



VCU

VIRGINIA COMMONWEALTH UNIVERSITY

“New Treatment for Carbon Monoxide and Cyanide Poisoning” VCU # 12-65

Applications

- Carbon monoxide poisoning
- Cyanide poisoning
- Smoke inhalation injury
- Use by first-responders, firefighters, military

Advantages

- Treats both carbon monoxide and cyanide poisoning
- Less expensive than current treatment
- Can be administered earlier, therefore more effective
- No known side-effects

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Market Need

Carbon monoxide (CO) poisoning resulting from smoke inhalation is a common cause of serious injury and mortality in fire victims, firefighters and military personnel. With smoke inhalation victims, CO poisoning often coexists with cyanide poisoning. Although a commercially available treatment known as Cyanokit exists for treating cyanide poisoning, there are no available treatments that are effective antidotes for both cyanide and CO poisoning. In fact, the only current treatment for CO poisoning is Hyperbaric O₂ (HBOC) therapy, which requires a large immobile pressure chamber, making it widely unavailable, especially for military applications involving combat situations. Furthermore, critical time is lost by having to transport patients to a hospital setting before treatment can begin. Therefore, a need exists for a pharmaceutical intervention that is easily administered by first-responders (e.g. EMTs or firefighters) and effective at treating both cyanide and CO poisoning.

Technology Summary

This is a new treatment and delivery system that offers an effective antidote for both cyanide and CO poisoning. This technology uses reduced forms of Hydroxocobalamin (Vitamin B12) that react with both CO and cyanide. These reduced compounds are very reactive with oxygen, so the inventors have also developed a novel delivery system using specially formulated IV fluids to prevent it from coming into contact with oxygen in the air or in solution until it has reached the patient's bloodstream. This product has several distinct advantages over the currently used, FDA approved, form of Hydroxocobalamin (Cyanokit). First, it reacts not only with Cyanide, but also with Carbon Monoxide, which is something that has never been done before. Also, due to its higher reactivity it appears that it requires roughly half of the active ingredient than the current formulation and can be infused in about half the time. Most importantly, this treatment kit can be easily carried and quickly administered by first-responders, military personnel, or others at the time of injury.

Technology Status

Patent pending: U.S. and foreign rights are available.

Compounds have been synthesized and ex vivo studies, using swine blood, performed.

This technology is available for licensing to industry for further development and commercialization.