

- Policy:** The following policies and procedures apply specifically to work associated with autopsy practice.
- Purpose:** The purpose of the policy is to provide biosafety guidance to employees that encounter specific potential biohazards
- Scope:** This policy applies to all employees working in the autopsy area or those working with infectious agents or potentially infected materials. Employees must be aware of potential hazards. These employees must be trained and demonstrate proficiency in the practices and techniques required to handle such material safely.

1. GENERAL RULES

- 1.1. Handle all autopsies and autopsy samples as if they contain an infectious agent.
- 1.2. The entire autopsy area and its contents are designated a biohazard area and posted with appropriate warning signs.
- 1.3. The DC Office of the Chief Medical Examiner (OCME) autopsy suite is well ventilated with a negative airflow exhaust system and contains a separate low-traffic isolation room.
- 1.4. If multiple autopsies are to be performed sequentially, those with the greatest infectious risk should be done first to avoid performing them when staff is fatigued.

2. LIMITING AEROSOLS

- 2.1. Aerosolization of bone dust during the removal of the calvaria or vertebral bodies should be reduced with a plastic cover or a vacuum bone dust collector, or both, on the saw.
- 2.2. Bone surfaces should be moistened before sawing to cut down on the disposal of bone dust.
- 2.3. To limit aerosols, one should use screw cap rather than snap-top, rubber-stoppered, or cork-stoppered containers.
- 2.4. When opening capped containers, one should cover the opening with a plastic bag to contain aerosols and splashes.
- 2.5. Overfilling a blood specimen vacuum tube by applying pressure through a syringe should be avoided.

- 2.6. One should not sear tissue to sterilize it before obtaining a culture. Rather, the organ surface should be swabbed with an iodine solution and incised and then a sample can be removed.

3. PHOTOGRAPHY

- 3.1. Photography of fresh specimens should be carried out with care.
- 3.2. For cleanliness, a pan should be used for organ transport to the photographic stand or area.
- 3.3. One should handle the camera with clean gloves.
- 3.4. After photographs have been taken, the photo stand (if applicable) should be cleaned with disinfectant with a variety of germicidal substances without compromising the camera, lenses and other equipment.

4. TISSUE FIXATION

- 4.1. Adequate formalin fixation (3.7% formaldehyde in at least 10 times the volume of tissue) kills or inactivates all significant infectious agents, except prions and mycobacteria.
- 4.2. Adequate time must be allowed for fixatives to penetrate tissues before trimming blocks for histology
 - 4.2.1. Mycobacteria are killed by 10% formalin in 50% ethyl alcohol (one part 3.7% formaldehyde plus nine parts 10% ethyl alcohol in saline solution).
 - 4.2.2. When working with prion-infected or contaminated material, caution must be taken to avoid breach of the skin. Cut-resistant gloves should be worn. If accidental contamination of the skin occurs, swab the area with 1 N sodium hydroxide for 5 minutes and then wash with copious amounts of water.

5. REMAINS

- 5.1. After autopsy, one should wash the body with a detergent solution followed by an antiseptic or a 1:10 dilution of household bleach. The body should be rinsed with water and placed into a disposable leak-proof plastic body bag.
- 5.2. Bodies in storage should be inspected on a daily basis to assess whether there has been any undue leakage of fluid into the body bag. If necessary, place a warning on the outside of the body bag alerting others of potential leaking fluids.

6. ISOLATION PROCEDURES

- 6.1. Autopsies of cases that harbor a known hazardous microorganism are best performed in a separate isolation room within the OCME autopsy suite to contain any infectious material.
- 6.2. While performing these autopsies, personnel are limited to the medical examiner, autopsy assistant or pathologist assistant, and a backup assistant.
- 6.3. Special safety and decontamination procedures are instituted as required with guidance from the D.C. Department of Health's Public Health Laboratory.
- 6.4. Infections for which postmortem examination should be performed in a separate or "isolation" room include:
 - Anthrax
 - Hantavirus
 - Hepatitis
 - Human immunodeficiency virus/acquired immunodeficiency syndrome
 - Influenza
 - Leprosy
 - Meningococcal meningitis
 - Multidrug-resistant bacteria (methicillin-resistant staphylococcus (MRSA), vancomycin-resistant enterococcus (VRE))
 - Plague
 - Prion diseases
 - Rabies
 - Rickettsial diseases (Rocky Mountain spotted fever)
 - Tuberculosis
 - Typhoid fever

7. FORMALDEHYDE

- 7.1. The autopsy suite should have sufficient ventilation and effective chemical fume hoods to reduce employee exposure to formaldehyde vapor.
- 7.2. As mandated by OSHA, OCME monitors formaldehyde levels and maintain employee exposures below the legal limit.

8. IMPLANTABLE CARDIOVERTER-DEFIBILLATOR

- 8.1. An implantable cardioverter-defibrillator (ICD), also known as an automatic implantable cardioverter-defibrillator (AICD) may be encountered during autopsy.
- 8.2. There is a small but definite risk of electric shock when the detection lead of an ICD is broken or cut, resulting in a discharge of 25 to 40J.

8.3. Although shocks of this magnitude are unlikely to cause death, manufacturers recommend that the ICDs be deactivate before manipulation and that high-quality latex surgical gloves be used when handling the devices.

8.4. One should determine whether a device is a pacemaker or an ICD before continuing with an autopsy.

9. BULLET RECOVERY

9.1. Bullets may fragment on impact or may by design raise pointed edges on entering their target. This results in deformation and the production of sharp edges in shrapnel that present risk for penetration injuries to those required to remove or handle them.

9.2. Radiographs should be taken of the body for location of bullet or bullet fragments.

9.3. Bullets should be handled only be personnel wearing double heavy-duty gloves.

9.4. To prevent deformation of the projectile, a rubber-tipped bullet extractor fashioned from a Kelly forceps fitted with 2 cm of rubber catheter over its ends or a plastic forceps should be used to recover bullets and bullet fragments.

9.5. After collection of any trace evidence on the projectile itself, the bullet should be gently rinsed to remove contaminating blood or body fluids to decrease its subsequent infectious risk.

9.6. The bullet or bullet fragments should be double packed in leak-proof packaging with at least one of the containers composed of hard plastic to prevent injury during subsequent handling.

9.7. Appropriate identifying information and label should be placed on the container (i.e., biohazard sticker).

10. NEEDLE FRAGMENTS

- 10.1. Needle fragments are a potential hazard to medical examiners performing autopsies (particularly in drug-addicted decedents).
- 10.2. Preautopsy radiographic screening, reduced tissue manipulation during prosection, and delay of autopsy of human immunodeficiency virus-positive cases, along with standard recommendations for protection against injury from sharp instruments, should be implemented.

11. CYANIDE EXPOSURE

- 11.1. Exposure to cyanide vapors during autopsy has been associated with clinical symptoms and toxic concentrations of cyanide in autopsy personnel.
- 11.2. Autopsy should be performed in pressure isolation room.
- 11.3. Although cyanide may vaporize from other tissues, stomach contents containing ingested cyanide salts present the highest risk because the gastric acid converts cyanide salts to volatile hydrocyanic gas. The prosector should only open the stomach in a chemical fume hood or externally vented biologic safety cabinet to reduce the risk of exposure to toxic gas.
- 11.4. Toxicology laboratory workers handling samples possibly containing cyanide should wear gloves and face and eye protection and manipulate the specimen only in a chemical fume hood.