BEST PATIENT PRACTICE

HEMOGLOBIN OPTIMIZATION –

GAIL MURRAY PATIENT BLOOD MANAGEMENT COORDINATOR FOR ONTRAC

ONTraC
Ontario Transfusion Coordinators

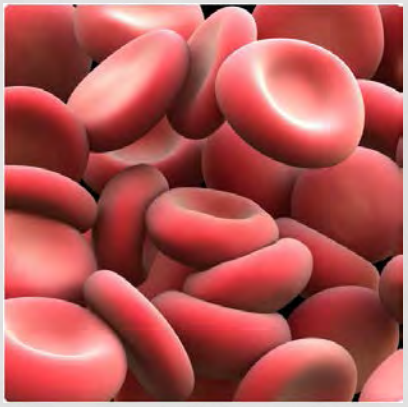
OBJECTIVES

1. Hemoglobin Optimization – why and how
2. Alternatives to Blood transfusion/Patient Blood Management – ONTRaC program
3. Iatrogenic Anemia – what, why, how
4. Refusal of Blood Products

ONTraC
Ontario Transfusion Coordinators

HEMOGLOBIN OPTIMIZATION

- **What Is Hemoglobin?**
- Hemoglobin is a complex protein found in red blood cells that contains an iron molecule.
- The main function of hemoglobin is to carry oxygen from the lungs to the body tissues,
- to exchange the oxygen for carbon dioxide, then carry the carbon dioxide back to the lungs where it is exchanged for oxygen.



- **Anemia** - is a potent multiplier of morbidity and mortality
- **Anemia** – unchecked, is associated with organ injury and unfavorable outcomes
- **Anemia** – should be viewed as a serious and treatable or modifiable medical condition, not simply an abnormal lab value
- **Anemia** – increases the cost of delivering health care by> 50 %
- **Anemia** – is a leading risk factor for blood transfusion

- **Transfusion** – although sometimes life saving there is indisputable evidence of potential harmful effects associated with transfusion

ANEMIA OFTEN ACCEPTED AS A NORMAL PART OF DOING BUSINESS

- **30-70%** of patients come to surgery anemic
- Long tradition of accepting anemia as a relatively harmless problem that can be corrected easily with transfusion; for many this remains the default position

- BUT

Blood transfusion is inherently hazardous and costly and should only be prescribed when there is evidence that patient benefit would outweigh the potential for harm.

RISK OF TRANSFUSION

- Transfusions are overused and sometimes inappropriate. – 40 – 60 % may be inappropriate, suggesting no benefit or worse harm to our patients!
- Exposing our patients to the risks of transfusion – TACO,TRALI, Sepsis, Allergic reaction, Bacterial infection,
- Increased mortality
- High cost of transfusions.
- Increased Length of Hospital Stay.
- Prolonged ventilation time.
- More risk of infection.
- Limited blood supply – good stewards for our blood donors

“ A transfusion will change our patients immune system for the rest of their lives”

PATIENT BLOOD MANAGEMENT ONTRAC

- Improve patient outcomes !
- Conserve limited resources !
- Identify cost-saving opportunities !

These goals are on the to-do list of every hospital administrator.

One initiative could simultaneously advance each of these important goals.

PATIENT BLOOD MANAGEMENT (PBM)

- -evidence based
- Multidisciplinary approach
- optimizing patients who might need a transfusion
- International initiative in best patient practice
- TRUST scale for predicting transfusion –
- Hemoglobin <130G/L
- Age > age 65 years
- Female Sex
- Weight < 50 kgms
- Creatinine > 120umol/L
- Nonelective surgery
- Previous cardiac Surgery
- Non-isolated surgery

ALTERNATIVES TO TRANSFUSION

- Anemia is modifiable and preventable risk factor
- Identify anemia
- Early evaluation and education
- 3 – 4 weeks before surgery
- CBC,TIBC, Ferritin, Retic Count,Folate, and B12 blood test
- Always keep in mind the expectant blood loss

TREATMENTS FOR ANEMIA

- **Oral Iron**

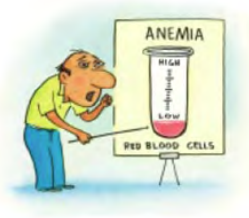
100 – 200 mgs. of elemental iron by mouth

1. Ferrous Fumarate 300 mgs , 1 – 2 tabs
2. Feramax 150 mgs. 1 -2 tabs

Or Heme Iron Polypeptide

1. Proferrin, Optifer or Jamp Iron 11 mgs. 1 – 3 tabs all per day.

TREATMENTS OF ANEMIA



- Intravenous Iron
- Venofer (Iron Sucrose)300 mgs iv X 3 doses ,q5 – 7 days
- **Criteria for venofer** –
- failed oral iron course of 3 months
- Intolerant of oral iron
- HGB < 70g/L
- HGB < 90g/L and symptomatic, persisting or worsening
- Intestinal malabsorption
- Hgb. optimization for surgery
- Pregnancy greater than 34 weeks

ERYTHROPOIETIN (EPREX)

- Eprex 20,000 – 40,000 iu. Sc. weekly to a maximum 4 doses
- Eprex must be supported by iron
- Coverage – third party coverage, government benefit plan, trillium or EAP
- Storage
- Blood work must follow
- Retic. HGB count
- CBC day of surgery
- Can be given post op

SOME PRECAUTIONS FOR ESA

- History of Seizures
- Thrombotic events - stroke
- Significant coronary artery disease
- Recent transient ischemic attacks (TIA)
- Uncontrolled congestive heart failure
- Renal Insufficiency pts. – increased risk of clotting complications
- Uncontrolled hypertension – eprex may cause BP to rise
- Cancer patients- tumor may grow faster if Hgb120g/l
- Gout – increase in uric acid

FOLLOW UP

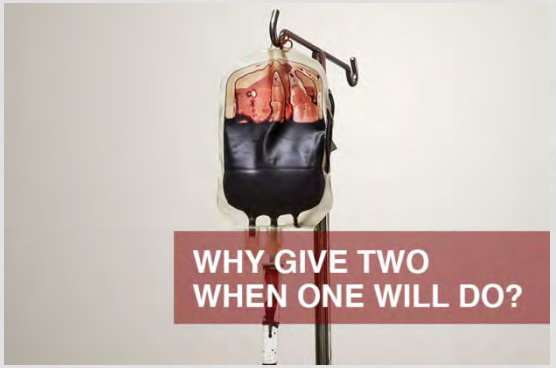
- Communicate with Family Physician or Nurse Practitioner
- Anemia
- Treatment
- Follow up

INTERESTING CASE STUDY

- Called to Maternal Child
- 47 yr. old female
- Hgb. 26 g/L MCV 76 fL
- Came to Emerg because of fatigue
- Pt. Blood management called
- 1 units RBC's and venofer 300 mgs.
- Hgb. 50 g/L, MCV 80 fL
- Venofer 300 mgs. As out Pt. x 2 more doses
- Hgb 96 g/L from March 28 – April 13
- Put on oral Iron

BEST PATIENT PRACTICE

- Blood transfusion can be life saving
- CWC – Why Give Two When One Will Do
- One Unit Transfusion Policy and Reassess
- Transfusion trigger
- Restrictive Transfusion Policy
- Look at your patient, not just a number – nurses are patients advocate – look at the whole picture
- ? Disch. pts with HGB >100 G/L



Factors to consider in the surgical transfusion decision

Clinical history

- Cardiopulmonary disease
- Existing coagulopathy
- Anemia
- Trauma classification (mechanism of injury)

Medications

- Antiplatelet drugs; Anticoagulants

Clinical symptoms

- Dyspnea on exertion; Angina

Hemoglobin/hematocrit level

Oxygen delivery/consumption

Surgical procedure (elective vs emergency; laparoscopic vs open)

Estimated blood loss

Jehovah's Witness

OTHER PATIENT BLOOD MANAGEMENT STRATEGIES

- Cell Saver
- Antifibrinolytics – Tranexamic Acid
- Bear Hugger
- Epidural Anaesthetics
- Hemodilution
- Special Scalpels
- Controlled Hypotension
- Rotem
- Autologous Donations
- Drains

IATROGENIC ANEMIA- HOSPITAL ACQUIRED ANEMIA

- 1/3 of patients admitted to ICU are Anemic
- 2/3 of ICU patients are anemic by day 3

Hospital-Acquired Anemia (HAA):

- Phlebotomy for diagnostic testing can result in iatrogenic anemia & transfusion -- the term "Medical Vampires" coined 30 yrs ago. In critically ill patients, almost half the volume of blood transfused was accounted for by diagnostic phlebotomy.

- Two studies found average daily blood sampling volume in ICU was 41 mL (represented 17% of total blood loss when in ICU for > 3 days).

- Traditionally, when drawing blood from indwelling devices (such as arterial or central venous catheters), the initial sample used to clear the line is discarded. A process and device to re-infuse the initial blood taken to 'clear the line' (drawback blood) was associated with a 50% reduction in diagnostic blood loss.

IATROGENIC ANEMIA

- Reduce surgical blood loss
- Reduce phlebotomy
- Reduce disguard tubes
- Diet rich in Iron foods
- Supplemental Iron therapy
- Just be **AWARE of hospital acquired anemia**

REFUSAL OF BLOOD PRODUCTS

- Working with our Jehovah's Witness patients
- Collaboration – Hospital Liaison Committee
- Cooperation
- Non Judgmental
- Hospital Policy and Procedure in place with timely review
- Medical Alternatives to Blood Transfusion
- Involve Risk management
- Rewarding
- Learning experience

TAKE HOME MESSAGE

- Both Transfusion and Anemia are dangerous
- We can and should treat the anemia to avoid the transfusion
- PBM will improve your patient outcomes, satisfaction and decrease healthcare costs
- Each RBC transfusion should be an independent clinical decision
- Know the risks, Benefits and possible alternatives
- Treat the signs and symptoms of anemia not just a number

CASE STUDY

- 85 yr. old Female
- Jehovah's witness Faith, refused blood products
- # hip
- Hgb. – 85 g/L MCV – 84
- Orthopedics called ??? What to do with this patient
- Venofer 300 mgs – X 2 doses, 1 pre-operatively
- TXA intra – Op and IV q8h X 2 more doses
- Bear Hugger
- Epidural anaesthetic
- Meticulous surgical technique.
- Post Op Hgb. day 1 - 80 g/L and day 3 – 85 g/L .
- Pt. disch. on day 5 to her retirement residence.

PBM is not easy

Bloodless medicine (or blood conservation or PBM)

Requires coordination of services across a variety of departments…. cooperation between outpatient scheduling, surgical and anesthesia physicians and their clinic personnel, operating room scheduling, intensivists and hematologists to get the patient prepared, …

This is in contrast to a transfusion, which can usually be accomplished with one phone call…. A plethora of new techniques and therapies are available … relative merits, alone and in combination, still needs to be investigated, **but it is becoming standard of practice.**

[from T Kickler, Johns Hopkins, Transfusion 43:550, May 2003]

LUCKY IRON FISH

- Cast iron ingots

- Placed in hot boiling water to leach the iron out into the water and food
- 2008 by a Canadian Christopher Grant University of Guelph
- Fish is a symbol of good luck to Cambodia
- Rate of anemia decreased by 43% in 12 months

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