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NATIONAL FUNERAL DIRECTORS ASSOCIATION
FUNERAL HOME MEDICAL WASTE PROTOCOL

Medical waste disposal firms have revised their medical waste acceptance policies following new restrictions imposed by the United States Department of Transportation (DOT), OSHA and State regulatory agencies. The waste acceptance protocols generally define the kind of waste that is considered medical waste and list the medical waste that the firms will accept. The waste acceptance protocols require customers, including funeral homes, to segregate and to identify the contents of specified medical waste. Because the medical waste of funeral homes does not fit neatly into the medical waste disposal categories that have been established, the National Funeral Directors Association has prepared this **Funeral Home Medical Waste Protocol** to assist funeral directors with the proper characterization, handling and disposal of medical waste. This protocol recognizes that funeral directors discharge embalming wastewater to publicly owned treatment works and to septic systems and that if embalming products are properly handled, funeral homes generally do not generate hazardous wastes regulated under RCRA[*].

Accepted Medical Waste

The following medical wastes are considered acceptable for disposal:

- **Sharps** (from recent DOT regulations, any object that may be contaminated with an infectious substance, and able to cut or penetrate the skin or packaging material. This includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires. For funeral homes, sharps needles, suture needles, syringes, scalpel blades; autopsy needles, dental wires, and similar objects, which are not cleaned and disinfected for re-use, are to be placed in the designated sharps container for periodic disposal.)

- **Materials that accompany the deceased to the funeral home** (plastic and cloth sheeting; gauze; leftover IV tubing; disposable gloves, gowns, booties, and masks; hospital wrappings such as catheters and casts; and other disposable equipment, instruments or materials that have come in contact with bodily fluids, blood, or any infectious agents categorized by the World Health Organization as Risk Groups 2 or 3, such as CJD, anthrax, hantavirus, Hepatitis B, HIV, or influenza. Ordinarily the applicable Risk Group should be determined by the treating physician or other health professional prior to the deceased arriving at the funeral home. Risk Group 4 materials may not be discarded as regulated

[*] RCRA is the federal Resource Conservation and Recovery Act, which is administered jointly by EPA and State environmental regulatory agencies. RCRA-regulated Hazardous Wastes include wastes that: i) exhibit a hazardous characteristic (reactivity; corrosivity/pH above 12.5 or below 2; toxicity; or ignitability) or ii) appear on a particular list. If funeral directors follow NFDA's best management practices, a funeral director should not produce hazardous wastes.

medical waste. More information about the classification of infectious agents by Risk Groups is available in the Appendix attached to this Protocol.)

- **Materials that are used in the preparation room** (tubes; disposable gloves, gowns, and other garments, gauze and cloths used in embalming and other disposable equipment, instruments or materials that have come in contact with bodily fluids, blood, or infectious agents categorized by the World Health Organization as Risk Groups 2 or 3, such as CJD, anthrax, hantavirus, Hepatitis B, HIV, or influenza, and materials having trace amounts of embalming fluids containing formaldehyde and phenol.)

Accepted Medical Waste to be Labeled and Segregated for Incineration

Pathological and trace chemotherapy wastes ordinarily should be, and is required by law in some states to be, incinerated and labeled for incineration. Funeral homes typically do not produce chemotherapy or pathological wastes and any autopsy-related or other viscera, organs or tissues that accompany the deceased to the funeral home will be included with the remains for burial or cremation.

Funeral homes take steps to ensure that medical waste is not transported to the funeral home with the deceased. In the event that medical waste accompanies the deceased to the funeral home and the funeral home cannot determine the exact nature of the medical waste, the funeral director agrees to assume that the waste is trace-contaminated chemotherapy waste and the waste will be labeled and segregated from other waste.

- **Trace-contaminated chemotherapy waste** (empty drug vials; syringes and needles; spill kits; IV tubing and bags; gloves and gowns associated with chemotherapy treatment.)
- **Pathological wastes** (organs, tissues and surgical specimens.)

Waste NOT Accepted

The following wastes are not considered medical wastes and will not be accepted by a medical waste firm.

- **Pharmaceutical waste** (may be subject to special rules; consult the medical waste firm.)
- **Chemicals** (containers holding liquid chemicals, such as formaldehyde, acids, alcohols, waste oil, solvents, and reagents, will not be accepted; **however, bottles, gauzes, gowns, sheets and the like with trace amounts of chemicals or chemical embalming solutions are acceptable for disposal**.)
- **Hazardous waste** (drums or other containers with a hazard warning symbol, batteries, heavy metals and other RCRA-regulated hazardous waste will not be accepted. Ordinarily funeral homes do not generate drums of waste. Pace makers, which are likely to have batteries, are to be removed from the remains and returned to the manufacturer.)
- **Radioactive waste** (a container with a radioactivity level that exceeds regulatory limits; materials containing lead.)
- **Bulk chemotherapy waste**
- **Compressed gas cylinders, canisters, inhalers and aerosol cans**
- **Glass thermometers or other medical devices or solutions containing mercury**

If asked to fill out a form indicating whether cultures or stocks or pathological or chemotherapy wastes will be among the medical waste that the funeral home discards, NFDA suggests placing the following statement on the form, in lieu of checking one of the suggested boxes.

> We are a funeral home and do not generate pathological or chemotherapy wastes. From time to time, we will be asked to handle a case where the cause of death is due to cancer or an infectious agent. Funeral homes take steps to ensure that medical waste is not transported to the funeral home with the deceased and that the treating physician or other health professional identifies the cause of death. In the event such materials do accompany the deceased to the funeral home and the funeral director is not able to determine the exact nature of the waste, it will be assumed that the waste is trace-chemotherapy waste and the waste will be labeled and segregated from other waste for proper disposal as required by state and local regulations. Funeral homes do not routinely handle cases where the cause of death is due to an infectious agent in Risk Group 4. In the event of a Risk Group 4 agent, the funeral home will be provided with specific instructions for handling and disposal from NFDA and the assigned government agency or official.

A funeral home can expect the medical waste firm it uses to provide containers for medical waste disposal. Nonetheless, please note that OSHA and DOT have imposed requirements governing the specifications for medical waste containers, which include that:

i. sharps must be placed in a container that is closable, puncture-resistant, leak proof, and labeled or color-coded as a Biohazard;
ii. other medical waste must be placed in a container that is closable, constructed to contain all contents and to prevent leakage of all fluids, and labeled or color-coded as a Biohazard; and
iii. if a container is leaking or if leakage is possible, the container must be housed in a second container that meets all the requirements.

Training must be provided to employees as provided under the OSHA bloodborne pathogen standard and the DOT hazardous material regulations. **Contact NFDA's OSHA Hotline with training questions (800.NFDA.OSH or 800.633.2674).**

For additional information or questions about the Funeral Home Medical Waste Protocol, contact NFDA (John Fitch/202.547.0441 or Carol Green, NFDA's environmental counsel/301.941-8038).

LIST OF INFECTIOUS AGENTS BY RISK GROUP

from
NIH GUIDELINES FOR RESEARCH INVOLVING RECOMBINANT DNA MOLECULES (NIH GUIDELINES)
April 2002

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Visit the OBA Web site at:
http://www4.od.nih.gov/oba
For current information on Guidelines, Protocols, Principal Investigators, Meetings,

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines)

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APPENDIX B. CLASSIFICATION OF HUMAN ETIOLOGIC AGENTS ON THE BASIS OF HAZARD

This appendix includes those biological agents known to infect humans as well as selected animal agents that may pose theoretical risks if inoculated into humans. Included are lists of representative genera and species known to be pathogenic; mutated, recombined, and non-pathogenic species and strains are not considered. Non-infectious life cycle stages of parasites are excluded. This appendix reflects the current state of knowledge and should be considered a resource document. Included are the more commonly encountered agents and is not meant to be all-inclusive. Information on agent risk assessment may be found in the *Agent Summary Statements* of the CDC/NIH publication, *Biosafety in Microbiological and Biomedical Laboratories* (see Sections V-C, V-D, V-E, and V-F, *Footnotes and References of Sections I through IV*. Further guidance on agents not listed in Appendix B may be obtained through: Centers for Disease Control and Prevention, Biosafety Branch, Atlanta, Georgia 30333, Phone: (404) 639-3883, Fax: (404) 639-2294; National Institutes of Health, Division of Safety, Bethesda, Maryland 20892, Phone: (301) 496-1357; National Animal Disease Center, U.S. Department of Agriculture, Ames, Iowa 50010, Phone: (515) 862-8258. A special committee of the American Society for Microbiology will conduct an annual review of this appendix and its recommendation for changes will be presented to the Recombinant DNA Advisory Committee as proposed amendments to the *NIH Guidelines*.

Appendix B - Table 1. Basis for the Classification of Biohazardous Agents by Risk Group (RG)

Risk Group 1 (RG1)	Agents that are not associated with disease in health adult humans
Risk Group 2 (RG2)	Agents that are associated with human disease which is rarely serious and for which preventative or therapeutic interventions are *often* available
Risk Group 3 (RG3)	Agents that are associated with serious or lethal human disease for which preventative or therapeutic interventions *may be* available (high individual risk but low community risk)
Risk Group 4 (RG4)	Agents that are likely to cause serious or lethal human disease for which preventative or therapeutic interventions are *not usually* available (high individual risk and high community risk)

Appendix B-I. Risk Group 1 (RG1) Agents

RG1 agents are not associated with disease in healthy adult humans. Examples of RG1 agents include asporogenic *Bacillus subtilis* or *Bacillus licheniformis* (see Appendix C-IV-A, *Bacillus subtilis* or *Bacilluslicheniformis* Host-Vector Systems, Exceptions); adeno- associated virus (AAV) types 1 through 4; and recombinant AAV constructs, in which the transgene does not encode either a potentially tumorigenic gene product or a toxin molecule and are produced in the absence of a helper virus. A strain of *Escherichia coli* (see Appendix C-II-A, *Escherichia coli* K-12 Host Vector Systems, Exceptions) is an RG1 agent if it (1) does not possess a complete lipopolysaccharide (*i.e.*, lacks the O antigen); and (2) does not carry any active virulence factor (*e.g.*, toxins) or colonization factors and does not carry any genes encoding these factors.

Those agents not listed in Risk Groups (RGs) 2, 3 and 4 are not automatically or implicitly classified in RG1; a risk assessment must be conducted based on the known and potential properties of the agents and their relationship to agents that are listed.

Appendix B-II. Risk Group 2 (RG2) Agents

RG2 agents are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are *often* available.

Appendix B-II-A. Risk Group 2 (RG2) - Bacterial Agents Including Chlamydia

--*Acinetobacter baumannii* (formerly *Acinetobacter calcoaceticus*)
--*Actinobacillus*
--*Actinomyces pyogenes* (formerly *Corynebacterium pyogenes*)
--*Aeromonas hydrophila*
--*Amycolata autotrophica*
--*Archanobacterium haemolyticum* (formerly *Corynebacterium haemolyticum*)
--*Arizona hinshawii* - all serotypes
--*Bacillus anthracis*
--*Bartonella henselae, B. quintana, B. vinsonii*
--*Bordetella* including *B. pertussis*
--*Borrelia recurrentis, B. burgdorferi*
--*Burkholderia* (formerly *Pseudomonas* species) except those listed in Appendix B-III-A (RG3))
--*Campylobacter coli, C. fetus, C. jejuni*
--*Chlamydia psittaci*, *C. trachomatis*, *C. pneumoniae*
--*Clostridium botulinum*, *Cl. chauvoei, Cl. haemolyticum, Cl. histolyticum, Cl. novyi, Cl. septicum, Cl. tetani*
--*Corynebacterium diphtheriae, C. pseudotuberculosis, C. renale*
--*Dermatophilus congolensis*
--*Edwardsiella tarda*

--*Erysipelothrix rhusiopathiae*
--*Escherichia coli* - all enteropathogenic, enterotoxigenic, enteroinvasive and strains bearing K1 antigen, including *E. coli* O157:H7
--*Haemophilus ducreyi, H. influenzae*
--*Helicobacter pylori*
--*Klebsiella* - all species except *K. oxytoca* (RG1)
--*Legionella* including *L. pneumophila*
--*Leptospira interrogans* - all serotypes
--*Listeria*
--*Moraxella*
--*Mycobacterium* (except those listed in Appendix B-III-A (RG3)) including *M. avium* complex, *M. asiaticum, M. bovis* BCG vaccine strain, *M. chelonei, M. fortuitum, M. kansasii, M. leprae, M. malmoense, M. marinum, M. paratuberculosis, M. scrofulaceum, M. simiae, M. szulgai, M. ulcerans, M. xenopi*
--*Mycoplasma*, except *M. mycoides* and *M. agalactiae* which are restricted animal pathogens
--*Neisseria gonorrhoeae*, *N. meningitidis*
--*Nocardia asteroides, N. brasiliensis, N. otitidiscaviarum, N. transvalensis*
--*Rhodococcus equi*
--*Salmonella* including *S. arizonae, S. cholerasuis, S. enteritidis, S. gallinarum-pullorum, S. meleagridis, S. paratyphi,* A, B, C, *S. typhi*, *S. typhimurium*
--*Shigella* including *S. boydii, S. dysenteriae,* type 1, *S. flexneri, S. sonnei*
--*Sphaerophorus necrophorus*
--*Staphylococcus aureus*
--*Streptobacillus moniliformis*
--*Streptococcus* including *S. pneumoniae, S. pyogenes*
--*Treponema pallidum, T. carateum*
--*Vibrio cholerae, V. parahemolyticus, V. vulnificus*
--*Yersinia enterocolitica*

Appendix B-II-B. Risk Group 2 (RG2) - Fungal Agents

--*Blastomyces dermatitidis*
--*Cladosporium bantianum, C. (Xylohypha) trichoides*
--*Cryptococcus neoformans*
--*Dactylaria galopava (Ochroconis gallopavum)*
--*Epidermophyton*
--*Exophiala (Wangiella) dermatitidis*
--*Fonsecaea pedrosoi*
--*Microsporum*
--*Paracoccidioides braziliensis*
--*Penicillium marneffei*
--*Sporothrix schenckii*
--*Trichophyton*

Appendix B-II-C. Risk Group 2 (RG2) - Parasitic Agents

--*Ancylostoma* human hookworms including *A. duodenale, A. ceylanicum*
--*Ascaris* including *Ascaris lumbricoides suum*
--*Babesia* including *B. divergens, B. microti*
--*Brugia* filaria worms including *B. malayi, B. timori*
--*Coccidia*
--*Cryptosporidium* including *C. parvum*
--*Cysticercus cellulosae* (hydatid cyst, larva of *T. solium*)
--*Echinococcus* including *E. granulosis, E. multilocularis, E. vogeli*
--*Entamoeba histolytica*
--*Enterobius*
--*Fasciola* including *F. gigantica, F. hepatica*
--*Giardia* including *G. lamblia*
--*Heterophyes*
--*Hymenolepis* including *H. diminuta, H. nana*
--*Isospora*
--*Leishmania* including *L. braziliensis, L. donovani, L. ethiopia, L. major, L. mexicana, L. peruvania, L. tropica*
--*Loa loa* filaria worms
--*Microsporidium*
--*Naegleria fowleri*
--*Necator* human hookworms including *N. americanus*
--*Onchocerca* filaria worms including, *O. volvulus*
--*Plasmodium* including simian species, *P. cynomologi, P. falciparum, P. malariae, P. ovale, P. vivax*
--*Sarcocystis* including *S. sui hominis*
--*Schistosoma* including *S. haematobium, S. intercalatum, S. japonicum, S. mansoni, S. mekongi*
--*Strongyloides* including *S. stercoralis*
--*Taenia solium*
--*Toxocara* including *T. canis*
--*Toxoplasma* including *T. gondii*
--*Trichinella spiralis*
--*Trypanosoma* including *T. brucei brucei, T. brucei gambiense, T. brucei rhodesiense, T. cruzi*
--*Wuchereria bancrofti* filaria worms

Appendix B-II-D. Risk Group 2 (RG2) – Viruses

Adenoviruses, human - all types

Alphaviruses (Togaviruses) - Group A Arboviruses
--Eastern equine encephalomyelitis virus
--Venezuelan equine encephalomyelitis vaccine strain TC-83
--Western equine encephalomyelitis virus

Arenaviruses
--Lymphocytic choriomeningitis virus (non-neurotropic strains)
--Tacaribe virus complex
--Other viruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Bunyaviruses
--Bunyamwera virus
--Rift Valley fever virus vaccine strain MP-12
--Other viruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Caliciviruses

Coronaviruses

Flaviviruses (Togaviruses) - Group B Arboviruses
--Dengue virus serotypes 1, 2, 3, and 4
--Yellow fever virus vaccine strain 17D
--Other viruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Hepatitis A, B, C, D, and E viruses

Herpesviruses - except Herpesvirus simiae (Monkey B virus) (see Appendix B-IV-D, *Risk Group 4 (RG4) – Viral Agents*)
--Cytomegalovirus
--Epstein Barr virus
--*Herpes simplex* types 1 and 2
--*Herpes zoster*
--Human herpesvirus types 6 and 7

Orthomyxoviruses
--Influenza viruses types A, B, and C
--Other tick-borne orthomyxoviruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Papovaviruses
--All human papilloma viruses

Paramyxoviruses
--Newcastle disease virus
--Measles virus
--Mumps virus
--Parainfluenza viruses types 1, 2, 3, and 4
--Respiratory syncytial virus

Parvoviruses
--Human parvovirus (B19)

Picornaviruses
--Coxsackie viruses types A and B
--Echoviruses - all types
--Polioviruses - all types, wild and attenuated
--Rhinoviruses - all types

Poxviruses - all types except Monkeypox virus (see Appendix B-III-D, *Risk Group 3 (RG3) - Viruses and Prions*) and restricted poxviruses including Alastrim, Smallpox, and Whitepox (see Section V-L, *Footnotes and References of Sections I through IV*)
Reoviruses - all types including Coltivirus, human Rotavirus, and Orbivirus (Colorado tick fever virus)
Rhabdoviruses
--Rabies virus - all strains
--Vesicular stomatitis virus - laboratory adapted strains including VSV-Indiana, San Juan, and Glasgow

Togaviruses (see Alphaviruses and Flaviviruses)
--Rubivirus (rubella)

Appendix B-III. Risk Group 3 (RG3) Agents

RG3 agents are associated with serious or lethal human disease for which preventive or therapeutic interventions *may be* available.

Appendix B-III-A. Risk Group 3 (RG3) - Bacterial Agents Including Rickettsia

--*Bartonella*
--*Brucella* including *B. abortus, B. canis*, *B. suis*
--*Burkholderia (Pseudomonas) mallei, B. pseudomallei*
--*Coxiella burnetii*
--*Francisella tularensis*
--*Mycobacterium bovis* (except BCG strain, see Appendix B-II-A, *Risk Group 2 (RG2) - Bacterial Agents Including Chlamydia*), *M. tuberculosis*
--*Pasteurella multocida* type B -"buffalo" and other virulent strains
--Rickettsia akari, R. australis, R. canada, R. conorii, R. prowazekii, R. rickettsii, R, siberica, R. tsutsugamushi, R. typhi (R. mooseri)
--*Yersinia pestis*

Appendix B-III-B. Risk Group 3 (RG3) - Fungal Agents

--*Coccidioides immitis* (sporulating cultures; contaminated soil)
--*Histoplasma capsulatum, H. capsulatum var.. duboisii*

Appendix B-III-C. Risk Group 3 (RG3) - Parasitic Agents
None

Appendix B-III-D. Risk Group 3 (RG3) - Viruses and Prions

Alphaviruses (Togaviruses) - Group A Arboviruses
--Semliki Forest virus
--St. Louis encephalitis virus
--Venezuelan equine encephalomyelitis virus (except the vaccine strain TC-83, see Appendix B-II-D (RG2))
--Other viruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Arenaviruses
--Flexal
--Lymphocytic choriomeningitis virus (LCM) (neurotropic strains)

Bunyaviruses
--Hantaviruses including Hantaan virus
--Rift Valley fever virus

Flaviviruses (Togaviruses) - Group B Arboviruses
--Japanese encephalitis virus
--Yellow fever virus
--Other viruses as listed in the reference source (see Section V-C, *Footnotes and References of Sections I through IV*)

Poxviruses
--Monkeypox virus

Prions
--Transmissible spongioform encephalopathies (TME) agents (Creutzfeldt-Jacob disease and kuru agents)(see Section V-C, *Footnotes and References of Sections I through IV*, for containment instruction)

Retroviruses
--Human immunodeficiency virus (HIV) types 1 and 2
--Human T cell lymphotropic virus (HTLV) types 1 and 2
--Simian immunodeficiency virus (SIV)

Rhabdoviruses
--Vesicular stomatitis virus

Appendix B-IV. Risk Group 4 (RG4) Agents
RG4 agents are likely to cause serious or lethal human disease for which preventive or therapeutic interventions are *not usually* available.

Appendix B-IV-A. Risk Group 4 (RG4) - Bacterial Agents
None

Appendix B-IV-B. Risk Group 4 (RG4) - Fungal Agents
None

Appendix B-IV-C. Risk Group 4 (RG4) - Parasitic Agents
None

Appendix B-IV-D. Risk Group 4 (RG4) - Viral Agents

Arenaviruses
--Guanarito virus
--Lassa virus

--Junin virus
--Machupo virus
--Sabia

Bunyaviruses (Nairovirus)
--Crimean-Congo hemorrhagic fever virus

Filoviruses
--Ebola virus
--Marburg virus

Flaviruses (Togaviruses) - Group B Arboviruses
--Tick-borne encephalitis virus complex including Absetterov, Central European encephalitis, Hanzalova, Hypr, Kumlinge, Kyasanur Forest disease, Omsk hemorrhagic fever, and Russian spring-summer encephalitis viruses

Herpesviruses (alpha)
--Herpesvirus simiae (Herpes B or Monkey B virus)

Paramyxoviruses
--Equine morbillivirus

Hemorrhagic fever agents and viruses as yet undefined

Appendix B-V. Animal Viral Etiologic Agents in Common Use

The following list of animal etiologic agents is appended to the list of human etiologic agents. None of these agents is associated with disease in healthy adult humans; they are commonly used in laboratory experimental work.

A containment level appropriate for RG1 human agents is recommended for their use. For agents that are infectious to human cells, e.g., amphotropic and xenotropic strains of murine leukemia virus, a containment level appropriate for RG2 human agents is recommended.

Baculoviruses

Herpesviruses
--Herpesvirus ateles
--Herpesvirus saimiri
--Marek's disease virus
--Murine cytomegalovirus

Papovaviruses
--Bovine papilloma virus
--Polyoma virus
--Shope papilloma virus
--Simian virus 40 (SV40)

Retroviruses
--Avian leukosis virus
--Avian sarcoma virus
--Bovine leukemia virus
--Feline leukemia virus
--Feline sarcoma virus
--Gibbon leukemia virus
--Mason-Pfizer monkey virus
--Mouse mammary tumor virus
--Murine leukemia virus
--Murine sarcoma virus
--Rat leukemia virus