

# FORE-SIGHT ELITE™ Absolute Tissue Oximetry – Real Value in Monitoring

In today's healthcare environment, products and technologies must provide evidence of clinical benefit and economic value for clinicians and hospitals. FORE-SIGHT® Absolute Tissue Oximetry provides both. FORE-SIGHT has been the pillar of multiple clinical studies showing the benefits of accurate cerebral oxygen saturation monitoring and the importance of early detection of cerebral desaturation events to prevent adverse outcomes and reduce hospital length of stay (LOS).



## The Facts

Cardiovascular surgery complications or adverse postoperative outcomes can lead to longer LOS, translating to potential higher operating costs.



- Adverse cerebral outcomes have been reported in 6%-53% of patients undergoing surgeries requiring cardio-pulmonary bypass (CPB).<sup>1-5</sup> This represents up to 246,000 cases per year in the U.S.
- Cerebral oxygen desaturation occurs in 17%-23% of surgeries requiring CPB.<sup>6</sup> Detected events are often identified after damage to the brain may have occurred.
- During the first 6 hours postoperative, 53% of patients had cerebral desaturation events (CDE)<sup>7</sup>:
  - 14% of patients with CDE had postoperative nausea and vomiting (PONV), while patients without CDE did not experience PONV.
  - Patients with CDE had 18% mortality, while none of the patients without postoperative CDE died.

- **FORE-SIGHT ELITE Absolute Tissue Oximetry**
- **Reduces** patient variability using 5 wavelengths of near infrared light
- **Improves** accuracy to unprecedented levels (3.05%  $A_{rms}$ )
- **Eliminates** pre-induction baseline reading requirement
- **Detects** otherwise unnoticed cerebral desaturation events

## Clinical Value of FORE-SIGHT ELITE

Cerebral Oximetry has become the standard of care in many health care centers, allowing clinicians to treat cerebral desaturation events that are known to be associated with complications and additional use of hospital resources.

"Patients who spent more than 30 minutes under the absolute threshold of 60% had an extended hospital stay of 4 days, leading to an additional cost of \$8,300."<sup>8</sup>

"A potential advantage of absolute brain tissue oxygenation is that threshold values may be more strongly associated with adverse outcomes than trends."<sup>8</sup>

"Decreased SctO<sub>2</sub> values were associated with major complications, prolonged postoperative mechanical ventilation, and prolonged ICU and hospital LOS."<sup>8</sup>

"Intraoperative CDEs were associated with a higher incidence of nausea and vomiting in the PACU."<sup>9</sup>

"Treatment of declining cerebral oxygen saturation prevented prolonged desaturations and was associated with a shorter ICU LOS and a significantly reduced incidence of major organ morbidity and mortality."<sup>10</sup>

"Cerebral oxygen desaturation was also significantly associated with prolonged length of stay... Patients with prolonged cerebral oxygen desaturation had a near three times risk of increased length of stay."<sup>11</sup>

## Real Economic Value of FORE-SIGHT ELITE

The table below demonstrates the potential savings when using FORE-SIGHT to monitor cerebral oxygen saturation in patients undergoing cardiovascular procedures. The data are a result of the study conducted at a recognized Cardiovascular Anesthesia Program in the U.S.<sup>8,12</sup>

Number of CVOR cases per year	900
Number of CVOR cases where cerebral oxygen desaturations occur (assuming 23% of total cases <sup>6</sup> )	207
Cost of ICU stay per day	\$2,400
Decrease in ICU days using cerebral oximeter per patient	x3
<b>Total ICU savings per patient</b>	<b>\$7,200</b>
Cost of Non-ICU stay per day	\$1,100
Decrease in Non-ICU stay using cerebral oximeter per patient	x1
<b>Total Non-ICU savings per patient</b>	<b>\$1,100</b>
<b>Total savings per patient (ICU + Non-ICU savings)</b>	<b>\$8,300</b>
<b>Total savings per year if 207 cases (\$8,300x207)</b>	<b>\$1,718,100</b>
Cost of Sensors per patient	\$200
Cost of Sensors per year (Total number of cases x Cost of sensors)	\$180,000
Cost of FORE-SIGHT (List Price)*	+\$37,000
<b>Total FORE-SIGHT cost</b>	<b>\$217,000</b>
<b>Net Savings to Hospital</b>	<b>\$1,501,100</b>

\* Rental and Placement programs are also available.



### References:

1. Roach GW et al. Adverse cerebral outcomes after coronary bypass surgery. *N Engl J Med* 1996;335(25):1857-63.
2. Murkin JM et al. A randomized study of the influence of perfusion technique and pH management strategy in 316 patients undergoing coronary artery bypass surgery: I. Mortality and cardiovascular morbidity. *J Thorac Cardiovasc Surg* 1995;110(2):349-62.
3. Murkin JM et al. Longterm neurological and neuropsychological outcome 3 years after coronary artery bypass surgery. *Anesth Analg* 1996;82(Suppl):S328.
4. Newman MF et al. Longitudinal assessment of neurocognitive function after coronary artery bypass surgery. *N Engl J Med* 2001;344(6):395-402.
5. Selnes O et al. Cognitive changes 5 years after coronary artery bypass grafting: is there evidence of late decline? *Arch Neurol* 2001;58(4):598-604.
6. Croughwell ND et al. Jugular bulb saturation and cognitive dysfunction after cardiopulmonary bypass. *Ann Thoracic Surgery* 1994;58(6):1702-8.
7. Greenberg SB et al. Cerebral desaturation events in the intensive care unit following cardiac surgery. *J Crit Care*. 2013 Jun; 28(3):270-6.
8. Fischer GW et al. Noninvasive cerebral oxygenation may predict outcome in patients undergoing aortic arch surgery. *J Thorac Cardiovasc Surg* 2011;141(3):815-21.
9. Murphy GS et al. Cerebral Oxygen desaturation events assessed by near-infrared spectroscopy during shoulder arthroscopy in the beach chair and lateral decubitus position. *Anesth Analg* 2010;111(2):496-505.
10. Murkin JM et al. Monitoring brain oxygen saturation during coronary bypass surgery: a randomized, prospective study. *Anesth Analg* 2007;104(1):51-8.
11. Slater JP et al. Cerebral oxygen desaturation predicts cognitive decline and longer hospital stay after cardiac surgery. *Ann Thorac Surg* 2009;87(1):36-44; discussion 44-5.
12. Fischer GW et al. Decreased cerebral tissue oxygen saturation during aortic surgery increases length of stay. *Anesth Analg* 2009;108(SCA Suppl):1-104.

