

Avian Influenza (Bird Flu)

Kimberly-Clark Professional is committed to providing our customers information on the avian influenza (bird flu). To assist you, we have compiled information from various health/safety organizations around the world (Centers for Disease Control, World Health Organization, National Institute of Health, etc.).

We have also listed Personal Protection items for:

- Healthcare Providers
- Lab Workers
- Farm Workers/Food Handlers

What is avian influenza (bird flu)?

Avian influenza (bird flu) was identified over a century ago. Infections are normally very mild, making wild fowl (usually ducks) ideal reservoirs for carrying the disease wherever they fly. Infected birds shed the flu virus in their saliva, nasal secretions, and feces. Other birds become infected when they contact virus-containing excretions or surfaces contaminated with the excretions. Close human contact with diseased birds provides the opportunity for the virus to infect man. Concern heightened recently after a large outbreak of avian flu occurred in northern Russia. The flu is spreading among wild and domestic birds as infected flocks fly south along migration routes. As increasing numbers of birds become infected and enter more densely human populated regions, the probability for successful transmission to man is increased.

When someone becomes infected with avian flu, their immune system does not recognize this “bird virus” (Type A, H5N1) as anything it has encountered before. Thus, the virus multiplies, virtually unchecked. The body tries to respond, but the infection progresses so rapidly that vital organs are usually severely damaged before there is sufficient opportunity to mount an effective defense. The result is a very high mortality rate, usually exceeding 50%.

The fear that this avian flu may become a highly lethal pandemic has recently been heightened with new research evidence suggesting strongly that the 1918 flu pandemic, responsible for 20 to 40 million deaths globally, was caused by an avian-human hybrid virus (H1N1). However, at this time, the H5N1 avian flu virus has not sustained person to person transmissibility.

How does SARS compare to avian flu?

Severe Acute Respiratory Syndrome (SARS) was caused by a completely different virus (coronavirus). The avian flu virus has a shorter incubation period, is much more capable of rapid mutation, can be transmitted before the onset of symptoms (from birds) and is anticipated to have a much higher death rate (avian flu at greater than 50%; SARS at less than 10%).

Can bird flu be transmitted to humans?

Currently:

Direct contact with poultry or surfaces and objects contaminated by their droppings or saliva, are considered the main routes of human infection. Exposure risk is considered highest during slaughter, defeathering, butchering, and preparation of poultry for cooking.

With very rare exceptions, bird flu is incapable of being transmitted from person to person. However, like all Type A influenza viruses, this Type A (H5N1) has a tremendous ability to mutate – rapidly. Therefore, it is possible that just the right mutation will occur to facilitate human to human transmission. The probability of this occurring is significantly increased if the avian flu infected individual is also infected with a human flu virus (seasonal flu). This provides the opportunity for the avian virus to exchange genetic information with the human virus, including the ability to transfer from human to human. Just as human influenza is extremely easy to catch by inhalation of droplets (created by coughing, sneezing, speaking, etc.), or by touching the droplets after they land on surfaces such as furniture, door knobs, telephones, skin, clothes, soiled tissues, etc.) and then touching your mouth, nose or eyes, the avian-human hybrid virus could spread very rapidly. Unlike human influenza, there is some evidence that this virus may also be spread via the airborne route. Seasonal human influenza infectious droplets are greater than 5 micrometers in diameter. Due to their size and weight, these droplets have a 3 foot trajectory from the mouth before falling. There is a possibility that evaporated droplets (smaller than 5 micrometers) containing avian flu virus are still infectious as they are carried on air currents for significant distances. This is referred to as airborne transmission.

It does appear that this H5N1 virus has become more capable of causing disease (pathogenic). Infected ducks now excrete greater numbers of virus for longer periods of time and often show no signs of illness. The virus is also capable of remaining infectious in the environment for an extended period. It is also adapting more readily to mammals as the virus has been found to infect pigs and felines (house cats, tigers and leopards). As pigs can be infected with both avian and human influenza, they can also serve as mixing vessels for the creation of avian-human hybrid viruses.

Can bird flu be transmitted from humans to humans?

Currently, human cases of avian flu have been acquired almost exclusively from birds. Although there are a few cases of suspected human to human transmission, there is no evidence of sustained transmission (the second person has not infected others). There is no data on human shedding of the infectious avian flu virus at this time.

How can bird flu be prevented?

Food Preparation

Poultry

There is no evidence that properly cooked poultry (170 F°; 77 C°) can be a source for infection. Eggs should be cooked thoroughly. However, it is very important to properly clean surfaces and wash hands after handling uncooked poultry, prior to preparing any food that will not be subsequently cooked. Fortunately, disinfection with most common disinfectants is very effective in killing the influenza virus as discussed under the section on Cleaning and Disinfection.

Pork

Avian flu has been isolated in infected pigs. It is not known at this time whether food preparation activities of infected pork can spread the infection. Because influenza is easily killed by the heat required to cook pork adequately, there should be no possibility of the survival of infective influenza virus – avian or otherwise. The same attention to hand washing and surface cleaning applies to pork as it does to poultry, and should to the preparation of any meat, fish or poultry products at any time regardless of the threat of infection.

Cleaning and disinfection

- Detergents
- Alcohol surface disinfectants
- Sodium hypochlorite
- EPA approved virucidal agents

Reduce possible exposure

Avoid close contact with people who have the flu or show symptoms of respiratory illness. Wash hands regularly. Avoid crowds and remain several feet away from individuals who are coughing. See Protective apparel for additional information.

Vaccination

Annual flu vaccinations will reduce seasonal flu-related illness and death. By limiting the number of people infected with human influenza, the possibility of creating a communicable avian-human influenza virus as a result of co-infection is decreased, thus reducing the risk of pandemic spread.

Vaccines against the avian H5N1 virus are being produced. The process requires the inoculation of fertilized chicken eggs in which the virus will multiply before they are killed to produce the vaccine. The process takes 5 to 6 months. Realistically, the amount of vaccine produced will fall far short of the amount needed if the avian flu becomes pandemic this season. As the H5N1 virus must still mutate to become efficient at person to person transmission, it cannot be guaranteed that the vaccine under production will be protective against that mutant viral strain. Therefore, it is extremely important that personal protection and other preventative measures be practiced.

What are the symptoms of bird flu in humans?

Symptoms are usually those of a typical flu with fever, cough, sore throat, and muscle aches being the most prominent. However, some patients have presented with eye infections, severe diarrhea, acute respiratory distress, pneumonia, encephalitis or other severe and life-threatening complications. If you have suggestive symptoms **and** have been traveling in a country where avian flu has been reported, in contact with sick or dead birds, or been near persons with confirmed or suspected avian flu, seek immediate medical attention. It is critical that the possibility of avian flu be declared when first contacting medical providers so that diagnosis and treatment can begin immediately and you can be isolated as quickly as possible to prevent spreading the infection to others.

Patient Care

Incubation period: The time between human exposure and onset of illness (incubation period) is usually 3 days (range 2 to 4 days).

Anti-viral agents

Anti-viral drugs are normally used on infected patients and on individuals thought to be exposed. It is critical that the anti-viral drugs be given promptly after onset of symptoms to be effective (usually about 48 hours). This may be difficult due to the rapid progress of avian flu and the similarity of initial symptoms to those of other less harmful illnesses. There are four anti-viral drugs that have been shown to be effective against the H5N1. However, the capability of this virus to rapidly adapt by mutation has already been demonstrated with an acquired resistance to two of them: amantadine and rimantadine. No resistance to the anti-viral drugs oseltamivir (Tamiflu) and zanamavir (Relenza) has yet been detected.

Personal protection for Healthcare Providers and Visitors

Healthcare providers should practice Standard, Airborne, Droplet and Contact precautions until directions from CDC or WHO direct otherwise. The following is a review of essentials. Use disposable protection whenever possible as the virus remains infectious on the garment for long periods of time.

- **Hand hygiene:** Use soap and warm water for 15 to 20 seconds and alcohol-based disposable hand wipes or gels.
- **Facial protection:** Because there is some evidence that H5N1 may be capable of airborne spread and the fact that it has such a high mortality rate, a fit-tested NIOSH approved disposable, particulate respirator of N-95 rating or higher is recommended at this time (NIOSH Particulate Filtration Efficiency (PFE) test challenge is approx. 0.3 micrometers). Similar respirator mask rating systems such as those designated as FFP2 or greater are utilized for airborne transmission protection in several countries. A surgical mask is a second alternative if respirators are unavailable; however, the mask should have bacterial filtration efficiency (BFE) greater than 97% (ASTM F 2101 challenge aerosol is approximately 3 micrometers). However, surgical masks are not as protective as respirators.

Note: Masks of cotton, gauze, wool, cloth, or paper are NOT effective barriers.

Eye protection: Wear goggles or a face shield (note: must still wear a mask) within 3 feet of patient. Remember, if splashes, sprays, aerosols, or contaminated hands touch the eyes, the virus can cause an infection.

- **Gloves:** Wear clean non-sterile gloves when entering the patient’s room. Wash hands immediately after removing gloves.
- **Long-sleeved cuffed gown:** Wear a clean, non-sterile gown with long cuffed sleeves when entering the room if substantial contact with patient, environmental surfaces or items within the room is anticipated.
- **Cap:** A cap is appropriate in high risk situations where there may be increased aerosols.
- **Limit patient movement:** If transport is necessary, mask the patient. All individuals involved in transport should be in full personal protective equipment (PPE). Clean areas contacted by patient with 70% alcohol or disinfectant with virucidal capability.
- Patient should be placed in a private, negative pressure, airborne isolation room. Cohort if necessary (persons with the same infection placed in the same room).
- **Removal of contaminated apparel:** Remove carefully to reduce the risk of self-contamination by remembering that the virus is alive on the surface of your PPE. Recommendations from the CDC and WHO follow:

CDC Removal sequence	WHO Removal sequence
Gloves	Gown
Face shield or goggles	Gloves
Gown	Alcohol-based hand rub or wash hands
Remove respirator after leaving room (do not touch front)	Remove cap and face shield
Alcohol-based hand rub or wash hands	Remove respirator (do not touch front)
Also wash or use alcohol rub any time hands become visibly contaminated	Alcohol-based hand rub or wash hands
	Leave room
	Alcohol-based hand rub or wash hands

Personal protection for Laboratory Workers

H5N1 virus is considered highly pathogenic and all precautions for Biosafety Level (BSL) 3+ (<http://www.cdc.gov/od/ohs/symp5/jyrtext.htm>) laboratory conditions must be implemented. Laboratories working on these viruses must be certified by the US Department of Agriculture. ⁱ

- **Hand hygiene:** Use soap and warm water for 15 to 20 seconds and alcohol-based disposable hand wipes or gels. People should wash their hands after handling infectious materials, after removing gloves, and when they leave the laboratory
- **Facial protection:** A fit-tested NIOSH approved disposable particulate respirator of N-95 rating or higher is recommended when working with animals. ⁱⁱ (NIOSH Particulate Filtration Efficiency (PFE) test challenge is approx. 0.3 micrometers). Similar respirator mask rating systems such as those designated as FFP2 or greater are utilized for airborne transmission protection in several countries.

Note: Masks of cotton, gauze, wool, cloth, or paper are NOT effective barriers.

Eye protection: Wear goggles or a face shield (note: must still wear a mask) Remember, if splashes, sprays, aerosols, or contaminated hands touch the eyes, the virus can cause an infection.

- **Gloves:** Wear clean non-sterile disposable gloves when working with infectious agents.
- **Long-sleeved cuffed gown:** Wear solid front or wrap-around gowns, scrub suits, or coveralls. Laboratory clothing should not be worn outside the laboratory, and should be decontaminated prior to laundering or disposal.
- **Hood:** A hood is appropriate in high risk situations where there may be increased aerosols.

Personal protection for Farm Workers/Animal Handlers

- **Hand hygiene:** Use of soap and warm water for 15 to 20 seconds and alcohol-based disposable hand wipes or gels. 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. Wash hands after handling frozen or thawed raw chicken or eggs, surfaces and utensils that have been in contact with raw meat. To avoid the spread of the virus through food, separate raw meat and cooked, ready-to-eat food during preparation. Wash hands in between handling raw and cooked foods.
- **Facial protection:** A fit-tested NIOSH approved disposable particulate respirator of N-95 rating or higher is recommended at this time (NIOSH Particulate Filtration Efficiency (PFE) test challenge is approx. 0.3 micrometers). Similar respirator mask rating systems such as those designated as FFP2 or greater are utilized for airborne transmission protection in several countries.

Note: Masks of cotton, gauze, wool, cloth, or paper are NOT effective barriers.

- **Eye protection:** Wear goggles or a face shield (note: must still wear a mask) Remember, if splashes, sprays, aerosols, or contaminated hands touch the eyes, the virus can cause an infection.
- **Gloves:** Wear clean non-sterile disposable gloves when involved in the culling, transport, or disposal of avian influenza-infected poultry
- **Long-sleeved cuffed coveralls:** Wear protective clothing capable of being disinfected or disposed, preferably coveralls plus an impermeable apron.
- **Hood:** A hood is appropriate in high risk situations where there may be increased aerosols.
- **Boots:** Because animal manure containing influenza virus can contaminate dust and soil, wear boots or protective foot covers that can be disinfected or disposed.

Personal protection for Food Handlers

Potential risk in the transmission of virus is lowered when good hygiene practices during the handling of raw poultry meat and usual recommended cooking practices for poultry products are followed. Eggs from infected poultry could be contaminated with the virus.

- **Hand hygiene:** Use soap and warm water for 15 to 20 seconds and alcohol-based disposable hand wipes or gels. Wash hands after handling frozen or thawed raw chicken or eggs, surfaces and utensils that have been in contact with raw meat. To avoid the spread of the virus through food, separate raw meat and cooked, ready-to-eat food during preparation. Wash hands in between handling raw and cooked foods.

Pandemic prevention in summary

The most effective methods of preventing the spread of avian flu are:

- 1) Stop the reservoirs (sources) of the infection
 - kill infected animals
 - protect domestic fowl (chickens, turkeys, ducks) from contact with wild fowl
 - keep pigs separate from birds (wild and domestic)
- 2) Vaccinations
 - high public compliance with seasonal human flu vaccinations
 - develop and produce an effective H5N1 avian flu vaccine
- 3) Antiviral drugs
 - Produce effective anti-viral drugs
- 4) Utilize protective barriers
 - wear appropriate personal protective apparel
 - isolate patients/ groups/ communities with avian flu

For additional information visit these websites:

- **CDC at:** www.cdc.gov/flu/avian/
 - **WHO at:** www.who.int/en/
1. NIH at: U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes of Health “Biosafety in Microbiological and Biomedical Laboratories” 4th Edition, May 1999 online at <http://bmbi.od.nih.gov/sect3bsl3.htm>
 2. University of Colorado Health Center Services, “Biosafety Manual” online at <http://www.uchsc.edu/safety/Manuals/BioSafety/biochp3b.html>
 3. OSHA at: <http://www.osha.gov/dsg/guidance/avian-flu.html>
 4. WHO at: International Foods Safety Authorities Network (INFOSAN) Note No. 2/04 online at http://www.who.int/foodsafety/fs_management/No_02_Avianinfluenza_Dec04_en.pdf
 5. WHO at: WHO laboratory biosafety guidelines for handling specimens suspected of containing avian influenza A virus; revised 12 January 2005 General recommendations online at http://www.who.int/csr/disease/avian_influenza/guidelines/handlingspecimens/en/

ⁱ <http://www.osha.gov/dsg/guidance/avian-flu.html>
“Guidance for Protecting Workers Against Avian Flu”