

## **Intraoperative Perfusion Changes at Two Pulse Oximetry Monitoring Sites: The Digit vs. the Nare**

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### **Introduction**

Routine monitoring of the surgical patient includes pulse oximetry. Most commonly the sensor is attached to a digit. Intraoperative changes in peripheral perfusion may occur, especially in patients in whom the body temperature is not maintained. As peripheral temperature decreases, peripheral perfusion may also decrease. It is possible, although uncommon, that this decrease may cause difficulties in monitoring pulse oximetry. Therefore an alternate monitoring site should be available. Here, we evaluate the nare as a potential alternate site. We evaluated changes in perfusion to the digits and the nares in surgical patients, using the Perfusion Index (PI), as measured by the Masimo SET Radical pulse oximeter (Masimo, Irvine, CA).

### **Methods**

Following IRB approval, 17 adult surgical patients undergoing general anesthesia were enrolled prospectively. In addition to routine monitoring, sensors from 2-pulse oximeter were attached. The Masimo Adt LNOP sensor was attached to a finger and the Masimo TC-I sensor was attached to a nare. Each probe was attached to a Masimo radical oximeter. The PI values from these two oximeters were recorded digitally to a laptop computer at a frequency of 1Hz. The change in PI from the beginning of the case to end of surgery was calculated for each monitoring site. Paired t-tests were used to compare values, with significance determined by  $p < 0.05$ .

### **Results**

Data are presented as mean ( $\pm$  SD). The mean age of the patients was 48 ( $\pm 16$ ) years. The mean length of surgery was 74.8 ( $\pm 26.1$ ) minutes. The PI for the finger was 6 ( $\pm 2$ ) at the beginning of the case and decreased by 2 ( $\pm 3$ ) at the end of the case. The PI for the nare was 2.0 ( $\pm 0.9$ ) at the beginning of the case and decreased by 0 ( $\pm 2$ ) at the end of the case. The decrease in the digit was significantly greater than that of the nare,  $p < 0.001$ .

### **Discussion**

We evaluated the perfusion to the digit and the nare simultaneously in surgical patients. Although the surgery was of short duration, we found statistically significant decreases in perfusion to the digits. This decrease may not be clinically significant. However, in longer cases or in more critically ill patients such changes may become clinically significant. In contrast, we demonstrated no change in perfusion to the nare during surgery. Although further research is needed in critically ill patients, these data suggests the nare may be a useful alternate site for monitoring pulse oximetry, as perfusion is maintained to this site.