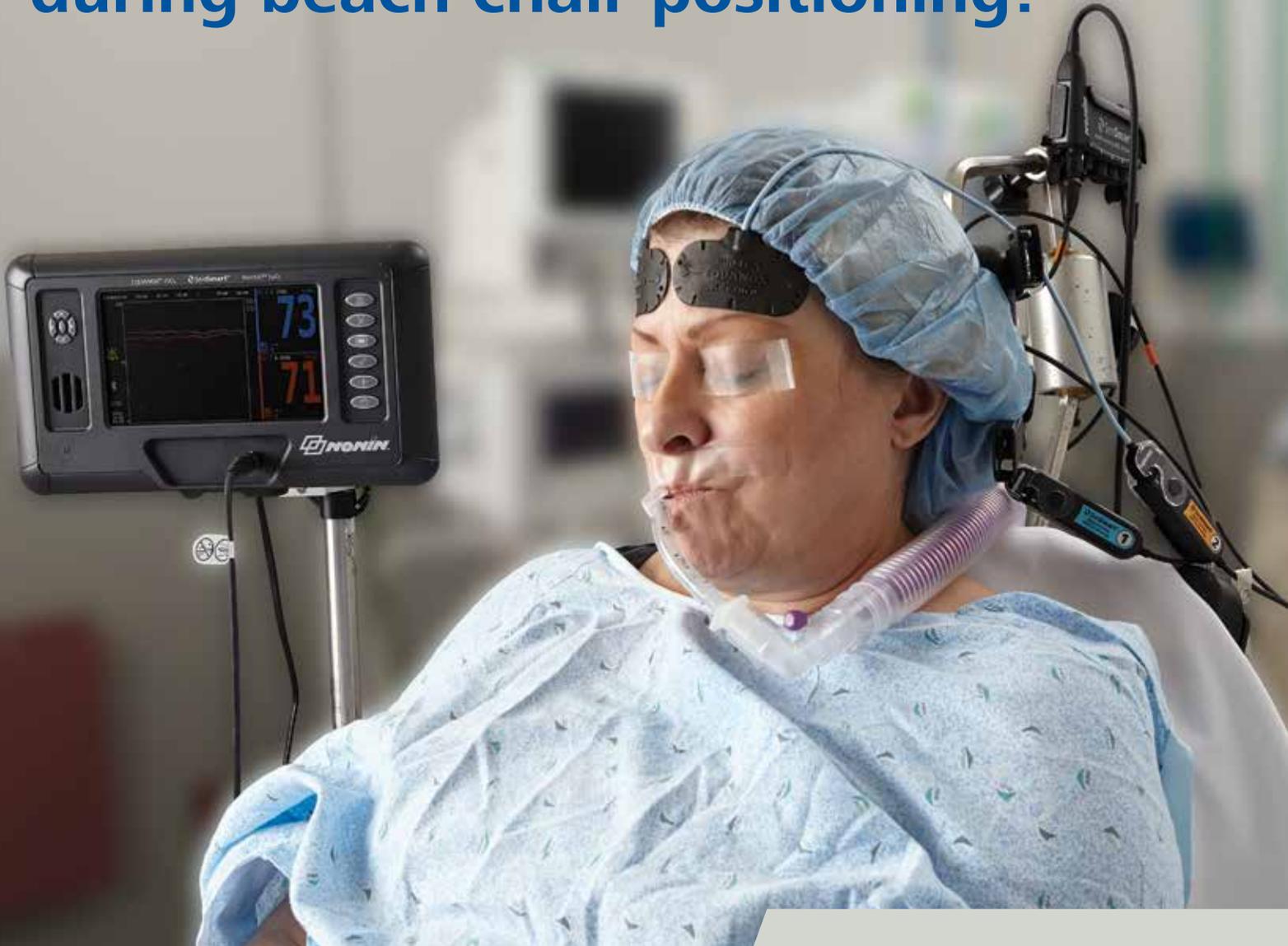


Concerned about cerebral perfusion during beach chair positioning?



Rely on Nonin's SenSmart™ Model X-100 Universal Oximetry System to help safely optimize the surgical field and your patient's experience.

Studies have shown that significant cerebral oxygen desaturation events are not infrequent during beach chair position surgery.¹ Desaturation events have been associated with post-operative patient nausea, vomiting, cognitive dysfunction¹ and, in rare instances, catastrophic cerebral injury.²

Nonin's SenSmart™ Model X-100 Universal Oximetry System continuously monitors cerebral oxygen saturation, helping surgeons and anesthesiologists prevent cerebral hypoperfusion while they safely optimize the surgical field in beach chair position surgery. On a cost-per-case basis, the SenSmart System can be your most cost-effective, neuro-protective monitoring tool.

Studies have found that deliberate or accidental hypotension in beach chair position surgery has the potential to result in periods of serious cerebral oxygen desaturation³. Cerebral ischemia during surgery is associated with post-operative transient or permanent cognitive decline, and may have the potential to slow rehabilitation progress and prolong length of stay.⁴ In a few cases, cerebral oxygen desaturation has led to catastrophic outcomes, including death.³

“The high prevalence of significant cerebral oxygen desaturation during shoulder surgery in the upright position underlines the need for close monitoring. NIRS [near-infrared spectroscopy] might constitute a valuable technique to detect cerebral hypoperfusion in this high-risk group of patients.”⁵

Electroencephalogram (EEG) and Transcranial Doppler (TCD) are methods to monitor brain activity (EEG) and blood flow to the brain (TCD) intra-operatively, but neither provides you knowledge of whether the brain tissue is receiving and extracting adequate oxygen. Cerebral oximetry (rSO₂), on the other hand, is simple to use, provides real-time monitoring, and rapidly responds to changes in oxygen supply and demand, alerting the surgical team to impending cerebral desaturation.

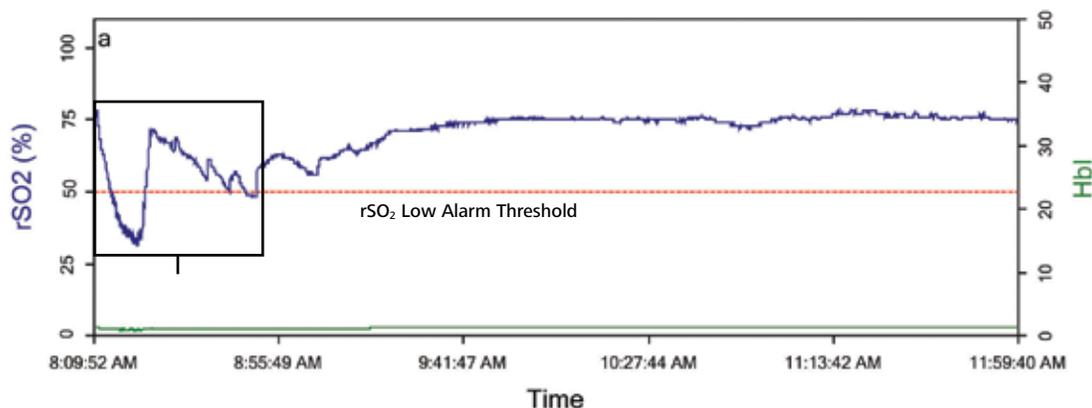
The Art

Lowering blood pressure safely to clear the surgical field is a common practice used in beach chair intraoperative patient management, but until now, determining adequate cerebral perfusion has been more of an art than a science:

- How do you know if the intermittent blood pressure taken from a cuff is reflective of the second-to-second cerebral perfusion pressure at the brain?
- How do you know if a given blood pressure is too low or too high for an individual’s proper cerebral perfusion pressure?
- How do the surgeon and anesthesiologist “referee” their manipulation of blood pressure?
- How low is too low for patients who live with hypertension?

Why Cerebral Oximetry

NIRS rSO₂ in Beach Chair Position Surgery*



This graph demonstrates that desaturation events in the Beach Chair position can be both rapid and severe. In this example the patient desaturated to a critical level in less than 4 minutes and maintained a critical level for 9 minutes before treatment was initiated.

Nonin's **SenSmart System** offers distinct advantages for the beach chair position:

Bright, easy-to-read monitor that is lightweight (<1 kg) and pole-mountable for easy portability

Intuitive, easy-to-operate user interface with fast signal acquisition delivering readings within seconds of start up and updating every 1.5 seconds — no patient data entry required

SenSmart EQUANOX Advance sensors for adult to pediatric populations with proprietary sensor and signal processing technology for industry-leading accuracy**

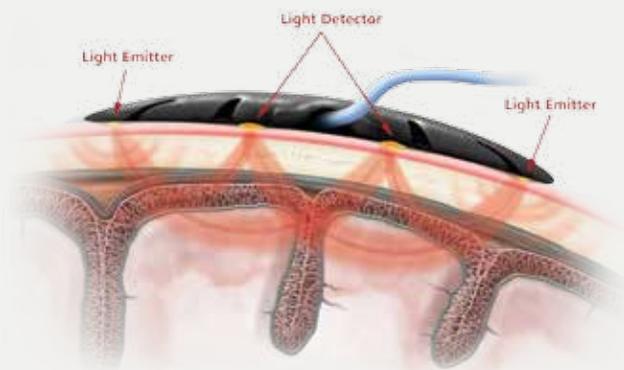


Sensor cables that allow for easy placement and function in the beach chair position

"Near-infrared spectroscopy (NIRS), a non-invasive optical technology, can be utilized at the bedside to monitor brain oxygenation to detect tissue hypoxia-ischemia, allowing for early intervention and potential prevention of permanent injury."⁶

The Science

Cerebral oximetry (rSO₂) is already widely used in cardiac surgery to monitor for cerebral ischemia, resulting in reduced postoperative cognitive decline.⁷ Increasingly, anesthesiologists and orthopedic surgeons are also turning to cerebral oximetry to quickly, easily and accurately monitor the cerebral oxygen saturation of their patients in the upright position.

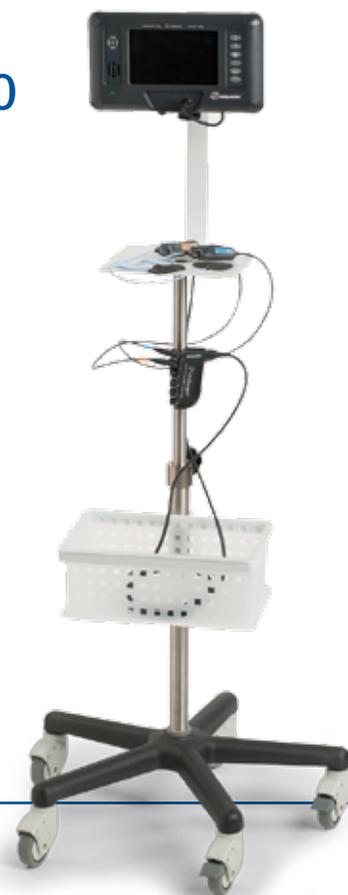


Only Nonin's sensors use two emitters and two detectors to provide cerebral cortex measurements that are minimally affected by intervening tissue or surface effects.⁸

Evaluate Nonin's SenSmart™ Model X-100 Universal Oximetry System at no cost in your beach chair position procedures.

Contact your Nonin Medical representative today to discuss a free, no-obligation evaluation:

- ▶ **Call** 1.800.356.8874 (toll free US and Canada)
+1 763.553.9968
- ▶ **E-mail** sensmarteval@nonin.com
- ▶ **Visit** sensmart.com/ortho



Nonin Medical: A Leader in Innovative, Noninvasive Medical Monitoring

Nonin Medical is a technology-driven company and a global leader in developing high performance, low cost, easy-to-use noninvasive medical monitoring solutions that improve the quality of people's lives. Nonin's innovative sensor and signal processing technologies give millions of clinicians confidence that the numerical values they see reflect their patients' true physiology. Headquartered in Plymouth, Minnesota, the company sells its products to clinicians, consumers and OEM customers worldwide. For more information, visit nonin.com or sensmart.com.

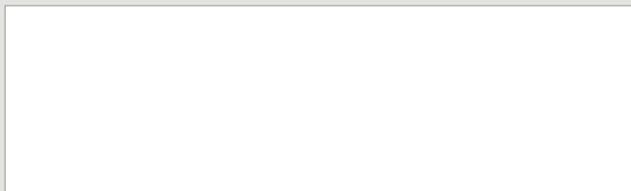
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*Actual case. Data on file at Nonin Medical.

**Model 8004CA sensor

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