



Emergency Oxygenation Kit

Summary

This technology is an apneic oxygenation device to quickly perform a cricothyroidotomy during an emergency situation. This device allows for short term oxygenation up to an hour until a patient arrives at a medical facility. The currently used devices and methods for cricothyroidotomy call for a skilled/experienced professional with extensive training to perform the emergency procedure. This device would allow medical professionals to perform this task with minimal training.

Key Investigator

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Field

Device

Technology

Technology Key Words

Technology Status

Ongoing proof of concept studies in non-breathing swine models

Status

Available for licensing
Available for sponsored research

Patent Status

US EU Patent 13 823 262.4,
filed 1/23/15, CIP
14/602,991, filed 1/22/2015

UMB Docket Reference

JW-2011-054

Market

A few minutes of oxygen deprivation can lead to lifelong brain damage and brain death is inevitable unless blood oxygen levels are restored to normal. Emergency oxygen delivery systems are available for first aid use but, these systems are not useful in certain emergency medical events such as airway obstruction from aspirated foreign bodies, cardiac arrest, anaphylaxis, windpipe damage and/or fluids in the mouth. During the standard “hands only” CPR, patient survival can be limited by lack of oxygen since this is not currently part of basic life support protocol. At the hospital, intubation and mechanical ventilation is done to help patients breathe when they cannot move enough air in and out of their lungs on their own. When physicians are faced with a “cannot intubate and cannot ventilate” situation, they perform an emergency oxygenation procedure, wherein a hole is cut through the cricothyroid membrane and an oxygenation catheter is inserted into the airway for oxygen supply to the lungs. This emergency airway puncture procedure is called cricothyroidotomy and it is one of the several emergency airway management techniques that offer lifesaving short-term oxygenation but it can be performed safely only in the clinic.

Technology

This technology is a first aid emergency oxygenation device that can deliver oxygen (and drugs) directly to the lungs, for up to one hour, thus limiting the many dangerous consequences of oxygen deprivation to the brain. It consists of a skin puncture/delivery component and a ventilator catheter for oxygen delivery to the lungs. Unlike conventional methods, this device does not require the use of a scalpel or a guide wire to insert a catheter into the trachea, and hence is technically straightforward and quick to deploy. With some minimal basic training and by following the kit instructions, individuals with a Basic Life Support (BLS) certification will be able to deploy the device effortlessly. The device will supply oxygen to the hypoxic individual until an intubation can be done by skilled personnel. A modified version enables operation in the dark for use on a battlefield.

Advantages

- Oxygen is delivered *to the lungs directly and for up to 1 hour*
- Maintenance of blood oxygen levels to prevent brain injury or death
- Continuous flow of oxygen without manual ventilation
- A portable device
- Emergency use in the dark
- Lower skill level requirement, minimal training