

<b>Abstract Title:</b>	<b>Hydroxocobalamin Administration after Inhalation Injury is not Associated with Mesenteric Ischemia</b>
<b>Author and Co-authors:</b>	Abigail J. Engwall, MD; Anna Blache, RN; Alicia Lintner, NP; Clint Leonard, NP; Kaitlin Alexander, Pharm; Steven Kahn, MD University of South Alabama Medical Center, Arnold Luterman Regional Burn Center Mobile, AL
<b>Objective:</b>	Upon completion of the lecture, attendees should be better prepared to: <ul style="list-style-type: none"><li>• Discuss the safety of cyanokits related to mesenteric ischemia</li></ul>
<b>Abstract:</b>	<p><b>Introduction:</b> Hydroxocobalamin was initially used in France in the 1980s to treat suspected cyanide toxicity. In 2006, the FDA approved hydroxocobalamin and it is sometimes used in burn centers and by first responders to treat cyanide toxicity that occurs with smoke inhalation injury. Some limited data suggests this may be a life-saving intervention, but large scale prospective studies are lacking. A recent retrospective publication from France suggests that hydroxocobalamin administration after burn and inhalation injury may be associated with an increased risk of mesenteric ischemia. The purpose of this study is to describe a single center's use of hydroxocobalamin for inhalation injury and characterize the risk of mesenteric ischemia.</p> <p><b>Method:</b> This study was a retrospective analysis of all burn patients who received hydroxocobalamin for suspected inhalation injury at a regional burn center over a 3 year period. Demographics and outcomes were recorded, including incidence of mesenteric ischemia. Mesenteric ischemia was defined for this study as presence of pneumatosis or perforation on CT scan or necrotic bowel on laparotomy. Inhalation injury was diagnosed by either an ABG with elevated carboxyhemoglobin or via bronchoscopy.</p> <p><b>Results:</b> Over a 3 year period, 21 patients received hydroxocobalamin. Three were excluded and had withdrawal of care for what was deemed to be a non-survivable injury. Patients were primarily male (72%) with a median age of 60.5 years (IQR: 47, 66). Four patients had isolated inhalation injuries without cutaneous burn injury. Total Body Surface Area of burns had a mean of 10% (IQR: 0.4, 39). Sixty-six percent of inhalation injuries were confirmed with bronchoscopy. Thirty-nine percent were confirmed by carboxy hemoglobin with 33% receiving both and 2 patients receiving cyanokits without carboxy hemoglobin testing or bronchoscopy. Five percent (1 out of 18) of patients suffered mortality. This patient developed renal failure and abdominal compartment syndrome requiring decompressive laparotomy after large volume</p>

resuscitation. Baux scores were calculated to be a median of 10 (IQR: 5.75, 28.25). None of the patients in the study developed mesenteric ischemia.

**Conclusion:** Hydroxocobalamin administration was not associated with mesenteric ischemia in this study. Although prospective data about efficacy is lacking, it appears to be safe in the current study. The suggestion of increased risk in the French study was likely related to something intrinsically different about severity of illness and clinical course in the group that received the drug when the retrospective study was performed. Additional large scale studies regarding treatment for cyanide toxicity should be conducted in the future to further delineate the role for hydroxocobalamin.

#### **References and Resources**

1. Borron SW, Baud FJ, Barriot P, Imbert M, Bismuth C. Prospective study of hydroxocobalamin for acute cyanide poisoning in smoke inhalation. *Ann Emerg Med.* 2007;49(6):794-801. &&& ase. FDA approves drug to treat cyanide poisoning. US Food and Drug Administration. December 15, 2006
2. Jones, K. (2008). Applied pharmacology. Hydroxocobalamin (Cyanokit): a new antidote to cyanide toxicity. *Advanced Emergency Nursing Journal*, 30(2), 112-121
3. Marina Taccori, S., Christian De Tymowski, T., & Francois, D. et al. (2018). Risk factors for acute mesenteric ischemia in critically ill burns patients- a matched case-control study. *Shock Society.* doi:10.1097/SHK.0000000000001140

#### **Disclosure:**

Abigail J. Engwall – No Relevant Financial Relationships to Disclose  
Anna Blache – No Relevant Financial Relationships to Disclose  
Alicia Lintner – No Relevant Financial Relationships to Disclose  
Clint Leonard – No Relevant Financial Relationships to Disclose  
Kaitlin Alexander – No Relevant Financial Relationships to Disclose  
Steven Kahn – No Relevant Financial Relationships to Disclose