I. General Considerations

A. Responsibility

Although employers bear some of the responsibility for prevention of spread of disease, each EMS provider must take the responsibility to safeguard his or her own health and safety. This includes using the personal protective equipment (PPE) appropriate for a particular situation. Although this protocol describes many of the elements of an exposure control plan, it is not an exposure control plan.

B. Risks of Disease Transmission

The risk for transmission of most serious infectious diseases is low, e.g., the human immunodeficiency virus (HIV), which causes AIDS. If an EMS provider is stuck by a needle containing HIV-positive blood, the chance of becoming HIV-positive is approximately 0.3% (less than 1 in 300). This risk can be reduced even further by taking a few precautions. Hepatitis B, on the other hand, is much easier to contract; there is a 15% - 30% chance of an unvaccinated person becoming infected after being stuck by a needle containing blood with hepatitis B virus (HBV).

Disease can be passed by fluids other than blood. Other potentially infectious materials are semen, vaginal secretions, cerebrospinal fluid, synovial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood and all body fluids in situations where it is difficult or impossible to differentiate between body fluids. It is frequently not possible for EMS providers to know whether a patient has an infectious disease.

C. Preventing the Spread of Disease

1. The easiest and most effective way to prevent spread of disease is handwashing. The preferred agent to use for cleaning unsoiled hands is an alcohol-based hand rub. Clean soiled hands with soap and water. Either plain (non-antimicrobial) or antimicrobial soap is acceptable. Hands are soiled if they are visibly dirty, contaminated with proteinaceous material, or soiled with blood or other body fluids. They are also considered soiled after the healthcare worker has used a restroom or if the healthcare worker has had either suspected or proven exposure to *Bacillus anthracis*, the bacterium that causes anthrax.
2. Another way to prevent spread of disease is to use standard precautions, which combine the major features of universal (or blood and body fluid) precautions and body substance isolation (BSI) and applies them to all patients. Standard precautions apply to 1) blood; 2) all body fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; 3) nonintact skin; and 4) mucous membranes.
3. EMS providers should not recap, bend or break needles or other sharps. Recapping is permitted only when no alternative is feasible or it is required for a specific medical procedure. When it is done, the provider should use a mechanical device or one-handed technique.
4. EMS providers should dispose of contaminated needles and sharps as soon as possible in appropriate sharps containers.
5. The spread of airborne diseases can also be limited by a few simple precautions. Patients who are at risk for infection with an airborne disease include those who have a persistent cough (more than three weeks), bloody sputum, night sweats, weight loss, anorexia or fever. If the patient is not in acute respiratory distress and has no other indications for oxygen, have the patient wear a surgical mask if he will tolerate it. The EMS provider should be qualified for and wear an N-95 mask or other respirator rated at N-95 or higher. Additionally, EMS providers should avoid aerosol-generating procedures or anything that might provoke coughing by the patient. As circumstances allow, keep windows open and set heating and air conditioning systems on a nonrecirculating cycle. If the ambulance is equipped with HEPA (high efficiency particulate air) filtration, this should be used.

As circumstances allow, limit the number of providers in close contact with the patient.

Whenever possible, use a pocket mask, bag valve mask or other device to ventilate a patient rather than perform mouth-to-mouth. This is true for all patients.

D. Exposure Control Plan

Each EMS agency should have an exposure control plan that is reviewed and updated at least annually. It should include:

- a general explanation of the modes of transmission, epidemiology and symptoms of bloodborne and airborne diseases;
- a description of engineering controls and work practice controls (equipment and procedures) that instructs providers in the means to prevent exposure;
- information on the hepatitis B vaccine and how to obtain it free of charge;
- the procedure for vaccination against hepatitis B;
- a description of types, selection, proper use, location, removal, handling, decontamination and disposal of PPE;
- the procedure to follow when a potential exposure occurs, including the actions to take and the person to contact;
- how a provider should get evaluation and follow-up after an exposure;
- a description of how hazards are communicated;
- record keeping standards; and
- documentation of the agency's compliance with the requirement for annual consideration of new technology that reduces exposure to bloodborne pathogens (as required by the revisions made in 29 CFR 1910.1030 after passage of the Needlestick Safety and Prevention Act of 2000).

Each agency should also have a respiratory protection program that is reviewed and updated at least annually. This may be included as part of the exposure control plan. Elements of such a program include:

- procedures for selecting respirators for use in the workplace;
- medical evaluations of employees required to use respirators; a physician or other licensed health care professional shall perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire; the employer shall provide a follow-up medical examination to any employee who gives a positive response to certain questions on the questionnaire;
- fit testing procedures for tight-fitting respirators; fit testing must be repeated annually and whenever there is a change in the respirator facepiece provided by the employer and whenever there is a change in the employee's physical condition that could affect respirator fit;
- procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
- procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding and otherwise maintaining respirators;
- training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
- procedures for regularly evaluating the effectiveness of the program.

E. Immunization

Each EMS agency should provide hepatitis B vaccinations free of charge to EMS providers who may in the course of their EMS duties have occupational exposure, i.e., they may reasonably be expected to come into contact with blood or other body fluids. Agencies should also assure that providers are immune to or up to date in their vaccinations against

measles, mumps, rubella, tetanus and pertussis.

F. Personal Protective Equipment (PPE)
PPE consists of gloves, eye protection, masks and respirators, gowns, pocket masks and other ventilation devices that the EMS agency furnishes to providers at no charge. They should be used as appropriate to prevent contact with blood and other body fluids. See Appendix 1, "Examples of Recommended Personal Protection for Worker Protection Against HIV and HBV Transmission in Prehospital Settings." The provider may briefly and temporarily decline to use PPE when, under rare and extraordinary circumstances, the provider decides that the use of PPE would prevent the delivery of health care or would pose an increased hazard to the safety of the responder.

G. Housekeeping
All equipment and environmental working surfaces should be cleaned and decontaminated after contact with blood or other potentially infectious materials. See Appendix 2, "Reprocessing Methods for Equipment used in the Prehospital Health-Care Setting" and Appendix 3, "Recommendations for Decontamination and Cleaning of Rescue Vehicles."

H. Hazard Communication
Containers with blood or other potentially infectious materials should have the fluorescent orange or orange-red biohazard label on them. There are two major exceptions to this. First, red bags or containers may be substituted for the labels. Second, containers of blood for clinical use (e.g., blood drawing tubes) do not have to be labeled.

I. Training
An EMS agency should provide information and training on bloodborne and airborne diseases before an EMS provider begins providing patient care. The agency should provide annual refresher training to providers. The refresher training should include, among other things, a description of any changes in tasks or procedures that affect the provider's occupational exposure.
Initial training should include:

- a description of OSHA's requirements;
- a description of the EMS agency's exposure control plan;
- a general explanation of the modes of transmission, epidemiology and symptoms of bloodborne and airborne diseases;
- a description of engineering controls and work practice controls (equipment and procedures) that assist providers in avoiding exposure;
- information on the hepatitis B vaccine;
- the procedure for vaccination against hepatitis B;
- a description of types, selection, proper use, location, removal, handling, decontamination and disposal of PPE;
- the procedure to follow when a potential exposure occurs, including the actions to take and the person to contact;
- how a provider should get evaluation and follow-up after an exposure;
- a description of how hazards are communicated; and
- an opportunity to get answers to providers' questions.

J. Record Keeping
Each EMS agency should establish and maintain an accurate, confidential medical record for each EMS provider with occupational exposure, i.e., the provider may reasonably be expected to come into contact with blood or other body fluids. The record should include:

- the provider's name;

- a copy of the provider's hepatitis B vaccination status;
- a copy of all results of examinations, medical tests and follow-up procedures for the provider;
- the agency's copy of the healthcare professional's written opinions on the desirability of hepatitis B vaccination and post-exposure evaluation and follow-up;
- for an exposure, the information provided to the healthcare professional who evaluated the provider (description of the provider's duties as they relate to the exposure incident, documentation of the route(s) of exposure and circumstances under which the exposure occurred and results of the source individual's blood testing, if available).

Each EMS agency should have training records. The records should be maintained for at least three years from the date the training occurred. The training records should include:

- dates of training sessions;
- contents or a summary of the training sessions;
- names and qualifications of the person(s) conducting the training;
- names and job titles of the person(s) conducting the training.

K. Occupational Safety and Health Administration (OSHA)

OSHA has rules pertaining to bloodborne pathogens (29 CFR 1910.1030) and tuberculosis (29 CFR 1910.134, the Respiratory Protection Standard, and OSHA Instruction CPL 2.106, Enforcement Procedures and Scheduling for Occupational Exposure to Tuberculosis (TB)).

L. Ryan White Comprehensive AIDS Resources Emergency Act

The Ryan White CARE Act is a federal law that gives emergency response employees certain rights and obligations when they are exposed to certain potentially life-threatening diseases during the course of an emergency. The potentially life threatening diseases include certain airborne diseases (infectious pulmonary tuberculosis), bloodborne diseases (hepatitis B and human immunodeficiency virus infection, including AIDS) and uncommon or rare diseases (diphtheria, meningococcal disease, plague, hemorrhagic fevers and rabies). The law requires that each emergency response agency have a designated officer (DO) for infection control who coordinates information gathering and communication. The Ryan White law specifically includes not just employees, but also "other persons (including employees of legally organized and recognized volunteer organizations, without regard to whether such employees receive nominal compensation) who, in the course of professional duties, respond to emergencies in the geographic area involved."

M. Emerging Infectious Diseases

The 2002-2003 outbreak of Severe Acute Respiratory Syndrome (SARS) demonstrated very effectively that new infectious diseases can and will occur. It is not possible to predict the location, form or virulence of such a disease, so EMS providers and agencies will need to be vigilant. Providers can rely on the Vermont Department of Health and the Centers for Disease Control and Prevention to be reliable and timely sources of information and advice when these outbreaks occur.

II. Procedures

A. Exposure to Bloodborne Disease

1. An exposure has occurred when there is eye, mouth, other mucous membrane, non-intact skin or parenteral contact between an EMS provider and blood or other potentially infectious material as a result of the EMS provider's duties. Non-intact skin includes weeping wounds, rashes and open wounds less than one hour old.
2. As soon as possible after an exposure, the EMS provider should wash with soap and water any skin that was involved. Flush exposed mucous membranes with water.
3. The EMS provider should contact the agency's designated officer (DO) for infection control and document the route of exposure and the circumstances under which the incident occurred.

4. The designated officer should collect the facts relating to the circumstances of the incident and determine whether the responder could have been exposed to hepatitis B or HIV (assuming the source patient had either or both of those diseases).
5. If the DO determines that the responder could have been exposed to a bloodborne disease, then the DO should submit to the hospital to which the patient was transported a written request for a determination of exposure.
6. The hospital should evaluate the facts and, if the source patient can be identified, review the patient's medical records for results of tests for hepatitis B, HIV infection, and infectious pulmonary tuberculosis (TB) and for signs and symptoms compatible with these diseases.
7. Federal law requires the hospital, within 48 hours, to submit one of three written responses:
   a. there was no exposure;
   b. there is insufficient information to determine whether there was an exposure; or
   c. there was an exposure.
8. If the hospital notifies the DO that there was an exposure, the notification shall include the name of the infectious disease involved and the date the source patient was transported.
9. The DO shall notify providers who responded to the incident and who may have been exposed:
   a. That they may have been exposed;
   b. Of the name of the disease involved;
   c. Of any actions the provider should take;
   d. If medically appropriate, of the date of the incident.
10. The EMS agency should cooperate with the receiving hospital in seeing that HBV and HIV testing is performed on the source patient when the patient's HBV and HIV status is unknown and the patient has given consent. The agency and hospital should make the source individual's test results available to the provider in accordance with federal and state laws and regulations.
11. The EMS agency should arrange for the responder's blood to be tested for HBV and HIV as soon as feasible after consent is obtained.
12. The agency should provide post-exposure prophylaxis when medically indicated. Free consultation with experienced experts is available from the National Clinicians' Post-Exposure Prophylaxis Hotline (PEP Line). This is a 24-hour emergency hotline that provides immediate information to clinicians regarding the management of an employee who has experienced an occupational exposure to blood. The toll-free number is (888) 448-4911.
13. The EMS agency should also provide counseling to the provider as needed. This is especially important with regard to HIV exposure.
14. If the provider reports an illness that may have resulted from the exposure, the EMS agency should arrange for medical evaluation.

B. Exposure to Airborne Disease

1. An exposure may occur when a provider shares air space with a patient who has an infectious disease caused by an airborne pathogen. Vermont has one of the lowest TB case loads in the country. There were seven cases of infectious pulmonary TB in the entire state in 2001, 4 cases in 2000 and 3 in 1999. Similarly, suspected cases of Severe Acute Respiratory Syndrome (SARS) have been uncommon, but not unheard of, in Vermont. This knowledge must be balanced with an awareness that people diagnosed in another state may visit Vermont.
2. If a hospital determines that a patient transported by ambulance has infectious pulmonary TB, federal law requires the hospital to notify the DO for the service within 48 hours of making the diagnosis.

3. An EMS provider may request a determination by the agency's DO if the provider believes he or she may have been exposed to infectious pulmonary tuberculosis. The procedure is the same as for bloodborne diseases.

C. Exposure to Uncommon or Rare Diseases

1. An EMS provider may request a determination by the agency's DO if there is reason to believe he or she may have been exposed to an uncommon disease like meningococcal disease. The procedure is the same as for bloodborne diseases.

III. Appendices

Appendix 1 Examples of Recommended Personal Protection for Worker Protection Against HIV and HBV Transmission in Prehospital Settings

Appendix 2 Reprocessing Methods for Equipment used in the Prehospital Health-Care Setting

Appendix 3 Recommendations for Decontamination and Cleaning of Rescue Vehicles

APPENDIX 1: Examples of Recommended Personal Protection for Worker Protection Against HIV and HBV Transmission in Prehospital Settings

Task or Activity	Disposable Gloves	Gown	Mask	Protective Eyewear
Bleeding control with spurting blood	Yes	Yes	Yes	Yes
Bleeding control with minimal bleeding	Yes	No	No	No
Emergency childbirth	Yes	Yes	Yes, if splashing is likely	Yes, if splashing is likely
Blood drawing	At certain[1] times	No	No	No
Starting an intravenous (IV) line	Yes	No	No	No
Endotracheal intubation, esophageal obturator use	Yes	No	No, unless splashing is likely	No, unless splashing is likely
Oral/nasal suctioning, manually clearing airway	Yes[2]	No	No, unless splashing is likely	No, unless splashing is likely
Handling and cleaning instruments with microbial contamination	Yes	No, unless soiling is likely	No	No
Measuring blood pressure	No	No	No	No
Measuring temperature	No	No	No	No
Giving an injection	No	No	No	No

NOTE: The examples provided in this table are based on application of universal precautions. Universal precautions are intended to supplement rather than replace recommendations for routine infection control, such as handwashing and using gloves to prevent gross microbial contamination of hands (e.g., contact with urine or feces).

[1] Gloves should be worn for phlebotomy if cuts, scratches or other breaks in the skin are present on the worker's hands, if the worker is inexperienced, or if the situation suggests a greater possibility of bleeding.

[2] While not clearly necessary to prevent HIV or HBV transmission unless blood is present, gloves are recommended to prevent transmission of other agents (e.g., Herpes simplex).

Centers for Disease Control, February 1989

APPENDIX 2: Reprocessing Methods for Equipment Used in the Prehospital Healthcare Setting

Sterilization

Destroys: All forms of microbial life, including high numbers of bacterial spores.

Methods: Steam under pressure (autoclave), gas (ethylene oxide), dry heat, or immersion in EPA-approved chemical "sterilant" for prolonged period of time, e.g., 6-10 hours or according to manufacturers' instructions. Note: liquid chemical "sterilants" should be used only on those instruments that are impossible to sterilize or disinfect with heat.

Use: For those instruments or devices that penetrate skin or contact normally sterile areas of the body, e.g., scalpels, needles, etc. Disposable invasive equipment eliminates the need to reprocess these types of items. When indicated, however, arrangements should be made with a health-care facility for reprocessing of reusable invasive instruments.

High-Level Disinfection

Destroys: *Mycobacterium tuberculosis,* vegetative bacteria, most viruses, and most fungi, but does not kill bacterial spores.

Methods: EPA-registered "hospital disinfectant" chemical germicides that have a label claim for tuberculocidal activity; commercially available hard-surface germicides or solutions containing at least 500 ppm free available chlorine (a 1:100 dilution of common household bleach – approximately ¼ cup bleach per gallon of tap water).

Use: For those surfaces that come into contact only with intact skin, e.g., stethoscopes, blood pressure cuffs, splints, etc., and have been visibly contaminated with blood or bloody body fluids. Surfaces must be precleaned of visible material before the germicidal chemical is applied for disinfection.

Low-Level Disinfection

Destroys: Most bacteria, some viruses, some fungi, but not *Mycobacterium tuberculosis* or bacterial spores.

Methods: EPA-registered "hospital disinfectants" (no label claim for tuberculocidal activity).

Use: These agents are excellent cleaners and can be used for routine housekeeping or removal of soiling in the absence of visible blood contamination.

Environmental Disinfection: Environmental surfaces which have become soiled should be cleaned and disinfected using any cleaner or disinfectant agent which is intended for environmental use. Such surfaces include floors, woodwork, ambulance seats, countertops, etc.

IMPORTANT: To assure the effectiveness of any sterilization of disinfection process, equipment and instruments must first be thoroughly cleaned of all visible soil.

Centers for Disease Control, February 1989

APPENDIX 3: Recommendations for Decontamination and Cleaning of Rescue Vehicles

Clean-Up Kit

Household utility gloves
Plastic spray bottle with cleaning agent
Plastic spray bottle with disinfectant solution or bottle with concentrated household bleach to be diluted with water (1:100 dilution approximates ¼ cup bleach per gallon of water)*
Disposable toweling
Plastic bags (hospital red bags, household plastic bags)
Basket/carrier to hold cleaning supplies

Clean-Up Procedure After Each Call

1. Prepare vehicle for cleaning/decontamination.
   a. Always wear utility gloves throughout clean-up procedure.
   b. Remove used or soiled linen and place in designated bag for laundering. Either leave laundry at the hospital or reprocess in the EMS laundry using warm water, detergent, and bleach as recommended on the product labels.
   c. Discard any soiled dressings, bloody materials, and other contaminated, non-sharps waste in a red bag and leave at the hospital.
   d. Place reusable equipment which needs reprocessing in plastic bag (any color other than red).
   e. Check the vehicle for any needles or other sharps which may have been left and carefully dispose in a sharps container.

2. Check for areas soiled with blood and other visible body substances and remove.
   a. Remove moist blood and other body substances with paper toweling and discard in a red bag.
   b. Spray cleaner on affected area and remove any remaining blood or body substances. Dispose of towels in red bag.
   c. Spray disinfectant* on affected area, wipe over the surface, and allow to air dry. Dispose of towels in red bag.

3. Spray cleaner on remaining surfaces with which the patient had contact as well as surfaces which were used in the course of providing prehospital care. Wipe the surface with toweling and allow to air dry.

Periodic Cleaning of Rescue Vehicles

On a regular basis (e.g., weekly, monthly) as determined by the frequency of vehicle use and obvious need, the floors, walls, interior and exterior of cabinets and drawers, benches, and other surfaces, should be thoroughly cleaned. The same cleaning agent used between cases can be used for this more extensive cleaning. A supply kit should be kept in a central location for this purpose (e.g., pail, reusable cleaning cloths that are laundered after use, supply of cleaning agents). Wipe with toweling and allow to air dry.

Since carpeting and permeable seat covers in the patient compartment of ambulances are more difficult to clean than non-permeable surfaces, their use is not recommended.

***NOTE:** Bleach solution should be made up fresh at the time of use or daily.

Centers for Disease Control, February 1989