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ALAR SITE EFFECTIVE SITE FOR PULSE OXIMETRY

Assurance® Alar One-Sense™ Sensor offers a simple, highly-effective single-point-of-contact device that reliably monitors critical parameters

Research presented at the 2013 Society for Technology for Technology in Anesthesia demonstrates that the "nasal ala is an attractive site for pulse oximetry because of the rich perfusion by branches of both the external and internal carotid arteries."

"Sites on the face, particularly the nasal ala, have been shown to detect desaturations sooner than peripheral sites," explained Dr. Mark J. Rice, Section Chief, Liver Transplantation and General Surgery Sections, Department of Anesthesiology, University of Florida College of Medicine.

"Nasal ala pulse oximetry demonstrates accurate SpO_2 (±2%) values over a range of 70—100%,"said Richard J. Melker, PhD, MD, Professor of Anesthesiology and Pediatrics and Biomedical Engineering at the University of Florida College of Medicine, Gainesville, FL, in a presentation at the 2013 Society for Technology for Technology in Anesthesia.



The Assurance® Alar One-Sense™ Sensor is not affected by patient movement, eating, or talking

Alternative to Finger Pulse Oximetry Needed

Multiple studies highlight potential safety risks of finger pulse oximetry. A survey conducted at the International Anesthesia Research Society in 2013 found that many anesthesia educators and investigators have concerns about the limitations of conventional pulse oximetry:

- Nearly all of anesthesiologists (94%) noted the need to switch out pulse oximetry sensors during surgery—about one-third of these doctors reported having to do this "regularly" or "often."
- A significant number of anesthesiologists (53%) reported difficulty getting an oxygen saturation reading in 50% of their patients.
- Ambient light interfered with oxygen saturation readings on a regular or frequent basis for nearly 20% of those surveyed.

"It is important to understand that the finger provides a damped photoplethysmography (PPG) signal as compared to the ala," commented Dr. Rice. "The signal is used to calculate oxygen saturation. It is not surprising that situations that increase sympathetic tone or result in decreased peripheral perfusion will result in a poor signal to the digits."

Alar Site Advantageous for Clinicians and Patients

The alar region is rich in vasculature and offers a unique monitoring site. Alar oximetry takes advantage of the external and internal carotid

arteries which feed into this site and leverages the link of these internal arteries to the brain. "In instances of poor peripheral perfusion, anesthesiologists find the PPG signal to be superior and often increased at the nasal ala. This is particularly true when vasopressors are given to shunt blood flow from the periphery to the central circulation," explained Dr. Rice.

Advantages of the ALAR SITE

- Earlier detection of the SpO_2 signal, faster reflection of saturation changes
- Better perfusion and stronger signal than traditional finger site
- Easy access to the alar site by clinician...site at the head; not wrapped against the body
- Unaffected by poor peripheral perfusion
- Less signal distortion due to motion artifact

The ala is also an ideal site as it is usually easily available to an anesthesiologist," concluded researchers reviewing the results of a study performed at the University of California San Francisco's HYPO2XIA lab. The alar site yielded strong and reliable signals, which were also highly responsive to cardiorespiratory changes. In addition, the alar site allowed for rapid detection of events because it proved more responsive to desaturation compared with the usual peripheral locations. This translates to the ability to intervene sooner to potentially severe alterations in oximetric readings.

"The nasal ala is supplied by branches of the internal and external carotid arteries and is less influenced by increased sympathetic tone (especially the internal carotid artery), thus there is a more consistent and reliable signal, which results in more reliable oxygen saturation determinations," said Dr. Rice.

Reflecting on his 28 years of clinical experience, Dr. Rice shared what he considered to be the three main advantages of the alar site:

1. Reliable oxygen saturation reading in instances where finger readings fail.
2. When used in conjunction with peripheral sites, the combined readings (especially if the PPG signal is displayed) are valuable in estimating the quality of cerebral blood flow.
3. The face is where the anesthesiologist works. It is easier to place sensors on the nose where they are less likely to be problematic and need replacement during the anesthetic. Plus, there are many cases where the arms are tucked and not accessible.

The nasal ala site has also been found to be comfortable for patients because the absence of alar signal distortion results in readings for the non-anesthesia application that are not affected by patient movement, eating, or talking.

Unique Nasal Ala Pulse Oximetry Sensor

In the University of California study discussed above, researchers used the Assurance® Alar One-Sense™ Sensor. "We designed, built, and tested the accuracy of a nasal alar pulse oximetry sensor," wrote Dr. Melker in a recent issue of *Respiratory Therapy*. "The Assurance® Alar One-Sense™ Sensor is an important advancement in pulse oximetry."

"An anesthesiologist has a limited amount of time to respond to severe hypoxemia before permanent cerebral injury occurs. Any technology that provides faster response time to the detection of hypoxemia provides a wider window of safety for the anesthesiologist to determine the cause and correct it," said Dr. Rice.

Dr. Rice evaluated the Assurance® Alar One-Sense™ Sensor, comparing its effectiveness with finger pulse oximetry. He noted, "Early on in our study, we were doing a Whipple procedure that had an episode of unexpected blood loss. There was a point at which we were giving pressors before we could restore the blood volume to a normal level. The pulse oximetry signal in the finger completely went away, but the signal from the alar sensor was still very strong. At that moment, I knew this new technology was special."

Additional studies have concluded that the Assurance® Alar One-Sense™ Sensor is highly effective. This single-point-of-contact device is attached to the nasal ala, which is fed by both the external and internal carotid arteries; the latter also supplies blood to the brain. The rich vascular supply to the ala provides a strong, reliable signal, even when it is difficult to get a signal at the fingertips. It has been found to reliably monitor critical parameters, even with the most challenging cases.

"After using this probe numerous times, especially during large cases, I believe that this technology will become very popular with the anesthesia community," noted Dr. Rice.

The Assurance® Alar One-Sense™ Sensor was developed by Xhale Assurance, Inc. The company is committed to providing clinicians with easy-to-use, cost-effective diagnostic solutions that improve patient safety and reduce false alarms. Xhale Assurance is a wholly owned subsidiary of Xhale, Inc., a medical technology innovator in the use of sensors that analyze vapor and exhaled breath, focused on novel patient-centric monitoring solutions.

For more information about Xhale Assurance please call 855-743-4589; visit the website at www.assurance.xhale.com.

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