LABORATORY SAFETY PLAN

INFECTION CONTROL IN THE CLINICAL LABORATORY

PART 1. GENERAL SAFETY STANDARDS

- Smoking is prohibited at UAMS and all campus buildings.
- No food or drink will be stored in refrigerators in the laboratory work area.
- Application of cosmetics is prohibited in the laboratory work area.
- Hair should be worn or secured so that it cannot become either a safety hazard or a source of contamination. Beards require the same precautions.
- Open cuts and broken skin must be covered with a suitable means of protection, such as gloves, to avoid the risk of contamination and possible infections.
- Personnel must have annual TB screening.
- Personnel are encouraged to receive the Hepatitis B vaccine offered through the Student/Employee Health Service.
- ALL personnel must wear lab coats while at work. These coats must be left in the lab when going to lunch, on breaks, or when leaving at the end of the shift.

PART 2. HANDWASHING

Hand-washing is considered the most important single procedure for preventing and controlling the spread of infection. Proper hand-washing has been shown to eliminate or greatly reduce hand carriage of pathogens.

There are two types of hand-washing to be used in the Laboratory: routine and antiseptic.

ROUTINE is used:

- When coming on duty
- Before and after eating
- Before and after using the restroom
- Before going off duty

ANTISEPTIC is used:

- After contact with contaminated objects
- After contact with patient specimens, particularly “Blood and Body Fluid Precaution” specimens
- After removal of protective gloves

HANDWASHING PROCEDURE:

A. ROUTINE:

1. Wet hands under running water
2. Keep hands lower than elbows, apply SOAP
3. Work into a lather scrubbing fingers, palms, backs of hands, wrist and forearms creating friction for at least 15 seconds. Cleaning under nails should be attempted.
4. Thoroughly rinse hands under running water
5. Use paper towels to blot and dry hands
6. Use dry paper towel to turn off faucet, then discard

**B. ANTISEPTIC:**

1. Follow the procedure for routine hand-washing, but use an ANTISEPTIC product instead of soap.

**PART 3. PROCESSING SPECIMENS SUBMITTED TO THE LABORATORY**

All specimens received in the UAMS Anatomic Pathology Department will be handled in accordance with practices set forth by the Occupational Exposure to Bloodborne Pathogens; final rule of December 6, 1991.

All specimens are to be received in a closed container or plastic bag with the appropriate patient information attached. All tissues for a pathological examination, dissection, sectioning, and gross description shall be places in one of the four provided exhausted cutting stations prior to removal from it container before any of the mentioned procedures are started.

All cytology specimens are opened and processed under the biological safety hood.

The cryostats used for frozen section shall be cleaned and disinfected with 95% ETOH. The four cutting stations shall be rinsed and cleaned of bloody fluids and tissue debris in between cases as the need arises. The cutting stations should be cleaned thoroughly at least once a day with a 20% bleach aqueous solution with liquid hand soap added. This comprehensive cleaning which will include other possibly contaminated areas of the laboratories should be performed at the beginning or at the end of each working day. Heavily soiled contaminated areas may require more frequent cleaning.

All sharps including scalpels tissue prep blades, needles and discarded glass slides are to be disposed of in a suitable biohazard marked sharps container. All disposable glover, paper towels, empty specimen containers and personal safety equipment shall be disposed in a biohazard red plastic bag for incineration. All linen soiled with blood and body fluids are washable personal safety apparel should be placed in a biohazard marked linen hamper for laundering.

Upon leaving the laboratories all personnel shall remove, store and dispose of all personal safety equipment in the appropriate fashion. Lightly soiled fluid impermeable nylon surgical gowns may be stored upon exit and reused on return to the laboratories.

The required personal equipment worn in the laboratory is as follows, but not limited to:

1. Fluid impermeable nylon surgical gowns, smocks or laboratory coats.
2. Surgical or examination gloves
3. Eye goggles

4. Polyethylene disposable aprons

In addition, shoe covers and head covers are provided and used at the discretion of the laboratory personnel.

All cutting instruments, forceps, rulers and applicable dissection equipment should be washed in a 20% aqueous bleach solution with liquid hand soap, dried and stored in a dry state until further use. Frequent debridement and rinsing of dissecting equipment is encouraged throughout the day to prevent cross contamination of surgical specimens as dictated by good laboratory personnel.

Any technicians, residents or other parties dispensing fixatives, cleaning solutions and reagents are required to wear at the minimum protective eye wear, gloves and a polyethylene apron.

The laboratory support staff shall, at the minimum, be required to wear gloves, an impermeable disposable gown or a disposable polyethylene apron.

**PROTOCOL FOR LABORATORY EMPLOYEE PROTECTION**

**PART 1: HEPATITIS B EXPOSURE**

Hepatitis B immune Globulin is now available to those Laboratory employees and students, who accidentally come into contact with a patient’s blood which is confirmed positive to Hepatitis B Virus. Examples of common laboratory accidents which may qualify one for protection with Hepatitis B Immune Globulin include:

- Accidental “Needle Stick”
- Direct Mucous Membrane Contact (mouth/nose/eye)
- Oral Ingestion (pipetting accident)
- Open Wound Contact (accidental splash)
- Cut Finger (from blood contaminated tube)

If one has such an accident involving blood, plasma or serum from a SPECIFIC IDENTIFIABLE PATIENT, he should report immediately to his supervisor. Accidental injury reports, available on the UAMS website, should be completed. If there is need of immediate medical attention, the employee should go directly to Employee Health or the Emergency Room depending on the time of day or night.

Employee Health will obtain patient information so that they can determine if the patient has a known positive HBV; if so, they will so advise the Laboratory Director, who in turn will consult the Employee Health Director. If testing for HBV has not been done on this patient, a blood specimen is to be obtained from the patient and sent to the laboratory to be tested. If the results are negative, no further actions will be taken except to inform the employee and to send the report to Employee Health. If the result is positive, the Laboratory Director will consult the Employee Health so the arrangements can be made for the employee to receive two injections of Hepatitis B Immune Globulin; the first with 7 days of exposure, the second within 28-30 days of exposure.
PART 2: HEPATITIS C EXPOSURE

Health-care professionals who provide care to persons exposed to HCV in the occupational setting should be knowledgeable regarding the risk for HCV infection and appropriate counseling, testing, and medical follow-up.

UNIVERSAL (Standard) BLOOD AND BODY FLUIDS PRECAUTIONS, as recommended by CDC, are to be used in the care of ALL patients, especially including those in emergency-care settings in which the risk of blood exposure is increased and the infection status of the patient is usually unknown.

IG and antiviral agents are not recommended for PEP after exposure to HCV-positive blood. In addition, no guidelines exist for administration of therapy during the acute phase of HCV infection. However, limited data indicate that antiviral therapy might be beneficial when started early in the course of HCV infection. When HCV infection is identified early, the person should be referred for medical management to a specialist knowledgeable in this area.

Testing for HCV:

- For the source, perform testing for anti-HCV.
- For the person exposed to an HCV-positive source
  - ---perform baseline testing for anti-HCV and ALT activity; and
  - ---perform follow-up testing (e.g., at 4--6 months) for anti-HCV and ALT activity (if earlier diagnosis of HCV infection is desired, testing for HCV RNA may be performed at 4--6 weeks).
- Confirm all anti-HCV results reported positive by enzyme immunoassay using supplemental anti-HCV testing (e.g., recombinant immunoblot assay [RIBA™]).

Counseling for Health Care Professionals Exposed to Viral Hepatitis

Health Care Professionals exposed to HBV- or HCV-infected blood do not need to take any special precautions to prevent secondary transmission during the follow-up period; however, they should refrain from donating blood, plasma, organs, tissue, or semen. The exposed person does not need to modify sexual practices or refrain from becoming pregnant. If an exposed woman is breast feeding, she does not need to discontinue.

No modifications to an exposed person's patient-care responsibilities are necessary to prevent transmission to patients based solely on exposure to HBV- or HCV- positive blood. If an exposed person becomes acutely infected with HBV, the person should be evaluated according to published recommendations for infected HCP. No recommendations exist regarding restricting the professional activities of HCP with HCV infection. As recommended for all HCP, those who are chronically infected with HBV or HCV should follow all recommended infection-control practices, including standard precautions and appropriate use of hand washing, protective barriers, and care in the use and disposal of needles and other sharp instruments.
PART 3: ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

Human immunodeficiency virus (HIV), the virus that causes acquired immunodeficiency syndrome, is transmitted through sexual contact and exposure to infected blood or blood components and perinatally from mother to neonate. Epidemiologic evidence has implicated only blood, semen, vaginal secretions, and possible breast milk in transmission.

The increasing prevalence of HIV increases the risk that laboratory workers will be exposed to blood from patients infected with HIV, especially when blood and body fluid precautions are not followed for all patients. **UAMS Infection Control Committee emphasizes the need for health-care workers to consider ALL patients as potentially infected with HIV and/or other blood-borne pathogens and to adhere vigorously to infection-control precautions for minimizing the risk of exposure to blood and body fluids of all patients.**

**UNIVERSAL BLOOD AND BODY FLUIDS PRECAUTIONS**, as recommended by CDC, are to be used in the care of ALL patients, especially including those in emergency-care settings in which the risk of blood exposure is increased and the infection status of the patient is usually unknown.

1. All laboratory workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or other body fluids of any patients is anticipated. Gloves should be worn for touching blood and body fluids, for handling items or surfaces soiled with blood and body fluids, and for performing venipuncture. Gloves should be changed after contact with each patient. Masks and protective eyewear or face shields should be worn during procedures that are likely to generate droplets of blood or other body fluid to prevent exposure of mucous membranes of the mouth, nose, and eyes. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or other body fluids.

2. Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids. Hands should be washed immediately after gloves are removed.

3. All laboratory workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures; when cleaning used instruments during disposal of used needles, and when handling sharp instrument after procedures. To prevent needle stick injuries, needles should not be recapped, purposely bent or broken by hand, removed from disposal syringes; and needles, scalp blades, and other sharp items should be placed in puncture-resistant containers for disposal. The puncture resistant containers should be located as close as practical to the use area. Large bore reusable needles should be placed in a puncture resistant container for transport to the reprocessing area.

4. Laboratory workers who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient care equipment until the condition resolves.

5. Pregnant laboratory workers are not known to be at greater risk of contracting HIV infection than laboratory workers who are not pregnant; however, if a laboratory worker develops HIV infection during pregnancy, the infant is at risk of infection resulting from perinatal transmission. Because of this risk, pregnant laboratory workers should be especially familiar with and strictly adhere to precautions to minimize the risk of HIV transmission.
6. All specimens of blood and body fluids should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the specimen container.

7. For routine procedures, such as histologic and pathologic studies or microbiologic culturing, a biological safety cabinet is not necessary. However, biological safety cabinets (Class I or II) should be used whenever procedures are conducted that have a high potential for generating droplets. These include activities such as blending, sonication and vigorous mixing.

8. Mechanical pipetting devices should be used for manipulating all liquids in the laboratory. Mouth pipetting must not be done.

9. Use of needles and syringes should be limited to situations in which there is no alternative.

10. Laboratory work surfaces should be decontaminated with an appropriate chemical germicide after a spill of blood or other body fluids and when work activities are completed.

11. Contaminated materials used in laboratory tests should be decontaminated before reprocessing or be placed in bags and disposed of in accordance with institutional policies for disposal of infective waste.

12. Scientific equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.

13. All persons should wash their hands after completing laboratory activities and should remove protective clothing before leaving the laboratory.

MANAGEMENT OF POSSIBLE EXPOSURE TO HIV, as recommended by CDC. If a laboratory worker has a parenteral or mucous-membrane exposure to blood or other body fluids or has a cutaneous exposure involving large amounts of blood, the laboratory worker should be counseled regarding the risk of infection and evaluated clinically and serologically for evidence of HIV infection as soon as possible after the exposure. The laboratory worker should seek medical evaluation for any acute febrile illness that occurs within 12 weeks after the exposure, particularly one characterized by fever, rash, or lymphadenopathy. Seronegative persons should be retested 6 weeks post exposure and on a periodic basis thereafter (e.g., 12 weeks and 6 months after exposure) to determine whether transmission has occurred. During this follow up period, especially the first 6-12 weeks after exposure, when most infected persons are expected to seroconvert, exposed persons should follow U.S. Public Health Service recommendations for preventing transmission of HIV.

PART 4: TUBERCULOSIS EXPOSURE CONTROL PLAN (Pathology and Clinical Laboratory Services).

I. Objective

To reduce the risk of infection (especially to personnel) in an area where all specimens are potentially infectious (Mycobacterium tuberculosis (TB) and fungal specimens). This will be accomplished by the proper use of equipment and techniques designed for that purpose.

II. Personnel Requirements
A. Health:

1. Laboratory personnel must fulfill all pre-employment and annual health requirements as outlined in Section 6.11 Employee Health Service. This includes required testing and/or immunizations.

2. Tuberculin skin Test (PPD): All laboratory personnel (all employees) are required to have an annual tuberculin skin test. Individuals who have a “positive” screening will be referred to ASHD for further evaluation and treatment, if necessary.

   Tuberculosis—If an exposed employee has had a negative skin test in the past, recheck immediately and again 8 weeks after exposure.

   If an employee has a history of Bacillus Calmette-Guerin (BCG) immunization or positive skin test, chest x-ray may be done in 8 weeks.

B. Orientation and Instruction:

All new employees are required to have a post-employment examination to include a tuberculin skin test. All employees with a positive reaction will be referred to the Arkansas State Health Department of Health.

III. General Infection Control Measures:

A. Hand hygiene:

   Wearing of gloves does not replace the need for hand hygiene. Hand hygiene is considered the most important single procedure for preventing and controlling the spread of infection. Proper hand hygiene has been shown to eliminate or greatly reduce hand carriage of pathogens and, therefore, represents an important means of preventing cross infection between patients.

   Healthcare workers must clean their hands with soap and water if they are visibly dirty or contaminated with blood or other body fluids. If hands are not visibly soiled, alcohol based hand cleaner may be used to decontaminate hands.

B. Universal (Standard) Precautions:

STANDARD PRECAUTIONS (previously known as Universal Precautions, See Exposure Control Plan for further detailed information - Occupational Health and Safety) The CDC recommends standard precautions be used when caring for ALL patients, especially in settings where the risk of blood exposure is increased and the patient's antibody (HIV,HCV, and/or HBV) status is unknown. All specimens are handled with standard precautions.

1. Standard precautions include:

   a. Use barrier techniques to prevent skin or mucous membrane exposure. **DEPENDING UPON THE PROCEDURE:** gloves, gowns, masks, and/or protective eyewear may be required
b. Clean hands with an antimicrobial agent immediately if contamination with blood or body fluids occurs. (See Addendum D of the UAMS Infection Control Plan)

2. For personnel performing invasive procedures, specific recommendations call for routine use of appropriate barrier techniques to prevent skin and mucous membrane contact with blood or other body fluids. Minimum precautions for invasive procedures include:

a. Gloves and surgical masks for all procedures which pose potential exposure.

b. Protective eyewear or face shields for procedures that commonly result in the generation of droplets and/or splashing of blood or other body fluids.

c. Household bleach (1:10 dilution) or a disinfectant approved by the Environmental Protection Agency (EPA) for hospital use to disinfect blood spills.

Then use a tuberculocidal agent according to manufacturer's recommendation to disinfect.

IV. Strict Precautions –

Microbiology:

Personal Protective Equipment: All personnel must wear gloves; impermeable lab coats and N-95 mask when performing tasks in the Microbiology TB and fungal processing area.

All personnel that decontaminate specimens for mycobacterial culture are fitted for the N-95 mask. This fitting is performed by The Department of Occupational Health and Safety. The assessment of the employee for the N-95 mask fitting is performed by Student Employee Health. The Microbiology processing area for Fungal and AFB specimens is classified as a BL-3 lab designed with negative room pressure and ultraviolet germicidal (UVG) irradiation lights are positioned throughout the area. All specimens are evaluated under a BCL-3 hood containing UVG irradiation lamps which are checked and certified yearly. In the event of a spill, Occupational Health and Safety will be notified immediately (See Microbiology Accident Emergency Plan; Infection Control: Clinical Laboratory). Respirators are located in the back left upper cabinet in room 337C (left of the BCL-3 processing area.) and extra boxes are stored in Room 339 (middle right shelf).

Surgical Pathology Gross Room (fresh tissue for frozen sections):

Universal or Standard Precautions are followed when handling ALL SPECIMENS. All required Personal Protective Equipment (PPE) for the task performed must be worn (gloves, gown, mask, etc.). For routine procedures, such as histologic and pathologic studies, or microbiologic culturing, a biological safety cabinet is not necessary. However, biological safety cabinets (Class I or
II) should be used whenever procedures are conducted that have a potential for aerosolization or droplets. These include activities such as blending, sonication, vigorous mixing and handling of specimens infected with TB or other fungal agents.

Cryostats for frozen tissue sectioning are decontaminated regularly. Tuberculocidal disinfectants are used daily on all the workstations.

Autopsy Suite:

All persons performing or assisting in postmortem procedures must wear appropriate PPE. Extreme precautions are taken during autopsies on patients who are infected or suspected to be infected with Mycobacterium tuberculosis. These autopsies are preformed utilizing level B biohazard suit.

Refer to Comprehensive Infection Control Plan, Addendum B.

3. Microbiology Accident Emergency Plan:

a. Notify supervisor.

NOTE: Gloves are to be worn during all clean-up procedures.

b. Accident and spills:

1) "Dry" spills (overturned or broken culture plate) with no significant aerosol formation

Evacuation of room probably not indicated.

Flood area with a tuberculocidal disinfectant, such as 10% bleach. Soak up disinfectant and contaminated material with an absorbent material (sand, paper towels), place in a Biohazard container, and seal the container. The spill area is thoroughly washed down with a tuberculocidal disinfectant after the contaminated material has been removed. Biohazard bag is to be placed into another bag for removal to the incinerator.

2) Liquid spills on bench or floor:

NOTE: If significant aerosols were formed, the area is to be evacuated and not reentered for at least one hour.

Cover the spill with an absorbent material (as above). When absorption is complete, the absorbent and contaminated material should be placed in a Biohazard bag for disposal as noted above.

The entire spill area should be thoroughly washed down with a tuberculocidal disinfectant (as above) after the contaminated material has been removed.
3) Centrifuge spills:

Shut off instrument. Do NOT open the centrifuge for at least one hour. In addition to gloves, the person responsible for clean-up of the area is to wear a mask and protective clothing.

If liquids are present, absorbent materials should be used as noted above. After removal of contaminated material, the instrument is to be thoroughly cleaned with a tuberculocidal disinfectant before resuming work.

**NOTE:** Traffic should be minimized in the area during clean-up procedures.

4) Spills in incubators or other closed areas:

Absorbent material is to be used as above if liquids are present. The organic material must be removed as thoroughly as possible before disinfection or sterilization can occur. If routine cleanup is not possible, the unit may have to be decontaminated by means of a sterilizing gas such as ethylene oxide in Central Sterile Supply.

The spill area is to be thoroughly washed after the contaminated material has been removed.

References:

Hospital Policy and Procedure Manual. HR.4.01, HR.4.06

UAMS Infection Control Manual, Isolation Guidelines; Addendum B

UAMS Infection Control Manual, 7.12: Clinical Laboratory.

UAMS Infection Control, Employee Health/Student Preventive Health Services. IC.6.11.

[CDC MMWR 50 (RR11) 1-42]