Influenza A (H5N1): WHO Interim Infection Control Guidelines for Health Care Facilities

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1. Avian influenza ("bird flu") and the significance of its transmission to humans

1-1. The disease in birds: impact and control measures

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. The disease, which was first identified in Italy more than 100 years ago, occurs worldwide.

All birds are thought to be susceptible to infection with avian influenza. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics. The latter is known as "highly pathogenic avian influenza (HPAI) ". This form is characterized by sudden onset, severe illness, and rapid death of affected birds/flocks, with a mortality rate that can approach 100%.

Direct or indirect contact between domestic flocks and wild migratory waterfowl has been implicated as a frequent cause of epidemics in poultry populations. It is generally accepted that migratory waterfowl – most notably wild ducks – are the natural reservoir of avian influenza viruses which can be transmitted to domestic populations of birds and to commercial poultry. Live bird markets can also play an important role in the spreading avian influenza viruses.

The use of quarantine for infected farms and destruction of infected or potentially exposed flocks are standard control measures aimed at preventing spread of the virus in a poultry population. Apart from being highly contagious, avian influenza viruses are readily transmitted from farm to farm by mechanical means, such as by contaminated equipment, vehicles, feed, cages, or clothing. Stringent sanitary measures on farms can confer some degree of protection.

In the absence of prompt control measures backed by good surveillance, epidemics can last for years. For example, an epidemic of H5N2 avian influenza which began in Mexico in 1992 started with low pathogenicity, evolved to the highly fatal form, and was not controlled until 1995.

Highly pathogenic strains of avian influenza virus, for example H5N1, have crossed from birds to humans and are known to cause fatal disease.[1] In January 2004, clinical samples taken from two children and one adult admitted to hospital with a severe respiratory illness in Ha Noi tested positive for avian influenza virus strain A (H5N1). Although reports of avian-to-human transmission have been received from a number of countries, at present there is no evidence that human-to-human transmission

[1] Webby, R.J., and Webster, R.G. (2003) Are we ready for pandemic influenza? *Science*.302:1519-1522.

has occurred. Nevertheless, WHO regards every case of transmission of an avian influenza virus to humans as a cause for heightened vigilance and surveillance.

1-2. Clinical course and treatment, prevention of humans infected by influenza A (H5N1)

Published information about the clinical course of humans infected by influenza A (H5N1) is limited to studies of cases in the 1997 Hong Kong (China) outbreak,[2,3] and preliminary reports of recent cases in Thailand[4] and Viet Nam.[5,6] In these three outbreaks, patients developed symptoms of fever, respiratory symptoms and, in several of the fatal cases, severe respiratory distress secondary to viral pneumonia. Although previously healthy adults and children, and some with chronic medical conditions, were affected, the majority were mild cases.

Tests for diagnosing all influenza strains of animals and humans vary in sensitivity and specificity depending on the timing of specimen collection and type of test used. For further information on specimen collection see the specimen collection guidelines http://www.who.int/csr/disease/avian_influenza/guidelines/humanspecimens/en/ and the laboratory guidelines http://www.who.int/csr/disease/avian_influenza/guidelines/handlingspecimens/en/

Antiviral drugs, some of which can be used for both treatment and prevention, are clinically effective when used for uncomplicated influenza A infection, but have some limitations. Some of these drugs are also expensive and supplies are limited.

Any health care worker who has had potential contact with respiratory secretions or droplets from a patient with confirmed influenza A (H5N1), or for whom an influenza A (H5N1) virus diagnostic test result is pending, should be considered for prophylaxis or treatment with a neuraminidase inhibitor such as oseltamivir.

For information on the clinical management of a patient with influenza A (H5N1) see the clinical management guidelines, available at WHO Headquarters website: http://www.who.int/csr/disease/avian_influenza/guidelines/clinicalmanage/en/

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[2] Yuen K.Y., *et al.* Clinical features and rapid viral diagnosis of human disease associated with avian influenza A H5N1 virus. *Lancet* 1998 Feb 14. 351 (9101): 467-71.

[3] Chan PK. Outbreak of avian influenza A(H5N1) virus infection in Hong Kong in 1997. *Clinical Infectious Diseases*, 2002, 34:S58–S64.

[4] *Weekly Epidemiological Record*, 2004, 79(7): 65–70, available at http://www.who.int/wer/2004/en/wer7907.pdf

[5] *Preliminary clinical and epidemiological description of influenza A (H5N1) in Viet Nam*, available at http://www.who.int/csr/disease/avian_influenza/guidelines/vietnamclinical/en/

[6] Tran T. H., Nguyen T. L., *et al*, Avian Influenza A (H5N1) in 10 Patients in Vietnam. *New England Journal of Medicine* 2004; 350: 1179-88.

1-3. 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).[7]

1-4. 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:

- positive viral culture for influenza A/H5;
- positive polymerase chain reaction (PCR) for influenza A/H5;
- positive immunofluorescence antibody (IFA) test to H5 antigen using H5 monoclonal antibodies;
- 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.

[7] *Weekly Epidemiological Record*, 2004, *op. cit.* Ref. 4; *Preliminary clinical and epidemiological description of influenza A (H5N1) in Viet Nam*, *op. cit.* Ref. 5; Tran *et al*, *New England Journal of Medicine* 2004, *op. cit.* Ref. 6.

2. Infection control precautions for influenza A (H5N1)

2-1. 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[8] in addition to droplet and contact precautions. In addition, a negative pressure room – if available – is recommended.

2-2. Infection control precautions

Infection control for influenza A (H5N1) involves a two-level approach:

- 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. (see Annex 3 for when to initiate infection control precautions in health care facilities).

2-2-1. Standard precautions

Treating all patients in the health care facility with the same basic level of "standard" precautions involves work practices that are essential to provide a high level of protection to patients, health care workers and visitors.

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[8] High-efficiency masks are US NIOSH certified N-95, European CE approved respirators, or of a comparable national/regional standards applicable to the country of manufacture. Higher level particulate respirators may also be used.

These include the following:

- hand washing and antisepsis (hand hygiene);
- use of personal protective equipment (PPE) when handling blood, body substances, excretions and secretions;
- appropriate handling of patient care equipment and soiled linen;
- prevention of needlestick/sharp injuries;
- environmental cleaning and spills-management; and
- appropriate handling of waste.

2-2-2. Additional (transmission-based) precautions

Additional (transmission-based) precautions are taken while still ensuring standard precautions are maintained. Additional precautions include:

- droplet precautions;
- contact precautions; and
- airborne precautions (including the use of high efficiency masks – negative pressure rooms if available)

A combination of these precautions will give the appropriate level of precaution for influenza A (H5N1). 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[9] have lapsed since onset of illness**.** Where this is not feasible (because of a lack of local resources), the family should be educated on personal hygiene and infection control measures (e.g. hand-washing and use of a paper or surgical mask by a child who is still coughing).

[9] Shedding of virus can be at high titres for up to 21 days in young children (Douglas, R.G. (1975) Influenza in Man. In: E.D. Kilbourne (ed), *The influenza viruses and influenza*, Academic Press, pp. 395-447).

The following precautions need to be taken:

- Implement and/or reinforce standard precautions.
- Place patient in a single room. If a single room is not available, where possible cohort confirmed cases and those for whom the diagnosis of influenza A (H5N1) virus infection is being considered separately in designated multibed rooms or wards. Where cohorting is being carried out the distance between beds should be more than 1m 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.
- Ensure that anyone who enters the room wears appropriate PPE: mask (high-efficiency masks should be used where possible, with surgical masks as a second alternative), gown, face shield or goggles and gloves.
- Limit the movement and transport of the patient from the room for essential purposes only. If transport is necessary, minimize dispersal of droplet nuclei by masking the patient.
- Wear clean, non-sterile gloves when entering the room.
- Wear a clean, non-sterile gown when entering the room if substantial contact with the patient, environmental surfaces or items in the patient's room is anticipated.

Single rooms

Single rooms reduce the risk of transmission of infection from the source patient to others by reducing direct or indirect contact transmission. Where possible, single rooms should have the following facilities:

- hand washing facilities; and
- toilet and bathroom facilities.

Anterooms

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

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

PPE used for influenza A (H5N1)

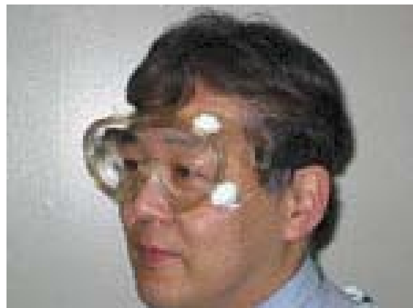
PPE reduces the risk of infection if used correctly. It includes:

- gloves (nonsterile),

- mask (high-efficiency mask),

- long-sleeved cuffed gown,

- protective eyewear (goggles/visors/face shields),



- cap (may be used in high risk situations where there may be increased aerosols),

- plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.

Who should use personal protective equipment?

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

Waste disposal

All waste generated in the isolation room/area should be disposed of in suitable containers or bags. All waste from a room/area containing patient(s) with influenza A (H5N1) should be treated as clinical (infectious) waste.

Staff responsible for routinely removing waste from isolation wards/areas should wear full PPE when removing waste.

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).

Liquid waste such as urine or faeces can be safely flushed into the sewer system if there is an adequate sewage system in place.

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

Disinfectants	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	• 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.	• 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.

2-3. Specimen collection and transportation

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.

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.)** Personnel who transport specimens should be trained in safe handling practices and decontamination procedures in case of a spill.

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". 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.

For further information see specimen collection guidelines at: http://www.who.int/csr/disease/avian_influenza/guidelines/humanspecimens/en/

2-4. Care of influenza A (H5N1) patients in isolation

Patients with influenza A (H5N1) should be cared for in single rooms (where possible) to prevent direct or indirect transmission.

Strict adherence to the infection control guidelines is essential to prevent transmission of infection between patients and from patients to health care workers and others.

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 of microorganisms (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. Collect linen as needed.

5. Stock the hand basin with suitable supplies for hand washing.

6. Place appropriate waste bags in the room on a foot-operated bin.

7. Place a puncture-proof container for sharps in the room.

8. 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.

9. 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.

10. Set up a trolley outside the door to hold personal protective equipment. A checklist may be useful to ensure all equipment is available (see Annex 2).

11. 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.

12. Keep adequate equipment required for cleaning and disinfection inside the patients' room. Scrupulous daily cleaning of the isolation unit is important in the prevention of cross infection.

13. If possible, the air conditioning should ensure the direction of the air-flow is from the outside adjacent space (e.g. the corridor) into the room. This is known as "negative pressure". See glossary at the end of the text.

14. Cutlery and crockery should be cleaned in hot soapy water.

15. For more information on isolation rooms see the CDC Guidelines for Isolation Precautions in Hospitals: http://www.cdc.gov/ncidod/hip/isolat/isolat.htm (see Annex 4 for a diagram of an appropriate isolation room for influenza A (H5N1).

Entering the room

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

Leaving the room

Remove PPE in the correct order:

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

2-5. 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 – see Annex 5.

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 an 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 (http://www.who.int/csr/disease/avian_influenza/guidelines/seasonal_vaccine/en/).

2. They should take one oseltamivir phosphate 75 mg tablet 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

Observe good respiratory and hand hygiene at all times and:

1. Check temperature twice daily and monitor self for respiratory symptoms especially cough.

2. Where at all possible, keep a personal diary of contacts. The diary should not be taken into isolation areas.

3. 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.

2-6. 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 (see Annex 5 – advice for family and friends).

3. Carry out appropriate cleaning and disinfection of the room after discharge (see Annex 1 and Table 1).

2-7. Care of the deceased[10]

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. If the patient died in the infectious period, the family should wear gloves and a gown.

7. Cultural sensitivity should be practised when a patient with influenza A (H5N1) dies.

Post mortem[11]

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[12]

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.

[10] Claydon, S.M. The high risk autopsy. Recognition and protection. *American Journal of Forensic Medical Pathology*. 1993. 14: 253-256

[11] Newsom S.W.B., Rowlands, C. Matthews, J., et al. Aerosols in the mortuary. *Journal of Clinical Pathology*. 1983. 36: 127-132.

[12] Healing, T.D., Hoffman, P.N. and Young, S.E.J. The infection hazards of human cadavers. *Communicable Disease Report*. 1995. 5(5):R61-R68.

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[13]

- 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.
- Embalming may be conducted as routine.
- Hygienic preparation of the deceased (e.g. cleaning, tidying of hair, trimming of nails, shaving) may also be conducted.

[13] Young, S.E.J. & Healing, T.D. Infection in the deceased: a survey of management. *Communicable Disease Report*. 1995. 5(5):R69-R76.

3. Glossary

Airborne infection: The infection usually occurs by the respiratory route, with the agent present in aerosols (infectious particles < 5μm in diameter)

Airborne precautions: These are additional to standard precautions and are designed to reduce the transmission of diseases spread by the airborne route.

Anteroom: As an extra precaution to prevent airborne transmission, some single rooms used for isolation purposes may include an anteroom where staff may put on and remove personal protective equipment.

Clinical Waste: Also known as "infectious waste" – includes waste directly associated with blood, body fluids secretions and excretions. It also includes laboratory waste that is directly associated with specimen processing, human tissues, including material or solutions containing free-flowing blood, and animal tissue or carcases used for research. Also includes discarded sharps.

Cohorting: For infection control purposes, if single rooms are not available or there is a shortage of single rooms, patients infected or colonised with the same organisms can be cohorted (sharing of room(s)). When cohorting is used during an outbreak, these room(s) should be in a well defined area that has been designated for the purpose and is clearly segregated from other patient care areas in the health care facility used for non-infected/colonized patients.

Contact transmission: Micro-organisms that are transmitted by direct contact with hands/ equipment or indirect contact between and infected or colonized patient and a susceptible patient.

Contact precautions: These are additional to standard precautions and are designed to reduce the risk of transmission of micro-organisms by direct or indirect contact.

Disinfection: A process of removing micro-organisms without complete sterilization.

Droplet infections: Large droplets carry the infectious agent (>5μm in diameter)

Droplet precautions: These are additional to standard precautions and are designed to reduce the transmission of infectious spread by the droplet route.

Health care worker: Any person working in a health care facility, for example, medical officer, nurse, physiotherapist, cleaner, psychologist.

Health care facility: Organization that employs health care workers and cares for patients/clients.

Negative Pressure Room This is a term used for an isolation area which receives many air changes per hour (ACH) (≥12 ACH for new construction as of 2001; ≥6 ACH for construction before 2001), and is under negative pressure. In other words, the direction of the air flow is from the outside adjacent space (e.g., the corridor) into the room. It is preferable that the air in a negative pressure room is exhausted to the outside, but may

be recirculated if the air is filtered through a high-efficiency particulate air (HEPA) filter.[6] (For more information see the CDC Guidelines for Environmental Infection Control in Health Care Facilities. MMWR, June 6, 2003/52(RR10);1-42. Also found at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

Personal protective equipment: Includes gloves, gowns, caps, masks – (surgical and high efficiency masks), and overshoes. These items are used to protect the health care worker from splashes of blood, body fluids, excretions and excretions or from droplets or aerosolization of organisms from the respiratory tract. It is the responsibility of the health care worker to put on the appropriate personal protective equipment in any situation that is likely to lead to exposure of blood, body fluids, excretions and secretions.

Standard precautions: These are applied for all patients at all times regardless of their known or presumed infectious status.

Sterilization: The destruction of all microorganisms. This is defined as a decrease in microbial load. Sterilization can be either conducted by physical or chemical means.

Annex 1. Infection control in the health care facility: a quick reference guide for influenza A (H5N1)

Items entering the room or area where patients with influenza A (H5N1) are present must be cleaned or placed into an appropriate clean container before removal from the environment.

All persons (staff/visitors) should ensure that they clean their hands and remove the outside layer of PPE before exiting the room or area.

1. Patients or groups of patients with influenza A (H5N1) should be placed in a single room – if possible one with negative pressure.

2. Only essential staff/visitors who have been educated about influenza A (H5N1) should enter the room.

3. All staff/visitors who enter the room should sign a log book.

4. All health care workers (and visitors) must wear PPE when entering the room.

5. The patient must wear a surgical face mask when in contact with staff/visitors.

6. The infection control equipment trolley should remain outside the door (Annex 2).

7. Patients should have clinical equipment (e.g. sphygmomanometer, thermometer) dedicated to their exclusive use

8. Sterile items should be disposable where possible. Reusable items should be placed in a plastic bag and then into another plastic bag inside the equipment collection bin on the trolley. Request the sterile service department to collect.

9. Alcohol-based handrub should be located in and outside the room.

10. The patient's room must be cleaned each day – including all horizontal surfaces and blinds. Curtains should be thoroughly cleaned (by laundering in hot water) at least weekly.

11. Cleaning equipment must be cleaned after each use. Mop heads should be sent to the laundry for proper laundering in hot water.

12. Pathology specimens must be taken directly to the laboratory. Request form must indicate " influenza A (H5N1)".

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.

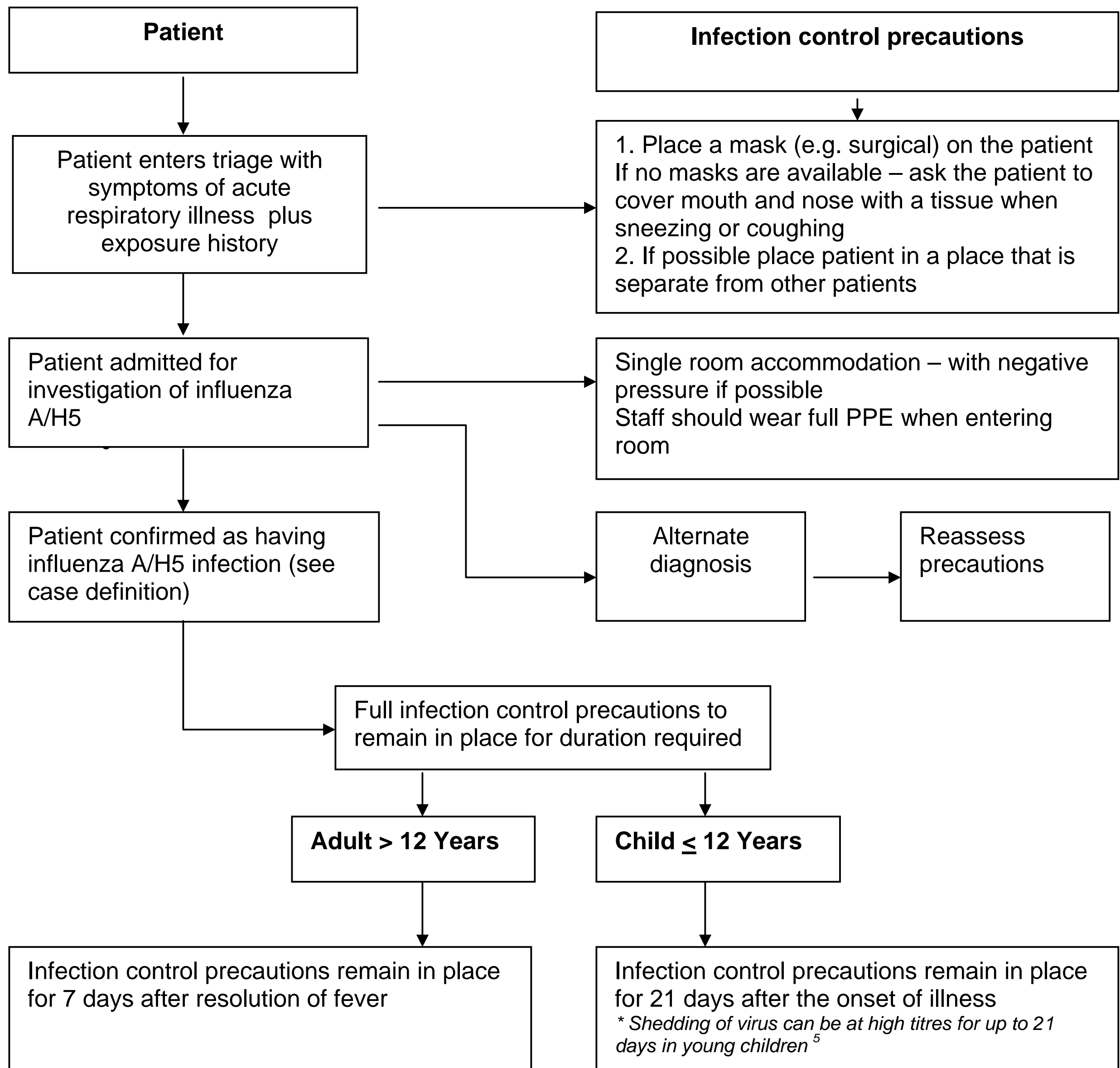
16. Keep the door to negative pressure rooms closed at all times.

Annex 2. Suggested checklist for influenza A (H5N1) trolley/table

Items should be kept on this trolley at **all times** so that personal protective equipment is always available for staff.

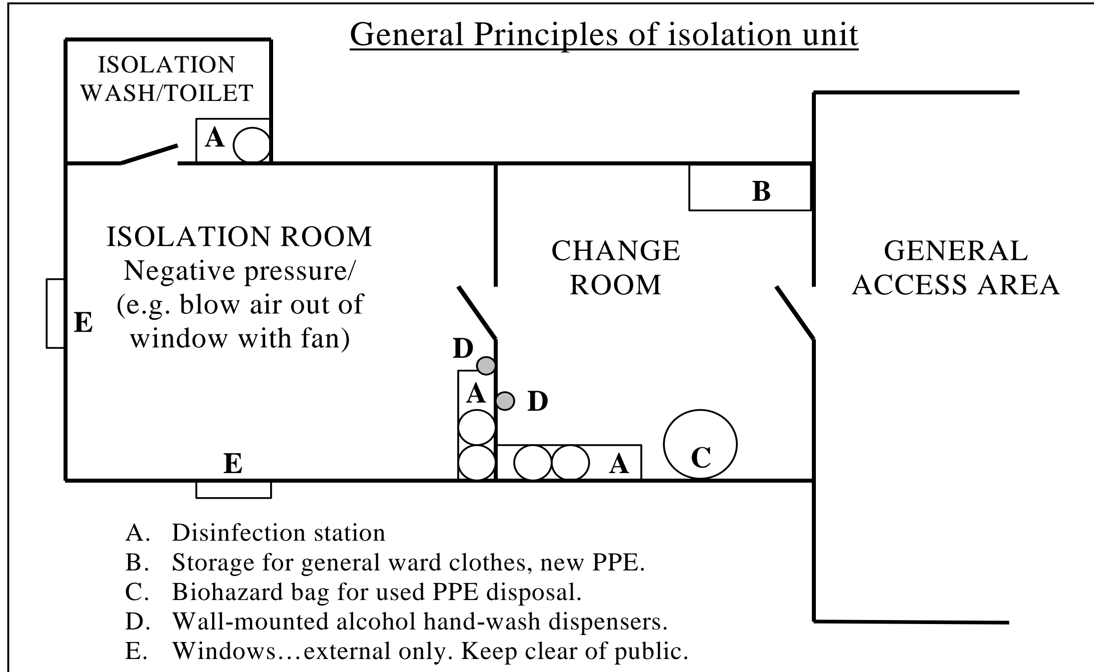
Equipment	Stock present
Face shield/eye protection goggles	
Single use gloves for clinical use (sizes: small, medium, large)	
Gloves (reusable for environmental cleaning)	
Theatre caps (optional for high-risk situations but should be available)	
High efficiency masks	
Surgical masks	
Single-use long sleeved gowns	
Single-use plastic aprons	
Alcohol-based handrub **or** alternative method for washing hands in clean water Soap Disinfectant Clean towel	
Appropriate disinfectant for environmental cleaning	
Pathology equipment Request form Biohazard pathology specimen bags FBC tube EDTA tube NPA tubing set **or** Sterile dacron or rayon swab sticks with plastic shafts and tube containing Viral Transport Media with a lid Sterile stool specimen container Sterile urine specimen container	
Large plastic bags	
Appropriate waste bags	
Linen bags	
Collection container for used equipment	

Annex 3. Case management: when to initiate infection control precautions in health care facilities



Annex 4. Isolation room

Typical isolation facility appropriate for patients with influenza A (H5N1)



Annex 5. Infection control advice for hospital staff who do not have direct patient contact

Advice about contact with chickens, ducks or other animals

- Avoid contact with chicken farms, duck farms or any farm where animals have been ill, slaughtered or are thought to harbour avian influenza.

- If you inadvertently come into contact with an environment that has had sick/dead chickens in it – wash hands thoroughly and monitor your temperature for 7 days. If you develop a high fever (>38ºC) – consult your doctor regarding whether or not you should receive antiviral medication.

- If you have had contact with any dead chickens that have died from avian influenza or if you have had contact with the faeces of these chickens – monitor your health for 7 days and consult your doctor for advice.

Advice about visiting friends or relative in health care facilities

- Avoid contact with patients known to have influenza A (H5N1) during the infectious period of their illness. This is 7 days for adults and 21 days for children (< 12 years old).

- If you must visit a patient who is suspected of having influenza A (H5N1) or confirmed as having influenza A (H5N1) – follow the infection control precautions in place in the hospital for the period the patient is infectious.

- You will need to wear personal protective equipment if you have direct contact with the patient or the patient's environment.

- 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.

- Personal protective equipment you will need to wear includes mask, gown, gloves and goggles.

- When you leave the room you must remove these items and wash your hands very well.

- After you have been in contact with a patient with influenza A (H5N1) you should monitor your health for 7 days. If you develop a sudden high fever (>38ºC) and sore throat you should consult your doctor for advice regarding antiviral treatment.

General advice about respiratory illness

- Anyone with respiratory-type illnesses should be careful with secretions from the nose and mouth.
- Cover the nose and mouth when coughing or sneezing – use a tissue and dispose of this once used in the waste.
- Always wash hands after having any contact with respiratory secretions.
- 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.
- Avoid contact with secretions of people who have respiratory illnesses.
- Ask people to use a tissue and cover their nose and mouth when coughing or sneezing.
- Seek medical advice if the illness is severe.

Annex 6. Infection control advice for family and friends or contacts of patients with influenza A (H5N1)

- 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.
- 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.
- You will need to wear personal protective equipment if you have direct contact with the patient or the patient's environment.
- 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.
- Personal protective equipment you will need to wear includes mask, gown, gloves and goggles. Make sure the mask is fitted correctly.
- When you leave the room you must remove these items and wash your hands very well.
- 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.
- If your illness becomes severe you should seek medical advice immediately and inform them you have been in contact with influenza A (H5N1).

General advice about respiratory illness

- Anyone with respiratory-type illnesses should be careful with secretions from the nose and mouth.
- Cover the nose and mouth when coughing or sneezing – use a tissue and dispose of this once used in the waste.
- Always wash hands after having any contact with respiratory secretions.
- 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.

- Avoid contact with secretions of people who have respiratory illnesses.
- Ask people to use a tissue and cover their nose and mouth when coughing or sneezing.
- Seek medical advice if the illness is severe.

Advice about contact with chickens, ducks or other animals

Avoid contact with chicken farms, duck farms or any farm where animals have been ill, slaughtered or are thought to harbour avian influenza

- 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 (>38ºC) or signs of respiratory illness - consult your doctor regarding whether or not you should receive antiviral medication.
- 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.
- If you have poultry that have died in your back yard – you should know how to decontaminate your yard.

  1. Wear personal protective equipment – at least cover your face and wear gloves or plastic bags over your hands.
  2. Bury the dead poultry to at least 2.5 meters. This must be away from water supplies.
  3. Clean area of all chicken droppings – scrape or use rake and bury the chicken droppings.
  4. Clean the chicken shed or area where droppings have been with soap and water.

Annex 7. Where to find information about influenza A (H5N1)

1. WHO, Communicable Disease Surveillance & Response, Avian influenza
   http://www.who.int/csr/disease/avian_influenza/en/
2. WHO, Communicable Disease Surveillance & Response, Avian influenza, frequently asked questions
   http://www.who.int/csr/disease/avian_influenza/avian_faqs/en/
3. WPRO, Avian influenza,
   http://www.who.int/csr/disease/avian_influenza/avian_faqs/en/
4. Centers for Disease Control and Prevention, Avian influenza,
   http://www.cdc.gov/flu/avian/index.htm