**SCOPE:**

This policy and procedure applies to all nurses, Nurse Practitioners (NP), Anesthesia Assistants (AAs) and Registered Respiratory Therapists (RRT), who administer blood products to all patients (adult, paediatric and neonatal populations) at the Royal Victoria Regional Health Centre (RVH).

**POLICY STATEMENT:**

As *Safety is our promise*, all blood products shall be obtained from the Blood Bank and administered safely. It is the policy of RVH to promote and support best practice in the safe and effective administration of blood products in all patient populations.

1. Transfusions shall be:
   1. Ordered by the most responsible provider (MRP);
   2. Administered after evidence of consent is in the chart. The MRP proposing the treatment within their scope of practice is responsible for obtaining informed consent or refusal prior to embarking on the treatment;
   3. Monitored under close supervision in case of potential transfusion reaction.
2. A safety line shall be readily available at the patient’s bedside during all transfusions in the event of a transfusion related reaction and/or emergency (see *Appendix IV: Safety Line Set-up for Blood Product Administration)*.
3. The nurse administering the blood product shall notify Blood Bank immediately in the event of a suspected transfusion reaction.
4. Clinical staff administering blood products shall complete required education via the Learning Management System (LMS) on an annual basis.

This policy is not applicable to managing patients requiring a Massive Transfusion at RVH (*Refer to RVH Policy and Procedure: Massive Transfusion Protocol).*

It is the expectation that staff shall adhere to the principles outlined in this policy.

**DEFINITIONS:**

**Albumin:** Is the main protein in blood and is produced in the liver. No crossmatch is required prior to administration. Available in two doses:

* Albumin 5%: Oncotic equivalent of normal plasma - will expand circulating blood volume by an amount approximately equivalent to the volume infused
* Albumin 25%: Hyper-oncotic equivalent of normal plasma - will expand the plasma volume by approximately five times the volume administered by drawing fluid in from the interstitial spaces

**Cryoprecipitate:** Prepared from plasma and containing coagulation factor VIII, fibrinogen, factor XIII and von Willebrand’s factor. Cryoprecipitate will be thawed and pooled by staff in the Blood Bank. Once thawed and pooled, cryoprecipitate must be transfused within four hours.

**Emergency:** A situation where the patient is experiencing severe suffering or is at risk of sustaining serious bodily harm if the treatment is not administered promptly.

**Exceptional Circumstances:** Emergency situations where a delay would cause harm to the patient.

**Frozen Plasma:**  Made from plasma which is frozen within eight to 24 hours of donation. Fresh frozen plasma contains all the clotting factors. Plasma must be ABO compatible with the recipient, therefore an ABO group must be performed for any patients requiring a plasma transfusion.

**Informed Consent:** Consent refers to the exchange of information which occurs between the physician and/or other health practitioner proposing the treatment and the patient or the incapable patient’s substitute decision maker (SDM) resulting in the agreement to, or the refusal of, treatment. The dialogue between the patient or SDM and the health practitioner is the process of obtaining consent. A signed consent document provides evidence of consent, but it is not the consent itself.

**Intravenous Immunoglobulin (IVIG**): Fractionated blood product extracted from donated plasma that contains immunoglobulins with greater than 90% as Immunoglobulin G (IgG). Dose and dosage regimen are dependent on the indication and are determined by the Most Responsible Physician (MRP). Ministry of Health (MOH) IVIG Request Form must be completed by the MRP prior to administration.

**Neonate:** For the purposes of transfusion medicine, a neonate is defined as an infant under four months of age.

**Paediatric:** For the purpose of transfusion medicine, a paediatric patient is defined as a person over the age of four months and under the age of 18 years.

**Platelets:** Platelet concentration in plasma with red cells removed, involved in clotting. ABO/Rh identical platelets are preferred but ABO/Rh non-identical platelets may be used at laboratory discretion, based on product availability.

**Red Cell Concentrate (RCC):** Red blood cells that have been collected, processed, and stored. Red cell transfusion must be initiated within 30 minutes of issue of blood from Blood Bank.

**Safety Line:** a separate IV administration set, pre-primed with blood product compatible IV solution, readily available at patient’s bedside in the event of suspected transfusion reaction (See *Appendix IV: Safety Line Set-up for Blood Product Administration*).

**PROCEDURE:**

Equipment

1. Smart Pump with MedNet Library
2. Syringe pump *(*neonatal population only*)*
3. Appropriate administration tubing for blood product (see *Appendix Ia: Blood Product Administration Overview-Adult* and *Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric*)
4. Compatible intravenous fluid for blood product (see *Appendix Ia: Blood Product Administration Overview-Adult* and *Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric*)
5. Bifuse extension set (Y-site)
6. Safety line
7. Blood product as ordered by MRP and released by Blood Bank.
8. Blood Product Issue Form

Procedure

Informed consent

1. The MRP proposing the treatment within their scope of practice is responsible for obtaining informed consent prior to initiating the treatment. This person has the necessary information about the treatment and the necessary knowledge and ability to answer the patient’s questions.
2. Evidence of informed consent by the MRP shall be placed on the patient’s chart through a signed consent form *(RVH Form 0354-Authorization to administer blood and/or blood products)* and/or through documentation in the patient’s chart.
3. If a signed consent form is not on the chart, documentation of informed consent must be present in note form from the MRP.
4. In an emergency/life-threatening situation where a delay in blood product administration would cause serious bodily harm or prolonged suffering, the MRP shall document inability to obtain consent from patient and/or SDM (Refer to RVH Corporate Clinical Policy and Procedure: *Consent to Treatment)*.
5. Consent is valid for:
   1. In outpatient areas such as: Medicine Treatment Clinic, Paediatric Outpatient Clinic, Simcoe Muskoka Regional Cancer Program, and Dialysis patients: a period of up to one year for the same treatment plan. If the patient develops a new condition requiring blood products, a new consent is required.
   2. Admitted inpatients, Rh negative obstetrical patients, emergency patients and surgical patients: The informed consent will remain effective throughout the course of treatment for the patient. If the patient develops a new condition requiring blood products, a new consent is required.
6. Refusal of blood and/or blood product administration:
   1. The MRP proposing the treatment within their scope of practice is responsible for obtaining refusal of blood and/or products.
   2. Evidence of refusal shall be placed on the patient’s chart (*RVH Form-0541-Refusal of blood and/or blood products administration).*

Preparing for transfusion

1. Nursing staff shall verify the MRP order for blood and/or blood product transfusion by ensuring order includes:
2. Product to be administered,
3. Any special blood requirements (i.e. irradiated),
   1. Neonates born preterm and have a birth weight less than or equal to 1300 grams shall have irradiated blood product ordered, except in the case of an emergency where irradiated blood product is not readily available.
4. Volume or amount to be transfused,
5. Time over which product is to be administered (Refer to *Appendix Ia: Blood Product Administration Overview-Adult and Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric*),
6. Use of pressure infusion devices,
7. Use of blood warmers,
8. Any necessary medications that shall be given prior to, between units and/or blood product, or post-product infusion, and
9. Evidence of informed consent to administer blood or blood products on patient’s chart.
10. For IVIG:
    * 1. Ministry of Health IVIG Request Form must be filled out and faxed to Blood Bank for approval. There are two forms available depending on the indications:
         1. MOHLTC IG Request Form: Non-Neurology,
         2. MOHLTC IG Request Form: Neurology
      2. Forms are be located on RVH Intranet-Laboratory Resources & Manual/Clinical staff resources & Education/Blood Bank.
      3. Once approved, the form will be forwarded back to the respective area where the patient is to be transfused and shall be placed on the patient’s chart. Refer to form for length of time it is valid depending on indication for treatment.
11. Ensure order is placed in MEDITECH, outlining the appropriate product and amount ordered.
12. Verify the patient has had a blood type and screen on file for initial transfusion of any blood product.
    1. In an emergency situation, until blood type can be established:
       1. Group O Positive red cells shall be issued for females over the age of 45 and all males despite age.
       2. Group O Negative red cells shall be issued to females up to the age of 45 years.
       3. Group AB Frozen Plasma (FP) shall be used.
13. Ensure patient has dedicated vascular access. To decrease the risk of hemolysis the largest possible gauge cannula shall be used for the patient:
    1. For adults:
       1. Red blood cells, rapid transfusion: 16 to 18 gauge
       2. Red blood cells, routine transfusion: 20 to 22 gauge
       3. All other blood components/products: any size gauge
    2. For paediatric and neonatal patients 22 to 24 gauge is acceptable;
    3. Central venous access devices are acceptable for administration of all blood products for all ages;
    4. Blood must not be administered via TPN line or Groshong PICC lines.
14. A safety line shall be connected to the vascular access device, via a bifuse extension set, along with the blood product (see *Appendix IV: Safety Line Set-up for Blood Product Administration).*
    1. Exceptions include: Patients receiving blood and/or blood products in the Cancer Centre (outpatient), Medical Treatment Clinic, and Dialysis outpatient clinic settings shall have a safety line primed and readily available in the event of an emergency.
15. All blood products shall be administered via a smart pump device.
    1. Exceptions include: emergency situations with physician present in the Emergency Department (ED), the Operating Room (OR), Critical Care Areas, Endoscopy or the Birthing Unit Operating Room (BUOR)
16. The administration set and vascular access device shall be primed with compatible intravenous fluid for the blood product (see *Appendix Ia: Blood Product Administration Overview-Adult and Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric).*
17. Before retrieving blood and/or blood product from the Blood Bank, ensure a baseline record of vital signs is completed including temperature, pulse, respirations, and blood pressure. If the patient is febrile prior to retrieving the blood, consult with MRP before proceeding further with the transfusion.
18. Bring the patient summary sheet to Blood Bank to verify the patient’s information. Obtain the ordered blood component from Blood Bank. Blood is only issued by Medical Laboratory Technologists to messengers (which include: Nurses, RRTs, Physicians, RVH volunteers, Patient Service Clerks, nursing students and Logistic Attendants), who bring the current registration sheet for the patient (i.e., Patient Summary Sheet, Emergency Admission Sheet) to Blood Bank.

Transfusion of Blood and/or Blood Products

1. Perform hand hygiene and don appropriate personal protective equipment (PPE) as per risk assessment.
2. Introduce yourself to the patient and family using standardized introduction.
3. At the bedside, the nurse administering the blood in conjunction with another nurse or physician or RRT, shall verify and confirm the following information:
   1. Confirm the patient’s surname, given name(s) and hospital unit number (i.e. V#) match on:
      1. the patient summary sheet (i.e. face sheet),
      2. the patient identification arm band,
      3. the laboratory Blood Product label, and
      4. the Blood Product Issue Form that accompanies the blood product.
   2. Verify the blood product received from Blood Bank matches the MRP order.
   3. Confirm the donor number on the blood product matches the donor number on the Blood Product label and the Blood Issue form.
   4. Confirm the patient’s ABO and Rh type match on the Blood Product label and Blood Issue form.
   5. Ensure the patient’s ABO and Rh type are compatible with the donor unit ABO and Rh type. Consult with Medical Laboratory Technologist if required.
   6. Check the donor blood for discolouration or the presence of clots. If either of these occur then do not administer the blood—return to Blood Bank immediately.
   7. Check the expiration date and time on the unit of blood.
   8. Record the verification process with your initials and initials of the professional verifying the check on the Blood Product Issue form.
4. The nurse shall ensure that the appropriate tubing and compatible intravenous fluid is prepared for transfusion of blood and/or blood products (see *Appendix Ia: Blood Product Administration Overview-Adult and Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric*).
5. All blood and/or blood products shall be transfused using:
   1. For adult and paediatric patients:
      1. a Smart Pump with MedNet™ library,
      2. rapid transfuser or by gravity for emergency situations in the ED, Critical Care Units, endoscopy, OR, or BUOR only (for massive transfusions protocol, refer to RVH Corporate clinical policy and procedure: *Massive transfusion policy.)*
   2. For neonates: a syringe pump shall be used to administer all blood products.
6. If blood product requires filter, ensure IV blood administration set filter is completely wet with the chamber 1/3 to 1/2 full.
   1. For neonates, the volume of blood product to be administered shall be drawn into a syringe through a blood filter.
7. Blood and/or blood product administration shall be initiated within 30 minutes of issue from Blood Bank and infusion completed within four hours of issue from Blood Bank. The nurse, RRT, NP, AA, or physician hanging the blood shall record the time the transfusion started and ended on the Blood Product Issue form.
8. The nurse shall document transfusion start time on the Blood Product Issue Form and ensure that the blood and/or blood products are transfused within the recommended transfusion time and maximum time to use product (see *Appendix Ia: Blood Product Administration Overview-Adult and Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric*).

Monitoring during a transfusion

1. The nurse transfusing the blood and/or blood product shall remain in close approximation to the patient for the first 15 minutes of blood and/or blood product reaching the patient.
2. Obtain a baseline set of vital signs prior to starting the infusion. Transfuse slowly for the first 15 minutes (see *Appendix Ia: Blood Product Administration Overview-Adult and Appendix Ib: Blood Product Administration Overview-Neonatal and Paediatric* and *Appendix IIa: Adult IVIG Infusion Rate Table and Appendix IIb: Paediatric IVIG Infusion Rate Tables*).
3. Vital signs shall be taken:
   1. 15 minutes after the initiation of the transfusion (blood and/or blood product has reached patient),
   2. 60 minutes after the start of the transfusion,
   3. Every hour until completed,
   4. At the end of the infusion, and
   5. PRN with any change in patient’s status.
4. For monitoring vital signs during IVIG infusion refer to Appendix IIa: Adult IVIG Infusion Rate Table *and Appendix IIb: Paediatric IVIG Infusion Rate Tables*).
5. Monitor the patient frequently for signs and symptoms of adverse reaction, which may include:
   1. Fever,
   2. Rash,
   3. Alteration in vital signs,
   4. Chills,
   5. Dyspnea,
   6. Bronchospasm,
   7. Hemoglobinuria, or
   8. New onset of nausea and vomiting both during transfusion and up to four hours after the transfusion has ended.
6. For all transfusions, record the time the transfusion ended and the volume transfused on the Blood Product Issue form.
7. If there is no evidence of a transfusion reaction place the empty blood product bag and tubing in the biohazard container and the completed issue form in the chart.

Transfusion reaction

1. All transfusion reactions and transfusion-related errors shall be reported immediately to the MRP and to Blood Bank (Refer to *Appendix III: Algorithm for Suspected Transfusion Reactions*).
2. Acute reactions can occur during or up to six hours following the end of a transfusion and may present with:
   1. Fever,
   2. Rigors with or without rash,
   3. Hives, or rash, pruritus, swelling,
   4. Dyspnea, shortness of breath, or wheezing,
   5. Hypotension or hypertension,
   6. Red urine, diffuse bleeding or oozing,
   7. Lumbar pain,
   8. Anxiety,
   9. Pain at IV site,
   10. Nausea and vomiting,
   11. Headache,
   12. Change in vital signs.
3. In the event of a suspected transfusion reaction, the nurse shall:
   1. Stop the infusion immediately, clamp the blood product tubing, and remove tubing from Smart Pump (see *Appendix IV: Safety Line Set-up for Blood Product Administration)*.
   2. Unclamp safety line and infuse compatible IV fluid (see *Appendix I a-b: Blood Product Administration Overview: Adult, Paediatric & Neonatal)* via Smart Pump at a rate of:
      1. Adults: 60 mL/hr
      2. Paediatrics: 20 mL/hr
      3. Neonates: 2 mL/hr
   3. DO NOT discard blood product or administration set.
   4. Contact the MRP for medical assessment and administer medications as ordered.
   5. Check vital signs every 15 minutes until return to baseline.
   6. Check all labels, forms and the patient’s identification band to determine if there is a clerical discrepancy.
   7. Notify Blood Bank at extension 43242**.**
4. Record all signs and symptoms of the adverse reactions, the volume transfused and the time the transfusion was discontinued on the Blood Product Issue form and in the patient’s health record.
5. Place the unused portion of the blood product, including the tubing, in a plastic bag and return it immediately to Blood Bank along with the completed Blood Product Issue form.
6. Complete a Safety Learning System report if it is deemed that an administrative error has occurred.
7. Continue to monitor patient.

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Product** | **Compatible Intravenous Fluid** | **Pore Size/**  **Type of Filter** | **Tubing and Filter Change Schedule** | **Recommended Rates** | **Recommended Infusion Time** |
| **Red Cells** | **ONLY compatible with 0.9% sodium chloride\*** | Standard Blood Administration Tubing  (170 to 260 microns) | Every two units or every four hours, whichever is less | **Initial:**  **50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, may increase | 120 minutes per unit *(60 to 120 minutes per unit for hemodialysis)*  (maximum four hours from time of issue) |
| **Platelets** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | For each bag or every four hours, whichever is less | **Initial:**  **50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, may increase | 60 minutes per dose  (maximum four hours from time of issue) |
| **Frozen Plasma** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | Every four hours | **Initial:**  **50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, may increase | 30 to 120 minutes (maximum four hours from time of issue) |
| **Cryoprecipitate** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | Every four hours | **Initial:**  **50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, may increase | 10-30 minutes per dose (maximum four hours from time of issue) |
| **Albumin** | **Compatible with all IV solutions** | Standard vented IV set. No blood tubing or filtering required | After every bottle intermittent infusion or every four hours | Volume and rate as per MRP  Do not to exceed maximum rates of:  **5%:** **5 mL/minute (300 mL/hr)**  **25%: 1 to 2 mL/minute (60 to 120 mL/hr)** | As per MRP  Start slowly then increase rate as tolerated  **Do not exceed maximum rate** |
| **IVIG** | **ONLY compatible with D5W** | Standard vented IV set or tubing that comes with product | After every intermittent infusion or every four hours | Rates for each product on Appendix II | Infusion time for each product on Appendix II |
| \* emergency situations with physician present, IV fluid may be at the discretion of the MRP | | | | | |
| **Product** | **Compatible Intravenous Fluid** | **Pore Size/**  **Type of Filter** | **Tubing and Filter Change Schedule** | **Recommended Rates** | **Recommended Infusion Time** |
| **Red Cells** | **ONLY compatible with 0.9% sodium chloride\*** | Standard Blood Administration Tubing  (170 to 260 microns) | Every two units or every four hours, whichever is less | **Initial:**  **1 mL/kg/hr up to 50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, increase rate to 2 to 5 mL/kg/hr up to 150 mL/hr | 120 minutes  (maximum four hours from time of issue) |
| **Platelets** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | For each bag or every four hours, whichever is less | **Initial:**  **1 mL/kg/hr up to 50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, increase rate to 5 to 10 mL/kg/hr | 60 to 120 minutes |
| **Frozen Plasma** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | Every four hours | **Initial:**  **1 mL/kg/hr up to 50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, increase rate to 5 to 10 mL/kg/hr | 60 minutes |
| **Cryoprecipitate** | **ONLY compatible with 0.9% sodium chloride** | Standard Blood Administration Tubing  (170 to 260 microns) | Every four hours | **Initial:**  **1 mL/kg/hr up to 50 mL/hr for the first 15 minutes**  If no signs for adverse reactions, increase rate to 5 to 10 mL/kg/hr | 30 to 60 minutes |
| **Albumin 5% and 25%** | **Compatible with all IV solutions** | Standard vented IV set. No blood tubing or filtering required | After every bottle intermittent infusion or every four hours | Maximum infusion rate 1.5 mL/kg/hr | 30 to 120 minutes  **Do not exceed maximum rate** |
| **IVIG** | **ONLY compatible with D5W** | Standard vented IV set or tubing that comes with product | After every intermittent infusion or every four hours | Rates for each product on Appendix IIb & IIIb | Infusion time for each product on Appendix IIb & IIIb |
| \* emergency situations with physician present, IV fluid may be at the discretion of the MRP | | | | | |

**Adult IVIG Infusion Rate Table 40 kg to 120 kg**

* **Start Rate: 0.3mL/kg/hour *(Privigen®)\****
* **Start Rate: 0.5 mL/kg/hour (*Other IVIG Products)\*\****
  + If tolerated, increase rate after first **30 minutes**
    - *All products first increase is to 2.0 mL/kg/hour*
  + If tolerated, gradually increase rates every **1 hour** in accordance with the infusion rate increments below.
* Please consult the authorized prescriber if the ordered rate exceeds the recommendations on this document.
* Monitor vital signs as follows:

|  |  |
| --- | --- |
| **First Infusion or greater than 8 weeks since last infusion** | **Subsequent Infusions if previously well tolerated** |
| Immediately prior to the infusion | Immediately prior to the infusion |
| Q 15 minutes x 2 | Q30 minutes x 2 |
| Q 30 minutes x 2 | Hourly until complete and on completion |
| Hourly until complete and on completion |  |
| Assess patient for side effects prior to increasing infusion rate. | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rate**  **mL/kg/hour** | **Patient Weight in Kilograms** | | | | | | | | | | | | | | | | |
| **40** | **45** | **50** | **55** | **60** | **65** | **70** | **75** | **80** | **85** | **90** | **95** | **100** | **105** | **110** | **115** | **120** |
| **Infusion Rate mL / hour** | | | | | | | | | | | | | | | | |
| **0.3\*** | 12 | 13.5 | 15 | 16.5 | 18 | 19.5 | 21 | 22.5 | 24 | 25.5 | 27 | 28.5 | 30 | 31.5 | 33 | 34.5 | 36 |
| **0.5\*\*** | 20 | 22.5 | 25 | 27.5 | 30 | 32.5 | 35 | 37.5 | 40 | 42.5 | 45 | 47.5 | 50 | 52.5 | 55 | 57.5 | 60 |
| **2.0** | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 |
| **3.0** | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 345 | 360 |
| **4.0** | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | 420 | 440 | 460 | 480 |
| **OUTPATIENT AREAS ONLY MAY RUN HIGHER INFUSION RATES:** | | | | | | | | | | | | | | | | | |
| **6.0** | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 | 480 | 510 | 540 | 570 | 600 | 630 | 660 | 690 | 720 |
| **Maximum recommended rate of infusion of IVIG is determined by location:**   * **Inpatient areas and in patient receiving initial doses: 4 mL/kg/hour** * **Outpatient areas: Can run doses of 6 mL/kg/hour, if previously tolerated incremental administration.** * **This may not reflect the maximum infusion rate as per the product monograph.** * ***Note: it is not necessary to revert to the initial rate when subsequent bottles of the same infusion are started.*** * **Each bottle must be completed within four hours of being spiked as there is no preservative in IVIG.**   **Caution:**   * **Increased rates of infusion are associated with rate related side-effects and transfusion reactions.** * **Slower infusion rates may reduce/minimize rate related transient side effects.** | | | | | | | | | | | | | | | | | |

**Paediatric IVIG Infusion Rate Table 1 kg to 20 kg:**

**Gammunex® 10%, Gammagard Liquid® 10%, Privigen® 10%**

* Start Rate: 0.3mL/kg/hour
* If tolerated, gradually increase rates every 15 minutes in accordance with the infusion rate increments below.
  + **Once a rate of 3.6 mL/kg/hr has run for 30 minutes, increase to the maximum rate for product being administered**
* Please consult the authorized prescriber if the ordered rate exceeds the recommendations on this document.
* Monitor vital signs as follows:
  + Immediately prior to the infusion
  + Immediately prior to any rate changes
  + 15 minutes after maximum rate reached
  + Hourly until complete and on completion
  + 30 minutes after completion of infusion
  + **Assess patient for side effects prior to increasing infusion rate.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rate**  **mL/kg/hour** | **Patient Weight in Kilograms** | | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **14** | **16** | **18** | **20** |
| **Infusion Rate mL / hour** | | | | | | | | | | | | | | | |
| **0.3** | 0.3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 6 |
| **0.6** | 0.6 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 7 | 8 | 10 | 11 | 12 |
| **1.2** | 1 | 2 | 3 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | 13 | 14 | 17 | 19 | 22 | 24 |
| **2.4** | 2 | 4 | 6 | 8 | 12 | 14 | 16 | 20 | 22 | 24 | 26 | 28 | 34 | 38 | 44 | 48 |
| **3.6\*** | 3 | 7 | 10 | 14 | 18 | 21 | 25 | 29 | 32 | 36 | 40 | 43 | 50 | 58 | 65 | 72 |
| **7.2\*** | 7 | 14 | 21 | 28 | 36 | 43 | 50 | 58 | 65 | 72 | 79 | 86 | 101 | 115 | 130 | 144 |
| **8\*** | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 | 112 | 128 | 144 | 160 |
| **8.4\*** | 8 | 16 | 25 | 33 | 42 | 50 | 59 | 67 | 76 | 84 | 92 | 101 | 118 | 134 | 151 | 168 |
| **\* 3.6 mL/kg/hr is maximum rate for Kawasaki disease**  **7.2 mL/kg/hr is maximum rate for Privigen®**  **8 mL/kg/hr is maximum rate for Gammagard liquid®**  **8.4 mL/kg/hr is maximum rate for Gamunex®**   * **This may not reflect the maximum infusion rate as per the product monograph.** * **Note: it is not necessary to revert to the initial rate when subsequent bottles of the same infusion are started.** * **Each bottle must be completed within four hours of being spiked as there is no preservative in IVIG.**   **Caution:**   * **Increased rates of infusion are associated with rate related side-effects and transfusion reactions.** * **Slower infusion rates may reduce/minimize rate related transient side effects.** | | | | | | | | | | | | | | | | |

**Paediatric IVIG Infusion Rate Table 20 kg to 70 kg:**

**Gammunex® 10%, Gammagard Liquid® 10%, Privigen® 10%**

* Start Rate: 0.3mL/kg/hour
* If tolerated, gradually increase rates every 15 minutes in accordance with the infusion rate increments below, to a maximum rate of 200 mL/hr.
  + **Once a rate of 3.6 mL/kg/hr has run for 30 minutes, increase to the maximum rate for product being administered**
* Please consult the authorized prescriber if the ordered rate exceeds the recommendations on this document.
* Monitor vital signs as follows:
  + Immediately prior to the infusion
  + Immediately prior to any rate changes
  + 15 minutes after maximum rate reached
  + Hourly until complete and on completion
  + 30 minutes after completion of infusion
  + **Assess patient for side effects prior to increasing infusion rate.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rate**  **mL/kg/hour** | **Patient Weight in Kilograms** | | | | | | | | | | | | | | | | | |
| **20** | **22** | **24** | **26** | **28** | **30** | **32** | **34** | **36** | **38** | **40** | **45** | **50** | **55** | **60** | **65** | **70** |
| **Infusion Rate mL / hour** | | | | | | | | | | | | | | | | | |
| **0.3** | 6 | 7 | 7 | 8 | 8 | 9 | 10 | 10 | 11 | 11 | 12 | 13.5 | 15 | 16.5 | 18 | 19.5 | 21 |
| **0.6** | 12 | 13 | 14 | 16 | 17 | 18 | 19 | 20 | 22 | 23 | 24 | 27 | 30 | 33 | 36 | 39 | 42 |
| **1.2** | 24 | 26 | 28 | 31 | 34 | 36 | 38 | 40 | 43 | 46 | 48 | 54 | 60 | 66 | 72 | 78 | 84 |
| **2.4** | 48 | 52 | 56 | 62 | 68 | 72 | 76 | 80 | 86 | 92 | 96 | 108 | 120 | 132 | 144 | 156 | 168 |
| **3.6\*** | 72 | 79 | 86 | 94 | 100 | 108 | 115 | 122 | 130 | 137 | 144 | 162 | 180 | 198 | 200 | 200 | 200 |
| **7.2\*** | 144 | 158 | 173 | 187 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| **8\*** | 160 | 176 | 192 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| **8.4\*** | 168 | 185 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| **\* 3.6 mL/kg/hr is maximum rate for Kawasaki disease**  **7.2 mL/kg/hr is maximum rate for Privigen®**  **8 mL/kg/hr is maximum rate for Gammagard liquid®**  **8.4 mL/kg/hr is maximum rate for Gamunex®**   * **This may not reflect the maximum infusion rate as per the product monograph.** * **Note: it is not necessary to revert to the initial rate when subsequent bottles of the same infusion are started.** * **Each bottle must be completed within four hours of being spiked as there is no preservative in IVIG.**   **Caution:**   * **Increased rates of infusion are associated with rate related side-effects and transfusion reactions.** * **Slower infusion rates may reduce/minimize rate related transient side effects.** | | | | | | | | | | | | | | | | | | |

**Patient exhibits signs and symptoms of a transfusion reaction as per transfusion record**

**YES**

Clerical

Discrepancy/

Incompatibility?

**NO**

1. Complete Physician’s orders
2. Send Blood product, administration set and completed blood issue form back to Transfusion services immediately
3. Transfusion Services shall initiate Transfusion Reaction Protocol
4. Physicians shall consider:

* Blood cultures if patient temperature is greater than or equal to 39°C
* Chest x-ray for severe dyspnea

**CONSIDER SERIOUS FEBRILE NON-HEMOLYTIC, ACUTE HEMOLYTIC, ANAPHYLACTIC, SEVERE ALLERGIC, FLUID OVERLOAD/TRANSFUSION ASSOCIATED CIRCULATORY OVERLOAD (TACO) , TRANSFUSION-RELATED ACUTE LUNG INJURY (TRALI) OR BACTERIAL CONTAMINATION**

**IF PATIENT HAS ANY OF THE FOLLOWING SYMPTOMS:**

* Onset less than or equal to 15 min
* Hypotension/shock
* Hypertension
* Rigors
* Back/chest pain
* Dyspnea/SOB
* Hemoglobinuria
* Bleeding from IV site
* Nausea/Vomiting
* Temperature greater than or equal to 39°C
* Tachycardia arrhythmias
* Generalized flushing
* Hives/rash covering great than 2/3 body

1. **STOP TRANSFUSION IMMEDIATELY**.
2. **Disconnect patient from administration set**.
3. **Connect patient to pre-primed safety line**: Infuse compatible IV fluid
4. **Contact the physician** for medical assessment.
5. **Check vital signs** every 15 minutes until stable.
6. **Check all labels, forms and the patient’s identification** band to determine if there is a clerical discrepancy.
7. **Notify Blood Transfusion Service (Blood Bank)** **Ext. 43242.**
8. **DO NOT discard blood product or administration set.**
9. Complete transfusion reaction section of blood issue form

**PHYSICIAN SHALL DETERMINE IF TRANSFUSION SHALL CONTINUE BASED ON PATIENT’S SYMPTOMS**

Serious Signs & Symptoms?

Minor Symptoms?

* Skin reaction ONLY and no other symptoms
* Hives rash over less 2/3 body
* Temp rise greater than or equal to 1°C **AND** temperature greater than or equal to 38°C during transfusion or within 4 hours of the end of transfusion
* Physician may order medications for symptom management
* Resume transfusion cautiously as per Physician order
* Patient shall be directly observed for first 15 minutes after resuming transfusion

**YES**

**MINOR FEBRILE NON-HEMOLYTIC**

**MINOR ALLERGIC REACTION**

**NO**

Patient develops serious signs and symptoms?



