



# From Prone to Upright: A case study in the challenges of feeding in the trauma ICU

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## High Speed Motor Vehicle Crash's

"In 2008, there were an estimated 5,811,000 police-reported traffic crashes, in which 37,261 people were killed and 2,346,000 people were injured" <sup>1</sup>



## Case Study

A 25 year old Male was the unrestrained driver of a vehicle. He was found under a steering wheel and intubated at scene. Once stable he was airlifted to HMC.

## Initial Assessment:

### Assessment:

-190cm 115kg (based on family reported usual body weight). BMI 31.9.

-Injuries included small frontal/parietal hemorrhagic contusions (traumatic brain injury), bilateral pulmonary contusions (acute respiratory insufficiency), multiple rib fractures, spinal fractures, and minor fluid collection in the abdomen.

-There were no signs of malnutrition.

-Needs were assessed using the following: BEE x1.2-1.4, 1.5-2.0grams of protein/kg usual body weight

### Diagnosis:

Inadequate PO intake related to intubation status as evidence by naso-gastric tube for enteral access.

## Intervention: Enteral Feeding

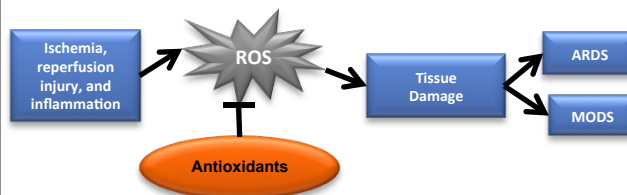
The patient was intubated upon assessment and a naso-gastric tube was available for feeding. The patient was started on a high protein with fiber formula providing 27kcal/kg and 1.7g protein/kg when goal rate would be achieved.

## ARDS and MODS

Acute Respiratory Distress Syndrome (ARDS): Characterized by inflammation and increased vascular permeability in the lung. This decreases the lungs function and requires mechanical ventilation.

Multiple Organ Dysfunction Syndrome (MODS): Characterized by altered organ function which inhibits the ability to maintain homeostasis. This is often caused by uncontrolled inflammation in the critically ill.

## Intervention: Trauma Vitamins



### Trauma Vitamin Protocol: <sup>2,3</sup>

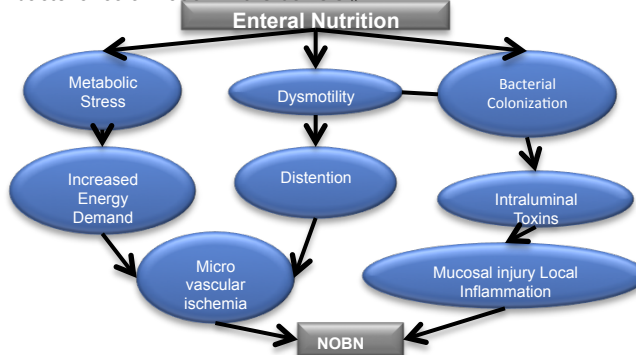
1000mg Vitamin C TID IV x2 days, pft x 5days

1500 IU Vitamin E BID pft x 7days

400mcg Selenium q day IV x2 days, pft x 5 days

## Monitor and Evaluation: Vasopressors and Fiber

The patient was placed on vasopressors during the first 48 hours. A fiber free formula was used to decrease the fluid collection and bacterial colonization in the bowels.



## Monitor and Evaluation: Prone Position

The patient presented with severe ARDS in the first 7 days. To improve lung functions the patient was placed in a prone position for 5 days during his stay. Despite the lack of data, it is possible to feed a prone positioned patient with continued monitoring for tolerance and bowel tones.<sup>5</sup> Thus, enteral feeding was continued.

## Monitoring and Evaluation: Continuous Renal Replacement Therapy

Acute Kidney Injury is common in MODS and often requires renal replacement therapy. Continuous Renal Replacement Therapy (CRRT) provides a method of dialysis 24 hours to avoid large fluid swings. The patient underwent CRRT for 4 days during his second week. Due to the continual filtration of fluids, nutritional concerns include increased protein/amino acid and water soluble nutrient losses.<sup>6,7</sup>

### Recommendations for tube feeding during CRRT include:

Renal formula (low K and Phos)  
25-35kcal/kg and 1.5-1.8g/kg protein  
Glutamine supplementation  
MVI + mineral  
Vitamin C 250mg  
Selenium 100mcg/d  
Thiamine 100mg/d

## Outcome:

With constant re-evaluation, re-assessments, and changes to the interventions this patient slowly recovered. Renal function returned, however respiratory status did not fully recover during his ICU stay. During the 4 weeks of evaluation the patient received 68% of recommended kcals and start PO towards the end of the 4 weeks.

### ACKNOWLEDGEMENTS

Katie Farver RD and the Harborview dietitians!

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5.Van der Voort et al. Enteral feeding in the critically ill: comparison between the supine and prone position. Crit Care 2001; 5:216-220.

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