Critical Care Mailbag: Critical Transfusions

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- Type + Screen versus Type + Crossmatch
  - "Type": the ABO group for the patient.
  - "Screen": evaluates if the patient has any of the common minor antibody groups (such as Rh, Kell, Duffy, etc).
  - "Crossmatch": takes blood that matches the patient for both major and minor antibody groups and reserves it for the patient, essentially taking it out of the pool of available blood.
    - Blood bank performs a final confirmatory screen for major antibody compatibility.
  - Take Home #1: There is no need to routinely obtain Type + Cross on every patient who may need blood.
    - If the patient screens "negative" for any minor antibody groups, crossmatch is unnecessary.
    - If the patient needs immediate transfusion (eg, in the event of massive GI bleed or trauma with shock), you can transfuse without having the minor antibody groups known.
      - See EM:RAP 2021 November Mailbag
    - If the patient screens "positive" for minor antibody groups, crossmatch can be helpful in ensuring compatible blood is available.
  - Take Home #2: Every hospital should have a system where the blood bank notifies the clinician when the patient screens positive for minor antibodies.
    - In this situation, taking a number of units out of circulation is important to ensure that when the patient with minor antibodies needs a transfusion, they have the right blood available.

- Intermediate Transfusion Strategy
  - In most hospitals, massive transfusion protocol is the only way to rapidly get blood.
  - However, this approach is often more than is needed and can be wasteful as it utilizes a lot of resources and can shut the blood bank down to other patients.
    - Many bleeding patients will stabilize after 1-2 units making massive transfusion protocol unnecessary.
  - An intermediate pack can be considered
    - These are immediate-release "universal donor" blood products.
    - Scott recommends the pack consists of 2 units pRBCs and 2 units FFP.
  - Advantages
    - Enables rapid release of blood products.
    - If a patient stabilizes after 1-2 units, the blood bank hasn't over-activated and unnecessarily used resources.
    - This can act as a screen for massive transfusion protocol.
      - If the patient remains unstable after 2 units pRBCs, then the massive transfusion can be activated while administering the 2 units of FFP.
  - Role of plasma prior to procedure:
    - Target INR < 1.5 for delicate procedures like neurosurgery or lumbar punctures
    - In cirrhosis, INR is not an accurate measure of the patient's bleeding risk.
    - There is no specific target INR for central lines, chest tubes, thoracentesis or paracentesis.
      - There is no INR value that precludes the procedure.
- Calcium supplementation in massive transfusion
  - Citrate and other chelators in the blood can lower serum calcium levels. This is important as calcium is involved in hemodynamics as well as in the clotting cascade.
  - In an exsanguinating patient requiring massive transfusion:
    - Administer 1 g CaCl (or 2-3 g calcium gluconate) immediately.
    - Administer 1 g CaCl (or 2-3 g calcium gluconate) for every 2-4 units of product administered.
  - In non-massive transfusion in patients with a functional liver, there may not be a need to supplement calcium routinely as the liver can keep up with metabolizing citrate and other calcium chelators.

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