

## Tissue-Pulse Oximeter Differences Related to Local Tissue Perfusion

### Background:

This neonatal case shows how pulse and tissue oximetry co-vary as perfusion changes.

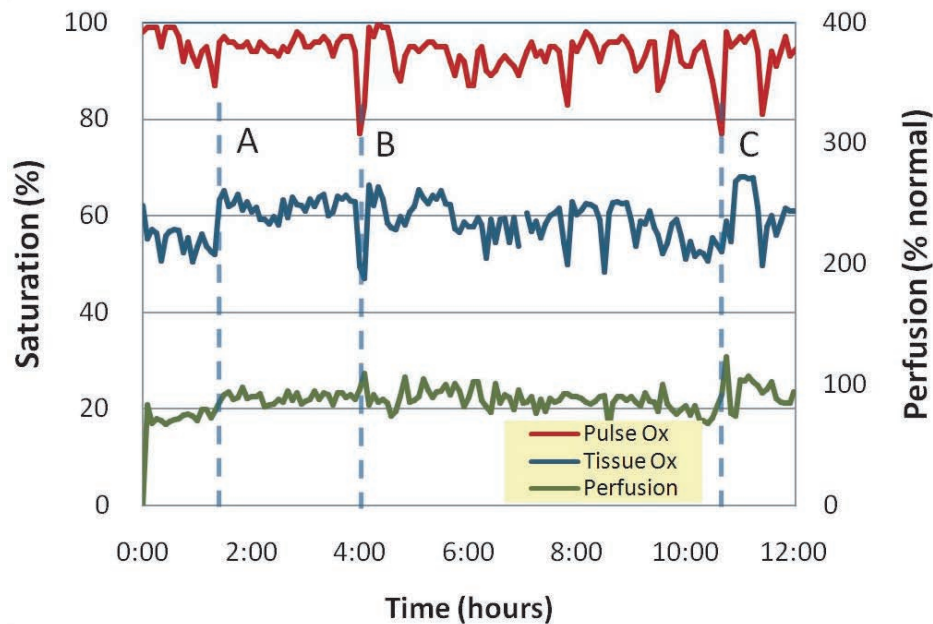
### Method Summary:

A neonate with respiratory and hemodynamic instability was monitored using both pulse oximetry and Visible Light (VLS) spectroscopy, sensitive to ischemia (T-Stat®, Spectros).

### Results:

Over 12 hours, the pulse oximeter ranged 78-99%; T-Stat ranged 54-75%. The gap between the two oximeters, the A-V Difference (A-VDo<sub>2</sub>), is inversely proportional to local perfusion 3 (green). At (A), both oximeters rise 15% during improved arterial oxygenation, with no change in local perfusion (green). At (B), both oximeters fall 20% during worsening arterial oxygenation, and perfusion transiently increased 10% in response to hypoxemia to maintain oxygen delivery. At (C), the arterial saturation again transiently falls 20%, while tissue oximetry remains stable. This time, AVDo<sub>2</sub> falls and there is a calculated 50% increase in local perfusion to maintain oxygen delivery, which resolves when arterial saturation is restored.

**T-Stat Sto<sub>2</sub> versus Pulse Oximeter Spo<sub>2</sub> Related to Local Tissue Perfusion**



### Discussion:

Tissue-Pulse differences, a measure of A-VDo<sub>2</sub>, may allow for rapid estimation of changes in local tissue perfusion in response to therapeutic interventions, in real time.