

IMMEDIATE ACTIONS!

1. **STOP** the transfusion
2. Maintain **IV access**
3. Check **vital signs**
4. Verify **patient ID matches** transfusion label/tag
5. **Notify physician**
6. **Patient care** per order, **report every reaction to Transfusion Medicine Lab (TML), document** per policy



TTISS-ON

Acute Transfusion Reaction Chart

SIGNS AND SYMPTOMS

FEVER, URTICARIA, DYSPNEA, HYPOTENSION

Airway or Facial Edema, Anxiety, Coughing,
Diffuse bleeding/oozing, Hemoglobinuria,
Hypertension, Itching, Nausea/Vomiting,
Pain (Back, Headache, IV site), Rash,
Shaking Chills/Rigors, Subjective chills,
Tachycardia, Urine colour– dark/red, Wheezing

Consider Recommended Investigations and Suggested Treatment and Actions in the context of each patient's specific clinical scenario and blood component/product transfused.
The initial presenting sign/symptom may evolve, if so re-contact TML. Close patient monitoring is essential.

For additional assistance, call TML at extension: _____

SIGNS & SYMPTOMS		TIMING	POSSIBLE ETIOLOGY	RECOMMENDED INVESTIGATIONS	SUGGESTED TREATMENT AND ACTIONS
FEVER: Temperature of at least 38° C and an increase of at least 1° C from pre-transfusion and/or Shaking Chills/Rigors NOTE: Isolated symptom subjective chills, may consider as Low Risk	Low Risk: 38° C to 38.9° C but NO other symptoms High Risk: a) at least 38° C but with other symptoms or b) 39° C or greater or c) Shaking Chills/Rigors	During or up to 4 hours post transfusion. Often within first 15 minutes. During or up to 4 hours post transfusion.	Febrile non-hemolytic transfusion reaction Febrile non-hemolytic transfusion reaction Bacterial contamination Acute hemolytic transfusion reaction	No testing required • TML: Group & Screen, DAT • TML: Blood component culture • Patient blood culture (from a different peripheral site) • Urinalysis (first void post-reaction) • Hemolysis work-up: CBC, bilirubin, LDH, AST, haptoglobin, reticulocyte count, blood film • If indicated, assess for - AKI {Acute Kidney Injury} (electrolytes, creatinine) - DIC {Disseminated Intravascular Coagulation} (INR, PTT, fibrinogen, D-dimer)	• Antipyretic • With physician order and if blood still viable, may resume transfusion with close patient assessment • If recurrent reactions, possible trial of antipyretic premedication DO NOT restart transfusion • Return blood to TML for clerical check & culture • Broad spectrum IV antibiotics; DO NOT wait for culture results • Aggressive hydration; maintain good urine output • Supportive care per physician's discretion: IV fluid, vasopressors, oxygen, respiratory support • Monitor for hypotension, renal dysfunction, DIC {Disseminated Intravascular Coagulation} • If severe rigors, consider meperidine (if no patient contraindications) • Serious reaction, call TML immediately
URTICARIA (Hives) Rash or Itching	Less than 2/3 body surface but NO other symptoms 2/3 body surface or more but NO other symptoms With other symptoms, i.e., Airway or Facial Edema, DYSPNEA, HYPOTENSION	During or up to 4 hours post transfusion. Often early in transfusion. During or up to 4 hours post transfusion. Often early in transfusion. During or up to 4 hours post transfusion.	Minor allergic Minor allergic (Extensive) Anaphylactoid reaction /Anaphylaxis	No testing required No testing required • If also DYSPNEA: chest X-ray, • If also hypoxia: blood gases • Suggest consult Transfusion Medicine physician: explore if indication for - TML: Group & Screen, DAT - Haptoglobin - IgA level (if pre-transfusion sample available) - Anti-IgA testing (performed via Canadian Blood Services, TML will assist in sending samples)	• Antihistamine • With physician order and if blood still viable, may resume transfusion with close patient assessment • If recurrent/severe reactions, possible trial of antihistamine premedication DO NOT restart transfusion • Antihistamine; may require steroid if symptoms slow to resolve • If recurrent/severe reactions, possible trial of antihistamine /steroid premedication • If continued reactions with premedication, possible trial of washed/plasma depleted components DO NOT restart transfusion • Epinephrine; consider steroid, antihistamine • Return blood to TML for clerical check • Supportive care per physician's discretion: oxygen, respiratory support, vasopressors • Pending outcome of investigations, washed/plasma depleted components • Serious reaction, call TML immediately

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SIGNS & SYMPTOMS		TIMING	POSSIBLE ETIOLOGY	RECOMMENDED INVESTIGATIONS	SUGGESTED TREATMENT AND ACTIONS
DYSPNEA or SpO ₂ (oxygen saturation) of 90 % or less and a decrease of at least 5 % from pre-transfusion or intervention required to maintain SpO ₂ (oxygen saturation)	With Hypertension , tachycardia, +/- FEVER	During or up to 12 hours post transfusion	TACO* (Transfusion Associated Circulatory Overload)	- TML: Group & Screen, DAT - Consider chest x-ray: Findings - pulmonary edema, Kerley B lines, peri bronchial cuffing; may be pleural fluid - Cardiac biomarkers (as available)	DO NOT restart transfusion - Oxygen, high fowler's position, diuretics (document fluid balance) Future transfusion: Slow transfusion rate Pre-transfusion diuretics ** Consider TML to divide unit (as available)
	ACUTE DYSPNEA With HYPOTENSION , tachycardia, +/- FEVER	During or up to 6 hours post transfusion	TRALI (Transfusion Related Acute Lung Injury)	- TML: Group & Screen, DAT - Chest x-ray: Findings – bilateral interstitial /alveolar infiltrates without elevated pulmonary pressures - If also hypoxia: blood gases - Canadian Blood Services requires follow up information & patient blood tests, contact TML, will assist in sending samples	DO NOT restart transfusion - Supportive care per physician's discretion: oxygen, respiratory support, vasopressors (benefit uncertain for diuretics {document fluid balance}, steroids, and bronchodilators) Serious reaction, call TML immediately
	With FEVER +/- HYPOTENSION	Possible Etiology: Bacterial contamination, Acute hemolytic transfusion reaction Consider/Follow FEVER, High Risk: Timing, Recommended Investigations, Suggested Treatment and Actions			
	With URTICARIA, Airway or Facial Edema, HYPOTENSION	Possible Etiology: Anaphylactoid Reaction / Anaphylaxis Consider/Follow URTICARIA, With other symptoms: Timing, Recommended Investigations, Suggested Treatment and Actions			
	Mild respiratory symptoms that do not align with TACO or TRALI	During or up to 24 hours post transfusion	TAD (Transfusion Associated Dyspnea)	Consider chest x-ray: Findings - normal/unchanged, no pulmonary edema, No bilateral interstitial/alveolar infiltrates	DO NOT restart transfusion Supportive care per physician's discretion: oxygen, respiratory support
HYPOTENSION SBP (Systolic blood pressure) 80 mmHg or lower AND from pre-transfusion SBP: - 30 mmHg or greater absolute decrease or - 15 to 25 % or greater relative decrease or - intervention required to maintain SBP	Alone or with facial flushing	During or up to 4 hours post transfusion	***Bradykinin mediated hypotension	No testing required	DO NOT restart transfusion - Supportive care per physician's discretion: IV fluids - If taking ACE {angiotensin converting enzyme} inhibitor medication, consider an alternative anti-hypertensive agent prior to additional transfusion
	With FEVER, +/- DYSPNEA	Possible Etiology: Bacterial contamination, Acute hemolytic transfusion reaction Consider/Follow FEVER, High Risk: Timing, Recommended Investigations, Suggested Treatment and Actions			
	With URTICARIA, Airway or Facial Edema, DYSPNEA	Possible Etiology: Anaphylactoid Reaction / Anaphylaxis Consider/Follow URTICARIA, With other symptoms: Timing, Recommended Investigations, Suggested Treatment and Actions			
	With ACUTE DYSPNEA, tachycardia +/- FEVER	Possible Etiology: TRALI Consider/Follow ACUTE DYSPNEA: Timing, Recommended Investigations, Suggested Treatment and Actions			

* **TACO: Pre-transfusion assess patients for TACO risk factors:** advanced age, history heart failure, history myocardial infarction, left ventricular dysfunction, renal dysfunction, positive fluid balance

** **Pre-transfusion diuretics:** Furosemide PO: onset 30 to 60 minutes, maximal effect 1-2 hours, effect persists about 6-8 hours

Furosemide IV: onset 5 minutes, maximal effect 20-60 minutes, effect persists about 2 hours

*** **Bradykinin mediated hypotension**

Bradykinin is believed to have a major role in producing hypotension. Patients taking ACE {angiotensin converting enzyme} inhibitor medication - decreased bradykinin degradation related to increased angiotensin converting enzyme. Also, some individuals have genetic polymorphism leading to decreased bradykinin degradation.

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