



TRANSFUSION TALES:

...presented for your learning

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Patient Case:

Annie, a 76 year old woman with severe aortic stenosis, has been scheduled for aortic valve replacement surgery. She has hypertension, dyslipidemia, and diabetes. She also has borderline anemia and is unable to tolerate oral iron, ferrous gluconate, due to nausea. Her height is 152 cm, weight is 50 kg, hemoglobin (Hb) is 119 g/L, and ferritin is 18 ug/L (normal female 30-150 ug/L, male 30-400 ug/L).

QUESTION 1

Annie has been referred to the blood conservation program. She is highly likely to require allogeneic blood transfusion for her surgery related to (select all that apply):

- a) Her proposed surgery is major, significant blood loss is anticipated
- b) Hb is < 130 g/L
- c) Ferritin is low
- d) She is “small” - height < 165 cm; weight < 65 kg
- e) She is elderly with multiple medical issues

QUESTION 2

Blood conservation patients assessed in Preadmission clinic include:

	Annie	Edward	Julia
Surgery	Aortic Valve Replacement	Hip Joint Replacement	Right Hemicolectomy
Demographics	76 year old female 152 cm, 50 kg	65 year old male 170 cm, 71 kg	45 year old female 149 cm, 50 kg
Health History	hypertension, dyslipidemia, diabetes, anemia unable to tolerate ferrous gluconate	hypertension, dyslipidemia, severe osteoarthritis, anemia - ferrous gluconate PO x 1-2 years, has been regular blood donor up to 6 months ago	healthy, has inflammatory bowel polyp with ongoing bleeding, anemia - ferrous gluconate PO x 1 year
Time frame to surgery date	3-4 months (patient choice, family issue)	6 weeks	3 weeks
Laboratory Results	Hb 119 g/L Ferritin 18 ug/L	Hb 124 g/L Ferritin 31 ug/L	Hb 101 g/L Ferritin 4 ug/L

Choose the best blood conservation plan of care for each patient

- a) Initiate feramax (polysaccharide iron, absorbed in duodenum) 150 mg PO once daily, re-assess Hb in 1 month

- b) Initiate feramax 150 mg PO once daily and eprex 40,000 IU/mL sc weekly, re-assess Hb every 2 weeks
- c) Administer venofer 300 mg IV and eprex 40,000 IU/mL sc, re-assess Hb in 7 days, if Hb < 130 g/L administer second eprex 40,000 IU/mL sc
- d) Administer venofer 300 mg IV, in 10 days administer second venofer 300 mg IV as well as eprex 40,000 IU/mL sc
- e) Administer venofer 300 mg IV, in 10 days administer second venofer 300 mg IV

ANSWERS

QUESTION 1: a), b), c), d), and e)

QUESTION 2: (the rest of the story):

Annie: a)

Annie tolerated the feramax with no difficulty, after 1 month her Hb was 128 g/L and ferritin 20 ug/L. She continued the feramax; day of surgery her Hb was 140 g/L, reticulocyte count $65 \times 10^9/L$ (immature red blood cells, will be Hb in 1-2 days; normal $10-100 \times 10^9/L$). Each 150 mg feramax tablet provides 150 mg elemental iron whereas each 300mg ferrous gluconate tablet provides only 33 mg of elemental iron. Feramax is a more costly non-prescription oral iron but has been found to avoid nausea associated with PO iron in some patients. For Annie, sufficient pre-operative time frame was key to successful oral iron treatment.

Edward: a) initially, c) subsequently

Edward also tolerated the feramax with no difficulty, after 1 month his Hb was 119 g/L and ferritin 27 ug/L. He did not respond to feramax. His pre-existing anemia was thought to be related to his regular blood donations. Inflammation from his extensive osteoarthritis may also be a factor. Edward was further treated with venofer 300 mg IV and eprex 40,000 IU/mL sc weekly for 2 doses. Day of surgery his Hb was 142 g/L, reticulocyte count $175 \times 10^9/L$.

Julia: e)

Julia's surgical procedure is not associated with major blood loss. However, she has anemia and ongoing bleeding, not responding to oral iron. The venofer treatments were well tolerated. Intravenous iron is recommended for patients very cautiously (some risk of reaction, requires return to LHSC for about 4 hour treatment time frame). Day of surgery Julia's Hb was 118 g/L, reticulocyte $98 \times 10^9/L$.

All three patients had uneventful operations and post-operative courses.

For both Annie and Edward, it was recommended that their Family Physician follow up/further investigate etiology of anemia post-operatively.

DISCUSSION:

Each patient is specifically reviewed within blood conservation guidelines. The surgical procedure/anticipated blood loss is a major variable. A multi-disciplinary team approach is essential. Hemoglobin optimization is the goal of pre-operative blood conservation strategies. Pre-operative time frame can become a limitation. Intra-operative strategies to minimize blood loss and post-operative transfusion trigger are additional, equally important aspects of blood conservation but not addressed at this time.

For more information:

http://www.lhsc.on.ca/About_Us/Blood_Conservation_Program/

https://appserver.lhsc.on.ca/med_dirs/view.php?id=SRG-2008-002&live=1

https://appserver.lhsc.on.ca/med_dirs/view.php?id=SRG-2008-003&live=1