By How Much Does a Single Unit Transfusion Increase the Recipient's Hemoglobin?

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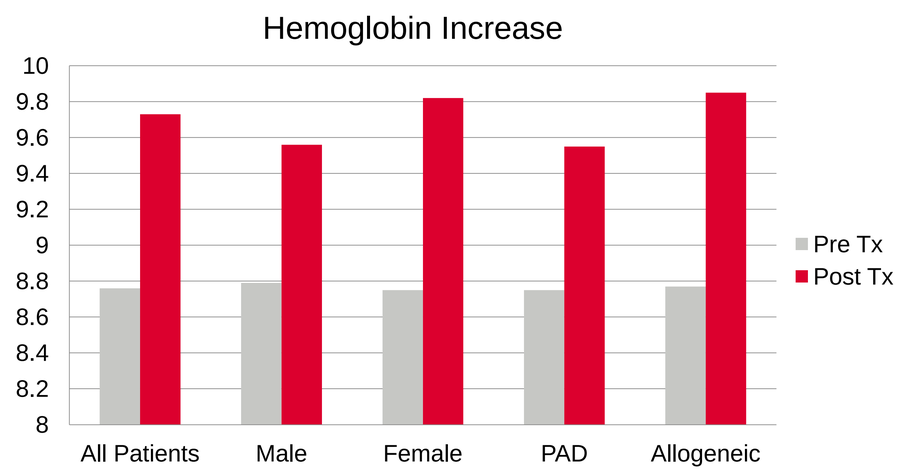
Methods

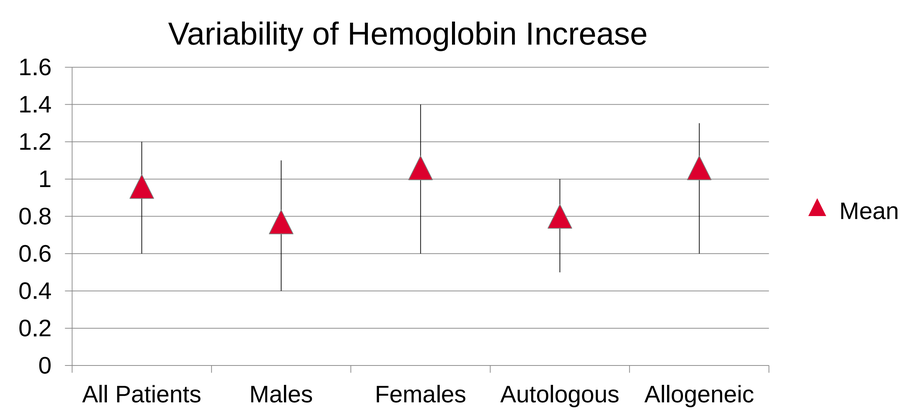
The effect of a single unit RBC transfusion on the recipient's Hgb was measured in 113 patients who received only one unit of stored RBC (allogeneic or predonated autologous) during their hospital stay. Only patients who had both pre and post-transfusion measurements were included and we selected only those patients who were transfused on postoperative day 2 or 3 to eliminate the confounding variables of ongoing blood loss and/or infusion of shed blood.

M/F	41/72
Age (mean)	68.8 years
Allogeneic	68
Predonated	45

Poster abstract presented at AABB 2010

	Mean Pre-transfusion Hgb (g/dL)	Mean Post-transfusion Hgb (g/dL)	Mean Hgb Increase (g/dL) (± SD)	Range of Hgb Increase (g/dL)	Hgb Increase 25th percentile (g/dL)	Hgb Increase 75th percentile (g/dL)
All patients	8.76	9.73	0.96 ± 0.54	0 – 3.2	0.6	1.2
Males	8.79	9.56	0.77 ± 0.41	0.1 – 2.0	0.4	1.1
Females	8.75	9.82	1.06 ± 0.58	0 – 3.2	0.6	1.4
Autologous	8.75	9.55	0.80 ± 0.41	0 – 2.0	0.5	1.0
Allogeneic	8.77	9.85	1.06 ± 0.59	0.1 – 3.2	0.7	1.3





Conclusions

- The mean Hgb increment closely approximated 1 g/dL
- There was a wide variation among the patients
- Females experienced a greater Hgb increase than males
- Allogeneic units increased Hgb more than autologous units
- More work is needed to define expectations of a RBC transfusion
- The mean pre-transfusion Hgb raises questions as to the necessity for many of the transfusions

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Postoperative Blood Salvage with Cell Washing Reduces Transfusion Requirements for Patients Having Total Knee Replacement Surgery

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Methods

During 2009, postoperative blood salvage with cell washing was employed by three experienced surgeons following all 400 of their TKR procedures. We compared the PAD and allogeneic transfusion rates for these patients with similar rates for the 370 TKR patients (Control) operated on by the same surgeons in 2007 (prior to the availability of the salvage system).

Washed salvaged red cells were returned to over 80% of patients in the study group.

Outcomes

- Postoperative blood salvage with cell washing successfully reduced transfusion requirements for patients having TKR
- Discharge hemoglobin was not compromised
- The routine use of PAD has been discontinued for these patients.

	2007 Control	2009 OrthoPAT®	Reduction
Number of patients	370	400	
Allogeneic transfusion rate (%)	39.5	26.5	33%
PAD transfusion rate (%)	47.3	25.8	45%
Allogeneic units transfused per patient (all patients)	0.69	0.41	41%
PAD units transfused per patient (all patients)	0.69	0.37	46%
Mean Discharge Hgb (g/dL)	10.1	9.9	2%

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- Salvages RBC lost during and after orthopedic surgery
- Concentrates and washes RBC to a hematocrit of 70% to 80%
- RBC recovery between 75% and 98%
- High-quality RBC product
  - Albumin removal 93.9%–99.6%
  - Free Hgb removal 89.6%–98.8%
  - Heparin removal 96.9%–100%

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