

AVIAN FLU: GUIDANCE FOR PROTECTING WORKERS

1.5 Contact Hours

Presented by:

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AVIAN FLU: GUIDANCE FOR PROTECTING WORKERS

By: Dr. Ratnakar P. Kini

The contents of this course are taken from the Centers for Disease Control and Prevention. Learning objectives and post test have been prepared by Dr. Ratnakar P. Kini

OBJECTIVES:

Upon completion of this course, the learner will be able to:

1. Define what avian flu is
2. Discuss the various strains of the avian flu viruses and the naming system used to identify them
3. Explain the mode of transmission and the clinical features of avian flu
4. Name three (3) common symptoms of avian flu.
5. Identify routes of exposure to avian flu
6. Discuss CDC's guidance for medical workers that transport/treat avian flu patients

BACKGROUND ON THE CURRENT OUTBREAK

An outbreak of influenza A (H5N1), also known as "avian flu" or "bird flu," has been reported in several countries throughout Asia. Cases of avian influenza A (H5N1) in birds have been confirmed in Cambodia, China, Hong Kong, Indonesia, Japan, Laos, Pakistan, South Korea, Thailand, and Vietnam. Human cases of avian influenza have been reported in Thailand and Vietnam. During this outbreak investigation, it has not been determined that avian flu is spread from person to person. This strain of avian influenza A (H5N1) currently affecting Asia has not been found in the United States. The current outbreak of avian influenza has prompted the killing of more than 25 million birds in Asia.

In February 2004, different strains of avian flu were detected among several flocks of birds in the U.S. and state officials ordered the destruction of hundreds of thousands of birds. The avian influenza strain found in Delaware was (H7N2), in Pennsylvania the strain was (H2N2), and the (H5N2) strain was found in Texas. The strain found in Texas has been determined to be "highly pathogenic" to birds. However, the strain of avian influenza in Texas is not the same as the strain that is affecting Asia.¹ There does not appear to be any connection between the illness in the flocks on the East Coast and the flock in Texas. Wild birds are the natural hosts for the virus. Avian flu viruses circulate among birds worldwide and are highly contagious among birds. It is also important to note that the United States annually imports an estimated 20,000 birds from countries with current avian influenza outbreaks, according to the U.S. Fish and Wildlife Service.

BACKGROUND ON INFLUENZA AND AVIAN FLU

Influenza is a category of viruses associated with acute (short), usually self-limited infections, whose symptoms are most commonly fever, muscle pain or aches, and cough. However, illness can be more severe based upon the properties of the virus, the patient's age, pre-existing immunity status, or pre-existing medical conditions.

The influenza virus is described by a three part naming system that includes the virus type, subtype, and strain. There are three major types (A, B, C) and a number of subtypes which are classified based upon the surface coatings of the virus. These surface coatings determine whether the virus will affect humans, pigs, horses or birds, or more than one type of animal.² Within a specific type and subtype of influenza, there are also important differences in the particular strain of virus. For example, the strain of influenza A (H5N1) that has affected birds and humans in much of Asia is not the same strain that is affecting birds in the U.S. or Pakistan.

Influenza viruses also change or mutate over time. "Scientists know that the avian and human influenza viruses can exchange genes when a person is simultaneously infected with viruses from both the common human influenza virus and the avian type. This process of gene swapping inside the human body can give rise to a completely new subtype of the influenza virus to which few, if any, humans would have any natural immunity...If the new virus contains sufficient human flu virus genes, transmission directly from one person to another (instead of from birds to humans only) can occur."³ Some previous outbreak investigations documented limited human-to-human transmission of avian influenza. It is believed that most cases of avian influenza in humans have resulted from contact with infected poultry or contaminated surfaces.

In particular, influenza A (H5N1) has a documented tendency to acquire genes from viruses infecting other animals.⁴ There is particular cause for concern because this strain of influenza A (H5N1) is now spreading from birds (e.g., chickens, ducks, turkeys) to humans, and scientists are trying to determine if the virus is also spreading from human to human.⁵ Since this strain of influenza virus does not commonly infect humans, the general population may not have natural immunity to the virus. The current strain of influenza A (H5N1) that is transmitted from birds to humans is considered to be "highly pathogenic."

ROUTES OF EXPOSURE TO AVIAN FLU

Most human influenza infections are spread by virus-laden respiratory droplets that are expelled during coughing and sneezing. Influenza viruses range in size from 0.08 to 0.12 micrometers.⁶ They are carried in respiratory secretions as small-particle aerosols (less than 10 micrometers in diameter).⁷

In an agricultural setting, animal manure containing influenza virus can contaminate dust and soil, causing infection when the contaminated dust is inhaled. Contaminated farm equipment, feed, cages, or shoes can carry the virus from farm to farm. The virus can also be carried on the bodies and feet of animals, such as rodents. "The virus can survive, at cool temperatures, in contaminated manure for at least three months. In water, the virus

can survive for up to four days at 72° F and more than 30 days at 32° F. For the highly pathogenic form (of influenza A), studies have shown that a single gram of contaminated manure can contain enough virus to infect 1 million birds."⁸

In a food handling/preparation setting, there is also some concern that avian influenza could be transmitted from uncooked birds or bird products. The World Health Organization has also reported a study that found avian influenza A (H5N1) in imported frozen duck meat. Eggs from infected poultry could also be contaminated with the virus.

ADDITIONAL SOURCES OF INFORMATION

There are other federal agencies and international organizations that have further resources on avian flu.

- The U.S. Centers for Disease Control and Prevention (CDC) has established avian flu public hotlines: Public 888-246-2675; Spanish 888-246-2857; and for Clinicians 877-246-4625. The CDC has additional online resources at <http://www.cdc.gov/flu/avian/index.htm>.
- The World Health Organization has information on avian flu online at http://www.who.int/csr/disease/avian_influenza/en/.
- Physicians, employers and employees should contact their state or local health department (<http://www.cdc.gov/mmwr/international/relres.html>) to notify them of any symptomatic employees or suspected exposure incidents.

BAN ON IMPORTATION OF POTENTIALLY INFECTED ANIMALS

The U.S. government has issued an order for an immediate ban on the import of all birds (Class: Aves) from the following Asian countries: Cambodia; Indonesia; Japan; Laos; People's Republic of China, including Hong Kong, SAR; South Korea; Thailand; and Vietnam. The ban applies to all birds, whether dead or alive, and all bird products, such as eggs. This step was taken because birds from these affected countries potentially can infect humans with influenza A (H5N1). This order is enforced by the U.S. Department of Agriculture (USDA), the CDC and other federal agencies, such as the Animal Plant Health Inspection Service of the U.S. Department of Agriculture, Bureau of Customs and Border Protection of the Department of Homeland Security, and the U.S. Fish and Wildlife Service of the Department of Interior. (See http://www.aphis.usda.gov/lpa/issues/ai_us/ai_trade_ban_status.html)

GUIDANCE FOR FARM WORKERS / ANIMAL HANDLERS

Avian influenza is a highly contagious disease of birds which is currently epidemic amongst poultry in Asia. Despite the uncertainties, poultry experts agree that immediate culling of infected and exposed birds is the first line of defense for both the protection of human health and the reduction of further losses in the agricultural sector. However, culling must be carried out in a way that protects workers from exposures to avian influenza virus and therefore reduces the likelihood of illness or gene swapping or mutation.

Exposure to infected poultry and their feces or dust contaminated with feces has been associated with human infection; however this is a rare occurrence. The following summarizes the recommendations that have been developed by the CDC and the World Health Organization (WHO) because human infections have occurred in Asia during the current poultry epidemic. They will be updated as more information becomes available.⁴

1. All persons who have been in close contact with the infected animals, contact with contaminated surfaces, or after removing gloves, should wash their hands frequently. Hand hygiene should consist of washing with soap and water for 15-20 seconds or the use of other standard hand-disinfection procedures as specified by state government, industry, or USDA outbreak-response guidelines.
2. All workers involved in the culling, transport, or disposal of avian influenza-infected poultry should be provided with appropriate personal protective equipment:
 - Protective clothing capable of being disinfected or disposed, preferably coveralls plus an impermeable apron or surgical gowns with long cuffed sleeves plus an impermeable apron;
 - Gloves capable of being disinfected or disposed; gloves should be carefully removed and discarded or disinfected and hands should be cleaned;
 - Respirators: the minimum recommendation is a disposable particulate respirator (e.g. N95, N99 or N100) used as part of a comprehensive respiratory protection program. The elements of such a program are described in 29 CFR 1910.134. Workers should be fit tested for the model and size respirator they wear and be trained to fit-check for facepiece to face seal;
 - Goggles;
 - Boots or protective foot covers that can be disinfected or disposed.
3. Environmental clean up should be carried out in areas of culling, using the same protective measures as above.
4. Unvaccinated workers should receive the current season's influenza vaccine to reduce the possibility of dual infection with avian and human influenza viruses.
5. Workers should receive an influenza antiviral drug daily for the duration of time during which direct contact with infected poultry or contaminated surfaces occurs. The choice of antiviral drug should be based on sensitivity testing when possible. In the absence of sensitivity testing, a neuraminidase inhibitor (oseltamavir) is the

first choice since the likelihood is smaller that the virus will be resistant to this class of antiviral drugs than to amantadine or rimantadine.

6. Potentially exposed workers should monitor their health for the development of fever, respiratory symptoms, and/or conjunctivitis (i.e., eye infections) for 1 week after last exposure to avian influenza-infected or exposed birds or to potentially avian influenza-contaminated environmental surfaces. Individuals who become ill should seek medical care and, prior to arrival, notify their health care provider that they may have been exposed to avian influenza.

GUIDANCE FOR LABORATORY WORKERS

Highly pathogenic avian influenza A (H5N1) is classified as a select agent and must be worked with under Biosafety Level (BSL) 3+ laboratory conditions. This includes controlled access double door entry with change room and shower, use of respirators, decontamination of all wastes, and showering out of all personnel. Laboratories working on these viruses must be certified by the U.S. Department of Agriculture. The same BSL 3+ laboratory guidelines are recommended for conducting virus isolation for SARS-associated coronavirus. CDC recommends that virus isolation studies on respiratory specimens from patients who meet the above criteria **not** be conducted unless stringent BSL 3+ conditions can be met. Therefore, respiratory virus cultures should not be performed in most clinical laboratories and such cultures should not be ordered for patients suspected of having H5N1 infection.

Clinical specimens from suspect influenza A (H5N1) cases may be tested by polymerase chain reaction (PCR) assays using standard BSL 2 work practices in a Class II biological safety cabinet. In addition, commercial antigen detection testing can be conducted under BSL 2 levels to test for influenza.

Furthermore, all employers processing biologic specimens suspected of being infected with influenza A (H5N1) must ensure that their employees comply with all provisions of 29 CFR 1910.1030 for employee protection against bloodborne pathogens.

GUIDANCE FOR MEDICAL WORKERS THAT TRANSPORT/TREAT AVIAN FLU PATIENTS

All patients who present to a health-care setting with fever and respiratory symptoms should be managed according to the CDC's recommendations for respiratory hygiene and cough etiquette and questioned regarding their recent travel history (see <http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm>). It has not yet been determined that avian flu can be spread from person to person. However, due to the potential risks of human to human infection, isolation precautions identical to those

recommended for SARS should be implemented for all hospitalized patients diagnosed with or under evaluation for influenza A (H5N1) as follows:

1. Standard Precautions
 - Pay careful attention to hand hygiene before and after all patient contact.
2. Contact Precautions
 - Use gloves and gown for all patient contact.
3. Eye protection
 - Wear when within 3 feet of the patient.
4. Airborne Precautions
 - Place the patient in an airborne isolation room (i.e., monitored negative air pressure in relation to the surrounding areas with 6 to 12 air changes per hour).
 - The CDC has recommended that, the minimum requirement is a disposable particulate respirator (e.g. N95, N99 or N100) used in accordance with 29 CFR 1910.134 for respiratory protection programs. Workers must be fit tested for -the model and size respirator they wear and must be trained to fit-check for facepiece to face seal, when entering the room.
 - If transport or movement is necessary, ensure that the patient wears a surgical mask. If a mask cannot be tolerated, apply the most practical measures to contain respiratory secretions.

For additional information regarding these and other health-care isolation precautions, see the CDC's Guidelines for Isolation Precautions in Hospitals. These precautions should be continued for 14 days after onset of symptoms until an alternative diagnosis is established or until diagnostic test results indicate that the patient is not infected with influenza A virus (see Laboratory Testing Procedures below). Patients managed as outpatients or hospitalized patients discharged before 14 days should be isolated in the home setting on the basis of principles outlined for the home isolation of SARS patients (see <http://www.cdc.gov/ncidod/sars/guidance/i/pdf/i.pdf>).

GUIDANCE FOR FOOD HANDLERS

In general, good hygiene practices during handling of raw poultry meat and usual recommended cooking practices for poultry products would lower any potential risk to insignificant levels. Eggs from infected poultry could also be contaminated with the virus and therefore care should be taken in handling shell eggs or raw egg products. Some, more limited, knowledge is available about the effect of food handling and treatment on the influenza virus. While freezing and refrigeration would not substantially reduce the concentration or virulence of viruses on contaminated meat, proper cooking kills such viruses. In general, chicken should be cooked to reach an internal temperature of 180°F. Employers should continuously emphasize the importance of good hygiene practices

during handling including hand washing, prevention of cross-contamination and thorough cooking of poultry products.

GUIDANCE FOR AIRLINE FLIGHT CREWS

This guidance is intended to assist airline flight crews in establishing appropriate precautions in the event they must interact with a person suspected of having avian influenza. Personnel should be aware of the symptoms of avian influenza. Although experience with human infection is limited, persons infected with avian influenza would likely have fever and respiratory symptoms (cough, sore throat, shortness of breath).

1. Wash hands frequently with soap and water or use an alcohol-based hand rub if hands are not visibly soiled.
2. Personnel should wear disposable gloves for direct contact with blood or body fluids of any passenger. ***However, gloves are not intended to replace proper hand hygiene.*** Immediately after activities involving contact with body fluids, gloves should be carefully removed and discarded and hands should be cleaned. Gloves must never be washed or reused.
3. The CDC has developed specific guidance on the handling of sick passengers. (See http://www.cdc.gov/travel/other/avian_flu_ig_airlines_021804.htm)
4. The CDC has stated that, the captain of an airliner bound for the United States is required by law to report the illness to the nearest U. S. Quarantine Station prior to arrival or as soon as illness is noted. Quarantine officials will arrange for appropriate medical assistance to be available when the airplane lands and will notify state and local health departments and the appropriate CDC Headquarters' officials.

GUIDANCE FOR TRAVELERS

The CDC has issued precautions for travel to countries that are reporting outbreaks of avian influenza A (H5N1) in humans and animals. **Currently, CDC does not recommend that the general public avoid travel to any of the countries affected by avian influenza A (H5N1).** CDC has issued the following recommendations for travel to countries reporting human or animal cases of avian influenza A (H5N1):

Before you leave:

- Assemble a travel health kit containing basic first aid and medical supplies. Be sure to include a thermometer and alcohol-based hand rub for hand hygiene.
- Educate yourself and others who may be traveling with you about influenza. Information about influenza is provided on CDC's influenza website: (<http://www.cdc.gov/flu/>).

- Be sure you are up to date with all your shots, and see your health-care provider at least 4–6 weeks before travel to get any additional shots or information you may need. CDC's health recommendations for international travel are provided on CDC's Travelers' Health website: <http://www.cdc.gov/travel/>.
- You may wish to check your health insurance plan or get additional insurance that covers medical evacuation in the event of illness. Information about medical evacuation services is provided on the U.S. Department of State website: <http://www.travel.state.gov/medical.html>.
- Identify in-country health-care resources in advance of your trip.

While you are in an area where avian influenza cases have been reported:

- **At this time, CDC recommends that travelers to countries experiencing outbreaks of this disease in poultry should avoid areas with live poultry, such as live animal markets and poultry farms. Large amounts of the virus are known to be excreted in the droppings from infected birds.**
- As with other infectious illnesses, one of the most important and appropriate preventive practices is careful and frequent hand hygiene. Cleaning your hands often using either soap and water or waterless alcohol-based hand sanitizers removes potentially infectious materials from your skin and helps prevent disease transmission.
- Influenza viruses are destroyed by heat; therefore, as a precaution, all foods from poultry, including eggs, should be thoroughly cooked.
- If you develop respiratory symptoms or any illness that requires prompt medical attention, a U.S. consular officer can assist in locating appropriate medical services and informing family or friends. See this website for more information about what to do if you become ill while abroad <http://www.cdc.gov/travel/other/illness-abroad.htm>. It is advisable that you defer further travel until you are free of symptoms.

After your return:

- Monitor your health for 10 days.
- If you become ill with fever or respiratory symptoms during this 10-day period, consult a health-care provider. *Before your visit to a health-care setting, tell the provider about your symptoms and recent travel so that he or she can be aware you have traveled to an area reporting avian influenza.*

- Information for health care providers wishing to test for or report cases of influenza A (H5N1) and SARS can be found at this website <http://www.cdc.gov/flu/han020302.htm>

EMPLOYEE TRAINING

All employees with potential occupational exposure, as described in this document, should be trained on the hazards associated with exposure to influenza A (H5N1) and the protocols in place in their facility to isolate and report cases or reduce exposures.