State Burn Coordinating Center
STATE OF MICHIGAN

Guidelines for Burn Resuscitation

January 2018

PURPOSE

To provide standardized orders and a protocol for the U of M Burn Service regarding burn patient resuscitation in the intensive care unit. Recommendations are also included for difficult fluid resuscitation and hypotension.

DEFINITION

This protocol applies to all cutaneous burn patients. Prior to initiating the protocol an assessment of the patient's TBSA burn must be performed including only partial and full-thickness burn injury using the Rule-of-Nines diagram. Obtain the patients weight or close estimate in kg.

RESUSCITATION GUIDELINES

1. **First 24 hours post-burn.**

A. TBSA < 20%

1. Maintenance IV fluid until patient taking adequate oral intake.

B. TBSA ≥ 20% and Weight ≥ 30 kg

1. Calculate estimated intravenous fluid needs:
   a. 2 cc of LR x kg body weight x %TBSA burn
   b. Administer half of calculated volume over the first 8 hours post burn. (8hr – time since injury in hrs)
   c. Administer remaining half of calculated volume over the subsequent 16 hours.
2. If the patient's urine output is less than 0.5 cc/kg/hr (usually 30 cc/hour) then increase the infusion of LR by 33% of the hourly calculated fluid requirement.
3. If the patient's urine output is > 70 cc/hour:
   a. Dip urine to exclude glycosuria.
   b. Decrease the infusion of LR by 33% of the hourly calculated fluid requirement.
   c. Do not decrease IVF rate below 175 cc/hr.

C. TBSA ≥ 20% and Weight < 30 kg

1. Calculate estimated intravenous fluid needs:
   a. 3 cc of LR x kg body weight x %TBSA burn

b. Administer half of calculated volume over the first 8 hours post burn.
c. Administer remaining half of calculated volume over the subsequent 16 hours

2. If the patient's urine output is less than 1 cc/kg/hr then increase the infusion of LR by 33% of the hourly calculated fluid requirement.
3. If the patient's urine output is > 1/cc/kg/hour:
   a. Dip urine to exclude glycosuria.
   b. Decrease the infusion of LR by 33% of the hourly calculated fluid requirement.
   c. Do not decrease the total IVF rate below 1.5x calculated maintenance rate in cc/hr.

D. Place enteral feeding tube as early as possible in all patients with burns ≥ 20% TBSA.

E. Consider cardiac output monitoring for intubated patients with TBSA ≥ 30%, age > 50 yrs and/or inhalational injury.

F. At 12 hours after burn injury, assess IVF administered and calculate the projected 24 hour total IVF if fluid rates are kept constant. If the projected 24 hour IVF requirement exceeds 6cc/kg/%TBSA burn then switch to the difficult fluid resuscitation guideline.

2. 24 hours post-burn.

A. Check serum Na^+ and K^+ every 12 hours on the second burn day.

B. Adjust type of fluid by the serum Na^+ level.

C. If after 24 hours the IVF rate remains high consider switching to 5% albumin.

D. Goal is to decrease IVF rate to half of rate infused over the previous 16 hours. (Attending input recommended).
1. If the patient is > 30 kg, the urine output goal is 0.5 cc/kg/hr (usually 30 cc/hour with a maximum of 70 cc/hour).
2. If the patient is ≤ 30 kg, the urine output goal is 1 cc/kg/hr (maximum 2/cc/kg/hr).

3. Treatment of low urine output

A. In adult patients with continued low urine output despite increased fluid rates:

a. Consider cardiac output monitoring

b. If central pressures normal to high with low urine output

   i. Start low dose Dobutamine @ 5mcg/kg/min

c. If central pressures are low with low urine output

   i. Continue fluid resuscitation at increased rate

4. For patients with burns > 20% TBSA start Oxandrolone 10 mg po BID.