

# MMC BURN RESUSCITATION PROTOCOL

## Acute burn resuscitation protocol

Adults with TBSA  $\geq$  20%, children with TBSA  $\geq$  15%

### Standard crystalloid resuscitation

#### First 24 hours

##### Hours 0-6

- Administer IV LR; initial estimate is 3ml/kg/percent burn, with half administered over first 8 hours post-injury
- Goals: urine output 30ml/hr (adults), mean arterial pressure (MAP): 60 mmHg
- Children (< 30 kg): add maintenance fluid, using D5 LR
- Children (< 30 kg) urine output goal: 0.5mL/kg/hr, systolic blood pressure (SBP) goal: age-appropriate minimum (by Broselow chart)
- Reduce LR rate by 10% every hour that resuscitation goals are met
- If uo 20-29ml in past hour, increase LR rate by 10%
- If uo 10-19 ml in past hour, increase LR rate by 20% and call attending
- If uo <10 ml in past hour, increase LR rate by 30% and call attending

### Adjuncts to resuscitation

#### First 24 hours

##### Down Titration of IV fluids

- Goal UOP for adults is 25cc -35cc during acute phase
- For sustained (more than 2hrs) UO > 45cc/hr, Decrease LR rate by 10%
- If UO > 60cc/hr for past 2 hours, decrease LR rate by 20% and call attending
- If UO > 85cc/hr for last hour, decrease LR rate by 30% and call attending to discuss more aggressive down titration of fluids

#### Identification of patients with difficult resuscitation (hours 6-12)

- LR infusion rate increased twice (or more) in hours 6-12 of resuscitation
- Ongoing crystalloid requirement for 1<sup>st</sup> 8 hours expected to exceed 150% of predicted volume
- By the 12<sup>th</sup> hour post-injury: Hourly LR infusion rate exceeds 80% of the rate predicted for 1<sup>st</sup> 8 hours

Notify Attending MD  
Consider OR/SCU excision + Xeno  
Or  
**Plasma exchange (if available)**

For every hour that resuscitation goals not met during hours 8-24, increase LR rate by 10% and:

#### Colloid rescue

Administer 250 ml of 5% albumin over 1hour, may repeat dose once for maximum of 500ml of 5% albumin. If goals still not met, notify attending MD - may consider Colloid only resuscitation after hour 10.

#### Second 24 hours

##### Resuscitation parameters

- Reduce crystalloid infusion by 10% every hour that resuscitation goals are met
- Target maintenance infusion: 1500 ml/m<sup>2</sup> estimated BSA over 24 hours
- Urine output and MAP goals: same as first 24 hours
- **For every hour that resuscitation goals not met**

#### Second 24 hours

##### Colloid supplementation

Administer 250 ml of 5% albumin over 1hour, may repeat dose once for **maximum** of 500ml of 5% albumin. Notify Attending MD if resuscitation goals still not met.

## **Acute burn resuscitation protocol**

### **Adults with TBSA $\geq$ 20%, children with TBSA $\geq$ 15%**

Type of crystalloid: LR (and maintenance fluid in children < 30 kg) is the initial crystalloid resuscitation fluid.

Crystalloid bolus infusion: A 500 ml LR bolus is a recommended treatment in a patient with a systolic blood pressure (SBP) < 90 mmHg and MAP < 60 mmHg, confirmed on repeat measurement. Along with bolus infusion, hourly LR infusion is increased by 10% of current rate. For children < 30 kg, the bolus is 10 ml/kg of LR.

Colloid infusion: Colloid infusion protocol is detailed in flow chart. No colloid administration outside of the protocol should be administered.

Vasopressor use: Vasopressin 0.025 U/min is first line vasopressor treatment for low mean arterial pressure (<60mmHg). Vasopressor initiation needs attending physician authorization.

Resuscitation goals: include an hourly urinary output of 30ml/hr and a MAP of 60mmHg. For patients whose pre-injury dry weight is less than 60kg, a urinary output of 0.5 ml/kg/hour is targeted. For Children (< 30 kg), the urine output goal is 0.5mL/kg/hr, the systolic blood pressure (SBP) goal is according to age-appropriate minimum (detailed in Broselow chart)

???Coordination of plasma exchange: The burn service is responsible for providing dialysis access prior to the start of the plasma exchange procedure. \*\*\*\*\* Availability @ MMC

Monitoring parameters: Hemodynamic monitoring consists of continuous EKG, pulse oximetry, Q10min blood pressure monitoring and/or arterial line placement, and Foley catheter for urinary output and bladder pressure measurements. Urinary output is recorded hourly during the first 48 hours. Analgesics and sedatives are provided with goal to keep an alert and calm patient. Active ambient warming (heat shield, Bair hugger) of the patient and local environment is initiated to maintain a core body temperature of at least 37°C.

Nutrition: Enteral nutrition should be started as soon as feasible after admission and at the latest by 6 hours. Since oral nutrition cannot achieve caloric goals in patients with challenging resuscitation, a feeding tube should be placed for gastric or postpyloric feeding and nutrition commenced.

Eye care: All burn patients with > 25% TBSA burns undergoing resuscitation should have ophthalmologic consultation.

Glucose control: No intravenous dextrose is administered in adults the first 24 hours, except in patients with persistent serum glucose  $\leq$  50 mg/dL. Treatment for hyperglycemia will be initiated for blood glucose  $\geq$  180 mg/dL. Hyperglycemia is managed with continuous IV insulin infusion for a serum glucose goal < 150 mg/dL.

Surgical management in first 24 hours: Only surgical procedures approved by the attending physician should be permitted. These include establishment of a surgical airway, emergency amputations, decompression procedures for extremities and abdominal compartment syndromes, and long bone stabilization procedures. If feasible, surgical procedures should be performed at the bedside so as to avoid patient transport.