



# VIGILAIR® White Paper: Influenza's Airborne Attack

Recently (October 2006), the Centers for Disease Control and Prevention revised its infection control recommendations for Health Care Workers (HCW) who are responding to an influenza pandemic<sup>1</sup>. The CDC now recommends that it would be “prudent” for HCWs to use N-95 respirators for “...direct patient care activities (e.g., examination, bathing, feeding) and for support staff who may have direct contact with pandemic influenza patients.”

## Why the Change?

This change reflects escalating concern about, and a growing body of literature supporting the prevalence of airborne transmission of influenza and other pathogens. Historically the importance of airborne transmission has been overlooked (minimized), but recent studies and scientific reviews have demonstrated that:

- Many pathogenic microorganisms can become airborne
- Airborne pathogens can travel considerable distances
- Airborne pathogens can cause infections in susceptible hosts

## Is Influenza Transmitted via the Airborne Route?

Yes.

The scientific community recognizes several modes of influenza transmission: “Human influenza is transmitted by inhalation of infectious droplets and droplet nuclei, by direct contact, and perhaps, by indirect (fomite) contact...The relative efficiency of the different routes of transmission has not been defined.”<sup>2</sup>

It is true that the *exact* role each mode contributes to infection is not clear. However, recent literature has recognized the emerging significance of aerosolization involving droplet nuclei. In fact, many well respected medical reference books say that aerosols are an important mode of transmission for influenza.<sup>3,4,5,6</sup>

## Influenza Implications

As the world prepares for a potential influenza pandemic, now is the time to consider all the methods to mitigate this threat. Acknowledging the role airborne transmission plays in the spread of influenza allows healthcare providers to plan properly. Recent studies show that we ignore this pathogen pathway at our own peril.

## About the Authors

VIGILAIR Systems, Inc. is the leader in providing airborne contamination control solutions for hospitals. Installed within the ventilation system of a hospital, VIGILAIR® technology combines enhanced Ultraviolet Germicidal Irradiation (eUVGI), Computational Fluid Dynamics (CFD) and high efficiency filtration to provide predictable pathogen removal and destruction. VIGILAIR® installations can be found in the U.S., Canada, Mexico and Asia. In addition to healthcare, VIGILAIR serves cleanroom manufacturing and biodefense clients. VIGILAIR® is designated as an Approved Anti-terrorism Technology (ATT) by the Department of Homeland Security.

## Notable Peer Reviewed Studies Suggesting Influenza is Airborne

Study	Findings/Excerpts
Tellier R. Review of aerosol transmission of influenza A virus. <i>Emerging Infectious Diseases</i> . 2006; Vol. 12, No. 11:1657-1662.	"Evidence supporting aerosol transmission...appears compelling...Despite extensive searches, I have not found a study that proves the notion that large-droplets transmission is predominant and that aerosol transmission is negligible (or non-existent)."
Tang JW, et al. Factors involved in the aerosol transmission of infection and control ventilation in healthcare premises. <i>Journal of Hospital Infection</i> 2006; Vol. 64:100-114	"...Most reports of influenza transmission do not provide enough temporal-spatial data to determine whether transmission is mainly due to droplet, contact or airborne spread... However, there are reports to suggest that in pandemic or large, explosive outbreak situations, influenza can become truly airborne."
Moser MR, et al. An outbreak of influenza aboard a commercial airliner. <i>American Journal of Epidemiology</i> . 1979; Vol. 110:1-6.	Study documents how airborne transmission played a role in the influenza infection of passengers who were aboard an airplane with a malfunctioning ventilation system.
Riley RL. Airborne infection. <i>American Journal of Medicine</i> . 1974 Vol. 5:466-75.	Strongest evidence of aerosol transmission. Study group of hospitalized TB patients protected with aerosol prevention precautions (and not droplet protection) experienced a 2% flu infection rate. The infection rate for the control group of patients without these precautions was 18%.

## Additional Peer Reviewed Sources Supporting Airborne Influenza

Goldmann D. Epidemiology and prevention of pediatric viral respiratory infections in healthcare institutions. *Emerging Infectious Diseases*. 2001; Vol. 7, No. 2:249-253.

Knight V. Airborne transmission and pulmonary deposition of respiratory viruses. In: Hers JF, Winkles KC, editors. *Airborne transmission and airborne infections*. 6<sup>th</sup> International Symposium on Aerobiology. New York: Wiley; 1973:175-182.

Douglas RG. Influenza in man. In: Kilbourne ED, editor. *The influenza viruses and influenza*. New York: Academic Press; 1975:375-447.

Loosli C, Lemon H, Robertson O, Appel E. Experimental air-borne influenza infection. 1. Influence of humidity on survival of virus in air. *Proc Soc Exp Biol Med*. 1943; Vol. 53:205-6.

Alford RH, Kasel JA, Gerone PJ, Knight V. Human influenza resulting from aerosol inhalation. *Proc Soc Exp Biol Med*. 1966; Vol.122:800-804.

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- Avian influenza A (H5N1) infection in humans Beigel et.al, Writing Committee of the World Health Organization (WHO) Consultation on Human Influenza A/H5.N *Engl J Med*. 2006 Feb 23;354(8):884.
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