Society for Technology in Anesthesia 21st Annual Meeting & 31st Computers in Anesthesia Meeting

January 12-15, 2011 at the Venetian Hotel in Las Vegas, Nevada

Engineering Challenge

The Society for Technology in Anesthesia (STA) is an international organization of physicians, engineers, students and others with an interest in anesthesia-related technologies. Its mission is to improve the quality of patient care in anesthesia by promulgating the development of better healthcare technologies and the more appropriate application of technology. The Society promotes education and research, collaborates with local, national, and international organizations, sponsors meetings and exhibitions, awards grants, and recognizes achievement. Membership is open to all who are interested. The journal *Anesthesia & Analgesia* is STA's official publication.

This year, for the first time, the STA is announcing an engineering challenge that is open to non-member post-high school engineering and engineering technology students. The competition is held as part of the STA (Society for Technology in Anesthesia) Annual Meeting. The goal is to give student teams an opportunity to use the engineering design process to build a specific medical device, and to advance students' awareness of anesthesia technology. Student teams not only have to build a specific medical device, but also have to submit an abstract of their work and give a presentation before a panel of judges. One student for each submission will receive free attendance at the STA Annual Meeting. Abstracts of all entries will be published on the Society's web page, and the winning student team will be recognized with a plaque.

The clinical problem: Wired connections are commonly used in medical monitors to connect the patient to the device. But, wires limit mobility, tend to become tangled, and can create a physical hazard to personnel. Clinicians have long awaited wireless solutions.

The task: Consider available technologies and design a wireless patient monitoring system. The focus of the task is to develop a wireless link between the patient and the monitor display. Standard medical devices may be used for any other part of the monitoring system. The solution should address where the wireless link is (in the path from biological signal to display), which wireless protocol is used (i.e. signal range, bandwidth, and immunity to interference), and how the system would work in a multi-bed environment (i.e., how one patient is assigned to each monitor, or transferred between monitors).

Judging: Entries will be judged using the following criteria:
- 5 points awarded for submission of a concept (meaning it is all on paper),
- 8 points awarded for submission of a proof of concept (something that has some implementation detail, but not a working prototype),
- 15 points awarded for submission of an implementation (something that functions)
- 5 points awarded for meeting the goal of wireless link between patient and monitor (as opposed to another wireless interface)

- 0-5 points awarded based upon the device cost, (or the ability to easily make the device from off-the-shelf components)
- 0-5 points awarded based upon power efficiency (i.e., battery life, battery level indicators, recharging convenience)
- 0-5 points awarded for number of physiologic signals incorporated (e.g., ECG, pulse oximeter, invasive blood pressure, non-invasive blood pressure, temperature, respiratory gases)
- 0-5 points awarded for ease-of-use (i.e., ability to use in multi-bed environment, ease of assigning device to a particular patient and monitor)
- 0-5 points awarded for reliability (i.e., resistance to interference, indication of signal strength)
- 0-5 points awarded for creativity

Maximum point score = 50

So that the session can be properly organized, a short abstract of each proposed demonstration must be submitted by January 5, 2011 using the form at:

http://www.anestech.org/meetings_staannual.htm