



Healthcare worker vaccination: clinical evidence (updated September 2018)



Public Health
England

Contents

Why should we worry about influenza?	3
Why is flu vaccination important for clinical staff?	3
Protecting yourself against flu	3
Protecting your patients against flu	3
Protecting your family against flu	3
Advice from professional bodies about the flu vaccine	4
How effective is the flu vaccine?	4
How safe is the flu vaccine?	4
Is the flu vaccine safe in pregnancy?	4
Is the flu vaccine safe for those who are immunocompromised or have HIV?	5
What about severe reactions to the flu vaccine?	5
How is safety of the flu vaccine monitored?	5
Does the vaccine contain porcine products?	5
Why do some doctors/clinicians refuse the flu vaccine?	5
When should I be vaccinated?	6
References	7

Every year, the influenza vaccination is offered to frontline healthcare workers in the NHS as a way to reduce the risk of staff contracting the virus and transmitting it to their patients and service users. This document outlines the clinical evidence supporting the need for flu vaccination among healthcare workers.

Why should we worry about influenza?

Influenza can cause a spectrum of illness ranging from mild to severe, even among people who were previously well. The impact on the population varies from year to year, depending on how many people are susceptible, any changes to the influenza virus and the severity of the illness caused by the influenza subtype in circulation. The capacity for the virus to mutate/change and the duration of protection from the vaccine (about one season), are the reasons that the vaccine is tailored each year to protect against the most commonly circulating strains and shows why annual vaccination is necessary.¹

The timing, extent and severity of influenza seasons is unpredictable and intermittent epidemics can cause significant illness and mortality.

Public Health England estimated that an average 8,000 people die from flu in England each year. Some years that figure could go beyond 14,000. That's more than eight times the number of confirmed cases of measles (91), mumps (717) and rubella (5) combined in 2016²⁶⁻²⁷

Why is flu vaccination important for clinical staff?

Protecting yourself against flu

Frontline healthcare workers are more likely to be exposed to the influenza virus, particularly during winter months when some of their patients will be infected. It has been estimated that up to one in four healthcare workers may become infected with influenza during a mild influenza season – a much higher incidence than expected in the general population.³

Typically, the elderly, the very young, and people with underlying medical conditions are at a greater risk of suffering severe illness. However, even previously healthy people and the young can develop severe complications from influenza including bronchitis, secondary bacterial pneumonia and, more rarely, meningitis, encephalitis and/or death. Many cases of severe illness were in those aged under 65 years (89 per cent of hospital admissions, 87 per cent of critical care beds occupied and 79 per cent of deaths).³⁻⁷

Protecting your patients against flu

Influenza is a highly transmissible infection. The patient population found in hospital is much more vulnerable to its severe effects.⁷ Healthcare workers may transmit the illness to patients even if they are mildly or sub-clinically infected. There are reports of influenza outbreaks within hospitals and other care settings where transmission from healthcare workers to patients is likely to have facilitated the spread of the disease.⁸⁻¹⁰ In one outbreak, 118 staff and 49 patients were infected.¹³ A second resulted in six infections among neonates and one death.¹⁰

Settings randomised to high levels of immunisation had reduced rates of flu-like illness, hospitalisation and mortality in the elderly in comparison with controls.¹²⁻¹⁵

Protecting your family against flu

Some healthcare workers, aware that they are more likely to become infected with influenza, get the flu vaccination in order to try to protect their family members, particularly young children or other relatives who may fall into at-risk groups.¹⁶

Advice from professional bodies about the flu vaccine

Immunisation against infectious disease (The Green Book), recommends that healthcare workers directly involved in patient care be vaccinated annually.⁷ It is also encouraged by the General Medical Council¹⁷ as part of good medical practice, and by the British Medical Association (BMA).¹⁸

How effective is the flu vaccine?

When the vaccine is well matched to the circulating strain, it is 50-70 per cent effective depending on the age and health of the person receiving it.^{2,19-21}

Every February, the World Health Organization makes recommendations to vaccine manufacturers on which strains to include in the vaccine for the coming influenza season. This decision is based on a number of factors, including the strains of influenza that have recently or that are currently circulating.

Occasionally a strain of influenza that is different or 'drifted' from the vaccine component will emerge after the manufacturer has started production. It takes the manufacturers six to eight months to produce sufficient quantities of vaccine for the annual influenza programme, therefore it is not possible to change the vaccine component when this happens. In some cases, this means the vaccine may be less effective against the drifted strain. However, as the vaccine has at least three components then the vaccine will usually offer some protection against the circulating influenza strains. Even a vaccine that is poorly matched can offer some level of protection.

How safe is the flu vaccine?

The most common side effect can be bruising or local muscular stiffness at the injection site (10– 64 per cent).²² Other reported side effects include short-lived fever, malaise and myalgia with an incidence in studies that is similar to those who receive a placebo vaccine (fever, 3 per cent vs 1 per cent; malaise, 9 per cent vs 6 per cent; myalgia, 18 per cent vs 10 per cent).²³

Although people sometimes say that the vaccine gave them influenza, this is not possible. The influenza vaccines offered to healthcare workers in the UK are inactivated and do not contain live viruses. Only one vaccine (Fluenz) contains a live virus that has been attenuated and adapted to grow at temperatures below body temperature, but this is only used for the extension of the flu immunisation programme to healthy children.

It is most likely that the flu-like symptoms experienced by people who have just had the vaccine are not caused by influenza but by one of many other circulating viruses that can produce influenza-like symptoms. Since it can take up to two weeks following vaccination to develop immunity to influenza, it is possible for infection to occur if exposed to influenza during this period.

Is the flu vaccine safe in pregnancy?

No study to date has demonstrated an increased risk of either maternal complications or adverse foetal outcomes associated with inactivated influenza vaccine. In fact there are benefits to both mother and child and inactivated influenza vaccine is now recommended for women during pregnancy.

Is the flu vaccine safe for those who are immunocompromised or have HIV?

The Green Book: Immunisation against infectious diseases⁷, advises immunisation of those who are immunocompromised or have HIV. For specific references on safety, use the BHIVA guidelines at www.bhiva.org/immunization-guidelines.aspx

What about severe reactions to the flu vaccine?

The risk of having an anaphylactic reaction to the seasonal influenza vaccine is very low, but anyone who has had a severe reaction (anaphylaxis) to a previous dose of seasonal influenza vaccine, or to any part of the vaccine, should not receive it.

Individuals who have an egg allergy can be immunised in primary care with an egg-free influenza vaccine if available, or an inactivated vaccine with an ovalbumin content of less than 0.12 µg/ml. Patients who have either confirmed anaphylaxis to egg or egg allergy with severe uncontrolled asthma can be immunised with an egg-free influenza vaccine. If no egg-free vaccine is available, patients should be referred to specialists for immunisation in hospital.

In all settings providing vaccination, facilities should be available and staff trained to recognise and treat anaphylaxis.

More detailed information on the characteristics of the available vaccines, including age indications and ovalbumin (egg) content, can be found in chapter 19 of Immunisation against infectious disease (The Green Book).⁷

How is safety of the flu vaccine monitored?

As with all medicines used in the UK, influenza vaccines require licensing by the Medicines and Healthcare Products Regulatory Agency (MHRA). Like other medical products, passive surveillance, using reports from yellow cards, is used to identify adverse events. The observed rate of adverse reports is compared to the expected rate, based on data from a general practice research database, after making allowance for under-reporting.

This is complemented by active surveillance, which uses very large population cohorts from primary care databases, to proactively look at the risk of an adverse event which may be of concern. Comparisons are made between patterns of self-presenting illness to general practice in the period after vaccination compared to controls. Other countries have similar systems and data is pooled and reviewed at national and international levels.

Does the vaccine contain porcine products?

The live attenuated vaccine Fluenz that is used for the childhood flu programme contains a highly processed form of gelatine that is derived from pigs, which is used in a range of many essential medicines. The inactivated vaccine that is routinely offered to healthcare workers does not contain porcine products.

Why do some doctors/clinicians refuse the flu vaccine?

There are a variety of reasons why staff decline the vaccine. A recent survey of healthcare workers in University Hospitals of Leicester and Leicestershire Partnership Trust²⁴ found that one third of unvaccinated clinician respondents felt that universal infection control practices are sufficient. One third of unvaccinated clinician respondents reported they were not vaccinated because they have a good diet and/or take vitamins or supplements that work as well as or better than the influenza vaccine.

Although infection control measures are vital and a good diet is encouraged, these actions alone will not prevent influenza; vaccination is the best option for protecting yourself, your family and vulnerable patients from the virus.

When should I be vaccinated?

The new vaccines should be available each year from the end of September and any healthcare worker with direct patient contact is urged to get vaccinated as soon as possible. Your local occupational health department is likely to lead on delivery so the advice is to contact them or the appropriate team. Any healthcare worker in at-risk groups can receive the vaccine at their GP surgery, but are asked to report this vaccination at work to ensure inclusion in uptake figures collected and published by PHE.

References

1. Public Health England (2018), National flu immunisation programme plan. Available online: www.gov.uk/government/publications/national-flu-immunisation-programme-plan
2. Public Health England (2016), Surveillance of influenza and other respiratory viruses in the United Kingdom: Winter 2017/18. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710483/Surveillance_of_influenza_and_other_respiratory_viruses_in_the_UK_2017_to_2018.pdf
3. Elder AG, O'Donnell B, McCrudden EA, Symington IS, Carman WF (1996), Incidence and recall of influenza in a cohort of Glasgow healthcare workers during the 1993-4 epidemic: results of serum testing and questionnaire. *The British Medical Journal*, 1996; 313:1241-2.
4. Health Protection Agency (2011), Epidemiological report of the 2009 pandemic (H1N1) 2009 in the UK.
5. Campbell CN, Mytton OT, McLean EM et al (2011; 139(10):1560-9), Hospitalization in two waves of pandemic influenza A(H1N1) in England. *Epidemiology and Infection*.
6. Mytton OT, Rutter PD, Mak M et al (2011), Mortality due to pandemic (H1N1) 2009 influenza in England: a comparison of the first and second waves. *Epidemiology and Infection*.
7. Salisbury D, Ramsay M, Noakes K (2011), Immunisation against infectious disease – 'the Green Book'. Department of Health. Update on Influenza (August 2015). Available at: www.gov.uk/government/publications/influenza-the-green-book-chapter-19
8. Pachucki CT, Pappas SA, Fuller GF et al (1989), Influenza A among hospital personnel and patients. Implications for recognition, prevention and control. *Archives of Internal Medicine* 1989; 149:77-80.
9. Horcajada JP, Pumarola T, Martinez JA et al (2003), A nosocomial outbreak of influenza during a period without influenza epidemic activity *European Respiratory Journal* 2003; 21:303-7.
10. Cunney RJ, Bialachowski A, Thornley D, Smaill FM, Pennie RA, An outbreak of influenza A in a neonatal intensive care unit. *Infection Control and Hospital Epidemiology* 200; 21;449-54.
11. Pachucki CT, Pappas SA, Fuller GF et al (1989), Influenza A among hospital personnel and patients. Implications for recognition, prevention and control. *Archives of Internal Medicine* 1989; 149:77-80.
12. Potter J, Stott DJ, Roberts MA et al (1997), The influenza vaccination of healthcare workers in long-term care hospitals reduces the mortality of elderly patients *Journal of Infectious Diseases*. 1997; 175:1-6.
13. Carman WF, Elder AG, Wallace LA et al (2006), Effects of influenza vaccination of healthcare workers on mortality of elderly people in long term care: a randomised control trial. *The Lancet* 2000; 355:93-97.

14. Hayward AV, Harling R, Wetten S et al (2006), Effectiveness of an influenza vaccine programme for care home staff to prevent death, morbidity, and health service use among residents: cluster randomised controlled trials. *The British Medical Journal* 2006; doi:10.1136/bmj.39010.581354.55.
15. Lemaitre M, Meret T, Rothan-Tondeur M et al (2009), Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster randomised trial. *Journal of American Geriatric Society* 2009; 57:1580-6.
16. Hollymeyer HG, Hayden F, Poland G, Buchholz U (2009), Influenza vaccination of healthcare workers in hospitals – a review of studies on attitudes and predictors *Vaccine* 2009; 27:3935- 44.
17. The General Medical Council (2006), *Good medical practice*.
18. Buckman L, Porter M, Shanbhag R, Dolphin T, Datta S (2011), A message for doctors. BMA letter to doctors NHS Employers flu fighter campaign 2011/12.
19. Andrews N, McMenamin J, Durnall H, Ellis J, Lackenby A, Robertson C (2014), Effectiveness of trivalent seasonal influenza vaccine in preventing laboratory-confirmed influenza in primary care in the United Kingdom: 2012/13 end of season results. *European Centre for Disease Prevention and Control (ECDC)*; 19(27).
20. Jackson L, Jackson ML, Hallie Phillips C, Benoit J, Belongia EA, Cole D (2013), Interim adjusted estimates of seasonal influenza vaccine effectiveness - United States, 62(7):119–23.
21. Yang P, Thompson MG, Ma C, Shi W, Wu S, Zhang D, Influenza vaccine effectiveness against medically-attended influenza illness during the 2012–2013 season in Beijing, China. *Vaccine*.
22. Centres for Disease Control (2011), *Influenza Prevention and Control Recommendations Adverse Events After Receipt of TIV*. Available at: www.cdc.gov/flu/professionals/acip/index.htm
23. Jackson LA, Gaglani MJ, Keyserling HL (2010), Safety, efficacy and immunogenicity of an inactivated influenza vaccine in healthy adults: a randomised, placebo controlled trial over twominfluenza seasons. *BMC Infectious Disease*; 10:71. doi. 10.1186/1471-233410-71
24. Burch T (2012), Motivators and barriers for influenza vaccine uptake among healthcare workers: results of an online staff survey, *East Midlands Seasonal Influenza Debrief*.
25. Public Health England (2016), *Influenza vaccine effectiveness in adults and children in primary care in the UK: provisional end-of-season results 2017-18*. Available on line: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726342/Influenza_vaccine_effectiveness_in_primary_care_2017_2018.pdf
26. Public Health England (2014), *Public Health England and the NHS prepare for unpredictable flu season*. Available at: www.gov.uk/government/news/public-health-england-and-the-nhs-prepare-forunpredictable-flu-season
27. Public Health England (2015), *Confirmed cases of measles, mumps and rubella in England and Wales: 2012 to 2015*. Available at: www.gov.uk/government/publications/measles-confirmed-cases/confirmed-cases-ofmeasles-mumps-and-rubella-in-england-and-wales-2012-to-2013

