



Protecting, maintaining and improving the health of all Minnesotans

April 4, 2006

Dear Infection Control Director and Occupational or Employee Health Director:

RE: Infection Control and Clinical Issues for Potential Avian and Pandemic Influenza

I am writing to discuss the Minnesota Department of Health (MDH) recommendations for infection control for avian and pandemic influenza and to provide you with a clinical approach to evaluating patients who may be infected with avian influenza. These recommendations will be published in an upcoming issue of the MDH Disease Control Newsletter, but we wanted to inform you of them prior to publication.

MDH Recommendations

MDH recommends full barrier precautions for avian and pandemic influenza. Full barrier precautions include airborne precautions. Because this recommendation will have implications for health care facilities to provide respiratory protection for employees, we thought it was important to review the rationale behind these recommendations. We are sending these recommendations to the hospital administrators, infection control departments, and occupational and employee health departments of Minnesota hospitals. In addition, we are arranging conference calls to discuss these recommendations. **The dates and times of the calls are April 7 at 8 am, April 10 at 1 pm and April 11 at 9 am (the calls will cover the same content). The call in number is 1-866-248-0553.** MDH is aware that supplies of PPE will be limited during a pandemic and we will provide additional guidance to healthcare facilities on the prioritization and possible reuse of PPE. In the meantime, we suggest that you review your healthcare facility's Infection Control Plan and capacity for airborne precautions. This includes beginning a systematic process to purchase, fit-test employees, and stockpile personal protective equipment, particularly respiratory protection equipment including N-95 respirators and powered air purifying respirators (PAPRs). It is almost a certainty that world-wide demand for respiratory equipment will exceed the manufacturing capacity to produce these products in the event of a pandemic and there are long waiting lists even now.

Infection Control Guidelines

MDH recommends full barrier precautions: airborne and contact precautions, plus eye protection, in addition to standard precautions for all known and suspect cases of H5N1 avian influenza or pandemic influenza (see attached posters), while personal protective equipment (PPE) are available. The rationale for these recommendations is based upon reviews of the scientific literature suggesting that airborne transmission of influenza can occur, and an understanding of respiratory aerosols and their transmission. In addition, it is anticipated that vaccine will not be available during the initial months of a pandemic and antiviral agents are likely to be in short

supply. Current World Health Organization (WHO) and U. S. Centers for Disease Control and Prevention (CDC) infection control guidelines for avian influenza recommend full barrier precautions (including airborne). In contrast, during a pandemic influenza period HHS guidelines for pandemic influenza recommend droplet precautions for routine patient care and airborne precautions for aerosol generating procedures.

CDC infection control guidelines cite a particle size of 5 microns (μm) as a break point that distinguishes between diseases spread by "droplet transmission" (particles $\geq 5 \mu\text{m}$) and diseases spread by "airborne transmission" (particles $< 5 \mu\text{m}$). Larger droplets have been thought to typically travel no more than 3 feet while small particle aerosols have the ability to travel longer distances. Larger droplets are thought to be deposited mainly in the mucous membranes of the nose, eyes, and mouth; small particle aerosols are more likely to be deposited in the lower respiratory tract.

Communicable diseases are classified by their presumed route of transmission (droplet or airborne) and infection control recommendations are based on this classification. Current CDC guidelines recommend that health care workers wear a surgical mask when working within 3 feet of patients with an infection spread via the droplet route and a respirator when in the same room as a patient with an infection spread via the airborne route.

However, transmission of respiratory particles is quite complex. In reality, there is not a clear delineation between droplet and airborne transmission, and the distances that particles travel can vary (e.g., particles $\geq 5 \mu\text{m}$ can travel more than three feet). In addition, the length of time particles remain airborne varies and is determined by particle size, settling velocity, and airflow in the area. Further, there is not a predictable size for droplet nuclei (dried residues); final size depends on the nature of the fluid that contained the organism, the initial size of the aerosol, environmental conditions (e.g., temperature, relative humidity, airflow), the time spent airborne, and the size of the organism within a droplet.

Current H5N1 Situation

Currently, the WHO has confirmed human H5N1 influenza cases in nine countries (Vietnam, Indonesia, Thailand, China, Turkey, Azerbaijan, Cambodia, Egypt and Iraq). The outbreak in birds is extensive and involves Asia, Europe, the Middle East, and Africa. As of April 3, 190 human cases, 107 deaths, have been reported. Updated information on H5N1 can be found on the WHO website (www.who.int). To date, most H5N1 patients have had a history of direct contact with poultry. Nevertheless, there has been evidence of human-to-human transmission in some small clusters, particularly in the case of a child to mother who had prolonged unprotected exposure to the child's respiratory secretions. However, at this point H5N1 influenza is not very transmissible person to person. If a mutation or re-assortment occurs that generates a virus that is very transmissible among humans, this strain could generate a pandemic.

Clinical Features of H5N1

Most patients with H5N1 avian influenza have been previously healthy and presented with respiratory symptoms. Typically, fever and lower respiratory symptoms are present. Watery diarrhea may precede respiratory symptoms. Vomiting, pleuritic pain, and bleeding from the gums and nose may occur. Lower respiratory manifestations are usually present at the time of seeking clinical care. Chest radiographs generally depict abnormalities including diffuse, multifocal, patchy or interstitial infiltrates or segmental or lobar consolidations with air bronchograms. Atypical presentations have included diarrhea and encephalitis. The frequencies of milder illnesses and subclinical infections are unknown. Lower respiratory disease may progress

to the acute respiratory distress syndrome. Multi-organ failure may occur. Common laboratory findings have included lymphopenia and thrombocytopenia.

An algorithm for a clinical approach to patients with possible H5N1 avian influenza is enclosed. **If there is a patient in Minnesota in whom a clinician is suspecting H5N1 infection, MDH should be called at 651-201-5414 or 1-877-676-5414.** There is an epidemiologist available 24/7 to take these calls. Viral isolation should not be attempted in a clinical laboratory. MDH will help facilitate testing at the MDH Public Health Laboratory. Should H5N1 mutate and become a pandemic strain, MDH will issue further recommendations on the clinical approach for patients with pandemic influenza at that time.

Thank you for all you are doing to prepare for potential avian and pandemic influenza. We look forward to continuing to work closely with you as all of us take the steps necessary to protect Minnesotans in the event these diseases occur in the state.

Please do not hesitate to contact us with any questions about avian or pandemic influenza at 651-201-5414 or 1-877-676-5414.

Sincerely,



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