Royal Devon and Exeter NHS
NHS Foundation Trust

GUIDANCE FOR THE MANAGEMENT OF SUSPECTED OR PROBABLE CASES OF HIGHLY PATHOGENIC AVIAN INFLUENZA (BIRD FLU)

Not to be used for Pandemic Influenza

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Date written:	**January 2006**
Date reviewed:	**February 2010**
Approval route (names of committees):	**Infection Control Committee**
Level of Impact Assessment (Screening or Full – attach to policy)	**Screening**
Date of final approval:	**7th May 2010**
Date due for revision:	**May 2012**
Date policy becomes live:	**May 2010**
This document replaces:	**Guidance for the Management of Suspected or Probable Cases of Highly Pathogenic Avian Influenza – February 2008**

This policy etc. covers: (Please tick ✓ relevant box below)

Healthcare Standards (CORE)	C4a,b,c	Monitor	
Healthcare Standards (DEVELOPMENTAL)		Finance	
Service Development Strategy		Performance Management	
Local Delivery Plan		Business Planning	
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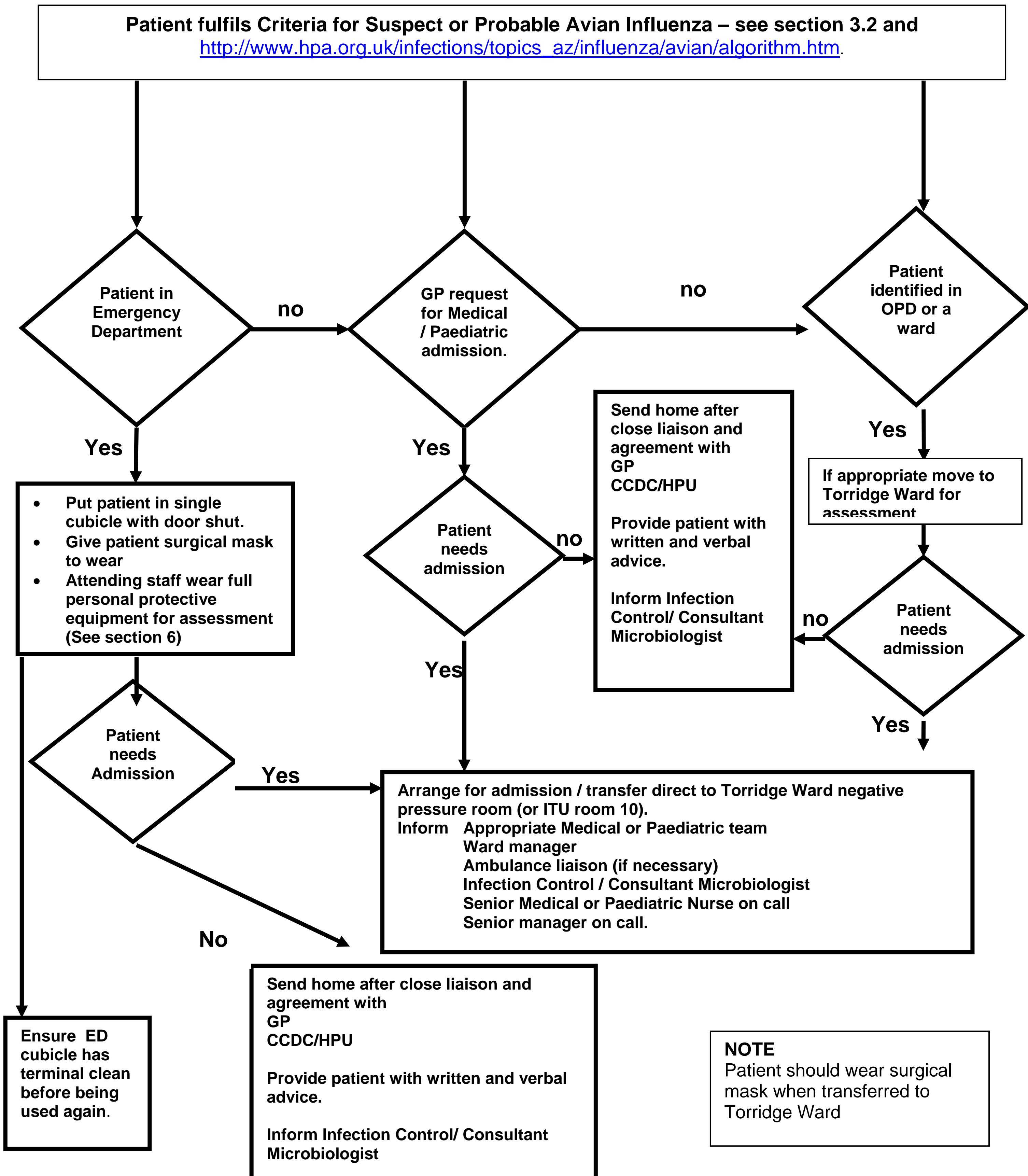
Flow Chart for Management of Patients with Suspected Avian Influenza Presenting to the Royal Devon & Exeter Hospital



1. BACKGROUND

Avian influenza, or "bird flu", is a contagious disease of animals caused by strains of influenza A viruses that normally infect only birds and, less commonly, pigs. Avian influenza naturally circulates in wild waterfowl such as ducks and geese. While all bird species are susceptible to infection, it often causes little or no disease in wild waterfowl but sometimes large outbreaks with high mortality affect domestic poultry. When this happens the term “highly pathogenic avian influenza” (HPAI) is used. Birds can die on the same day that symptoms first appear. Outbreaks in poultry may spread rapidly. Many other bird species are susceptible to infection with these HPAI viruses and in some but not all it may also cause severe disease with high mortality.

Avian influenza viruses like other influenza viruses are described according to properties of two surface proteins: haemagglutinin (H) and neuraminidase (N). Since December 2003 there have been substantial outbreaks of HPAI affecting poultry in various countries in central, east and south east Asia. More recently outbreaks have occurred in Russia, Romania and Turkey. These outbreaks are caused by the **H5N1 subtype of the influenza A virus**, the same subtype (but not identical to the virus) that caused an outbreak of HPAI in Hong Kong in 1997.

Human infection with avian ‘flu viruses has been documented from time to time in the past. Infectivity and symptoms vary from strain to strain. Human infection with this Avian Influenza A virus H5N1 is fortunately rare. Although millions of domestic poultry ducks and geese have been affected or culled to control infection since 2003, by December 2007 only about 335 human infections have been virologically confirmed by the WHO. However with the current H5N1 virus, symptoms are severe with a mortality rate so far of over 50% (206 deaths). In those who died, severe pneumonia was the main cause of death.

Humans are infected through direct or very close contact with infected birds or their excretions. Occasional infections have been described through eating dishes of raw meat from infected birds. Human to human infection does not occur easily. Possible cases have been described within families, probably through prolonged nursing of seriously ill people.

Avian Influenza H5N1 is not pandemic influenza. However it is thought that pandemic influenza may follow if a virus like H5N1 mutates so that it can infect humans easily and spread from human to human rapidly. Currently there are no reports of sustained human-to-human transmission. Avian Influenza in humans is a threat because it causes severe life threatening infection, and poses a risk to healthcare personnel in close contact with infected patients.

2. INTRODUCTION

Transmission of human influenza is by inhalation of droplets and fine droplet nuclei (airborne) generated from infected bird faeces. Transmission by direct and indirect contact is also recognized. During the 1997 influenza A (H5N1) outbreak in humans in Hong Kong (China), droplet and contact precautions successfully prevented nosocomial spread of the disease.

Current evidence for human influenza H5N1 suggests that there has been transmission from bird to human, possibly environment to human, and limited, non-sustained human to human.

Although current evidence suggests that the risk of nosocomial infection is low,

Influenza A H5N1 in humans is a severe infection with a high mortality. Therefore stringent infection control precautions are appropriate.

The aim of this guideline is to ensure that patients who may have highly pathogenic avian influenza H5N1 (hereafter referred to as **avian 'flu**) are promptly identified and managed correctly in order to :

- Ensure measures are taken to prevent transmission to healthcare workers (HCW), and other patients
- Direct optimal medical management including use of antivirals
- Alert the Health Protection Agency (HPA) for surveillance purposes to ensure appropriate diagnostic investigations.

3. IDENTIFICATION OF POTENTIAL CASES

3.1 Screening of admissions

Patients with a risk of avian 'flu may present via several routes.

- GPs may alert the hospital when requesting admission.
- Patients may have contacted NHS direct and attend a GP or Hospital
- Patients may be referred from a Walk-In Centre or Minor Injury Unit at a Community Hospital
- Patients may arrive in the ED (Emergency Department) by ambulance, or present themselves.

ED and Emergency Medical Unit (EMU) reception staff should be proactive in requesting an appropriate travel or contact history in patients with fever and respiratory symptoms. Clinicians should be aware of avian 'flu as a potential differential diagnosis.

Screening patients for risk of avian 'flu depends on identifying people with **all three** of the following:

1. Patients with suspicious symptoms - fever and respiratory symptoms or severe life threatening symptoms.
2. Travel to an area affected by avian 'flu
3. Close contact with birds or other people with respiratory disease or contact with avian 'flu as a health care worker.

The HPA "Algorithm for the management of returning travellers and visitors from countries affected by avian influenza (H5N1) presenting with a febrile respiratory illness: recognition, investigation and initial management" should be used to screen patients for avian 'flu. This is available at http://www.hpa.org.uk/infections/topics_az/influenza/avian/guidelines.htm and is kept updated as information on affected areas and other risk factors becomes available.

Appropriate managers should ensure that the HPA website is checked regularly, at least once a week while there is avian 'flu activity.

Current copies of the HPA algorithm should be available and displayed where patients are either assessed for treatment or admitted to hospital. Locations include the Emergency Department, Emergency Medical Unit, Torridge and Bramble Wards at the RD&E, Walk-In Centres and Community Hospitals.

3.2 Case definitions

Suspected case for screening purposes

Fever (› or = 38°C) **OR** history of fever **AND** respiratory symptoms (cough or shortness of breath) **OR** other severe life threatening illness

AND

History of travel **in the last 2 weeks** to any area of the world known to have cases of avian influenza A (H5N1). A list of affected countries is attached to the HPA algorithm – see above.

AND

Within 7 days of onset of symptoms close contact (within 1 metre) with live (well) or sick, dying or dead domestic fowl/poultry or wild birds, including live bird markets, or with a confirmed H5N1 infected animal other than poultry or wild birds (e.g. cat or pig).

OR

One or more of the following:

a. Close contact (touching / speaking distance) with other human case(s) of severe respiratory illness or confirmed H5N1 infection or unexplained death from areas identified in the HPA algorithm.

b. Part of a HCW cluster of severe unexplained respiratory illness.

c. Laboratory worker working in listed areas with potential exposure to influenza A (H5N1).

4. MANAGEMENT OF CASES

4.1 Admissions to hospital

Cases should only be managed in hospital if their current clinical condition warrants it. Otherwise cases should be managed in their own homes and followed up by Primary Care / Health Protection Teams within 48 hours (see below).

Patients identified as possible cases before admission
Patients identified as possible avian 'flu cases before arriving at the hospital will be admitted directly to a negative pressure room either on Torridge Ward or Intensive Care Unit (ICU) depending on whether ventilation support is necessary. It is essential to confirm that Torridge Ward or ICU is prepared to receive the patient in advance.

There must be close liaison with ambulance personnel by the admissions coordinator, informing them where they should bring the patient. The patient should be given a surgical mask to wear while being transported through the hospital and be taken to the isolation room without delay.

Patients identified as possible avian 'flu cases after admission
These patients should be transferred to a negative pressure room either on Torridge or ICU as soon as possible. The patient should be given a surgical mask to wear until

transferred to a single room. The infection control team should be contacted to advise on identifying contacts, and environmental cleaning required.

Patients in the Emergency Department or Walk-In Centre
As soon as the potential for avian 'flu case is recognised, the patient should be moved to a cubicle room with the door closed. If the patient's condition allows it he/she should wear an ordinary surgical mask. Oxygen may be given by nasal prongs, but nebulisers should NOT be used.

Attending staff should put on full protective clothing (see infection control section) before any further action is taken.

If assessment shows he/she possibly has avian 'flu, and that admission is indicated, then he/she must be admitted to a negative pressure room as soon as assessment is complete and the receiving ward is ready. The cubicle used for assessment must then be terminally cleaned using the standard terminal clean procedure before it is used again.

If admission is not indicated but the patient is thought to have avian 'flu, there must be extensive liaison between hospital staff, the GP and Consultant in Communicable Disease Control (CCDC) before the patient is sent home. Written as well as verbal advice must be given to the patient.

Passengers taken unwell on flights into the airport
Such patients are reported to the CCDC who will assess whether admission is indicated.

4.2 Baseline diagnostic investigations

Includes investigations for the diagnosis and management of respiratory tract infection, and specific investigations for avian 'flu.

Radiology

- Chest X ray

Microbiology – specific arrangements for diagnostic tests for avian 'flu H5N1 will be made by microbiology in liaison with the HPA. The following specimens should be taken and handled as "high risk":

- **Blood Culture**
- **Respiratory Sample for Influenza A&B**. **Duplicate specimens** of one or more of the following should be taken. It is crucial that good quality specimens are obtained for a reliable diagnosis to be made. If in doubt discuss with Consultant Microbiologist first.
  - Nose and Throat Swabs in viral transport medium
  - Nasopharyngeal aspirate*
  - Endotracheal aspirate*
  - Broncholveolar lavage*
- **Sputum culture and Gram stain**
- **Legionella and Pneumococcal urinary antigens**
- **Serology for respiratory pathogens**

* obtaining these specimens should be taken with great care as aerosols may be generated. They should only be taken if the investigation is essential for other reasons, and protective clothing including FFP3 masks must be worn.

Haematology and Biochemistry

- FBC with differential (lymphopenia may be a prominent feature of avian ‘flu)
- Liver function tests and electrolytes

4.3 Specimen collection and labelling

All specimens and request forms for Microbiology, Biochemistry and Haematology must have “Risk of Infection” stickers applied and “Avian ‘flu” included in the clinical details. Specimens will be transported to the laboratories by portering staff (who must be contacted specially), and NOT the vacuum tube system. Out of hours requests should be telephoned.

4.4 Radiological investigations

Portable chest radiographs should be used in the first instance. The X ray machine must be cleaned after use. For the duration of admission of patients with avian ‘flu a dedicated portable x-ray machine must be identified and kept for the use of infected patients in a designated area.

If departmental radiological investigations are essential for a patient suspected of having avian ‘flu, the procedure for taking Severe Acute Respiratory Syndrome (SARS) patients for departmental x-rays and scans should be used

4.5 Visits to other departments for investigations or treatment

These should be limited, but investigations that are clinically essential must be performed. Suitable arrangements must be made in advance and agreed with Infection Control or Consultant Microbiologist out of normal working hours.

While outside the isolation room the patient should wear a surgical mask and a clean gown. All staff involved in transportation, and in contact with the patient in the receiving department must wear personal protective equipment (PPE) – see section 6.

5. TREATMENT

The medical staff in charge will determine appropriate treatment including whether oseltamivir should be started. A stock of oseltamivir for bird ‘flu incidents is held by the HPA in the pharmacy at Derriford Hospital. The duty CCDC must be contacted (01803 861833 or through RD&E switchboard out of hours) to release this stock.

Treatment modalities that may result in aerosol production should be avoided as far as possible without compromising patient care. Such procedures increase the risk of infection of healthcare staff and include:

- Nebulisation / humidification – this should be avoided
- Intubation and certain types of ventilation - especially non-invasive ventilation - are associated with aerosol risk. Ventilators must be protected by appropriate HEPA filters changed daily.
- Suction – closed suction systems should be used for intubated patients. Otherwise suction should be avoided.
- Cardiopulmonary resuscitation.
- Bronchoscopy
- Surgery
- Post mortem

6. INFECTION CONTROL

Human influenza is transmitted by droplets and fine droplet nuclei - airborne - and also by direct and indirect contact. During the 1997 outbreak of influenza A H5N1 in Hong Kong, contact and droplet precautions prevented nosocomial spread of the disease.

So far there is no evidence to support airborne transmission to humans in the current outbreak of avian 'flu A H5N1. However because of the high mortality, and the potential for mutations increasing human to human infectivity, WHO and the HPA recommend the use of high-efficiency (FFP3) masks and negative pressure ventilated isolation as well as standard infection control precautions to prevent contact and droplet spread.

Adults and children older than 12 years should be considered infectious until 7 days have lapsed since resolution of fever. Children of 12 and under are considered infectious until 21 days after the onset of illness. Virus excretion may be considerably longer in immunocompromised patients.

6.1 Isolation

Patients with suspected or confirmed avian 'flu will be admitted to a negative pressure isolation room with a lobby on Torridge Ward. If they require ventilatory support, a negative pressure room on ICU should be used instead.

6.2 Protective clothing (PPE)

This will be available in key areas, including ED, EMU and Torridge ward. Only personnel who have been trained in the safe use and disposal of PPE, and have been fit tested with the FFP3 masks in use, will be allowed contact with affected patients.

All staff who enter the isolation room, or who have contact with the patient should wear:

- a correctly fitted high filtration mask (FFP3)
- fluid resistant gowns or long sleeved plastic aprons – non-sterile
- gloves – non-sterile
- eye protection – face shield or goggles
- theatre caps must be worn for direct or close contact.

It is crucial that masks are fitted correctly and cover both nose and mouth. People must be fit tested to ensure masks are used correctly. Gloves, gowns, caps, face shields and masks must be single use and disposed of as clinical waste. It may be possible to reuse some goggles if they can be safely decontaminated.

Training must be given in the correct use and disposal of protective clothing to all those who come into direct or close contact with avian flu patients. Training material and laminated *aide memoirs* should be appropriately displayed in clinical areas.

6.3 Hand hygiene

It is likely that hand hygiene is the single most important practice needed to reduce transmission of the virus. Influenza viruses are susceptible to alcohol. Hand hygiene must be performed using soap and water if visible soiling is present. Otherwise alcohol hand rub is appropriate.

Hand hygiene must be performed after removing protective clothing and **prior** to leaving the isolation room. Hands must then be further cleaned, using alcohol hand rub after exiting the isolation room. Hand hygiene must also be performed after cleaning of contaminated equipment.

6.4 Waste

Infected patients may excrete avian 'flu virus in respiratory secretions and in faeces. E*n suite* facilities in the isolation rooms should be used if possible. If unable to use the en suite the patient should use a disposable bedpan / urinal. Urine can then be poured carefully down the en suite toilet. Faeces and the receptacle should be disposed of in a clinical waste sack.

All clinical waste must be placed in clinical waste bags and bags sealed in the normal way AND KEPT WITHIN THE ISOLATION ROOM. Double bagging is not necessary. Waste will be collected by the porters wearing appropriate PPE and taken for disposal by incineration.

6.5 Laundry

Laundry should be placed in water-soluble bags and then into a red outer bag. This bag must be labelled as INFECTED. Contact the Porters to arrange for separate collection of the laundry bag for transportation to the Laundry Department.

6.6 Cutlery and crockery

Disposable cutlery and crockery is not necessary for infection control purposes. However for small numbers of patients the use of disposable cutlery and crockery may well be administratively easier. If used it should be disposed of in clinical waste.

6.7 Domestic issues

Daily cleaning of isolation rooms with Chlorclean will initially be a nursing responsibility. Frequent cleaning of ward areas, door knobs, staff toilets, sluice etc. is also essential and this is the responsibility of Housekeeping. Damp dusting should be performed wherever possible to avoid aerosolisation of virus. It is important that all areas are allocated and none missed. This should be monitored by infection control staff or ward managers.

Terminal cleaning is the responsibility of Housekeeping and Nursing. Surfaces within the room must be disinfected using Chlorclean solution 1000ppm. There is no need to wash walls. Curtains must be changed.

7 OCCUPATIONAL HEALTH & MANAGEMENT OF CONTACTS

Avian influenza may be transmitted from human to human, but in most cases where human to human spread has been considered, a common exposure to infected birds is also found. These have included people living with or caring for cases at home.

In the UK household or other close contacts should be monitored for evidence of infection especially if exposed to potential avian sources. Contact tracing and monitoring is a role of the Consultant in Communicable Disease Control (CCDC) / Health Protection Unit (HPU). The incubation period is reported to be 1 to 7 days.

7.1 Staff contacts

Only essential HCW should have access to the isolation room. Nursing and junior medical staff should be dedicated to avian 'flu patients, and trained in infection control procedures and use of PPE. Other staff, e.g. Consultant Medical Staff should ensure that they have protected time for avian 'flu cases, to ensure that they can concentrate on infection control issues. If avian 'flu is confirmed by the HPA Laboratory, then all HCW in contact with a patient with avian 'flu should take prophylaxis as recommended in current guidelines. This is likely to include immunisation with current influenza vaccines and taking oseltamivir. For current details see WHO avian flu infection control guidance at
http://www.who.int/csr/disease/avian_influenza/guidelines/en/Guidelines_infectioncontrol_19Feb.pdf .

A visitors book system will be maintained to record the names and times that staff and visitors have contact with avian 'flu patients. The names of staff attending suspected or probable cases must be documented and a list sent to the Occupational Health Department.

Staff contacts will monitor their temperature twice daily for fever or respiratory symptoms, especially cough until 10 days after their last contact with an avian influenza case.

Immunocompromised staff, and those with chronic respiratory illness must not enter the isolation room (if in doubt consult Occupational Health Department). At present there is no evidence that pregnant women are more susceptible to avian influenza than other staff but it is recognised that pregnant staff should not be exposed to unknown risks.

7.2 Visitors

Any visitors must be advised of the risks of infection and preferably not visit. Written guidance is available and a specialist nurse or doctor will be available for discussion of the risks with the visitors. If they insist on visiting they must take the same precautions as staff. They must go directly to/from the ward/unit and not visit any other part of the hospital, including the shops or the restaurant.

Those visitors that have been close contacts may be incubating the disease or already be infectious due to common exposure. They must be advised not to come to the hospital if they have a fever or feel unwell and to contact their GP, informing the GP that they are unwell and have had contact with avian influenza.

7.3 Contacts who become unwell

Staff contacts who develop a fever >38 °C or respiratory symptoms should stay at home. They should contact their GP informing him/her of the exposure to avian 'flu. They should also contact the duty manager in the hospital (via the switchboard), who will liaise with the CCDC, Occupational Health and Microbiology.

8. DISCHARGE OF PATIENTS

All suspected or probable cases of avian 'flu which are admitted must remain in appropriate isolation until discharge 7 days after resolution of fever for adults or children more than 12 years, or until the Infection Control Team agree that isolation is not necessary. Children of 12 years or younger should be isolated for 21 days after onset of illness.

Staff who have had avian flu should not return to work until advised by Occupational Health.

9. CARE OF THE DECEASED

Standard precautions should be followed when caring for a person who dies of avian 'flu. If they die during the infectious period full PPE should also be worn for last offices. The body should be placed in an impermeable bag prior to transfer to the mortuary.

Family should be able to view the body if they wish. If the person died during the infectious period they should wear gloves and gowns.

If a full or limited post mortem examination should be performed, this must be discussed first with Infection Control and a Consultant Microbiologist. This is to allow appropriate precautions to be undertaken and to make arrangements for specialist diagnostic services.

10. COMMUNICATION

Good communication is essential to ensure that the risks posed by possible avian 'flu cases are reduced to the minimum possible. This should start as soon as a possible avian 'flu patient is identified.

Staff, patients and visitors to the hospital are likely to be worried. There is also likely to be media interest, possibly excessive. A co-ordinated and effective response should achieve a safe outcome.

Identification of a suspected or probable case must be reported to the Infection Control Team and/or on-call Consultant Microbiologist immediately and the Consultant Physician/Paediatrician on call. The Consultant in charge of the ICU should also be informed if respiratory support is likely to be needed. The senior manager on duty must also be informed.

The duty Consultant Microbiologist and Senior Infection Control Nurse can be contacted via the hospital switchboard. They will advise on infection control precautions, microbial investigation and treatment. They will also inform the Consultant in Communicable Disease Control (CCDC).

11. USEFUL CONTACTS

Duty Consultant Microbiologist	Page via switchboard
Senior Nurse Infection Control	Page #6579 or via switchboard
Infection Control Nurses' Office	Ext. 2355 (Mon-Fri 08.30 – 16.30hrs)
Bed Manager	Bleep 273
Senior Nurse on-call	Page via switchboard
Matron general medicine	#6490 or via switchboard
Senior Paediatric Nurse on-call	Page via switchboard
Night Manager	Bleep 217 (9pm – 8pm)
Senior Manager on-call	Page via switchboard
EMU Admissions Co-ordinator	Bleep 513
CCDC (and Health Protection Unit)	01803 861833

12. REFERENCES

Avian Influenza, including Influenza A (H5N1), in Humans: WHO Interim Infection Control Guidelines for Health Care Facilities. Updated 10 May 2007.
http://www.who.int/csr/disease/avian_influenza/guidelines/infectioncontrol1/en/index.html

Avian Influenza A (H5N1) Infection in Humans NEMJ 2005; 353:1374-1385
http://content.nejm.org/cgi/content/full/353/13/1374

Algorithm for the management of returning travellers from countries affected by avian influenza (H5N1) presenting with a febrile respiratory illness: recognition, investigation and initial management. Revised 18 December 2007.
http://www.hpa.org.uk/infections/topics_az/influenza/avian/guidelines.htm

Health Protection Agency revised interim guidelines for investigation and reporting of suspected human cases of avian influenza
http://www.hpa.org.uk/infections/topics_az/influenza/avian/case_definition.htm