HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

Department:	Laboratory and Blood Bank (Microbiology)		
Document:	Internal Policy and Procedures		
Title:	Microbiology Laboratory Safety Manual		
Applies To:	All Laboratory Staff		
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1. PURPOSE:

1.1 To set basic operational rules and precautions to be adhered to by all Microbiology technologists in order to minimize the risks associated with safety of employees and hospital properties.

2. DEFINITONS:

2.1 **Biosafety**: Safety concerns in the laboratory include biological, chemical, physical and ergonomic safety. In general, biosafety programs include recommendations in work practices, laboratory design, personal protective equipment, and safety devices. Adherence to biosafety guidelines can reduce the risk of exposure and consequent laboratory acquired infections.

2.2 **Biosafety Levels:** There are four biosafety levels that correspond directly to the four risk groups (RGs) of microorganisms listed in the 'Partial List of Hazardous Agents' (see below). Infectious agents are classified according to their degree of hazard as follows:

2.2.1 Biosafety Level 1 (BSL 1):
A microorganism that is not known to cause disease in healthy adult humans or animals i.e. Low risk.

2.2.2 Biosafety Level 2 (BSL 2):
A pathogen that can cause human or animal disease but it is unlikely to be a serious hazard to laboratory workers or the environment. Laboratory exposures may cause serious infection, but effective treatment and preventive measures are available and the risk of spread of infection is limited i.e. Moderate risk.

2.2.3 Biosafety Level 3 (BSL 3):
An indigenous or exotic agent with potential for aerosol transmission and may cause serious or lethal human disease for which preventive or therapeutic interventions may be available.

2.2.4 Biosafety Level 4 (BSL 4):
A dangerous or exotic agent that poses high risk of life-threatening disease, aerosol transmitted laboratory infections or related agents with unknown risk of transmission which likely causes human disease for which preventive or therapeutic interventions are not usually available.

2.3 **Partial List of Hazardous Agents:**

2.3.1 Examples of risk group (RG) 1 agents: E.coli-K2 and Klebsiella oxytoca.

2.3.2 Examples of risk group (RG) 2 agents include, but not limited to:

2.3.2.1 Bacterial agents such as Actinobacillus, Acinetobacter, Corynebacterium species, Bacillus anthracis, Bordetella species, Camplyobacter species, Chlamydia, Clostridium species, all strains of E. coli with K1 antigen including E. coli O 157:H7, Klebsiella species except K. oxytoca, Legionella, Neisseria, Salmonella, Shigella, S. aureus and Yersinia enterocolitica.

2.3.2.2 Parasitic agents such as Giardia, Cryptosporidium, Ascaris, Entamoebahistolytica, Taeniasolium, Toxoplasma, Trypanosoma, Schistosoma, Leishmania, Trichinella spiralis and Filaria worms.

2.3.3 Examples of risk group(RG) 3 agents include, but not limited to:

2.3.3.1 Bacterial agents such as Brucella, Francisella, M. bovis, M. tuberculosis, Yersinia pestis, Coxiella burnetii, Bartonella, Rickettsiae and Burkholderia.

2.3.3.2 Fungal agents such as Coccidioide simmitis, Histoplasma capsulatum
2.3.3.3 Viruses and Prions such as Hepatitis (A, B, C, D, E), Toga viruses (group A), prions, pox viruses, Retrovirus (HIV, HTLV, SIV) and Rhabdo viruses.

2.4 Class II, B2 Biological safety cabinet is available in the Microbiology section.

3. POLICY:

3.1 Diagnostic laboratory work involves repeated exposure to blood and body fluids and other potentially infectious materials.

3.2 Knowledge of basic information about biological hazards, sources, and routes of exposures is essential to ensure safety of laboratory personnel and surrounding environment.

3.3 In addition, practicing proper and safe microbiology techniques as well as utilizing of personnel protective equipment and engineering controls are essential to prevent spread of infectious microorganisms and laboratory acquired infections (LAIs).

3.4 Adherence with Laboratory General Safety rules as per Laboratory Safety Manual is mandatory for all staff.

4. PROCEDURE:

4.1 General:

4.1.1 Use universal precautions when dealing with patient specimens.

4.1.2 Wear gloves when performing routine laboratory work (e.g. handling specimens or potentially contaminated items) where there is potential for contact between blood and other potentially infectious materials with mucous membranes, tissues and non-intact skin.

4.1.3 All infected materials, including equipment and instruments such as centrifuge, safety hood, incubators, refrigerators and freezer should be considered capable of transmitting HIV, HCV and other infectious agents. Wear gloves when cleaning these items.

4.2 A summary of recommended practices, techniques and safety equipment's is indicated in the following table:

Housekeeping Measures	**<u>Daily Decontamination:</u>** 1. Decontaminate work surfaces with appropriate disinfectant and record in appropriate form. 2. After completion of procedures (at least once a day; 3. Immediately after any spill of viable material or overt contamination with blood or any potentially infectious materials; and 4. At the ends of the work shift, if the surface may have become contaminated since the last cleaning. **<u>Equipment Protective Coverings:</u>** 1. Remove protective coverings (such as plastic wraps, aluminium foil or imperviously backed absorbent paper) used to cover equipment, bench tops and other environmental surfaces and replace as soon as feasible. When they become overtly contaminated; or at the end of the work shift if they may have become contaminated during the shift. **<u>Re-usable Receptacles & Re-usable Sharps:</u>** 1. Regularly inspect and decontaminate all bins, pails, cans and similar receptacles intended for re-use and with likelihood of being contaminated with blood or other potentially infectious materials; or clean/ decontaminate as soon as practical upon visible contamination.

	2. Do not store or process re-usable potentially contaminated sharps in a manner that requires employees to reach by hand into the containers where these sharps have been placed. **Contaminated Sharps Disposal:** 1. Dispose immediately or as soon as practical all contaminated sharps or infectious wastes in containers that are closable, puncture resistant, leak proof on sides and bottom and labelled or colour coded. **Sharps Containers should be:** 1. Placed in an easily accessible place near immediate work area; 2. Maintained in upright position throughout use; 3. Replaced routinely and not allowed to be overfilled (beyond mark line or up to ¾ filled only). **Transport of Contaminated Sharps/ Biohazards Wastes:** 1. Prior to removal or replacement, containers should be closed to prevent spillage or protrusion of contents during handling, storage, transport or shipping; 2. Placed in a secondary container, if leakage is possible or there is outside contamination of primary waste container; the secondary container should be closable, labelled or colour coded and constructed to contain all contents and prevent leakage during handling, storage, transport or shipping. **Re-usable Waste Containers:** 1. Do not open, empty or manually clean re-usable containers which would expose employees to the risk of percutaneous injury.
Biohazardouswaste decontamination	1. Decontaminate all contaminated liquid or solid wastes before disposal, preferably by autoclaving.
Needle Recapping	1. Never recap a needle. 2. If at all it is done, it should be by single-handed technique only
Eating, drinking, application of cosmetics or contact lenses	1. Store food in cabinets or refrigerators located outside of the work area and designated for food storage. 2. Do not eat or drink in technical work stations. 3. Do not apply cosmetics and handle contact lenses while performing diagnostic procedures or in the laboratory.
Hand wash facilities	1. Always wash your hands after handling biological materials, removal of gloves or PPE and before leaving the laboratory.
Aerosol minimization procedures	1. Carefully perform all procedures to minimize the creation of aerosols.

Personal Protective Equipment (PPE)	**Gloves:** 1. Wear gloves when performing routine laboratory work (e.g. handling specimens or potentially contaminated items) where there is potential hand contact with blood, other potentially infectious materials, mucous membranes, tissues and non-intact skin. **Protective Body Clothing:** 1. Wear laboratory coats, gowns, or uniforms with front buttons to prevent contamination or soiling of street clothes. 2. Recommended to wear solid front or wrap-around gowns, scrub suits with overalls when handling infectious agents in the laboratory. **Masks, Eye Protection and Face Shields:** 1. Wear masks in combination with eye protection devices such as goggles or glasses with solid side shield or chin-length face shields/visors whenever splashes, spray, spatter or droplets of blood or other potentially infectious material are likely to be generated and where potential eye, nose or mouth contamination is expected.
General instructions	1. Do not wear laboratory clothing outside the laboratory. 2. Remove all PPE prior to leaving the work area and place in the appropriately designated area or container for storage, washing, decontamination or disposal. 3. Protect/ cover skin cuts or injuries before entering the laboratory. 4. Telephones and computers are designated as "*clean*" and "*not clean*". Do not wear gloves when using telephones and computers labelled as "clean". Regular staff, technical support staff and outside visitors should also be adhering to this guideline.
Contaminated Waste Disposal	1. Place contaminated materials in a properly labelled, durable leak-proof container and close it before removal from the laboratory by housekeeping personnel and send for treatment. 2. Autoclave infectious (inoculated media) waste bags before removal from laboratory. 3. Segregate waste according to Hazardous Waste Management guidelines.

4.3 **Specific for Microbiology Lab.:**

4.3.1 Discard all specimen biohazard bags into the yellow bag-lined garbage bins.

4.3.2 Clean bench after processing of specimens.

4.3.3 Process all patient samples inside the Biological Safety Cabinet, wearing gloves. Remove gloves and wash hands immediately after processing.

4.3.4 Always clean hood surface and disinfect after each batch of specimen processing. Immediately wipe spills with gauze pads soaked with disinfectant. It is suggested that a pack of gauze pads and a bottle of disinfectant be always made available inside the hood or within close range.

4.3.5 When decanting supernatants of centrifuged body fluids, discard fluids into the yellow bucket containing disinfectant solution located inside the hood.

4.3.6 When processing patient specimens inside the hood, discard used swabs, pipettes, or other materials into the yellow bag-lined container or yellow puncture proof container located inside the hood.

4.3.7 Do not stack unnecessary items inside the hood which may obstruct airflow.

4.3.8 Discard processed 7day old specimens into the yellow-lined garbage bins.

4.3.9 Discard specimens in glass tubes & microscope slides into the sharp container.

4.3.10 Make sure lids of containers are tightly closed to avoid spillage or unpleasant odour, especially stool containers.

4.3.11 Seal plates with air permeable tapes when fungus and other highly infectious organisms such as Brucella are suspected to be growing on cultures.

4.3.12 Culture plates growing mould and those suspected of growing Brucella and other highly infectious organisms should not be opened on the bench.

4.3.13 Work-up suspected **Brucella isolates** inside the hood, wearing gloves, mask and disposable gown. Discard items used in processing the culture such as loops, swabs, pipettes, etc in yellow bucket containing disinfectant located inside the hood. Always use formalinized saline when preparing smears of this organism as well as the other organisms of the same category.

4.3.14 Immediately wipe spills with disinfectant when working on cultures on the bench. It is suggested that a pack of gauze pads and a bottle of disinfectant be always made available on each reading bench, easily accessible to the technologist.

5. MATERIALS & EQUIPMENT:

5.1 Personal Protective Equipment (PPE)
5.2 Detergents & disinfectants

6. RESPONSIBILITIES:

6.1 Assigned Technician for Microbiology
6.2 Clinical Pathology Specialist/ Consultant

7. APPENDICES:

7.1 NA

8. REFERENCES:

8.1 Procedure Manual, Toronto Medical laboratories / Mount Sinai Hospital department of microbiology.
8.2 Bailey & Scott's Diagnostic Microbiology. Feingold & Baron;12th. Ed.2007, C.V. Mosby Co. p. 301.
8.3 Isenberg HD(Ed) Clinical Microbiology Procedures handbook. American Society for Microbiology, Washington, DC, Vol 1, Section 1.4, 1992.

9. APPROVALS:

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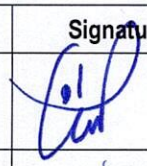
Prepared by:	Dr. Kawther M. Abdou	Consultant & Lab. Medical Director		January 02, 2025
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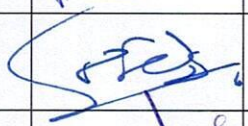
Reviewed by:	Mr. Abdulelah Ayed Al Mutairi	QM&PS Director		January 07, 2025
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