

# Varicella zoster virus

Occupational  
aspects of  
management

Evidence-based guidance for  
**healthcare professionals**



Royal College  
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Setting higher medical standards

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## Introduction

This leaflet summarises the findings from a review of the published scientific literature on varicella zoster virus (VZV) infection in the workplace.<sup>1</sup> The review was carried out by a guideline development group (GDG) that included representatives from occupational health, hospital infection control and virology.

As VZV infection poses a particular risk in the healthcare setting, the majority of the literature, and our recommendations, are aimed at healthcare workers (HCWs). The findings from our systematic literature review support most of the Green Book recommendations on VZV and HCWs.<sup>2</sup> We have summarised these recommendations and referred you to the Green Book for the full text to ensure consistency of advice.

We have covered some areas of management of VZV infection that are not included in the Green Book. Where our literature review did not provide an evidence base for these recommendations, they have been agreed by the GDG as representing good practice and supporting consistency of case management across the healthcare setting.

The publication *Guidance on chicken pox and shingles infection control in prisons, places of detention and immigration removal centres* has been adapted from the Green Book. We recommend that healthcare professionals refer directly to this guidance.<sup>3</sup>

Staff working in most other employment sectors do not require VZV screening and immunisation programmes. We have produced a leaflet giving simple advice to managers and staff in these non-healthcare sectors.

## Epidemiology of chickenpox

In the UK, chickenpox occurs most commonly during childhood and over 90% of adults are already protected. Chickenpox is less common in tropical and subtropical climates and a significant proportion of individuals raised in these areas may be susceptible to primary infection in adulthood.

Chickenpox is a notifiable disease in Northern Ireland but not in Scotland, England or Wales. There are no routinely collected national data on the incidence of chickenpox in healthcare workers and patients, and no national data on nosocomial chickenpox infection. Hence we do not know what the burden of the disease is for the NHS or the effectiveness of efforts to reduce nosocomial transmission.

## Clinical features of VZV infection

*Varicella zoster virus* (VZV) is one of the human herpes viruses. Primary infection causes varicella (chickenpox). The virus is not cleared from the body but persists in a quiescent state in the dorsal root and/or cranial nerve ganglia. Subsequent reactivation of latent virus, typically occurring decades later, causes zoster (shingles).

*Chickenpox (varicella)* is characterised by a generalised vesiculopustular rash. Symptoms usually begin with 1 or 2 days of fever, flu-like symptoms and generalised malaise, although this may be absent. The classic sign of chickenpox is the appearance of blisters (vesicles) on the face and scalp, which spread to the trunk and eventually limbs. After 4 to 7 days the blisters dry out and scab over.

Chickenpox in adults may be severe, leading to hospital admission (rate 18 per 1000) and even death (rate 50 per 100,000). The

illness poses a particular threat for pregnant women, fetuses, neonates, smokers and those with compromised immunity.

*Shingles (zoster)* is due to reactivation of the virus in someone who has previously been infected with chickenpox. It is a self-limiting, localised vesicular rash occurring over one to three contiguous unilateral dermatomes. Pain is common and may persist after the rash resolves (post-herpetic neuralgia).

## Recommendations

Most of the recommendations in this section are aimed at occupational health (OH) professionals. There may be circumstances where recommendations will be implemented by other health professionals involved in the management of staff exposed to, or infected with, VZV. As arrangements within organisations vary, we have not listed alternatives to OH professionals.

The term healthcare worker (HCW) means those who have direct contact with patients and includes clinical healthcare workers, eg doctors, nurses and physiotherapists, and non-clinical healthcare workers, eg receptionists, ward clerks, porters and domestic assistants.

## VZV immunity and vaccination

Recommendation*	Grade
OH professionals should ask the HCW, on employment, if they have ever had chickenpox and/or shingles. For employees who grew up in temperate climates, a positive history should be taken as evidence of immunity to VZV.	B

*continued*

Recommendation*	Grade
OH professionals should arrange for HCWs who give a negative or uncertain history of chickenpox and shingles to have serological testing for VZV antibodies.	B
OH professionals should ensure that, on employment, HCWs born or raised in tropical or subtropical climates have serological screening regardless of a positive history of past VZV infection.	C
OH professionals should offer the VZV vaccination, using two doses of vaccine, to all VZV-susceptible HCWs (HCWs who test seronegative to VZV).	C
Where immunocompetent HCWs decline vaccination, the OH professional should assess the risk of varicella infection to the HCW and the risk of onward transmission of infection to their patients.	GPP
The OH professional should explore with the HCW their reasons for declining vaccination, explain the benefits of vaccination and the individual's professional duty to protect their patients from infection, and encourage them to take up vaccination. Doctors should be reminded of the relevant GMC guidance ( <i>Good medical practice</i> ) which states that 'you should protect your patients, your colleagues, and yourself by being immunised against common serious communicable diseases where vaccines are available'. <sup>4</sup> Other HCWs should be reminded of any relevant professional guidance.	GPP
Where vaccination is still declined, the OH professional should recommend that the HCW should preferably avoid work with high-risk patients, eg immunocompromised patients, pregnant women and neonates.	GPP
Where HCWs have a contraindication to vaccination, eg they are immunocompromised through illness or treatment, the OH professional should assess the risk of varicella infection to the HCW and the risk of onward transmission of infection to their patients. Where appropriate the HCW should be advised to avoid work with high-risk patients.	GPP

*continued*

<b>Recommendation*</b>	<b>Grade</b>
Where a contraindication to vaccine is temporary, eg pregnancy, the OH professional should advise the HCW to be vaccinated once the contraindication ceases.	GPP
For all the groups above, avoiding high-risk patients is the ideal for susceptible staff who remain unvaccinated. However, where particular skills or numbers of staff will be compromised by excluding such staff, the risk assessment needs to acknowledge the additional risk and staff made aware of the need to be vigilant for symptoms and signs of infection.	GPP
Decisions about placement may need to be taken in conjunction with the HCW, their manager and infection control, while respecting the HCW's right to medical confidentiality.	GPP
OH professionals should advise non-immunised HCWs to avoid patient contact immediately and take advice from their OH department or GP if they develop signs or symptoms suggestive of chickenpox or shingles.	GPP

\*Recommendations in green are similar to those in the Green Book which should be referred to for consistency of actions.<sup>2</sup>

## **Management of healthcare workers who are infected with VZV or are contacts of infected cases**

<b>Recommendation*</b>	<b>Grade</b>
OH professionals should advise a HCW diagnosed with chickenpox to remain away from the workplace until there are no new lesions and all lesions have crusted over.	GPP
OH professionals should recommend that a HCW diagnosed with localised herpes zoster on a part of the body that can be covered with a bandage and/or clothing, and who does not work with high-risk patients, should be allowed to continue working. If the HCW is in contact with high-risk patients, then an individual risk assessment should be carried out.	GPP

*continued*

Recommendation*	Grade
<p>The risk assessment should consider the vulnerability of the patients and whether skill and staffing levels will be compromised by redeploying the infected staff member. Decisions about redeployment will need to be taken in conjunction with the HCW, their manager and infection control, while respecting the HCW's right to medical confidentiality.</p>	GPP
<p>OH professionals should recommend that HCWs with localised herpes zoster lesions that cannot be covered with a bandage and/or clothing, or who are immunocompromised, and HCWs with disseminated herpes zoster, should be excluded from the workplace until there are no new lesions and all lesions have crusted over.</p>	GPP
<p>OH professionals should recommend that unvaccinated HCWs without a definite history of chickenpox or zoster and having a significant exposure to VZV should either be excluded from contact with high-risk patients from 8 to 21 days after exposure, or should be advised to inform their OH department before having patient contact if they feel unwell or develop a fever or rash.</p>	GPP
<p>In the majority of situations a high level of vigilance for malaise, rash or fever (including taking temperature daily) throughout the incubation period will be adequate. Decisions about redeployment away from high-risk patients need to take into account the vulnerability of the patients and whether skill and staffing levels will be compromised by redeploying the exposed staff member. Decisions about redeployment may need to be taken in conjunction with the healthcare worker, their manager and infection control.</p>	GPP
<p>OH professionals should offer VZV vaccine to unvaccinated HCWs without a definite history of chickenpox or zoster and having a significant exposure to VZV. Where vaccine is given within 3 days of exposure, the OH professional should explain to the HCW that the vaccine may offer some protection from the recent exposure but it cannot be relied upon to interrupt transmission.</p>	GPP
<p>Irrespective of the interval since exposure, OH professionals should offer vaccine to reduce the risk of the HCW exposing patients to VZV in the future.</p>	GPP

*continued*

Recommendation*	Grade
OH professionals should inform vaccinated HCWs exposed to VZV that the vaccination does not give 100% protection and they must report any symptoms to OH.	GPP
Where pregnant and immunocompromised HCWs are exposed to VZV, an OH or other appropriate health professional must assess them for varicella zoster immunoglobulin (VZIG). Pregnant HCWs with a positive history of chickenpox do not require VZIG.	GPP
Pregnant HCWs <i>without</i> a positive history of chickenpox or shingles and HCWs who are immunocompromised regardless of their history of VZV infection, should be tested promptly for VZ antibodies. Those who are antibody negative require VZIG.	GPP

\*Recommendations in green are similar to those in the Green Book which should be referred to for consistency of actions.<sup>2</sup>

#### Grades of recommendation

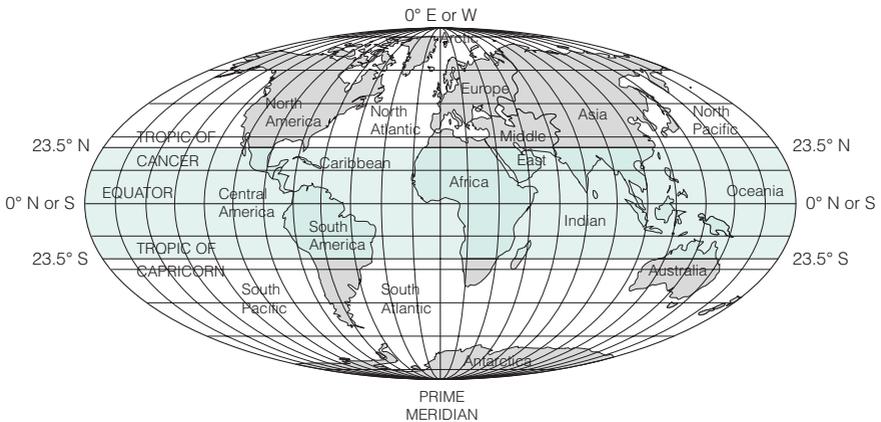
A	At least one meta-analysis, systematic review, or randomised controlled trial (RCT) directly applicable to the target population; or A body of evidence directly applicable to the target population, and demonstrating consistency of results.
B	A body of evidence, including good-quality studies directly applicable to the target population, and demonstrating overall consistency of results.
C	A body of evidence, including reasonable-quality studies directly applicable to the target population and demonstrating overall consistency of results.
D	Evidence from non-analytical studies or expert opinion.
GPP	Practical points that the GDG wished to emphasise but for which there is not, nor is there likely to be, any research evidence.

## References

- 1 NHS Plus, Royal College of Physicians, Faculty of Occupational Medicine. *Varicella zoster virus: occupational aspects of management. A national guideline*. London: RCP, 2010.

- 2 Salisbury D, Ramsey M, Noakes K. *Immunisation against infectious disease* ('The Green Book'). London: Department of Health, 2006. [www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_063665.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_063665.pdf)
- 3 Department of Health, Health Protection Agency. *Guidance on chickenpox and shingles infection control in prisons, places of detention and immigration removal centres*. [www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1204186195209](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204186195209)
- 4 General Medical Council. *Good medical practice*. London: GMC, 2009. [www.gmc-uk.org/guidance/good\\_medical\\_practice/health.asp](http://www.gmc-uk.org/guidance/good_medical_practice/health.asp) [Accessed May 2010]

## World map showing tropical and temperate zones



**Tropical zones are shown within the Tropic of Cancer and the Tropic of Capricorn.** Tropical climates have high temperatures throughout the year. Subtropical climates are found adjacent to the tropics. Temperate climates have mild to warm summers and cool winters (most European countries). Some countries have a mixture of climates. Map reproduced with kind permission of: [www.worldatlas.com](http://www.worldatlas.com)

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