Policy and Procedure:
Infection Control

Department of
Anatomic Pathology,
Boston Medical Center
June 11th 2007

Prepared by:
Chris Andry, Ph.D., Administrative Director, Anatomic Pathology
Gail Garvin, RN, Hospital Epidemiology
Bob Burke, RN, Hospital Epidemiology

Distribution:
All Medical Staff, House Officers and Support Staff
All laboratories at 670 Albany St., HP 2093,
Newton Pavilion 3800, Autopsy Suite HB11

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Role and Scope of the Department of Anatomic Pathology

I. Patient Care Mission Statement

The patient care mission of the department is to provide state of the art pathologic interpretation of surgical and cytopathology patient accessions, and, in the context of each patient's clinical setting, to furnish diagnostic reports to their physicians, that are timely, complete and accurate.

The department is also committed to the performance of autopsies on patients who die in this medical center in a conscientious and respectful manner and to providing expert and timely reports of autopsy findings. The goal of such reports is to provide detailed information on causes of mortality and morbidity to deceased patient's families and attending physicians, and to contribute to the knowledge of disease and improvement of the quality of patient care.

The department actively contributes to the overall mission of the Boston Medical Center: "to provide exceptional care without exception".

II. Description of Services

a. Patients, Physicians and Customers served

The Anatomic Pathology department serves all patients who undergo surgery or a procedure, regardless of age or medical insurance status, which results in the removal of tissue. All physicians and services that generate these specimens are also considered the department's customers. The department also manages the hospital's Decedent Affairs Office which cares for deceased patients and their families and serves area funeral directors and related governmental agencies.

b. Scope of Services

- Surgical Pathology
- Intra-operative Consultation
- Cytology
- Aspiration biopsy
- Immunohistochemical assays
- Ultrastructural studies
- Image Analysis and Morphometry
- Telepathology consultations
- Molecular Pathology
- Decedent Affairs Office
- Autopsy

Sub-specialty expertise

- Cytopathology
- Dermatopathology
- Hematopathology
- GI & Liver disease
- Muscle Pathology
- Neuropathology
- OB-Gyn. pathology
- Oral pathology
- Pediatric pathology
- Renal pathology

c. Hours of operation and how services are provided

Menino Pavilion (MP) and Newton Pavilion (NP)
Normal office hours for surgical pathology are from 8 a.m. to 5 p.m., Monday through Friday. All other hours (evenings and week-ends) are covered by the MP pathologist on call. The pathologist can be contacted via the hospital page service or the operator (638-5795 #0784). A weekly schedule listing pathologists and their phone/beeper numbers as well as service rotations and coverage, is distributed throughout both hospital, including the OR and Operator Services and is posted weekly on the hospital intranet (under Departments; Anatomic Pathology). A departmental administrator responsible for support staff (laboratories etc.) and the Decedent Affairs Office (DAO) is on call 24/7 Pager #1027)

The pathologist on weekly service covers the daily operation of surgical pathology report sign-out and the frozen section intraoperative consultation service. Requests for frozen section service are directed to the pathologist via the pathology office (see Surgical Pathology procedure manual) or the hospital page operator.

d. Where services are provided

Menino Pavilion (MP)
Intraoperative consult service
Inpatient facility, room 2093
Phone: 617-414-5310
Fax: 617-414-7040

Mortuary, Patient Viewing and Family room

Newton Pavilion (NP)
Surgical pathology sign-out, intraoperative consult service and surgical specimen processing.

Surgical pathology sign-out and *records, Robinson D914*
Denise Johnson, Office Manager
Phone: 617-638-6990
Fax: 617-638-6942

Surgical pathology sign-out, room D914
Phone: 617-638-6995

Intraoperative Consult (frozen section service), H3800
Christian Kiriakos, Surgical Pathology Processing
and Decedent Affairs Office Supervisor
Phone: 617-638-6993 or 638-6922

Autopsy Suite, HB11
Phone: 617-638-4908

670 Albany Street, 3rd floor
Administrative offices and Laboratories (Histology. Cytology, Molecular, Electron Microscopy, Special Procedures)

Chief, Department of Anatomic Pathology and Systems Manager
617-414-4683

Administrative Director
617-414-5292

Practice Manager
617-414-5314

Senior Supervisor
Charline Mack
617-414-3379

Histology Supervisor
Andrew Clary
617-414-5345

Physical Facilities
Administrative offices and laboratories, 670 Albany Street, 3rd floor
Mortuary, MP
Autopsy Suite and mortuary, NP HB11
Diagnostic Suite, intraoperative consult service, MP 2093
Diagnostic Suite, Surgical pathology sign-out, NP D-914
Intraoperative consult service and surgical specimen processing, NP H3800

e. Description of Physical Space

BMC laboratories
The main diagnostic laboratories are located at 670 Albany Street, 3rd floor, including: histology, special procedures (immunohistochemistry assays), cytology, electron microscopy, molecular pathology, neuropathology and image analysis. Surgical specimens generated at the MP, Yawkey ACC clinics or MP ED are transported to 670 Albany Street, 3rd floor for accessioning and processing. Cytology specimens generated at MP and NP or DOB are brought directly to 670 Albany Street for processing. Deliveries from the Neighborhood Health Centers are made to 670 Albany Street, outside consultations are delivered directly to the main laboratory at 670 Albany Street.

There is a 40 berth mortuary refrigerator in the basement of the MP. Designated egress for deceased MP patients is via the loading dock passenger elevator. Emergency egress is possible via the tunnel to the Power Plant.

Menino Pavilion (MP)
The frozen section laboratory and sign-out room occupy a total of 400 sq. ft (MP2093). Specimens are submitted from two ORs, MP and Moakley into a locked two way refrigerator. Further specimen collection rounds are undertaken by the pathology assistant.

The MP mortuary occupies approx. 300 sq. ft. and comprises a 40 berth body-storage refrigerator, a viewing area and a family room. The autopsy room is under negative pressure.

Newton Pavilion (NP)
The Anatomic Pathology laboratory (H3800) occupies approx. 600sq. ft. and includes a specimen accessioning area, a frozen section area, surgical specimen dissection bench (complete with a fume exhaust system), telepathology and specimen recording area and secretarial area. A direct link between the O.R. and the office is provided by the in-house vacuum transport system.

NP D914 sign-out office and secretarial area.

The autopsy suite, located in the NP building basement occupies approx 500 sq. ft. and contains a nine berth body storage facility, main autopsy room, specimen storage areas and office space.

f. How services are organized and accessed

There are 3 main services within the department, Surgical Pathology, Cytopathology, and Autopsy Pathology, which are under the direction of **C. J. O'Hara, M.D.** and **A. de las Morenas, M.D.** and Philip Croft, MD respectively. Each chief reports to **Michael J.**

O`Brien, M.D., M.P.H. Vice Chair for Anatomic Pathology and chair of the departmental QI committee. Six attending pathologists provide most of the inpatient and out-patient diagnostic services at both pavilions. Consultant pathologists are employed for their special expertise in the areas of Dermatopathology, Oral Pathology and Renal Pathology.

The support services (laboratories, secretarial, Decedent Affairs Office etc.) are managed by the Administrative Director and Vice Chair for Operations and Management, **Chris Andry, PhD**. The B.U. Mallory Pathology Associates practice manager is **Mr Robert Foley**. The record rooms and secretarial services are co-ordinated by the Office Manager **Mrs. Johnson**; the laboratories are supervised by **Mrs Charline Mack** and their respective leaders. The Surgical Specimen Processing service (including frozen section areas) and Decedent Affairs Office (including autopsy service) are supervised by **Mr. Christian Kiriakos**. Specimens for accession and processing are delivered, along with a completed surgical pathology request form to the pathology office NP D914 (Office Manager responsible, **Mrs. Johnson)**

A. Employee Health Service

Upon employment and yearly thereafter, all employees received tuberculin testing and all other necessary immunizations.

All employees developing a communicable illness/condition shall be evaluated by Employee Health as to their ability to safely perform his/her duties.

Any employee sustaining an exposure to blood or other body fluid will promptly report to the Occupational Health (OH) department, Preston building F-5, ENC from 8 a.m. to 4 p.m. and off hours to the nearest Emergency room on either campus.

Employees with potential exposure to an infectious agent are required to comply with the departmental Accidental Exposure Control Policy (see attached).

B. Education and Consultation

All employees are required to attend an annual in-service training session given by a member of the Hospital Epidemiology department. This will equip them with an understanding of their role in the surveillance, prevention and control of infection. Standard Universal Precautions are explained as well as strategies of risk assessment and reduction as well refamiliarization with both hospital and departmental policies on the prevention and control of nosocomial infections.

Consultation with a member of the Hospital Epidemiology department is also encouraged at any time, with questions or concerns.

The hospital requires mandatory TB testing and also offers vaccination against Hepatitis B virus free of charge.

Standard Precautions

This manual will start by outlining Standard Precautions and will then focus on particular areas in the Pathology department. It also includes the guidelines from the Centers of Disease Control (CDC) on "Management of Exposures" and "Implementation of recommended precautions".

The manual has been prepared in accordance with CDC recommendations and with advice from the Epidemiology and the infectious disease departments at the Boston Medical Center.

With the increasing prevalence of HIV infection, the Federal Government and the CDC have issued guidelines for Standard Precautions to protect Health Care Workers (HCW) from HIV, HBV and other nosocomial infections. The Anatomic Pathology department at BMC will adhere strictly to these guidelines as they apply to handling tissue and fluids from all patients.

Standard Precautions apply to blood, tissue and to other body fluids. Occupational transmission of HIV and HBV to health-care workers by blood is well documented. Blood is the single most important source of HIV, HBV, and other pathogens in the occupational setting. Infection control efforts must focus on preventing exposures to blood as well as on delivery of HBV immunization.

The measures outlined below are not only to protect HCW from infected patients, they also prevent infections between workers in the various areas of the hospital and protect family and friends outside the hospital.

General Measures

Utmost precautions, immediate clean-up of spillage and generalized cleanliness should be the rule in the laboratory. It is understood that no eating, drinking or smoking will be allowed in areas where tissue or fluids from patients are being handled. ***All specimens should be considered as potentially contaminated (i.e. Standard Precautions).***

B. General Laboratory Procedures

Confine work to a specific limited area.
Use mechanical pipetting devices. ***Do not mouth pipette.***

Minimize the generation of aerosols or droplets when using centrifuges, and sonicators; such procedures should be performed under a hood.

Centrifuge covers are to remain closed until the machine has stopped completely. The preparation of specimens and their placement into carriers for centrifugation are to be

done according to the specific instructions for each machine. All centrifuges must have lockable lids. These instructions as well as specific instructions for cleaning a centrifuge after accidental breakage or spillage during the use should be easily available to and well understood by the operator. Refer to Lab. Safety Manual for specific policy.

Fluorescent activated cell sorters generate droplets - a plastic shield between droplet collecting area and the operator should be used. Operators should always wear gloves and face masks with shields. (Sorters with a closed system are now available).

C. Protective Barriers and Personal Protective Equipment (PPE)

Use protective barriers to prevent exposure to blood and other body fluids. The type of protective barrier(s) should be appropriate for the procedure being performed and the type of exposure anticipated.

1. Always be careful. A proper awareness of danger is the best defense even when carrying out frequently repeated maneuvers.

2. The following must be used ***all the time*** that body and tissue fluids are being handled.

a. Wear surgical gloves whenever handling unfixed, (potentially contaminated) material. Wear Kevlar® cut-resistant gloves when handling large knives or performing autopsies.

. Utility gloves must also be used whenever cleaning instruments and surfaces.

. Wash hands after removing gloves.

After removing gloves wash your hands thoroughly and dry with disposable paper towels. See that the towels are safely discarded in bin for tissues which will be incinerated.

b. Wear aprons (waterproof) or fluid-impervious gowns
If handling materials for any length of time, change into a clean scrub suit.

c. Mask, cap and protective eyewear (goggles, welder's shield) must be used if a splash to the face is anticipated.

Gloves and protective clothing must be removed and hands washed when leaving the work areas. In particular, the practice of walking around with gloves (opening doors, answering phones) is not allowed.

3. Handling of specimens must be restricted to well defined geographic areas, i.e.:

Autopsy room - HB11 (East Newton Campus)

Surgical Specimen Dissection Laboratory, 670 Albany Street, 3rd floor

Storage Refrigerator, H3800 (NP), MP 2093

Other areas designated for tissue use or handling at 670 Albany St.

All such areas are to be used only by authorized personnel. If other storage places contain clinical specimens they should be clearly labeled BIOHAZARD.

D. Blade and Needle Precautions

In the event of an injury: *Immediate Action is Necessary*

Intact skin that has been contaminated with body substances or microbe-bearing material should be washed immediately with soap and water.

Percutaneous wounds should be bled, washed, painted with antiseptic and the incident should be reported to a department manager or supervisor. The exposed employee should proceed to the Occupational and Environmental Medicine (OEM) office, Preston building F-5 (Newton) during work hours. Work hours are between 7:30 a.m. - 4:00 p.m. Phone 638-8400 Mon - Fri.

Exposure to the mucus membranes of the eyes, nose, mouth with blood or other potentially infectious material should be flushed at an eye-wash station according to laboratory protocol. This should also be reported to the laboratory supervisor and the employee should report to OEM as above. The employee should also be seen as soon as possible to ensure proper medical evaluation, counseling and follow-up.

1. Needle sticks and cuts and sharp instruments present the greatest risk for transmission of blood-borne nosocomial infections. ***Never re-cap a needle***, always discard needles into a labeled “Sharps bucket”.

2. Pathologists are at a particular risk for blade cuts of the finger tips. Extreme care should be taken in loading the scalpel, removing the blades and all through the dissection process. Forceps are always used to remove scalpel blades.

3. Blades and needles must be disposed of in puncture-proof containers that are to be located in close proximity to the work area.

E. Exposure to Contaminants

1. ***Intact skin*** that has been contaminated with body substances or microbe-bearing material must be washed immediately with soap and water. Never expose yourself to biohazard material if you have a recent cut, open sore or ulcer on your hands, arms or face.

2. **Percutaneous wounds** should be bled, washed, painted with antiseptic and reported to the staff pathologist. The exposed employee should immediately report to the Occupational and Environmental Medicine Department (OEM, Preston, F-5, ENC) or, if the exposure occurs after hours, the employee should report to the emergency room and subsequently ensure medical evaluation, counseling and follow-up. **All accidents should be reported to the Administrative Director**

3. Exposures of the **mucous membranes** of the eyes, nose or mouth with infectious material should be flushed thoroughly with water at an eye-wash station and reported to the staff pathologist and OEM.

4. If a percutaneous or mucous membrane exposure involves material that could be infected with **HIV or Hepatitis B or C virus**, the OEM should be informed immediately so that the proper procedures for testing the patient for the viruses can be initiated. The employee should report to OEM to ensure proper medical evaluation counseling and follow-up.

Management of HIV Exposures

If a health-care worker has a parenteral (e.g., needlestick or cut) or mucous-membrane (e.g., splash to the eye or mouth) exposure to blood or other body fluids or has a cutaneous exposure involving large amounts of blood or prolonged contact with blood - especially when the exposed skin is chapped, abraded, or afflicted with dermatitis - the source patient should be informed of the incident and tested for serologic evidence of HIV, Hepatitis B and C infection after consent is obtained. Policies should be developed for testing source patients in situations in which consent cannot be obtained (e.g., an unconscious patient).

If the source patient has AIDS, is positive for HIV antibody, or refuses the test, the health-care 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 health-care worker should be advised to report and seek medical evaluation for any acute febrile illness that occurs within 12 weeks after the exposure. Such an illness - particularly one characterized by fever, rash, or lymphadenopathy - may be indicative of recent HIV infection.

Seronegative health-care workers 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 health-care workers should follow U.S. Public Health Service (PHS) recommendations for preventing transmission of HIV.

No further follow-up of a health-care worker exposed to infection as described above is necessary if the source patient is seronegative unless the source patient is at high risk of HIV infection. In the latter case, a subsequent specimen (e.g., 12 weeks following exposure) may be obtained form the health-care worker for antibody testing. If the source patient cannot be identified, decisions regarding appropriate follow-up should be individualized. Serologic testing should be available to all health-care workers who are concerned that they may have been infected with HIV.

If a patient has a parenteral or mucous-membrane exposure to blood or other body fluid of a health-care worker, the patient should be informed of the incident, and the same procedure outlined above for management of exposures should be followed for both the source health-care worker and the exposed patient.

F. **Cleaning and Disinfection**

1. **Environmental surfaces** such as walls, floors, and other surfaces are not associated with transmission of infections to patients or HCW.

2. **Work surfaces** are cleaned and disinfected with Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant, at least once a day or after any spill of viable material.

3. **Spills** should be cleaned at once using freshly prepared Clorox bleach (10%) or approved hospital disinfectant. A pair of utility gloves should be worn. In the event of a large spill the Environmental Health and Safety department should be called **8-6666.**

4. **Instruments** - All cutting instruments, after use, are left soaking in Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant, the solution should be changed daily.

5. **Disinfectants**

The following solutions are approved by BMC to be used as disinfectants:

a. **Sodium hypochlorite** (household bleach, 10%) prepared fresh daily is an inexpensive and effective germicide.

b. **Approved** hospital disinfectant,

G. **Disposal of Tissue and contaminated items**

All pathology tissue/specimens are to be discarded into cardboard containers labeled "Hazardous Infectious Waste: Formalin Contaminated Material" double lined with a red bag. Cardboard boxes can be obtained from Environmental Services (BUSM). All pathological waster will be transferred off site for incineration.

All contaminated (non disposable) clothing, towels, etc. must be placed into cardboard containers labeled "Hazardous Infectious Waste" lined with a red bag.

H. **Disposal of Sharp Objects**

1. Needles, blades, glass slides, broken unbroken glassware and sharp plastic items are disposed of in puncture-proof containers.

III. Surgical Pathology/Cytology

A. **General Guidelines**

1. **All specimens** of blood and body fluids are placed 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 container and the laboratory form accompanying the specimen.

2. As this material is obtained fresh from the patient, infectious agents are much more likely to be viable. Thus, handling of this material should be undertaken with special care. Lung tissue should never be squeezed because it sprays small liquid droplets into the air. If infection is suspected, the specimen should be kept moist with fixative solution. Large and bloody specimens (e.g. placentas, spleens) are placed in fixative for 48 hours before cutting.

Surgical Pathology/Frozen Section

Although all specimens should be handled with Standard Precautions the following additional steps must be taken:

Frozen sections known biohazardous tissues:

PPE to be worn when performing a frozen section include: a face shield or mask and eye protection (approved safety goggles), gloves and fluid-impermeable gowns with a full sleeve. Open-toed shoes must not be worn

When performing frozen sections on biohazardous materials:

- Confine contamination to a small area.

- Do not contaminate reusable items such as the mounting media container or writing utensils.

- Do not create aerosols in the cryostat, i.e., use of quick-freezing aerosols.

- Immerse frozen section slide in alcohol immediately. Use of a one-step metachromatic stain avoids contaminating of multiple staining trays. Discard excess staining fluid into an appropriate receptacle containing a 10% solution of bleach.

3. **Disinfecting the cryostat**

a. Defrost cryostat and decontaminate with hospital approved disinfectant once a week, document cleaning

b. Wear protective clothing to include:N95 filter masks, eye protection, gloves, Kevlar (cut-resistant) gloves and fluid-impermeable gowns with a full sleeve. Open-toed sandals should not be worn

c. Remove knife (using forceps and cut resistant gloves) and discard

d. Wipe entire inside surfaces of cryostat with sponge soaked in Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant,

Clean work area

a. Wear a new pair of gloves

b. Discard scalpel blades in an appropriate impervious container

c. Place instruments in Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant

d. Wipe bench top with Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant

IV. The Autopsy Service

The autopsy room must be kept clean. Spillage of blood, organ contents or tissue juices is dangerous and must be avoided. Each prosector should take pride in keeping his/her work area clean with no floor spillage. Every autopsy is potentially infectious, and Standard Precautions

must be taken to avoid tissue and bloody fluid contact in ***ALL*** autopsies.

Highly contagious (biohazard) cases - General rules

1. Standard Precautions (as described above) will be applied to ***ALL*** autopsies. However, in ***highly contagious*** infectious disease categories some modification of the autopsy procedure and fixation may be applied, including limiting the autopsy at the attending pathologists discretion.

2. **Access to The Autopsy Room**

No other autopsy will be performed at the same time as a ***highly contagious*** case nor until the autopsy room has been cleared and disinfected.

During this time **only** the chief diener, an assistant, the prosector and the staff pathologist will be allowed in the morgue. Access for any other person will require the permission of the chief of the autopsy service. Clinicians may be allowed into the autopsy room, but they will be required to wear the same protective dress as the pathologists.

3. **Limiting the Autopsy**

Please Remember: As health care professionals and physicians we are obligated at times to fulfill our obligations to our patients, our colleagues and our professional responsibilities. Below is outlined a standard limited autopsy procedure which we use in cases of AIDS, hepatitis and other biohazardous diseases which fulfills virtually all the basic objectives of the autopsy in most cases, and minimizes personal risk to pathologists and autopsy assistants.

A limited autopsy should remain as complete as the individual case requires in order to reach a diagnosis or confirm a clinically uncertain one. Thorough knowledge of the clinical course is particularly important in these cases. Before starting the autopsy, the case and the possible modified autopsy procedure will be discussed between the staff pathologist and the attending physician that had taken care of the patient. The attending physician might himself suggest limiting the post mortem examination to one of a few organs (i.e. to the liver in cases of hepatitis B).

A standard limited procedure

a. External examination with particular attention to genital and anal lesions, other skin lesions and lymphadenopathy.

b. Y incision

c. Cutting the chest plate at the chondro-osseous junction with a bone cutter.

d. Cultures will be taken avoiding needle use if possible. (No blood cultures).

e. Thorough examination of chest and abdominal organs. The heart should be removed, dissected over the thoracic cavity and put back in the cavity after tissue is taken for histology. One lung should be removed and inflated with formalin for subsequent dissection if there appears to be a pneumonitis.

f. The brain should be removed and fixed in 10% formalin in all cases where there are neurologic symptoms.

g. The other major visceral organs (liver, spleen, and kidneys) should removed with care and sampled for histology.

h. Dissect and sample all other organs/tissues with gross pathology as if clinically indicated.

i. Small and large bowels will be examined in situ and sampled for microscopy only if significant pathology is appreciated grossly or if clinically indicated.

j. The following tissue samples should be taken routinely for histology.

Lungs, two from each side even if no gross pathology is present

Heart

Liver

Pancreas

Kidney (at least one)

Adrenal (at least one)

Spleen

Lymph nodes

Bone marrow (squeeze a rib)

Other tissues may also be sampled if easily accessible.

4. **Procedure**

Never do a biohazard case if you are especially tired or rushed.

Dissection technique

a. Refer to blade and needle precautions above.

b. Never put one hand under the tissue you are cutting with the other hand.

c. Never do any blind dissection, especially with a scalpel.

d. Use the scalpel as little as possible, rely as much as possible on the scissors.

e. If you use a long knife make sure it is sharp.

f. The electric saw will be used as little as possible and only under a hood. The chest plate is opened at the chondro-osseous junction with a bone cutter and the skull will be opened with a hand saw.

g. **Brain removal**: Although use of a manual saw is recommended for removal of the skull to reduce the risk of aerosols, this procedure is difficult, tedious and time consuming. An alternative method using a power saw has been proposed. It entails wrapping the power saw in a small plastic bag leaving the blade exposed and then wrapping the prosector in a large transparent bag taped around the neck of the cadaver and the wrist of the prosector. The skull is removed inside the bag, and after 3 to 4 minutes to allow aerosolized particles to settle, the bag is removed, discarded in an appropriate container, and the exposed brain is examined and removed in the usual manner.

Personal Protective Equipment

In addition to standard precautions - protective barriers, add the following:

a. **Gloves**: Either thick gloves or double gloves with band-aids at the tip of the fingers.

b. **Clothes**:

. Scrub shirt, trousers and long-sleeved impervious grown or Tyvek suit

. Shoe coverings

6. **Cleaning and Disinfection**

A solid surfaces should be thoroughly cleaned with soap and water before being disinfected. The best overall disinfectant is Clorox bleach (freshly prepared 10% solution) or approved hospital disinfectant,

7. **Disposal of tissue** (see general standard precautions).

C. **Specific Diseases**

Tuberculosis

In tuberculosis cases or in cases suspicious of TB, the Routine Standard Precautions should be strictly adhered to with particular emphasis on the following points:

1. **General**

- The tissue should be kept moist in fixative and not allowed to dry-up.

- Lungs and other organs with gross pathology should not be squeezed.

- TB cultures should be taken if the diagnosis is uncertain.

- In Miliary TB, the organs should be examined in situ and only samples taken i.e. follow the standard limited autopsy for HIV and HBV (or the whole block could be immersed in fixative).

2. **Procedure**: Follow the order below:

a. Remove the bowel and the abdominal block before cutting the chest plate. The sites most likely to have TB are kidneys, adrenals, lymph nodes and terminal ileum.

b. Brain removal

c. Chest organs: Before cutting the chest plate, mobilize upper trachea or larynx and through a tube and inject app. 1000 ml of fixative. Let it settle for a while then proceed with the removal of the chest organs, leaving the trachea and lungs as an intact block. Keep the lungs in fixative for 2 weeks before handling it further.

3. **Fixative**

Use 10% formalin

4. **Creutzfeldt-Jacob Disease (CJD)**

Creutzfeldt-Jakob disease

NB: phenol is no longer recommended for CJD cases.

In addition to practicing universal precautions during the autopsy on patients suspected of having Creutzfeldt-Jakob disease, pathologists should consider taking the following special precautions as well in cases of (a) rapidly progressive dementia, (b) dementia with seizures, especially myoclonic seizures, and (c) dementia associated with cerebellar or lower motor neuron signs. The recommended method for handling these brains to reduce infectivity is immersion of tissue blocks in 95% formic acid. Aerosol formation must be avoided during removal of the brain by using the bone saw with attached dust collector available in the autopsy suite.

If there is any suspicion of Creutzfeldt-Jakob disease, the autopsy should be limited to the brain, and the tissue treated as outlined below. There must be no exceptions to this rule.

Autopsy brain tissues should be handled as follows:

The intact brain is fixed in formalin for 1-2 weeks before cutting. Tissue blocks (representative regions of neocortex, basal ganglia, and cerebellum) are taken, agitated in at least 50-100 mL of 95-100% formic acid for 1 hour, and then returned to formalin for 2 days before embedding. Alternatively, one may take the necessary diagnostic sections from the fresh brain, fix them in formalin for 2-7 days, treat with formic acid for 1 hour, fix again in formalin for 2 days, and then embed in paraffin. This method significantly reduces infectivity.

At the conclusion of the autopsy, the area of incision and other contaminated skin surfaces are washed with freshly opened undiluted commercial household bleach (sodium hypochlorite). As sodium hypochlorite deteriorates after several months, a newly opened container should be used for each autopsy. After 10 minutes, the skin may be washed with water. All gowns, gloves,

plastic sheets, and other disposable supplies are placed in a red or orange biohazard bag and incinerated. Alternatively, they may be autoclaved (132ºC steam) and discarded.

Hard surfaces are decontaminated with freshly opened undiluted bleach or NaOH. 1N NaOH is adequate unless there will be dilution by surface liquid, in which case 2N NaOH should be used. Bleach and NaOH are equally effective, but NaOH is preferred for steel instruments and surfaces because it is less corrosive than bleach. The disinfectant should remain in contact with the surface for at least 15 and preferably 60 minutes.

Autopsy instruments should have any visible blood removed, then decontaminated with undiluted bleach or 1-2N NaOH as above. Alternatively, they may be autoclaved for 1 hour at 132ºC and 20 psi.

Neuropathology tissues from cases of Creutzfeldt-Jakob disease should be processed by hand. Tissue treated with formic acid is essentially decontaminated and may be processed routinely, although some laboratories prefer to hand-process this material.

Such hand-processed material is treated as potentially infectious. Double gloves are worn at all times. All solutions, including water washes, are collected and treated with equal volumes of fresh undiluted household bleach for 60 minutes before disposal. Disposables, glassware tools, *etc*. are handled according to the procedures employed in the autopsy room described elsewhere in this Checklist. All scraps of paraffin and unused sections should be collected on a disposable sheet. The microtome may be wiped with bleach or NaOH solution. No special precautions are needed in handling intact glass slides once they have been coverslipped. Broken slides should be decontaminated and discarded. Paraffin blocks should be stored in a bag or box and labeled as infectious.

REFERENCES: 1) Brown PW, *et al*. A simple and effective method for inactivating virus activity in formalin-fixed tissue samples from patients with Creutzfeldt-Jakob disease. *Neurology.* 1990;40:887-890; 2) Greenblatt, M. Q&A. In: *CAP Today.* 1993(March);7(3):69-70. Northfield, IL: College of American Pathologists; 3) Brown P. Special precautions for autopsies of patients with Creutzfeldt-Jakob disease. In: Collins KA, *et al*. . Autopsy Performance and Reporting. 2nd ed. Northfield, IL: College of American Pathologists;2003:chap 1; 4) Johnson MD, *et al*. Autopsy risk and acquisition of human immunodeficiency virus infection: a case report and reappraisal. *Arch Pathol Lab Med.* 1997;121:64-66. 5) Crain BJ. Safety tips for anatomic studies of possible CJD. Northfield, IL: College of American Pathologists, *CAP Today*. 1996(Jan);10(1):56; 6) Rank JP. How can histotechnologists protect themselves from Creutzfeldt-Jakob disease. *Lab Med.* 1999;30:305; 7) Nixon RR. Prions and prion diseases. *Lab Med.* 1999;30:335-338.

2. **Special Precautions**

a. The sink from which water from the autopsy table collects should be plugged and **2.0N Sodium Hydroxide solution** should be added and left for 2 hours before it is drained.

b. All tissues should be considered infectious even after prolonged fixation and histologic processing.

c. Xylene and other organic solvents should be disinfected and discarded rather than reused.

Meningococcal Meningitis

Contact the Hospital Epidemiology department for guidelines.

V. Implementation of Recommended Precautions

Employers of health-care workers should ensure that policies exist for:

1. Initial orientation and continuing education and training of all health-care workers - including students and trainees - on the epidemiology, modes of transmission, and prevention of HIV and other blood-borne infectious and the need for routine use of universal blood and body-fluid precautions **all** patients.

2. Provision of equipment and supplies necessary to minimize the risk of infection with HIV and other blood-borne pathogens.

3. Monitoring adherence to recommended protective measures. When monitoring reveals a failure to follow recommended precautions, counseling, education, and /or re-training should be provided, and, if necessary, appropriate disciplinary action should be considered.

Professional associations and labor organizations, through continuing education efforts, should emphasize the need for health-care workers to follow recommended precautions.

VI. **Radioactive Isotopes in Autopsies and Surgical Specimens**

Although not infectious, exposure to radio-isotopic materials has many of the characteristics discussed above.

1. **General**: The two principal dangers from radiation are internal (eating, drinking, inhaling) and external (irradiation due to high energy isotopes). In medical use at present, except when dealing with radium needles, etc., the danger from external radiation is slight. Therefore, particular attention should be paid to **avoid accidental ingestion of isotopes**, and avoid skin or body contact with isotopes.

2. A body containing less than 30 millicuries of isotopes may be released to a funeral director for embalming.

3. When doing an autopsy or handling a specimen with radioactivity, observe these suggestions:

   1. Observe general standard precautions.

   2. If radioactivity is concentrated in a particular area, such as a thyroid with I131, or a chest cavity with gold (Au198), save that area for the last examination.

   3. If body fluid contains considerable radioactivity such as urine, ascitic fluid, chest fluid, drain those fluids off carefully and pour them carefully down a drain. Don't splash.

   4. Handle radioactive tissues with forceps.

   5. Work with radioactive tissues for short periods of time.

   6. Wrap contaminated clothing and instruments in a dry cloth until they can be monitored and decontaminated.

E. Disposal of waste materials

The term "hazardous infectious waste" (H.I.W) means waste which because of its infectious characteristics may cause or contribute to an increase in mortality or serious irreversible or incapacitating reversible illness. It may also pose a hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

Definition of Hazardous Infectious Waste

1. **BLOOD AND BLOOD PRODUCTS**: Discarded bulk human blood and blood products in free draining, liquid state; body fluids removed and discarded during surgery and autopsy, or other medical procedures, as well as specimens of body fluids and their containers.

2. **PATHOLOGICAL WASTE**: Human anatomical parts, tissues, organs, and body fluids removed and discarded during surgery and autopsy, or other medical procedures, as well as specimens of body fluids and their containers.

3. **CULTURES AND STOCKS OF INFECTIOUS AGENTS AND ASSOCIATED BIOLOGICAL**: All cultures and stocks of infectious agents and associated biological, biotechnological by-product effluents, cultures of specimens from medical and pathological laboratories, cultures and stocks of infectious agents from research laboratories, wastes from the production of biological, and discarded live and attenuated vaccines intended for human use.

4. **CONTAMINATED ANIMAL CARCASSES, BODY PARTS AND BEDDING**: Carcasses of research animals and their bedding which is known to have been exposed to pathogens.

5. **SHARPS**: Discarded medical articles that may cause puncture or cuts, including but not limited to used and discarded hypodermic needles, syringes, Pasteur pipettes, broken medical glassware, scalpel blades, disposable razors and suture needles.

6. **BIOTECHNOLOGICAL BY-PRODUCT EFFLUENTS**: Any discarded preparations made from genetically altered living organisms and their products.

ON-SITE DISPOSAL AND STORAGE OF HAZARDOUS INFECTIOUS WASTE

1. **BULK BLOOD AND BLOOD PRODUCTS**: Free draining blood and blood products, except blood saturated materials, is disposed of directly into the municipal sewerage system. If bulk blood or fluids contaminated with visible blood are disposed of in containers, such as suction liners, they are securely closed before being enclosed in a leak proof container.

2. **SHARPS**: All sharps are disposed of into rigid, puncture resistant needle boxes. The size and location of needle disposal boxed will be dictated by the clinical setting and the needs of the health care provides. Full boxes are picked up for transport by an outside contractor.

3. **BLOOD SATURATED MATERIALS AND LABORATORY WASTE** are segregated at the point of origin by the user who will discard it into a fiber-drum which is lined with two red bags. When full, this bag is boxed tightly sealed and picked up for transport to the HIW holding area.

4. **BODY PARTS** are placed into a fiber-drum that is lined with two red bags and transported to an approved incinerator for disposal.

5. **LABELING**: every container or bag of HIW is marked with the international BIOHAZARD symbol and shall be colored red. In addition, needle disposal boxes are labeled to indicate that they contain waste capable of inflicting punctures or cuts. Boxes of HIW which are to be transported off the premises bear the name, address and phone number of Boston Medical Center Hospital.

6. **ALL H.I.W. SEGREGATED FROM OTHER WASTE AND SOILED LAUNDRY** during holding and transport. On-site storage of H.I. W. is a clearly identified room, away from general traffic flow patterns. The manner of storage prevents access to or contact with such waste by unauthorized persons.

PACKAGING AND TRANSPORT OF HIW

1. **HIW BROUGHT TO THE HOLDING AREA IS PACKAGED FOR REMOVAL** to an approved processing facility. Red bagged waste are securely sealed within two 3 mil red bags (labeled BIOHAZARD) and packed in a properly marked box for loading onto the contractors truck. (see specific Environmental Services policies).

2. **IN THE HOLDING AREA, HIW MUST BE SEPARATED FROM TRASH AND LAUNDRY**. The room must be cleaned at least weekly and must be maintained in sanitary condition.

3. **MANIFESTS**: The manifest is a tracking document designed to record the movement of waste from Boston Medical Center (East Newton Campus), through its transport to an approved disposal facility and final disposal. If East Newton Campus does not receive a copy of the manifest from the disposal facility within 30 days after shipment of the HIW, this fact shall be reported to the State Depart. of Environmental Engineering. Copies of original manifests and copies returned from the disposal facility shall be maintained for 3 years.

Policy and Procedure:

In the Event of Accidental Exposure to Infectious Agents

Department of Anatomic Pathology, Boston Medical Center

Prepared by: **Date reviewed: 6/11/07**

Chris Andry, Ph.D., Administrative director, Anatomic Pathology

Distribution:

All Medical Staff, House Officers and Support Staff
670 Albany Street laboratories, Menino 2093,
Newton H3800, Autopsy Suite HB11

In the Event of Accidental Exposure to an Infectious Agent

Immediate Action is Necessary

Intact skin that has been contaminated with body substances or microbe-bearing material should be washed immediately with soap and water.

Percutaneous wounds should be bled, washed, painted with antiseptic and the incident should be reported to a department manager or supervisor. The exposed employee should proceed to the Occupational and Environmental Medicine (OEM) office, Preston building F-5 (Newton) during work hours. Work hours are between 7:30 a.m. - 4:00 p.m. Phone 638-8400 Mon - Fri.

Exposure to the mucus membranes of the eyes, nose, mouth with blood or other potentially infectious material should be flushed at an eye-wash station according to laboratory protocol. This should also be reported to the laboratory supervisor and the employee should report to OEM as above. The employee should also be seen as soon as possible to ensure proper medical evaluation, counseling and follow-up.

For work related injuries between 8 a.m. and 4 p.m. proceed to the Occupational Health Department, Preston building, F-5, East Newton Campus. Be sure to also report to the department administrator and complete an accident report form.

For work related injuries off-shift and at week-ends report to the emergency department at either campus.