



Australian Government
Department of Health and Ageing

**Interim Infection Control Guidelines for Pandemic
Influenza in Healthcare and Community Settings**
(June 2006)

Annex to

**Australian Health
Management Plan for**

**PANDEMIC
INFLUENZA**

IMPORTANT INFORMATION FOR ALL AUSTRALIANS

2006

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Disclaimer

These guidelines will evolve over time, as new information becomes available on the epidemiological and clinical characteristics of the disease. Readers are advised to visit the Department of Health and Ageing website **www.health.gov.au** to ensure that they have access to the most current and up to date version. While this document includes guidance for those involved in providing patient care, readers should note that the information contained in the plan is not a substitute for, and is not intended to replace, independent professional advice. The Commonwealth of Australia does not accept any legal liability or responsibility for any injury, loss or damage incurred by the use of, or reliance on, or interpretation of the information contained in these guidelines.

INTERIM INFECTION CONTROL GUIDELINES FOR PANDEMIC INFLUENZA IN HEALTHCARE AND COMMUNITY SETTINGS

AUSTRALIAN GOVERNMENT DEPARTMENT OF HEALTH AND AGEING
2006

This document contains guidance primarily for health professionals regarding infection control for healthcare and community settings, in the management of pandemic influenza patients, agreed by experts from an infection control working group of the National Influenza Pandemic Action Committee.

REQUEST FOR FEEDBACK

Pandemic planning is an ongoing activity. These infection control guidelines will need revision to incorporate information on the clinical and epidemiological features of any new influenza virus and local arrangements for access to medical care. Submissions and comment are invited and will contribute to future versions of the guidelines. These should be forwarded to:

Interim Pandemic Influenza Infection Control Guidelines

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GLOSSARY OF TERMS

Airborne transmission	Transmission by air of infectious agents from respiratory secretions.
Antisepsis	The prevention of infection by topical application of bacteriostatic agents to tissues.
Antiseptic hand rub	A waterless, alcohol-based product that is applied to all surfaces of the hands to reduce the numbers of micro-organisms present.
Clinical waste	Potentially infectious waste that is generated by human or animal health care facilities, health care teaching establishments, laboratories, pharmaceutical or similar settings.
Cleaning	The physical removal of foreign material, e.g. dust, soil, organics material such as blood, secretions, excretions and micro-organisms. Cleaning physically removes rather than kills micro-organisms. It is accomplished with water, detergents and mechanical action, and must precede disinfection and sterilisation.
Cohort	Two or more patients exposed to, or infected with, the same organism who are separated physically (e.g., in a separate room or ward) from other patients who have not been exposed to, or infected with, that organism.
Cohort staffing	The practice of assigning specific personnel to care only for patients/residents known to be exposed to, or infected with, the same organism. Such personnel would not participate in the care of patients/residents who have not been exposed to, or infected with, that organism.
Contact transmission	Transmission of an infectious agent by person-to-person contact (direct) or via a contaminated inanimate object (indirect).
Decontamination	The removal of micro-organisms and/or foreign matter from contaminated materials or living tissue.
Disinfection	The inactivation of non-spore-forming micro-organisms using either thermal or chemical means.
Droplet transmission	Transmission of infectious agents in droplets from respiratory secretion.
Personal Protective Equipment (PPE)	Gloves, gowns, aprons, eyewear, caps and masks, worn to protect the operator from infectious hazards.
Hand antisepsis	A process for the removal or reduction of resident and transient micro-organisms. This term refers to the use of either antiseptic handwash or antiseptic handrub.
Hand hygiene	A general term that applies either to hand washing, or use of an antiseptic hand wash, an antiseptic hand rub, or a surgical handscrub.

Handwashing	Washing hands with plain (i.e., non- antimicrobial) soap and water. A process for the removal of soil and transient micro-organisms.
Health care worker (HCW)	Refers to all health care professionals, including students and trainees, and employees of health care establishments, who have contact with patients or with blood or body substances from patients.
Immunocompromised patient	Person whose immune system is not functioning normally because of an immune deficiency disorder or other disease, or as the result of the administration of immunosuppressive drugs or radiation.
P2 (N95) mask	A high efficiency filter disposable mask with the capacity to filter up to 95% of airborne particles with an aerodynamic diameter of ≥ 0.3 micron.
Surgical mask	A barrier covering the nose and mouth used in this context to protect the mucous membranes of the wearer from accidental splashes or sprays of respiratory secretions, or other body fluids. Surgical masks may also be used to contain large droplet particles generated by coughing or sneezing persons.
Suspected case	A person who meets the case definition in use at the time prior to confirmation of the diagnosis using laboratory tests.

1. AUTHORS AND ACKNOWLEDGEMENTS

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These guidelines were produced by a working group of the National Influenza Pandemic Action Committee (NIPAC). NIPAC Core Group have endorsed this document. Members of the working group were:

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The working group would like to acknowledge that a number of proposals relating to infection control products and technologies have been sent to the Department of Health and Ageing and these products and technologies have been referred to the working group for review. While noting these with interest the working group has not been in a position to evaluate them and have therefore forwarded them to the appropriate experts and government bodies such as the Therapeutics Goods Administration.

The working group would like to acknowledge the following valuable sources of information on the infection control of pandemic influenza:

- Interim Australian Infection Control Guidelines for Severe Acute Respiratory Syndrome 2004
- Centers for Disease Control Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS), Supplement I: Infection Control in Healthcare, Home, and Community Settings 2004
- The United States Department of Health and Human Services Pandemic Influenza Plan, Supplement 4 Infection Control and Supplement 8 Community Disease Control and Prevention, November 2005
- Department of Health, England, Health Protection Agency, Guidance for Pandemic Influenza: Infection control in Hospitals and Primary Care Settings, October 2005
- Public Health Agency of Canada, Health Canada, Canadian Pandemic Influenza Plan, September 2004
- Communicable Diseases Network Australia, Guidelines for the Prevention and Control of Influenza Outbreaks in Residential Care Facilities in Australia, September 2005.

2. INTRODUCTION

The aim of the initial Australian response to pandemic influenza is to contain the spread of the virus. Along with the judicious use of antiviral medications, crucial strategies for containing the spread of the virus are detection and isolation of cases, identification and monitoring of contacts, adherence to infection control precautions, and in some instances, measures such as quarantine to restrict the movement of potentially infected persons. These measures are the traditional public health tools used to prevent the transmission of any infectious disease, and they will be the cornerstone of influenza prevention in the event of an influenza pandemic. If transmission can be slowed, the impact on health services may be reduced and more time made available for the production of a pandemic vaccine.

Once a pandemic is established, containment may not be as effective a strategy and may not be feasible due to the large numbers of cases; therefore the strategy may change to one of maintenance of social functions. Although contact tracing and the adherence to full airborne precautions may not be used, simple infection control measures such as hand and respiratory hygiene and spatial separation practices will be crucial in preventing cases of influenza. These simple measures should be emphasised throughout the phases of a pandemic and in all settings, and will be the most practical and useful when patients are being cared for in the home. Furthermore, it is important to note that an influenza pandemic will not be 'business as usual' for health services in Australia. Staff will be required to work flexibly to meet increased demands and usual clinical and infection control practices may need to be altered to accommodate the exceptional circumstances.

The strategy for the use of surgical and particulate respirator masks such as P2 (N95) masks are based on the most recent World Health Organization (WHO) [1] infection control guidelines as well as the infection control guidance documents from the United Kingdom (UK) [2], the United States (US) [3] and New Zealand (NZ) [4]. These countries recommend that P2 (N95) masks should be worn when aerosol generating procedures are being performed while surgical masks are recommended for all other patient care contact. The Canadian guidelines suggest that they regard surgical masks as being adequate for any patient contact by healthcare workers (HCWs). The stance we have taken in this document is consistent with the current WHO guidelines for pandemic influenza and in taking a risk based approach we have also recommended the use of P2 (N95) masks by HCWs in close (within 1 metre) contact with an infectious patient when involved in examination or treatment procedures. This is based on the possibility that the risk of small particle aerosol transmission may be increased in close proximity to an infectious patient. Some support for this approach is provided in the US guidelines for pandemic influenza [3] which states "the addition of airborne precautions including respiratory protection (an N95 filtering face piece respirator or other appropriate particulate respirator), may be considered for strains of influenza exhibiting increased transmissibility, during initial stages of an outbreak of an emerging or novel strain of influenza, and as determined by other factors such as vaccination/immune status of personnel and availability of antivirals". This and all other infection control recommendations will be reviewed in the light of new information which becomes available concerning the transmission characteristics of any new influenza virus.

SCOPE

This annex focuses on the infection control and public health management principles applicable to the care of patients with suspected or confirmed pandemic influenza and their contacts. The guidelines are written from the national perspective, and are intended to be adapted for use in various settings across Australia. Logistic and operational issues such as the use of influenza-specific hospitals, fever clinics or other facilities are being further considered at the jurisdictional and local level. The principle of keeping influenza patients separated from non-influenza patients in the interests of reducing spread of the virus is supported.

The recommendations are different for the early phases of a pandemic compared to seasonal influenza because with a newly emergent pandemic virus, the population will have no immunity, there is unlikely to be a vaccine available and the behaviour of the virus will be unknown. In the early phases (for example, during the pandemic alert period from Phase 3 to Phase 5), the virus that is causing infections in humans may still be classified as an avian influenza virus. For the sake of simplicity, the term pandemic influenza may be used in relation to phases 4 and 5, despite the virus technically being a potential pandemic strain in these phases rather than an actual pandemic strain.

Furthermore, when new information becomes available on the clinical and epidemiological characteristics of the disease, the guidelines will be updated and subject to review. A description of the different pandemic phases is found in the *Australian Health Management Plan for Pandemic Influenza 2006*.

Guidelines for seasonal influenza are found in the *Infection control guidelines for the prevention of transmission of infectious diseases in the health care setting* which are accessible from:
<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/icg-guidelines-index.htm>

The *Guidelines for the Prevention and Control of Influenza Outbreaks in Residential Care Facilities in Australia* provide guidance for staff of public health units during seasonal outbreaks of influenza and can be found at:
http://www.health.gov.au/internet/wcms/publishing.nsf/Content/cda-pubs-other-flu_guidel.htm

3. BACKGROUND

3.1 TRANSMISSION

3.1.1 Human influenza

When influenza viruses pass from human to human, as is the case with the normal human seasonal influenza, they are transmitted by contact with virus-containing respiratory secretions.

The three potential modes of the spread of the virus are:

i. Droplet: Droplet transmission occurs when large (greater than or equal to five micrometre diameter) droplets are generated, propelled a distance of up to one metre and deposited on the mucous membranes or conjunctivae (mouth, nose or eyes) of another person. Transmission via large droplets requires close contact as the droplets do not remain suspended in the air and generally only travel short distances (usually a metre or less).

ii. Contact: Direct contact transmission occurs when skin to skin contact results in the physical transfer of micro-organisms. Direct contact transmission can also occur when a virus contaminates a person's hand and then that person touches his or her mouth, nose or eyes. Indirect contact transmission occurs when the virus is transferred to a person's eyes, mouth or nose after coming into contact with a contaminated object or surface.

iii. Airborne: When smaller (less than five micrometres diameter) droplets or dust particles containing the infectious agent are produced (e.g., from the evaporation of water from larger droplets) which remain suspended in the air, are dispersed by air currents, and may be inhaled by a person who is some distance from the source patient.

The relative contribution and clinical importance of the different modes of influenza transmission are currently unknown. However, the epidemiologic patterns observed is generally consistent with spread through close contact i.e. exposure to large respiratory droplets, direct contact or near-range exposure to aerosols. While some observational and animal studies support airborne transmission through small particle aerosols, there is little evidence of airborne transmission over long distances or prolonged periods of time (as seen in *M. tuberculosis*). [3] (see further discussion of this issue in section 4.2.1).

Influenza and air-conditioning units

There is no scientific evidence that influenza can be spread through ventilation systems or through prolonged residence in air [3]. Proper ventilation can be expected to reduce the concentration of airborne organisms in enclosed spaces.

In a pandemic situation, it would not be possible to provide special air handling facilities for every influenza patient i.e. independent air supply and exhaust system or negative pressure room. This would particularly be the case in 'fever clinics' which might be in buildings not originally designed for this purpose. Part of the process of planning for these clinics should include an assessment of existing mechanical (or natural) ventilation and adjustments being made to increase outdoor air ventilation rates and reduce the proportion of recirculated air where appropriate and without necessarily rebuilding the systems.

Environmental factors and virus survivability

The transmission of influenza virus is affected by the relative humidity of the room and by diminished ventilation (which enhances transmissions) [6]. Ultraviolet irradiation has also been shown indirectly to potentially reduce airborne transmission of influenza [7].

Survival of the influenza virus

Influenza A and B viruses have been shown to survive on hard, non-porous surfaces for 24–48 hours, on cloth, paper and tissue for less than 8–12 hours and on hands for 5 minutes [8].

3.2 INCUBATION PERIOD

Human influenza usually has a short incubation period of one to three days. The incubation period for avian H5N1 influenza may be longer, most cases have occurred within two to four days of exposure, although the range has been up to eight days [9]. For the purposes of these guidelines the incubation period for any newly emerging influenza virus will be assumed to be up to seven days and will be adjusted in light of further epidemiological information.

3.3 PERIOD OF COMMUNICABILITY

Based on current epidemiology of influenza the period of communicability will be assumed to be approximately seven days from the onset of symptoms for those older than 12 years, 14 days for school aged children 5 to 12 years and 21 days for pre-school aged children [10, 11, 12]. Individuals may be infectious from 24 hours before the onset of symptoms. The risk is greatest during the period that the patient is symptomatic (e.g., coughing and sneezing) [13]. These periods will need to be reviewed in the light of information that becomes available regarding any new influenza sub-type.

3.4 CASE DEFINITIONS

Case definitions will vary through the phases of the pandemic, and definitions will be updated as more is learnt about the transmission characteristics and severity of disease associated with the particular strain.

Suspected case

A common surveillance case definition for human influenza infections is:

- Person with acute respiratory illness, characterised by fever (temperature > 38 degrees Celsius), cough and fatigue
- This definition may have to be amended in the light of information that becomes available regarding any new influenza sub-type.

Contact

The definition of a contact is likely to change once the transmission characteristics of a pandemic strain are known and depending upon the stage of the pandemic. A more sensitive definition may be used in the early containment stages and a less sensitive definition in the later stages.

Contacts include:

- People who have had within one metre contact with an infectious case including physical contact
OR
- exposure to their respiratory droplets or secretions.

Examples include:

- Household contacts including anybody who has slept in the same house as the case during the infectious period
- Healthcare workers who provided immediate care to the case
- Children from the same school or child care cohort or students from university
- Residents of the same section of a residential aged care facility
- Anybody else who came within one metre of the case and may have been coughed or sneezed over.

Note: Those who have spent more than a specified time (e.g., 15 minutes) in a confined space with an infectious case may be regarded as lower risk contacts if they did not also have the close contact referred to above. Whether any public health action is taken in regard to these lower risk contacts will depend on the stage of the pandemic (i.e. containment or maintenance), as well as such factors as the time spent in the enclosed space with the case, the degree of ventilation in the room, the total number of people present in the room at the time, the relative humidity and size of the room. Decisions on public health actions under these circumstances will be made by local public health units taking the above factors into consideration as well as the resources available and would also be the subject of further discussion and consensus through Communicable Diseases Network Australia (CDNA).

4. BASIC INFECTION CONTROL PRINCIPLES AND PRACTICES

This section is an outline of the infection control precautions applicable in health care and other special settings. This guidance also applies to healthcare personnel going into the home of patients. Measures that should be taken at international ports are also included.

Detailed information on standard and additional precautions are found in the *Australian Infection control guidelines for the prevention of transmission of infectious diseases in the health care setting* which are accessible from:

<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/icg-guidelines-index.htm>

During a pandemic, conditions that may affect infection control include availability and effectiveness of antiviral medications and pandemic vaccines, virulence of the influenza strain and availability of personal protective equipment (PPE) and hospital isolation rooms. When the pandemic is widespread in Australia it is recognised that full airborne precautions may not be achievable.

This summary section contains recommendations that are generally applicable throughout the different pandemic phases. In some cases, as indicated, recommendations may be modified as the situation progresses from limited cases to widespread community illness.

4.1 PRINCIPLES

- (a) Limit contact between infected and non-infected persons¹
 - Isolate infected persons (e.g., confine patients to a defined area as appropriate for the health care setting)
 - Limit contact to a small number of health care workers and close family and friends
 - Promote spatial separation in common areas (e.g., sit or stand as far away as possible, at least one metre, from potentially infected persons) to limit contact between symptomatic and asymptomatic persons.
- (b) Protect persons caring for influenza patients in health care and other special settings from contact with the pandemic influenza virus. Persons who must be in close patient contact should wear appropriate PPE (see section 4.2.1).
- (c) Contain infectious respiratory secretions:
 - Instruct patients who have 'flu-like' symptoms to use respiratory hygiene/cough etiquette (see *Box 2: Respiratory hygiene/cough etiquette*)
 - Promote use of surgical masks by symptomatic persons in common areas (e.g., in waiting rooms) or when being transported (e.g., by ambulance).

¹ During the early stages of a pandemic, laboratory-confirmation of influenza infection is recommended where possible.

Box 1: Respiratory hygiene/cough etiquette

To contain respiratory secretions, all persons with signs and symptoms of a respiratory infection, regardless of presumed cause, should be instructed to:

- Cover the nose/mouth when coughing or sneezing
- Use tissues to contain respiratory secretions
- Dispose of tissues in the nearest waste receptacle after use
- Perform hand hygiene after contact with respiratory secretions and contaminated objects/materials.

Healthcare facilities should ensure the availability of materials for adhering to respiratory hygiene/cough etiquette in waiting areas for patients and visitors:

- Provide tissues and no-touch receptacles for used tissue disposal
- Provide conveniently located dispensers of alcohol-based hand rub
- Provide soap and disposable towels for handwashing where sinks are available.

Surgical masks and separation of symptomatic persons

During periods of increased respiratory infection in the community, persons who are coughing should be offered a surgical mask to contain respiratory secretions. Coughing persons should be encouraged to sit as far away as possible (at least one metre) from others in common waiting areas. Some facilities may wish to institute this recommendation year-round.

4.2 PRACTICES

When caring for patients with pandemic influenza, healthcare personnel should be particularly vigilant to avoid:

- touching their eyes, nose or mouth with contaminated hands (gloved or ungloved). Careful placement of PPE before patient contact will help avoid the risk of self-contamination whilst making PPE adjustments. Careful removal of PPE is also important; and
- contaminating environmental surfaces that are not directly related to patient care (e.g., door knobs, light switches).

4.2.1 Personal protective equipment (PPE)

PPE is used to protect the wearer from contact with the pandemic influenza virus. During the early phases of a pandemic when the transmission characteristics of the newly emergent virus are not fully understood, immunity to the virus is absent and a vaccine is not available, adherence to appropriate PPE is recommended for all contacts with avian or pandemic influenza patients (see Table 1). In the later phases, recommendations will be updated in light of increasing knowledge about the virus, availability of PPE and availability of antivirals and vaccines.

Appropriate PPE should be worn by:

- all people who provide direct patient care (e.g., doctors, nurses, radiographers, physiotherapists, border healthcare workers)

- all supporting staff, including medical aides and cleaning staff when working in a room when an avian or pandemic influenza patient is being cared for
- all laboratory workers handling specimens from a patient being investigated for pandemic influenza
- all sterilizing service workers handling equipment that requires decontamination and had come from a patient with pandemic influenza; and
- family members or other visitors.

Masks or respirators

- Masks that are commonly used by health care workers include P2 (N95) disposable respirators² and surgical masks. Surgical masks do not protect the wearer from pathogens that are transmitted via the airborne route, but are used to protect the wearer from contact or droplet contamination of the nasal or oral mucosa
- P2 (N95) masks provide a facial fit to the wearer that ensures inhaled and exhaled air travels through the filter medium. If a good facial seal cannot be achieved (e.g., the intended wearer has a beard or long moustache), an alternative respirator such as a powered air-purifying respirator (PAPR) should be used, provided the wearer is trained in its use
- If a PAPR is unavailable, the HCW should consider the removal of their facial hair
- Exhalation valves are available on some models of the P2 (N95) masks to increase the wearers' comfort and reduce the build-up of moisture from exhaled breath in the filter medium. These masks should never be worn by suspected or confirmed pandemic influenza patients
- Respirators, including P2 (N95) masks, should be used within the context of a respiratory protection program that includes fit-testing, fit-checking and training. A fit check should be carried out each time a respirator is worn
- P2 (N95) masks are essential when aerosol generating procedures are being performed (e.g. intubation, suctioning, chest physiotherapy, bronchoscopy or nebulisation). They may provide an increased level of safety in other close contact situations. Therefore:
 - It is recommended that all health care workers who have to be in close (within one metre) contact of a pandemic influenza patient for example undertaking procedures relating to examination or treatment of the patient should wear a P2 (N95) mask, or other appropriate high filtration device
 - If a P2 (N95) mask is not available a surgical mask should be worn
 - If P2 (N95) masks are in short supply at any stage of a pandemic, they should be prioritised for use by health care workers undertaking aerosol generating procedures
 - The mask should be applied before entering the patient's room. A mask should be worn once and then discarded. If pandemic influenza patients are cohorted in a common area or in several rooms on a nursing unit, and multiple patients must be visited over a short time, it may be practical to wear one mask for the duration of the activity
- Change a mask when it becomes moist. The mask should never be reapplied after it has been removed
- Do not leave them dangling around the neck
- Upon touching or discarding a used mask, perform hand hygiene.

² P2 respirators, as defined by AS/NZS 1716 are equivalent to NIOSH approved N95 respirators. Examples are half face-piece disposable P2 respirator or half face-piece maintenance free P2 respirator. These guidelines will use the term P2 (N95) mask.

Gloves

- Gloves should never replace the need for hand hygiene
- Gloves should be worn in accordance with standard precautions i.e. when contact with respiratory secretions or other body fluids is anticipated (e.g. during provision of oral care, handling soiled tissues). They are not necessary when performing other tasks such as changing bed linen unless the linen is visibly soiled, provided hand hygiene is performed afterwards
- Gloves should always be replaced between different patient contacts
- Always perform hand hygiene after glove removal.

Gowns

- Gowns should be worn when attending to pandemic influenza patients. A disposable gown made of synthetic fibre or a washable cloth gown may be used. The gown should cover the wearer's clothing
- Gowns are essential when soiling of clothes is anticipated (e.g. during invasive procedures or suctioning, nebulisation, bronchoscopy, chest physiotherapy or intubation). In such circumstances, a long sleeved, cuffed and fluid repellent gown is recommended
- If gowns are in short supply, consideration should be given to establishing priorities for their use. For example, if soiling of clothes with a patient's blood or body fluids is anticipated such as during intubation or when holding a patient close to the body (e.g., paediatric patient)
- Gowns should be worn only once and then placed in waste or laundry receptacle, as appropriate and hand hygiene performed.

Protective eyewear (goggles/visor/shield)

- In general, wearing goggles or a face shield for routine contact with patients with pandemic influenza is not necessary, unless sprays or splatter of infectious material is likely especially if the patient is not wearing a surgical mask at the time
- Protective eyewear should be worn during aerosol generating procedures (see below)
- These items should be removed and decontaminated between patient uses, according to manufacturer's instructions.

PPE for aerosol generating procedures³

During procedures that may generate aerosols the use of full PPE, is essential. Full PPE consists of:

- A properly fitted P2 (N95) mask or PAPR
- A disposable fluid-repellent, long-sleeved gown. Wear a plastic apron if splashing of blood, body fluids, excretions or secretions is anticipated and a fluid repellent gown is not available
- Gloves
- Protective eyewear
- Disposable theatre-type cap.

³ The CDC defines aerosol generating procedures as those that stimulate coughing and promote the generation of aerosols such as aerosolised or nebulized medication administration, diagnostic sputum induction, bronchoscopy, airway suctioning, endotracheal intubation, positive pressure ventilation via face masks and high frequency oscillatory ventilation.

Table 1: Summary of PPE for health care settings

	Entering patient room but no close patient contact	Close patient contact (< 1 metre)	Aerosol generating procedure being performed
P2 mask	No	Yes	Yes, or PAPR
Surgical mask	Yes	Only if P2 unavailable	N/A
Gown	No*	Yes	Yes
Gloves	No*	Yes	Yes
Eyewear	No	Yes, if body fluid exposure anticipated	Yes
Cap	No	No	Yes
Apron	No	Yes, if splashing possible and impermeable gown not available	Yes, if impermeable gown not available

* Note: Any cleaners who have to enter the room of an infectious patient should wear a gown and gloves, in addition to a surgical mask. This is because cleaning activities are likely to bring their hands and clothes into contact with potentially contaminated surfaces. They should also be advised to maintain a distance of at least one metre from the patient if possible.

Box 2: Airborne precautions when performing aerosol generating procedures

Airborne precautions are designed to reduce the risk of airborne transmission of infectious agents. Airborne transmission occurs by dissemination of small (less than 5 micrometres in size) droplets containing the infectious agents that may remain suspended in the air for long periods of time. Whilst there is no evidence that influenza transmission can occur across long distances (e.g through ventilation systems) or through prolonged residence in the air, precautions should be taken when performing aerosol generating procedures. Procedures that are associated with increased small particle aerosol generation include: endotracheal intubation, bronchoscopy, nebuliser treatment, and airway suctioning and sputum induction.

- Limit performance of aerosol-generating procedures on suspected or confirmed pandemic influenza patients. Clinically appropriate sedation during intubation and bronchoscopy may minimize resistance and coughing during the procedure
- Limit the number of healthcare workers in the room during an aerosol-generating procedure to those essential for patient care and support
- Perform aerosol-generating procedures in a negative pressure isolation room (NPIR). If a NPIR is not available, perform the procedure in a private room, away from other patients. If possible, increase air exchanges, create a negative pressure relative to the hallway, and avoid recirculation of the room air
- Keep doors closed and minimise entry and exit during procedures
- Anyone who enters the room must wear full PPE including a properly fitted P2 (N95) mask or PAPR.

4.2.2 Hand hygiene

Box 3: Hand hygiene

Hand hygiene is a crucial practice to reduce the transmission of infectious agents in healthcare settings and is an essential element of standard precautions. The term 'hand hygiene' includes both hand washing with either plain or antimicrobial soap and water and use of alcohol-based products (gels, rinses, foams) containing an emollient that do not require the use of water.

- If hands are visibly soiled or contaminated with respiratory secretions, wash hands with soap (either plain or antimicrobial) and water
- In the absence of visible soiling of hands, approved alcohol-based products for hand disinfection may be preferred over antimicrobial or plain soap and water because of their reduced drying of the skin, and convenience
- Always perform hand hygiene between patient contacts and after removing PPE.
- Ensure that resources to facilitate hand washing (i.e., sinks with warm and cold running water, plain or antimicrobial soap, disposable paper towels) and hand disinfection (i.e., alcohol-based products) are readily accessible in areas in which patient care is provided.

4.2.3 Disposal of solid waste

Standard precautions are recommended for disposal of solid waste (clinical and non-clinical) that might be contaminated with a pandemic influenza virus.

- Contain and dispose of clinical waste in accordance with facility-specific and/or local or State/Territory regulations for handling and disposal of medical waste, including used needles and other sharps
- All other waste, including disposable gowns, gloves and masks and soiled tissues should be disposed of in the general waste stream
- Wear disposable gloves when handling contaminated waste. Perform hand hygiene after removal of gloves.

4.2.4 Linen and laundry

Standard precautions are recommended for linen and laundry that might be contaminated with respiratory secretions from patients with pandemic influenza.

- Place soiled linen directly into a laundry bag in the patient's room. Contain linen in a manner that prevents the linen bag from opening or bursting during transport and while in the soiled linen holding area
- Wear gloves and gown when directly handling visibly soiled linen and laundry (e.g., bedding, towels, personal clothing) as per standard precautions. Do not shake or otherwise handle soiled linen and laundry in a manner that might create an opportunity for disease transmission or contamination of the environment
- Linen should be decanted directly from the bag into the washing machine without contact. It should be laundered on a normal hot cycle and then aired or tumble-dried
- Perform hand hygiene after removing gloves that have been in contact with soiled linen and laundry
- Paper sheeting is a good alternative to standard linen sheets for use on patient examination tables/couches and should be changed after each patient.

4.2.5 Dishes and eating utensils

Standard precautions are recommended for handling dishes and eating utensils used by a patient with known or possible pandemic influenza:

- Wash reusable dishes and utensils in a dishwasher with detergent and hot water as usual
- Disposable dishes and utensils should be discarded with other general waste
- Wear gloves when handling patient trays, dishes and utensils

4.2.6 Patient-care equipment

Disposable equipment should be used wherever possible during the treatment and care of patients and should be disposed of appropriately in the general waste. If equipment is to be reused, then it should be disinfected in accordance with the manufacturer's instructions.

Follow standard precautions for handling and reprocessing used patient-care equipment, including medical devices:

- Wear gloves when handling and transporting used patient-care equipment

- Clean heavily soiled equipment with water and neutral detergent followed by a disinfectant solution (see Table 2 for recommended disinfectants). Follow current recommendations for cleaning and disinfection or sterilization of reusable patient-care equipment
- Decontaminate external surfaces of portable equipment that may be used on other patients (e.g. portable X-Ray machine, oximeter, IV pump etc) with a disinfectant upon removal from the patient's room
- Combination detergent/disinfectant or alcohol wipes would be an acceptable method.

4.2.7 *Environmental cleaning and disinfection*

Cleaning and disinfection of environmental surfaces are important components of routine infection control in health care facilities.

- Cleaning of environmental surfaces with a neutral detergent followed by a disinfectant solution is recommended (see Table 2)
- Refer to Table 2 for appropriate concentrations of the disinfectant and precautions that should be taken
- When cleaning areas where pandemic influenza patients have been cared for, to prevent generation of dust particles, 'wet' dusting rather than 'dry' dusting should be used, and vacuum cleaners should be fitted with HEPA filters
- Dedicated or single-use/disposable cleaning equipment should be used wherever possible. Non-disposable equipment, including mop-heads, should be laundered after use
- If possible, cleaning staff should be allocated to specific areas and not moved between influenza and non-influenza areas. They must be trained in the correct methods of wearing PPE and the precautions to be taken when cleaning cohorted areas.

Cleaning and disinfection of patient-occupied rooms

- The person cleaning the room should wear appropriate PPE including a surgical mask, gown and gloves (see Table 1)
- The gloves used should be in accordance with facility policies for environmental cleaning
- Keep areas around the patient free of unnecessary supplies and equipment to facilitate daily cleaning
- Give special attention to frequently touched surfaces (e.g., bedrails, bedside and over-bed tables, TV controls, call buttons, telephones, lavatory surfaces including safety/pull-up bars, door knobs, commodes) in addition to floors and other horizontal surfaces.

Cleaning and disinfection after patient discharge or transfer

- The door to the patient's room should be kept closed until the room is cleaned and windows should be kept open if possible
- Once a patient has left the room, the main source of infection (i.e., respiratory secretions) has been removed. However, there may be residual respiratory secretions on environmental surfaces
- Clean and disinfect all surfaces that were in contact with the patient or might have become contaminated during patient care. No special treatment is necessary for window curtains, ceilings and walls unless there is evidence of visible soiling
- If bed curtains are used in a single room they should be washed and changed following patient discharge

- If a multi-bed room is being used to cohort avian or pandemic influenza patients, the bed curtains need not be changed, provided they are not visibly soiled, until the room is no longer being used for cohorting of avian or pandemic influenza patients.

Table 2: Recommended Disinfectants for Pandemic Influenza virus

Disinfectants	Recommended use	Precautions
<p>Sodium hypochlorite: 1000 parts per million of available chlorine, usually achieved by a 1 in 50 dilution of 5% liquid bleach</p>	Disinfection of material potentially contaminated with blood and body fluids	<ul style="list-style-type: none"> – Should be used in well-ventilated areas – Protective clothing required while handling and using undiluted bleach – Do not mix with strong acids to avoid release of chlorine gas – Corrosive to metals
<p>Granular chlorine: e.g., Det-Sol 5000 or Diver sol, to be diluted as per manufacturer's instructions</p>	May be used in place of liquid bleach if this is unavailable	Same as above
<p>Alcohol: e.g. Isopropyl 70%, ethyl alcohol 60%</p>	Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used	<ul style="list-style-type: none"> – Flammable, toxic, to be used in well-ventilated area, avoid inhalation – Keep away from heat sources, electrical equipment, flames, hot surfaces – Allow it to dry completely, particularly when using diathermy as this can cause diathermy burns

4.2.8 Laboratory specimens and practices

Laboratory staff should adhere to the general infection control principles and practices outlined in these guidelines. More detailed information is found in the *Laboratory Guidelines* annex in *the Australian Management Plan for Pandemic Influenza June 2005*. Laboratory staff should also refer to standard operating procedures that are relevant to their place of employment.

4.2.9 Use of multi-dose vials

The Australian Government has contracts with two vaccine manufacturers for the production of an influenza vaccine in the event of a pandemic. To lessen the delay before this can be administered to the population, the vaccine will be packaged in multi-dose vials.

The following precaution should be taken when drawing up the vaccine from the multi-dose vials:

- A new sterile disposable needle and syringe must be used for each draw-up.

5. OCCUPATIONAL HEALTH ISSUES

Healthcare personnel are at risk for pandemic influenza through community and healthcare-related exposures. This risk will be minimised by adherence to infection control principles and practices.

Key occupational health recommendations

- Prompt recognition of healthcare workers with influenza is essential to limit the spread of a pandemic
- Healthcare workers with pandemic influenza should stay home until they are free of symptoms (this recommendation may need to be varied in circumstances where there are severe work force shortages and there are HCWs who feel well enough to return to work before they are completely asymptomatic)
- Healthcare workers who care for pandemic influenza patients should not care for other patients. Decisions regarding this issue will need to be made in light of local workforce availability.
- Healthcare workers at high-risk for complications from pandemic influenza (e.g those with chronic medical conditions, pregnant or immunocompromised) should not provide direct patient care to pandemic influenza patients
- Agency staff should follow the same recommendations
- Prior to vaccination, available staff who have been confirmed to have developed immunity after natural infection will be ideally placed to care for patients with pandemic influenza
- Implement a system to educate personnel about occupational health issues related to pandemic influenza.

5.1 FOR INSTITUTIONS

5.1.1 Monitoring and managing illness

Once person to person transmission in Australia begins to occur (i.e., during Australia Phase 4 and beyond), healthcare facilities must implement systems to monitor for illness in the facility workforce and manage those who are ill.

- Screen all personnel for influenza-like symptoms before they commence work. Symptomatic people should be sent home and advised not to return for the duration of the infectious period (seven days for adults, longer if patient is still symptomatic after seven days)
- Institutions should be vigilant in maintaining accurate records of health care workers who have attended patients with suspected or confirmed pandemic influenza. The number of staff caring for the patient should be minimised.

5.1.2 Staff deployment

Healthcare workers assigned to care for patients with pandemic influenza or who work in areas of a facility designated for patients with pandemic influenza should not be assigned to care for non-influenza patients or work in non-influenza areas. Exceptions to this include:

- In hospitals, occupations with a limited number of staff (e.g. allied health staff), although segregation of staff should be maintained as much as practically possible

- In primary care settings this may not be feasible. However, comparable options such as arranging for one general practitioner or nurse to see all patients with symptoms of influenza during a session, or referral to a fever clinic, should be explored
- Situations where the care and management of the patient would be compromised
- Staff who are vaccinated or developed immunity after infection.

Health care workers who have recovered from pandemic influenza are expected to develop antibodies against future infection with the same virus. The feasibility and accuracy of tests to determine immunity are being explored. It is anticipated that workers who have protective immunity should be prioritised for the care of patients with active pandemic influenza and its complications. These workers would also be well suited to care for patients on units where the introduction of influenza would have serious consequences for patients (e.g. transplant units and neonatal care units).

Personnel who are at high risk for complications of pandemic influenza (e.g. pregnant women, immunocompromised persons) should be informed about their medical risk and offered an alternative work assignment, away from influenza-patient care until pandemic influenza has abated in the community. At the very least, they should not provide care to patients known to have influenza nor enter parts of the hospital segregated for the treatment of patients with influenza. However, implementation of this recommendation should not interfere with staff privacy and confidentiality.

5.1.3 Staff uniforms

The appropriate use of PPE will protect uniforms in most circumstances.

Facilities could consider the use of theatre type uniforms for staff who do not usually wear a uniform if they have to care for pandemic influenza patients.

5.2 FOR INDIVIDUAL HEALTH CARE WORKERS (INCLUDING GENERAL PRACTITIONERS)

- Always adhere to infection control principles and practices. Good hand hygiene and cough etiquette are simple and effective protective measures. Be aware of the times you touch your face and try to avoid this
- When caring for suspected or confirmed pandemic influenza patients, you should check your temperature twice daily and monitor for respiratory symptoms
- When pandemic influenza is circulating in the general community in Australia all health care workers, regardless of whether they are looking after pandemic influenza patients should monitor their health for the onset of fever and respiratory symptoms
- In the event of a fever or respiratory symptoms, immediately stop work and notify your supervisor or infection control team
- When caring for patients with pandemic influenza some simple measures to further decrease the risk of transmission to family members (additional to the infection control principles and practices that are followed at work) include carefully washing your hands before leaving your work place and on return to home
- Provided there have been no breaches in infection control in the workplace and you have been provided with post-exposure or pre-exposure antiviral prophylaxis when caring for pandemic influenza patients the risks of you transmitting influenza to family members and others is very low. Although

people with influenza can shed the virus without symptoms, the amount of shedding correlates with temperature and symptoms, and is therefore likely to be low when you do not have symptoms.

- However, if you decide to take extra precautions, the following can be considered if circumstances allow:
 - Use a separate bedroom and bathroom from the rest of the family
 - If possible, keep a distance of one metre from family members and avoid physical contact
 - If caring for children in the home this will not be possible and you could consider wearing a surgical mask when you come into contact with family members
 - Continue these measures for seven days after you have been caring for pandemic influenza patients.
- You can play an important role in educating the community, through discussions with friends and family, about the simple infection control practices (e.g., hand and respiratory hygiene and spatial separation measures) that will help to reduce the spread of an influenza pandemic.

For further information see also the '*Looking after yourself in a pandemic*' information found in the Clinical Care Guidelines.

6. SETTING SPECIFIC GUIDELINES

6.1 AMBULATORY SETTINGS (GENERAL PRACTICES, HOSPITAL EMERGENCY ROOMS, COMMUNITY HEALTH CENTRES)

During a pandemic, people with suspected or confirmed pandemic influenza may telephone or present to community health care settings (e.g., GPs' surgeries, Hospital emergency rooms). In this situation, the objective is to prevent transmission to attending health care staff and patients.

6.1.1 *General principles*

i) Detection of patients with possible pandemic influenza

Post visual alerts (in appropriate languages) at the entrance to the facility instructing persons with respiratory symptoms to:

- Inform reception and other healthcare personnel when they first register for care
- Practice respiratory hygiene/cough etiquette
- Request and wear a surgical mask.

Triage patients calling for medical appointments for influenza symptoms:

- Discourage unnecessary visits to medical facilities
- Instruct symptomatic patients on infection control measures to limit transmission in the home and when traveling to necessary medical appointments.

ii) "Source control" measures

Post signs that promote cough etiquette in common areas (e.g., waiting areas and toilets) where they can serve as reminders to all persons in the healthcare facility. Signs should instruct persons to:

- Cover the nose/mouth when coughing or sneezing
- Use tissues to contain respiratory secretions
- Dispose of tissues in the nearest waste receptacle after use
- Perform hand hygiene after contact with respiratory secretions
- Wear a surgical mask if they have respiratory symptoms.

Facilitate adherence to respiratory hygiene/cough etiquette. Ensure the availability of materials in waiting areas for patients and visitors:

- Provide tissues and no-touch receptacles (e.g., waste containers with pedal-operated lid or uncovered waste container) for used tissue disposal
- Provide conveniently located dispensers of alcohol-based hand wash product
- Provide soap and disposable towels for hand washing where sinks are available
- Provide surgical masks for use by those with respiratory symptoms
- Promote the use of surgical masks and spatial separation for persons with symptoms of influenza
- Offer and encourage the use of surgical masks by symptomatic persons to limit the dispersal of respiratory droplets
- Encourage coughing persons to sit at least a metre from other persons in common waiting areas
- Consider arranging a specified time for the assessment of patients with suspected pandemic influenza.

iii) Patient placement

- Where possible, designate separate waiting areas or rooms for patients with symptoms of pandemic influenza. Place signs indicating the separate waiting areas
- If this is not feasible, a waiting area should be set up to enable patients with respiratory symptoms to sit as far away as possible (at least one metre) from other patients
- Place symptomatic patients in an evaluation room as soon as possible to limit their time in common waiting areas.

6.1.2 Other measures

i) Prior to clinical assessment

- During a pandemic, any patient who telephones or presents for an appointment should immediately be questioned to determine if he or she could be an infectious case
- The suspected case should be provided with a surgical mask upon entering the facility and separated from other patients and staff, prior to assessment by a doctor or nurse.

ii) During clinical assessment of an infectious case

- The attending doctor should wear appropriate PPE consisting of gown, gloves, eye protection (if body fluid exposure is anticipated) and properly fitted P2 (N95) mask when examining the patient or taking clinical samples
- Use disposable items for examination where possible
- If seen by a GP who considers that the patient needs immediate hospitalisation, the GP should telephone the ambulance service and advise the ambulance officer that the patient is a potentially infectious case
- The attending ambulance officer should wear the recommended PPE (see section 6.3) and inform the receiving hospital Emergency Department or clinic prior to the patient's arrival.

iii) Following clinical assessment of a suspected case

- Attending HCWs should avoid touching their own eyes, noses and mouths until they have removed themselves from the vicinity of the case, disposed of their gloves, eyewear (if used), masks and gowns, and washed their hands
- Used masks, gown, and gloves should be disposed of in general waste and reusable PPE (i.e. goggles/visor/shield) should be cleaned and disinfected as per the manufacturer's instructions
- If the patient is discharged home, then the patient should be advised to avoid contact with other persons until the infectious period has passed, and should be provided with written information advising the patient what infection control precautions to take and what actions to take if the symptoms worsen
- Non disposable equipment used on the patient should be cleaned and disinfected according to manufacturer's instructions.

6.1.3 Triage arrangements

As the scope of the pandemic escalates, set up a separate triage area for persons presenting with symptoms of respiratory infection. Because not every person presenting with respiratory symptoms will have pandemic influenza, infection control measures will still be important in preventing these patients from contracting pandemic influenza.

6.1.4 *Assessment of patients in influenza clinics*

Based on overseas experience during the 2003 SARS epidemic, the establishment of “fever clinics” is considered a useful strategy to contain and limit the spread of influenza among hospital patients and staff.

During a pandemic, when there is widespread community transmission, states and territories will consider establishing influenza clinics staffed by health care workers taking prophylactic antivirals or who are immune, to reduce the risk of transmission of influenza in hospitals and medical practices. This will reduce the health care demands on these facilities and to allow rationalisation of resources such as antivirals. Health care workers at these clinics should wear appropriate PPE, and undertake environmental cleaning and waste disposal as outlined above.

6.2 HOSPITALISATION SETTINGS

6.2.1 *Patient placement and care*

- Limit admission of influenza patients to those who cannot be cared for in the home (see Clinical Care annex)
- The patient should immediately be isolated in a single room (preferably a negative pressure room if available), and should wear a surgical mask until he or she is advised to remove it by attending staff. If the patient is a child this may not always be possible. Any carer remaining with the child should be given a surgical mask to wear while in the room
- The door to the patient’s room should remain closed and attending staff and the patient should be informed of this requirement, including appropriate signage.
- The patient’s movement should be restricted. If the patient must leave his or her room, then he or she should only do so while wearing a surgical mask
- If oxygen is required, nasal oxygen prongs should be used and covered with a surgical mask. If high-flow oxygen is required, a non-rebreather oxygen mask should be used
- Nebulizers should not be used in any patient suspected to have pandemic influenza because of the infection control hazards associated with their use, and the increasing body of evidence that spacers are just as effective in delivering the medication. Other high risk activities that disrupt the airway such as suction and intubation need to be performed with caution and will require the use of P2 masks by all HCWs involved
- Disposable equipment should be used wherever possible during the treatment and care of pandemic influenza patients and should be disposed of appropriately. If equipment is to be re-used, it should be cleaned and disinfected in accordance with the manufacturer’s instructions.

The order of priority for patient room placement is:

- 1) Negative pressure isolation room
- 2) Single room
- 3) Area designated for cohorting of pandemic influenza patients.
 - The attending infection control staff should immediately be notified on admission of a patient with suspected or confirmed pandemic influenza
 - Ideally single rooms should have hand-washing facilities, toilet and bathroom facilities and an anteroom to support the use of PPE.

6.2.2 Cohorting

- Designated units or areas of a facility should be used for cohorting patients with pandemic influenza⁴. During a pandemic, other respiratory viruses (e.g., non pandemic influenza, respiratory syncytial virus, parainfluenza virus) may be circulating concurrently in the community. Therefore, to prevent cross-transmission of respiratory viruses, whenever possible assign only patients with confirmed pandemic influenza to the same room. At the height of a pandemic, laboratory testing to confirm pandemic influenza is likely to be limited, in which case cohorting should be based on having symptoms consistent with pandemic influenza
- Personnel (clinical and non-clinical) assigned to cohorted patient care units for pandemic influenza should not “float” or otherwise be assigned to other patient care areas. The number of personnel entering cohorted areas should be limited to those necessary for patient care and support. Personnel with acquired immunity to the pandemic virus should be selected if possible
- Personnel assigned to cohorted patient care units should be aware that patients with pandemic influenza may be concurrently infected or colonized with other pathogenic organisms (e.g., *staphylococcal aureus*, *Clostridium difficile*) and should adhere to routine infection control practices as per standard and additional precautions, to prevent nosocomial transmission
- Because of the high patient volume anticipated during a pandemic, cohorting should be implemented early in the course of a local outbreak.

6.2.3 Patient transport

- Limit patient movement and transport outside the isolation area to medically necessary purposes
- Consider having portable X-ray equipment available in areas designated for cohorting influenza patients
- If transport or movement is necessary, ensure that the patient wears a surgical mask. If a mask cannot be tolerated, apply the most practical measures to contain respiratory secretions. Patients should perform hand hygiene before leaving the room.

6.2.4 Visitors

- Screen visitors for signs and symptoms of influenza before entry into the facility and exclude persons who are symptomatic
- Family members who accompany patients to the hospital are assumed to have been exposed to influenza and should take measures such as careful attention to hand and respiratory hygiene and keeping a distance of one metre from other people in the hospital. Keep the numbers of family members accompanying the patient to a minimum
- Limit visitors to persons who are necessary for the patient’s emotional well being and care
- Visitors should be educated about influenza transmission and infection control principles and practices
- When entering the patient’s room, visitors should wear a surgical mask, be instructed to maintain a distance of at least a metre from the patient and to perform hand hygiene upon leaving.

⁴ During the early stages of a pandemic, when case numbers are small laboratory-confirmation of influenza infection is recommended when possible before cohorting patients.

6.2.5 Control of nosocomial pandemic influenza transmission

- Once patients with pandemic influenza are admitted to the hospital, nosocomial surveillance should be heightened for evidence of transmission to other patients and health-care personnel
- Appropriate control measures should also be implemented. These may include:
 - Cohorting of patients and staff on affected units
 - Restriction of new admissions (except for other pandemic influenza patients) to the unit(s) with the pandemic influenza patient
 - if nosocomial transmission is detected in the hospital, consider only allowing admissions to the hospital of pandemic influenza patients
 - Restriction of visitors to the affected unit(s) to those who are essential for patient care and support (if nosocomial transmission detected, consider these restrictions hospital wide).

6.2.6 Designated influenza hospitals

During a pandemic, states and territories should consider cohorting (or collocating) cases in designated influenza hospitals staffed by health care workers on prophylactic antivirals or immune. This may reduce the risk of transmission to staff and patients in the other hospitals, reduce the health care demands on these facilities and allow rationalization of resources such as antivirals. Like influenza clinics, influenza hospitals could maximise the safety and efficiency of the management of infectious cases.

6.3 TRANSPORT SETTINGS (E.G., AMBULANCES)

Patients with severe pandemic influenza or disease complications are likely to require emergency transport to hospital. The following information is designed to protect ambulance personnel during transport.

6.3.1 Screening of patients

- Screen patients requiring ambulance transport for symptoms of influenza (further information on screening for ambulance settings is found in the Clinical Care Annex).

6.3.2 Source control

- All suspected or confirmed pandemic influenza patients should wear a surgical mask during transport. If this is not possible due to the clinical condition of the patient use the most practical alternative to contain respiratory secretions
- Consider routine use of surgical masks for all patient transport when pandemic influenza is in the community.

6.3.3 Staffing and PPE

- Follow standard, contact, droplet and where possible, airborne precautions when transporting suspected or confirmed pandemic influenza patients
- The number of staff caring for the patient should be minimised. If the patient is to be transferred then the original crew should be utilised if possible

- All officers who are in close (within one metre) contact with the patient or involved in any aerosol generating procedure should wear appropriate PPE for the duration of the trip consisting of gown, gloves, eyewear (if body fluid exposure is anticipated) and P2 (N95) mask
- Consideration could be given to having dedicated influenza teams for patient transport.

6.3.4 Communications and record keeping

- The hospital, the ambulance will attend should be notified; if there is a designated pandemic influenza hospital then the patient should be taken there
- Ambulance services should keep accurate records of any attendances and/or transports of suspected pandemic influenza cases. This information should include the officers who cared for the patient and any potential breaches in infection control.

6.3.5 Patient equipment

Disposable equipment is preferred in the treatment and care of patients with suspected pandemic influenza and, this should be disposed of appropriately. If equipment is to be reused, it should be reprocessed in accordance with the manufacturer's instructions:

- If oxygen is required, nasal oxygen prongs should be used and covered with a surgical mask. If high-flow oxygen is required, a non-rebreather oxygen mask should be used. If needed, positive pressure ventilation should be performed using a resuscitation bag-valve mask
- If aerosol generating procedures need to be performed to support life whilst in transport, these high risk procedures should be performed with caution and full PPE including a P2 (N95) mask is required for all HCWs involved
- If the patient requires treatment with a nebulised medication, consideration should be given to using a spacer instead.

6.3.6 Air-flow in vehicle

Optimize the vehicle's ventilation to increase the volume of air exchange during transport. When possible, use vehicles that have separate driver and patient compartments that can provide separate ventilation to each area.

6.3.7 Cleaning and disinfection

After transport the ambulance should be left for a period of 10 minutes to allow droplets to fully settle on surfaces, with the windows and doors left open.

- Surfaces should then be cleaned as outlined in 4.2.7
- Cleaning personnel should wear gloves, gown, eye protection (if body fluid exposure is anticipated) and a surgical mask
- All reusable equipment should be processed in accordance with manufacturer's instructions.

6.4 DENTAL PRACTICE SETTINGS

The same infection control principles and practices should be applied in dental practice settings as in other medical settings.

The following recommendations also apply at all phases of the pandemic alert and pandemic period:

- Suspected and confirmed pandemic influenza patients should not undergo elective consultation and dental procedures until they have passed the infectious period and are no longer symptomatic (e.g., seven days for adults, 14 days for school aged children and 21 days for pre-school children) or the diagnosis has been excluded
- Contacts of suspected and confirmed pandemic influenza patients should not undergo elective consultation and dental procedures until the incubation period (e.g., seven days) has passed or the diagnosis in the index case has been excluded. If the contact is living with the index case and the contact is not on post-exposure antiviral prophylaxis, this period will be extended to seven days after the index case is no longer infectious
- Where urgent dental surgery is required, strict adherence to infection control procedures for all staff that come into contact with the patient, including the correct use of PPE is recommended. Where possible, these patients should be referred to a designated dental clinic for possibly infected patients
- If there is effective human to human transmission of the newly emergent influenza virus overseas (e.g., from phases overseas 4 onwards) all people who have been in an affected area should defer elective dental consultations and procedures for seven days (e.g., duration of the incubation period) since they have left the area
- Once the pandemic is established in an area in Australia, dental practices may consider deferring all non-essential consultations and procedures until the pandemic has subsided. If dental practices continue to see patients for routine procedures then all involved dental staff should follow additional precautions for all patients (see below). Once the pandemic vaccine is widely available this may not be necessary

Urgent consultations or procedures are required:

- If a designated influenza dental practice has been set up, the patient should be referred to this facility
- Standard and additional (including contact, droplet and airborne) precautions should be followed. Whenever any dental work involves the potential generation of aerosols, full PPE including P2 (N95) masks and caps are essential for all personnel in the room
- Surfaces should be cleaned and disinfected according to section 4.2.7.

6.5 RESIDENTIAL CARE SETTINGS

Residents of nursing homes and other residential care facilities will be at particular risk of pandemic influenza and disease complications. Pandemic influenza can be introduced through facility personnel and visitors and once a pandemic influenza virus enters such facilities, controlling its spread is problematic. Therefore, as soon as pandemic influenza has been detected in the region, nursing homes and other residential care facilities should implement aggressive measures to prevent introduction of the virus. These recommendations also apply to settings such as boarding houses, schools and military camps.

The basic infection control principles and practices such as hand and respiratory hygiene, spatial separation of patients and environmental cleaning and disinfection should be adhered to.

6.5.1 Prevention or delay of pandemic influenza virus entry into the facility

Control of visitors:

- From the very early phases people with suspected pandemic influenza and their contacts will be advised to stay at home and should therefore not be visiting residential care facilities
- Once the virus is easily transmissible between humans (e.g., Australia phase 4) consider reinforcing the control of visitors by posting visual alerts at the entrance to the facility restricting entry by persons who have been exposed to or have symptoms of pandemic influenza
- From Australia phase 4 enforce visitor restrictions by assigning personnel to verbally and visually screen visitors for respiratory symptoms at points of entry to the facility.

Control of staff:

- Once the virus is easily transmissible between humans (e.g., Australia phase 4) consider implementing a system to screen all personnel for influenza-like symptoms before they commence work each day.

6.5.2 Monitoring patients for pandemic influenza

Despite aggressive efforts to prevent the introduction of pandemic influenza virus, persons with asymptomatic or pre-symptomatic disease could introduce it to the facility. Early detection of the presence of pandemic influenza in a facility is critical for ensuring timely implementation of control measures. As soon as there has been effective human-to-human transmission of the virus (e.g., from Australia phase 4), increase surveillance for influenza-like symptoms. Protocols for communication with public health units in relation to suspected cases would be a matter for state/territory authorities to determine ideally seeking consensus through CDNA.

6.5.3 Control measures

Once a case of suspected or confirmed pandemic influenza is detected in a residential care facility the following control measures should be implemented:

- Public health units will give guidance for determining when these measures can be ceased
- Wherever possible, residents should not leave the facility during the period that the measures are in place
- Residents should only be transferred to a hospital for acute medical conditions that cannot be managed in the residential care facility.

6.5.4 PPE for staff

- If symptoms of pandemic influenza are apparent, implement droplet and contact precautions for the resident and roommates, pending confirmation of pandemic influenza virus infection
- Any staff member undertaking examination or treatment procedures that require close (within one metre) contact or any aerosol generating procedure with an infectious patient should use a properly fitted P2 (N95) mask
- If P2 (N95) masks are in short supply, staff should wear a surgical mask when in close contact with symptomatic residents.

6.5.5 Movement restrictions for index case and contacts

- Once a resident has been diagnosed with pandemic influenza, roommates should be regarded as exposed contacts. Patients and roommates should not be separated or moved out of their rooms unless medically indicated

- Restrict the ill resident and roommates to their room for at least seven days, or until asymptomatic
- The ill resident should wear a surgical mask to restrict droplet spread when others are in the same room
- The resident should not be transferred to hospital unless their condition cannot be managed in the facility
- If the outbreak is confined to one unit, all residents and staff from that unit should avoid contact with residents in the other units of the facility.

6.5.6 *Movement restrictions for entire facility*

- Limit movement within the facility (i.e., temporarily close the dining room and serve meals on nursing units, cancel social and recreational activities)
- Admissions of new residents during the outbreak are not recommended
- The return from hospital of residents who left the facility during the outbreak is permitted (because they are likely to already have been exposed) provided appropriate care can be provided
- The return from hospital of patients who left the facility before the outbreak commenced is generally not recommended unless there is adequate staff and the patient can be provided with antiviral prophylaxis from the facility
- Reschedule non-urgent medical appointments during the outbreak
- If a resident is transferred to hospital during the pandemic, details of the influenza status (i.e., whether any residents are infected with pandemic influenza) of residents in the facility must be provided to the hospital and those transferring the patient
- Any transfer to hospital of a resident within the facility during the course of the outbreak should be avoided if possible. Transfer to hospital for elective procedures is not recommended
- Resident transfers from anywhere in the facility to another facility is not recommended during the outbreak.

6.5.7 *Recommendations for staff*

- Ideally, all staff (including volunteers) who are working in the facility at the time a case is detected should not work in other settings until the outbreak has ceased.
- Staff should report any illness to the facility manager
- In general, symptomatic staff should be sent home until they are no longer infectious
- Cohorting of staff should be considered (i.e., staff working on an affected unit should not work on other units).

6.5.8 *Visitors*

- During the outbreak, signage should be used to notify visitors that an outbreak is occurring and there is a potential risk of infection
- Next of kin/guardian of ill residents should be notified
- Visitors should be screened for respiratory illness and not permitted to enter the facility if unwell
- Visitors who choose to visit during the outbreak should be advised to only visit the resident they have come to see.

- Visitation by groups should not be permitted
- Signage should be placed on the door of the ill residents' rooms. It should advise visitors to check with the nursing station before entering the room. Visitors should be advised to:
 - Wash hands on arrival and just before leaving the room
 - Wear a surgical mask and maintain a distance of greater than one metre from the symptomatic resident
 - Visit ill residents in their rooms only.

6.5.9 Antiviral medications

Dependent upon the availability of antiviral medications, the index case may be provided with antiviral treatment and all other residents with antiviral prophylaxis.

The duration of antiviral prophylaxis will be determined depending upon the situation at the time.

6.6 HOME HEALTHCARE SERVICES

Home healthcare includes nursing, allied health and rehabilitative services performed in the home. The scope of services ranges from assistance with activities of daily living to wound care, occupational therapy and chronic ambulatory peritoneal dialysis.

Communication between home healthcare providers and patients or their family members is essential for ensuring that these personnel are appropriately protected.

When pandemic influenza is circulating in the community, home health agencies should consider contacting patients before the home visit to determine whether persons in the household have an influenza-like illness. If patients with pandemic influenza are in the home, consider:

- Postponing non-essential services
- Assigning providers who are not at increased risk of complications of pandemic influenza to care for these patients
- Consideration should be given to using a minimum number of staff to care for pandemic influenza patients.

Home healthcare providers who enter homes where there is a person with suspected or confirmed pandemic influenza should follow the same infection control principles and practices that are recommended for other healthcare providers. Communication with the household ahead of the visit will be important to ensure the patient is wearing a surgical mask and to assist the provider in deciding when to apply PPE. In case suitable handwashing facilities are not available, the provider should bring alcohol based hand hygiene products along with PPE.

6.7 OTHER HEALTHCARE SERVICES

Organisations that provide other services involving close contact with people (e.g. chiropractors, physiotherapists, and massage therapists) should consider implementing control measures similar to those for medical practices. Other infection control strategies that may be utilised when the newly emergent influenza virus is transmitted effectively between people include:

- Screening patients for influenza like illness or contact with a person with influenza like illness by phone or before coming into the facility and rescheduling appointments for those whose care is non-emergency
- Cancelling all non-emergency services when there is pandemic influenza in the community.

6.8 SCHOOLS, CHILDCARE AND WORKPLACES

In these settings, infection control for pandemic influenza should focus on:

- Keeping people who meet the suspected or confirmed case definition for pandemic influenza and who are potentially infectious away from the facility
- Keeping contacts of the above away from the facility
- Promoting respiratory and hand hygiene
- Isolating from others (by at least one metre) any person with respiratory symptoms, ensuring that person wears a mask and arranging for a medical assessment
- When the pandemic is circulating in the community this may be extended to keeping a distance of over one metre between all people regardless of symptom status
- School administrators and employers should ensure that materials needed for hand and respiratory hygiene are available (i.e., tissues and receptacles for their disposal and hand washing products)
- If schools or childcare centres are to be closed, administrators and employers will be advised by their state or territory government.

6.9 RECOMMENDATIONS FOR INFECTION CONTROL IN OTHER COMMUNITY SETTINGS

Infection control in the community should focus on respiratory and hand hygiene. Keeping a distance from people with respiratory symptoms should be promoted and when the pandemic is circulating in the community this may be extended to keeping a distance of over one metre between all people regardless of symptom status. This could include the use of masks by persons with respiratory symptoms if feasible. Although there is only limited evidence that the use of masks in community settings is a public health measure to decrease infections during a community outbreak, persons may choose to wear a mask as part of individual protection strategies that include cough etiquette, hand hygiene and avoiding public gatherings.

Persons at high risk for complications of influenza may choose to avoid public gatherings when pandemic influenza is circulating in the community. The use of other persons for shopping or home delivery services may be considered.

6.10 INTERNATIONAL PASSENGER SETTINGS

6.10.1 Air travel

Transmission of influenza has been reported among aircraft passengers. Close contacts (e.g., adjacent passengers) of an infectious case are at highest risk of infection. Aircraft should have sufficient PPE and hand washing facilities (or alcohol-based hand wash products), to manage infectious cases and protect staff.

Prior to departure, passengers should be advised to immediately report symptoms of influenza to the crew.

i. Symptomatic passengers

If a passenger reports or is observed to have symptoms of influenza then:

- The passenger should be isolated as much as possible from other passengers and crew (at least one metre away from other passengers)
- The passenger should be given a surgical mask to wear
- For meals, the passenger should remove the mask and place it in a disposable bag, then wash his or her hands with an alcohol-based hand hygiene product and dispose of the bag in general waste
- Once his or her meal is finished, the passenger should be supplied with a new mask
- The mask should be changed when it becomes moist or damaged
- The captain of the aircraft must report the presence of symptomatic passengers to AQIS, prior to landing as required under the *Quarantine Act 1908*.

ii. Attending crew

Crew members should wear appropriate PPE (surgical mask and gloves) when attending a symptomatic passenger and immediately wash their hands after removing their gloves and masks. If running water and soap are not available, then crew members should use alcohol-based hand hygiene products to decontaminate their hands. Used gloves and masks should be placed in a disposable bag, and disposed of in general waste.

iii. Cleaning passenger aircraft

- Once an infectious passenger has left an aircraft, the main source of infection has been removed. However, there may be residual respiratory secretions on environmental surfaces
- Cleaners should wear gown, gloves and a surgical mask
- Cleaners should avoid touching their eyes, noses or mouths, and immediately wash their hands after removing and disposing of their gloves and mask in disposable bags in general waste.

iv. Linen

Linen, such as pillows and blankets that have been in contact with a symptomatic passenger, should be transported in leak-resistant, closed laundry bags for washing. Special cleaning of upholstery, carpets and storage compartments is not required.

6.10.2 Sea travel

Transmission of influenza has been reported among ship passengers. Close contacts of an infectious case are at highest risk of infection.

- Ships should have sufficient PPE and hand washing facilities (or alcohol-based hand hygiene products), to manage infectious cases and protect staff
- Prior to departure, passengers should be advised to immediately report symptoms of influenza to the crew.

In general, the recommended infection control precautions for sea travel are the same as for air travel. However, the following, additional recommendations apply:

- People with suspected pandemic influenza should be isolated from other travelers as soon as possible
- If the infectious case is a crew member, then the person should be relieved of his or her duties and isolated

- The master of the vessel should immediately inform AQIS about the suspected case and record the name, the date of onset of symptoms and the symptoms of the suspected case, and the names, cabin numbers, home addresses and phone numbers of the crew and passengers who were on board the vessel at the same time as the infectious case.

6.10.3 Assessment of infectious cases on arrival in Australia

Passengers or crew may be referred for assessment because they were symptomatic during travel or on arrival, because they were detected as having a temperature on thermal scanners or because they reported contact with an infectious case. In this situation, an AQIS officer will conduct the initial assessment in accordance with established AQIS procedures.

i. Clinical assessment of passengers

- After initial assessment, passengers may be referred to a nurse or doctor for clinical assessment
- Nurses or doctors in this situation would be expected to be in close contact with a potentially infectious case and therefore should wear P2 (N95) masks, gloves, protective eyewear (if body fluid exposure is anticipated) and a long sleeve disposable gown
- Following assessment and removal of PPE, hand hygiene should be performed using soap and water or alcohol based hand hygiene product
- Used masks, gloves, and gowns should be disposed of in a sealed bag in general waste, and reusable eyewear should be cleaned and disinfected according to manufacturer's instructions
- Clinical equipment, such as stethoscopes, should be decontaminated after the examination using a disinfectant wipe.

6.10.4 International airport procedures for border nurse referrals

March 2005

Border nurses are placed at international airports for the purpose of screening travellers for influenza only. They are not provided for general medical assessment.

From the health declaration card, incoming travellers may be referred by AQIS staff for assessment by a nurse because they are unwell or because they have been in contact with a person with severe respiratory disease. Those identified as being unwell will be issued with a surgical mask and escorted to an interview room.

From the infra-red thermal imaging, incoming travellers may be referred for assessment by a nurse because they are suspected to have a fever, a prominent symptom of influenza. Those identified as having fever will be issued with a surgical mask and escorted to an interview room.

Prior to interview of the 'at risk' traveller, the interviewing border nurse should be aware of the infection control guidelines. AQIS staff should organise a medical interpreter if required. Care must also be taken to ensure that the interpreter is adhering to the infection guidelines.

In the interview room, the following questionnaire is to be administered to determine whether the unwell traveller should be referred to the Chief Quarantine Officer (CQO).

Actions by the border nurse

Outcomes

1. Isolate

People who have signs or symptoms of influenza like illness or contact with person(s) with influenza like illness before the onset of illness and have been in an affected area should be provided with a surgical mask.

The nurse should:

- report the case to the CQO or duty medical officer by telephone; and
- **fax this record to an appropriate public health unit.**

2. Health advice

People **who do not need isolation after the assessment** will be released with health advice given by the nurse. The nurse should advise them to continue to monitor for any signs or symptoms of influenza like illness. If symptoms occur, these people should seek medical attention immediately and report their travel histories to the physician.

If the person is **symptomatic and his/her temperature is less than 38°C**, apart from health advice given, he/she should be:

- provided with a surgical mask; AND
- provided with printed advice on managing their symptoms; AND
- provided with a telephone number of an appropriate public health unit.

What is the outcome of the assessment of this traveller? (Please circle one of the following)

Isolation & contact CQO/Released with health advice

* Fax the border nurse assessment summary form(s) at the end of each shift to the National Incident Room on (02) 6289-3041.

Border nurse

Name _____

Telephone number _____ Date ____ / ____ / ____

Location _____ State _____

Border Nurse Assessment Summary

Duty Nurse's name _____ Date _____ State/Territory of this Airport _____

Please record the details of the assessed travellers in the table below.

Outcome of assessment

1 = released – no contact with a case of flu and not travelled in flu pandemic affected area/other cause of symptoms

2 = released with advice about flu and need to monitor his/her own health

3 = Chief Quarantine Duty Officer contacted – record faxed to a public health unit

Nurse	Sex	Date of Birth	Flight number	Where his/her flight came from	State of residence/ State of temporary stay for visitor	Contact number/mobile number in Australia	Email	Body temperature? (degrees Celsius)	Any flu-like symptoms? Please specify (fever, cough, sore throat, fatigue)	Contact with someone who had a respiratory illness?	Referred to a public health unit	Outcome of assessment
Example: Jack Li	M	1/12/1976	CX 100	Hong Kong	NSW	02 -62441066 0414333222	janetli@yahoo.com	38.2	Yes (cough, sore throat)	Yes	Yes	3

Fax this form to the National Incident Room on 6289-3041 at the end of your shift.

7. INFECTION CONTROL FOR THE CARE OF PANDEMIC INFLUENZA PATIENTS AT HOME

Patients who do not require hospitalisation for medical indications will be managed at home. This will become increasingly important as the demand for hospital beds grows in the later phases of the pandemic.

7.1 INFECTION CONTROL PRECAUTIONS FOR PANDEMIC INFLUENZA PATIENTS ISOLATED AT HOME

Infection control principles used in healthcare settings also apply in the home care setting. However, due to practical limitations, there are some differences between what can be done in the home and in health-care settings. For example, airborne precautions cannot be practised completely outside of fully controlled settings such as healthcare facilities. Since the most efficient modes of spread of influenza are thought to be droplet and contact spread, the use of modified precautions that focus on preventing droplet and contact spread are recommended for isolation in the household setting.

7.1.1 *Duration of infection control measures*

Adult patients greater than 12 years of age are potentially infectious for 7 days from the onset of illness, school aged children aged 5–12 years for 14 days and pre-school aged children for 21 days.

However, the risk is greatest when symptoms are still present. In terms of not leaving the house and discouraging visitors, this should be maintained for the full duration of the potentially infectious period. This means that the person should not attend work/school/childcare for that period.

However, for measures within the household such as use of surgical masks for the patient and carer and separate bedroom and bathroom for the patient, consideration can be given to relaxing these when the patient is no longer symptomatic.

This period may be reduced if a medical practitioner has determined that home isolation can be safely undertaken because a diagnosis of pandemic influenza has been ruled out.

7.1.2 *Home isolation precautions for the duration of the potential infectious period:*

- Patients should not leave the home, except as necessary for follow-up medical care. When movement outside the home is necessary, the patient should wear a mask, if tolerated, and not use public transport. Elective medical consultations (including dental) should be deferred. The patient should not visit any residential care facilities
- The patient should be separated from other persons in the household. Use a separate bedroom and bathroom if available
- Unexposed persons who do not have an essential need to be in the home should not visit.

7.1.3 *Infection control measures in the home*

Hand hygiene

All persons in the household should carefully follow recommendations for hand hygiene (See Box 5) after touching body fluids and potentially contaminated surfaces and materials (e.g., linen). Hand hygiene supplies (soap/water, alcohol based hand hygiene products, disposable towels) should be available and replenished as needed.

Box 5: Hand Hygiene for the general public

- The term 'hand hygiene' includes both hand washing with soap and water and the use of alcohol-based products that do not require the use of water
- If hands are visibly soiled or contaminated with respiratory secretions, wash hands with soap and water
- In the absence of visible soiling of hands, alcohol-based products (gels, rinses, foams) for hand disinfection may be used
- Always perform hand hygiene after providing close contact care, handling used tissues, and after removing masks
- Ensure that resources to facilitate hand washing and hand disinfection (i.e. alcohol-based products) are readily accessible in areas in which patient care is provided.

Avoid touching face

Contacts may be infected with influenza by touching a surface that is contaminated by the influenza virus and then transferring the organisms to his/her mouth, eyes, and nose.

Source control

(a) Cough etiquette (see Box 6)

Patients should cover the nose/mouth with a disposable tissue when coughing, dispose of tissues into a lined waste container and wash hands afterwards.

Box 6: Respiratory hygiene/cough etiquette for the general public

To contain respiratory secretions, all persons with signs and symptoms of a respiratory infection should:

- Cover the nose/mouth when coughing or sneezing
- Use tissues to contain respiratory secretions
- Dispose of tissues in the nearest waste receptacle after use
- Have a 'no touch' bin available for tissue disposal (e.g., open)
- Perform hand hygiene after contact with respiratory secretions and contaminated objects/materials.

In the household:

- Have a supply of tissues available
- Consider having conveniently located dispensers of alcohol-based hand rub
- Provide soap and disposable towels for handwashing near sinks.

The patient should be encouraged to sit as far away as possible (at least one metre) from others in the household, this is especially important if the person is coughing.

(b) Surgical masks for patient and carer

If possible, the patient should wear a surgical mask when others are present in the same room (If the patient is a child wearing a mask may not be tolerated). Persons in contact with the patient should also wear a surgical mask.

Surgical masks should fit snugly around the face and should not be touched or handled during use. Masks should be changed when they become moist or wet and should not be reused. If masks are unavailable or are in short supply, attention to respiratory hygiene/cough etiquette will be even more crucial.

Because any barrier placed over the nose and mouth is likely to reduce the amount of droplets being released into the environment, or provide a barrier that prevents the wearer from touching his/her nose/mouth, if surgical masks are unavailable, consideration should be given to wearing cloth masks which could be reasonably effective [24]. These should be laundered when moist or soiled.

(c) Social distancing

Household members should attempt to keep a distance of at least one metre from the patient. The number of persons entering the bedroom of the patient should be kept to a minimum.

Gloves and other protective equipment

Use of disposable gloves should be considered for any direct contact with the body fluids of a patient with possible or confirmed pandemic influenza. However, gloves are not intended to replace proper hand hygiene. Immediately after gloves are removed, they should be discarded and hand hygiene should be performed. Gloves must never be reused or washed.

Laundry (e.g., bedding, towels and clothing)

Towels and bedding should not be shared between the patient and other household members. Laundry may be washed in a standard washing machine with warm water and detergent. Care should be taken when handling soiled laundry to avoid direct contact of skin and/or clothing with contaminated material. Soiled laundry should not be shaken or otherwise handled in a manner that may aerosolize infectious particles. After laundry has been cleaned in this manner it may be used by others.

Dishes and other eating utensils.

Objects used for eating should not be shared, but separation of eating utensils for use by the pandemic influenza patient is not necessary. Soiled dishes and eating utensils should be washed either in a dishwasher or by hand with warm water and soap. After the eating utensils have been washed in this manner, they may be used by others.

Household waste

Gloves, tissues and other waste generated in the care of a pandemic influenza patient should be bagged and placed in another container for disposal with other household waste.

Cleaning and disinfection of environmental surfaces.

Environmental surfaces that are frequently touched by the patient or are soiled with body fluids should be cleaned with warm water and detergent and then wiped down with a household disinfectant (e.g., diluted bleach). The bathroom used by the patient should be cleaned daily, if possible. Household utility gloves should be worn during the cleaning process.

7.2 INFECTION CONTROL PRECAUTIONS FOR HOUSEHOLD OR OTHER CONTACTS

7.2.1 Introduction

Quarantine may apply to contacts who have been exposed to someone with pandemic influenza and may be infected, but are not symptomatic. Separating exposed people and restricting their movements is intended to stop the spread of pandemic influenza. People may be quarantined in their own home or in another facility. In most cases, quarantine is voluntary; however, state, territory and the Australian governments have authority to compel quarantine to protect the public.

7.2.2 Duration of quarantine

Provided the person who is a contact does not become symptomatic, the usual duration of quarantine will be for:

- 7 days from the last day of exposure in adults and may be longer for children (these periods will be reviewed in the light of any new information)
- OR
- Until the diagnosis has been excluded in the index case.

If the person is a contact of someone who he/she does not share a household with (e.g., a work colleague) then the duration of home quarantine will be as above, i.e., 7 days.

If the index case also lives in the household this may need adjustment. For example, the last day of exposure for a household could be considered as the end of the infectious period for the index case. However, studies of household contact post-exposure prophylaxis for seasonal influenza [22, 23] provide support for a policy of keeping the duration of household quarantine at 7 days, even if the index case resides in the household, provided that household contacts receive post-exposure prophylaxis for duration of 7 days.

If antivirals are not being used as above, and the index case resides in the same household, the duration of quarantine for household contacts should be 7 days from the last day that the index case is infectious. If the index case is an adult, this will be 14 days in total, if the index case is a child this will be for 21–28 days.

7.2.3 Contacts should be advised

- If the index case lives in the same household as the contact, follow the infection control principles outlined in 7.1 Infection control precautions for pandemic influenza patients isolated at home
- Be vigilant for fever and respiratory symptoms
- If these symptoms develop, arrangements should be made immediately for a medical evaluation. In advance of the medical assessment, health care providers should be informed that the person is a contact of a pandemic influenza patient so arrangements can be made to prevent transmission to others in the health care setting.

As much as possible, contacts should remain in the home for the duration of the quarantine period. This means:

- Contacts should not attend work/school/childcare, not use public transport, and not attend public spaces such as shopping centres and movie theatres
- Contacts should defer non-essential medical appointments, including dental
- Contacts should not visit people in hospital or residential care facilities

If the index case does not live in the same household, other household members who are not contacts can attend work or school or other activities as normal.

8. POST MORTEM CARE

People who may have contact with a patient who died with avian or pandemic influenza include:

1. Health care workers who initially attend to or transport the body
2. Family and friends:
 - when a person dies at home
 - when visiting the deceased in hospital
 - when viewing the deceased in a funeral home
 - when viewing the deceased in cemetery chapels
3. Those performing autopsies
4. Staff in funeral homes
5. Embalmers
6. People attending funerals
7. Those who are involved in the burial or cremation of the body
8. Family and friends visiting cemeteries

This section is intended to deal broadly with all of the scenarios above for the funeral industry and cemetery workers where applicable. However standard infection control and occupational health and safety guidelines should be adhered to at all times.

There are many social, religious and cultural considerations relevant to the care of the deceased and these need careful attention at all times.

Data on the survival of the influenza virus in the human body after death is minimal. One study from the 1968 Hong Kong pandemic [16] reports that of seven autopsies performed, the influenza virus was isolated from lung tissue in six of them. However, details are not given about the time since death that the autopsies were performed or how the bodies were stored. It is known that:

- Both influenza A and B viruses survive for 24–48 hours on hard non-porous surfaces such as stainless steel and plastic and for less than 8–12 hours on cloth, paper and tissues
- The virus has been shown to survive on body surfaces such as hands for five minutes after transfer from these environmental surfaces [8]
- Virus survival in respiratory tract tissues and on the surface of the body will also be influenced by temperature, humidity, ventilation and the use of disinfectants.

On the basis of these observations, it is reasonable to assume that if the patient died of pandemic influenza during the infectious period, infectious virus may be present in respiratory tract tissues beyond death, possibly for a matter of days or weeks in a cooled body. An infectious risk may also be posed if the respiratory secretions or fluids were aerosolised. However, the survival of the virus on the surface of the body beyond a matter of minutes appears unlikely.

Therefore, the following precautions are recommended in addition to strict attention to standard precautions. Standard precautions apply to all contact with blood, body fluids, non-intact skin and mucous membranes, regardless of the patient's presumed infectious status.

Those attending to the deceased are likely to be at much greater risk from contracting pandemic influenza in the community at large, or through contact with those suffering from pandemic influenza prior to death than from contact with the deceased.

Definitions:

- a. Bagging: placing the body in a plastic body bag or plastic sheeting
- b. Viewing: allowing the bereaved to see, touch and spend time with the body before disposal
- c. Embalming: injecting chemical preservatives into the body to slow the process of decay
- d. Hygienic preparation: cleaning and tidying the body so it presents a suitable appearance for viewing.

Transportation and body bags

- A surgical mask or cloth should be placed on the body in the initial hours after death in view of possible residual infective droplets that may be expelled from the lungs in transportation [17]
- The body should be transferred to the mortuary as soon as possible after death. Prior to transport, the body should be fully wrapped in a standard linen shroud to contain body fluids or substances
- A diagnosis of pandemic influenza does not necessitate the use of a body bag, provided the above precautions are followed and those transporting the body wear gown, gloves and a surgical mask (to prevent the wearer from touching his/her mouth/nose and to protect against possible contact with droplets). Body bags are indicated only when leakage of body fluids or substances is likely and cannot be contained by a standard linen shroud. Furthermore, bagging slows down the cooling process and can make viewing of the body unpleasant
- As a minimum, body bags should be used after an autopsy has been performed because of the greater likelihood of leakage.

Advice for healthcare workers attending to the deceased

- When moving the body of the deceased, a surgical mask should be placed over the patient's nose and mouth to prevent inhalation of residual air that may be expelled from the lungs when the body is moved
- Provided the healthcare worker is not transporting the body, standard precautions are sufficient for contact with the deceased. Therefore, gloves and gowns are not necessary unless contact with respiratory secretions or other body fluids is anticipated. Surgical masks are not necessary although may be used to prevent the healthcare worker from touching his/her mouth/nose and to protect against contact with droplets that may occur if fluids are splashed.

Advice for family members

- In general, family members should be allowed to view the body
- If family members are in home quarantine, viewing the body in hospital will not be permitted. Viewing may still be possible in the funeral home, provided only those who are in quarantine are present in the room, and guidance may be obtained from the local public health unit
- Family members should be educated about hand hygiene and avoiding touching their own mouth/eyes/nose after touching the body
- Provided hand hygiene is performed after touching the body, gloves are not necessary for family members unless there are visible secretions or other bodily fluids present on the body

- Although the associated risks are low, family members should be advised not to kiss the body of the deceased because of the potential for contamination of their mucous membranes.

Funerals and Cemeteries:

- There is potential for transmission of the virus amongst those attending a funeral, related to the gathering of people in an enclosed space, not to any risk placed by the body of the deceased
- However, because of the potential adverse psychological impact, it is not anticipated that funerals will be banned, even when school closures and restriction of other mass gatherings are in place. To minimise transmission however, public health authorities may place restrictions on the type and size of the gathering. For example, it may be recommended that only close family and friends attend (people who have already been exposed to the virus through contact with the patient before he/she died), or the gathering may take place in an open-air venue rather than an enclosed space. Although some of these people may strictly speaking be in home quarantine, provided attendance at the funeral does not involve travelling on public transport or transit through other places of public gathering, this should be permitted.

Staff in funeral homes and cemeteries:

- By the time the body is transported to the funeral home, it is very unlikely that infectious virus is present on the surface of the body
- There is also unlikely to be air present in the lungs. However, as a simple precaution, a cloth or surgical mask should be placed over the patient's nose and mouth when the body is moved
- Provided the funeral workers are not transporting the body, standard precautions are sufficient for contact with the patient
- Gowns are not necessary unless having contact with a body that has visible respiratory secretions or other body fluids. Surgical masks are not necessary although may be used to prevent the funeral worker from touching his/her mouth/nose and to protect against contact with droplets that may occur if fluids are splashed
- Gloves should be worn when handling all bodies (wrapped or unwrapped), blood, blood stained fluids or articles, or when handling surfaces contaminated with blood or body fluids [18, 19]
- Hygienic preparation of the deceased may be conducted according to routine practice.

Embalming:

Embalming is not recommended during an influenza pandemic. However if this procedure needs to be undertaken for social or cultural reasons precautions should be taken to avoid aerosol generation and workers involved in performing embalming should wear full PPE (properly fitted P2 (N95) mask, gown, gloves, cap and eyewear) [20].

Mortuary staff:

- If the patient died during the infectious period, respiratory tract tissues may still contain viable virus that may survive for an unknown period of time
- Aerosols, particles and splashes can be generated during autopsies. The risks associated with performing autopsies appear to depend upon contact with infected material, and particularly with splashes on surfaces, rather than inhalation of infectious material [21]
- Mortuary staff should adhere to contact, droplet and airborne precautions when performing autopsies on patients with avian or pandemic influenza who dies during the infectious period
- Full PPE, including properly fitted P2 (N95) masks, goggles, gown, gloves and cap should be worn.

- Care should be taken to minimise the production of aerosols, especially when excising the lung, by:
 - Avoiding the use of power saws
 - Avoiding splashing when removing lung tissue.

Note: that conducting procedures under water to minimise aerosols is NOT recommended because of the risk of sharps injuries.

Cremations and burials:

There are no known infection control hazards associated with cremations and burials of persons deceased as a result of pandemic influenza. Normal infection control procedures relevant to the handling of the deceased should be followed. Similar restrictions to funerals regarding the gathering of people may be instituted.

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APPENDIX— RESOURCES FOR HEALTH PROFESSIONALS

I. USEFUL NUMBERS

1. Department of Health and Ageing Public Information Hotline: 1800 004 599

The following numbers are for health professionals. Please ensure that the general public are directed towards the numbers in Appendix A: *Information for the general public – looking after yourself in a pandemic* under III. *Useful numbers.*

2. State and Territory public health unit contact details (**for health professionals**):

Australian Capital Territory	02 6205 2155
New South Wales	See list below
Northern Territory	08 8922 8044 a/h Royal Darwin Hospital: (08) 8922 8888
Queensland	See list below
South Australia	08 8226 7177
Tasmania	1800 671 738
Victoria	1300 651 160
Western Australia	1800 022 222

New South Wales

For after hours calls, contact the on-call Public Health Officer by ringing the appropriate number below and a recorded message will direct you to the after-hours telephone number.

Metropolitan areas			Rural areas		
Northern Sydney/ Central Coast	Hornsby	02 9477 9400	Greater Southern	Goulburn	02 4824 1837
	Gosford	02 4349 4845		Albury	02 6021 4799
South Eastern Sydney/Illawarra	Randwick	02 9382 8333	Greater Western	Broken Hill	08 8080 1499
	Wollongong	02 4255 2200		Dubbo	02 6841 5569
Sydney South West	Camperdown	02 9515 9420	Hunter/ New England	Bathurst	02 6339 5601
	Liverpool	02 9828 5944		Newcastle	02 4924 6477
Sydney West	Penrith	02 4734 2022	North Coast	Tamworth	02 6767 8630
	Parramatta	02 9840 3603		Port Macquarie	02 6588 2750
Justice Health Service	Matraville	02 9289 2993		Lismore	02 6620 7500
NSW Department of Health - 02 9391 9000 (North Sydney)					

Queensland

The reporting of communicable disease cases in Queensland is facilitated by the individual public health units listed below:

Bundaberg	07 4150 2785
Brisbane Northside	07 3624 1111
Brisbane Southside	07 3000 9148
Cairns	07 4050 3600
Darling Downs	07 4631 9888
Hervey Bay	07 4120 6000
South Coast	07 5509 7222
Mackay	07 4968 6611
Mt Isa	07 4744 4404
Rockhampton	07 4920 6989
Sunshine Coast	07 5409 6600
Townsville	07 4750 4000
Wide Bay	07 4120 6000

