Burn Trauma Conference: Burn Resuscitation

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Disclosure

- Feldman
 - Avita Research grant

Learning Objectives

- Review the latest updates to our approach to burn resuscitation
- Review the approach to burn resuscitation in the setting of additional trauma, inhalation injury, and electrical injury
- Review the approach to non-responders
- Understand appropriate times to escalate information during burn resuscitation
- Apply the Evans-Haynes Burn Center (EHBC) approach to burn resuscitation in different case scenarios

What aspect of the burn qualifies a patient for burn resuscitation?

- Adult?
- Pediatric?
- Electrical?
- Inhalation injury?

Mediators of Increased Vascularity Cysteinyl Leukotrienes



What are some pitfalls of burn resuscitation?

- Over-resuscitation
 - Fluid Creep
 - Over estimation of burn size
- Reluctance to reduce fluids
- Use of goal-directed resuscitation
 - Resuscitation based on vital signs or lab findings only
- Compartment syndrome
- Wound conversion
- Cardiac or Pulmonary compromise

Initial 24 Hours

- Familiarize yourself with the guideline
 - Sharepoint, Evans-Haynes Burn Center Policies section
- 2 ml of fluid x weight in kg x TBSA burned
 - This is a starting point
 - Starting rate depends on time from injury and pre-hospital fluids
 - Use 4 instead of 2 for electrical injury patients
- Goal urine output
 - Adults (>/= 15 years): 30-50 ml/hr
 - Pediatric: 1 ml/kg/hr

Initial 24 hours

- Titrate to maintain urine output goal based on the guideline
- Avoid fluid boluses in general
- No Colloid (5 % human albumin) until at least 8 hours from the time of the injury







Patient Label

RESUSCITATION FORMULA USED FOR BURNS 20% OR GREATER: 3mi LR X TBSA X Weight (kg) = Estimated 24 hr fluid requirement calculated from time of injury Desired urine output is 30-50mi/hr Time of Injury: Time of Arrival to ED: Patient Weight (Kg): Admission: Total in: Total out: Percent burn from SAGE IIc: Amount recvd pre-hospital: 24 hour expected fluid: 1st 8 hour expected fluid: Following 16 hour expected fluid:

Evans-Haynes Burn Center Adult Fluid Resuscitation Flowsheet

Date:														
Time / Hour Post Burn	Crystallold	Colloid	Hourly Total	Running Total	HR	UOP	BP	MAP	SVV / CVP	Bladder Pressure	Base Deficit	Lactate	Vasopressors	Comments
/1							1		1					
/2							1		1					
/ 3							1		1					
/4							1		1					
/ 5							1		1					
/ 6							1		1					
17							1		1					
/ 8							1		1					
8h TOTAL														ROR LOW URINE OUTPUT (40 ML FOR 2 HOURS)
/ 9							1		1					
/ 10							1		1					
/ 11							1		1					
/ 12							1		1					
/ 13							1		1					
/ 14							1		1					
/ 15							1		1					
/ 16							1		1					
/ 17							1		1					
/ 18							1		1					
/ 19							1		1					
/ 20							1		1					
/ 21							1		1					
/ 22							1		1					
/ 23							1		1					
/ 24							1		1					
16h TOTAL														
24h TOTAL														

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Pilot by Evans-Haynes Burn Center

Escalation criteria for resuscitation

- Hemodynamic instability
- Hypotension
- Eminent vasopressor usage
- Anuria
- Oliguria for 2 consecutive hours
- Increasing arterial lactate
- Inability to place/verify gastric access upon admission

Fluid Resuscitation Adjuncts

- Foley catheter placement as soon as possible
- Establish feeding access and start tube feeds within 24 hours (unless contraindicated)
 - Can be gastric!
- Arterial line placement and Vigileo/FloTrac monitor with continuous waveform pulse analysis on admission
- Follow lactate levels BUT lactic acidemia alone does not necessitate fluid bolus
- Discuss before giving a bolus



2 y/o Female with scald burn



2 y/o Pulled a bowl of soup down onto herself



24 y/o Male pilot of a small plane that crashed



45 y/o Male trapped in a burning car



Eshcarotomies

- Why
- When
- How
- Where
 - What part of the hospital is appropriate
 - Anatomic location

Escharotomy incision sites









30 y/o Housefire



Escharotomy incision to lower extremity



Escharotomy incision upper extremity



40 y/o Male housefire





Decompressive laparotomy



60 y/o Female caught her clothing on fire while smoking inside



Finding on indirect laryngoscopy



Limited transthoracic echo (LTTE) Superior

Heart

Infe

Liver

IVC

IVC Collapse

Rescue Protocol

- Approach to patients who don't respond
 - Rule out trauma
 - Start albumin drip (1 mL/Kg is converted to 5% albumin and subtracted from the total crystalloid rate)
 - Consider early dialysis
 - Check bladder pressure every four hours
 - Early excision...

Mechanism and approach to resuscitation?





What do we teach our prehospital providers?

- 5 years and younger
 - 125 mL/hr
- 6 13 years
 - 250 mL/hr
- 14 years and older
 500 mL/hr

• Only includes second and third degree injuries

THANK YOU

