Identifying Tissue Oxygenation State by Spectrographic Analysis

Brief Description of Technology
By determining the oxygen state of tissue using a photonic needle, the clinician knows when to infuse additional oxygen to the tissue during surgery.

Technology ID
2011-1202

Technology Overview
Standard cardiac surgery includes stopping a beating heart and reducing the metabolism of the cardiac tissue to a minimal state. The cardiac tissue is perfused with a cardioplegia solution, which has the ability to keep the tissue from beating and oxygenate the tissue. The risk associated with not regularly oxygenating the tissue is cardiac tissue damage and release of free radicals during surgery, thereby increasing the damage to surrounding tissue. Surgeons currently use various methods to decide when to re-infuse the cardioplegia solution without actually knowing if the tissue needs the solution.

The use of the photonic needle (a small optical coherence tomography device) can provide accurate real time values of the cardiac tissue and monitor the ideal time to re-oxygenate.

Applications
- Cardiac surgery on a non-beating heart

Advantages
- Accurate registration of tissue stress and oxygen level

Market Overview
CABG is the most common type of open-heart surgery in the US, with more than 500K surgeries performed each year. In addition, more than 2K heart transplants and 100K heart valve surgeries are performed each year in the US.

Investigator Overview
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