North West Anglia
NHS Foundation Trust

# Policy for the use of Cytomegalovirus (CMV) negative blood products

| | |
|---|---|
| **Division** | Family and Integrated Support Services Division |
| **Department** | Pathology – Transfusion |
| **Year** | 2019 |
| **Version Number** | 4 |
| **Central Index Number** | C0661 |
| **Ratifying Committee** | Quality Governance Operational Committee |
| **Date Ratified** | 17/05/2019 |
| **Approval Committee** | Hospital Transfusion Committee |
| **Date Approved** | 29/04/2019 |
| **Author Name and Job Title** | Kaye Bowen & Andy King Venables<br>Transfusion Practitioners |
| **Date Published on Document Library** | 28/05/2019 |
| **Review Date** | 17/05/2022 |
| **Target Audience** | All NWA staff involved in blood transfusion |
| **Staff Side Approval** | N/A |

**Equality Impact Assessment**

Peterborough and Stamford Hospitals NHS Foundation Trust (PSHFT) strives to ensure quality of opportunity for all service users, local people and the workforce. As an employer and a provider of health care, PSHFT aims to ensure that none are placed at a disadvantage as a result of its policies. This policy has therefore been equality impact assessed to ensure fairness and consistency for all those covered by it regardless of their individuality. The results are shown in the Equality Impact Tool at Appendix C.

| DOCUMENT VERSION CONTROL SCHEDULE | | | | | |
|---|---|---|---|---|---|
| **Year and Version Number** | **Author** | **Date Published on Document Library** | **Revisions from previous issue** | **Ratifying Committee** | **Date of Ratification** |
| 2010 Version 1 | Hospital Transfusion Team | Sept 2010 | Original Document | Quality Governance Operational Committee | Sept 2010 |
| 2012 Version 2 | Hospital Transfusion Team | June 2012 | New advice from the Advisory committee on the Safety of Blood Tissues and Organs (SaBTO) regarding the use of CMV negative components- now only indicated for intrauterine transfusion and neonates (up to 28 days post expected date of delivery), and for transfusion during pregnancy. | Quality Governance Operational Committee | October 2011 |
| 2015 Version 3 | Hospital Transfusion Team | February 2016 | Reviewed by Hospital Transfusion Team- no changes in practice. | Quality Governance Operational Committee | February 2016 |
| 2019 Version 4 | Kaye Bowen & Andy King Venables | 28/05/2019 | Reformatted into NWA template.<br>Information on Granulocyte transfusion added<br>New version of factsheet added<br>No changes to practice | Quality Governance Operational Committee | 17/05/2019 |

**Summary of key points in this document:**

- This policy applies to all staff with responsibility for prescribing and administering blood and blood components.

- This policy gives guidance on when and how to request CMV negative blood products.

## Contents

## 1. Introduction

Cytomegalovirus (CMV) is a member of the herpes virus group, which includes herpes simplex and varicella zoster. These share the ability to remain dormant within the body for long periods. Primary infection is usually asymptomatic but may cause a flu or glandular fever like illness, leading to a lifelong infection.

Infection frequently occurs in childhood and in the UK it is estimated that 50-60% of adults are CMV positive. As CMV is very common, most adults will have been infected earlier in life and will have developed an immune response to the virus in the form of immunoglobulin (Ig) G i.e. they will be CMV IgG positive.

CMV is also transmissible by transfusion through white cells contained in blood components e.g. units of red cells and platelets. of blood. Severe impairment of the immune system by medication or disease may reactivate the virus from its latent state to cause clinical disease which may be fatal. CMV disease is the commonest infection problem in the post-transplant period and the commonest cause of congenital infection, leading to neuro development abnormalities in babies born in the UK.

CMV negative blood components are those that are collected from donors who have been tested and found negative for CMV IgG antibodies. A proportion of donations are screened by the Blood Services for CMV IgG antibodies to provide a 'CMV negative' inventory for red cells and platelets, which are provided to hospitals on request.

All blood products apart from granulocytes are routinely leucocyte depleted which effectively reduces CMV transmission. As fresh frozen plasma (FFP) and cryoprecipitate contain very few cells, they are extremely unlikely to transmit CMV and thus CMV seronegative issues of these products are not manufactured.

## 2. Purpose

The purpose of this policy is to ensure that CMV negative components are requested for and transfused to patients who require them.

## 3. Scope

This document applies to all members of staff involved in transfusion, and all patients who are prescribed red cells and/or platelet transfusion.

## 4. Duties and Responsibilities

It is the responsibility of the prescriber to ensure that the indication for CMV negative components is noted on the prescription chart and the laboratory request form.

It is the responsibility of the member of staff administering the component to check the component is of the correct specification before administration.

| Role | Responsibility |
|---|---|
| **Any member Staff requesting Blood components** | Must ensure they are aware of which patients may require CMV negative components, and that the request form (whether paper or electronic) clearly states that CMV products are required if applicable |
| **Biomedical Scientists working in Transfusion** | Must ensure that any units requested for neonates and pregnant women include the information that CMV negative units are required.<br><br>Must ensure that units issued must comply with any request for CMV negative components |
| **Staff prescribing blood components** | Must be aware of the indications for CMV negative blood components, and also ensure this is indicated on the dedicated Blood Component Prescription Chart |
| **Staff administering blood components** | Must check that the unit issued by the transfusion laboratory meets any requirement for CMV negative units on the prescription chart. If the chart has not been completed correctly, or the requirements are not clear, they must check with the prescriber and ask them to amend the chart before proceeding the transfusion. |
| **Transfusion Practitioners** | Regular review of the policy, and making amendments if required.<br>Reviewing new evidence for changes in practice, amending policy, and communicating these changes to the wider clinical teams.<br>Ensuring that the approved document is sent to the compliance leads with evidence of minutes from the approval committee<br>Ensure that the correct version has been uploaded to Document Library.<br>Ensure that information on the document is communicated to staff.<br>Ensure the implementation of the policy is assured as specified in the compliance monitoring table. |
| **Hospital Transfusion Committee** | Responsible for review and approval of the policy |

## 5. Definitions

# Definition of Terms

A.1 Cytomegalovirus (CMV) - Cytomegalovirus is a common herpes virus that causes asymptomatic infection or a mild glandular fever-like illness in most healthy individuals. Despite an antibody response (seroconversion), the virus persists in blood monocytes and 50–60% of adults in the UK, including blood donors, are lifelong carriers of the virus. It can be transmitted by transfusion of cellular blood components although this may be difficult to distinguish from reactivation of previous infection. CMV can cause severe, sometimes fatal, infection in foetuses, neonates and immunocompromised adults.

A.2 Leucodepletion- `All blood donations are filtered to remove white blood cells (pre-storage leucodepletion) to leave $<1\times10^6$ leucocytes in the pack. This was introduced in 1998 as a vCJD risk-reduction measure but also reduces the incidence of febrile transfusion reactions and alloimmunisation to white cell (including HLA) antigens.

A.3 SaBTO - the Advisory Committee for the Safety of Blood Tissues and Organs. SaBTO Advises UK ministers and health departments on the most appropriate ways to ensure the safety of blood, cells, tissues and organs for transfusion/transplantation.

A.4 SOP -Standard Operational Procedure. This is a set of detailed step by step actions that describes how tasks or activities should be carried out to achieve the highest standards possible and to ensure efficiency, consistency and safety.

A.5 DATIX - Electronic Adverse event and near miss reporting form.

A.6 SHOT - Serious Hazards of Transfusion UK wide haemovigilance reporting system for adverse transfusion events and ‘near misses’.

A.7 SABRE - Serious Adverse Blood Reactions and Events. This system allows reporters to electronically submit reports of serious adverse events or serious adverse reactions directly to the Medicines and Healthcare Products Regulatory Agency (MHRA).

## 6. Indications for use of CMV negative blood products

CMV negative red cells and platelets should be provided for intrauterine transfusions and neonates (up to 28 days after expected date of delivery)

CMV negative red cells and platelets should be provided, where possible, for pregnant women. In an emergency, such as major haemorrhage, standard leucocyte depleted components should be given to avoid delay.

CMV negative granulocytes should ideally be provided for recipients who are at risk of CMV disease (infants, pregnant women, CMV negative recipients of CMV negative allogeneic bone marrow transplants) as these components cannot be leucocyte depleted. The risk of failure to supply and morbidity / mortality from bacterial or fungal infection would need to be balanced against a risk of subsequent CMV disease. Discussion between an NHSBT consultant and the consultant looking after the patient would be required if there were inadequate supplies to support the issue of CMV negative components to a patient in the above at risk groups.

Standard pre-storage leucodepleted components are suitable for all other transfusion recipients, including haemopoietic stem cell transplant patients, organ transplant patients and immune deficient patients, including those with HIV.

For shared care patients (for example children under shared care with Great Ormond Street hospital), the transfusion lab will honour the request from the referring hospital for CMV negative products

## 7. How to request CMV negative blood products

If using the ICE requesting system, the requirement for CMV negative blood products should be indicated by clicking the yes button at the 'special requirement' option screen. If using paper requests, the need for CMV negative components must be clearly indicated.
The transfusion laboratory must also be informed by telephone of the requirement for CMV negative blood products.

Once the requirement for CMV negative blood products has been communicated to the Transfusion Laboratory, all further blood products issued will be CMV negative until the Transfusion Laboratory is informed otherwise.

The requirement for CMV negative blood products must be noted in the Special Requirement box on the dedicated Blood and Blood Products prescription and Transfusion Record.

## 8. Monitoring of Compliance

The transfusion laboratory will maintain responsibility for ensuring CMV negative products are issued when requested appropriately.

Compliance with the policy will be monitored each time a component is issued, as described in Appendix D. A DATIX will be raised if any non conformances are identified.

If CMV unscreened products are transfused in error to a patient who requires CMV negative components, a report must be made to the Serious Hazards of Transfusion (SHOT) Haemovigilance reporting scheme, as 'Incorrect Blood Component Transfused- Special Requirements not met'

## 9. References

Department of Health Advisory Committee on Safety of Blood Tissues and Organs (SaBTO) position statement on Cytomegalovirus tested Blood Components. 2012. Available http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_132965 [Accessed 6 March 2019]

Elebute, M, Massey E et al (2016) Clinical Guidelines for the Use of Granulocyte Transfusion – Information Document INF276/4 Available:

https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/14874/inf2764-clinical-guidelines-for-the-use-of-granulocyte-transfusions.pdf [Accessed 6 March 2019]

New, H. V. et al and the British Committee for Standards in Haematology (2016), Guidelines on transfusion for fetuses, neonates and older children. British Journal of Haematology, 175: 784–828.

NHS Blood and Transplant (2018). Cytomegalovirus (CMV) Negative Blood Components- Information for Healthcare Professionals. Version 2. Available:

https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/14652/blc7071.pdf [Accessed 6 March 2019]

Norfolk D., (Ed) (2013) Handbook of Transfusion Medicine.5th Edition, TSO

## Compliance Monitoring Tool

## Appendix A

| Document Section | | Control | Checks to be carried out to confirm compliance with the policy | How often the check will be carried out | Responsible for carrying out the check | Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)* | Frequency of reporting |
|---|---|---|---|---|---|---|---|
| | | **WHAT?** | **HOW?** | **WHEN?** | **WHO?** | **WHERE?** | **WHEN?** |
| 4.2 | | Staff administering the component check the component is of the correct specification before administration. | As part of pre transfusion bedside check | Each transfusion | Staff performing the bedside check | DATIX to be raised if non-conformance identified. | On each occurrence |
| 5.1 | | CMV negative red cells and platelets should be provided for neonates (up to 28 days after expected date of delivery). | Transfusion Laboratory will check that any requests received for blood components for neonates are for CMV negative Components, and that CMV negative components are issued | At each request of blood components for neonates | Transfusion Laboratory Biomedical Scientist | DATIX to be raised if non-conformance identified | On each occurrence |
| 5.2 | | CMV negative red cells and platelets should be provided for pregnant women | Transfusion Laboratory will check that any requests received for blood components for pregnant women are for CMV negative Components, and that CMV negative components are issued | At each request of blood components for pregnant women | Transfusion Laboratory Biomedical Scientist | DATIX to be raised if non-conformance identified | On each occurrence |

**NHS Blood and Transplant Factsheet** **APPENDIX B**

Blood and Transplant

# FACTSHEET

## Cytomegalovirus (CMV) Negative Blood Components

### Information for Healthcare Professionals

### What is Cytomegalovirus?

Cytomegalovirus (CMV) is a type of herpes virus. Primary infection is usually asymptomatic but may cause a flu or glandular fever like illness, leading to a lifelong infection in all age groups. The virus can reactivate from its latent state and it is commonly shed asymptomatically in various bodily secretions, such as nasopharyngeal secretions and urine. More severe disease may occur in individuals with impaired immunity such as foetuses, neonates and patients of any age who have been immuno-suppressed by disease or treatment.


### How are people exposed to CMV?

Infection frequently occurs in childhood and in the UK it is estimated that 50-60% of adults are CMV positive. As CMV is very common, most adults will have been infected earlier in life and will have developed an immune response to the virus in the form of immunoglobulin (Ig) G i.e. they will be CMV IgG positive.

A person can become infected with CMV in several ways; most commonly via person to person contact, through exposure to body fluids. A mother can infect her unborn baby in utero or her newborn baby via breast feeding. Most disease in immuno-compromised patients occurs through these routes or from reactivation of a previous CMV infection.

CMV is less commonly transmitted by receiving donated blood or organs from a person who is carrying CMV, or from donors who have acute CMV infection but are CMV IgG negative as they have not yet formed an immune response but have the circulating virus in their blood. Transmission of CMV present in blood components can give rise to primary infection in CMV negative patients or to reinfection in previously infected patients.

## Why is CMV important?

CMV can cause a potentially life threatening infection in patients who cannot form an effective immune response. CMV disease is the commonest infection problem in the post-transplant period and the commonest cause of congenital infection, leading to neuro development abnormalities in babies born in the UK.

## There are certain groups at particular risk of severe disease:

- **Foetuses and neonates:**

  CMV is the most common cause of congenital infection in the developed world, affecting 1-2% of infants worldwide (Luck and Sharland, 2009b) and 0.3-0.4% in the UK (Griffiths et al, 1991). CMV is estimated to cause up to 12% of all sensorineural hearing loss (Peckham et al, 1987) and 10% of cerebral palsy. Primary infection is more likely to cause symptomatic congenital CMV and may increase the risk of spontaneous abortion, stillbirth and foetal hydrops. Ophthalmic complications, including chorioretinitis, cataract and blindness, occur in 10-20% of congenital cases presenting in the neonatal period. Mortality from symptomatic neonatal CMV infection is 10-30% but, much higher if the baby is premature.

- **Immuno-compromised patients:**

  Immuno-compromised patients who have not been infected with CMV (CMV negative) are also at risk: from transfusion transmitted CMV infection, through person to person contact and stem cell or solid organ transplants. The Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) undertook a literature review and risk assessment and identified that randomised studies and systematic reviews demonstrated that leucodepletion (i.e. the blood component is filtered to reduce white cells) is as effective as CMV IgG negative blood components. These patients should receive leucodepleted blood; CMV IgG negative donations are not required. This approach has also been adopted in other developed countries.

## Who needs to receive CMV IgG negative blood components?

In March 2012, SaBTO released a position statement containing the following indications for the provision of CMV IgG negative blood components:

- **Intra-uterine transfusions**
- **Neonates up to 28 days post expected date of delivery**
- **Pregnancy:**
  - Elective transfusions during pregnancy (not during labour or delivery)
  - If in an emergency situation, it is not possible to provide CMV negative blood components, leucocyte depleted components may be used.

Organ transplant patients do not require CMV IgG negative blood components. CMV IgG negative red cells and platelets may be replaced with leucodepleted blood components for adults and children post haemopoietic stem cell transplantation for all patient groups, including negative donors and recipients.

Individual transplant centres, however, should have a policy of CMV monitoring by PCR for haemopoietic stem cell transplants and some groups of transplant patients. This practice allows early detection of any possible CMV infection (whether transfusion-transmitted, acquired or reactivated). There has been variability of practice with many centres repeatedly monitoring CMV IgG positive recipients for reactivation by PCR, SaBTO suggested that this practice should be extended to CMV IgG negative individuals.

## What is a CMV negative blood component?

CMV negative blood components are those that are collected from donors who have been tested and found negative for CMV IgG antibodies. A proportion of donations are screened by the Blood Services for CMV IgG antibodies to provide a 'CMV negative' inventory for red cells and platelets, which are provided to hospitals on request.

Depending on age group, 25-40% of UK blood donors are CMV IgG antibody positive (this is a smaller number than that stated above for 'adults', as the prevalence of CMV IgG positivity increases with age and donor populations are younger than screened adult populations).

## How is the risk of CMV transmission through blood components reduced?

The virus can be transmitted through white cells contained in blood components e.g. units of red cells and platelets. In the UK, blood components (except white cell components) are leucocyte-depleted to reduce the transmission risk of variant Creutzfeldt Jakob Disease (vCJD). However, it can not be guaranteed that the risk of transmitting CMV is completely eliminated (Vamvakas, 2005); in the same way that CMV IgG testing is not a guarantee.

Despite the theoretical risk of CMV transmission, fresh frozen plasma (FFP) and other plasma components have not been shown to transmit CMV so the CMV status is not shown on the label for these components.

Granulocyte components should be provided as CMV negative for all CMV negative patients as these components can not be leucocyte depleted. A medical decision may be made to transfuse units which are not CMV tested or which are known to be CMV IgG positive into a CMV negative patient if the urgency to treat a non responsive bacterial or fungal infection outweighs the risks of potentially developing CMV infection at a later stage.

**For further information contact your Transfusion Practitioner, Consultant Haematologist or Hospital Transfusion Laboratory**

References:

New, H. V. *et al* and the British Committee for Standards in Haematology (2016), *Guidelines on transfusion for fetuses, neonates and older children*. Br J Haematol, **175**: 784–828.

Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) (2012), Cytomegalovirus Tested Blood Components Position Statement, https://www.gov.uk/government/news/provision-of-cytomegalovirus-tested-blood-components-position-statement-published (last accessed May 2018)

Griffiths P.D., *et al* (1991) *Congenital and maternal cytomegalovirus infections in a London population.* Br.J.obstet.Gynaecol., 98, 135-140

Luck S. and Sharland M. (2009) *Congenital cytomegalovirus: new progress in an old disease.* Paediatrics and Child Health, 19, 178-184

Norfolk D., (Ed) (2013) *Handbook of Transfusion Medicine.* 5th Edition, TSO

Peckham C. S., et al (1987) *Congenital cytomegalovirus infection: a cause of sensorineural hearing loss.* Arch.Dis.Child., 62, 1233-1237

Vamvakas E.C., (2005) *Is white blood cell reduction equivalent to antibody screening in preventing transmission of cytomegalovirus by transfusion? A review of the literature and meta-analysis.* Transfus.Med.Rev., 19, 181-199

Version 2 May 2018 1819196 BLC707.1

**Equality Impact Assessment (EqIA) screening form** **Appendix:C**

North West Anglia
NHS Foundation Trust

| |
|---|
| **Policy name & Central Index number:**<br>Policy for the use of Cytomegalovirus (CMV) negative blood products(C0661)<br>**Name of Principal author or Policy: Kaye Bowen & Andy King Venables**<br>**Division: Family and Integrated Support Services Division** **Date:** |

**Equality Impact Assessment Stage 1**
Indicate in the table below what kind of impact this policy will have upon the protected groups or how it is likely to influence the Trust's ability to comply with the Public Sector Equality Duty, which is to;

a) Eliminate discrimination, victimisation, harassment or other unlawful conduct that is prohibited under the Equality Act 2010 and/or;
b) Advance equality of opportunity between people who share a characteristic and those who do not and/or;
c) Foster good relations between people who share a relevant protected characteristic and those who do not.

Consider this in the context of the whole policy being updated. The easiest means of approaching this is to consider the following questions;

- **Would the adaptation meet my needs or ensure I had equal opportunities if I had any of the protected characteristics?**
- **Is there anything about the policy that would have a detrimental impact on me if I had one of the protected characteristics?**
- **Does it affect our ability to comply with the Public Sector Equality Duty?**

Please check the appropriate boxes relating to the impact of the policy or adaption:

| | | | | |
|---|---|---|---|---|
| **Age** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Disability** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Gender Reassignment** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Marriage/Civil Partnership** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Pregnancy and Maternity** | ◉ Positive | ○ None | ○ Negative | ○ Unknown |
| **Race** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Religion or Belief** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Sex (Gender)** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |
| **Sexual Orientation** | ○ Positive | ◉ None | ○ Negative | ○ Unknown |

**If any boxes are checked as Negative, please escalate to a stage 2 assessment by emailing nwangliaft.qualitygovernance@nhs.net**

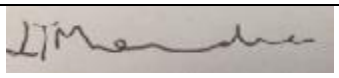
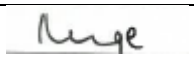
**If any boxes are checked as Unknown, please contact nwangliaft.edi@nhs.net**

| **Agreement by** | **Signature** | **Date** |
|---|---|---|
| Approving Panel Chair for Stage 1 |  | **29/4/19** |
| Ratifying Panel Chair (if required) for Stage 2 | | |
| Equality, Diversity and Inclusion Lead (if required) for Stage 2 | | |

**Quality Assurance Checklist - Version Number: 4** **Appendix D**

| | | Y/N/ n/a | COMMENTS (where necessary) |
|---|---|---|---|
| **1** | **Title of document**<br>Policy for the use of Cytomegalovirus (CMV) negative blood products (C0661) | | |
| **2** | **Type of document (e.g. policy, guidance)** | Policy | |
| | Is the title clear and unambiguous? | Yes | |
| **3** | **Introduction** | | |
| | Are reasons for the development of the document clearly stated? | Yes | |
| **4** | **Content** | | |
| | Is there a standard front cover? | Yes | |
| | Are the key points identified? | Yes | |
| | Is the document in the correct format? | Yes | |
| | Is the purpose of the document clear? | Yes | |
| | Is the scope clearly stated? | Yes | |
| | Are the definitions clearly explained? | Yes | |
| | Are the roles and responsibilities clearly explained? | Yes | |
| **5** | **Evidence Base** | | |
| | Is the type of evidence to support the document explicitly identified? | Yes | |
| | Are key references cited? | Yes | |
| | Are associated documents referenced? | Yes | |
| **6** | **Approval Route** | | |
| | Does the document identify which committee/group will approve it? | Yes | |
| **7** | **Process to Monitor Compliance and Effectiveness** | | |
| | Are there measureable standards or KPIs to support the monitoring of compliance with the effectiveness of the document? | Yes | |
| **8** | **Review Date** | | |
| | Is the review date identified? | Yes | |
| **9** | **Equality and Diversity** | | |
| | Is a completed Equality Impact Assessment attached? | Yes | |

If answers to any of the above questions is 'no', then this document is not ready for endorsement, it needs further review.

| **Compliance Team:** | | | |
|---|---|---|---|
| 1. | Date of Compliance Team approval | 15/03/2019 | |
| 2. | Comments to author for any amendments | | |
| 3. | Name of compliance lead | Stanley Balachander, Quality Governance Operational Committee | |
| **Approval Committee: Hospital Transfusion Committee** | | | |
| If the committee/group is happy to approve this document would the chair please sign below and send the document and the minutes from the approval committee to the author. To aid distribution all documentation should be sent electronically wherever possible. | | | |
| **Name** | Dr Lynda Menadue | **Date** | **29/4/19** |
| **Signature** |  | | |
| **Ratifying Committee: Quality Governance Operational Committee** | | | |
| If the committee/group is happy to endorse this document would the chair please sign below and send the document and the minutes from the endorsing committee to the author. To aid distribution all documentation should be sent electronically wherever possible. | | | |
| **Name** | KANCHAN REGE | **Date** | 17.5.19 |
| **Signature** |  | | |