



Blood transfusions & vital signs: The evidence

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Background

Before 2009, policy at our hospital required 3 sets of vital signs:

- Pre-transfusion
- 15 minutes after initiation
- At completion

Corporate policy standardization increased blood transfusion vital signs to 5 sets, adding:

- 1 hour after initiation
- 1 hour after completion

Extensive literature review for best practice was inconclusive

Purpose

Examine vital sign frequency and timing during administration to determine best practice for monitoring patients receiving blood products

Methods

- Retrospective cohort study
- Medical record review of every patient record from 2008-2012 with documented blood transfusion reactions
 - 77,842 total units
 - 116 positive for reaction



Results

- Reaction rate: 0.15%
- Severe reaction rate: 0.0077%
- Qualities of reactive patients:
 - 100% cross-matches completed, 99% accuracy
 - 78% caused by PRBCs
 - 41% of patients pre-medicated for transfusion
 - 44% male, 56% female
 - 67% greater than 60 years old
- Result of reaction:
 - 80% no harm
 - 15% required symptom alleviation
 - 5% (n=6) required life-sustaining intervention
 - 4 patients died



Signs and Symptoms of Patients Experiencing a Transfusion Reaction (N = 116)

Signs & Symptoms	% of Patients
Febrile	46%
Hives & Itching	23%
Tachycardia	18%
Chills	18%
Dyspnea	17%
Hypotension	16%
Hypoxemia	12%
Flushing	8%

- Reactions occurred at 92 minutes into the transfusion (range = 0 - 485)
- Severe reactions occurred at 129 minutes (range = 5 - 230)
 - 67% with hypoxemia
 - 50% with chills, dyspnea, hypotension & fever
- Severe reactions occurred in sicker patients:
 - Lower baseline BP, higher baseline HR
 - All greater than 60 years old

Mean Vital Sign Changes before and at Reaction

	Baseline	Reaction
SBP	124.5	125.7
DSP	65.0	66.0
HR	89.9	97.2
Temp	98.5	99.8

Mean Vital Sign Changes of Patients Experiencing a Transfusion Reaction (N = 116)

	Baseline	15 minutes	1 hour	Completion
SBP	124.9	124.8	129.7*	126.2*
DBP	64.6	65.2	64.9	66.6
HR	89.5	91.6	88.1	93.4
Temp	98.4	99.0*	99.3*	99.3*

**Statistically significant difference from baseline (p < 0.05)*

- Temperature rose early, stayed elevated
- HR reactive only at point of reaction
 - Rose from 89.9 to 97.2 at reaction identification
- SBP rose later, stayed elevated
- Only 15% of patients react within 15 minutes
- Reactions occur with regularity up to 300 minutes after initiation of transfusion

Conclusions

- Blood products are very safe
- Regular monitoring *throughout* transfusion period is best practice
- Nurses should use critical thinking, ongoing assessments and increased vital sign monitoring as needed to identify a reaction