form:

DECLARATION OF DECONTAMINATION

To: Ref/Order No:

1. Equipment Details

Equipment Make	Equipment Description	ID No	Make / Serial No

Note: For equipment numbers greater than 3 check the box below and attach a separate sheet

☐ See attached sheet

Note: for equipment that has not been contaminated this form does NOT need to be signed by Senior Microbiology

2. Biological Agent Contamination

Detail all (known) biological agents the equipment has been contaminated by:

3. Hazardous Substance Contamination

Detail all hazardous substances the equipment has been contaminated by:

4. Decontamination Method Used

Detail the decontamination method/s used:

5. Declaration (tick appropriate box)

☐ I declare that the equipment detailed in section 1 has been used for LIVE PATHOGENIC samples but has been decontaminated as far as reasonably practicable. Residual risks associated with its former use may remain and due caution should be exercised in handling to maintain its protective wrapping.

☐ I declare that the equipment detailed in section 1 has been suitably decontaminated according to **General decontamination- SOP** and is free from hazards associated with its former use.

☐ I declare that the equipment detailed in section 1 has not been in contact with any biological agent or hazardous substance that the equipment does not require decontamination and is free from any hazards.

Person Responsible: Date:

Signature:

6. Safety Signature (Note: Signature only required if equipment has required decontamination)

I have checked that the equipment has been decontaminated according to **General decontamination- SOP** and that this certificate has been completed correctly.

Senior Microbiologist/ Biosafety officer: Date:

Signature:

Annex II: BSC decontamination log:

Daily maintenance record format (Bio-safety cabinet)

Bio-safety cabinet

Date	Before use		After use		Signature
	Cleaning with 70 % alcohol/ other disinfectant	UV illumination 15 min	Cleaning with 70 % alcohol/ other disinfectant	UV illumination 15 min	

DECONTAMINATION LOG-SHEETS MUST BE FILLED AFTER EACH DECONTAMINATION PROCEDURES MENTIONED ABOVE

4. Waste management

1.0 SUMMARY:

This document relates to procedures to manage waste generated during routine laboratory activities.

2.0 INTRODUCTION

- **Principle of waste management, i.e,** *Waste reduction, waste segregation, proper collection, storage and transport and waste treatment* must be strictly followed
- Colour coded bins must be used for waste segregation (eg. Red- infectious non- sharps, Yellow- Sharps, Blue- Non-infectious waste)
- All staff involved in waste management, including waste handlers, must be sufficiently trained and must be provided with appropriate PPE.
- It is advised to treat highly infectious waste (eg. waste generated during COVID-19 related sample processing) at site of generation, to minimise risk to waste transporters and environment.
- Autoclaving is preferred waste treatment method for lab activities generated waste.

- It is necessary to ensure that all stages of waste treatment and disposal are logged appropriately to safeguard both laboratory staff and external persons.
- Each waste sack placed out for collection must be labelled with either a unique identifier zip-tie or dedicated sticker for non-hazardous/ decontaminated waste.
- Autoclaving of waste material will only be carried out in a validated autoclave. Details of each autoclave run will be recorded on the Autoclave Run Sheet. Quality control log should also be recorded.
- If possible (local procedures may differ depending on location) collecting staff will date and initial the log when they collect the waste for either landfill or autoclaving.
- All highly infectious waste (i.e. isolator/glove-box waste) is to be autoclaved (either in the laboratory or via a central autoclave) or incinerated – records of final destruction are to be completed and retained by the laboratory.

3.0 PROCEDURE

3.1 BSL 2-3 waste

3.1.1 Waste for autoclaving and incineration

- All high containment waste material generated within the Laboratory should be autoclaved in a validated autoclave
  OR decontaminated with concentrated (4-6%) Chlorine solution before removal from laboratory for further disposal.

  ⚠ **Infectious waste leaving the laboratory must either be firstly inactivated via autoclaving or exposure to hypochlorite.**

- Details of each autoclave run are recorded on the Autoclave run record and records are held by the Laboratory. All unique identifier numbers will be recorded on corresponding Autoclave Run Sheet.
- If available, autoclave printouts should be retained along with the aforementioned log.
- After autoclaving, waste will be placed in large waste sacks which will be "swan necked" and marked with allocated unique identifier, ready for collection by central waste disposal services for further processing in accordance to local rules and procedures. Details should be recorded on a Waste Disposal Log.

3.1.2 Sharps Bins for autoclaving

- sharp bins must be placed at working area with freshly prepared 0.5% to 1% hypochlorite
- When sharp bins are two- third full, lid is fully closed and contact period for overnight is allowed.
- Drain the disinfectant into sink and flush with plenty water
- Empty the sharps in incinerator and burn
- Sharp bins can be reused after rinsing properly with 0.5% hypochlorite.

  ⚠ **The closing of sharps bins must be done with care. Do not attempt to close an overfilled sharps bin – if in doubt consult Senior Microbiology.**

3.1.3 General/"domestic" waste

- General waste should be placed in blue sacks for further processing (e.g. uncontaminated packaging and paper towels).
- "Swan neck" blue sack, allocate unique identifier, lab number and date.
- Document details on a Waste Disposal Log.

4.0 RESPONSIBILITIES:

It is the responsibility of Biosafety officer/ Senior Microbiologist to ensure that waste management is being carried out properly as per SOP and documentation of all related activities are also being filled on daily basis.

It is the responsibility of all staff to ensure they have read and understood this SOP and all relevant Risk Assessments.

5.0 ANNEXURE:

4.1 Sterilisation log sheet

Annex I: Sterilisation log sheet

STERILIZATION LOG SHEET

Month/Year: _____ Location/Unit: _____

Date *(dd/mm/yy)*	Time			Temp. °F or °C	Pressure	Temperature-sensitive indicator: *Colour Change Observed (Y/N)*	Operator's Initials	Comments
	Start	*End*	*Cycle Length*					

☐ **Biweekly spore strip tests submitted:** *(dd/mm/yy)* ☐ Result received *(dd/mm/yy)* ☐ Result received *(dd/mm/yy)* ☐ Result received

PLEASE NOTE:
1. Pressure cookers, glass-bead sterilizers, microwaves, U.V. sterilizers, boiling water and dry-heat domestic ovens are **NOT** approved means of sterilizing.
2. The manufacturer's instructions for the sterilizing equipment must be onsite and easily accessible.
3. A record book for monitoring each load placed in the sterilizer (temperature, pressure and cycle length) must be maintained for a minimum of five years, with the last 12 months onsite.
4. Biweekly spore strip test results must be kept for a minimum of five years, with the last 12 months onsite.
5. Failed spore strip tests – refer to *Biological Monitoring of Sterilizer (Spore Test)* poster.

5.0Biological Spillage management

1.0 SUMMARY

This document relates to procedures to manage any spillage occurring within lab premises.

2.0 GENERAL

2.1 Laboratory supervisor/ Biosafety officer must be informed immediately of any significant breakage and/or spillage of pathogen or dangerous substances. Here we are defining a significant breakage/spillage as one where a person has been exposed or potentially exposed to pathogen or dangerous substances. In such circumstances, available medical staff must be consulted to determine the risk to health and any treatment which may be advised.

2.2 Before attempting to clear up any spillage, the potential risks associated with

The incident must be carefully assessed by available laboratory staff to determine the safest means of containing the risk.

2.3 Spill waste must be handled as per standard protocol for waste management.

2.0 REQUISITES:

Spillage kit- (must contain)

- Guideline
- List of accessories
- Gloves (normal/ nitrile)
- Utility gloves
- Zip lock bag, biohazard polythene bag
- Forcep
- Dust pan
- Cleaning Brush
- Cotton roll (absorbent)
- Paper towel (tissue paper)
- Sodium hypochlorite
- PPE set (mask, gown,gloves)

4.0 SPECIFIC PROCEDURES

4.0 PROCEDURE:

4.1 Minor liquid spill

4.1.1 If a small volume clinical specimen container (<5ml) is broken or fluid spilt, the contaminated area is absorbed by dry paper towel/ absorbent cloth; 5% hypochlorite solution(Biohazard Spills Kit) is added, enough amount to soak absorbent towel and allowed to act for 10-20 minutes.

> ⚠ **SAFETY NOTE: Never add liquid disinfectant directly to a liquid spill, as it may cause infectious splashes, and will spread the spillage further**
>
> ⚠ **SAFETY NOTE: Always ensure correct PPE is worn (e.g. gloves, gown, eye protection, etc).**

4.1.2. The paper/ cloth are collected up for disposal into leak-proof puncture resistant waste disposal container, using disposable scoops from the spill kit. Do not attempt to handle any broken containers by hand, in case of inoculation injury; use forceps.

4.1.3 Liquid chlorine disinfectant (0.5 to 1%) should then be used as a final treatment of the surface.

⚠ **SAFETY NOTE: Always use forceps to pick-up broken containers/glass – failure to do so could result in breach of PPE, injury and/or exposure to pathogen(s).**

4.1.4 If the treated surface is metal, such as the inside of a safety cabinet, the chlorinated surface should be cleaned down subsequently with water, to prevent corrosion of the metal by the action of residual chlorine.

4.1.5 **At the earliest possible moment, report the incident promptly to Laboratory Supervisor, so that they can assess potential for pathogen exposure and determine if any medical follow-up is necessary.**

4.1.6 Record the incident in incident log book.

4.2 Major liquid spill

4.2.1. If a spillage occurs with a larger volume (>5ml) of clinical sample(s), or any volume of cultured or otherwise concentrated material positive for a human pathogen, the potential risk of exposure to pathogens is likely to be greater. Spillage of collected waste fluids, such as that from immunoassay plate washers, may also present an increased risk of exposure to infectious materials.

4.2.2 In the first instance, immediately EVACUATE the Laboratory and keep other workers away, to minimise exposure to aerosols and splashes. Call for assistance from Laboratory Supervisor/ Biosafety officer. The potential for exposure can then be determined, any necessary intervention or follow-up with medical teams can be arranged and a planned clean-up organised.

⚠ **SAFETY NOTE: Always immediately EVACUATE the laboratory if a major spill occurs. Ensure no other personnel enter the room by locking entry points and placing appropriate notices on the door(s).**

⚠ **Solutions containing guanidine salts can form highly reactive compounds when combined with bleach. If liquid containing solutions is spilt, clean with a suitable laboratory detergent and water. If the spilt liquid contains potentially infectious agents, clean the affected area first with laboratory detergent and water, and then with 1% (v/v) sodium hypochlorite. (Some buffers used during RNA extraction, certain VTMs, Trizol)**

4.2.3 Decontamination of the spill will be similar to that used for minor spills, in terms of absorption and treatment of the fluids, but treatment time should be minimum of 30 minutes. However, if the spill has occurred within a safety cabinet/isolator/glove-box, formaldehyde fumigation may be considered.

4.2.4 Record the incident in incident log book.

⚠ **SAFETY NOTE: Formaldehyde is a known carcinogen and should only be used by trained personnel – inform the Laboratory Supervisor/ biosafety officer of your intent to use formaldehyde prior to employing it.**

4.3 CENTRIFUGE ACCIDENT

4.3.1 A spillage within a centrifuge, caused by a leak or breakage of tubes, may present a significant risk of exposure to infectious aerosols. Centrifugation methods must be considered in risk assessments, and practices used to minimise the chance of accidents occurring. Centrifugation procedures must use the following: e.g. using only centrifuge-grade vessels, centrifuges with biosafe seals and the loading & unloading of centrifuge buckets must take place inside a safety cabinet if handling BSL 3/4 pathogens.

4.3.2 Summary of actions in the event of a leak or breakage of infectious or potentially infectious material in a centrifuge:

- Do not open the centrifuge if a leak or breakage is suspected
- If breakage discovered upon opening, close the centrifuge immediately
- Keep it closed for at least 30 minutes. Label it with a warning to others
- Report the incident to Laboratory Supervisor, so that exposure risk can be assessed, and a clear-up planned

6.0 RESPONSIBILITIES:

It is the responsibility of Biosafety officer/ Senior Microbiologist to ensure that members of each laboratory team are designated responsible for the biological material spillage handling. It is the responsibility of all staff to ensure they have read and understood this SOP and all relevant Risk Assessments.

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