



Cardiopulmonary Resuscitation and Pandemic H1N1 2009 Influenza in healthcare settings

13 October 2009

Purpose

The Resuscitation Council (UK) has received several enquiries about the risks of pandemic H1N1 2009 influenza (swine influenza) during cardiopulmonary resuscitation (CPR).

This statement provides specific guidance for healthcare workers (HCWs) on CPR in healthcare settings for patients with suspected or confirmed pandemic H1N1 2009 influenza. This supplements guidance available from the Department of Health and Health Protection Agency (DH/HPA):

http://www.dh.gov.uk/en/Publichealth/Flu/PandemicFlu/DH_085433

This guidance may change based on increasing experience in the care of patients with H1N1 2009 influenza and the effect of the outbreak on health services. It is therefore important to check the latest guidance on the DH/HPA website.

The statement also provides guidance on the risks of training during the H1N1 2009 influenza outbreak.

Background

1. There is sustained transmission of H1N1 2009 influenza in the UK. Currently, in most cases H1N1 2009 influenza causes a mild illness and only a small proportion of cases require hospital admission. However, the size of the outbreak means that a significant number of hospital admissions are expected this autumn.
2. H1N1 2009 influenza is thought to spread in a way similar to 'routine' seasonal influenza: from person to person through close contact and droplets. Standard principles of infection control and droplet precautions are the main control strategies and should be followed rigorously. Aerosol transmission can also occur. Attention to hand hygiene and containment of respiratory secretions produced by coughing and sneezing are the cornerstones of effective infection control.

3. The DH/HPA recommends the following personal protective equipment (PPE) for HCWs:
 - a. All healthcare workers in contact* with a patient with a flu-like illness or a probable/confirmed case would be advised to wear a facemask, plastic apron, and gloves. If a risk assessment indicates that eye splashing is likely, eye protection should be considered. If the patient is wearing a mask this would further reduce any perceived risk.

* carrying out direct patient care in close contact (at a distance of 1 metre or less)
 - b. Where HCWs are caring for a patient with a flu-like illness or a probable/confirmed case and where aerosol generating procedures are being undertaken they would be advised to use an FFP3 respirator, gown**, gloves and eye protection.

** Gowns must be fluid repellent
4. During CPR there is the potential for rescuers to be exposed to body fluids and for procedures (e.g. tracheal intubation, ventilation) to generate an infectious aerosol.
5. Resuscitation team members must be trained (including respirator-fit testing) to put on PPE and also to remove PPE safely to avoid self contamination.

Guidance on CPR in patients with a flu-like illness or a confirmed case of H1N1 2009 influenza in healthcare settings

1. Patients with a flu-like illness who are at risk of acute deterioration and cardiac arrest should be identified early and appropriate steps taken to prevent cardiac arrest and avoid unprotected CPR. Use of physiological track and trigger systems will enable earlier detection of the acutely ill patient (www.nice.org.uk/CG50). Patients for whom a do-not-attempt-resuscitation (DNAR) decision is appropriate should also be identified early. Interventions in patients should ideally be planned to enable staff to wear the appropriate PPE.
2. Staff looking after patients with a flu-like illness and confirmed cases of H1N1 2009 influenza should have rapid access to the appropriate PPE (e.g. consider keeping PPE on resuscitation trolleys). Patients at risk of cardiac arrest should be monitored early (at least: pulse oximetry, ECG, and non-invasive blood pressure) and cared for in a suitable clinical area – this will make both the prevention and recognition of cardiac arrest easier.
3. The minimum PPE requirements to assess a patient, start chest compressions and establish monitoring of the cardiac arrest rhythm, are a surgical facemask, plastic apron, and gloves.
4. Recognize cardiac arrest by looking for absence of signs of life, and absence of normal breathing. Feel for a carotid pulse if trained. Do **not**

listen and feel for breathing by placing your ear and cheek close to the patient's mouth. If there are doubts about the diagnosis of cardiac arrest, the default position is to start chest compressions until help arrives.

5. Start compression-only CPR and monitor the patient's cardiac arrest rhythm as soon as possible. Avoid mouth-to-mouth ventilation and the use of a pocket mask during CPR.
6. If, as is highly likely, the patient is already receiving oxygen therapy using a face mask, leave the mask on the patient's face during chest compressions.
7. Defibrillate shockable rhythms rapidly - early restoration of a circulation may prevent the need for airway and ventilatory support.
8. Whilst chest compressions are ongoing, other members of the resuscitation team should don FFP3 respirators, gowns, gloves and eye protection before taking over from the first responders to the cardiac arrest.
9. If an FFP3 respirator is not available, rescuers should wear a surgical mask. If full PPE is not worn then the HCW should be assessed by the local Occupational Health Department to determine whether post-exposure prophylaxis (PEP) is required.
10. Airway interventions should be carried out by experienced individuals: techniques include bag-mask ventilation, use of supraglottic airway devices and tracheal intubation. Individuals should use the airway skills for which they have received training. For many HCWs this will mean a two-person bag-mask technique with the use of an oropharyngeal airway. Tracheal intubation should be attempted only by individuals who are experienced and competent in this procedure.
11. Patients may have a cardiac arrest that is caused directly by H1N1 2009 influenza or because of a co-existing illness. Cardiac arrest directly attributable to H1N1 2009 influenza may have a very poor prognosis. It is important, however, to attempt to identify and treat any reversible causes (e.g. severe hypoxaemia) before considering stopping CPR.
12. If a surge of pandemic flu occurs, follow local triage tools for guidance on starting and stopping CPR.
13. Dispose of, or clean, the equipment used during CPR, following manufacturer's instructions and according to local guidelines. Any work surfaces on which airway and resuscitation equipment has been placed will also need to be cleaned according to local guidance. Specifically, ensure that items of equipment used in airway interventions (e.g. laryngoscopes, face masks) are not left lying on the patient's pillow but are placed in a tray. Do not leave the Yankaeur sucker under the patient's pillow after use; instead, put the contaminated end of the sucker inside a disposable glove.
14. Remove PPE safely to avoid self contamination and dispose of clinical waste bags with care; follow this with hand hygiene.

Minimizing the risk of swine influenza transmission during CPR training

1. Any participant or instructor with signs or symptoms of H1N1 2009 influenza must postpone CPR training. Individuals with flu-like symptoms who attend a training session should be turned away.
2. Avoid contact with any saliva or body fluids on manikins.
3. Clean manikins according to the manufacturers' guidance.

Implementation

1. Individual healthcare organizations should carry out a local risk assessment, based on the latest guidance from the DH/HPA on use of PPE for HCWs, in order to develop local guidance.
2. Patients with H1N1 2009 influenza should be nursed separately from other patients or cohorted (grouped with other patients with influenza and no other infection).
3. Local guidance should include different patient groups (adults, children, pregnant patients, and neonates), and a strategy to ensure that CPR is not delayed in patients without H1N1 2009 influenza.
4. The need to don PPE may delay CPR in patients with H1N1 2009 influenza. Review of the processes involved (including availability of PPE kits on resuscitation trolleys), along with training and practice, will minimize these delays. Staff safety is paramount. In cardiac arrest of presumed hypoxic aetiology, as is likely in children, early ventilation with oxygen is usually advised. Any airway intervention performed without the correct PPE protection, however, will subject the rescuer to significant risk of infection. Consequently, we recommend, even in presumed hypoxic arrest, starting with chest compressions (leaving an oxygen mask on the victim, if possible), whilst a second rescuer dons the correct PPE. If full PPE is not worn, the HCW should be assessed by the local Occupational Health Department to determine whether post-exposure prophylaxis (PEP) is required.
5. Hand hygiene has an important role in decreasing transmission. Alcohol hand rub is effective. Alternatively use thorough hand washing with soap and water.
6. There is no evidence to suggest that the virus strains that cause severe/fatal disease differ from those causing mild influenza-like illness.
7. The hospital environment is not the only high risk factor for exposure and infection: if there is widespread community transmission occurring, HCWs will continue to be at risk whilst not at work. Healthcare staff who develop flu-like symptoms should call NHS Flu Line for advice on their personal health, and seek guidance from their occupational health department in relation to their work.