

	Minimizing Aerosol Exposure	Effective:	February 7, 2006
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1. Purpose:

1.1 The purpose of this Policy is to present general safety concepts that can be adapted to any laboratory to minimize aerosol exposure. Inhalation of aerosols is a common cause of chronic exposure to toxic chemicals and radioisotopes and of workplace-acquired infections. Aerosols do not have to be inhaled directly to produce their effects. The droplets dry up within a few seconds and, depending on their size, settle on surfaces in the work area or enter into the ventilation system. It is the smaller particles, with diameters less than 5 micrometers that can easily enter the lungs. Listed below are examples of laboratory equipment and procedures that generate aerosols and precautions you can take to minimize exposure.

2. Scope:

2.1. This procedure applies to all technicians employed by the Ross University School of Veterinary Medicine.

3. Procedure

3.1 Mouth Pipetting

This may lead to accidental ingestion of a fluid or create an aerosol cloud above the surface, which can be inhaled through the mouth. Use only mechanical pipetting aids and clean them regularly.

3.2 Mixing Solutions

The formation of bubbles during mixing spreads droplets effectively. Experiments with bacteria have shown that the use of a vortex mixer rather than vigorous stirring can eliminate aerosols from the source.

3.3 Using Needles and Syringes

Do not pressurize the contents of the bottle when withdrawing a solution from a bottle through a rubber stopper. Discharge air from the syringe before inserting it. Wrap a cotton ball soaked in 70% alcohol or other appropriate solution around the needle when removing it from the bottle. Aerosols can also be produced when a needle separates from a syringe during use. Needle-locking syringes or syringe-needle units are recommended. Discard used needles and syringes into a properly labeled, hard-walled sharps container. Never clip used needles because this produces aerosols.

3.4 Centrifugation

This can be a problem with tabletop centrifuges with poorly sealed test tubes or Eppendorf tubes. When spinning hazardous material, the centrifuge should be placed in a fume hood or biosafety cabinet (whichever is appropriate) during operation and decontaminated after use. With larger centrifuges, sealed rotors and/or tubes should be used and opened in a fume hood or biosafety cabinet after use. The rotor/tube seals or O-rings should be inspected before each run and replaced as needed.

3.5 Blending and Sonicating

Tissue specimens are often homogenized in a blender. This is one of the most potent sources of aerosols in the laboratory. The contents should be allowed to settle for at least 5 minutes after blending. Remove the blender cover in a fume hood or biosafety cabinet. Sonicators should be used with similar precautions.

3.6 Flaming

Use a safety incineration device to heat-sterilize inoculating loops, tubes or flasks. Gently manipulate the lab equipment, making no sudden movements. If the loop or lip of the tube or flask is wet, an aerosol may be created when flamed. Wiping the tube or flask with 70% alcohol, vacuum the droplets, or using pre-sterilized plastic loops is an alternative.

3.7 Opening Sealed Ampoules

snapping an ampoule may release a cloud of lyophilized organisms or volatile chemical substances into the air. If the tube is under vacuum, the glass should be cracked gently by applying a heated rod to a file mark on the ampoule neck and allowing the pressure to equalize before completely opening. Osmium tetroxide ampoules should be opened under water.

3.8 Cleaning Cages

Infected animals often shed pathogens in their feces and urine. The litter and bedding are particularly hazardous when dry because the light spores may be aerosolized a considerable distance. Some cages must be autoclaved prior to cleaning if required by the Biological Use Authorization or Animal Care Protocol. When cleaning animal cages, use a spray bottle filled with water or disinfectant to wet down the litter prior to dumping. Discard litter as gently as possible into a receptacle and seal the receptacle immediately.

3.9 Spills

All spilled materials considered potentially infectious must be disinfected thoroughly. Adequate PPE should be worn during disinfecting and all used cleanup material should be disposed of in the biohazardous waste. If a large spill occurs, contact Lynell Nolan from RUSVM Safety & Security Department, ext. 191.