**Useful Life of Pulse Oximeter Sensors in a NICU.**
Thomas A., Holmes M., Vogt J., Gangitano E., Stephenson C., Liberman R. *Respir Care.* 1998;43(10):860.

**Background**
Although multiple types of pulse oximeter sensors are available, disposable sensors are most commonly used in the NICU. During lengthy hospitalization, the sick newborn may utilize many pulse oximeter sensors due to sensor failure, hygiene, or unsightliness. Increasing the useful life of pulse oximeter sensors would directly reduce the costs of NICU care. A new pulse oximeter technology and family of sensors have been introduced using novel materials, however, sensor longevity has not been studied.

**Method**
Sixteen sick newborns with gestational ages of 25 to 41 weeks and weights of 465 to 3600 gm. were studied. A prototype Masimo SET pulse oximeter (Masimo Corp., Irvine, CA) and a Nellcor N-200 oximeter (Nellcor Puritan Bennett, Pleasanton, CA) used the Masimo neonatal sensor and Nellcor N-25 sensor, respectively. The start time, and the time a sensor was replaced or removed, along with the reason for replacement or removal were recorded. Both sensors were removed, the site assessed and the sensors repositioned every 12 hours.

**Results**
56 sensors were used for a total of 211 days. The Masimo neonatal sensors had a significantly longer useful life than the Nellcor N-25: 11.1 versus 5.7 days (range of 5 to 22.5 and 4 to 7.5 days respectively, $p < 0.01$). The reasons for replacing the sensors were: failure to adhere or display a value (3/19 for Masimo and 6/37 with Nellcor), soiled condition (0/19 for Masimo and 24/37 with Nellcor). What was impressive was that 13/16 times (81%) the original Masimo sensor applied to the neonate was used until monitoring was discontinued, compared to only 1/16 times (6%) with Nellcor. No difference in appearance of the monitoring sites was found between manufacturers.

**Experience**
We have used Masimo oximetry for 16 months and have been impressed with the longevity of the Masimo sensors. Reasons for the phenomenon include that the Masimo sensors are constructed of water-resistant material whereas the N-25 utilizes a cotton/elastic application tape. The cotton absorbed perspiration, bodily fluids, bath water, and parenteral fluids. Within days, the N-25 would exhibit an odor noticeable by the parent or staff which often dictated disposal. Whereas, the surfaces of the Masimo sensor can be cleaned of debris with an alcohol wipe allowing repeated applications. The disposal of the Masimo adhesive sensors was almost exclusively due to the neonate no longer needing monitoring and not because of Masimo adhesive sensor failure.

**Conclusions**
If the sensor cost to the hospital was identical, a nearly twofold savings could be realized with the Masimo SET neonatal pulse oximeter sensors.