

Appendix D: Aerosol Transmissible Pathogens – Laboratory (Mandatory)

This appendix contains a list of agents that, when reasonably anticipated to be present, require a laboratory to comply with Section 5199 for laboratory operations by performing a risk assessment and establishing a biosafety plan that includes appropriate control measures as identified in the standard.

Adenovirus (in clinical specimens and in cultures or other materials derived from clinical specimens)

Arboviruses, unless identified individually elsewhere in this list (large quantities or high concentrations* of arboviruses for which CDC recommends BSL-2, e.g., dengue virus; potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arboviruses for which CDC recommends BSL-3 or higher, e.g., Japanese encephalitis, West Nile virus, Yellow Fever)

Arenaviruses (large quantities or high concentrations of arenaviruses for which CDC recommends BSL-2, e.g., Pichinde virus; potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arenaviruses for which CDC recommends BSL-3 or higher, e.g., Flexal virus)

Bacillus anthracis (activities with high potential for aerosol production**, large quantities or high concentrations, screening environmental samples from *b. anthracis* -contaminated locations)

Blastomyces dermatitidis (sporulating mold-form cultures, processing environmental materials known or likely to contain infectious conidia)

Bordetella pertussis (aerosol generation, or large quantities or high concentrations)

Brucella abortus, *B. canis*, *B. "maris"*, *B. melitensis*, *B. suis* (cultures, experimental animal studies, products of conception containing or believed to contain pathogenic *Brucella* spp.)

Burkholderia mallei, *B. pseudomallei* (potential for aerosol or droplet exposure, handling infected animals, large quantities or high concentrations)

Cercopithecine herpesvirus (see Herpesvirus simiae)

Chlamydia pneumoniae (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Chlamydia psittaci (activities with high potential for droplet or aerosol production, large quantities or high concentrations, non-avian strains, infected caged birds, necropsy of infected)

birds and diagnostic examination of tissues or cultures known to contain or be potentially infected with *C. psittaci* strains of avian origin)

Chlamydia trachomatis (activities with high potential for droplet or aerosol production, large quantities or high concentrations, cultures of lymphogranuloma venereum (LGV) serovars, specimens known or likely to contain *C. trachomatis*)

Clostridium botulinum (activities with high potential for aerosol or droplet production, large quantities or high concentrations)

Coccidioides immitis, *C. posadasii* (sporulating cultures, processing environmental materials known or likely to contain infectious arthroconidia, experimental animal studies involving exposure by the intranasal or pulmonary route)

Corynebacterium diphtheriae

Coxiella burnetti (inoculation, incubation, and harvesting of embryonated eggs or cell cultures; experimental animal studies, animal studies with infected arthropods, necropsy of infected animals, handling infected tissues)

Crimean-Congo haemorrhagic fever virus

Cytomegalovirus, human (viral production, purification, or concentration)

Eastern equine encephalomyelitis virus (EEEV) (clinical materials, infectious cultures, infected animals or arthropods)

Ebola virus

Epstein-Barr virus (viral production, purification, or concentration)

Escherichia coli, shiga toxin-producing only (aerosol generation or high splash potential)

Flexal virus

Francisella tularensis (suspect cultures—including preparatory work for automated identification systems, experimental animal studies, necropsy of infected animals, high concentrations of reduced-virulence strains)

Guanarito virus

Haemophilus influenzae, type b

Hantaviruses (serum or tissue from potentially infected rodents, potentially infected tissues, large quantities or high concentrations, cell cultures, experimental rodent studies)

Helicobacter pylori (homogenizing or vortexing gastric specimens)

Hemorrhagic fever -- specimens from cases thought to be due to dengue or yellow fever viruses or which originate from areas in which communicable hemorrhagic fever are reasonably anticipated to be present

Hendra virus

Hepatitis B, C, and D viruses (activities with high potential for droplet or aerosol generation, large quantities or high concentrations of infectious materials)

Herpes simplex virus 1 and 2

Herpesvirus simiae (B-virus) (consider for any material suspected to contain virus, mandatory for any material known to contain virus, propagation for diagnosis, cultures)

Histoplasma capsulatum (sporulating mold-form cultures, propagating environmental materials known or likely to contain infectious conidia)

Human herpesviruses 6A, 6B, 7, and 8 (viral production, purification, or concentration)

Influenza virus, non-contemporary human (H2N2) strains, 1918 influenza strain, highly pathogenic avian influenza (HPAI) (large animals infected with 1918 strain and animals infected with HPAI strains in ABSL-3 facilities, loose-housed animals infected with HPAI strains in BSL-3-Ag facilities)

Influenza virus, H5N1 - human, avian

Junin virus

Kyasanur forest disease virus

Lassa fever virus

Legionella pneumophila, other legionella-like agents (aerosol generation, large quantities or high concentrations)

Lymphocytic choriomeningitis virus (LCMV) (field isolates and clinical materials from human cases, activities with high potential for aerosol generation, large quantities or high concentrations, strains lethal to nonhuman primates, infected transplantable tumors, infected hamsters)

Machupo virus

Marburg virus

Measles virus

Monkeypox virus (experimentally or naturally infected animals)

Mumps virus

Mycobacterium tuberculosis complex (*M. africanum*, *M. bovis*, *M. caprae*, *M. microti*, *M. pinnipedii*, *M. tuberculosis* (aerosol-generating activities with clinical specimens, cultures, experimental animal studies with infected nonhuman primates))

Mycobacteria spp. other than those in the *M. tuberculosis* complex and *M. leprae* (aerosol generation)

Mycoplasma pneumoniae

Neisseria gonorrhoeae (large quantities or high concentrations, consider for aerosol or droplet generation)

Neisseria meningitidis (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Nipah virus

Omsk hemorrhagic fever virus

Parvovirus B19

Prions (bovine spongiform encephalopathy prions, only when supported by a risk assessment)

Rabies virus, and related lyssaviruses (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Retroviruses, including Human and Simian Immunodeficiency viruses (HIV and SIV) (activities with high potential for aerosol or droplet production, large quantities or high concentrations)

Rickettsia prowazekii, *Orientia (Rickettsia) tsutsugamushi*, *R. typhi (R. mooseri)*, Spotted Fever Group agents (*R. akari*, *R. australis*, *R. conorii*, *R. japonicum*, *R. rickettsii*, and *R. siberica*) (known or potentially infectious materials; inoculation, incubation, and harvesting of embryonated eggs or cell cultures; experimental animal studies with infected arthropods)

Rift valley fever virus (RVFV)

Rubella virus

Sabia virus

Salmonella spp. other than *S. typhi* (aerosol generation or high splash potential)

Salmonella typhi (activities with significant potential for aerosol generation, large quantities)

SARS coronavirus (untreated specimens, cell cultures, experimental animal studies)

Shigella spp. (aerosol generation or high splash potential)

Streptococcus spp., group A

Tick-borne encephalitis viruses (Central European tick-borne encephalitis, Far Eastern tick-borne encephalitis, Russian spring and summer encephalitis)

Vaccinia virus

Varicella zoster virus

Variola major virus (Smallpox virus)

Variola minor virus (Alastrim)

Venezuelan equine encephalitis virus (VEEV) (clinical materials, infectious cultures, infected animals or arthropods)

West Nile virus (WNV) (dissection of field-collected dead birds, cultures, experimental animal and vector studies)

Western equine encephalitis virus (WEEV) (clinical materials, infectious cultures, infected animals or arthropods)

Yersinia pestis (antibiotic resistant strains, activities with high potential for droplet or aerosol production, large quantities or high concentrations, infected arthropods, potentially infected animals)

* 'Large quantities or high concentrations' refers to volumes or concentrations considerably in excess of those typically used for identification and typing activities. A risk assessment must be performed to determine if the quantity or concentration to be used carries an increased risk, and would therefore require aerosol control.

** 'activities with high potential for aerosol generation' include centrifugation