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Workshop on Respiratory Protection for Airborne Infectious Agents
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Breakout Summary Report

Questions Related to

Plenary Sessions 1 & 2

DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Breakout Summary Report
Questions Related to Plenary Sessions 1 & 2

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#1--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

What considerations differentiate infectious from non-infectious aerosols?

- For an aerosol to remain infectious, organisms must remain viable and competent to transmit infection. Exposure to particles incompetent to transmit infection is irrelevant for transmission of disease.
- Microorganisms replicate and thus can amplify.
- Current terminology about modes of transmission of disease – airborne, droplet, and contact – are not intuitive. More intuitive and better defined terms (respirable, spray, and contact?) would be useful.
- Size specific distribution of infectious particles should be determined for sick and healthy populations.

#1--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

- We need research for specific organisms to see how far they can be sprayed and remain viable and infectious. The 3 foot guideline for droplet transmission may or may be correct. Research should include field sampling from infectious patients, microbiological characteristics, epidemiology.

- We need research about ability of organisms be become re-aerosolized from filters and other surfaces.

- Individual susceptibility factors are an important factor and can differ greatly among individuals in a population.

#2--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

Without an exposure limit, how can one determine when respiratory protection is needed and select the appropriate respiratory protection?

- The most important research need as expressed by a number of speakers was the need to have better assessment of exposure and to develop information about exposure-response and infectious doses. Research should include animal modeling. This would help in determining rational exposure limits.
- Example of “exposure limit”: the military calculates survival rates for exposures.
- Infectious doses are the foundation for meaningful standards.

#2--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

- Modeling results should be validated by consistency with epidemiological observations. Where data is available, assumptions underlying models should be adjusted to incorporate observations.
- We need clear-cut and clinically relevant endpoints to monitor effectiveness of interventions, as in other industries. For example, TST conversion is a difficult end point.
- It should be remembered that respirators are part of a system and a systems approach should be used in determining use. Environmental controls, administrative controls, and other PPE need to be considered. In doing risk assessments, individual facilities should be able to consider their own environmental control capabilities – different APFs might be appropriate for different facilities.

#2--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

- There was discussion of how to do risk assessment. Epidemiology, clinical experience, modeling, should all be considered. This should guide operational research which should, in turn, translate into evidence-based rules and regulations.

- We need research that identifies the individual contributions of preventive interventions, including respirators (relative contributions of source control, environmental control, administrative controls, and PPE).

- We need biological models (including animal models) to assess the relative efficacy of preventive interventions.

#2--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

- Control banding approaches (categorizing agents according to risk and making recommendations based on that) may be quite useful.

- We need to develop generic, unified decision logic relevant to all infectious agents. It should include how to assess risk, hazards, and needed level of respiratory protection.

#3--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

Among the rules and regulations governing use of respirators in health care settings, which are the most appropriate? Which are the least? What research needs to be done?

- Respiratory protection should not be considered separate of the other elements of the prevention hierarchy. Respiratory protection is a back up to other interventions and is a last line of defense.

- If we understood relevant exposures and risks, it would be easier to do risk assessment in a fashion similar to that done by the EPA for nonviable agents.

#3--PLENARY SESSION 1: Control of Airborne Infectious Agents – Basics

- If risk assessment indicates need for respirators, than a program is needed. We need to be smarter about determining when respirators are needed.
- We need research to identify the individual protective contribution of respirators.
- We need to identify in what situations the use of FFP respirators should be voluntary.
- We need to look at other options than FFP respirators that do not require fit testing – better PAPRs or approved use of hospital air to drive supplied air respirators.
- Recommendations should be evidence and outcome based.

#4--PLENARY SESSION 2: Current state–of-science about transmission of airborne infectious agents

What did we learn from the foreign experience on SARS, particularly in Toronto and Taiwan, about respiratory protection in hospitals?

- We learned that contact and droplet precautions were highly effective. Even though there were several episodes of airborne transmission, they were the exception rather than the rule.
- A total approach taking mucosal, upper airway, respirable, and contact exposures all into account was important.
- Presence of an effective respiratory protection program will address even new, unknown threats.

#5--PLENARY SESSION 1: Control of Airborne Infectious Agents - Basics

In the era of BioWatch devices and monitoring of the mail by PCR, how can we improve upon current approaches to identifying contagious individuals and infectious environments? Do we need improved methods to assess the competence of microorganisms for airborne transmission of disease?

- Real time detection of ID agents was proposed, but debated on basis of cost-effectiveness and lack of ability of PCR or antibodies to differentiate between viable, infectious and nonviable noninfectious particles. Probably better for research or focused rapid identification of cases.
- We need to better define ability of organisms to survive and remain infectious in aerosols and thus transmit disease via an airborne (respirable) route.
- Perhaps latent TB infection should be a reportable disease. This would allow us to better track the impact of interventions.

Additional Relevant Comments

We cannot forget that emergency preparedness for bioterrorism, outbreaks of new, emerging and re-emerging diseases, etc. are important considerations. These catastrophic events may need a different paradigm than management of usual day to day hazards.

In catastrophic situations, supply and distribution of vaccines, respirators, drugs, etc. are very important issues.

In catastrophic situations, availability of respirators with good “out of box” fit would be highly desirable.