A new optical method of measuring tissue oxygenation

MICROVASCULAR TISSUE OXIMETRY

UNMET NEED

One of the most difficult tasks for any Emergency Medicine and Critical Care specialist is rapidly determining if a patient's tissues are receiving enough oxygen. When tissues and organs aren't properly oxygenated, they can begin to fail.

Currently, the best way to measure oxygenated blood is to insert long catheters into veins in the neck to sample blood returning to the heart. This is a time consuming procedure and can be associated with complications. Non-invasive, near-infrared optical means of measuring tissue oxygenation have not proven to be successful because of interference from certain tissue chemicals such as myoglobin.

SOLUTION

MCIRCC members have engineered a device that, placed in a patient's mouth on the buccal mucosa, utilizes Resonance Raman Spectroscopy (RSS) to measure tissue oxygenation from the inside of the patient's cheek.

RSS is a novel optical technique that uses a special wavelength of light to vibrate hemoglobin molecules. It is resistant to interference and provides a precise, quantitative chemical fingerprint of how well tissues are being oxygenated.

Our data shows that the values obtained through the new RSS sensor clip are the same as those obtained through central venous catheters.

COMPETITIVE ADVANTAGE

The sensor can be placed in the mouth and provide oxygenation information in seconds, allowing for continuous monitoring or intermittent screening.

Because of its non-invasive nature, RSS may serve as a faster, safer, and more cost-effective way to assess patient tissue oxygenation, aiding in the diagnosis and treatment of conditions such as sepsis, trauma, heart failure, and other critical states.

Licensed to Pendar Technologies

Principal Investigators
Kevin Ward, MD · Hakam Tiba, MD · Kyle Gunnerson, MD