



Epidemiology Unit

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Guidelines for Case Management of Patients with Avian Influenza A (H5N1) Virus Infection

Taking into consideration the possible introduction of Avian Influenza A (H5N1) Virus Infection among poultry in the country, following new guidelines should be used to achieve the objective of minimizing the impact of the disease on humans.

Clinical diagnosis

Patients with H5N1 infection usually present with symptoms and signs of influenza but clinical features may differ in terms of longer incubation period, early onset of pneumonia, rapid progress to respiratory distress and higher mortality.

To diagnose a human case of avian influenza both clinical and epidemiological criteria are to be met.

Clinical criteria

Fever of >38°C

Cough

Shortness of breath or difficulty breathing after 5-7 days of onset

Onset after 2-8 days of exposure to sick/dying poultry

Diarrhoea

Primary viral pneumonia

Rapid deterioration to Acute Respiratory Distress Syndrome (ARDS) and multi-organ failure

Infrequent features:

Vomiting

Abdominal pain

Chest pain

Bleeding from nose and/or gums

Encephalopathy (rare)

Epidemiological criteria

Within the seven days prior to symptom onset:

- ✓ Close contact (within one metre) with a person (e.g. caring for, speaking with or touching) who is a suspected, probable or confirmed H5N1 case
- ✓ Sustained exposure (e.g. handling, slaughtering, plucking, butchering or preparing for consumption) to poultry or wild birds or their remains or to environments

contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month

- ✓ Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month
- ✓ Close contact with a confirmed H5N1-infected animal other than poultry or wild birds (e.g. cat or pig);
- ✓ Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting.

Case definitions

Following case definitions must be adhered to in management and reporting of cases in future.

Suspected case:

An Individual presenting with unexplained acute febrile respiratory illness with fever ≥ 38 °C with the spectrum of disease from influenza-like illness (cough, sore throat, shortness of breath or difficulty in breathing to pneumonia

AND

One or more of above epidemiological criteria in the 7 days prior to the onset of the symptom

Probable case:

Definition 1: An individual who meets criteria of a suspected case

AND

One of the following additional criteria:

(a) Infiltrates or evidence of an acute pneumonia on chest radiograph plus evidence of respiratory failure (hypoxemia, severe tachypnea);

OR

(b) Positive laboratory confirmation of an influenza A infection but insufficient laboratory evidence for H5N1 infection.

Definition 2: A person dying of an unexplained acute respiratory illness who is considered to be epidemiologically linked by time place, and exposure to a probable or confirmed H5N1 case.

Confirmed case:

An individual who meets criteria of a suspected or probable case

AND

One of the following positive results conducted in a national, regional or international influenza laboratory whose H5N1 test results are accepted by World Health Organization (WHO) as confirmatory:

- (a) Isolation of an H5N1 virus
- (b) Positive H5 PCR results

- (c) A fourfold or greater rise in neutralization antibody titer for H5N1 based on testing of an acute serum specimen (collected 7 days or less after symptom onset) and a convalescent serum specimen.

High Risk Groups

Principal risk factors for human infections of avian influenza are direct or indirect contact with contaminated poultry or poultry products.

The following groups are considered to be at higher risk for H5N1 infection

- Children playing with infected poultry, particularly asymptomatic infected ducks
- Poultry handlers in live animal markets / wet markets
- Cullers without proper (Personal Protective Equipment) PPE
- Those handling fighting cocks
- Persons plucking and preparing of diseased birds in wet markets /backyard poultry/kitchens
- Persons consuming undercooked poultry products or food containing chicken or poultry blood*
- Healthcare staff managing human cases of AI without **appropriate** PPE

*(*A few human cases have been linked to consumption of dishes made of raw, contaminated poultry blood).*

1. Measures to be taken in an Medical Officer of Health (MOH) setting

In a farm with excessive bird die-offs or household with unusual backyard poultry deaths

1. Obtain a worker list from the management of the farm/owner of household with addresses and contact telephone numbers
2. Assign a Public Health Inspector (PHI) to monitor development of symptoms daily from workers/members of household over the telephone or by visiting
3. If anyone falls sick with acute respiratory symptoms and signs send the patient to an assigned hospital

Use of PPE

- If visiting a farm or household with excessive bird die-offs PHI should wear a normal surgical mask and gloves and practice frequent hand washing
- When referring to a hospital the patient should wear a normal surgical mask and gloves and practice frequent hand washing

In a farm or household (backyard) with confirmed H5N1 poultry deaths

1. Obtain a worker list from the management of the farm/households with addresses and contact telephone numbers
2. Assign a PHI to monitor development of symptoms daily from workers/members of household over the telephone or by visiting
3. If anyone falls sick with acute respiratory symptoms and signs send the patient to an assigned hospital

4. Provide chemoprophylaxis to those who have had direct contact with infected animals/poultry according to indicated national guidance

Use of PPE

- If visiting a farm or household with confirmed H5N1 poultry deaths PHI should wear a normal surgical mask and gloves and practice frequent hand washing
- When referring to a hospital the patient should wear a normal surgical mask and practice frequent hand washing

The following actions are also required at the MOH level

- o Notification of suspected and confirmed patients **promptly** to the Epidemiology Unit and Regional Epidemiology Unit (RE) through telephone, fax or email
- o Notification of suspected and confirmed patients weekly to the Epidemiology Unit through Weekly Return on Communicable Diseases (WRCD)
- o Monitoring and referral of symptomatic patients
- o Monitoring safe handling and trade of poultry meat in the area
- o Maintenance of adequate stocks of PPE for staff as per requirement
- o Maintenance of a minimum stock of lab consumables for specimen collection
- o Development of a contingency plan for staff deployment in an outbreak situation

2. Measures to be taken at the Out-Patient Department (OPD) of a Government or Private Hospital

As and when an H5N1 infection is detected in a poultry establishment, there is a possibility of the transmission of the disease from affected chicken to humans. These patients may seek medical attention at the OPDs of government or private hospitals. Hence screening of possible patients with H5N1 infection among patients attending to OPDs with influenza Like Illness (ILI) is important. Hospital authorities should be geared to handle this situation. OPDs may encounter three groups of patients who may have the potential to harbor H5N1 virus.

1. Suspected H5N1 patients referred for admission, confirmation and clinical management by General Practitioners (GPs) and MOH
2. ILI patients who have handled infected birds in poultry establishments or backyard poultry
3. ILI patients who have had close contacts with suspected, probable or confirmed cases of H5N1 during the last 7-8 days

Triage of possible H5N1 cases at the OPD is necessary. A system most suitable and practical for an individual institution should be in place in the Out Patient Departments in government and private hospitals so that persons with symptoms/signs, epidemiological evidence suggestive of H5N1 infection could be directed to a special counter/room where medical officer/s and supportive staff with appropriate PPE would assess them to decide on admission for clinical management.

Use of PPE

1. Medical officers, nursing staff and labourers assigned to the special counter/room screening the suspected patients should wear normal surgical masks and gloves.
2. Please note that N95 masks are required for staff involved in taking respiratory specimens from these patients if these are taken within the OPD premises.
3. The suspected patient should also be given a surgical mask to minimize the transmission of the infection to the health staff and the public.

In the initial screening, all ILI patients should be screened to ascertain if they meet clinical and epidemiological criteria of the case definitions. In the screening process, if the Medical Officer suspects that the patient is likely to be a patient with H5N1, he/she should be admitted to the hospital for isolation, laboratory confirmation and clinical management.

3. Measures to be taken by General Practitioners (GP)

It is highly likely that high risk individuals who develop ILI may seek medical attention from the GPs. Therefore, it is essential to inform GPs about the possibility of human cases of H5N1 infection seeking medical care from them when an avian influenza outbreak in poultry or among other birds occurs in a region.

- GPs should inquire from their ILI patients if they have had a contact history with suspected sick animals (birds, chicken, ducks) or a contact history with a possible, probable, or confirmed human case of H5N1 in the previous 7-8 days.
- In the event of finding such a patient, they should be referred to a government or private health institution with isolation facilities for admission, laboratory confirmation and clinical management.

Use of PPE

1. General practitioners and their nursing staff should wear normal surgical masks and gloves when handling the patient when attending to ILI patients during consultations.
2. The patient should also be given a surgical mask to minimize the transmission of the infection.

4. Transportation to identified hospital

If clinical findings and/or epidemiological link establish a human case of avian influenza, the patient should be transported to an assigned hospital. The ambulance should have basic facilities for oxygen therapy and non-invasive ventilation. If the patient is mechanically ventilated, then the patient should be accompanied by a trained technician. Aerosol-generating procedures should be avoided during transport unless life-saving. The identified hospital should be informed of the patient's arrival in advance.

Use of PPE

1. If patient is not in respiratory distress, then the mouth and nose should be covered by a normal surgical mask to contain droplets expelled during coughing.

2. Health-care workers should wear a similar mask and use standard and droplet precautions (please see page 8) if accompanying or handling a suspected or confirmed AI case during transport.

5. Measures to be taken at the wards in a health institution

When the admitting Medical Officer at the OPD makes the decision to admit the patient an assessment of the condition of the patient has to be made. If the suspected patient is having respiratory distress, patient should be admitted directly to an intensive care unit with a view to providing isolation, barrier nursing and respiratory support.

Other patients should be admitted to the hospital and placed in an isolation room/ward. An area for isolation should be identified beforehand. This area should ideally consist of the general access area, changing room with separate areas for storage of personal clothes and removal of PPEs and the area of isolation of patients. Head of the institution shall organize the needful arrangement recommended here according to the available facilities in the institute.

Patients admitted to isolation facilities who develop acute respiratory distress should be transferred to an intensive care unit.

Measures should be taken for laboratory confirmation by taking respiratory specimens from the patient and dispatching them to the virology section of the MRI, Colombo.

Use of PPE

1. Medical officers, nursing staff and labourers caring for admitted patients should wear normal surgical masks and gloves when handling the patient.
2. Please note that N 95 masks are required for staff involved in nebulising, sucking out secretions, suction, resuscitation, intubation or carrying out any other procedure that may generate aerosols.
3. The patient should also be given a surgical mask to minimize the transmission of the infection to the health staff.
4. By standers in paediatric cases should be given a surgical mask and taught on its proper use and safe disposal to minimize the transmission of the infection from the patient.

Clinical Management of cases in hospital setting

Anti Viral Therapy

The recommended antiviral Oseltamivir is available in all identified sentinel hospitals under the Pandemic Influenza Preparedness Programme (Annex I). In an outbreak situation this drug will be made available in other government hospitals at or above Base Hospital level and also in the private sector in a limited capacity.

Oseltamivir should be prescribed as soon as possible (ideally, within 48 hours following onset of symptoms) to maximize its therapeutic benefits. If the case meets the clinical and

epidemiological criteria, then treatment with antivirals should be started immediately without even waiting for the laboratory confirmation.

Treatment Recommendations

For Adolescents over 13 years of age and Adults: Oseltamivir 75mg twice a day for 5 days

For children over 1 year of age to 13 years of age: Oseltamivir to be given twice a day for 5 days, dosage based on child's weight.

≤ 16 kg	→	30 mg twice daily
16 - 23 kg	→	45 mg twice daily
24 - 40 kg	→	60 mg twice daily
> 40 kg	→	75 mg twice daily

Oseltamivir has been used to treat children <1year of age during the H1N1 pandemic during 2009/2010 and the same regime may be used for H5N1 infection in these children.

To be given for 5 days with dosage based on body weight:

- >3 months of age to 12 months – 3mg/kg twice daily
- 3 months to 1 month of age - 2.5mg/kg twice daily
- <1 month of age* – 2mg/kg twice daily

Treatment of severe cases

In cases of severe infection with the H5N1 virus, clinicians may consider increasing the recommended daily dose or/and the duration of treatment. In adults, doses up to 150 mg twice daily for 10 days could be prescribed.

Caution should be exercised when considering higher doses of oseltamivir in patients with renal impairment and in pregnancy.

Pregnant Women and Breast Feeding Mothers

Pregnant women, especially those with co-morbidities, are at increased risk for complications from influenza. Influenza in pregnancy is associated with an increased risk of adverse pregnancy outcomes, such as spontaneous abortion, preterm birth, and fetal distress. WHO currently recommends that Oseltamivir be used in pregnancy.

Mothers who are breast feeding may continue breastfeeding while ill and receiving oseltamivir.

Adverse effects of Oseltamivir

This drug is usually well tolerated. Reported adverse effects are as follows:

- Nausea and vomiting
- Transient neuropsychiatric events (self-injury or delirium). It is advisable that persons receiving oseltamivir be monitored closely for abnormal behavior.
- Oseltamivir suspension is formulated with sorbitol, which may be associated with diarrhea and abdominal pain in patients who are fructose-intolerant.
- Allergic reactions (rash, swelling of the face or tongue, anaphylaxis)

Antibiotic Therapy

- Suspected human cases of H5N1, if not having pneumonia, do not require antibiotic therapy.
- Patients with community-acquired pneumonia along with the H5N1 infection should receive antibacterial therapy. Stop antibiotic treatment if initial bacteriological studies are negative and H5N1 is confirmed.
- Patients on mechanical ventilation should be administered antibacterial drugs prophylactically to prevent hospital-associated infections.

Oxygen Therapy

Oxygen saturation should be monitored in hospitalized patients by pulse oximetry. Supplemental oxygen should be provided to correct hypoxaemia. For pneumonia maintaining oxygen saturations above 90% is recommended.

Adjunctive pharmacologic therapy

High dose systemic corticosteroids and other adjunctive therapies for viral pneumonitis are not recommended for use. Low doses of corticosteroids may be considered for patients in septic shock who require vasopressors. Generally, corticosteroids should be avoided unless indicated for another reason.

Chemoprophylaxis

Management of Contacts and Chemoprophylaxis with Antivirals

For antiviral chemoprophylaxis, oseltamivir is recommended. The duration of antiviral chemoprophylaxis *post-exposure* is 7 – 10 days after the last known exposure. Patients given post-exposure chemoprophylaxis should be informed that the chemoprophylaxis lowers but does not eliminate the risk of infection and that protection stops when the medication course is stopped. Patients receiving chemoprophylaxis should be encouraged to seek medical evaluation as soon as they develop a febrile respiratory illness that might indicate H5N1 infection.

Post-exposure chemoprophylaxis is indicated for high risk exposures such as household or family members and close contacts, including pregnant women, of a confirmed H5N1 patient.

Antiviral chemoprophylaxis may be considered in persons defined as having moderate risk:

- Persons handling sick animals, decontaminating environments, **without the appropriate use of PPE**
- Unprotected and very close direct exposure to sick or dead animals infected with H5N1 virus or birds implicated in human cases
- Healthcare workers in close contact with confirmed H5N1 patients (performing intubation, tracheal suctioning, delivering nebulized drugs, handling body fluids) **without the appropriate use of PPE**

However use of post exposure chemoprophylaxis of healthcare workers should be decided by the treating clinician in consultation with the Chief Epidemiologist on case by case basis.

In the case of animal health workers this decision should involve animal health authorities as well.

Adult Dosage for Prophylaxis

Oseltamivir 75mg once daily for 7 – 10 days

Paediatric Dosage for Prophylaxis

To be given once daily for 7 - 10 days, based on child's weight:

≤ 16 kg	→	30 mg daily
16 - 23 kg	→	45 mg daily
23 - 40 kg	→	60 mg daily
>40 kg	→	75 mg daily

Guidance for Laboratory Diagnosis

Facilities for testing are only available at the Medical Research Institute (MRI) which is the National Influenza Centre (NIC).

- Appropriate laboratory specimens one deep throat swab and two nasal swabs (one each from each nostril) from patients should be sent to NIC for laboratory diagnosis using the special request form developed by the MRI for sending in these specimens.

(Please see Epidemiology Unit website <http://www.epid.gov.lk> for the format)

- All samples should be sent in viral transport media (VTM), properly labeled and packed in another bag (to avoid possible contamination with leaked out contents) and sent in ice.
- Autopsy samples (lung tissue) should be sent in 70% alcohol using same procedure as above.
- A detailed clinical history should be included in the request. A special authorization from the head of the institution or an authorizing officer will be required by the MRI for all requests from private hospitals.
- MRI would be open to receive specimen for 24 hours. It would direct the test results within 24 hours to the respective hospital and to the Epidemiology Unit by telephone/fax. The contact number for NIC is 2697280.
- Patients presenting to the GPs who may require laboratory investigations should be directed to a government or private hospital where treatment facilities are available.

Infection Control

When Avian Influenza cases are identified, it is essential that steps are taken to minimize the probability of transmission to health workers, patient's family, or the public.

The mainstay of infection control in management of patients with H5N1 infection is to **apply Standard and Droplet precautions at all times** on triaging, transporting or managing H5N1 patients

Standard Precautions

- Hand hygiene
- Respiratory hygiene and cough etiquette
- Use of appropriate personal protective equipment (PPE)
- Prevention of needle sticks/sharps injuries
- Cleaning and disinfection of the environment and equipment

Droplet Precautions

In addition to Standard Precautions:

- Use a medical mask when within < 1 m of patient
- Maintain a distance ≥ 1 meter between infectious patient and others
- Place patient in a single room or cohort with similar patients
- Limit patient movement

In addition following contact precautions are also important.

Contact precautions

- Provide appropriate PPE for patient/room contact
- Avoid touching eyes, nose, and mouth with hands
- Avoid contaminating environmental surfaces
- Wash hand immediately after patient contact
- Dedicate equipments to single patient (if not possible, clean and disinfect between use)
- Clean and disinfect patient room daily including bed rails, bedside tables, and lavatory surfaces

During isolation

- Treat probable Avian Influenza patients in an isolation room/ward.
- Do not manage possible cases in the same room as probable cases.
- Provide a mask to the suspected patient to reduce respiratory spread
- Place a patient in a single room. If a single room is not available, place cohorts of confirmed, possible and probable cases of Avian Influenza separately in designated multi-bed rooms or wards.
- Where cohorting is being carried out, the distance between beds should be more than 1 meter and beds should preferably be separated by a physical barrier (e.g. curtain or partition).
- The room should preferably have monitored negative airflow pressure – often referred to as a “negative pressure room”. Keep doors closed at all times.

- Open external windows to areas with no public access.
- Maintain strict personal hygiene
- Ensure that anyone who enters the room wears appropriate PPE if substantial contact with the patient, environmental surfaces or items in the patient's room is anticipated.
- An essential part of isolation involves minimizing contact with other people. Visits by family and non-essential staff should be avoided wherever possible.
- Ensure safe disposal or cleaning and disinfection of all patient care equipment
- Limit the movement and transport of the patient from the room for essential purposes only
- The patient should be as self-caring as possible and the staff team assigned to care for the patient should be restricted to a minimum.
- Staff should be experienced in infection control and strictly supervised.

Who Should Use PPE?

Following categories of staff should wear appropriate PPE. And the number of staff should be kept to a minimum necessary.

- All doctors, nurses and health care workers who provide direct patient care to Avian Influenza cases
- All supporting staff including medical aides, cleaners, laundry staff who come into direct contact
- All laboratory staff who handle patient specimens from suspect cases
- By-standers: Hospital authorities should allow by-standers for paediatric cases. In such cases, by-standers should be provided appropriate PPE. Ward staff is advised to educate the by-standers on proper use of these

Infection control measures at indicated instances

1. When working in direct contact with patients

- Wear a surgical mask, if working within or > 1 meter of the patient.
- Wash hands well with soap and water before and after patient contact and immediately after removal of mask.

For procedures with a risk for splashes onto the face and body use the following PPE:

- facial protection with a surgical mask and goggles)
- a gown and clean gloves
- hand hygiene before and after patient contact and after PPE removal

2. When performing aerosol-generating procedures

These include aspiration of respiratory tract, intubation, resuscitation, bronchoscopy and autopsy.

- wear a N95 mask, eye protection (i.e. goggles), a clean, non-sterile, long-sleeved gown and gloves (some of these procedures may require sterile gloves)
- perform procedures in an adequately ventilated room
- limit entry of unnecessary personnel into the room
- perform hand hygiene before and after patient contact and after PPE removal.

3. Collection of laboratory specimens

- use face protection with a surgical mask and goggles
- wear a gown and clean gloves
- perform hand hygiene before and after patient contact and immediately after removal of PPE
- Use of N95 mask is not indicated during sample collection unless suction is used

4. Placement of suspected and confirmed patients in ward

- Cohort patients with the same diagnosis together keeping at least 1 metre distance between beds
- All persons entering the isolation area should adhere to Standard and Droplet Precautions
- Limit the number of health-care workers/family members/visitors exposed to the patient

5. Specimen transport/handling within health-care facilities

- Use Standard Precautions for specimen transport to the laboratory

6. Family member/visitor recommendations

- Family members/visitors should be limited to those essential for patient support and they should use the same infection control precautions as health-care workers

7. Patient transport within health-care facilities

- Patients should wear a surgical mask and practice appropriate hand hygiene while being transported within health-care facilities
- Healthcare workers should use infection control precautions similar to those practiced during hospital care when transporting patients to hospital
- After the patient is admitted to the hospital, the patient cabin of the ambulance and reusable patient-care equipment should be sanitized using recommended cleaning and disinfecting solutions.

8. Occupational health

- Health-care workers with symptoms should stay away from work
- Vulnerable groups at high risk for complications should carefully follow recommended infection-control measures. In addition, alternatives such as reassignment to other duties should be considered.
- Antiviral prophylaxis may be considered depending on exposure status and local policy

Duration of infection control precautions

- Adults and adolescents > 12 years of age – implement precautions at time of admission and continue for 7 days after symptoms have resolved.
- Infants and children ≤ 12 years of age – implement precautions at time of admission and continue for 21 days after symptom onset (young children can shed influenza viruses for up to 21 days).

- For immunocompromised patients, pathogen shedding may be protracted and there are no data to define the duration of infectiousness at the moment. Microbiologic monitoring to determine lack of pathogen detectability is advised whenever possible.

Infection control on Patient discharge

If the patient is discharged before 7 days from onset of illness he/she may still be infectious and instruct family members on appropriate infection control precautions at home.

Cleaning and disinfection

Cleaning MUST precede disinfection. Items and surfaces cannot be disinfected if they are not first cleaned of organic matter (patient excretions, secretions, dirt, soil, etc). Possible aerosolization should be avoided during the cleaning process.

Routine detergents should be used for cleaning.

Disinfectants that can be used are:

- **Sodium hypochlorite 1% (household bleach)** - disinfection of materials contaminated with blood and body fluids
- **70% alcohol** – toilets and bathrooms
- **Bleaching powder 7g/liter with 70% available chlorine** - Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used

Patient-care environment

- Horizontal surfaces in isolation rooms/areas, particularly those where the patient has been lying and/or has frequently touched, and immediately around the patient's bed, should be cleaned regularly and on discharge, using routine detergents and disinfected using recommended disinfectants.
- To avoid possible aerosolization, damp cleaning (moistened cloth) rather than dry dusting or sweeping should be performed.
- As cleaning solutions and equipment soon become contaminated during wet cleaning, cleaning solutions, cleaning cloths, and mop heads should be changed frequently
- Equipment used for cleaning and disinfection must be cleaned and dried after each use.
- Keep areas around the patient free of unnecessary supplies and equipment to facilitate daily cleaning.
- Do not spray (i.e. fog) occupied or unoccupied rooms with disinfectant. This is a potentially dangerous practice that has no proven disease control benefit.

Patient-care equipment

- If equipment is reused, follow general protocols for disinfection and sterilization.
- If not visibly soiled, wipe external surfaces of large portable equipment (e.g. X-ray machines, ultrasound machines) that has been used in the isolation room/area with an disinfectant upon removal from the patient's room/area.
- Proper cleaning and disinfection of reusable respiratory equipment is essential.

Dishes and eating utensils

- Items should be washed by hand with detergents. Nonsterile rubber gloves should be used.
- Dishes and eating utensils for the patient should be washed after each meal/use.
- Disposable items should be discarded as waste.

Linen and laundry

- Remove large amounts of solid material (e.g. faeces) from heavily soiled linen (wearing appropriate PPE) and place the solid wastes into a toilet for disposal before linen is placed into the laundry bag.
- Avoid sorting linens in patient-care areas.
- Place contaminated linen directly into a laundry bag in the isolation room/area with minimal manipulation or agitation to avoid contamination of air, surfaces, and persons.
- Wash and dry linen with routine detergents.
- Nonsterile rubber gloves should be used.

Packing and transporting patient-care equipment, linen and laundry, and wastes from isolation areas

- Place used equipment and soiled linen and waste directly into containers or bags in the isolation room/area.
- Contain the used equipment and soiled linen and waste in a manner that prevents the containers or bags from opening or bursting during transport.
- One layer of packing is adequate providing that used equipment and soiled linen and waste can be placed in the bag without contaminating the outside of the bag. Double bagging is unnecessary.
- All personnel handling the used equipment and soiled linen and waste should use Standard Precautions and perform hand hygiene after removing PPE.

Waste Management

- All waste from AI patients generated in the isolation room/area should be considered as clinical infectious waste and should be treated and disposed of in accordance with routine practice pertaining to such waste.
- When transporting waste outside the isolation room/area, use gloves followed by hand hygiene.
- Standard Precautions should be used when handling and disposing of sharps and contaminated items.
- Incineration is recommended for disposal of clinical waste.
- When an incinerator is not available, burn waste in a pit. Use fuel to accelerate the burning and ensure that all waste is completely destroyed.
- Select staff to supervise this activity

Care of the deceased

Removal of the body from the isolation room/area

- According to Standard Precautions, PPE use should be appropriately applied to avoid direct contact with body fluids.

- Cultural sensitivity should be practised. If the family of the patient wishes to view the body after removal from the isolation room/area, they may be allowed to do so, and Standard Precautions should be applied.
- Provide adequate explanation to the family. Each family should be managed on a case-by-case basis, balancing their rights with the risks of exposure to infection.
- Discarded waste should be disinfected/ disposed of safely according to routine procedures. Recommended disinfectants and cleaning solutions should be used to clean equipments and surfaces that may have been contaminated. This should be done as quickly as possible. All areas 'high-touch' areas e.g. door knobs should be cleaned with recommended disinfectants regularly.

Family Contact with the Deceased in Health Care Settings and Funeral Houses

- Direct contact with the body is discouraged; however, necessary contact may occur as long as hands are washed immediately with soap and water.

Mortuary care

- Mortuary staff and the burial team should apply Standard Precautions i.e. perform proper hand hygiene and use appropriate PPE (use of gown, gloves, facial protection if there is a risk of splashes from patient's body fluids/secretions onto staff's body and face).
- Embalming may be conducted according to usual routine, with Standard Precautions.
- Hygienic preparation of the deceased (e.g. cleaning of body, tidying of hair, trimming of nails, and shaving) also may be conducted with the application of Standard Precautions.

Postmortem examination

- Post-mortem examinations and collection of post mortem samples for microbiologic analyses if inward sampling had not been carried out are essential. However they are associated with risk of transmitting infections, and should be performed with safety measures in place.
- A minimum number of staff should be involved in the procedure.
- Use a well-ventilated room and appropriate PPE.

Packing and transport of dead body to mortuary, crematorium and burial

- If the patient has been laboratory confirmed as H5N1 positive, the body should be fully sealed in an impermeable body bag before removal from the isolation room/area or the mortuary to avoid leakage of body fluid.
- Transfer to the mortuary should occur as soon as possible after death.
- The body, when properly packed in the body bag, can be safely removed for storage in the mortuary, sent to the crematorium, or placed in a coffin for burial.
- Hand hygiene should be performed after completing transport.

Surveillance and Reporting

- ✓ All admitted suspected and confirmed cases should be notified to the Epidemiology Unit and the Regional Epidemiologist (RE) **promptly by telephone/fax/e mail** by the hospital.

- ✓ All admitted cases should be notified using routine procedure to the relevant Medical Officer of Health (MOH) by the treating clinicians
- ✓ In the event of a death from H5N1 influenza, the treating clinicians/ Infection Control Nursing Officer (ICNO) should inform the Epidemiology Unit and the RE **promptly by telephone/fax/e mail**. RE should inform the relevant MOH and they should handle the technical infection control matters pertaining to preparing the body and the funeral house personally.
- ✓ A weekly return on admitted patients should be completed by the ICNO. This should include H5N1 patients admitted to the hospital from Saturday of the week to coming Friday. The return should be posted to the Epidemiology Unit by Saturday morning with a copy to the Regional Epidemiologist. The format is available in the Epidemiology Unit website.
- ✓ A Special Investigation Form should be completed for each admitted H5N1 patient by the ICNO and should be sent to the Epidemiology Unit. The format is available in the Epidemiology Unit website.
- ✓ All above forms/returns will be available from the Epidemiology Unit website www.epid.gov.lk

This guideline had been developed using currently updated information and it may further change on availability of newer knowledge.

Circulars earlier issued on Avian Influenza Preparedness, Gen. Circular No.02-164/2005 'Guidelines for the Preparedness and Response to an Avian Influenza Pandemic Threat' dated 30/11/2005 and Gen. Circular No.01-19/2006 'Joint Circular on Guidelines on Collection and Transport of Specimens' dated 15/03/2006 (available at <http://www.epid.gov.lk/Disease%20Situations.htm>).

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Annex I

List of Hospitals selected as Sentinel Sites for Pandemic Influenza Preparedness and designated H5N1 Treatment Centers

1. GH Ampara
2. TH Karapitiya
3. GH Matara
4. LRH
5. IDH
6. NHSL
7. Colombo South Teaching Hospital
8. TH Peradeniya
9. TH Ratnapura
10. TH Kurunegala
11. GH Vavunia
12. GH Nuwara Eliya
13. TH Badulla
14. TH Anuradhapura
15. GH Polonnaruwa
16. GH Chilaw
17. TH Batticaloa
18. TH Jaffna
19. North Colombo Teaching Hospital