

Avian Flu and Human Pandemic Flu Summary Report—Meeting Held in Geneva, Switzerland 7-9 November, 2005

The World Health Organization (WHO), the Food and Agriculture Organization (FAO), the World Organization for Animal Health (OIE), and the World Bank jointly convened a meeting on avian influenza and human pandemic influenza on November 7-9, 2005. The meeting, which was attended by more than 600 experts from over 100 countries, marked the largest gathering held to date to assess the multiple threats arising from outbreaks of highly pathogenic H5N1 avian influenza

virus, that have been ongoing in parts of the world since mid-2003. The meeting summary report is found on the following site.

Reference

World Health Organization, Food and Agriculture Organization, World Bank, & World Organization for Animal Health. (2005). Avian Flu and Human Pandemic Flu Summary Report—Meeting Held in Geneva, Switzerland 7-9 November, 2005. Available at www.who.int/mediacentre/events/2005/avian_influenza/summary_report_Nov_2005_meeting.pdf

Ask the Experts

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Do you have a biosafety question and you're not sure who to ask? Send your questions to the "Ask the Experts" column and I'll get them answered for you. Drawing from my own experience or that of other experts in the field, we'll try to compile a thorough and comprehensive answer to your question. Please e-mail your questions to jkeene@biohaztec.com or to Co-Editor Barbara Johnson at barbara_johnson@verizon.net or Co-Editor Karen B. Byers at karen_byers@dfci.harvard.edu.

Should Decontamination of Biocontainment Laboratories Be Validated?

In the case of spills of biohazardous materials outside of the biosafety cabinet in a containment laboratory, aerosols of infectious agents are produced that can, theoretically, reach many areas of the laboratory. The spread and deposition of the hazardous material depends on many factors (size of spill, type of release, ventilation, etc.). Therefore, the decontamination process should be capable of reaching all areas of the facility that might become contaminated with aerosolized infectious materials during a laboratory incident.

Decontamination requires contact of the decontaminating agent with the infectious material for a specific time, under a proscribed set of environmental conditions (temperature, humidity, etc.). Historically, any decontamination process relies on the ability of the system to provide the standard concentration of disinfectant to the affected space for the proscribed period of time, under standard environmental conditions. Such a requirement

involves appropriate sealing of the space to prevent accidental release of the decontaminating agent and to insure appropriate concentration, as well as a standardized methodology for generation and distribution of the decontaminating agent until the decontamination process is complete.

A number of new materials, including Vapor Phase Hydrogen Peroxide (VHP) and Chlorine Dioxide (ClO₂), and processes using these materials are being considered for the decontamination of biocontainment laboratories in the case of a biohazardous spill because their toxicity is potentially lower than formaldehyde. Currently, the standard for biological decontamination of biocontainment spaces is the use of paraformaldehyde to generate formaldehyde gas. Although there are obvious potential problems with the use of paraformaldehyde, not the least of which is its toxicity, it has been, and can be, used safely by personnel who are experienced in space decontamination. However, it should be noted that disinfectants in general, including VHP and ClO₂, are all potentially toxic to varying extents and must be considered as hazardous chemicals (Aggazzoti, 2004; Monarca, 2005).

Any system for decontamination of a biocontainment laboratory should be validated in a standard configuration for the particular laboratory in question. Such validation allows for easy application of the disinfectant by facility personnel and ensures repetitive efficacy of the process. The paraformaldehyde process, unlike some of the newer processes, has been well documented and its efficacy has been validated.

For newer decontamination systems, prior to occupancy of each facility it is suggested that:

1. A standard protocol is developed that provides for attaining a standard disinfectant concentration in all rooms of the facility; the concentration should be sufficient to result in consistent, repeatable inactivation of the indicator organisms.
2. Within the space to be decontaminated, the concentration of the disinfectant should be constant for a sufficient time to allow for the inactivation as mentioned above.
3. Indicator organisms should be placed in areas of the facility that are considered difficult to decontaminate in order to demonstrate complete distribution and decontamination.
4. Any protocol that is chosen should be capable of being repeatable, and for validation purposes should be performed a minimum of three times with complete inactivation of the indicator organisms demonstrated for each test.
5. The validation of decontamination of HEPA filter housings should be a standardized process, performed by drawing the disinfectant gas through the filter and recirculating the disinfectant through the filter or holding the disinfectant in the filter at an appropriate concentration and for a sufficient time to inactivate indicator organisms on the surface and within the HEPA filter pleats. Again, this procedure should be performed a minimum of three times with complete inactivation of the indicator organisms demonstrated for each test.

Biosafety Tips

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Biosafety Tips brings you practical approaches to biosafety or “news you can use.” If you are looking for a useful and sensible solution to a biocontainment problem or perhaps a reference to help convince a skeptical researcher of the need for caution, this is the place to look. In this column I will share some biosafety insights for managing a variety of workplace situations. I welcome feedback or suggestions for future topics. Please e-mail any comments or suggestions to karen_byers@dfci.harvard.edu or to Co-Editor Barbara Johnson at barbara_johnson@verizon.net.

Zoonoses: 10 Exposures to Hantavirus in Animal and Laboratory Workers

What can we learn about zoonotic infections from a paper published in 1986? The report describes the uncon-

Any process suggested for use as biological decontamination of biocontainment laboratories should be demonstrated to be equal to, or exceed, the efficacy of the paraformaldehyde/formaldehyde process. Other decontamination materials (VHP, ClO₂, etc.) have significant potential to provide a safe and effective decontamination of such facilities; however, any new technologies for decontamination of biocontainment laboratories or HEPA filter housings must demonstrate a scientifically defensible, effective, repeatable process on either the specific laboratory facility or the HEPA filters and HEPA filter housings.

References

- Aggazzotti, G., Righi, E., Fantuzzi, G., Biasotti, B., Ravera, G., Kanitz, S., Barbone, F., Sansebastiano, G., Battaglia, M. A., Leoni, V., Fabiana, L., Triassi, M., & Sciacca, S. (2004). Collaborative group for the study of chlorinated drinking waters and pregnancy: Chlorination by-products (CBPs) in drinking water and adverse pregnancy outcomes in Italy. *Journal of Water Health*, 2(4), 233-247.
- Monarca, S., Feretti, D., Zani, C., Rizzoni, M., Casarella, S., & Gustavino, B. (2005). Genotoxicity of drinking water disinfectants in plant bioassays. *Environmental and Molecular Mutagenesis*, 46(2), 96-103.

tained maceration and homogenization of rat tissue that allowed the aerosol transmission of Hantavirus (Lloyd & Jones, 1986). At a cancer research institute in the United Kingdom, four clinical cases of Hantavirus infection occurred in laboratory personnel between January and July 1977. All of the infected staff members worked in the operating and postmortem room on tumor studies in the Louvain rat model, which had been imported from Belgium in 1975. Six other staff members worked in the same animal facility and five of them had subclinical infections, or antibody responses without clinical symptoms. Nine out of 10 staff who worked in this room had antibody test results that confirmed exposure to Hantavirus. This was a zoonotic outbreak; the rats were not experimentally infected.

A review of the postmortem room ventilation revealed that air from the supply vents in the ceiling flowed