ERAS for Acute Burn Patients with >20% TBSA Burns

Preoperative:

- Avoid prolonged fasting
    - For intubated patients, consider continuing tube feeding intra-operatively unless contraindicated, the patient will be prone during the procedure, or extubation is planned at the end of surgery.
    - For non-intubated patients, NPO after midnight except for electrolyte/carbohydrate drinks (e.g. Gatorade or Powerade) up to 2h prior to surgery (1st case starts should be encouraged to drink at 05:00 AM).
- Avoid hypothermia
    - Initiate measures to maintain normothermia during transport and in the OR (i.e. 37° C).
    - Preheat OR prior to anticipated surgery.
- Transport using the ventilator if any of the following are present
    - FIO2 > 0.50
    - PEEP > 8
    - PaO2/FIO2 < 200
    - Minute Ventilation > 12 Liters/min
- Estimate Anticipated Intraoperative Blood Loss
    - Expected blood loss from the tangential excision of a deep burn is 0.5-1 mL/cm^2. A pre-operative discussion with the surgical team about the surgical plan will aid in calculating the anticipated blood loss and facilitate the ordering of blood products accordingly in preparation for surgery. The actual intra-operative blood loss is mitigated by the use of a tourniquet, fascial excision, electrocautery, and the use of epinephrine soaked sponges.

Intraoperative

- Maintain normothermia using available warming methods
    - Increased ambient room temperature
    - Forced Air Warming (Bear Hugger Blanket)
    - Fluid Warmer
- No succinylcholine after the first 48 hours post burn. In addition, use non depolarizing muscular blockers only if necessary for the clinical scenario or procedure.
- Ketamine as adjunctive analgesia for patients regularly administered opioid analgesics
- For non-intubated patients, consider LMA whenever positioning and procedure permits
- Patients with late effect burns to neck and face should be considered a difficult airway due to restricted head and neck mobility, and reduced mouth opening. If intubation is required, then use video laryngoscope to facilitate the intubation and minimize repetitive glottic injury.
- Fluid Management
    - Avoid fluid overload. Goal is to maintain urine output 50-70 mL/hr (0.5-1 ml/kg/hr PBW). Reduce fluids if urine output is > 1 ml/kg/hr.
    - Hemoglobin goal perioperatively is 8 gm/dl. Transfuse as needed to maintain this goal unless goal is changed by burn team.
    - If albumin <2.5, then recognize the crystalloids will have limited utility for increasing intravascular volume. Assume that anemic and hypoalbuminemic patients are volume

contracted and will vasodilate following induction of anesthesia, resulting in a fall in blood pressure. Limit crystalloid to maintenance volumes and administer colloids or blood products to maintain intravascular volume. Hemoglobin values obtained during surgery are of very limited utility for guiding blood product transfusion.
    - If blood transfusion is not anticipated during the surgery, then administer albumin to maintain intravascular volume.
    - If blood transfusion is required for the proposed surgery, then administer FFP and PRBC in a 1:1 ratio. Administer platelets if < 50,000. Cryoprecipitate is rarely warranted.
- Adapt anesthetic plan to maintain hemodynamic stability in an effort to minimize the use of vasopressors; especially when autografting burn wounds as this may contribute to graft loss.
- Hourly huddle between surgeons and anesthetists to discuss patient's condition; to include temperature trends, urine output, hemodynamic and pulmonary status.
- For prone cases involving surgery on the neck, consider using the Mayfield head holder. This permits head positioning in neutral or flexion.

Postoperative

- Maintain normothermia using available warming methods
    - Raising ambient room temperature
    - Forced Air Warming (Bear Hugger Blanket)
    - Fluid Warmer
- Titrate oxygen therapy to maintain SpO2 > 93%.
- Titrate fluids to maintain urine output 50-70 ml/hr (0.5—1 ml/kg/hr PBW). Consider administering colloids (Fresh Frozen Plasma or Albumin) in place of crystalloid when Serum Albumin < 2.0.
- Obtain a full set of labs including CBC, CMP, ionized calcium and ABG.
- Transfuse to maintain Hemoglobin >7.0 gm/dl.
- Initiate ventilator weaning, as appropriate, following recovery from anesthesia and the completion of any resuscitation required postop. Patients able to breath spontaneously should be placed on a ventilator mode that permits them to do so (i.e. Volume Support, Pressure Support).
- Attempt to reduce the amount of narcotics required to treat postoperative pain by including opioid sparing measures. Burn patients postoperatively will require multimodal treatment of their pain; to include gabapentin and acetaminophen. NSAIDs may impair renal function in critically ill burn patients and should only be administered in consultation with the burn team.
- Consult Physical Therapy and initiate therapy in the immediate postoperative period. This includes the use of splints and elevation of the burned areas. Splints applied following autografting are to remain in place until postoperative day #4.
- Early mobilization out of bed is recommended when possible.
- Resume tube feeds postoperatively if held for surgery, or resume diet when the patient is awake and able to eat.
- Remove urinary catheter as soon as the patient is able to void without soiling dressings to minimize the risk of catheter associated infections.