ACUTE TRANSFUSION REACTIONS

SIGNS AND SYMPTOMS

**FEVER**

- **MILD REACTION**
  - Within 4 hours of starting transfusion
  - Temperature ≥ 38°C and rise ≥ 1°C from baseline
  - May have chills or rigors but NO other symptoms e.g. respiratory distress, nausea, vomiting or haemodynamic instability

- **SEVERE REACTION**
  - Within 15 minutes of starting transfusion but may be later
  - Temperature ≥ 38°C and rise ≥ 1°C from baseline
  - With other symptoms e.g. chills/fever, hypotension/shock, tachycardia, anxiety, dyspnea, back/chest pain, haemoglobinuria, bleeding from IV sites, disseminated intravascular coagulation (DIC), nausea/vomiting or
  - Temperature ≥ 38°C
  - Potentially life-threatening

**ACUTE ONSET SHORTNESS OF BREATH (DYSPNOEA, DECREASED O₂ SATURATION)**

- **MILD REACTION**
  - Within 15 minutes of starting transfusion but may be later
  - Hypotension, fever, with/without tachycardia
  - Potentially life-threatening

- **SEVERE REACTION**
  - Within 6 hours following transfusion
  - Typically with hypertension, also cyroanoxia, increased venous pressure/vascular distension, tachycardia, pulmonary oedema, elevated BNP, cardiomyopathy
  - Potentially life-threatening

- **ACUTE ONSET SHORTNESS OF BREATH (DYSPNOEA, DECREASED O₂ SATURATION)**
  - Within 6 hours following transfusion (usually within 1–2 hours)
  - Typically with hypotension, also bilateral pulmonary oedema, severe hypoxemia, cyanosis, fever, bilateral interstitial and alveolar infiltrates (pulmonary oedema), without elevated pulmonary pressures. No evidence of circulatory overload or pre-existing ALIARDS.
  - Potentially life-threatening

< 2/3 BODY

- **2–3 hours into transfusion**
  - Localised urticaria (hives), pruritus with NO other symptoms/signs

> 2/3 BODY

- **Early in transfusion**
  - Localised urticaria (hives), pruritus with NO other symptoms/signs

> 2/3 BODY

- **Within 45 minutes of starting transfusion (majority within 5 minutes)**
  - With other symptoms e.g. dyspnea/upper or lower airway obstruction (hoarseness, stridor, wheezing, chest pain, anxiety). Severe hypoxemia, bronchospasm, cyanosis. GI symptoms (nausea, vomiting). Urticaria is usually present with anaphylaxis.
  - Potentially life-threatening

**ACTION**

- STOP TRANSFUSION

**RECOGNISE**

- REACT

**REPORT**

- 1. STOP TRANSFUSION
  - Activate emergency procedures if required

- 2. CHECK VITAL SIGNS
  - Respiration, pulse, BP, temperature and urine output

- 3. MAINTAIN IV ACCESS but do not flush existing line

- 4. REPEAT ALL CLINICAL AND IDENTITY CHECKS of this patient and blood product

- 5. NOTIFY medical staff and Transfusion Service Provider

- 6. COLLECT blood and urine samples. Have blood pack and IV line for culture if required

- 7. COMMENCE SPECIFIC CLINICAL MANAGEMENT

- 8. DOCUMENT reaction in patients chart and complete incident report as per institution's policy

**CAUSES AND INVESTIGATIONS**

- **FNHTR (febrile non-haemolytic transfusion reaction)**
  - No investigation required

- **SEVERE FNHTR or TBI or AHTR**
  - Sepsis workup: Gram stain on blood product bag; blood cultures on both patient and product
  - Incompatible blood workup: Group, screen and DAT on pre- and post-transfusion samples
  - Haemolysis workup: FBC, LDH, bilirubin, haemoglobin, electrolytes, creatinine, urinalysis
  - Disseminated intravascular coagulation (DIC) may complicate a severe reaction - perform aPTT, PT, fibrinogen, D-Dimer (or FDP)

- **TTBI or AHTR or ANAPHYLAXIS**
  - TTBI or AHTR: see above
  - ANAPHYLAXIS: see below

- **TACO**
  - Assess chest X-ray for pulmonary oedema
  - Elevated BNP/N-terminal pro-BNP levels are more common in TACO

- **TRALI**
  - Assess chest X-ray for pulmonary infiltrates
  - Normal BNP/N-terminal pro-BNP levels are more common in TRALI
  - HLA/HNA typing and antibodies
  - TRALI is a clinical diagnosis – investigations to exclude other reactions

**CLINICAL MANAGEMENT**

- **FNHTR**
  - Do not restart transfusion
  - Give antipyretic and manage as a febrile reaction

- **SEVERE FNHTR or TBI or AHTR**
  - Do not restart transfusion
  - Give antipyretic and manage as a severe allergic reaction

- **SEVERE FNHTR**
  - Do not restart transfusion
  - Take cultures and if TBI suspected, start broad-spectrum IV antibiotics, IV fluids and inotropes to provide cardiovascular support and maintain urine output
  - Send implicated unit(s) to the transfusion laboratory for urgent culture and Gram stain; notify the Blood Service to ensure quarantine and testing of components from same donation

- **AHTR (acute haemolytic transfusion reaction)**
  - Do not restart transfusion
  - IV fluids and inotropes to maintain blood pressure and urine output. Induced diuresis may be needed
  - May have chills or rigors but other symptoms e.g. respiratory distress, nausea, vomiting
  - Do not restart transfusion
  - For further transfusions consider consultation with a haematologist

- **ANAPHYLAXIS**
  - See below

- **ANAPHYLAXIS (acute haemolytic transfusion reaction)**
  - See above

- **ANAPHYLAXIS (transfusion transmitted bacterial infection)**
  - See above

- **TACO (transfusion associated circulatory overload)**
  - Do not restart transfusion
  - Give oxygen, diuretics and sit patient upright
  - Do not restart transfusion

- **TRALI (transfusion-related acute lung injury)**
  - Do not restart transfusion
  - Give oxygen and ventilation as necessary; diuretics are not beneficial and may worsen TRALI
  - Notify the Blood Service to ensure quarantine and testing of components from the same donation

- **MINOR ALLERGIC REACTION**
  - See above

- **SEVERE ALLERGIC REACTION**
  - See above

- **MINOR ALLERGIC REACTION**
  - Give antihistamine and restart transfusion slowly if reaction subsides and product still viable
  - If no improvement or worsening of symptoms, stop transfusion and manage as a severe allergic reaction
  - Consider premedication with antihistamine for future transfusions if recurrent minor allergic reactions occur

- **SEVERE ALLERGIC REACTION**
  - Do not restart transfusion
  - Give antihistamine and corticosteroid as required
  - If recurrent severe allergic reactions occur, consider premedication with antihistamine or transusing with plasma-depleted or washed red cells

- **ANAPHYLAXIS**
  - Do not restart transfusion
  - Implement basic life support. Maintain airway and blood pressure. Adrenaline, IV fluids, oxygen and other resuscitation as indicated
  - To prevent recurrence, consider corticosteroid and antihistamine premedication. If IgA-deficiency with anti-IgA present, consider IgA-deficient or washed red cells
  - For further transfusions consider consultation with a haematologist