Perioperative Anemia Management

INTRAOPERATIVE CONSIDERATIONS

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SUMMARY

- Intraoperative considerations in perioperative anemia management Patient Blood Management (PBM) refer to the set of strategies and clinical practices used during surgery to minimize blood loss, preserve the patient's own blood, and optimize oxygen delivery with the ultimate goal of reducing or avoiding the need for allogeneic (donor) blood transfusions.
- Intraoperative perioperative anemia management focuses on Patient Blood Management to optimize oxygen delivery, reduce blood loss, and improve patient outcomes.
- This includes applying interdisciplinary blood conservation modalities, such as acute normovolemic hemodilution, hypothermia, and surgical technique optimization to minimize blood loss and the need for transfusion.

Why Are Intraoperative Considerations Important in Perioperative Anemia Management?

- Surgical blood loss can exacerbate existing anemia, making intraoperative management essential for improving a patient's ability to tolerate surgery and recover safely.
- Minimizing intraoperative blood loss reduces the need for transfusions and lowers associated risks, such as transfusion reactions, infections, and immune complications.
- Anemic patients have reduced oxygen-carrying capacity; intraoperative strategies help optimize oxygen delivery to ensure vital organs are adequately perfused, even with lower hemoglobin levels.

What Are the Key Strategies and Clinical Practices Utilized in Surgery?

Minimizing Blood Loss

- Surgical Techniques:
  - Meticulous hemostasis (precise bleeding control)
  - Minimally invasive approaches where possible
  - Use of electrocautery, harmonic scalpel,
  - Use of hemostatic agents to help control bleeding
  - Controlled Hypotension to lower blood pressure (within safe limits) to reduce bleeding
- Temperature Management:
  - Preventing hypothermia, which impairs coagulation and increases blood loss

Blood Conservation Techniques

- Cell Salvage (Intraoperative Autotransfusion): Collection, filtration, and reinfusion of the patient's own blood (Red Blood Cells only) lost during surgery
- Acute Normovolemic Hemodilution (ANH):
  - Removal of some blood pre-incision, replaced with fluids (Crystalloids and Colloids), then reinfused the patient's whole blood later
- Use of Tranexamic Acid (TXA):
  - Antifibrinolytic medication that reduces bleeding by stabilizing clots
- Restrictive Transfusion Strategies:
  - **Transfusions should be reserved for cases of acute, severe blood loss or when the patient becomes symptomatic due to anemia, rather than being based solely on hemoglobin levels**

Optimizing Coagulation

- Point-of-Care Coagulation Testing (e.g., TEG/ROTEM):
  - Real-time assessment of clotting function to guide targeted interventions
- Goal-Directed Therapy:
  - Use of platelets, plasma, fibrinogen, or coagulation factors only when indicated

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Anesthetic Considerations

- Anemia Tolerance and Oxygen Delivery Optimization:
    - Ensuring adequate oxygenation and perfusion despite lower hemoglobin
    - Use of restrictive fluid strategies and careful ventilator management

Communication and Team-Based Approach

- Preoperative planning with surgical, anesthetic, and transfusion services
- Clearly defined transfusion thresholds and triggers
- Open communication between the surgical, anesthesia, and blood bank teams is vital for coordinating intraoperative needs and ensuring patient safety
- Active monitoring of the patient's hemodynamic status (blood pressure, heart rate, oxygen saturation) and hemoglobin levels throughout the procedure is essential

What Are the Goals of Intraoperative PBM?

- Improve patient outcomes and recovery
- Reduce transfusion-related risks (e.g., infections, immunosuppression, volume overload)
- Conserve blood resources
- Enhance surgical safety and cost-effectiveness

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