

# **Managing Outbreaks of Acute Respiratory Illness in Care Homes**

## **Information and Advice for Health Protection Units**

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# MANAGING OUTBREAKS OF ACUTE RESPIRATORY ILLNESS IN CARE HOMES

## INTRODUCTION

This information and advice for staff working in Health Protection Units will be of use in the generic management of acute respiratory illness (ARI) in care homes. This includes the initial steps to identify respiratory pathogens sharing common modes of transmission, in order to direct appropriate public health interventions and the management of seasonal influenza outbreaks. Specific guidelines exist for the management of outbreaks of pneumococcal disease, Legionnaires' disease, and tuberculosis (TB); guidance on these can be accessed at:

Pneumococcal - [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1226652138810](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1226652138810)

Legionella - [http://www.hpa.org.uk/infections/topics\\_az/legionella/advice.htm](http://www.hpa.org.uk/infections/topics_az/legionella/advice.htm)

TB - [http://www.hpa.org.uk/infections/topics\\_az/tb/links/guidelines.htm](http://www.hpa.org.uk/infections/topics_az/tb/links/guidelines.htm).

This guidance will not apply to pandemic influenza; advice can be accessed at [http://www.hpa.org.uk/infections/topics\\_az/influenza/pandemic/default.htm](http://www.hpa.org.uk/infections/topics_az/influenza/pandemic/default.htm).

## BACKGROUND

People living in care homes are especially vulnerable to infections and severe disease because:

- Residents are often elderly and frail with other underlying diseases
- Infections can spread rapidly in care homes due to the close contact between residents and, without adequate infection control, carers can unintentionally facilitate the spread of infection between residents

An outbreak of ARI in a care home can therefore rapidly cause significant morbidity and mortality and requires prompt investigation and management.

Based on a review of the published accounts of investigated outbreaks, not survey data, the most common causes of ARI outbreaks in institutions for older people, in order of published frequency, are shown in table 1.

**Table 1. Relative frequency of organisms isolated from care home outbreaks**

Influenza
Respiratory syncytial virus (RSV)
Parainfluenza
Rhinovirus
<i>S. pneumoniae</i>
<i>H. influenzae</i>
<i>C. pneumoniae</i>
Human metapneumovirus (hMPV)
Coronavirus OC43
<i>B. pertussis</i>

The list consists of causal agents derived from published accounts representing a fraction of actual incidents and may be subject to publication bias. Therefore when considering possible causes of ARI, the list in table 1 should only be used as an indicator of the relative frequency with which each individual organism causes outbreaks of ARI. During the 2011/2012 season influenza, rhinovirus and RSV accounted for 88%, 5% and 4% respectively, of outbreaks reported to the Respiratory Diseases Department at Colindale.

Although outbreaks of ARI are more common in the winter, they may occur throughout the year. In particular, influenza outbreaks in care homes may occur early in the autumn before immunisation campaigns have been fully implemented and before any increased influenza activity is detected in the wider community, or late in spring when antibody levels from seasonal flu vaccination may have declined. Therefore a diagnosis of influenza should be considered in an outbreak situation at any time of the year.

### **CASE DEFINITIONS OF ARI**

There are no comprehensively accepted definitions for acute respiratory illness because of the nature of the symptoms, the wide range of its causes, and the wide range of illness caused by influenza and other respiratory viruses. The issue of atypical illness in the elderly is particularly problematic and fever is not always present. The definitions below are based on studies carried out in care homes in the UK.

#### **DEFINITION OF AN OUTBREAK OF ARI**

*Two or more cases (as defined below) arising within the same 48 hour period **OR** three or more cases arising within the same 72 hour period, which meet the same clinical case definition and where an epidemiological link can be established.*

*Oral temperature of 37.8° or more **PLUS** new onset or acute worsening of one or more respiratory symptoms:*  
*cough (with or without sputum), hoarseness,*  
*nasal discharge or congestion, shortness of breath*  
*sore throat wheezing*  
*sneezing, chest pain*

**OR**

*in older people an acute deterioration in physical or mental ability without other known cause*

### **TRANSMISSION DYNAMICS**

Respiratory infections are usually spread by close contact through droplet transmission from coughing and sneezing, direct human to human contact, touching contaminated surfaces or breathing aerosols generated by medical procedures.

Further information about transmission, viral shedding, incubation times and the period of communicability for specific diseases in adults is given in appendix 1.

Viral survival outside a host is another factor to be considered. Environmental cleaning will be an important infection control measure for those organisms that can survive in the environment (Table 2).

**Table 2: Persistence of viruses on dry inanimate surfaces**

<b>Virus</b>	<b>Persistence*</b>
Coronavirus (non SARS)	3 hours
Influenza	1-2 days
RSV	Up to 6 hours
Rhinovirus	2 hours – 7 days

\*Survival on other materials and the skin is likely to be of shorter duration

## **PREVENTION**

Vaccines are available against both influenza and pneumococcal disease and these can be used to prevent or reduce the likelihood of outbreaks of these diseases and their complications. Detailed advice on the use of influenza and pneumococcal vaccines is available in the [online edition of the green book](#).

Vaccination is of limited use as a control measure during an acute outbreak of influenza - it takes approximately 14 days for a person to develop a protective immune response. Therefore priority should be given to more effective measures (see control measures below) when managing an outbreak of ARI.

## **INVESTIGATION**

Early detection of an outbreak of ARI or potential ARI in a care home is crucial because prompt action is necessary in order to prevent further spread of the illness. HPU should make local arrangements for raising awareness of the importance of reporting outbreaks of ARI to HPUs among GPs, community provider services and care homes, and to ensure locally appropriate arrangements are in place for reporting and sampling.

Unless testing results are available quickly it is probably inadvisable to wait for microbiological/virological confirmation of an illness before implementing general outbreak control measures (covered below in Outbreak Control).

Microbiological/virological confirmation of the responsible organism should be ascertained as quickly as possible because acute respiratory infections often share similar clinical features. The HPU, in liaison with local microbiologists/virologists, should coordinate the taking of fresh diagnostic specimens from symptomatic residents as soon as possible. It will be important for the local virologist and microbiologist to be consulted about any testing that is being considered. HPUs should also ensure local laboratories are aware of and signed up to investigation protocols. All of the following specimens should be considered:

- Combined nose/throat swab in virus transport medium. Sensitivity is improved if specimens are taken from cases with the most recent onset of symptoms. As many cases as possible should be tested - up to a maximum of five.
- Sputum for culture.
- Legionella and pneumococcal urinary antigens.

- In certain circumstances it may also be appropriate to consider paired sera for: influenza A & B, RSV, mycoplasma, adenovirus, *chlamydia* and *coxiella* species. If undertaken, a plain clotted sample should be taken during the acute illness, followed by a convalescent specimen a minimum of 14 days later. If only a single convalescent serum is taken this should be taken 28 days post onset or post exposure.

Specimen collection and testing can also contribute important information to regional and national surveillance:

- By enabling early detection of influenza in a community – ‘early warning’.
- Identifying the dominant flu subtypes and any changes which might occur to the virus (drug resistance, severity)
- Providing information on vaccine efficacy

Sampling out of season and early or late in the ‘normal’ flu season is particularly important to get a confirmed diagnosis when it is least expected.

At the peak of the influenza season, testing is less useful as the probability that any ARI is influenza is much greater. There is still considerable benefit in tracking the evolution of the viruses during a season and it is therefore recommended that at the peak of the season advice on testing should be sought from the Respiratory IDiseases Department and/or the Respiratory Virus Unit at the HPA Colindale (see reporting section).

## **INFECTION CONTROL**

In the event of an outbreak, the standard infection control principles that should be in place in all health and care settings should be maintained. In addition, the HPA has developed very useful guidance that gives detailed information and advice on the types of droplet, contact and airborne precautions to minimise transmission of respiratory tract infections in healthcare settings or when dealing with ARI outbreaks: [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317131892566](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131892566). It is important to remember that these infection control precautions should be the mainstay of the public health response.

**Annex 1 includes detailed infection control information for care homes in relation to outbreaks of ARI plus two leaflets for use in influenza outbreaks**

## **SPECIFIC CONTROL MEASURES**

### **Influenza**

Specific outbreak control measures are an adjunct to properly implemented infection control precautions. The prevalence of antiviral resistance and epidemiology of circulating subtypes will need to be considered when considering the use of antivirals.

If influenza is suspected when community influenza activity is considered likely then influenza-specific measures should be implemented immediately, in accordance with recommendations from The National Institute for Health and Clinical Excellence (NICE):

- **Treatment**: unless contraindicated, oseltamivir or zanamivir should be given to all adult patients, where treatment can be started within 48 hours of onset of symptoms.
- **Prophylaxis**: unless contraindicated, oseltamivir or zanamivir is recommended for all adult residents, whether or not they have been vaccinated, who may have been exposed to the infection through droplet spread, direct contact or indirect contact with fomites. This is recommended where prophylaxis can commence within 48 hours of contact with the latest case and should continue until at least five days after the recovery of the final patient.

Outside of the periods when national surveillance indicates that influenza virus is circulating in the community, antiviral treatment should be started as soon as possible but prophylaxis should only be initiated if there is a high likelihood that the causative agent in a localised outbreak is influenza.

**In addition to the NICE guidance, the Health Protection Agency recommends:**

- In the event of a suspected or confirmed influenza outbreak in a care home, prophylaxis for care staff with patient contact and in at risk groups should be considered. Residents will already be receiving either treatment or prophylaxis and wider prophylaxis of staff is not usually required.
- If intervention with zanamivir or oseltamivir has been instigated in response to an incident where influenza is strongly suspected, but a non-influenza diagnosis is subsequently confirmed, therapy with either agent should be stopped.

**OUTBREAK INVESTIGATION AND MANAGEMENT**

The [communicable disease outbreak plan](#) provides a framework for the management of outbreaks of communicable disease in England at all levels of the HPA.

Local HPUs should have their local outbreak plan and arrangements in place in order to convene an outbreak control team to co-ordinate the investigation and management of the outbreak.

**RECORDING AND REPORTING**

Information on outbreaks should, in the first instance, be recorded on HPZone. Outbreaks in care homes caused by influenza may predate influenza activity in the community and thus provide valuable information on viral subtypes and clinical impact. They are also useful for monitoring the impact in this group of vulnerable people. Information on any local outbreaks should therefore be sent electronically to the Influenza Section, the Respiratory Diseases Department, Health Protection Services, Colindale (email: [respcdsc@hpa.org.uk](mailto:respcdsc@hpa.org.uk)).

The reporting form for Colindale is available from the influenza web page at: <http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/SeasonalInfluenza/>

Local templates should also be in place for collection of data for more detailed epidemiological investigations and HPU should ensure that information from routine ARI surveillance systems (GP spotter practice, RMN surveillance scheme) is shared with local GPs, provider services (acute and community trusts), and PCTs to give a clear local picture of infections. This information should be used to inform risk assessments and investigation of community clusters.

Reports of care home outbreaks should also be flagged at the weekly HPA update teleconference (every Tuesday morning) reporting the numbers of homes affected and any confirmed laboratory diagnoses



### Appendix 1: Transmission, incubation and communicability of respiratory pathogens

Infection	Reservoir	Dominant modes of transmission	Incubation period	Period of communicability*
<b>Rhinovirus or coronavirus</b>	Human	Respiratory droplets, direct and indirect contact with respiratory secretions.	Between 12 hours and 5 days, more usually around 48 hours.	From up to 1 day before* to 5 days after clinical onset.
<b>Influenza virus</b>	Humans are the primary reservoir for human influenza; birds and mammals are likely sources of new human subtypes for influenza A.	Respiratory droplets, direct and indirect contact with respiratory secretions.	Short, usually 1 to 3 days, but possibly up to 5 days.	From up to 12 hours before* to 3 – 5 days after** clinical onset in adults; up to 7 days in young children and occasionally longer
<b><i>Streptococcus pneumoniae</i></b>	Humans – pneumococci are commonly found in the respiratory tracts of healthy people.	Respiratory droplets, direct and indirect contact with respiratory secretions.	Uncertain, but possibly 1 to 3 days.	Until discharges are clear of virulent pneumococci, but 24 - 48 hours if treated with penicillin. Pneumococci remain viable in dried secretions for many months.
<b>Respiratory syncytial virus (RSV)</b>	Human	Respiratory droplets, direct and indirect contact with respiratory secretions.	Between 1 and 8 days, more usually around 48 hours.	From up to 1 day before* to 5 days after clinical onset, occasionally longer in infants – up to 4 weeks.
<b>Parainfluenza virus</b>	Human	Respiratory droplets, direct and indirect contact with respiratory secretions.	Between 12 hours and 7 days, more usually around 48 hours.	From up to 1 day before* to 5 days after clinical onset.

\* Few data exist which convincingly demonstrate that transmission by asymptomatic persons is important in producing additional symptomatic cases

\*\* Carriage may last for longer (7 days or possibly more) in older people with comorbidity and severe enough illness to warrant hospitalisation for this long<sup>19</sup>



## Appendix 2: Information for Care Homes

### TRANSMISSION DYNAMICS

Respiratory infections are usually spread by close contact through one of four mechanisms:

- **droplet transmission** – coughing, sneezing, or even talking may generate droplets more than 5 microns in size that may cause infection if droplets from an infected person come into contact with the mucous membrane or conjunctiva of a susceptible individual. The size of these droplets means that they do not remain in the air for a distance greater than a metre, so fairly close contact is required for infection to occur.
- **direct contact transmission** – this occurs during skin-to-skin or oral contact. Organisms may be passed directly to the hands of a susceptible individual who then transfers the organisms into their nose, mouth or eyes.
- **indirect contact transmission** – takes place when a susceptible individual touches a contaminated object, in the vicinity of an infected person and then transfers the organisms to their mouth, nose or eyes.
- **aerosol transmission** – takes place when droplets less than 5 microns in size are created and remain suspended in the air. This can sometimes occur during medical procedures, such as intubation or chest physiotherapy. These droplets can be dispersed widely by air currents and cause infection if they are inhaled.

### INFECTION CONTROL

#### Residents

- Enhanced surveillance for further cases should be initiated by way of daily monitoring of all residents for elevated temperatures and other respiratory symptoms. It is important to identify infected patients as early as possible in order to implement infection control procedures such as isolation and reduce the spread of infection. If possible, symptomatic residents should be cared for in single rooms. If this is not possible, symptomatic residents should be cared for in areas well away from residents without symptoms. If the design and capacity of the care home and the numbers of symptomatic residents involved are manageable, it is preferable to isolate residents into separate floors or wings of the home. Movement of symptomatic residents should be minimised. If the organism is unknown, assume cases will be infectious for up to 5-7 days following the onset of symptoms or until full recovered.
- Resident's clothes, linen and soft furnishings should be washed on a regular basis and all rooms kept clean. More frequent cleaning of surfaces such as lockers, tables, chairs, televisions and floors is

indicated, especially those located within one metre of a symptomatic patient. Hoists, lifting aids, baths and showers should also be thoroughly cleaned between patients.

- Residents should have an adequate supply of tissues, as well as convenient and hygienic methods for disposal. Patients should cover their nose and mouth with disposable single-use tissues when sneezing, coughing, wiping and blowing noses and clean their hands or use handrubs (microbicidal handrubs, particularly alcohol-based) afterwards.
- Depending on the nature of the infection and the impact on those affected, consideration might in very specific circumstances be given to the use of surgical facemasks by affected residents (if this can be tolerated) when they are within one metre of other individuals (unless microbiologically confirmed to share the same infection). The Health Protection Unit will advise if this is necessary.

### **Staff**

- If possible, care home staff should work either with symptomatic or asymptomatic residents (but not both) and this arrangement should be continued for the duration of the outbreak.
- Agency and temporary staff who are exposed during the outbreak should be advised not to work in any other health care settings until the cause is identified and appropriate advice given.
- Symptomatic staff and visitors should be excluded from the home until no longer symptomatic. Children and adults vulnerable to infection should be discouraged from visiting during an outbreak. Consistent with patient welfare, visitor access to symptomatic residents should be kept to a minimum.
- Frequent hand washing has been proven to be effective in reducing the spread of respiratory viruses. Staff should clean their hands thoroughly with soap and water or a handrub (microbicidal handrubs, particularly alcohol-based) before and after any contact with residents. Consideration should also be given to placing handrub dispensers at the residents' bedsides for use by visitors and staff. It is advisable to recommend carrying out a risk assessment before introducing handrubs into the workplace.
- Staff should wear single use plastic aprons, appropriately worn, when dealing with patients.
- Barrier measures such as gloves, gowns and facemasks (the higher the filtration the better) are also effective in reducing the spread of respiratory viruses if used correctly. Any decision about the use of personal protective equipment (PPE) needs to be taken in the light of the organism and the impact on the home. The Health Protection Agency can advise on the level of infection control needed.
- More stringent infection control is needed when aerosol generating procedures (such as airway suction and CPR) are carried out on cases or suspected cases. Such procedures should be performed only when necessary and in well ventilated single rooms with the door closed. Numbers of staff exposed should be minimised and FFP3 respirators

and eye protection should be used in addition to gowns, gloves and universal precautions.

- Staff, patients and visitors should be encouraged to avoid touching their eyes and nose to minimise the likelihood of infecting themselves from viruses picked up from surfaces or other people.
- Uniforms and other work clothing should be laundered at work if there are facilities for this. If laundered at home the general advice on washing work clothes would apply. Uniforms should never be worn between home and the place of work.
- Clinical waste should be disposed of according to standard infection control principles.
- Depending on the causative organism, there may be a case for staff at risk of complications if infected (e.g. pregnant or immuno-compromised individuals) to avoid caring for symptomatic patients. A risk assessment will need to be carried out on an incident by incident basis.

More advice on infection control precautions for respiratory tract infections can be found at:

[http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317131892566](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131892566)



## Influenza Outbreaks: Information leaflet for Residents and Carers

### 1. What is a flu (influenza) outbreak?

Flu-like illness affects many people during the winter months. Two or more cases of flu-like illness occurring within 48 hours in residents or staff from the same care home indicate that an outbreak of influenza is possible.

### 2. Recommended precautionary measures for homes with a possible flu outbreak

If the staff in the care home suspect an outbreak, they will ensure that measures are in place to reduce the risk of spread to other residents. They may also advise restrictions on staff and resident movements.

The local Health Protection Unit and Primary Care Trust will be supporting them in ensuring:

- adequate control measures are taken to prevent the spread of infection
- affected residents or staff receive appropriate treatment and
- residents, staff and carers receive appropriate and timely information on the measures being taken

### 3. What are the specific measures that staff can take?

- Wash hands frequently with soap and water and dry thoroughly
- Dispose of used/dirty tissues as clinical waste
- Ensure frequent cleaning of surfaces
- Ensure that supplies for hand washing are available where sinks are located
- Provide tissues to residents and visitors who are coughing or sneezing so that they can cover their mouth and nose.
- Staff should use appropriate infection control precautions while dealing with affected patients e.g. gloves, single use apron

### 4. How can residents and carers help?

- Residents with flu symptoms should
  - Avoid using common areas
  - Cover their mouth and nose with a tissue when coughing or sneezing
  - Sit at least 3 feet away from others, if possible
- All residents can:
  - Discourage visitors, especially children and vulnerable adults
  - Support the home by adhering to other restrictions which may be needed

Carers, family and friends should not visit the home if they have flu symptoms.



## Influenza Outbreaks: Information leaflet for Care homes

### 1. What is an outbreak of influenza?

Two or more cases of flu –like illness occurring within 48 hours in residents or staff who are in close proximity to each other in the care home indicates that an outbreak of flu is possible. Your local Health Protection Unit will confirm whether or not there is an outbreak.

### 2. How can you reduce the risk of influenza transmission in care homes?

- Wash hands frequently with soap and water and dry thoroughly
- Ensure frequent cleaning of surfaces
- Cover your mouth and nose with a tissue when coughing or sneezing
- Dispose of used/dirty tissues as clinical waste

### 3. What precautions should you take if you suspect a possible outbreak of flu in the care home?

#### 3.1 Care of patients

1. The first priority is the care of patients. If possible affected patients should be cared for in single rooms, or in the same area of the care home, to reduce the risk to other residents who are not affected.
2. Ensure that standard infection control precautions are in place.
3. Inform the local Health Protection Unit as soon as possible.

#### 3.2 Informing local Health Protection Unit

The Health Protection Unit staff will:

- Advise whether there is an outbreak, and collect further information.
- Offer advice on whether further tests or treatment is required
- Liaise with other health care professionals who may be involved with the care of residents.
- Ensure that detailed information on infection control precautions is made available, and
- Monitor the progress of the outbreak, and offer support for any other control measures that may be required

#### 3.3 Reinforce Infection Control Measures

In the event of an outbreak, the standard infection control measures that should be in place in all health and care settings should be maintained, and environmental cleaning measures should be enhanced.

**3.4 Additional key measures** recommended during outbreaks are outlined below. These cover three main areas:

- Restrictions to visitors and staff

- Respiratory hygiene
- Droplet precautions

Further advice on these matters can be obtained from your local Infection Control Nurse or Health Protection Unit.

➤ **Restrictions to residents, visitors and staff**

- Restrict *visitor* access to symptomatic patients to the minimum that is required for patient welfare. Children and vulnerable adults should be discouraged from visiting during an outbreak.
- Exclude *symptomatic staff and visitors* until fully recovered and at least five days after the onset of symptoms.
- *Agency and temporary staff* who are exposed during the outbreak should be advised not to work in other health or care settings until the outbreak is over.

➤ **Respiratory hygiene**

Respiratory hygiene/cough etiquette is essential when an outbreak of flu is being considered. Recommended measures include:

- Putting up signs at entrance or common areas instructing residents and visitors to inform staff if they have respiratory symptoms, and discouraging visitors with symptoms.
- Providing tissues to residents and visitors who are coughing or sneezing so that they can cover their mouth and nose.
- Residents with symptoms of respiratory infection should be discouraged from using common areas where feasible. Residents should have an adequate supply of tissues and covered sputum pots, as well as convenient and hygienic methods of disposing of these.
- Ensuring that supplies for hand washing are available where sinks are located and providing dispensers of alcohol-based hand rubs in other locations.
- Encouraging coughing persons to sit at least 3 feet away from others, if possible.

➤ **Droplet precautions**

- If possible symptomatic residents should be cared for in **single rooms** until fully recovered and at least five days after the onset of symptoms. If this is not possible then **group together** suspected flu residents with other residents suspected of having flu.
- If possible, staff should work with either symptomatic or asymptomatic residents (but not both), and this arrangement should be continued for the duration of the outbreak.
- Staff should use appropriate infection control precautions while dealing with affected patients e.g. gloves, single use apron etc.
- The Health Protection Unit will advise on the appropriate use of surgical masks.