LRI Children's Hospital

Management of chicken pox exposure in paediatrics

Staff relevant to:	Clinical staff working within the UHL Children's Hospital. Excluding paediatric oncology.
Team approval date:	July 2024
Version:	5
Revision due:	July 2027
Written by: Reviewed by:	Dr Sharon Koo, Dr Julian Tang Oliver Toovey, Ruth Radcliffe, Julian Tang, David Harris
Trust Ref:	C206/2016

1. Introduction and Who Guideline applies to

Varicella (chickenpox) is the primary infection with varicella-zoster virus (VZV). It is a highly contagious disease with a generalized vesicular rash in which successive crops of vesicles rapidly evolve to form pustules, crusts and scabs.

Shingles (zoster) manifests as a painful vesicular rash of a dermatomal distribution. It occurs following reactivation of VZV which being a herpes virus retains the hallmark of herpes viridae family in remaining latent in the host for its entire life following primary infection.

The aim of this document is to guide clinical staff in the management of babies and children who have been exposed to chicken pox.

This guideline does not apply to paediatric oncology patients who will be covered by the regional policy entitled "Guidelines for the vaccination of children and young people following treatment with high dose therapy and autologous stem cell transplant."

Related documents:

Consent to Examination or Treatment UHL Policy A16/2002
Isolation Precautions UHL Policy B62/2011

UKHSA update

UKHSA provided an update to their VZIG guidance restricting its use to neonates exposed within one week of delivery, either in utero from maternal infection or post-delivery. In the most recent update of January 2023, pregnant women, regardless of stage in pregnancy and immunosuppressed, significantly exposed patients are advised to receive oral anti-viral post-

exposure prophylaxis (PEP), dosed according to Table 1, starting from day 7 and continued to day 14 (ie 7 days total) from the date of exposure (See section 2.2, calculating exposure date). For algorithm see Figure 1.

In individuals eligible for oral anti-viral post-exposure prophylaxis but who have contraindications or precautions to aciclovir or valaciclovir, VZIG may be considered. This includes individuals with significant renal impairment or intestinal malabsorption.

Full UKHSA guidance including updates can be found at:

Post exposure prophylaxis for chickenpox and shingles - GOV.UK (www.gov.uk)

Contents

2. Clinical assessment

Incubation period: 8-21 days

Transmission by:

- Nasopharyngeal secretions – via both large droplet and aerosol
- Direct contact with early skin lesions
- Trans-placental

2.1 Definition of significant exposure to VZ virus (ALL 3 criteria needs to be fulfilled):

1) Infectious period in the source:

- Chickenpox/disseminated zoster (in the immunocompromised): for 24 hours before rash onset until cropping ceased AND all lesions have crusted over
- Localised zoster: day of onset of rash until lesions have crusted over – generally only by direct contact, therefore if covered by clothing, in an immunocompetent source, it is not infectious via aerosol

2) Type of VZ infection in the source:

- chickenpox
- disseminated zoster (mainly in the immunocompromised)
- exposed lesions (i.e. any sort of facial zoster)
- immunosuppressed patient with localised zoster to any part of the body (indicating that transmission by respiratory aerosolised VZV is possible)

3) Closeness and duration of contact with the source:

- Household contact (i.e. prolonged and close)
- Contact in same room/ classroom/ hospital bay for at least 15 minutes
- Maternal/neonate contact
- Face to face contact (i.e. having conversation)

2.2 How to count exposure date

- Exposure is counted from the day the rash appears in the index case if this is a daily household contact.
- If exposure occurred in the 1-2 days before the rash appeared in the index case, and this was the only exposure, start counting from this exposure date and start the PEP when the count reaches day 7.
- If patients present later than 7 days after exposure, the 7 day PEP regimen can be started any time up to day 14 post-exposure.

2.3 Current Guidance for Immunocompromised children – Aciclovir Prophylaxis

All immunosuppressed individuals as defined in Chapter 6 (Immunisation against infectious disease – the Green Book,) are at risk of severe chickenpox and should be assessed for the need for prophylaxis following a significant exposure.

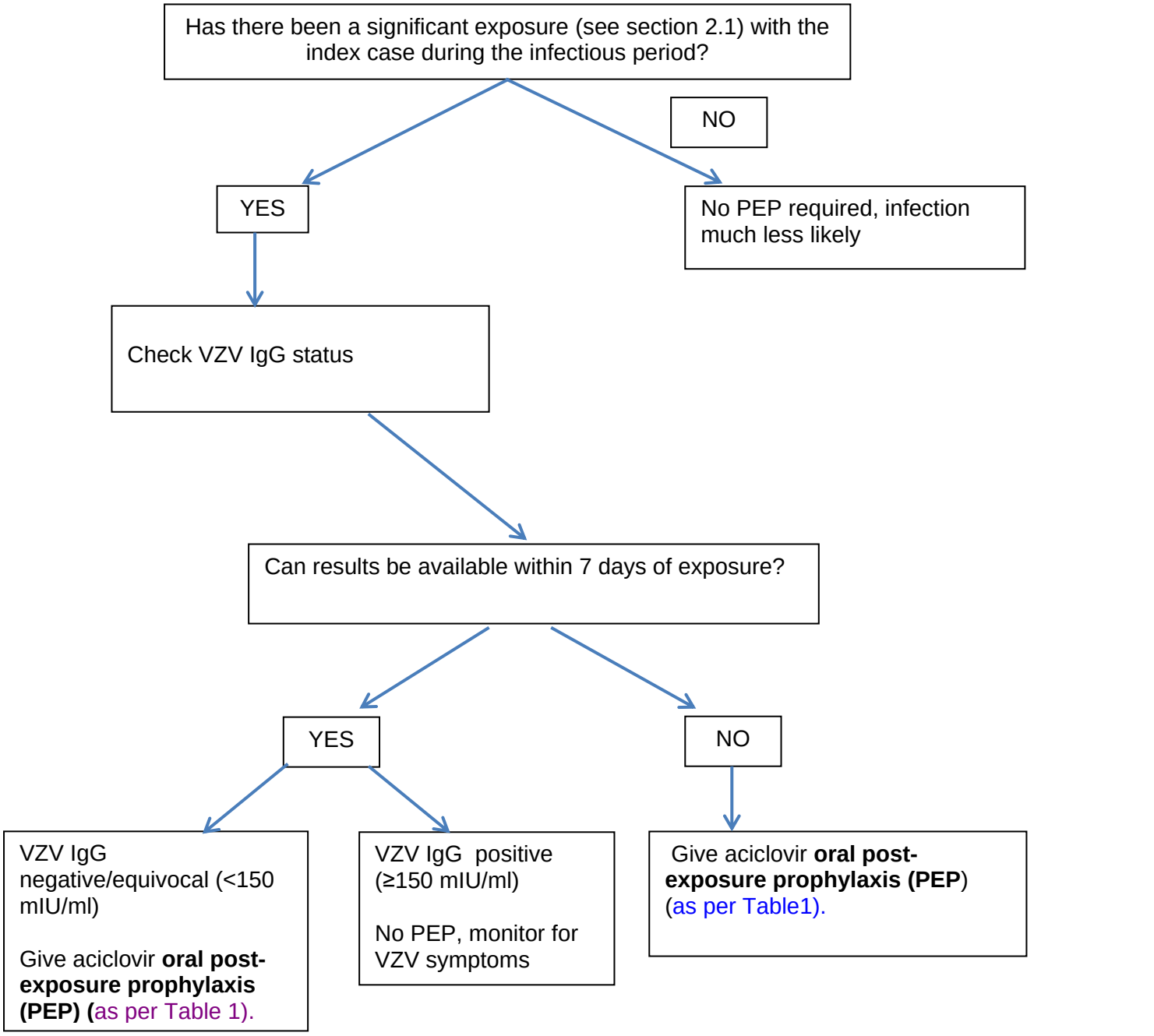
If spots appear despite PEP, the patient should be converted to a full intravenous (IV) treatment dose of aciclovir, which should continue until all spots have dried up and no new spots are appearing (as per usual treatment criteria). PO Valaciclovir is available on virology advice – discuss with pharmacy to order stock.

Individuals on long term aciclovir prophylaxis, e.g. post haematopoietic stem cell transplant may require their dose of aciclovir to be temporarily increased to the PEP dosage or, if breakthrough infection occurs, to the full treatment dosage.

In immunocompromised children **VZV IgG** testing is advised (algorithm in Figure 1). If IgG positive, prophylaxis would not be required.

Figure 1: Algorithm for immunocompromised paediatric patients

For any further queries, please follow the UKHSA link above (pg. 2), or contact Virology.



In any immunocompromised patient with VZV infection symptoms, give full intravenous (IV) treatment dose of aciclovir, until all spots have dried up and no new spots are appearing (as per usual treatment criteria).

*For urgent VZV IgG testing, liaise with virology, turnaround time in office working hours can be as little as 2 hours, provided the sample reaches the lab promptly.

Table 1. Dosages and duration for post exposure prophylaxis (PEP)

	Oral Aciclovir	**Oral Valaciclovir**
Children under 2 years age	10 mg/kg four times daily, day 7 to 14 post exposure	Not recommended
Children 2-17 years of age	10 mg/kg (up to maximum of 800mg), four times daily, day 7 to 14 post exposure	20mg/kg (up to a maximum 1,000mg) 3 times daily, day 7 to 14 post exposure
Children over 17 and adults	800 mg four times daily, day 7 to 14 post exposure	1,000mg 3 times daily, day 7 to 14 post exposure

2.4 Treatment of Neonates - Varicella Immunoglobulin (VZIG)

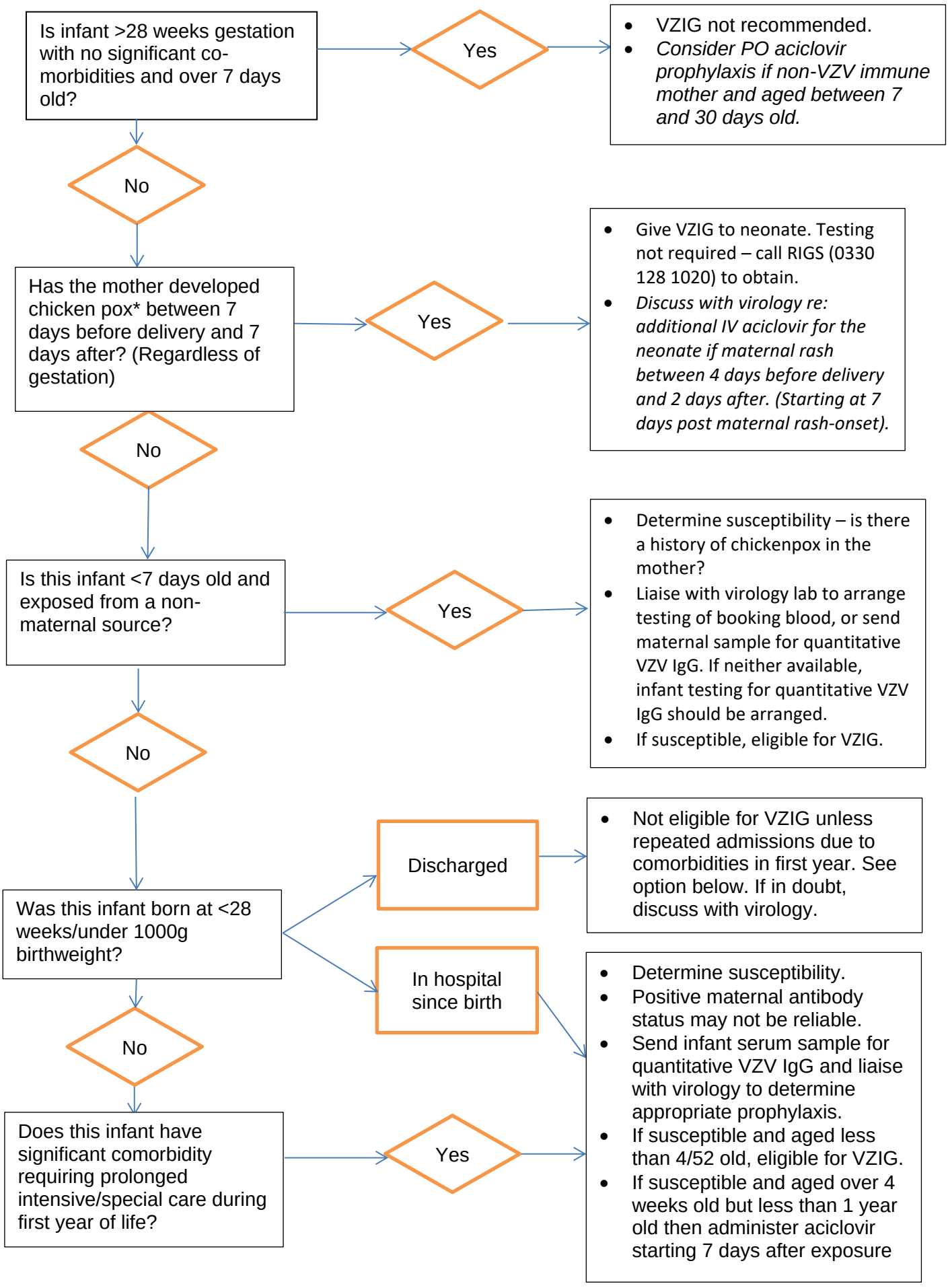
This is given to protect susceptible individuals who are at risk of suffering from severe varicella disease after significant exposure to the virus. These include:

- Infants born to non-immune mothers when the onset of maternal chickenpox rash (not herpes zoster) occurs from 7 days pre-delivery up to 7 days post delivery
- VZ antibody-negative infants exposed to chickenpox or herpes zoster (other than in the mother) in the first 7 days of life
- VZ antibody-negative infants less than 4 weeks old, exposed to chickenpox or herpes zoster who have remained in hospital since birth and:
    - Were born before 28 weeks' gestation, or
    - weighed less than or equal to 1000g at birth, or
    - have severe congenital or other underlying condition requiring intensive or prolonged special care nursing (
    - If over 4 weeks old but less than a year old then administer aciclovir starting 7 days after exposure

VZIG is NOT usually required for infants born more than 7 days after the onset of maternal chickenpox or if the mother develops zoster (shingles).

VZIG is NOT indicated if there was a significant exposure to VZV in a child >7days old whose mother is non-immune to VZV.
However, if the child is aged between 7-30 days, and exposed to VZV, prophylaxis with PO aciclovir 10mg/kg QDS for 7 days, to be started 1 week after exposure, should be considered, e.g. for a 8-day old neonate born to a non-VZV immune mother, going home to a household with older siblings who have chickenpox. (Blumental and Lepage, 2019)

Figure 2: Algorithm for infants that are exposed to VZV



*This should be clinician diagnosed rather than patient-reported as far as possible to avoid over treatment.

In any patient eligible for VZIG, **if breakthrough VZV infection despite VZIG** – give **aciclovir IV treatment dose** as early as possible and discuss with virology.

All infants within the first month of life, with symptoms of VZV infection will require IV aciclovir treatment.

If VZIG indicated but refused – give prophylaxis with aciclovir orally according to the PEP dosage and duration (Table 1). Please note that VZIG is a blood product.

2.5 Dosage of VZIG:

0 to 5 years	250mg
6 to 10 years	500mg
11 to 14 years	750mg
15 years and older	1,000mg

To be given by slow intramuscular injection ideally within 10 days (preferably within 7 days for neonates and immunosuppressed contacts).
If more than 3ml is to be given to young children and infants, or more than 5ml to older children and adults then the dose should be divided into smaller amounts and given into different sites.

2.6 How to obtain VZIG

Arranging VZV IgG testing (where required):

When sending serum for VZV IgG testing, please inform the virology biomedical scientist to ensure testing can be conducted in a timely fashion, though this should only be done in working hours as opposed to overnight (Extension 16522/via switchboard). Sample collection and transport to the lab can be done at any time. Should the clinical team be unable to arrange testing as outlined above, a fall-back option is to contact the on-call microbiology doctor, again in working hours rather than overnight. It is the responsibility of the clinical team to arrange appropriate handover between shifts to ensure this then happens in the daytime.

Obtaining VZIG during working hours, Monday – Friday (excluding bank holidays):

1. Inform the virologist of the suspected need for prophylaxis and for discussion regarding any points in the guideline above.

2. VZIG is no longer stored in UHL due to national shortages. It is therefore dispensed from the Rabies Immunoglobulin Service (RIGS) on a named patient basis. The cut-off time each day for next day delivery from RIGS for ordering is 15:15. Deliveries are not undertaken at the weekend unless clinically urgent (as determined by RIGS). Where VZIG is identified as required in accordance with the advice on this guideline on non-working days, the requesting clinician (consultant or senior registrar) can liaise directly with RIGS (telephone number 0330 128 1020, between 09:00 and 17:30, 7 days/week). The RIGS team will require details of the exposure as outlined above as well as the result of any VZV IgG testing if the algorithm requires it (see **Appendix 1** for a copy of the form and link for active version).

Obtaining VZIG out of normal working hours (including weekends and/or bank holidays):

1. There is no virologist out-of-hours service. In children, VZIG should be given promptly within 7 days of exposure and this can usually be arranged during the working week. There may be circumstances where it is necessary to arrange VZIG at a weekend or on a bank holiday however. It is not anticipated that overnight discussion would be required, and can be discussed the next day in working hours.

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If testing requirement is not clear, the RIGS team are able to undertake the risk assessment and advise on whether they require testing or not.

2. E-mail the consultant virologists (Dr Julian Tang, Dr Oliver Toovey) with the patient details and the clinical scenario for monitoring purposes.

2.7 How long does post-exposure prophylaxis protection last?

VZIG: If a second exposure occurs 3 weeks or more following the initial VZIG dose, a second dose may be required in infants <1 year old, who has remained in hospital since birth and requiring prolonged SCBU/ITU stay (see middle section of Figure 2). Prior to administration of a second dose of VZIG a blood sample should be forwarded to virology department for VZV IgG testing in order to exclude sub-clinical infection.
Aciclovir: If a second exposure occurs following completion of the course of anti-virals occurs, then a repeat risk assessment should be completed and a further course of anti-virals considered, again, starting 7 days following the exposure. As mentioned with VZIG above, a blood sample should be forwarded to the virology department for VZV IgG testing in order to exclude sub-clinical infection.

2.8 What if the child has bleeding disorders?

If the child has a bleeding disorder this should be discussed with the haematology registrar on call to advise whether it is safe to proceed with intramuscular injection with VZIG.

Oral aciclovir prophylaxis is also possible. Please use the doses in Table 1.

2.9 What if the child develops chickenpox despite VZIG or aciclovir prophylaxis?

In any patient eligible for VZIG or aciclovir prophylaxis that develops breakthrough VZV infection; early treatment with IV aciclovir is required as soon as possible following the eruption of the rash.
Also all infants in the first month of life, if they become symptomatic for VZV infection, will require IV aciclovir at treatment dose.
The doses for therapeutic aciclovir differ with age and can be found in the BNF. In renal impairment adjust dose as per BNF.

Discuss with virology if PO option is considered as a follow-on treatment.

3. Education and Training

None

4. Monitoring and Audit Criteria

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements

5. Supporting Documents and Key References

1. UKHSA Guidelines on post exposure prophylaxis (PEP) for varicella or shingles (January 2023)
2. Immunisation against infectious disease: The Green Book (June 2019) Chapter 34, Varicella (available in DoH website)
3. British National Formulary for children. Available on BNF.org
6. Blumental S and Lepage P. Management of varicella in neonates and infants, BMJ Paediatrics Open 2019;3:e000433. doi: 10.1136/bmjpo-2019-000433

6. Key Words

Chickenpox; Varicella Zoster virus; Varicella immunoglobulin; post-exposure prophylaxis; acyclovir; aciclovir; treatment; paediatric/ neonate;

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

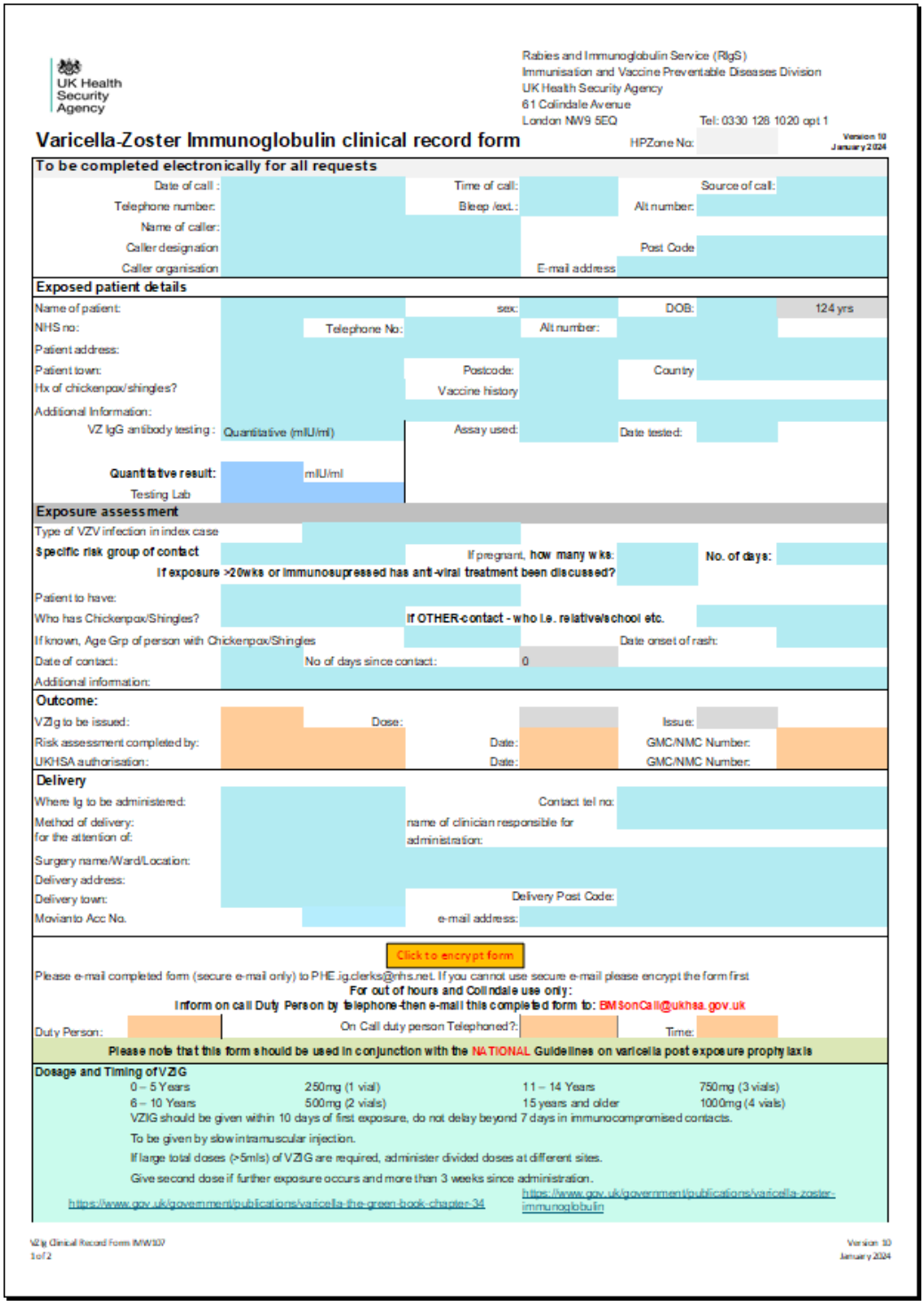
Contact & review details	
Guideline Lead (Name and Title) Dr Sharon Koo Consultant Microbiologist Dr Julian Tang Consultant Nafsika Sismanoglou - Registrar in Immunology Dr Oliver Toovey – Virology Consultant Dr Sarah Young – Microbiology Registrar	**Executive Lead** Chief Medical Officer
Details of Changes made during review: Added advice regarding: • UKHSA advice changes for VZIG • Updated UKHSA guidance link • Table 1 removed • Figure 1 flowchart updated • Oral Aciclovir and valaciclovir PEP • VZIG doses • Appendix 1 UKHSA RIGS Clinical Record Form updated	

Appendix 1 : UKHSA RIGS Clinical Record Form

The electronic version of the form below can be found at

Post exposure prophylaxis for chickenpox and shingles - GOV.UK (www.gov.uk)

It outlines the details required for dispensation of VZIG by RIGS.



UK Health Security Agency

Rabies and Immunoglobulin Service (RIgS)
Immunisation and Vaccine Preventable Diseases Division
UK Health Security Agency
61 Colindale Avenue
London NW9 5EQ
Tel: 0330 128 1020 opt 1

Varicella-Zoster Immunoglobulin clinical record form

HPZone No:

Version 10
January 2024

To be completed electronically for all requests

Date of call :
Time of call:
Source of call:
Telephone number:
Bleep /ext.:
Alt number:
Name of caller:
Caller designation
Post Code
Caller organisation
E-mail address

Exposed patient details

Name of patient:
sex:
DOB:
124 yrs
NHS no:
Telephone No:
Alt number:
Patient address:
Patient town:
Postcode:
Country
Hx of chickenpox/shingles?
Vaccine history
Additional Information:
VZ IgG antibody testing :
Quantitative (mIU/ml)
Assay used:
Date tested:
Quantitative result:
mIU/ml
Testing Lab

Exposure assessment

Type of VZV infection in index case
Specific risk group of contact
If pregnant, **how many wks:**
No. of days:
If exposure >20wks or immunosupressed has anti-viral treatment been discussed?
Patient to have:
Who has Chickenpox/Shingles?
If OTHER-contact - who i.e. relative/school etc.
If known, Age Grp of person with Chickenpox/Shingles
Date onset of rash:
Date of contact:
No of days since contact:
0
Additional information:

Outcome:

VZIg to be issued:
Dose:
Issue:
Risk assessment completed by:
Date:
GMC/NMC Number:
UKHSA authorisation:
Date:
GMC/NMC Number:

Delivery

Where Ig to be administered:
Contact tel no:
Method of delivery:
for the attention of:
name of clinician responsible for administration:
Surgery name/Ward/Location:
Delivery address:
Delivery town:
Delivery Post Code:
Movianto Acc No.
e-mail address:

Click to encrypt form

Please e-mail completed form (secure e-mail only) to PHE.ig.clerks@nhs.net. If you cannot use secure e-mail please encrypt the form first

For out of hours and Colindale use only:

Inform on call Duty Person by telephone then e-mail this completed form to: BMSonCall@ukhsa.gov.uk

Duty Person:
On Call duty person Telephoned?:
Time:

Please note that this form should be used in conjunction with the NATIONAL Guidelines on varicella post exposure prophylaxis

Dosage and Timing of VZIG

0 – 5 Years	250mg (1 vial)	11 – 14 Years	750mg (3 vials)
6 – 10 Years	500mg (2 vials)	15 years and older	1000mg (4 vials)

VZIG should be given within 10 days of first exposure, do not delay beyond 7 days in immunocompromised contacts.

To be given by slow intramuscular injection.

If large total doses (>5mls) of VZIG are required, administer divided doses at different sites.

Give second dose if further exposure occurs and more than 3 weeks since administration.

https://www.gov.uk/government/publications/varicella-the-green-book-chapter-34

https://www.gov.uk/government/publications/varicella-zoster-immunoglobulin

VZig Clinical Record Form IMW107
1 of 2

Version 10
January 2024

UK Health Security Agency

Rabies and Immunoglobulin Service (RIgS)
Immunisation and Vaccine Preventable Diseases Division
UK Health Security Agency
61 Colindale Avenue
London NW9 5EQ Tel: 0330 128 1020 opt 1

VZIg record of issue

VZIg has been ordered for delivery by Movianto, this form is to be e-mailed, faxed or posted to the recipient

Requestors details

Name of requestor:		Date of call :	
Post:		Time of call:	
Name of institution:		Ward / setting:	
Requester tel. no.		Bleep / ext.:	

Patient details

Patient name:		Ref No:	
NHS no:		DOB:	
Patient address:			

Please note: this product should be administered by a registered healthcare professional

VZIG delivery details

Where Ig to be administered:		Method of delivery:	
For the Attention of:		Movianto Reference No:	#REF!
Surgery name/Ward/Location:		Dose required:	
Delivery address:		No. vials required	
Delivery town:		Post Code:	

Date of contact:	00/01/1900		
No of days since first day of contact:	0	VZIg to be administered no later than 10 days from first day of contact. Do not delay beyond 7 days in immunocompromised contacts.	

For recipient use: on receipt of goods — Once completed, please retain for your records

Number of vials: Batch number: Expiry date:

Date received: _____ /_____ /_____ Time received: _____ : _____

Correct to order: yes / no

Comment on condition: _____

Signed: Date: _____ /_____ /_____

If this order is not correct or received more than 24 hours after despatch, please contact the RIgS Team on 0330 128 1020 during office hours

Please note
The advice given is based on the available information. It remains the responsibility of registered healthcare professionals prescribing, supplying or administering medicines to check the medicine is appropriate for the patient. This includes checking doses, contraindications and drug interactions. The clinician should also be aware of potential side effects and communicate these to the patient.

Please note that this form should be used in conjunction with the NATIONAL Guidelines on varicella post exposure prophylaxis

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