January 9-11, 2003
San Diego Hilton

Society for Technology in Anesthesia
www.AnesTech.org

Society for Technology in Anesthesia

STA 2003: Extending the Senses &
2003 International Meeting on Medical Simulation

Hilton San Diego CA

On behalf of the program committee and the Board of Directors, welcome to this year's STA meetings. We would personally like to thank the outstanding faculty who have generously given their time to prepare and present their lectures, workshops and demonstrations.

Please make every opportunity to network with our exhibitors, faculty and members during the meeting. This type of learning is important and beneficial to everyone. STA is a unique organization whose members represent the practice of anesthesiology as well as industry involved in development and production of technologies used by anesthesiologists in education and medical care. Interaction between the members is a strength of STA. If you are interested in becoming more active in STA and its educational programs, please contact one of the Board members. We welcome participation and involvement at all levels.

Accreditation: This activity has been jointly planned and implemented in accordance with the Essentials and Standards of the Accreditation for Continuing Medical Education. The Society for Technology in Anesthesia is accredited by the ACCME and takes responsibility for the content, quality and scientific integrity of this CME activity.
STA designates this activity for a maximum of 29 CME hours in Category 1 Credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

Evaluation: It is extremely important that you complete the evaluation form so that we might improve our educational programs and provide you with education that meets your needs. We are especially interested in any conflict of interest you may perceive that has not been appropriately disclosed.

CME certificate: Your CME certificate is enclosed with your on-site registration packet. *Keep for your records.*

Meal functions and special events: Please be sure to wear your name tag and present a ticket for all conference functions.

STA 2003: Extending the Senses
David Feinstein, Chair
Kirk Shelley, Research Committee Chair
Matthew Weinger, Local Host

Int'l Meeting on Medical Simulation
Brendan Flanagan, Chair
Steve Kimatian Research Chair
Lisa Sinz, Simulation Workshop Chair

2004 Dates

STA 04 – January 15-17, 2004
IMMS – January 16-18, 2004
Hyatt Regency Tamaya Resort

Near Albuquerque and Santa Fe, NM

STA 2003: Technology Connections
At a Glance

Wednesday, January 8
1000-1700 STA Board of Directors meetings
1600 Registration - continues through Friday

Thursday, January 9
0700 Continental Breakfast
0750 Welcome and Introductions
0800 **Session I: Displays that Appeal to the Senses**
0945 **Oral Poster Presentations:**
10:30 Break and poster viewing with authors present
11:00 **Session II: Keynote Address**
Technology Assessment & Implementation
John Halamka, MD
CIO, Harvard Medical School
1230 STA Business meeting and awards luncheon
1330 **Workshop: Technology Assessment**

1800 Welcome Reception with Exhibitors

Friday, January 10
0700 Continental Breakfast with Exhibitors and Posters
0800 **Session III: Joint Keynote Session with IMMS**
Patient Safety, Potential Adverse Drug Events and Medical Device Design
Kim Vicente, Director
Cognitive Engineering Lab
University of Toronto

1030 Technology Showcase and poster viewing
1130 Luncheon on your own
1300 **Off-site Enrichment Tours** *or participate in IMMS Meeting. IMMS registration required.*
1730 STA Focus Group – Light Refreshments

1900 **MASH MESS Banquet**

Saturday, January 11
0700 Continental Breakfast with Exhibitors
0800 **Session IV: Bringing a Product to Market**
0945 Technology Showcase
1015 **Session V: Information Systems**
1200 Adjourn meeting

Int'l Simulation Meeting
At a Glance

Thursday, January 9
1800 Welcome Reception for both STA 2003 and 2003 IMMS

Friday, January 10
0700 Continental Breakfast with Exhibits and Poster viewing
0800 **Joint Session: STA 2002 and 2002 IMMS**
Patient Safety, Potential Adverse Drug Events and Medical Device Design
Kim Vicente, Director
Cognitive Engineering Lab
University of Toronto

1030 Technology Showcase in Exhibit Area
1045 **General Session I Assessment: Skills and Credentialling**
1200 Lunch on your own
1345 **General Session II**: *Standards: Lessons Learned from Aviation*
1500 **Workshops**: Registrants will be able to rotate through their choice of four workshops.

1900 **MASH MESS Banquet**

Saturday, January 11
0700 Continental Breakfast with Exhibitors and Poster Viewing
0800 **Themed Poster Presentations I** followed by at-poster viewing
0930 **Themed Poster Presentations II** followed by at-poster viewing
1100 **Workshops**: Registrants will be able to rotate through their choice of four workshops.
1130 Box lunch
1230 **General Session III**: *Developments in Surgury and other Fields*

1500 **Workshops**: Registrants will be able to rotate through their choice of workshops.

Sunday, January 12
0700 Continental Breakfast
0800 **General Session IV**: *Integration into Established Curriculum*
0800 **General Session V**: *Simulation: A Vision to Future*
1200 Adjourn meeting

Wear your nametag

Society for Technology in Anesthesia
PMB 300 223 N. Guadalupe
Santa Fe, NM 87501

www.AnesTech.org

Society for Technology in Anesthesia 2003
Extending the Senses

Technology Showcase Hours	Thursday	6:00 – 8:00 pm Reception
	Friday	7:00 – 8:00 am – Continental Breakfast
		10:30 – 10:45 am – Break
		12:15 – 1:30 pm – Break
		4:00 – 5:00 pm – Break
	Saturday	7:00 – 8:00 am – Continental Breakfast
		9:45 – 10:15 am – Break
		11:00 – 12:00 am - Break
STA Poster & Demo Viewing	Thursday	8:00 am – 8:00 pm
	Friday	7:00 am – 12 noon
IMMS Poster & Demo Viewing	Friday	1:00 pm – 6:00 pm
	Saturday	7:00 am – 3:00 pm

Thursday, January 9, 2003

7:00 – 8:00	**Continental Breakfast**	*The breakfasts are generously supported by Nellcor*
8:00 am	**STA General Session I: Displays that Appeal to the senses**	*Butch Loeb, MD Panel Chair*
	The Problems with Current anesthesia displays	*Butch Loeb, MD* *University of Arizona, Tucson, AZ*
	Designing and testing ecological displays for ICU applications	*Judith Effken, RN, PhD* *University of Arizona, Tucson, AZ*
	Sonification of large and complex datasets	*Marty Quinn* *Design Rhymics Sonification Research Lab* *Lee, New Hampshire*
	Auditory displays in the operating room	*Marcus Watson, PhD* *University of Queensland, Brisbane, Queensland*
9:45 am	**Research Presentations:** *Selected poster presentations to be presented from the podium*	*Kirk Shelley, MD* *Yale University, New Haven, CT*
10:30	**Poster review and Technology Showcase**	
11:15	**STA General Session II: Keynote Address** **Technology Assessment and Implementation in the 21st Century**	*John Halamka, MD* *Chief Information Officer* *Harvard Medical School*
12:00	**STA Annual Awards and Annual Business Meeting** **Gravenstein Technology Award Presentation**	*David Seitman, MD President* *This luncheon and the Gravenstein Award are generously supported by METI*
	STA Research Grant Presentation and Research Awards	*Kirk Shelley*
1:30 pm	**STA Session III: Workshop:** **POWERFUL TECHNOLOGIES, FRIGHTENING COMPLEXITIES: a workshop on how to separate form, function, and usability when evaluating new technologies"**	*George Blike, MD* *Dartmouth University, Dartmouth NH* *John Pawlowski, MD* *Beth Israel Deaconess Hospital, Boston MA*
6:00 pm	**Welcome Reception in Technology Showcase Area**	

Friday, January 10, 2003

7:00 – 8:00	**Continental Breakfast**	*The breakfasts are generously supported by Nellcor*
8:00 am	**Joint IMMS/STA 03 Session Welcome**	*David Feinstein and Brendan Flanegan*
	Joint Keynote Address **Patient Safety, Potential Adverse Drug Events and Medical Device Design: A Human Factors Engineering**	*Kim Vicente, Director* *Cognitive Engineering Lab, University of Toronto*
10:30	**Poster Review and Technology Showcase**	
11:15	**STA General Session IV:** **Nanotechnology: The Virtual Made Actual**	*Chris Wiley,MD Chair* *Dartmouth University, Hanover, NH* *Christine Peterson* *Christopher Phoenix* *Warren Chan*
1:00 pm	**Enrichment Tours:** There is a charge for these tours. You may make selection at time of registration on-line or on-site. *Those taking a tour will receive a box lunch.*	*Matthew Weinger, MD Local Host* *UCSD, San Diego, CA*
5:30 pm	**STA Focus Group - Datex-Ohmeda** Light refreshments	*Robert Tham, facilitator*
7:00 pm	***The MASH Meal:*** *A buffet dinner with cocktails starting on the beach. March right into dinner. Fatigues and camouflage dress optional. Bring your ticket. This function is generously supported by METI*	

Saturday, January 11, 2003

7:00 – 8:00	**Continental Breakfast**	*The breakfasts are generously supported by Nellcor*
8:00 am	**STA General Session V:** **Bringing a Product to Market: Technology Development**: *Have a new idea? Want to get it from idea to manufacture? How to proceed and find the funding, too.*	*Dwayne Westenskow, MD* *University of Utah, Salt Lake City, UT* *Jeff Guise, Brobeck* *Jonathan Shanberge, Brobeck* *Marshall Anderson, The GlenRock Group*
9:45	**Poster Review and Technology Showcase**	
10:15	**STA General Session VI:** **Information Systems:** ***Is the information useful and/or accurate; how do we assess the cost vs the value.***	*Michael O'Reilly, MD, Chair* *University of Michigan, Ann Arbor, MI*

12 noon **STA 03 Adjourns:** Participants who also registered for 03 IMMS continue with the IMMS program schedule

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CONFLICT OF INTEREST: *STA encourages the interaction between the practicing and academic physician and the anesthesia, computer and simulator technology industry. Many of the faculty and abstract presentors for this conference have disclosed that they have relationships with commercial entities. They have been advised to make this known prior to their presentations. If you perceive an undisclosed conflict of interest, please note so on your evaluation form. Disclosures made by the faculty to STA prior to the conference are listed below their e-mail address.*

As of 122002

STA 2003 Presentation Descriptions

Designs that Appeal to the Senses

Robert Loeb, MD
Chair
University of Arizona
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The Problems with Current anesthesia displays Current anesthesia information displays are predominately formatted as single-sensor waveforms and numbers. While the physical integration of anesthesia information displays has improved over the past 10 years, there has been little advancement in the functional integration of information or the use of alternate display modalities. The speakers on this panel will describe their experience in developing and testing innovative information displays, such as ecological visual displays and auditory displays.

Judith Effken, RN, PhD
University of Arizona
Tucson, AZ
jeffken@nursing.arizona.edu

Designing and testing ecological displays for ICU applications
In this presentation I outline how the ecological approach to design differs from other approaches in terms of theory, analysis, design, and evaluation. The strong theoretical foundation in ecological psychology and cognitive engineering has implications for analysis, design and evaluation. Examples of how the ecological approach to design is being used to create visual designs that appeal to the visual senses are provided. Finally, current challenges ecological designers face are described.

Marty Quinn
Design Rhymics Sonification Research Lab
Lee, New Hampshire
marty@quinnarts.com

From the Climate Symphony to Mars Gamma Rays: Augmenting Cognition Using Musical Encoding
We can use our ability to perceive music as a vehicle for presenting information to the mind without the need to use our eyes, thereby increasing our situational awareness and understanding

Marcus Watson, PhD
University of Queensland, Brisbane, Queensland

Auditory displays in the operating room

Keynote Address: Technology Assessment and Implementation in the 21st Century

John Halamka, MD
Chief Information Officer
Harvard Medical School
Boston, Massachusetts
jhalmka@caregroup.harvard.edu

How do departments determine the need for new technologies. How companies decide their strategies for new technologies. How do both assess options, present appropriate information to decision makers. The web, wireless and mobile technologies have a significant role in improving healthcare quality, performance and value. This presentation will review the application of new technologies in healthcare IT and review major trends shaping healthcare informations currently and over the next year. Halamka will describe how to best advance your IT agenda with CIOs, CEOs and Boards

POWERFUL TECHNOLOGIES, FRIGHTENING COMPLEXITIES:

a workshop on how to separate form, function, and usability when evaluating new technologies"

George Blike, MD
Dartmouth University
Hanover New Hampshire
george.blike@hitchcock.org

John Pawlowski, MD
Beth Israel Deaconess Hospital
Boston Massachusetts
jpawlows@caregroup.harvard.edu

This workshop will consist of several rapid fire sessions that start with an introduction to a concept followed by a hands-on exercise and closing with sharing across workgroups. The first session will address "the pitch" that represents a sales strategy based on data such as market research. The participants will learn one strategy for aligning user needs with technological solutions. The second session will focus on usability testing of medical technologies. Participants will perform usability tests and better understand the trade-offs between new functionality, increasing complexity, and usability. The final session will explore human error in the new age due to failures in man-machine coordination and communication. Participants will consider features needed to make the technology they have been evaluating smarter; features that will better allow the device to be a "team" player. Small group facilitators will have diverse expertise including: clinical medicine, engineering, human factors, simulation, and research on medical device complexity

Joint STA 03 & IMMS Keynote Address : Patient Safety, Potential Adverse Drug Events and Medical Device Design: A Human Factors Engineering

Kim Vicente, PhD
Director, Cognitive Engineering Lab, University of Toronto
Jerome Clarke Hunsaker Distinguished Visiting Professor
MIT Dept. of Aeronautics & Astronautics
Cambridge Massachusetts
kjv@mit.edu

Adverse drug events are the single most important threat to patient safety. Within that category, the administration of analgesics via infusion devices is particularly error-prone. This presentation will describe the important role that simulation can play in evaluating new human factors design concepts that may reduce the frequency of such errors. The limitations of simulation will also be discussed, and ways of addressing those limitations through other methodologies will be presented. Finally, some of the obstacles that currently limit the impact of this type of research will be addressed.

Nanotechnology: The Virtual Made Actual

Chris Wiley,MD Chair
Dartmouth University
Hanover New Hampshire
chris.wiley@hitchcock.org

The panel will discuss the astounding, and rapidly developing, field of nanotechnology. The presentations will progress from a broad overview of the field and its general implications for our future to its dazzling possibilities for medicine as well as a report of some exciting current work in biomedical nanotechnology. Our coming ability to purposely manipulate matter atom-by-atom will allow us to quickly and cheaply build anything we can design with atomic perfection; thus, the virtual will be made actual.

Christine Peterson , BS,
President
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The goal of molecular nanotechnology is to build macro-scale objects and devices with atomic-scale precision. Building on a century of "bottom-up" work in chemistry, researchers are struggling to design and build increasingly-large nanostructures. The long-term goal is a general ability to build systems of molecular machines able to rearrange matter to any structure permitted by physical law. The medical potential of such nanosystems is hard to overestimate.

Christopher Phoenix, MS
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The convergence of nanotechnology and medicine will create a wide variety of new devices and techniques. However, this is only part of the story. As medical devices become more compact and more capable, we will see a marked increase in the data available to the physician, and a similar increase in our ability to treat most health problems. A new kind of medicine may emerge, characterized by an ongoing dialog between a health care provider and a body that is usually healthy.

This talk describes some near-future and possible far-future medical advances, building a case for the possibility of interactive, health-maximizing medicine. Topics include new drug families and diagnostic techniques; possible designs for several basic and advanced nanomedical devices; and an attempt to predict trends in medicine enabled by technology, with special attention to the role of anesthesiologists in future medical practice.

Warren Chan, PhD
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Organic/inorganic hybrid nanoparticles have recently attracted widespread interest. Inorganic nanoparticles have unique optical, electronic, and dimensional properties that are advantageous over traditional organic-only systems. The ability to integrate these nanoparticles with sophisticated recognition molecules can lead to the emergence of new technologies for high-throughput drug screening, clinical diagnostics, and in-vivo monitoring of gene expression and enzyme activity. This seminar describes the use of bimolecule-coated semiconductor nanoparticles, also known as quantum dots, as an optical detection probe for in vitro and in vivo medical applications. Organic probes are limited by photobleaching, environmental quenching, broad and asymmetric emission spectra, and the inability to excite more than 2-3 colors at a single wavelength. These problems can be overcome by exploiting the unique optical properties of semiconductor nanoparticles (e.g., quantum dots are estimated to be 20 times brighter and 100 times more stable against photobleaching than organic reporter molecules). To take advantage of these optical properties for biological labeling, the surface chemistry of quantum dots are modified with bifunctional thiolated molecules to render them water-soluble and conjugateable. In vitro, we demonstrate the use of biomolecule-coated quantum dots for cell studies, basic immunoassay, and genomic detection. We will also describe the selective targeting of inorganic nanoparticles inside living mammals in this seminar. Specifically, we coated green and red luminescent ZnS-capped CdSe quantum dots with vascular targeting peptides obtained by phage display, and showed the accumulation of quantum dots coated with tumor homing peptides in the blood or lymphatic vessels of human breast carcinoma MDA-MB-435 xenograft tumors after intravenous injection. This work provides a first step towards the use of nanomaterials (e.g. optically-active metallic colloids, near-infrared emitting nanocrystals, magnetic nanoparticles) as in vivo optical and magnetic probes for non-invasive imaging of diseases (e.g., cancer or HIV) or the use of peptides to target drug carrying nanostructures (such as those composed of fullerenes or dendrimers).

Bringing a Product to Market: Technology Development

Dwayne Westenskow, PhD
University of Utah
Salt Lake City, Utah

Have a new idea? Want to get it from idea to manufacture? How to proceed and find the funding, too.
Moving an idea through a university technology transfer office and into a royalty bearing commercial product.

Jeff Guise, Esq
Attorney at Law
San Diego, California
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How to identify the technology idea and protect it.

Jonathan Shanberge, Esq
Attorney at Law
East Palo Alto, California
jshanberge@brobeck.com

Forming a small business.
I would focus on how to organize a business entity, how to obtain financing, exit strategies and how to avoid various pitfalls in those processes. In thinking about the business organization issues, I am also aware that the development of anesthesia devices is not entirely comparable to medical devices in general. The impression that I have gotten is that development is largely done by individuals who then sell those devices to large corporations rather than attempting to build businesses themselves. If this is the case, the business organization issues are greatly simplified.

Marshall G. Anderson
The Glenrock Group
mga@thegrg.com

Early stage investing of $1-2M where the investor (bank or VC) takes an active role for 1 ½ years. The CEO is appointed by the investor.

Information Systems: *Is the information useful and/or accurate; how do we assess the cost vs the value.*

Michael O'Reilly, MD, Chair
University of Michigan,
Ann Arbor Michigan
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Anesthesia Work-flow: Working Smarter
While implementation of an anesthesia information system may yield many benefits to various stakeholders in the perioperative process, this lecture will concentrate on the direct benefits to the practicing anesthesiologist. At the conclusion of the presentation the audience will understand how an anesthesia information may be used to reduce the aggravation associated with caring for complex patients in a busy clinical environment.

Jeff Feldman, M.D
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Medicolegal Aspects of Anesthesia Information Systems
One of the major obstacles to acceptance of anesthesia information system technology in the United States is the appropriate concern by anesthesia practitioners who care for patients in a very aggressive medicolegal climate. Proponents of anesthesia information system technology assert that it can be an important risk management tool and actually reduce medicolegal exposure. Although the overall use of these systems is limited to a small number of departments, many of these departments have accumulated several years of experience. This lecture will review existing evidence on the medicolegal aspects of anesthesia information systems including analysis of malpractice law, case law experience, closed claims reviews, malpractice insurer experience and the experience of individual departments. At the conclusion of the presentation and discussion, the audience will understand the role of anesthesia information technology as a risk management tool.

David Goldstein, M.D.
Queens University
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The use of hand held computers in the Acute Pain Setting

Jay Iaconetti, M.D.

The Automated Perioperative Anesthesia Record:
Looking Beyond The Bottom Line
The benefits of instituting the use of an Automated Perioperative Anesthesia Record goes far beyond any financial return that comes from improved rofessional and material charge capture. A properly designed and utilized record system can not only drive an improvement in the care process through a more accurate and effective QA process, but provides a wealth of information vital to improving OR efficiency and throughput.

2003 Exhibitors and Supporters

Booth	Exhibitor	Web Address
9	Alaris	www.alarismed.com
13	Andros	www.andros.com
19	Criticare Systems Inc.	www.csiusa.com
7&8	Datex-Ohmeda, Inc.	www.us.datex-ohmeda.com
6	DocuSys Inc	www.docusys.net
20	Dolphin Medical	www.dolphinmedical.com
15	Draeger Medical	www.draegermedical.com
16	EKO Systems	www.ekosystems.com
10&11	GASNet	www.gasnet.org
5	GE Medical Systems	www.gemedical.com
12	Immersion Medical	www.immersion.com
1&2	Laerdal	www.laerdal.com
3	Masimo	www.masimo.com
17	Medrad Inc.	www.medrad.com
Workshops, dinner & award support;	Medical Education Technologies	www.Meti.com
Support for Breakfasts	Nellcor	www.Nellcor.com
4	PICIS	www.picis.com
21	PMM InfoSolutions	www.ppminfo.com
23	Pyxis Corporation	www.pyxis.com
14	Viasys Healthcare	www.viasyshealthcare.com

Thanks to each one. Please visit their websites and their booths at our conference.

STA 2003 Technology Connections & International Meeting on Medical Simulation

Exhibitor Information

Alaris

ALARIS Medical Systems, Inc., a wholly owned subsidiary of ALARIS Medical, Inc. (AMEX: AMI), develops practical solutions for medication safety at the point of care. The company designs, manufactures and markets intravenous (IV) medication delivery and infusion therapy devices, needle-free disposables and related monitoring equipment. ALARIS Medical Systems' "smart" technology, tools and services reduce the risks and costs of medication errors, and safeguards patients and clinicians. The company provides its products, professional and technical support and training services to over 5,000 hospital and health care systems, as well as alternative care sites in more than 120 countries through its direct sales force and distributors.

Andros

Andros is a technical and scientific instrumentation company specializing in medical, automotive, and environmental process automation applications of precision gas analyzers and associated sensors. Located in Richmond, CA, the company is a recognized world leader in the development of gas analyzers based on DIR and NDIR technology.

Criticare Systems, Inc.

CSI is committed to addressing the needs of a rapidly changing healthcare system by designing, manufacturing, and marketing cost-effective patient monitoring systems and noninvasive sensors – using proprietary technology – that reduce healthcare costs and improve patient management. The company's products address patient safety concerns and monitoring needs in anesthesia, critical care, respiratory care, transport, and outpatient care environments. Comprehensive customer support, economical rental ownership programs, prompt equipment service and technical support programs make even its most advanced systems affordable and consistently productive.

Datex-Ohmeda

Datex-Ohmeda is a leading manufacturer of patient monitors, anesthesia delivery systems and supplies and accessories for anesthesia and critical care. Datex-Ohmeda will feature their System 5 product line. Datex-Ohmeda's vision is to help our customers improve the patient care management process through clinically superior and cost-efficient medical products and services. We are devoted to caring for life

DocuSys

DocuSys provides an Information System for Anesthesia requiring no keyboard entry. Unique is the ability to automatically document, bill and deliver injectable medications (in one motion) as a by-product of current clinical care, including the capability to warn clinicians of impending medication errors and other contraindications before administering medications

Dolphin Medical, Inc.

Dolphin Medical brings together the best from numerous companies such as OSI Systems, TFT Medical, UDT, and Aristo by consolidating all the medical products under the name of Dolphin Medical. Dolphin Medical is the world's largest OEM supplier of oximetry products in the world, manufacturing products for many of the top names in oximetry. Dolphin introduces their newly patented Noise Elimination Oximetry (NEO) system, the first platform to use a digital sensor.

Draeger Medical

Draeger Medical, Inc. is a leader in design, engineering and manufacturing of Anesthesia Systems, Patient Monitors, Critical Care Systems as well as Information Management Systems. Draeger Medical has been a supporter of the Society for Technology in Anesthesia for many years and most recently participated in the ASA Breakfast panel presenting their newest technologies in a "Meet the Press" format.

EKO Systems

Frontiers™, eko systems' advanced electronic anesthesia record system, captures data transduced from medical devices, such as physiologic monitors and anesthesia machines, to facilitates the creation of electronic anesthesia records. Frontiers'™ clinician-friendly electronic charting and data mining functionality represents the next generation in clinical information and record management tools for anesthesia.

GASNet

Global Anesthesiology Server NETwork. Founders have been long-time supporters and members of STA. They want you to stop by their booth and let them "give you a cookie" GASNet provided a Guidebook that accompanied the breakfast panel of STA held at the ASA Annual Meeting in Orlando in 2002.

GE Medical Systems Information Technologies

GE Medical Systems *Information Technologies* provides healthcare systems with advanced software and technologies to improve their clinical performance. The Company's expertise spans the areas of cardiology, patient monitoring, image management, clinical communications, clinical information systems and Six Sigma-based management tools to enable a real-time, integrated electronic medical record. The recent acquisition of Data Critical further extends wireless and mobile patient monitoring capabilities. GE Medical Systems is an $8 billion global leader in medical imaging and technology.

Immersion Medical

Immersion Medical, based in Gaithersburg, Maryland, designs, manufacturers and markets computer-based medical simulators that allow healthcare personnel to practice minimally invasive procedures without placing patients at risk. Three product lines cover intravenous therapies, endoscopic procedures, and endovascular interventions. More information is available at www.immersion.com.

Laerdal Medical Corporation

Dedicated to helping save lives, Laerdal provided products, services and system solutions for COR, BLS, and ACLS Training as well as a full line of Pre-Hospital products including Airway Management, Suction, Spinal Motion Restriction and Defibrillation.

Masimo Corporation

Masimo Corporation designs, develops, manufactures, and licenses advanced signal processing and sensor technologies for the noninvasive monitoring of vital signs. Masimo manufacturers pulse oximeters, which can be used to upgrade existing multiparameter monitors to Masimo SET technology. The company also offers a full line of disposable and reusable sensors..

Medical Education Technologies Inc.

The METI Human Patient Simulator (HPS™) represents the latest in the state of the art simulation technology for training clinicians at all levels of medical education. Sophisticated mathematical models of human physiology and pharmacology determine automatically the patient's response to user actions and interventions. With dynamic coupling of the cardiovascular, pulmonary and pharmacological models along with the physical embodiment of the mannequin, the simulator allows for the complete characterization of the real patient. METI is a workshop supporter and provides generous support for the Gravenstein Technology Award and luncheon and the annual STA banquet.

Medrad

MEDICAL IMAGING is a window into the vast, mysterious terrain of the human body. It can reveal the health of a beating heart, which produces an amazing three billion beats over the average lifetime... detect a blockage within the body's 60,000 miles of vessels and arteries... and illuminate a single nerve. More than ever, medical imaging is a life-saving endeavor in which Medrad is playing a vital part. Medrad is headquartered in Indianola, Pennsylvania, 15 miles northeast of Pittsburgh. The major location of 285,000-sq. ft. includes all headquarters, administration functions, and enterprise production units. A smaller facility nearby, of about 15,000-sq. ft., houses the circuit board assembly operation.

Nellcor: A Business Unit of Tyco Healthcare

Nellcor, a business of Tyco Healthcare, develops, manufactures and markets products that help diagnose, monitor, and treat respiratory and anesthesiology patients across the continuum of care. Nellcor is the world leader in pulse oximetry, and also offers a wide range of temperature and airway management solutions from names such as Shiley, DAR and Mallincrodt.

Novametrix Medical Systems Inc.

Novametrix Medical Systems, Inc. is a leading designer, manufacturer and marketer of non-invasive cardiac output monitors, hand-held and bedside pulse oximeters and mainstreat capnographs, transcutaneous and respiratory profile monitors. For information call, 800-234-3444 or 203-265-7701 or visit us at our web site at www.novametrix.com .

PICIS

Picis Chart+ for Anesthesis is a comprehensive anesthesia information system that records and assists care management throughout the entire perioperative process. Chart+ provides precise and accurate information needed to maintain or improve quality standards, while increasing efficiency and cost effectiveness.

PMM Information Solutions

Billing software designed exclusively for an anesthesia practice. Total billing, accounts receivable, collections, reporting needs are now available in one software package allowing users to fully maximize revenues.

Pyxis Corporation

Pyxis Anesthesia System™ is a unique automated mobile medication and supply dispensing workstation. Designed and built in collaboration with leading anesthesiologists nationwide, the product closely complements the clinician's workflow. Placed inside operating rooms, the Pyxis Anesthesia System is intended to replace traditionally manually operated work carts used by anesthesia professionals. All typical anesthesia supplies and medications, including controlled substances, are immediately available at the clinician's fingertips. The system is the ideal solution that addresses anesthesia's need for convenience and accessibility, and the organizational concern for patient safety.

Viasys Healthcare

VIASYS Healthcare is a global market leader in health care technology. Our companies specialize in developing, manufacturing, and marketing high technology medical products focused on respiratory care, neuroscience, critical care medicine and medical/surgical products. Our Neuro-Care group consists of four companies, combining more than 30 years of experience in the research, design and manufacturing of instruments for the diagnosis and monitoring of nerve, brain, hearing and other neurological disorders. These products include neurodiagnostics for EEG, EMG, audiodiagnostics, nerve monitoring, and epilepsy monitors. With more than 40 years of combined experience, our Respiratory Care group of six companies designs, manufactures and markets products for the diagnosis and treatment of respiratory-related disorders. These include mechanical ventilators, diagnostic instrumentation for respiratory and cardiac diseases and systems for diagnosing sleep-related disorders. Our Medical/Surgical group of five companies develops technology and produces products for a range of medical uses, including surgical implant components, critical care tube feeding systems, medical grade polyurethane and surgical barrier control systems, and wireless patient monitoring systems.

This information was provided by the exhibitor or taken from their website and received by December 23, 2002.