QUALITY STANDARD SYSTEM MANUAL	HALCYON MARINE HEALTHCARE SYSTEMS	DOCUMENT NO. QML 3.0	EFFECTIVITY DATE: May 4, 2018 REVISION. NO. 2
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SUBJECT: SAFETY RULES AND PRECAUTIONS			

General Laboratory Rules

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. When first entering the laboratory, do not touch any equipment, chemicals or other materials until you have your personal protective gear on.
3. Read all instructions and plan your work.
4. Follow the written laboratory procedure.
5. Laboratory tables should be as uncluttered as possible to allow work space and avoid accidents. Also keep the aisles clear to prevent tripping over your gear and so that people can pass unhampered. A laboratory personnel needs to be mobile.
6. Laboratory activities require your undivided attention. Electronic devices are not permitted. No cellular phone usage while working.
7. Learn where the safety and first-aid equipment is located. This includes fire extinguishers and the eyewash station. Notify the Chief Medical Technologist immediately in case of an accident, no matter how trivial it may seem.
8. Require that all accidents (incidents and near-miss events) be reported in the corresponding logbook, evaluate and discuss during departmental safety meetings.
9. Ensure that all reagents are properly labeled.
10. Always wear gloves when handling specimens and chemicals.
11. Appropriate clothing is required. Your clothing is a barrier between your skin and chemicals.
12. Roll up sleeves and tie up loose clothing and long hair when working with equipment, any chemical or biological substances.
13. Smoking or use of other tobacco products is prohibited.
14. Wash hands after working with chemicals; before and after putting on the gloves. Never re-wear used gloves.
15. Wear laboratory gown during bench work and inside laboratory premises.

Minimizing Equipment and Technique- Related Hazards

Pipettes

- Mouth pipetting must be banned at all times.
- Pipetting devices should be inspected routinely for leakage. It should be serviced and replaced as necessary.
- When discharging infectious materials from a pipette, it is important to minimize the formation of aerosols; the last drop in the pipette should not be forced out but left in the pipette.
- Care should be taken to avoid bubbling when mixing liquids with pipettes; it may advisable to discharge the liquid onto the side of the container.

Contaminated pipettes should always be discarded into disinfectant fluid which is prepared daily.

- Broken and chipped pipettes should be discarded.

Hypodermic needles and syringes

- Never attempt to re-sheath needles unless absolutely necessary.
- If re-capping the needles, do it by using the one-hand method.
- Fish out the needle cap with one hand. Or preferably, use those with needleguards which permit safe disconnection and recapping of needles.
- It is important that used needles are disposed properly into "sharps containers.' These "sharps containers" should be available where they are needed. These are puncture-proof containers in the form of empty gallon containers of Chlorox, mineral water or reagents.

Centrifugation

- Infectious material may be dispersed by a centrifuge either through broken tubes or other means such as through the threads of the tubes and caps.
- Sealed centrifuge buckets should be used when centrifuging infectious materials.
- Care should be taken to ensure that the centrifuge tubes are not cracked or flawed. Tubes should be capped.
- The tubes and the buckets should be balanced carefully to avoid vibration which may lead to breakage.
- Material containing agents which are particularly likely to cause laboratory infections should be centrifuged in sealed centrifuged buckets.

Collection, Transport and Receipt of Infectious Materials

Containers – Disposable, screw-capped containers for blood and urine samples

Blood – Traditional method of collection is through the use of hypodermic needles and syringes and then expelled into plastic containers. The modern method and much safer is the use of vacuum collection tubes since these minimize several of the hazards and problems of taking blood and disposing safely of syringes and needles. These containers are robust, leakproof; and cannot be contaminated externally.

Feces – Feces are probably the most hazardous material other than blood. Patients should be told to defecate on a pile of toilet paper in the lavatory pan and to remove a pea-sized portion with the spoon provided, to insert it carefully into the container and then to screw the cap on tightly.

Labeling specimens and containers

- Labels and stickers used should be self-adhesive.
- Specimens should be placed in self-sealing plastic bags and labeled "Potentially Infectious Material."
- Request forms should be separate from the specimen.

Transport of Specimens

- The container used must be robust and cocooned in enough absorbent packing material to retain the contents in the event of leakage or damage to the container.
- It is advisable to use self-sealing plastic bag and placed in a styrobox or cooler containing refrigerants to maintain the cold temperature of the specimen.

Receipt of infectious materials

- Any specimen in a plastic bag which is labeled "Potentially Infectious" should not be removed from that bag.
- Leaking or broken specimens should not be touched, nor should any others in the same box or tray.

Disposal of Wastes

Laboratory waste should be separated into color-coded containers. The recommended colors are;

- **Yellow/red** – biohazard materials as bodily fluids are for incineration.
- **Light blue or transparent with blue inscription** – for autoclaving (but may be incinerated subsequently)
- **Black** – normal household waste: Local Authority Refuse collection
- **White or clear plastic** – soiled linen
- **Green** – wet biodegradable wastes as food remnants, etc.
- **Contaminated liquid waste** may be poured down a deep sink and immediately flushed with disinfectant. Sometimes, chemical treatment is preferred.

Waste Segregation, Storage and Disposal:

1. All laboratory waste should be segregated and disposed in proper color-coded trash bags.
    a. Black Bag – Dry, Non-infectious wastes
    b. Yellow Bag – All Infectious wastes
    c. Red Bag – Sharps and Pressurized containers
2. All wastes segregated using black bags are collected daily by the city collection system.
3. Wastes collected using Yellow Bags are stored and disposed as follows:
    a. Blood sample –
        i. Nonreactive Specimens collected from patients are stored in the refrigerator for one week. After one week, a partnered waste collection system will collect and dispose the blood samples.
        ii. Reactive specimens collected from patients are stored in the freezer for 1 year. After a year, all blood samples will be incinerated by the partnered waste collection system and disposed properly.
    b. Other Infectious Wastes – all infectious wastes are stored in a yellow trash bin and are collected by a partnered collection system on a weekly basis.
4. Sharps are placed in a puncture proof container. Containers should only be filled ¾ full. Once full, cover the container tightly and wrap with red trash bag. Partnered collection system will collect the waste for proper disposal.
5. Urine waste is flushed directly on the toilet.

Chemical Disinfection

- Chemical disinfection should be regarded as a first line defense especially in the case of discarded bench equipment, which should be followed by autoclaving or incineration.
- The most commonly used disinfectants in laboratory work are clear phenolics and hypochlorites. Aldehydes have a more limited application and alcohol mixtures are less popular.

Precautions in the use of disinfectants –

- Some disinfectants have undesirable effects on the skin, eyes, and respiratory tract.
- Disposable gloves and safety spectacles, goggles, or a visor should be worn by anyone handling strong disinfectants.

Re-usable pipettes –

- After use, these should be completely immersed in disinfectant so that no air remains.
- It should remain in the disinfectant for at least 18 hours before washing and/or autoclaving.

Disinfection after accidents

Leakage of specimen –

- Disposable gloves should be worn and the offending container and any others which may be contaminated be placed on a tray which is then placed in a large plastic bag and removed to a laboratory, preferably a safety cabinet.
- The surface on which the leakage occurred should then be covered with paper towels over which the appropriate disinfectant is poured.
- This should be left for at least 30 minutes before the towels are removed.
- The area should then be disinfected and left for several hours with the disinfectant.
- Leakage into transport boxes should be treated in the same way except that the box can be autoclaved.
- Report the incident to the Senior Medical Technologist.

Simple spillages –

- Simple spills should be covered promptly with a paper towel and disinfectant poured gently on the towel.
- The towel should be removed after 30 minutes and the area swabbed with fresh disinfectant. Report incident to the Senior Medical Technologist.

Centrifuge accidents –

- Breakage of tubes in a centrifuge can disperse large amounts of aerosols.
- Sealed buckets should be used for all Hazard Group 3 agents.
- The action to be taken should be the same as in the breakage of a culture
- After the room is considered safe to enter, the centrifuge buckets and rotor can be removed and autoclaved and the bowl disinfected.
- Hazard Group 3 agents are the following: Hepatitis viruses, HIV, Salmonella typhi, Shigella dysenteria, etc.

Personal Injury

Minor Cuts and Punctures

- If the skin is accidentally punctured or that skin lesion is contaminated, immediate action is necessary.
- Bleeding should be encouraged under running water, a dressing applied and the accident reported and appropriate follow-up action taken.
- The affected part should be washed immediately with soap and water.
- Refer to Protocol on handling needle stick or body fluid contamination accidents.

Chemical Spill

- Flood exposed area with running water from faucet or safety shower for at least 15 minutes.
- For Alkali spills, neutralize with diluted HCl and for acid spills, use Sodium Bicarbonate powder.
- Remove contaminated clothing at once.
- Avoid contact with eyes. Put clothing in a plastic bag and seal it.
- Obtain medical attention immediately.

Clothing on Fire [Stop, Drop, Roll]

- Roll person around on floor to smother flame.
- Only drench with water if safety shower is immediately available.
- Obtain medical attention.
- Call the fire department.

Hazardous Material Splashed in Eye

- Immediately rinse eye and inner surface of eyelid with water continuously for 15 minutes.
- Forcibly hold eye open to ensure effective wash behind eyelids.
- **Obtain medical attention immediately.**

Notify the Senior Medical Technologist in case of an accident and document the incident in the corresponding logbook.

Protocol on Handling Needle stick or body fluid contamination accidents

A. Definition of Needle stick of body fluid contamination injury

Any injury with:

- ❖A sharp instrument, needle, blade, broken glass
- ❖A spicule of bone or tooth
- ❖Or any other thing causing a puncture wound or laceration that might be contaminated with blood or body fluids

Any splash of blood or body fluids into the eyes, mouth, or onto broken skin
Any human scratch that breaks the skin and may be contaminated with a patient's blood or body fluids
Any bite where the skin is broken
Unprotected mouth-to-mouth resuscitation

The main risk for transmission of blood-borne viruses is from blood, but other fluids and tissues may transmit infection, including:

- ❖Saliva
- ❖Semen and vaginal secretions
- ❖Any other bodily fluid with visible blood in it

B. Actions to be taken following the accident:

Ensure that First Aid has been given. If not – then do it without delay:

- Squeeze a sharps injury to make it bleed, then wash with soap and water, or
- Rinse the area and splash with water until clear of body fluids or
- Wash a scratch or bite with soap and water, then
- Cover broken skin with waterproof dressing
- Report the incident to the Chief Medical Technologist immediately
- Submit incident report to the Chief Medical Technologist and HR department and document the said accident in the corresponding logbook
- Acquire sufficient information to complete the relevant sections of the risk assessment forms A & B and document the residual risk of the injured person acquiring a BBV(blood-borne virus) infection
- Take blood samples (as appropriate) from the injured person, and ensure that samples obtained from the source patient (with consent)
- Test blood samples of both the source patient and the injured person for HIV, Hepatitis B and Hepatitis C. If the injured person has an Anti-HBs titre of more than 100 iU/L within the last 2 years, no booster dose of Hepatitis B vaccine is required. Otherwise, the injured person has to be given a booster dose.
- The injured person has to undergo HCV, HIV and HBV testing after 3 months.

HEPATITIS B PROPHYLAXIS FOLLOWING EXPOSURE INCIDENTS

	EXPOSURE STATUS OF SOURCE PATIENT		
HBV STATUS OF HCW	HBsAg Positive Source	Unknown Source	HBsAg Negative Source
< 1 dose HB vaccine pre-exposure	Accelerated course of HB vaccine* (given within 48 hours and no later than 7 days) HBIg x 1**	Accelerated course of HB vaccine*	Initiate course of HB Vaccine
> 2 doses HB vaccine pre-exposure (immune status not known)	One dose of HB vaccine followed by second dose 1 month later	One dose of HB vaccine	Completed course of HB vaccine
Known responder to HB vaccine (anti-HBs > 100 iU/L	Booster dose of HB vaccine	Booster dose of HB vaccine***	No further action

Poor response (anti-HBs 10-99 iU/L or known responder to HB vaccine - <10 iU/L, 2-4monthspost-Vaccination	HB (Immunoglobulin) x 1 Booster dose of HB vaccine	HBIg x 1 Booster dose of HB vaccine	No HBIg consider booster dose of HB vaccine only

LEGEND:

* Vaccine given at 0, 1 and 2 months, with booster at 12 months
** Hepatitis B immunoglobulin (HBIg) optimally given within 48 hours and no later than 7 days

Booster not required if anti-HBs > 100 iU/L within the last 2 years HBV – Hepatitis B Virus

HB - Hepatitis B

HCW – Health care worker