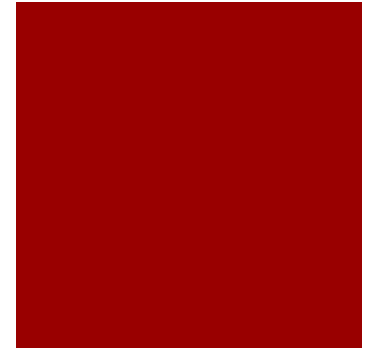




ED Transfusions

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Formal Objectives...

- Formulate a course of action for patient care using a myriad of factors involved in evaluating cases of dysfunctional uterine bleeding in an emergency situation
- Identify key factors in the decision making algorithm for transfusion in the emergency room of pregnant patients

...in English

- Presentation of cases from the ED to illustrate thought process when considering transfusion in the female patient



QCH ED Perspective

- Urban community hospital
- 75 000 emergency visits per year
- Catchment of ~ 1 million+



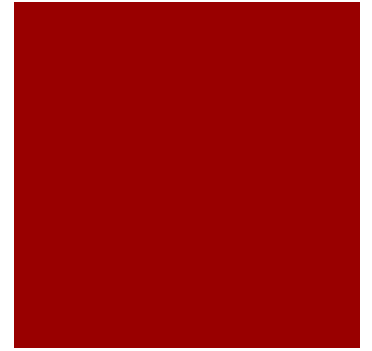
Do you know your limitations?



- You have to work within your own reality
- How many units of O Rh- or uncrossmatched type specific blood does your hospital have available?
- Do we get the blood or transfer the patient?
- How accessible are consultants?

Indications for PRBC transfusion in the ED

- Evidence of acute hemorrhage without immediate control



History

- 10/30 rule
- Hemoglobin above 10g/dL (100g/L)
- Hematocrit above 30%



History

- 1980s paradigm shift
- 1988 NIH Consensus Conference on Perioperative RBC Transfusions =>
 - No single criterion to be used as indication for RBC or component therapy
 - Multiple factors to consider
 - Clinical status
 - Oxygen delivery needs



When to transfuse?

- It's simple...
- When the risks of anemia outweigh the risks of transfusion.



Definition of Anemia

- A decrease in the number of red blood cells or less than the **normal** quantity of hemoglobin
- As per mayoclinic.com:
 - “Anemia is a condition in which you don’t have enough healthy red blood cells to carry adequate oxygen to your tissues”



Basic physiology of anemia (the emergency version)



- The bottom line...
 - Tissue oxygen- that's what we care about
 - Now
 - In the near future
 - Until we can deliver the patient to definitive safety or to a consultant who can (and will) handle definitive care

Basic physiology of anemia (the emergency version)



- O_2 delivery = Cardiac output x arterial O_2 content

$$DO_2 = CO \times \text{arterial } O_2$$

- We can affect DO_2 by
 - RBC transfusion
 - Improvement of oxyhemoglobin saturation
 - Augmentation of cardiac output

Basic physiology of anemia (the emergency version)



- At rest: DO_2 exceeds consumption by factor of 4
- This is why **volume** resuscitation works- we compensate
 - CO (stroke volume x heart rate)
 - O_2 extraction

Basic physiology of anemia (the emergency version)



- A study* of healthy patients who underwent **isovolemic** reduction in Hb to 5g/L (Hct =15%) resulted in no evidence of inadequate O₂ delivery
 - Increased stroke volume and
 - Heart rate
 - Reduced peripheral vascular resistance

*Weiskopf RB, Feiner J, Hopf H, et al. Heart rate increases linearly in response to acute isovolemic anemia. *Transfusion* 2003; 43:235

Basic physiology of anemia (the emergency version)



- In practice, transfusions of PRBCs should be considered and initiated when the patient develops **symptoms** of anemia regardless of the degree.
- Level of anemia when symptoms arise is variable
 - Age
 - Fitness
 - Underlying disease

Basic physiology of anemia (the emergency version)



- A Canadian, multicenter study of 838 critically ill patients challenges the approach to prophylactically transfuse to a hemoglobin of 10g/dL.
- No difference in mortality between patient groups randomly assigned to a transfusion strategy designed to maintain hemoglobin at 7 to 9 or 10 to 12 g/dL *

*Hebert PC, Wells G, Blajchman MA, et al. A Multicenter, randomized controlled clinical trial of transfusion requirements in critical care. Transfusion Requirements in Critical Care Investigators, Canadian Critical Care Trials Group. N Engl J Med 1999;

Case 1

- 46 yo female
- PV bleeding for 2 weeks waxing and waning
- Today cramping and passing clots
- Changing tampons q1-2h x 12 hours, saturated
- Now feeling lightheaded and gets presyncopal with rising from seated
- "at least" 2L of water PO today



Case 1

- G6P4A2 (all babies SVD)
- Last delivery complicated by PPH
- Regular periods until 3 months ago
- 1 missed period and now this...
- No hx of cardiac/resp/DM



Case 1 examination

- Pale, slender, in no distress, afebrile
- HR= 110 (her resting is usually 65)
- BP= 105/48
- Postural drop sitting to standing to 82/40
- RR= 18
- Chest/CVS wnl



Case 1 examination

- Abd bs+, soft, tender centrally low in pelvis
- Pelvic large BRB and clots, no adnexal or cmt
- Bedside EDE
 - no abd free fluid
 - no IUP



Case 1 investigations & Tx

- CBC
- T & S (or T&C?)
- Urine HCG

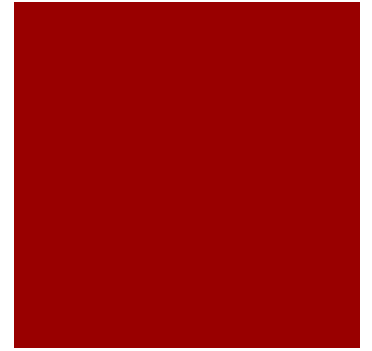
- crystalloid bolus



Case 1

- Neg urine pregnancy
- What's her hemoglobin???
- Hemoglobin 52

- Transfuse? Why?
- How much? How much time do we have?



Case 2

- 17 yo otherwise healthy female
- 2 day hx RLQ pain, at times severe much worse today, now 8-10/10
- 2nd day of menses, irregular cycles
- N/V/D
- not previously sexually active
- vegetarian



Case 2 examination

- Pale, medium build, moderate-severe distress
- 37.3 oral
- HR= 122
- BP= 92/60
- RR= 22



Case 2 examination

- Chest/CVS wnl
- Abd bs+, mildly distended, slight diffuse guarding, RLQ rebound, LLQ tenderness
- Pelvic not done
- Bedside EDE not done, machine out for repairs



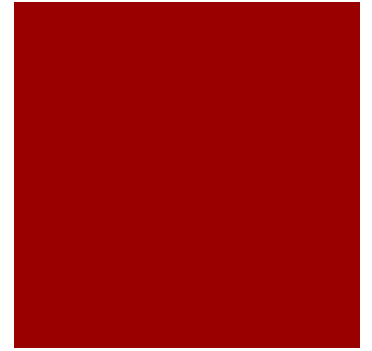
Case 2 investigations & Tx

- Lower abd pain directive
 - CBC, lytes, BUN, Cr, glucose
 - Urine R & M, C & S, HCG
- Blood cultures
- Formal U/S



Case 2 Investigations & Tx

- ? Abx
- Crystalloid bolus, how much?
- Pain control



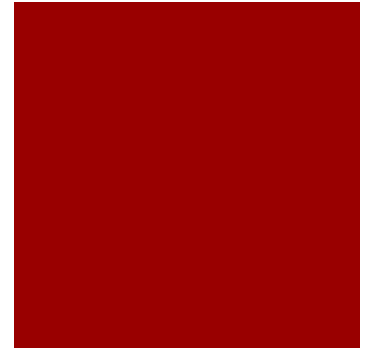
Case 2

- 2 hours later RN comes to find you...
- Just finished her bolus, pain 6/10, sleepy, not gone for her U/S yet
- Vitals...
 - 37.6
 - 118
 - 91/52
 - 20



Case 2

- Are you worried?
- Lab results? Not on the chart, pending in the computer...
- What does the U/S show?



Case 2

- While the patient is in U/S the RN pages you overhead to call her (you're busy in another area)
- Just as he tells you the patient's HCG is **positive** and her **hemoglobin** is **88** you get a stat call from the radiology department.
- **Free fluid** in the abdomen, R **ruptured ectopic**



Case 2

- OB/GYN consultant is doing a C-section, so anaesthesia is also busy
- What next?



Case 2

- Move patient back to ED and into resus
- Additional large bore IV access, 2 if possible
- Start aggressive crystalloid infusion with pressure bag
- Stat order 2 units PRBC, O Rh-
- As soon as they arrive, start infusion and prepare to transport ASAP when OR ready



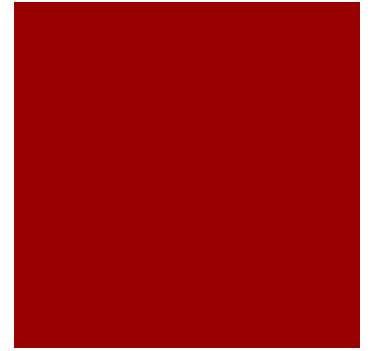
Case 3

- 36 yo, 11 weeks pregnant, G3P1A1
- 2 day hx of spotting, initially brown, then pink
- Mild nausea, no vomiting
- Otherwise healthy



Case 3

- Now pt c/o bright red PV bleeding large quantity including clots and cramping x 24 hours
- “too much blood”
- Soaking pads qhourly, progressively worse



Case 3 examination

- Pale, moderate distress
- 36.6 oral
- HR= 128
- BP= 126/85
- RR= 20



Case 3 examination

- H/N/Chest/CVS all wnl
- Abd bs+, no distention, tender central lower abd, no peritoneal signs
- Pelvic +cmt, bilateral adnexal tenderness, large clots in cervix and vagina, ++BRB
- Ext cool, pulses palpable
- Bedside EDE, no abd free fluid, no IUP



Case 3 investigations and Tx



- PV bleed directive blood work
 - Cbc, lytes, BUN, Cr, glucose, type and screen, quantitative HCG
- Formal U/S, OB/GYN consult
- Crystalloid bolus x 2L

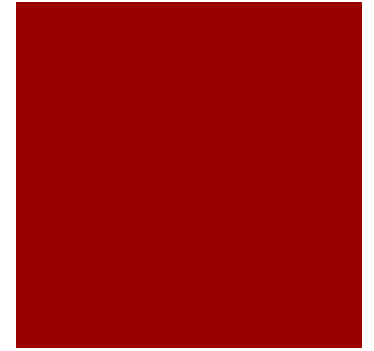
Case 3

- What is her hemoglobin?
 - 78
- Should I consider transfusion?
- How will I decide?
 - Symptomatic?
 - Bleeding controlled?
 - Patient consent?



Interesting...

- cma.ca InfoPOEMs
 - Restrictive transfusion strategy improves outcomes in acute upper GI bleeding
 - Bottom line: A restrictive transfusion strategy using a hemoglobin transfusion threshold of less than 7g/dL results in decreased mortality, shorter hospital stays, and fewer adverse events in patients with acute upper GI bleeding.



Thank- you!

