Reaction Type	Signs and symptoms						
	Skin	Inflammatory (fever, chills, rigors)	Pain	Respiratory	Cardio-vascular Hypotension	Cardio-vascular Hypertension	GI/ jaundice
Allergic (mild)	**X!**						
Allergic (severe)*	X			**X!**	**X!**		
Hemolytic (acute)		X	X		X		
Hemolytic (delayed)		X	X				X
Hypotensive*	X				**X!**		X
FNHTR*		X	X				X
TACO				**X!**		**X!**	
TAD*				**X!**			
TA-GVHD	X	X					X
TRALI		X		**X!**	X		
Bacterial Contamination		X		X	X		

X! = required or essential component of diagnosis
X = commonly associated with diagnosis
* = diagnosis of exclusion. Other possible reaction types with overlapping signs and symptoms should be excluded first.

Possible tests, and evaluations to consider	Signs and symptoms						
	Skin	Inflammatory (fever, chills, rigors)	Pain	Respiratory	Cardio-vascular Hypotension	Cardio-Vascular Hypertension	GI/ jaundice
ABO type, DAT, Hemolysis check Clerical Check		X	X	X	X	X	X
Repeat antibody screen							X
Chest X-ray				X			
B-natriuretic Peptide (BNP)				X		X	
Bacterial culture of patient and product		X	X	X	X		X
Review of patient fluid balance				X	X	X	
Repeat CBC (rule out bleeding)					X		
IgA level, Anti-IgA					X		

Allergic (mild)

- Valid only for non-life threatening reactions with ONLY cutaneous manifestation (hives, rash)
- Pre-treat or treat with anti-histamine with resolution of symptoms prior to additional transfusion

Allergic (severe)

- Without at least skin manifestations (erythema, edema, hives, rashes, or pruritis), or bronchospasm, this is a diagnosis of exclusion.
- Serum IgA and anti-IgA levels may be of diagnostic value, but not necessary for empiric treatment
- History of recent transfusion without reaction excludes IgA-deficiency associated anaphylaxis
- Provide appropriate cardiovascular and respiratory support (airway protection and ventilation as needed)
- Treat with epinephrine, anti-histamine, and steroids as dictated by institutional guidelines.

Hemolytic (Acute)

- Confirm identity of intended recipient of blood product
- Evaluate for hemolysis- order Direct Antiglobulin Test (DAT), ABO re-type, and check for hemolysis (plasma hemoglobin, LDH, bilirubin, haptoglobin)
- Use only group O blood for emergent need, otherwise return unused blood products and wait for reconfirmation of compatibility before continuing with transfusions
- If reaction is confirmed or suspected, provide appropriate cardiovascular and respiratory support, and provide adequate kidney perfusion with crystalloid infusion and diuretics.

Hemolytic (Delayed)

- Evaluate for hemolysis- order Direct Antiglobulin Test (DAT), ABO re-type, and check for hemolysis (plasma hemoglobin, LDH, bilirubin, haptoglobin)
- Repeat antibody screen (as part of Type and Screen)
- Reconfirm compatibility of previously crossmatched and available blood products before transfusing further
- Monitor hemoglobin level more frequently

Hypotension

- Diagnosis of exclusion
- Provide appropriate cardiovascular support

FNHTR (Febrile non-hemolytic transfusion reaction)

- Diagnosis of exclusion.
- Avoid by pre-medicating with antipyretic and use of leukoreduced blood
- Treatment/pre-medication with meperidine (Demerol) may be of value in instances of severe rigors

TACO (Transfusion associated circulatory overload)

- Review rate of transfusion and look for evidence of positive fluid balance
- Chest X-ray will be of diagnostic value
- Look also for other signs of heart failure (EKG (chest strain pattern)) Troponin levels)
- Pre- and post-transfusion B-natriurietic peptide (BNP) levels may be of diagnostic value
- Treat with diuretics
- Provide respiratory support as needed
- Transfuse at slower rates including use of split units

TAD (Transfusion associated dyspnea)

- Diagnosis of exclusion after severe allergic reaction, TACO, and TRALI are excluded.
- Provide respiratory support as needed

TA-GVHD (Transfusion associated-graft vs. host disease)

- Perform CBC to look for evidence of pancytopenia
- Skin or liver biopsy (of affected organ) is of diagnostic value
- WBC chimerism study is of diagnostic value
- Only treatment is immunosuppression with high mortality nonetheless. Irradiation of blood is only prevention.

TRALI (Transfusion-related acute lung injury)

- Chest X-ray will be of diagnostic value
- Diagnosis of exclusion. Donor HLA and neutrophil antibody testing is of diagnostic value, but not necessary for empiric treatment
- Provide appropriate cardiovascular and respiratory support

Bacterial contamination

- Culture patient and return blood product to Blood Bank for bacterial culture
- Perform Gram stain stat if there is high index of suspicion (sensitive to only 100,000 to 1,000,000 microbes per mL)
- Place patient on prophylactic antibiotics if there is high index of suspicion

Acknowledgements; Reaction table idea was adapted and modified from Nancy Heddle's original table of reaction categories vs. signs and symptoms for teaching residents at McMaster University, Hamilton, Ontario.