

**State of Kuwait
Ministry of Health
Infection Control Directorate**

Avian Influenza (H5N1)

Infection Control Emergency Plan
&
Guidelines For health care facilities

2005

Influenza A (H5N1)

Infection Control Guidelines for Health Care Facilities

Introduction

Transmission of human influenza is by droplets and fine droplet nuclei (airborne). Transmission by direct and indirect contact is also recognized. However, during the 1997 influenza A (H5N1) outbreak in humans in Hong Kong (China), droplet and contact precautions successfully prevented nosocomial spread of the disease. So far there is no evidence to suggest airborne transmission of the disease in the current outbreaks in Thailand and Viet Nam. Nevertheless, because of the high mortality of the disease and the possibility of the virus mutating to cause efficient human-to-human transmission, WHO is currently recommending the use of high-efficiency masks in addition to droplet and contact precautions. In addition, a negative pressure room – if available – is recommended.

Case definition of avian flu

Suspected cases

Patients with the following symptoms

1. Fever (body temperature $\geq 38^{\circ}\text{C}$ or higher and one of the following symptoms:
muscle ache, cough, abnormal breathing (unusual breathing difficulty), or suspected pneumonia by physician; in addition to history of
 - Direct contact with infected /dead birds in the past 7 days or occurrence of unusual death of a bird in the community in the past 14 days;
 - Or contact with a pneumonia patient
 - Or contact with another patient suspected of avian flu
 - Or having worked in a laboratory within 7 days prior to the onset of symptoms where there is processing of samples from persons or animals suspected of avian flu.
2. Or death from unexplained acute respiratory illness and one or more of the following:
 - Residing in an area where avian flu is suspected or confirmed.
 - In contact of another patient suspected of avian flu within 7 days prior to the onset of symptoms.

Probable cases

Which include the above mentioned symptoms of suspected cases in addition to:

1. Preliminary test shows infection of influenza group A but cannot yet be confirmed whether it is influenza from humans or birds.
2. Or respiratory failure.
3. Or death.

Confirmed case definition for influenza A/H5

A confirmed case of influenza A/H5 infection is an individual with an acute respiratory febrile illness for whom laboratory testing demonstrates one or more of the following:

1. positive viral culture for influenza A/H5.
2. positive polymerase chain reaction (PCR) for influenza A/H5;
3. positive immunofluorescence antibody (IFA) test to H5 antigen using H5 monoclonal antibodies.
4. 4-fold rise in H5 specific antibody titre in paired serum samples.

The laboratory tests for the diagnosis of influenza A/H5 infection included in the case definition are considered the standard for the identification of these viruses.

Incubation period

The incubation period for human influenza viruses is short – 2 to 3 days (range 1 to 7 days). However with influenza A (H5N1) the median time between exposure and onset of illness is 3 days (range 2 to 4 days).

Infection control measures for influenza A (H5N1)

Notify the Infection Control Department about any suspected, probable or confirmed case immediately.

Infection control precautions for influenza A (H5N1) involves:

- Standard precautions which apply to ALL patients at ALL times, including those who have influenza A (H5N1) infection and additional precautions which should include:
 - droplet precautions,
 - contact precautions, and
 - airborne precautions

A combination of these precautions will give the appropriate infection control. Strict adherence to these precautions is required to break the chain of infection transmission.

1. Standard and contact precautions

During the care of any patient with symptoms of a respiratory infection, health-care personnel should adhere to standard and contact precautions:

1. Handwashing and hand antisepsis (Hand Hygiene)

- A. Decontaminate hands before and after touching the patient, after touching the patient's environment, or after touching the patient's respiratory secretions, whether or not gloves are worn.
- B. When hands are visibly soiled or contaminated with respiratory secretions, wash hands with soap (either plain or antimicrobial) and water.
- C. If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in clinical situations.

2. Use of personal protective equipment (PPE) upon entering the room of the patient and/ or when handling blood, body substances, excretions and secretions.

PPE used for influenza A (H5N1):

- A. gloves (nonsterile)
- B. high-efficiency mask (N95 mask)
- C. long-sleeved cuffed gown
- D. protective eyewear (goggles/visors/face shields)
- E. cap (may be used in high risk situations where there may be increased aerosols)
- F. plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.

Who should use personal protective equipment?

- A. all health care workers who provide direct patient care (e.g. doctors, nurses radiographers, physiotherapists);
- B. all support staff, including medical aides and cleaning staff;
- C. all laboratory workers handling specimens from a patient being investigated for influenza A (H5N1);
- D. all sterilizing service workers handling equipment that requires decontamination and has come from a patient with influenza A (H5N1).
- E. family members or visitors.

Recommendations for use of PPE

- A. Wear gloves if hand contact with respiratory secretions or potentially contaminated surfaces is anticipated.
- B. Wear a gown if soiling of clothes with a patient's respiratory secretions is anticipated.
- C. Change gloves and gowns after each patient encounter and perform hand hygiene.

3. Appropriate handling of patient care equipment and soiled linen.

4. Prevention of needle stick/sharp injuries. If occurred report to Infection Control Department

5. Environmental cleaning and spills-management

6. Appropriate handling of waste.

3. Airborne Precautions

In addition to Standard and Contact Precautions, health-care workers should adhere to Airborne Precautions during the care of a patient with suspected or confirmed influenza H5N1:

A. Patient Placement

- Place the patient in an airborne isolation room that has:

- monitored negative air pressure in relation to the surrounding areas.
- 6 to 12 air changes per hour.
- Exhaust air directly to outside or have re-circulated air to other areas in the hospital filtered by HEPA filter.
- Keep the room door closed and the patient in the room.

- If an airborne isolation room is unavailable, place the patient in a private room and contact the healthcare facility engineer to assist for use of portable HEPA filters to augment the numbers of air changes per hour.
- If the above mentioned private room with HEPA filters is not available, place (cohort) suspected influenza patients with other patients suspected of having influenza; cohort confirmed influenza patients with other patients confirmed to have influenza in designated multi-bed rooms or wards. Where cohorting is being carried out apply droplet precaution (the distance between beds should be more than 1m and beds should preferably be separated by a physical barrier e.g. curtain or partition).

B. Respiratory Protection

- Wear respiratory protection (N95 respirator) when entering the room of a patient with known or suspected case

The precautions should be implemented while the patient is infectious:

- adults > 12 years of age – precautions to be implemented at time of admission and continued until 7 days have lapsed since resolution of fever.
- children <12 years of age – precautions to be implemented at time of admission and continued until 21 days have lapsed since onset of illness.

Infection control advice for visiting friends and relatives of patients with influenza A (H5N1) in health care facilities

- 1) Avoid contact with patients known to have influenza A (H5N1) during the infectious period of their illness. The infectious period is 7 days after resolution of fever in adults and 21 days after onset of illness in children.
- 2) If you must visit a patient who is suspected as having influenza A (H5N1) or confirmed as having influenza A (H5N1) – follow the infection control precautions in place in the hospital for the required period.
- 3) You will need to wear personal protective equipment if you have direct contact with the patient or the patient's environment.
- 4) You should receive advice on the proper way to put on the personal protective equipment, especially on how to fit the mask to your face.
- 5) Personal protective equipment you will need to wear includes mask, gown, gloves and goggles. Make sure the mask is fitted correctly.
- 6) When you leave the room you must remove these items and wash your hands very well.
- 7) If you do have contact with the patient during their infectious period of the illness (7 days after resolution of fever in adults and 21 days after onset of illness in children) then you should see your doctor for advice about antiviral treatment. You should also monitor your health for 7 days after you have had this contact – watch for increase in your temperature and a sore throat.
- 8) If your illness becomes severe you should seek medical advice immediately and inform them you have been in contact with influenza A (H5N1).

Care of influenza A (H5N1) patients in isolation

Care of patients in isolation units becomes a challenge when there are inadequate resources, or when the patient has poor hygienic habits, deliberately contaminates the environment, or cannot be expected to assist in maintaining infection control precautions to limit transmission (children, patients with an altered mental state, or elderly persons).

In caring for influenza A (H5N1) patients in isolation the following guidelines are to be followed:

Preparation of the isolation room

- 1) Ensure additional precautions through appropriate signage on the door.
- 2) Place a recording sheet at the entrance of the isolation room. All health care workers or visitors entering the isolation area should be encouraged to print their details on the recording sheet so that if follow up/contact tracing is required, details are available.
- 3) Remove all non-essential furniture. The remaining furniture should be easy to clean and should not conceal or retain dirt or moisture, either within or around it.
- 4) Stock the hand basin with suitable supplies for hand washing.
- 5) Place appropriate waste bags in the room on a foot-operated bin.
- 6) Place a puncture-proof container for sharps in the room.
- 7) Keep the patient's personal belongings to a minimum. Keep water pitcher and cup, tissue wipes, and all items necessary for attending to personal hygiene within the patient's reach.
- 8) The patient should be allocated his/her own non-critical items of patient care equipment, e.g. stethoscope, thermometer and sphygmomanometers. Any item of patient care equipment that is required for other patients should be thoroughly cleaned and disinfected prior to use.
- 9) Set up a trolley outside the door to hold personal protective equipment. A checklist may be useful to ensure all equipment is available
- 10) Place an appropriate container with a lid outside the door for equipment that requires disinfection and sterilization. Once equipment has been appropriately cleaned it can be sent to the sterilizing service department.
- 11) Keep adequate equipment required for cleaning and disinfection inside the patients' room.
- 12) Scrupulous daily cleaning of the isolation unit is important in the prevention of cross infection. Cleaning equipment must be cleaned after each use. Mop heads should be sent to the laundry for proper laundering in hot water.
- 13) Used linen should be placed in a linen bag inside the room and then into another bag outside the room. Take immediately to laundry collection area – treat as per normal soiled/contaminated linen.
- 14) All waste should be discarded into clinical waste bag inside the room. When waste is to be collected for disposal, place in another bag outside the room and then treat as "normal" clinical/contaminated/infectious waste.
- 15) A telephone should be set up in the patient's room.
- 16) Curtains should be thoroughly cleaned by laundering in hot water at least weekly.
- 17) Cutlery and crockery should be cleaned in hot soapy water.

Anterooms

Rooms used for isolation purposes may include an anteroom to support the use of PPE.

Entering the room

1. Collect all equipment needed.
2. Wear PPE.
3. Enter the room and shut the door.

Leaving the room

1. Remove PPE in the correct order:
2. Remove gown (place in rubbish bin).
3. Remove gloves (peel from hand and discard into rubbish bin).
4. Use alcohol-based handrub or wash hands.
5. Remove cap and face shield (place cap in bin and if reusable place face shield in container for decontamination).
6. Remove mask - by grasping elastic behind ears – do not touch front of mask.
7. Use alcohol-based handrub or wash hands.
8. Leave the room.
9. Once outside room use alcohol handrub again or wash hands.
10. Wash hands using plain soap, antimicrobial agent or waterless antiseptic agent such as an alcohol-based hand gel.

Waste disposal

1. All waste generated in the isolation room/area should be disposed of in suitable containers or bags.
2. All waste from a room/area containing patient(s) with influenza A (H5N1) should be treated as clinical (infectious) waste.
3. Staff responsible for routinely removing waste from isolation wards/areas should wear full PPE when removing waste.
4. One waste disposal bag is usually adequate, providing waste can be placed in the bag without contaminating the outside of the bag. If that is not possible, two bags are needed (double bagging).
5. Liquid waste such as urine or faeces can be safely flushed into the sewer system if there is an adequate sewage system in place.
6. Waste disposal bags should include appropriate biohazard labelling, and be treated and disposed of as per the policy of the hospital and in accordance with national regulations pertaining to hospital waste.

Cleaning and disinfection

The virus is inactivated by 70% alcohol and by chlorine, therefore cleaning of environmental surfaces with a neutral detergent followed by a disinfectant solution is recommended (see Table 1).

Table 1. Disinfectants Recommended use Precautions

| Disinfectant | Recommended use | Precautions |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sodium hypochlorite 1% in use dilution, 5% solution to be diluted 1:5 in clean water | Disinfection of material contaminated with blood and body fluids | <ul style="list-style-type: none">• Should be used in well-ventilated areas• Protective clothing required while handling and using undiluted• Do not mix with strong acids to avoid release of chlorine gas• Corrosive to metals |
| Bleaching powder 7g/litre with 70% available chlorine | Toilets / bathrooms - may be used in place of liquid bleach if this is unavailable | Same as above |
| Alcohol (70%) Isopropyl, ethyl alcohol, methylated spirit. | Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used. | <ul style="list-style-type: none">• Flammable, toxic, to be used in well-ventilated area, avoid inhalation.• Keep away from heat sources, electrical equipment, flames, hot surfaces.• Allow it to dry completely, particularly when using diathermy as this can cause diathermy burns. |

Transportation of patients

Limit the movement and transport of patients from the isolation room/area for essential purposes only and inform the receiving area as soon as possible prior to the patient's arrival. If transportation is required out of the isolation room/area within the hospital, the patient should wear a mask and a gown where possible. All staff involved in the transportation should wear PPE. If transportation outside the health care facility is required, the patient should wear a surgical mask and gown. Where there is contact with surfaces, these surfaces should be cleaned afterwards. For example, if a patient has been transported in an ambulance, the ambulance may be cleaned inside with a disinfectant such as 70% alcohol

Specimen collection and transportation

1. Following standard precautions, all specimens should be regarded as potentially infectious and staff who take, collect or transport clinical specimens should adhere rigorously to protective measures in order to minimize exposure.
2. Specimens for transport must be placed in leak-proof specimen bags, which have a separate sealable pocket for the specimen (i.e. a plastic biohazard specimen bag.).
3. Personnel who transport specimens should be trained in safe handling practices and decontamination procedures in case of a spill.

4. The accompanying request form should be clearly labelled as “influenza A (H5N1)” and the laboratory notified by telephone that the specimen is “on its way”.
5. Specimens should be hand delivered where possible. Pneumatic tube systems should not be used to transport specimens. A register should be kept of all those who have handled specimens of patients being investigated for influenza A/H5.

Discharging the patient

- 1) The infection control precautions should be implemented 7 days after resolution of fever, for adults (> 12 years of age), 21 days after onset of illness for children (<12 years of age).
- 2) The patient and family should be educated about the appropriate precautions to take when in contact with chickens, wet markets etc. Carry out appropriate cleaning and disinfection of the room after discharge

Care of the deceased

- 1) Health care workers must follow standard precautions when caring for the deceased patient.
- 2) Full PPE must be worn if the patient died during the infectious period (i.e. within 7 days after resolution of fever in adults and 21 days after the onset of symptoms in children).
- 3) The body should be fully sealed in an impermeable body bag prior to transfer to the mortuary.
- 4) No leaking of body fluids should occur and the outside bag should be clean.
- 5) Transfer to the mortuary should occur as soon as possible after death.
- 6) If the family of the patient wishes to view the body, they may be allowed to do so.
- 7) If the patient died in the infectious period, the family should wear gloves and a gown.
- 8) Cultural sensitivity should be practised when a patient with influenza A (H5N1) dies.

Post mortem

A post mortem examination of someone who had or probably had influenza A (H5N1) should be performed with caution if the patient died during the infectious period. If the patient is still shedding virus when he or she dies the lungs may still contain the virus. Therefore when any procedure is performed on the cadaver's lung, full PPE should be worn, including high-efficiency mask, gloves, gown and goggles.

Minimizing the risk from an infected cadaver

Prevent the production of aerosols – especially when excising the lung, by:

- avoiding the use of power saws,
- conducting procedures under water if there is a chance of aerozolation,
- avoiding splashing when removing lung tissue.

As a general guide follow standard precautions and:

- Use the minimal amount of equipment in the autopsy.
- Avoid using scalpels and scissors with pointed ends.
- Never pass instruments and equipment by hand – always use a tray.
- If possible use disposable instruments and equipment.
- Keep the number of staff present to a minimum.

Mortuary care/ funeral director's premises

- Staff of the mortuary or funeral home should be informed that the deceased had influenza A (H5N1). It should be explained that standard precautions are all that is required in the event of exposure to the body.
- Hygienic preparation of the deceased.

Staff health management

Health care workers who are involved in caring for a patient with influenza A (H5N1) should receive training on the mode of transmission, the appropriate infection control precautions and the exposure protocol.

Staff not involved in direct patient care should be given general advice about avian influenza

Exposed health care workers

Antiviral prophylaxis and influenza vaccination

It is recommended that all health care workers who are expected to have contact with influenza A (H5N1) virus; or influenza A (H5N1) patient; or an environment that is likely to be contaminated with the virus should take the following steps.

- 1) They should be vaccinated with the current WHO recommended influenza vaccine as soon as possible. Protective levels of antibodies are usually detectable between two and four weeks after vaccination with an inter-pandemic influenza vaccine. This will not protect against influenza A (H5N1), but it will help to avoid simultaneous infection by human influenza and avian influenza. This will minimize the possibility of re-assortment
- 2) They should take one oseltamivir phosphate 75 mg tablet (Tamiflu) each day for at least 7 days beginning as soon as possible after exposure. Antiviral prophylaxis should begin immediately, or at least within 2 days of exposure and may continue for up to 6 weeks.

Self-management and monitoring of healthcare workers

Observe good respiratory and hand hygiene at all times and:

- 2) Check temperature twice daily and monitor self for respiratory symptoms especially cough and or conjunctivitis for one week after the last exposure to avian influenza.
- 3) Where at all possible, keep a personal diary of contacts. The diary should not be taken into isolation areas.

- 4) In the event of a fever, immediately limit interactions and exclude yourself from public areas. Notify the infection control team, occupational health team and/or your healthcare provider that you may have been exposed to avian influenza.
- 5) With the exception of visiting a health care provider, health care workers who become ill should be advised to stay at home until 24 hours after resolution of fever unless an alternative diagnosis has been established or diagnostic tests are negative for influenza A virus.
- 6) While at home ill persons should practice good respiratory hygiene and cough etiquette to lower the risk of transmission of virus to others.

General advice about respiratory illness

- 1) Anyone with respiratory-type illnesses should be careful with secretions from the nose and mouth.
- 2) Cover the nose and mouth when coughing or sneezing – use a tissue and dispose of this once used in the waste.
- 3) Always wash hands after having any contact with respiratory secretions.
- 4) Be careful with respiratory secretions (e.g. coughing and sneezing) when around other people, especially small children. It may be best to avoid contact with individuals at risk (small children or those people with illnesses) until respiratory symptoms have resolved.
- 5) Avoid contact with secretions of people who have respiratory illnesses.
- 6) Ask people to use a tissue and cover their nose and mouth when coughing or sneezing.
- 7) Seek medical advice if the illness is severe.

Advice about contact with chickens, ducks or other animals

- 1) Avoid contact with chicken farms, duck farms or any farm where animals have been ill, slaughtered or are thought to harbour avian influenza
- 2) If you inadvertently come into contact with an environment that has had sick/dead poultry – wash hands thoroughly and monitor your temperature for 7 days. If you develop a sudden high fever ($>38^{\circ}\text{C}$) or signs of respiratory illness - consult your doctor regarding whether or not you should receive antiviral medication.
- 3) If you have had contact with any dead poultry that have died from avian influenza or if you have had contact with the faeces of these poultry – consult your health care adviser for advice regarding prophylaxis using antiviral medication.
- 4) If you have poultry that have died in your back yard, do not touch them and inform local authority and follow the instructions.

Suggested checklist for items required to control influenza A (H5N1) in healthcare facilities

Items should be provided in sufficient amounts and kept ready in the wards at **all times** so that personal protective equipment is always available for staff.

| Equipment | Stock present |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Face shield/eye protection goggles | |
| Single use gloves for clinical use (sizes: small, medium, large) | |
| Gloves (reusable for environmental cleaning) | |
| Theatre caps (optional for high-risk situations but should be available) | |
| High efficiency masks | |
| Surgical masks | |
| Single-use long sleeved gowns | |
| Single-use plastic aprons | |
| Alcohol-based handrub or alternative method for washing hands in clean water Soap Disinfectant: <ul style="list-style-type: none">- Chlorine-releasing agents e.g. Presept Tabs- Alcohol for surfaces that cannot be disinfected with chlorine Clean towel | |
| Appropriate disinfectant for environmental cleaning | |
| Relevant tubes and containers for specimen collection and transportation | |
| Large plastic bags | |
| Appropriate waste bags | |
| Linen bags | |
| Collection container for used equipment | |
| Cadaver plastic bags | |
| Mobile HEPA filters | |

Prevention and Control of Influenza in Peri- and Postpartum Settings

Pregnant women have been shown to be at increased risk of hospitalization from complications secondary to influenza infection. Infection control measures for hospitalized pregnant and recently-delivered women and their infants are detailed below. These guidelines were developed for clinicians and public health officials. However, there are insufficient data on use of influenza antiviral drugs in pregnant or recently-delivered women, and CDC is unable to provide guidance on antiviral use in these persons.

Pre-Delivery

- Prior to delivery, hospitalized influenza-infected pregnant women should be placed on standard, contact and airborne precautions.
- Hospital visitors of influenza-infected pregnant women should receive infection control education on airborne precautions and hand hygiene and should be asked to practice these measures during their hospital visit.

During Delivery

- Pregnant women with influenza in the labor and delivery suite should be placed on airborne precautions. The pregnant woman does not need to wear a mask during the time of delivery.
- After the infant is born, the mother should put on a surgical mask and then practice hand hygiene before handling the baby.
- Practice hand hygiene before and after contact with the mother.
- All persons in the delivery room should practice hand hygiene before and after handling the baby.

After Delivery

- **Rooming-in with Mother:** Newborn infants of influenza-infected mothers should stay in the same hospital room as the mother if possible, and should be housed in an isolette when available. The isolette should be placed at least 3 feet from the mother when she is not interacting with the baby.
- **Nursery:** If a newborn infant of an influenza-infected woman is housed in the hospital nursery instead of the mother's room, the infant should be placed on airborne precautions. The infant should be placed in a private room in the nursery, if available, and should be housed in an isolette when available. If a private room is not available in the nursery, the newborn should be kept 3 feet from other babies in the nursery and in an isolette when available.
- Hospital visitors of influenza-infected mothers and their infants should receive infection control education on airborne precautions and hand hygiene and should be asked to practice these measures during their hospital visit.

Breast Feeding by Influenza-infected Mothers

- Influenza-infected mothers who are breast feeding should put on a surgical mask and then practice hand hygiene before each feeding or other close contact with their infants. These practices should continue for each feeding during the 5-day period following the mother's symptom onset.

Control of Influenza Outbreaks in Health-care Settings

When influenza outbreaks occur in health-care settings, additional measures should be taken to limit transmission. These include:

- Confirm the presence of a nosocomial outbreak.
- Implement all recommended infection control measures for all patients with suspected or confirmed influenza.
- Separate suspected or confirmed influenza patients from asymptomatic patients.
- Restrict staff movement from areas with outbreaks to other units and buildings.
- Administer influenza antiviral prophylaxis and treatment to patients, residents, and health-care personnel according to current recommendations.
- Curtail or eliminate elective medical and surgical admissions and restrict cardiovascular and pulmonary surgery to emergency cases only.