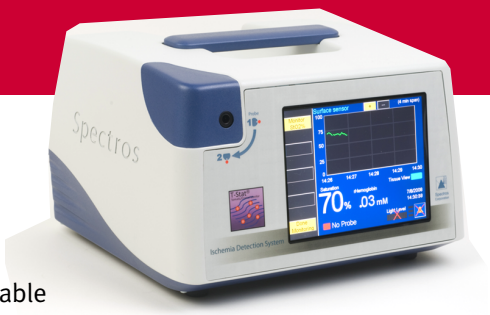
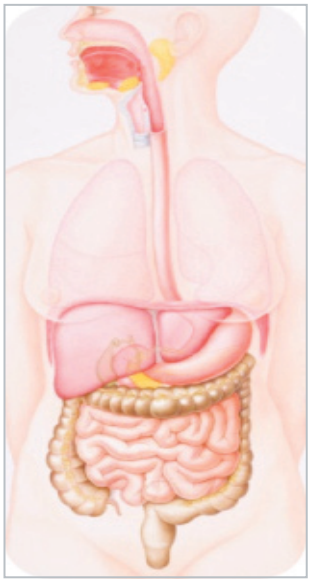
Real-Time Perfusion Monitors

Why Measure in the G.I. Tract?



Measuring StO_2 will give you an early indication of change.

When measurements are taken throughout the body the results are not always predictive, nor reliable. The skin is very sensitive to the surrounding environment and is not a reliable way to monitor tissue saturation. Monitoring in the brain gives results that are not reproducible and do not provide an early warning. However, if measurements are taken in the GI tract, there is the benefit of early diagnosis.



Recent finidings show that the mucosal surface of the buccal correlates to mucosal readings taken throughout the entire G.I. tract.

SITE	VALUE OF VENOUS MEASURE
SKIN	Not predictive, Too variable
MUSCLE	Not predictive, Too variable
CEREBRAL	Changes are too late, Correlated with outcome
G.I.	Changes early in course, Correlated to outcome, Correlated to SvO2

The body's natural reaction to compromised perfusion is to shunt blood away from the organs and periphery tissue towards the brain. The GI Tract will show compromised perfusion first. With auto-regulation and neuro-protection of the brain, it would not give an early warning sign that perfusion is at critically low values.

Time is critical when treating in the ICU. With early detection there is more time for proper diagnosis, more effective treatment and ultimately better outcome.

Measuring in the GI tract is "The Canary in the coalmine."
Why wouldn't you want an early warning sign?

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T-Stat® During Induced Hemorrhagic Shock in Neonatal Piglets

CASE STUDY

Background

This case data shows somatic (esophageal) and cranial (internal carotid distribution) saturation monitored during in a neonatal piglet model during acute hemorrhage.

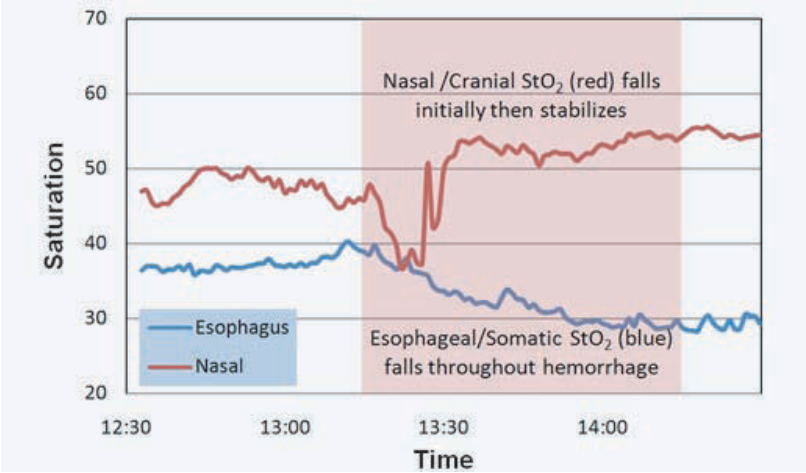
Methods

A neonatal piglet model of hemorrhagic shock was monitored using non-invasive Visible Light Spectroscopy (VLS), sensitive to ischemia. A bleed over 1 hour was performed, followed by resuscitation, on an intubated 8 kg piglet. Oxygen delivery was monitored in the somatic organs via an esophageal T-Stat® probe (T-Stat® Ischemia Detection System, Spectros); oxygen delivery was monitored in the cranium using an np (nasopharyngeal) T-Stat® probe placed within the internal carotid distribution.

Results

At the start of one hemorrhage (shown in pink, below), T-Stat® saturation fell at both the somatic and cranial sites. However, the cranial site showed rapid recovery, while the somatic saturation continued to fall throughout the hemorrhage. This supports a view that somatic sites are more robust early warning sites for reduced systemic perfusion.

T-Stat® During Induced Hemorrhagic Shock in Neonatal Piglets



Conclusions

T-Stat® VLS oximetry probes allowed hemorrhagic shock to be monitored in real time, with somatic sites more sensitive to reduced systemic perfusion than cranial sites. T-Stat® has been previously reported to allow monitoring of rapid-onset ischemic events within seconds, as previously published enabling early intervention to impending tissue ischemia.