

# Development and Implementation of a Nurse Driven Burn Fluid Resuscitation Protocol

Cheri Filewood RN, Megan Draney RN, Mary Martinat BSN Maria Ortega-Polanco RN RN, Stephen Ingerson APRN-CNS RN, Andrea Kovalcheck BSN RN, Emily Lashway-Fitzgerald BSN RN



## BACKGROUND

The adult burn patient with a total body surface area(TBSA) greater than 20% requires IV fluid resuscitation of Lactated Ringers for the first 24hours post burn injury. The Modified Brooke formula is used to calculate the IV fluid requirements; it is  $2\text{ml LR X WT(kg) X \%TBSA}$ . Burn injuries are followed by a trauma host response proportionate to the size of the burn %. This results in increased capillary permeability, increased tissue edema, and decreased intravascular volumes. The goal of fluid resuscitation in the first 24hours post-injury is to maintain tissue, organ perfusion and function, avoid burn shock and complications of administering too little or too much IV fluids. IV boluses are to be avoided as complications of too much fluid can result in fluid creep, increased tissue edema, compartment syndrome, and contribute to pulmonary and cerebral edema. In contrast, insufficient fluids can result in hypovolemia, inadequate tissue and organ perfusion, shock, and kidney injury.

## PURPOSE

Develop and implement a nurse-driven fluid resuscitation protocol for the adult burn patient with a TBSA greater than 20 percent.

- To decrease the variation of orders in administering IV fluids, decrease the need for IV boluses.
- To decrease the time to receive orders to adjust the IV resuscitation fluids based on the hourly urine output. Reduce the risk of over/under resuscitating by administering small incremental IV fluid changes.
- To improve patient outcomes.

## METHOD

The Burn Unit Based Council working group was established and reviewed the evidence-based research. It developed an algorithm of adjusting the IV resuscitative fluids hourly based on the hourly urine output via an indwelling catheter into the bladder.

Provisions are included in the algorithm when to call the Doctor based on the hourly fluid output and the required IVF adjustment increase or decrease greater than 20% of the current fluid rate.

The interprofessional working group consists of the Burn Clinical Nurses, the Burn Program Manager, the Burn unit manager, the clinical nurse specialist. Once the algorithm was finalized and approved by the Burn Medical Director, it was forwarded to the Burn Pharmacist to be incorporated into the MAR, EPIC charting.

- The algorithm was then added to the Adult Burn order set.
- A PowerPoint educational presentation was developed and aided in the burn nurses' education during the mandatory staff meeting.
- The PowerPoint was then added to the ESS as a mandatory requirement for all burn staff to complete within the required timeframe.

Total IV fluid rate adjustments based on hourly urine output in ml/hr

- <15 ml/hr = Increase total IV fluid rate by 20% (max 200ml/hr increase)
- 15-29 ml/hr = Increase total IV fluid rate by 10% (max 100ml/hr increase)
- 30-50 ml/hr = No change
- 51-200 ml/hr = Decrease total IV fluid rate by 10% (max 100ml/hr decrease)
- >200 ml/hr = Decrease total IV fluid rate by 20% (max 200ml/hr decrease)

## RESULTS

Initial feedback from the Nurses after the implementation of the Nurse driven fluid resuscitation protocol has been positive:

- easy to follow
- can adjust the IV fluid rate hourly based on the urine output with no delay in waiting for
- orders no variation in orders received from various Physicians.
- a noticeably decrease in edema formation.

## CONCLUSIONS

To monitor the effectiveness of the fluid resuscitation protocol, the number of IV fluid boluses required, monitor fluid creep, edema, patients weight, and the occurrence of abdominal and extremity compartment syndrome, and the requirement of escharotomies due to fluid creep/edema.

Conduct a retrospective chart review of patients with greater than 20% TBSA and compare to patients after the implementation of the Nurse driven fluid resuscitation protocol.

## REFERENCES

See Poster author for references

