

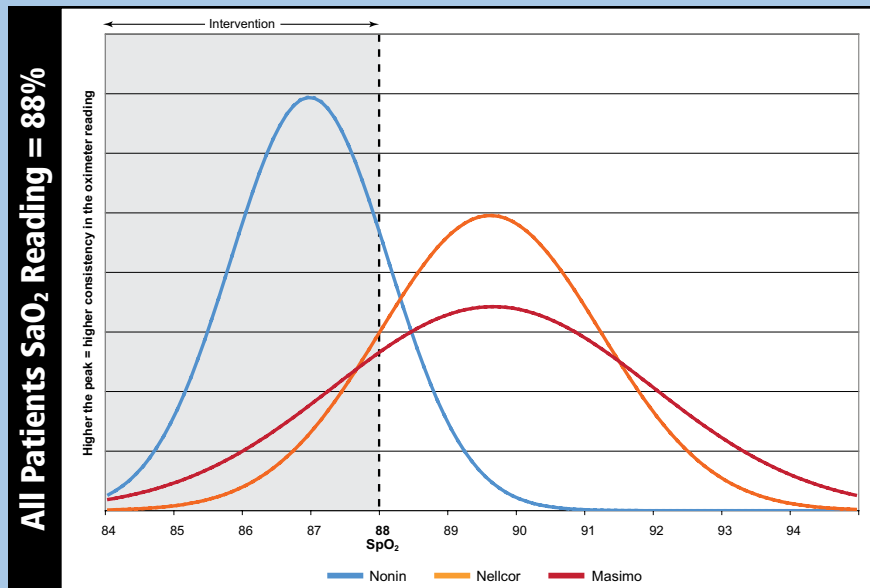
# Nonin Medical's PureSAT® Oximetry Technology Provides Superior Accuracy for Assessing Oxygen Intervention

A peer reviewed study on the accuracy of three pulse oximeter technologies was conducted by leading researchers from the UCSF hypoxia lab. The study concluded that pulse oximeter accuracy is affected by skin pigmentation. The SpO<sub>2</sub> accuracy was further evaluated by Nonin®, using the study data at the common intervention points for patient oxygen delivery. Conclusions from the distribution curves are:

- ✓ With Nonin technology, more patients are correctly identified for oxygen delivery at the intervention points, 88% and 92%. The other technologies demonstrated greater bias in dark skin pigmentation, potentially leading to a delay in treatment to patients with dark skin. With the other technologies, adjusting the intervention point to offset for the higher bias in dark skin pigmentation will be difficult due to the poor consistency in the readings.
- ✓ Nellcor® and Masimo® provide higher readings from the true co-oximeter measurement; Nonin provides readings slightly lower than the true co-oximeter. Nonin technology provides more consistent reading from patient to patient and sensor to sensor as illustrated by the width (or peak) of the distribution curves.

Figure 1: Distribution of Expected Pulse Oximetry Readings\*\*

## Actual CO-Oximetry SaO<sub>2</sub> Reading = 88%



### Interpretation of Distribution Curves:

- ✓ Higher the peak = higher consistency in oximeter reading
- ✓ Closer the peak to the dotted intervention line = better correlation to the true SpO<sub>2</sub> value

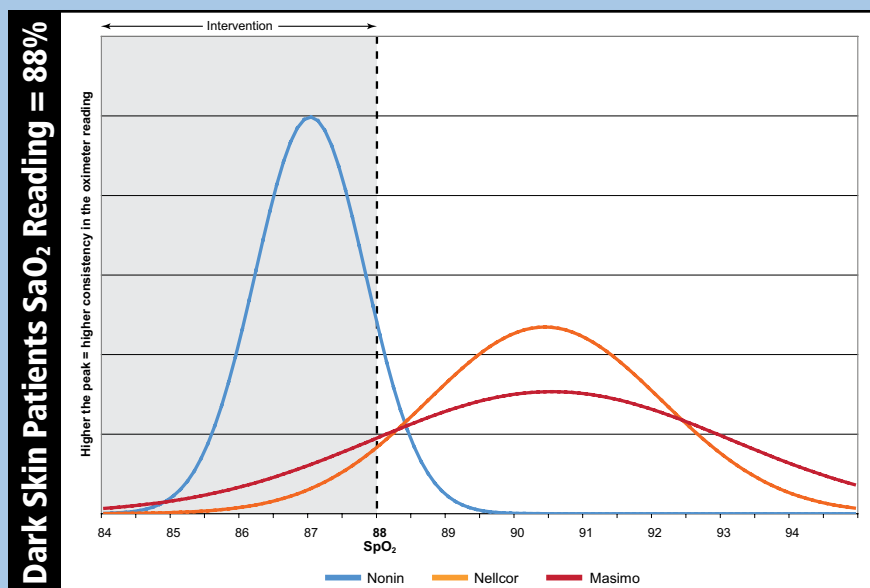
### All Patients SaO<sub>2</sub> Reading = 88%

#### Typical pulse oximetry readings expected:

Nonin	– 86% to 88%
Nellcor	– 88% to 91%
Masimo	– 87% to 92%

#### Percentage of patients identified for intervention:

Nonin	– 91%
Nellcor	– 25%
Masimo	– 32%



### Dark Skin Patients SaO<sub>2</sub> Reading = 88%

#### Most likely pulse oximetry readings:

Nonin	– 86% to 88%
Nellcor	– 89% to 92%
Masimo	– 88% to 93%

#### Percentage of patients identified for intervention:

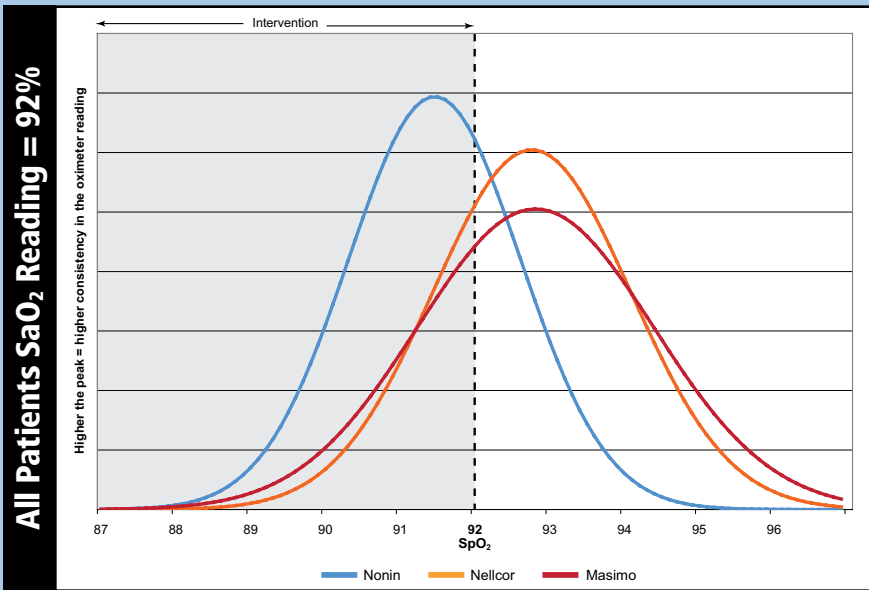
Nonin	– 97%
Nellcor	– 13%
Masimo	– 22%

\*\*Dark skin decreases the accuracy of pulse oximeters at low oxygen saturations: effects of oximeter probe type and gender”, John Feiner, et al. *Anesthesia & Analgesia*, December, 2007

\*\*Expected outcomes using reusable sensors based on Feiner, et al. study findings and normal distribution statistics.

Figure 2: Distribution of Expected Pulse Oximetry Readings\*\*

# Actual CO-Oximetry SaO<sub>2</sub> Reading = 92%



**Interpretation of Distribution Curves:**

- ✓ Higher the peak = higher consistency in oximeter reading
- ✓ Closer the peak to the dotted intervention line = better correlation to the true SpO<sub>2</sub> value

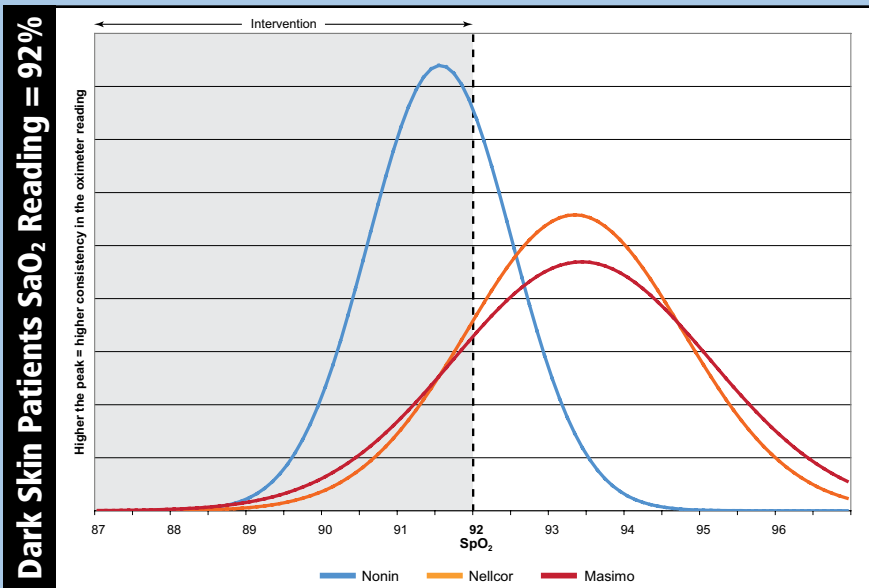
**All Patients SaO<sub>2</sub> Reading = 92%**

**Typical pulse oximetry readings expected:**

- Nonin — 90% to 93%
- Nellcor — 91% to 94%
- Masimo — 91% to 94%

**Percentage of patients identified for intervention:**

- Nonin — 82%
- Nellcor — 42%
- Masimo — 42%



**Dark Skin Patients SaO<sub>2</sub> Reading = 92%**

**Most likely pulse oximetry readings:**

- Nonin — 91% to 93%
- Nellcor — 92% to 95%
- Masimo — 92% to 95%

**Percentage of patients identified for intervention:**

- Nonin — 85%
- Nellcor — 29%
- Masimo — 30%

\*\*Dark skin decreases the accuracy of pulse oximeters at low oxygen saturations: effects of oximeter probe type and gender”, John Feiner, et al. *Anesthesia & Analgesia*, December, 2007

\*\*Expected outcomes using reusable sensors based on Feiner, et al. study findings and normal distribution statistics.

As indicated in the Figures 1 and 2, there is a difference in readings between the three oximeter technologies. When assessing the accuracy of oximeter technologies, it is critical that the oximeter measurement is compared to a blood sample measurement from a co-oximeter configured to report functional SpO<sub>2</sub>. Due to a delay of 10 to 30 seconds from the lungs to the finger (as found in healthy volunteers), it is essential to make sure the oximeter SpO<sub>2</sub> value is stable for 30 seconds before and after the blood draw. This will provide the most accurate assessment of the sensor’s precision and oximeter’s programmed calibration for that sensor.

Nonin’s PureSAT technology is widely used in markets that not only demand precision accuracy, but also demand consistent accuracy regardless of the sensor or patient as presented above. Nonin’s PureSAT technology provides precise measurements that can be trusted in the most challenging conditions including dark skin pigmentation, motion and low perfusion.

**Nonin Medical, Inc.**

13700 1st Avenue North, Plymouth, MN 55441-5443, USA  
 Phone: +1 763.553.9968 | Toll Free: 800.356.8874 | Fax: +1.763.553.7807 | Email: info@nonin.com



www.nonin.com