

MEETING PROCEEDINGS

SECOND ANNUAL MEETING OF

STA

**SOCIETY FOR TECHNOLOGY IN
ANESTHESIA**

Jerry M. Calkins, Ph.D., M.D.
Annual Meeting Chairman

U.S. Grant Hotel
San Diego, California, USA

January 30 - February 1, 1992

SCIENTIFIC SESSION CONTENT

**James H. Philip, M.E. (E.), M.D.
Scientific Chairman**

**SECOND ANNUAL MEETING OF STA
SOCIETY FOR TECHNOLOGY IN ANESTHESIA**

**U.S. Grant Hotel
San Diego, California, USA**

January 30 - February 1, 1992

SESSION 1 ANESTHESIA WORKSTATION COMPONENTS

1-1 LESSONS LEARNED IN BUILDING INTEGRATED ANESTHESIA DELIVERY AND MONITORING SYSTEMS

Wesley T. Frazier, M.D.*, S.H. Odom, M.D.†

* Emory University School of Medicine, Atlanta GA and

† Brigham & Women's Hospital and Harvard Medical School, Boston MA

After 15 years developing and using integrated anesthesia delivery and monitoring systems (IADMSs), we are simultaneously pleased and concerned by today's commercial IADMSs.

1-2 INTEGRATION CONCEPTS FOR ANESTHESIA WORKSTATION DISPLAYS

Jan J. van der Aa, Ph.D., Jan E. W. Beneken, Ph.D., Johannes H. van Oostrom, M.E., and J. S. Gravenstein, M.D.

University of Florida, Gainesville, Florida

We present an integrated anesthesia workstation incorporating dramatic reconceptualization of perioperative information management based on a requirement analysis rather than using the conventional evolutionary approach that has led to stacking additional monitoring equipment on top of old.

1-3 A MODERN BASIC ANESTHESIA WORKSTATION

Alexander A. Birch, M.D., Henry Casson, M.D., Barbara Tardiff, M.D., Bruce Hinshaw, M.D., Takeyasu Yamamura, M.D., Ph.D.

Oregon Health Sciences University, Portland, Oregon

A modern basic anesthesia workstation - compact, light and easy to use - is offered as an enhancement to current design.

1-4 AN ANESTHESIA WORKSTATION CREATED FROM AN ANESTHESIA MACHINE AND A PHYSIOLOGICAL MONITOR

J. Fox, CRNA, Technical Coordinator, P. Drew, CRNA, Anesthesia Coordinator
Pennsylvania Hospital, Philadelphia, PA

A simple modification to an Ohmeda Modulus Plus Anesthesia Machine and a Marquette Tramscope 12 Monitor created a functional anesthesia workstation which met defined goals.

1-5 INTRAOPERATIVE INFORMATION TRANSFER: A SUMMARY DISPLAY OF PATIENT STATUS

Jan J. van der Aa, Ph.D., Jan E. W. Beneken, Ph.D., Johannes H. van Oostrom, M.E., J. S. Gravenstein, M.D.

University of Florida, Gainesville, Florida

A summary display controlled by an Expert System is sufficient and effective for an initial rapid assessment of a patient's intraoperative condition.

1-6 DEVELOPMENT OF AN ELECTRONIC CLIPBOARD MODEL, PEN-BASED ANESTHESIA RECORD-KEEPING SYSTEM

Barbara Tardiff, M.D., Henry Casson, M.D., Alexander Birch, M.D.

Oregon Health Sciences University, Portland, OR

A prototype design for a clipboard model, pen-based anesthesia record that is founded on human factors guidelines and user-centered constraints is presented.

1-7

ANESTHESIA VIDEO DATA RECORDING SYSTEM

James Piepenbrink, BS, Joseph Cullen, BS, Timothy Stafford, MD, PhD
Boston City Hospital, Boston, Massachusetts

Recording monitor screens on videotape offers an inexpensive yet robust solution to anesthesia signal recording.

1-8

SILENT PAGE. A VIBRATORY ALARM FOR THE HEARING IMPAIRED

ANESTHESIOLOGIST

Mark S. Wallace, M.D.; Michael N. Ashman, M.D, M.S.
University of Maryland Hospital, Baltimore, Maryland

We investigated the adaptability of a vibratory wrist watch called Silent Page for monitoring anesthesia alarms and found this device to be reliable and practical for the hearing impaired anesthesiologist.

1-9

CAUSES, EFFECTS AND DETECTION OF INCORRECT MEDICAL GAS DELIVERY

J. Hutchinson M.D., E. Lee M.D., S. Nagle M.D., C.F. Mackenzie M.D.
University of Maryland Hospital, Baltimore, Maryland

There are many causes for incorrect medical gas delivery and mass spectrometers can identify most of them.

1-10

DEVELOPMENT OF PROBLEM CATEGORIES FOR COMPUTERIZED PREANESTHESIA EVALUATION OF OUTPATIENTS

G.L. Gibby, MD; K.I. Jackson, ME; J.S. Gravenstein, MD; and D.A. Paulus, MD
Depts of Anesthesiology and Mechanical Engineering, U. Florida, Gainesville FL

We designed and implemented a computerized anesthesia preoperative evaluation that structures the review systems (ROS) findings into problem subcategories. Despite the use of 49 specific subcategories, an "OTHER" subcategory was still required for more than 25% of the problems in six areas of the ROS.

1-11

A COMPUTER-BASED INTELLIGENT ASSISTANT FOR PREOPERATIVE EVALUATION

R.G. Carovano, K.I. Jackson, G.L. Gibby
Depts of Anesthesiology and Medicine, University of Florida, Gainesville, Florida

A sixteen-rule expert system to serve as an intelligent assistant to aid in preoperative anesthetic evaluation has been implemented easily and shown to function in a modular manner.

1-12

CREATING A PROLOG PROGRAM IN A HANDHELD PC COMPUTER FOR MANAGING THE CARDIOVASCULAR SYSTEM FOLLOWING SPINAL ANESTHESIA INDUCTION

M.L. Smith, M.D., T. Scanlon, M.D., N.Ty Smith, M.D.
VAMC, UCSD, and US Naval Hospital, San Diego CA

We created an artificial intelligence program to help manage the cardiovascular system after spinal anesthesia and demonstrated the feasibility of AI held in the palm of a hand.

1-13

ANALYSIS OF THE MORNING WARD ROUND IN AN INTENSIVE CARE UNIT

Ringeler U, Freisdorf W, Schwilk B, Wiedeck H

University of Ulm, Ulm, Germany

We evaluated the structure and content of the daily Morning Ward Round (MWR) on an Intensive Care Unit, revealed deficits in information transfer, and developed a structured model for a standard MWR that includes organ-system oriented information classification.

1-14

A SPINAL ANESTHESIA DATABASE ON A PERSONAL COMPUTER

N. Katchanov, K. Debolsky

Regional Hospital of Celinograd, USSR

We wrote a computerized database management system which we use for spinal anesthesia; we have discovered many interesting clinical relationships that have impacted our practice.

1-15

IMPROVING ALARM SYSTEMS: HOW TO DEFINE ACCEPTABLE VITAL SIGNS DURING GENERAL ANESTHESIA

J.H. van Oostrom, ME; C. Gravenstein; JEW Beneken, PhD; and JS Gravenstein, MD

University of Florida, Gainesville, Florida

Knowing the clinical operating range (COR) of physiologic variables is important in developing new monitor alarm strategies; COR values for BP, HR, S_pO_2 , and $P_{et}CO_2$ are reported from 50 patients during four phases of anesthesia.

1-16

ANALYSIS OF THE EFFICACY OF THE OHMEDA CD MODULUS II ALERT ZONE SYSTEM

†DM Feinstein, MD, MS B.M.E.; °ID Calalang, BS; °JH Philip, ME(E), MD; °DC Sutton, FFARACS

†Beth Israel Hospital, Harvard Medical School, Boston, MA

°Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Use of the Ohmeda Alert Zone System (AZS) reduced BP variation in a retrospective study but this relationship was not confirmed in two prospective studies.

1-17

CONTINUOUS QUALITY IMPROVEMENT USING ANESTHESIA INFORMATION MANAGEMENT SYSTEMS (AIMS) - BLOOD PRESSURE VERSUS INTUBATION: WHICH COMES FIRST?

David W. Edsall, M.D., Patricia Deshane, CCRN, SNA, John Farrow, Ph.D

Burbank Hospital, Fitchburg, MA

We used a computerized Anesthesia Information Management System (AIMS) to measure and improved our incidence of obtaining baseline blood pressures prior to intubation and discovered reasons why we occasionally failed to do so.

SESSION 2 NEW AND FUTURE DEVICES

2-1

A NONINVASIVE METHOD FOR ESTIMATING A NEW VARIABLE: ARTERIAL COMPLIANCE

T. S. Scanlon, M.D., N. T. Smith, M.D., H. Apple, Ph.D., G. Bergstrom MSEE, L.Hersh Ph.D.

Naval Hospital, VAMC, UCSD, Johnson & Johnson, and Critikon

Arterial compliance can be measured during Dinamap cuff deflation and the values obtained can be used to compute arterial impedance, a parameter used to determine cardiac output by the pulse contour method.

2-2

DOES ARTERIAL RIGIDITY AFFECT CARDIOVASCULAR FUNCTION IN VASCULAR SURGICAL PATIENTS?

Jorge Urzua, M.D., Gladys Meneses, B.S., Guillermo Lema, M.D., Carla Sacco, M.D., Hernan Muñoz, M.D., Albrecht Krämer, M.D., Francisco Valdes, M.D., Marcello Guarini, Ph.D., Aldo Cipriano, Ph.D., Marcelo Matus, B.A.

Departments of Anesthesiology, Electrical Engineering, and Cardiology, Catholic University, Chile

We conclude that arterial surgical patients may present increased apparent arterial rigidity and isolated systolic hypertension in the operating room; rigidity depends on the level of arterial pressure and may impair stroke volume.

2-3

CARDIOVASCULAR PARAMETER ESTIMATION USING NONLINEAR CIRCULATORY MODELS

Marcello Guarini, Jorge Urzua, Aldo Cipriano, Marcelo Matus
Pontificia Universidad Catolica de Chile, Santiago, Chile

We developed a computer program to estimate one nonlinear, one time-varying, and one linear parameter from a seven parameter physiologic model describing the human cardiovascular system; Data for model fit were obtained from the radial artery pressure waveform and estimated parameters were within the physiologic range.

2-4

TRANSFER FUNCTION FROM END-TIDAL AGENT TENSION TO BLOOD PRESSURE

Xin Bo Ji, PhD; Ignatius D Calalang BS; James H Philip, ME(E), MD

Brigham and Women's Hospital, Harvard Medical School, Boston MA

Using a recursive least squares (RLS) estimator, the relationship between systolic blood pressure (SBP) and expired isoflurane tension change was found to be 1st order, estimating SBP within 10%. This RLS approach will be extended to real-time estimation of SBP and anesthetic depth.

2-5

A NEW METHOD FOR ESTIMATING WORK OF BREATHING DURING PRESSURE SUPPORT VENTILATION

M. Leon, MD

University of South Florida College Of Medicine, Tampa, Florida.

A method that allows direct estimation of spontaneous inspiratory lung and airway work of breathing in a mechanical model during pressure support ventilation is described. If valid clinically, the method may contribute to the evaluation of the patient's share of the work of breathing during pressure support ventilation.

2-6

EVALUATION OF A NEW RESPIRATORY MONITOR

Vasilios Pratilas, M.D.

Mount Sinai Medical Center, New York, NY.

A flow-detecting ventilation monitor proved to be an accurate monitor of adequacy of ventilation in the 30 patients studied.

2-7

**APPLICABILITY OF A FOURIER TRANSFORM MASS SPECTROMETER
TO RESPIRATORY GAS ANALYSIS**

Kazuyuki Ikeda, M.D., Ph.D.*, Yoshimitsu Sanjo, Ph.D.*, Yuichi Iritani**

*Department of Anesthesiology and Critical Care Medicine,
Hamamatu University School of Medicine, Shizuoka, JAPAN.

**Central Research Laboratory, Nikkiso Co., Ltd., Shizuoka, JAPAN.

A compact FTMS (Fourier Transform Mass Spectrometer) is presented which provides direct separation and continuous measurement of respiratory and anesthetic gases with similar mass numbers.

2-8

**USE OF A PIEZOELECTRIC SENSOR TO MEASURE NEUROMUSCULAR BLOCKADE
DURING ANESTHESIA**

SE Kern M.S., DR Westenskow Ph.D., JA Orr Ph.D., JO Johnson M.D., Ph.D.

University of Utah, Salt Lake City, UT

The piezo sensor provides a convenient quantitative method of monitoring TOF ratio during recovery from neuromuscular blockade without the use of a fixed hand restraint.

2-9

A SIMPLE GAS SCAVENGING HOOD FOR ANESTHESIA MACHINES

Adel R. Abadir, M.D.

The Brookdale Hospital Medical Center, Brooklyn, NY

We constructed a scavenging hood applicable to new and old anesthesia machines and clearly demonstrated that the hood is an effective way to significantly reduce the levels of anesthetic gases in the operating room environment to below OSHA accepted standards.

2-10

**MULTILEAD DIGITAL ELECTROCARDIOGRAPHIC MONITORING DURING CARDIAC
SURGERY**

U Jain PhD MD, A Krishnamurthy MS, M Dasari MD, K Krishnamachari MS, K Zaworski BS

Loyola University Medical Center, Maywood, Ill

A system for the digital acquisition and processing of ECG, hemodynamic and clinical data for the detection of ischemia is presented.

2-11

**THE HAND SQUEEZE RESPONSE TEST PREDICTS LEARNING DURING EMERGENCE
FROM GENERAL ANESTHESIA**

R. C. Dutton, MD, W. D. Smith, PhD, and N. Ty Smith, MD,

Kaiser Permanente Medical Center, Hayward CA,
California State University, Sacramento, CA, and
UCSD, VAMC, San Diego, CA

The *hand squeeze response test* predicts a patient's ability to learn during emergence from general anesthesia and may be useful for evaluating anesthetic depth monitors; The patient who squeezes the anesthetist's hand other than four times in response to a request for four squeezes falls just short of the learning threshold.

Trans Esophageal Echocardiography, Sub-session 2A

2-12

QUALITY ASSURANCE IN INTRAOPERATIVE TRANSESOPHAGEAL ECHOCARDIOGRAPHY - A CRITICAL ANALYSIS OF A TWO YEAR EXPERIENCE

T. Rafferty, M.D., K. LaMantia, M.D., E. Davis, LPN, D. Phillips, BSEE, D. Gaal, M.D., S. Harris, M.D., J. Carter M.D., G. McCloskey, M.D., H. Godek, M.D., S. Rimar, M.D., P. Kraker, M.D., D. Jaeger, M.D., B. Kosarussavadi, M.D., R. Hines, M.D., C. Kopriva, M.D., T. O'Connor, MPH
Yale University, New Haven, CT

A TEE Quality Assurance Program in place over two years showed that a TEE endoscope-handling service prevented equipment malfunctions and that most clinicians attained reasonable data acquisition skills.

2-13

CARDIOPLEGIA-INDUCED AORTIC REGURGITATION IN PATIENTS WITHOUT PREEXISTING AORTIC VALVULAR DISEASE

S.N. Harris, M.D., T. Rafferty, M.D., E. Davis, L.P.N., M. Durkin, M.D.
Yale University, New Haven, CT

In patients with competent aortic valves demonstrated by color-flow Doppler, saline-contrast echocardiography demonstrated that pressurized cardioplegia commonly induces aortic regurgitation without left ventricular distension.

2-14

PERFORMANCE OF TRANSTRACHEAL DOPPLER CARDIAC OUTPUT MONITORING

A.C. Perrino, Jr., MD, T.Z. O'Connor, M.P.H., M. Luther, R.N.
Yale University, Yale-New Haven Hospital, New Haven, CT

Design improvements will be needed to produce a clinically acceptable Transtracheal Doppler Cardiac Output Monitor.

2-15

COLOR-FLOW DOPPLER TRICUSPID REGURGITATION SHOULD BE EXPRESSED AS A FUNCTION OF RIGHT ATRIAL DIMENSIONS

Terence Rafferty, M.D.; Michael Durkin, M.D.; Stephen N. Harris, M.D.; Joseph Mathew, M.D.; Roberta Hines, M.D.; Theresa Z. O'Connor, M.P.H.
Yale University, New Haven, CT

Color flow Doppler TR jet should be expressed as a fraction of right atrial dimension; then, tricuspid regurgitation is functionally significant when the jet area is greater than 3% of the atrial dimension.

2-16

ESTIMATION OF RIGHT VENTRICULAR TRANSGASTRIC SHORT AXIS ECHOCARDIOGRAPHIC PLANIMETERED DIMENSIONS BY QUALITATIVE MORPHOLOGIC CRITERIA

Terence Rafferty, M.D.; Michael Durkin, M.D.; Stephen N. Harris, M.D.; Elizabeth Davis, L.P.N.; Roberta Hines, M.D.; Theresa Z. O'Connor, M.P.H.
Yale University, New Haven, CT

The analysis of right ventricular function may be complicated by right ventricular rotation during changing loading conditions.

SESSION 3 INFORMATION OBTAINED USING TECHNOLOGY

3-1

CHANGES IN SvO₂ DO NOT PREDICT CHANGES IN THERMODILUTION CARDIAC OUTPUT.

DH Wong, PharmD., M.D., P. Weir, M.D., D. Mest, M.D., J. Zaccari, B.S., S. Daves, M.D., L. Ferraro, M.D., S. Barker, PhD., M.D.

Long Beach VA Hospital and Univ. of California, Irvine.

Changes in SvO₂ do not predict changes in thermodilution cardiac output.

3-2

CHANGES IN CARDIAC OUTPUT AFFECT P_{ET}CO₂ , CO₂ TRANSPORT AND O₂ UPTAKE DURING UNSTEADY STATE IN MAN

K. Shibutani, M.D., S. Shirasaki, M.D., T. Braatz, B. Sivaprakasapillai*, P. Gupte, M.E., B.M.E.*

Departments of Anesthesiology and Biomedical Engineering*, New York Medical College, Valhalla, NY

Confirming our previous report, P_{ET}CO₂, CO₂ elimination, and O₂ uptake correlated positively with changes in CO. Based on our observations and reasoning, these findings are not due to ventilation changes.

3-3

INSPIRATORY FLOW RATE AFFECTS INSPIRED CO₂ CONCENTRATION IN THE PRESENCE OF A CIRCLE CIRCUIT EXPIRATORY VALVE LEAK

Julian M. Goldman, M.D.

University of Colorado, Denver, CO

With a constant expiratory valve leak, inspired CO₂ concentration varies inversely with inspiratory flow, because as flow increases, a smaller portion of each breath passes through the incompetent expiratory valve.

3-4

A COMPARISON OF NEW SENSORS FOR RESPIRATORY RATE MONITORING.

Vegfors M. MD¹, Ugnell H. MSc², Hok B., Prof³, Oberg P. A. Prof² and Lennmarken C. MD, PhD¹.

Departments of Anesthesiology¹ and Biomedical Engineering², Linkoping University Hospital, Linkoping, Sweden.

Institute of Technology, University of Uppsala, Uppsala, Sweden³.

Results from a fiberoptic sensor and an acoustic monitor correlate well with traditional methods.

3-5

ON-LINE DATA COLLECTION FOR RESPIRATORY ANALYSIS

Andrew M. Sopchak, M.D., George J. Sheplock, M.D., Enrico M. Camporesi, M.D.

SUNY Syracuse NY

We have fully automated our respiratory analysis laboratory to provide reliable, precise and accurate collection of breath-to-breath data using the Macintosh® computer and customized respiratory analysis software written in LabVIEW II™; the system provides a significant advance in physiologic data collection and rapid on-line calculation of complex respiratory information.

3-6

GAS MAN SIMULATION OF TISSUE TIME CONSTANTS IS VERIFIED BY COMPARISON TO ANALYTIC SOLUTION

JH Philip MD, ID Calalang BS

Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Gas Man's ability to provide a numeric solution within 2% of the analytic solution to the simultaneous differential equations that govern inhalation anesthesia pharmacokinetics is demonstrated; vaporizer adjustment manipulations suggested by Gas Man should therefore be clinically applicable.

3-7

A THEORETICAL ANALYSIS OF THE FACTORS AFFECTING MAC AWAKE

D.C. Sutton, FFARACS; I.D. Calalang, BS; D.B. Raemer, Ph.D.;

J.H. Philip, ME(E), MD

Brigham and Women's Hospital, Harvard Medical School, Boston, MA

End-expired anesthetic concentration at the time of eye opening is significantly lower than the 0.58 MAC level present in the brain at the same time; the value is affected by ventilation, blood/gas partition coefficient, and duration of anesthesia.

3-8

ANALYSIS OF EUCAPNIC HYPERPNEA AS AN ALTERNATIVE TO OVERPRESSURE FOR INDUCTION OF INHALATION ANESTHESIA

DC Sutton, FFARACS; I D Calalang, BS; DB Raemer PhD; J H Philip, ME(E), MD

Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Eucapnic hyperpnea reduces the overpressure required for rapid induction with insoluble inhalation anesthetics and produces results similar to those achievable with the less soluble inhalants—sevoflurane and desflurane.

3-9

EUCAPNIC HYPERPNEA WITH ISOFLURANE PRODUCES SIMILAR EMERGENCE TIMES TO SEVOFLURANE OR DESFLURANE BUT REQUIRES ANESTHESIA MACHINE DESIGN CHANGES

DC Sutton FFARACS, ID Calalang BS, DB Raemer PhD, J H Philip ME(E) MD

Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Eucapnic hyperpnea with isoflurane produces emergence times similar to those achieved with sevoflurane and desflurane but would require costly and confusing anesthesia machine design changes; use of the new inhalation agents appears more prudent.

3-10

CLOSED CIRCUIT COASTING FROM HIGH FLOW ISOFLURANE ANESTHESIA

Ahmed Mohamed El-Attar, MS, MD

King Fahd Hospital, King Faisal University, Al-Khobar, K.S.A.

Closed circuit coasting from high flow anaesthesia is safe, simple, predictable, and practical.

3-11**AN EXPERIMENTAL APPROACH TO RECYCLING VOLATILE ANESTHETICS**

F. Groß-Alltag PHD, T. Marx MD and W. Friesdorf ME MD

University of Ulm, Ulm, Germany

Current waste of volatile anesthetics could be avoided using available techniques of charcoal absorption and recovery and thereby provide environmental and economic benefit.

3-12**ON-LINE DETERMINATION OF Na^+ , K^+ , Ca^{++} , AND PH DURING CARDIAC SURGERY AND TRANSURETHRAL RESECTION OF THE PROSTATE**

Michael L. Smith, M.D., N. Ty Smith, M.D., David Wong, Ph.D.

VAMC, UCSD, US Naval Hospital, and VIA Medical Corp., San Diego CA

We successfully measured electrolytes (Na^+ , K^+ , and pH for TURP and K^+ , Ca^{++} , and pH for cardiac surgery) in 9 of 18 patients using an automatic-withdrawal-reinjection analytic system and found results to be accurate and clinically useful.

3-13**CUTANEOUS INJURIES ASSOCIATED WITH PULSE OXIMETERS**

S. Mark Poler, MD, Sandra S. Walker, MS, CRNA, Michael J. Kibelbek, MD,

Michele Maroon, MD

Geisinger Medical Center, Danville, PA

We noted what appear to be thermal burns under pulse oximeter probes in 2% of pediatric patients and 0.02% of adult patients and have been unable to determine a specific cause. The manufacturers of the two devices involved are investigating the situation with us.

3-14**ROUTINE USE OF NERVE STIMULATOR REDUCES INCIDENCE OF POSTOPERATIVE MUSCLE WEAKNESS**

M. Hartmannsgruber, MD; and N. Gravenstein, MD

Departments of Anesthesiology and Neurosurgery, U. Florida Gainesville, FL

Routine use of nerve stimulation reduces the incidence of postoperative muscle weakness.

**We express our heartfelt thanks
to the meeting**

Sponsors and Advertisers

Becton Dickinson Vascular Access
Blue Bell Bio-Medical
Criticare Systems, Inc.
Datascope
Datex Medical Instrumentation
Diatek Patient Management Systems
Drägerwerk AG
Hewlett Packard Company
Interflo Medical, Inc.
Level 1 Technologies
Little, Brown & Company
Marquette Electronics, Inc.
North American Drager
Ohmeda
Organon, Inc.
PPG Bio-Medical Systems Division
Puritan Bennett Corporation
Siemens Patient Care Systems, Inc.
SpaceLabs, Incorporated
Yardley Software

**SECOND ANNUAL MEETING OF STA
SOCIETY FOR TECHNOLOGY IN ANESTHESIA**

**U.S. Grant Hotel
San Diego, California, USA**

January 30 - February 1, 1992

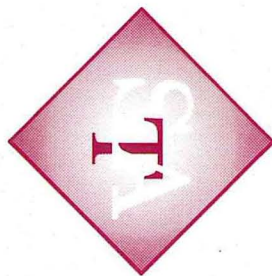
PROBLEM WITH
WORKSPACE. YOUR
IN CHAOS, DISTRACTING
FROM PATIENT CARE.
DOESN'T CONSIDER
AS A FALLIBLE HUMAN.
NEED TO BE CHANGED
YOUR WITS TO HELP

HODGEPODGE THAT'S

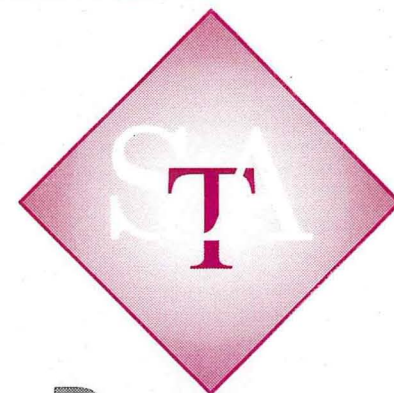
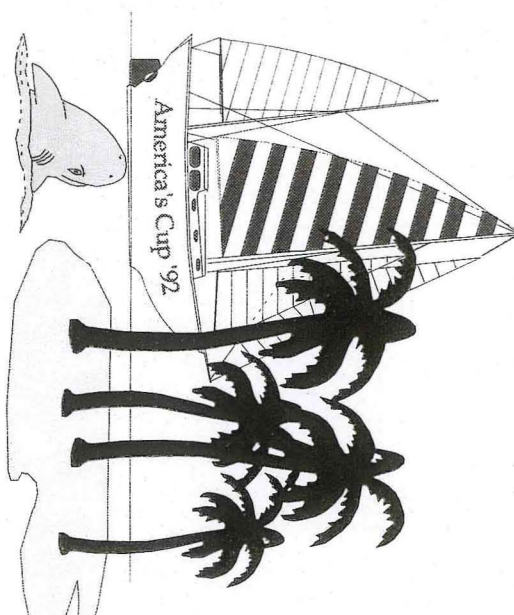
WORKSTATION:

**STA '92
IN
SAN DIEGO!**

**2nd Annual Meeting San Diego
January 30th-February 1st, 1992**

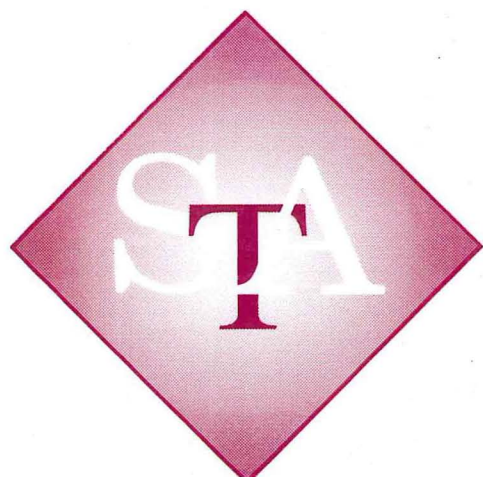


Society for Technology in Anesthesia
128 E. Court Street
Hastings, MI 49058, USA



**BEHIND
THIS
DOOR
LIES THE
FUTURE
OF
THE
ANESTHESIA
WORKSTATION**

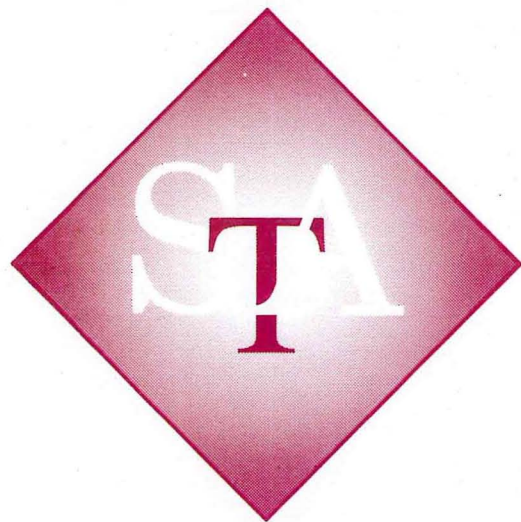
THERE IS A MAJOR OPPORTUNITY FOR YOU IN SAN DIEGO TO HELP REDESIGN
THE ANESTHESIA WORKSTATION. NEXT JANUARY 30-FEBRUARY 1, ANESTHESIA
EQUIPMENT IS GOING TO BE SEEN IN A NEW LIGHT. GIVE THREE DAYS OF
YOUR ATTENTION TO THIS PROBLEM, AND YOU CAN HELP CHANGE HOW
EQUIPMENT DESIGN IS DONE IN ANESTHESIA. EXPLORE YOUR STRENGTHS AND
YOUR LIMITATIONS WITH THE SOCIETY FOR TECHNOLOGY IN ANESTHESIA '92!
THIS WILL HELP YOU TO HAVE REAL INPUT INTO ANESTHESIA SYSTEM DESIGN,
WHEN YOU GATHER WITH OTHERS IN WORKGROUPS, SEMINARS AND LECTURES TO
REDESIGN THE WORKSPACE WHERE YOU SPEND MOST OF YOUR DAY! PLEASE,
THE ANESTHESIA SYSTEM OF THE FUTURE NEEDS **YOUR** INPUT IN JANUARY 1992!



The Society for Technology in Anesthesia 2nd Annual Meeting
The U.S. Grant Hotel, San Diego
January 30-February 1, 1992
Jointly sponsored with the Maricopa Medical Center, Phoenix

**Decision-making in Anesthesia:
Redesigning the Anesthesia Workstation**

STA '92



Decision-Making in Anesthesia:

Design of the Workstation

The Society for Technology in
Anesthesia
2nd Annual Meeting
San Diego
January 30-February 1
1992

REGISTRATION

The Society for Technology in Anesthesia 2nd Annual Meeting
January 30 - February 1, 1992 San Diego

Last Name _____
First Name _____
Title _____
Institution or Organization _____

Mailing Address _____

City _____

State _____ ZIP _____ Country _____

Daytime phone () _____ Evening phone () _____

STA membership # (if known) _____

Name of guest _____

Registration Fees

Physicians

Category 1 (Before January 1, 1992)

☐ STA members \$250

☐ Non-STA members \$300

Category 2 (After January 1, 1992)

☐ STA members \$300

☐ Non-STA members \$350

Non-Physicians

(Engineers, Executives, Technicians, Technologists)

Category 3 (At any time)

☐ STA members \$150

☐ Non-STA members \$250

Spouses' Activities

☐ All membership categories (includes breakfast
each day, dinner on Thursday, and lunch on Friday)
\$75

Form of payment:

☐ Check # _____ enclosed for \$US _____, payable to

STA Annual Meeting

☐ Charge to my (circle one) VISA/Mastercard/AmExpress

Card: # _____ US\$ _____

Exp. Date _____ Signature _____

**TUITION REFUND POLICY: Full refund less \$50
application processing fee may be obtained until Dec. 30,
1991. 50% of fees paid are refunded if cancellation is
postmarked by Jan. 8, 1992. No refunds if postmarked on
or after Jan. 9, 1992. All cancellations must be in writing.**

Mail completed application with payment to:

STA

128 E. Court Street
Hastings, MI 49058, USA
(800)875-2525 or (616)945-5110
FAX (616)948-2507

Office Use Only

____ DR
____ FM ____ LS
____ PC ____ CC
____ Code#

NOTE: Hotel reservation forms for those hotels
offering convention rates will be sent to registrants on
receipt of meeting application.

MEETING SITE

SAN DIEGO

San Diego provides an ideal January site for the STA meeting: its subtropical climate encourages outdoor recreation before, during and after the meeting. Cruise ships to Mexico's "Baja Riviera" leave from near the hotel, the beaches are spectacular, and outdoor attractions such as Sea World and the San Diego Zoo tempt you to stay a few extra days. Cultural and entertainment opportunities are diverse in this cosmopolitan city that also offers exciting shopping and dining opportunities. From the charm of suburban La Jolla to the excitement of deep-sea fishing, San Diego offers many ways for the winter-weary visitor to escape. In addition, trial competition for the America's Cup yacht races will be held before and after the STA meeting. Contact ICS, Inc. for details.

THE U.S. GRANT HOTEL

The historic U.S. Grant Hotel in San Diego is the headquarters for the 2nd annual STA meeting. A four-year, \$80 million renovation completed in 1985 restored the hotel to its former glory among the world's finest hotels. All rooms connote turn-of-the-century elegance; their furnishings include Queen Anne two-poster beds, armoires and wingback chairs. The modern convenience of wet bars, remote control televisions with cable and in-room cinema, and large baths with marble and ceramic tile tubs will delight you.

The U.S. Grant is directly across the street from Horton Plaza, renowned for its architectural features. The hotel is also next to the Gaslamp Quarter, a rich potpourri of restaurants, night clubs, art galleries, boutiques and antique stores. The San Diego Trolley leaves from the corner of the hotel for scenic Tijuana, Mexico, only a few minutes away. Live theater performances are plentiful close by the hotel, and the Convention and Performing Arts Center is a half block away. The Seaport Village and Cruise Ship Terminal are eight blocks away, the renowned San Diego Zoo is 5 minutes from the hotel, and Sea World is only 15 minutes distant. A 20-25 minute ride from the hotel takes the visitor to the San Diego Wild Animal Park.

HOW TO GET THERE

[Please note: Carriers provide convention discounts for registrants as a courtesy to STA and without obligation to us]



United Airlines, the official airline of the 2nd STA meeting, will provide convention rates for air travelers to this meeting in San Diego. For details, please call ICS, Inc.



Hertz Car Rentals provides convention rates to STA registrants attending the 2nd annual meeting in San Diego. Please call ICS, Inc. for information.

RESERVATION SERVICES

All of your reservations can be made at convention rates through the official agent for this meeting:

International Convention Services, Inc.
1-800-875-2525 or (616)945-5110

FACULTY

Panels, Workshops and Design Session

Steven J. Barker, Ph.D., M.D.
 Frank E. Block, Jr., M.D.
 Jerry M. Calkins, Ph.D., M.D.
 Robert T. Chilcoat, Ph.D.
 Jan Ehrenwerth, M.D.
 Wesley T. Frazier, M.D.
 David M. Gaba, M.D.
 George Grothowold, B.S.
 Betty L. Grundy, M.D.
 Donald Norman, Ph.D.
 Todd Peterson, M.D.
 James H. Philip, M.D.
 Allen K. Ream, M.D.
 Phillip T. Robinson, DVM
 Reynolds J. Saunders, M.D.
 Franklin L. Scamman, M.D.
 David B. Swedlow, M.D.
 Richard C. Watt, MSFE
 Matt Weinger, M.D.
 David Weissburg, M.S.I.F.
 Dwayne R. Westenskow, Ph.D.
 Christoph Westerteicher
 David Wong, Pharm.D., M.D.
 David Woods, Ph.D.

PROGRAM

January 30th:

0700-0745 Continental Breakfast
 0745-0800 Welcome: N. Ty Smith, President, STA
 0800-0810 Overview of Meeting: Jerry M. Calkins
 0810-1010 Data Acquisition: Steven J. Barker, Moderator
 David Wong: Hemodynamics and Cardiac Output
 Betty L. Grundy: Neurological function
 Dwayne Westenskow: Respiratory Gases
 Steven J. Barker: Oxygen and Carbon Dioxide Transport
 1010-1030 Break
 1030-1200 Scientific Sessions - Posters
 1200-1300 Luncheon
 1300-1500 Data Processing/Information Management:
 Franklin L. Scamman, Moderator [A discussion of design philosophies by
 colleagues from industry]
 George Grothowold---Drager
 David Weissburg---Arkive / Ohmeda
 Christoph Westerteicher---Hewlett-Packard
 1500-1520 Break
 1520-1630 Scientific Session
 1800-1900 Reception - Participants and Guests
 1900-2100 Dinner---Phillip T. Robinson, DVM, Campus Veterinarian, UCSD,
 Director, Office of Animal Resources, formerly Veterinarian, San Diego Zoo;
 "Anesthesia at the Zoo"
 1030-1200 Scientific Sessions -- Posters

PRE-PROGRAM ACTIVITIES

January 29th - Wednesday
 1600-1900 STA Board of Directors' Meeting
 1800-2100 Registration
 1900-2100 Reception - Registrants and Guests

SPOUSE/GUESTS' ACTIVITIES

January 30, 1992 - Thursday
 9:00 a.m. - Registration in the Crystal Room
 -- Continental Breakfast
 9:30 a.m. - Guest Speaker: "History of San Diego"
 7:00 p.m. - Dinner with meeting registrants and
 Guest Speaker
 January 31, 1992 - Friday
 9:00 a.m. -- Continental Breakfast
 12:00 noon -- Lunch with Meeting Registrants for
 STA Distinguished Lecturer
 February 1, 1992 - Saturday
 9:00 a.m. -- Continental Breakfast

ABSTRACT PRESENTATIONS

We invite participants to present abstracts at the STA 2nd Annual meeting. The format for the Scientific Sessions will be Poster Presentation preceded by approximately 1 minute (4-slide maximum) verbal summaries. We encourage non-commercial demonstrations as well.

STA will publish accepted abstracts in the Meeting Proceedings as well as the April 1992 issue of Journal of Clinical Monitoring. The final deadline for submission is October 1, 1991.

Abstracts should be 250-500 words long (plus tables, figures and references). Please include the following information: Title, Author(s) names and degrees, University, Institutional or Industrial affiliation as applicable. The Abstract should include the following sections: *Introduction, Methods, Results and Discussion*. In addition, please provide a final, single *Summary Sentence* that summarizes the work.

Published abstracts will be typeset professionally. Please use a monospaced font such as 12-point Courier, printed with a letter-quality printer if possible. We would appreciate submission of a text file on computer disk, in word processor or ASCII format, with the hard copy of the Abstract. We welcome submission of text files on E-Mail but please include hard copy by mail.

Please send abstracts to:

James H. Philip, MD, STA Scientific Chairman, 75 Francis Street, Boston MA 02115. Tel (617)732-7330; FAX (617)732-6798; E-Mail 241-8308 @ MCL.com. Enclose a cover letter or README file with mailing address, telephone number, FAX number, and E-Mail address if available. Please tell us of resources needed if you want to demonstrate a system.

Abstract participants will need to arrange their own reservations for accommodation and travel; we regret that neither honorarium nor subsidy can be provided for presenters.

January 31st:

0800-1000 Data Display---Human Factors/Human Error:
 David M. Gaba, Moderator
 Matt Weinger: Study of the Anesthesiologist's use of information displays on the Ohmeda Modulus CD Anesthesia Machine
 David Woods: Human-machine interactions with anesthesia monitoring and drug delivery systems
 Donald Norman: A science of information display
 David Gaba: Human-machine interaction problems documented through realistic simulation
 1000-1030 Break
 1030-1200 Scientific Session
 1200-1330 Luncheon/STA Distinguished Lecture ---Donald A. Norman, Professor and Chair, Department of Cognitive Science, UCSD, Author of the bestseller *The Design of Everyday Things*: "Don't Worry: It's only One Chance in a Million"
 1330-1500 Experts' Corner---Designing Workstation
 Components: Dwayne Westenskow and Robert Chilcoat, Moderators
 1520-1630 Special Cracker-Barrel Session: "Designed by a Committee? Now it's our turn!" [Small work groups redesign the anesthesia workstation led by facilitators: all conference registrants are encouraged to participate!]

February 1st:

0700-0800 Continental Breakfast
 0800-1000 A morning of reflection: Presentation by team leaders: synthesis of a unified approach to the anesthesia workstation design
 1030-1130 The Great Debate: "Controversies in Technology"---Block, Ream, Swedlow
 1130-1230 STA Business meeting
 1230 Adjourn

COURSE OBJECTIVES

AUDIENCE: Anesthesiologists, nurse anesthetists, anesthesia technicians, engineers involved in clinical instrumentation, design engineers, executives in the clinical device industry, and others interested in the problems inherent in design of the anesthesia workstation.

EDUCATIONAL OBJECTIVES: Registrants will be able to 1) Identify 3 major defects in anesthesia workspace design, 2) Inspect a sample workspace design and identify 2 problems requiring correction, 3) Name 3 elements of good workspace design, 4) Identify 3 human factors considerations in the anesthesia workstation, 5) Name 2 new developments in Data Monitoring, 6) Name 2 problems in Information Management in anesthesia.

ACCREDITATION

The Maricopa Medical Center is accredited by the Arizona Medical Association to sponsor continuing medical education for physicians. Maricopa Medical Center designates this continuing medical education activity for 14 credit hours in Category 1 of the Physicians Recognition Award of the American Medical Association.