Figure 1: Vital signs measurement during the period of transfusion

Definitions used for the study was dependent on the age of the patient and the acceptable range/limit for each of the vital signs. In general the following applied:

Fever – Temperature greater than 37.5 C

Tachycardia – A pulse rate greater than 100 beats per minute

Bradycardia – A pulse rate less than 60 beats per minute

Hypotension – A blood pressure less than 90/60 mmHg

Hypertension – A blood pressure greater than 140/90 mmHg

Tachypnea – A respiratory rate of more than 20 – 40 cycles per minute.

Table 1: A summary of definitions adopted and used from the SHOT classification of adverse events of transfusion.

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| **CATEGORY** | **DEFINITION\*** |
| **Acute transfusion reaction (ATR)** | Reactions occurring at any time up to 24 hours following a transfusion of blood or components, ***excluding*** cases of acute reactions due to incorrect component being transfused, haemolytic reactions, transfusion-related acute lung injury (TRALI), transfusion-related circulatory overload (TACO) or those due to bacterial contamination of the component. Examples of ATR are:  **Isolated febrile** – a rise in temperature of > 1oC +/- minor rigors and chills.  **Minor allergic** – skin +/- rash  **Anaphylactic** – hypotension with one or more of: urticaria, rash, dyspnoea, angioedema, stridor, wheeze, pruritus, within 24 hours of transfusion.  **Severe allergic reaction** – Severe allergic reaction with risk to life occurring within 24 hours of transfusion, characterised by bronchospasm causing hypoxia, or angioedema causing respiratory distress.  **Hypotension** – a drop in systolic and/or diastolic pressure of >30mm Hg occurring within one hour of completing transfusion, provided all other adverse reactions have been excluded together with underlying conditions that could explain hypotension.  **Febrile with other symptoms/signs** – rise in temperature of >1oC, with no features of an allergic reaction, but with one or more of myalgia, nausea, change in blood pressure or hypoxia. |
| **Acute Haemolytic transfusion reaction (HTR)** | **Acute** HTRs are defined as fever and other symptoms / signs of haemolysis within 24 hours of transfusion; confirmed by a fall in Hb, rise in LDH, positive DAT and positive cross match. |
| **Delayed Haemolytic transfusion reaction (HTR)** | **Delayed** HTRs are defined as fever and other symptoms / signs of haemolysis more than 24 hours after transfusion; confirmed by one or more of: a fall in Hb or failure of increment, rise in bilirubin, positive DAT and positive cross match not detectable pretransfusion.  Simple serological reactions (development of antibody without positive DAT or development of haemolysis) are excluded.  Cases with relevant features should be reported together with results of all laboratory investigations and antibody identification results if available.  Cases will be included with no clinical or laboratory features as long as DAT is positive. |
| **Transfusion related acute lung injury (TRALI)** | Acute dyspnoea with hypoxia and bilateral pulmonary infiltrates during or within six hours of transfusion, not due to circulatory overload or other likely cause. (Suspected cases should be discussed with a Blood Service Consultant, and reported if there is a high index of suspicion, even if serological investigation is inconclusive). |
| **Post transfusion purpura (PTP)** | Thrombocytopenia arising 5 – 12 days following transfusion of red cells, associated with the presence in the patient of alloantibodies directed against the HPA (Human Platelet Antigen) systems. (Cases where the platelet count drops more than 50% following transfusion should be investigated and reported if complete or partial serological evidence is available). |
| **Transfusion associated graft versus-host disease (TA-GvHD)** | Characterised by fever, rash, liver dysfunction, diarrhoea, pancytopenia and bone marrow hypoplasia occurring less than 30 days after transfusion. The condition is due to engraftment and clonal expansion of viable donor lymphocytes in a susceptible host. |
| **Transfusion transmitted infections (TTI)** | Include as a TTI if, following investigation, the recipient had evidence of infection post transfusion, and there was no evidence of infection prior to transfusion and no evidence of an alternative source of infection.  Plus; **Either** at least one component received by the infected recipient was donated by a donor who had evidence of the same transmissible infection.  **Or** at least one component received by the infected recipient was shown to contain the agent of infection. |
| **Transfusion associated circulatory overload (TACO)** | Any four of the following occurring within six hours of transfusion:  ° Acute respiratory distress.  ° Tachycardia.  ° Increased blood pressure.  ° Acute or worsening pulmonary oedema.  ° Evidence of positive fluid balance. |
| **Transfusion Associated Dyspnea (TAD)** | TAD is characterised by respiratory distress within 24 hours of transfusion that does not meet the criteria of TRALI, TACO or allergic reaction. Respiratory distress should not be explained by the patient’s underlying condition. |

Table 2: Types of Acute Transfusion Reactions observed

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| **Category** | **N (%)** | **Incidence/1000 transfusions** |
| Allergic | 43 (49.0) | 99.5 |
| Febrile | 26 (29.5) | 60.2 |
| Hemolytic | 4 (4.5) | 9.3 |
| TACO | 2 (2.3) | 4.6 |
| TAD | 1 (1.1) | 2.3 |
| Death | 1 (1.1) | 2.3 |
| Unclassified | 11 (12.5) | 25.4 |
| Total | 88 (100) | 203.7 |

TACO = Transfusion Associated Circulatory Overload; TAD = Transfusion Associated Dyspnea

Table 3: Events for which the blood transfusion was discontinued.

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| --- | --- |
| Type of Transfusion event | **Number (Percentage)** |
| Acute febrile transfusion reaction | 7 (43.8) |
| Acute allergic transfusion reaction | 5 (31.2) |
| Clots in blood bag  TACO | 4 (20.0)  2 (12.5) |
| Acute haemolytic reaction | 1 (6.3) |
| Death | 1 (6.3) |
|  | **20 (100)** |

TACO = Transfusion Associated Circulatory Overload