Problem: Burn injured patients with significant Total Burn Surface Area percentage (%TBSA) sustain intravascular volume depletion within the first 24 hours of injury. Fluid requirements necessary to replace fluid loss are calculated based on weight, %TBSA. Restoration of fluid volume is necessary to maintain organ function. However, due to various phenomena like fluid and opioid creep and other factors, burn patients are at risk for fluid overload which can result elevated abdominal pressures, prolonged dependence on mechanical ventilation and other negative sequelae.

Evidence: Studies have highlighted the detrimental effects of over-resuscitation and indicate a need for a nurse-driven protocol to manage fluid more accurately. Research indicates that a patient is resuscitated with 250ml/kg in less than 24 hours, the risk for abdominal compartment syndrome (ACS) increases.

Strategy: A Parkland formula worksheet and an algorithm for the bedside was designed for use by the physicians and nurses. The algorithm is based on hourly urine output as an endpoint of resuscitation; the primary nurse uses the tool to titrate in increments of ten and twenty percent to more tightly manage the amount of fluid used in resuscitation.

Practice Change: Practitioners shifted from using intravenous boluses to treat oliguria. Nurses managed resuscitation in an effective and timely manner.

Evaluation: Once the protocol was implemented, each patient admitted thereafter with a greater than 15% TBSA burn was reviewed and data collected regarding heart rate, mean arterial pressure, intake and output with the final resuscitation volume calculated in ml/kg/%TBSA.

Results: In our retrospective study of burn patients (n=23) the average resuscitation volume was 7.7ml/kg/%TBSA. After introduction of the nurse driven protocol a two year review was conducted (n=19), volumes averaged 7.3ml/kg/%TBSA (SD+4.63).

Recommendations: Education regarding the use of the algorithm and the detrimental effects of over-resuscitation must reach beyond the burn center to emergency personnel.

Lessons Learned: The protocol works well when applied; patients with significant injury were successfully resuscitated with volumes of 2-4ml/kg/%TBSA.

Bibliography:
Dulhunty JM, Boots RJ, Rudd MJ, Muller MJ, Lipman J. Increased fluid resuscitation can lead to adverse outcomes in major-burn injured patients, but low mortality is achievable. Burns. 2008 Dec;34(8):1090-7.