

Western Neurosurgical Society



56th Annual Meeting
October 8-11, 2010
Santa Fe, New Mexico



American
Association of
Neurological
Surgeons

jointly sponsored by aans

CALENDAR OF EVENTS

Friday, October 8, 2010

1:00PM-4:00PM	Executive Committee Meeting	Pinion Room
2:00PM-5:30PM	Registration	Anasazi Concourse
7:00PM-9:30PM	Opening Reception and Buffet	Presidential Suite

Saturday, October 9, 2010

6:30AM-7:30AM	Breakfast - Members / Professional Guests	Zia Ballroom
6:30AM-12:00PM	Exhibitors	Zia Ballroom
6:30AM-12:00PM	Registration	Anasazi Concourse
7:30AM-12:20PM	Scientific Session	Anasazi Ballroom
8:30AM-10:00AM	Breakfast - Spouses	Sunset Room
10:05AM-10:35AM	Break – Visit Exhibits	Zia Ballroom
1:00PM-6:00PM	Golf	Black Mesa
1:00PM-5:00PM	Tennis	Shellaberger Tennis Ctr
7:00PM-10:00PM	“A Night at the Museum”	NM History Museum

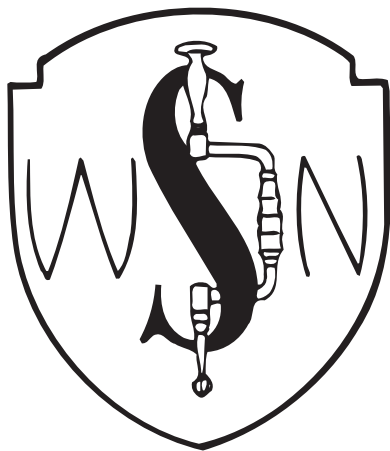
Sunday, October 10, 2010

7:00AM-8:00AM	Members Business Meeting & Breakfast	Sunset Room
7:00AM-8:00AM	Breakfast - Professional Guests	Zia Ballroom
7:00AM-12:00PM	Exhibitors	Zia Ballroom
7:00AM-12:00PM	Registration	Anasazi Concourse
8:00AM-12:10PM	Scientific Session	Anasazi Ballroom
10:00AM-10:30AM	Break – Visit exhibits	Zia Ballroom
8:00AM-10:00AM	Breakfast - Spouses	Sunset Room
1:00PM-6:00PM	Golf	Marty Sanchez Links
1:00PM-5:00PM	Tennis	Shellaberger Tennis Ctr
6:00PM-7:00PM	Formal Reception	Eldorado Court
7:00PM-10:00PM	Formal Banquet / Dance	Anasazi Ballroom

Monday, October 11, 2010

6:30AM-7:30AM	Breakfast - Members / Professional Guests	Zia Ballroom
6:30AM-11:30AM	Exhibitors	Zia Ballroom
6:30AM-11:30AM	Registration	Anasazi Concourse
7:30AM-11:30AM	Scientific Session	Anasazi Ballroom
8:30AM-10:00AM	Breakfast - Spouses	Sunset Room
10:00AM-10:30AM	Break – Visit Exhibits	Zia Ballroom
11:30 AM	Scientific Meeting Adjourned	

*See you at the 57th Meeting of the WNS
September 10 to September 13, 2011
Grand Hyatt Resort & Spa, Kauai*



Western Neurosurgical Society

56th Annual Meeting

Eldorado Hotel - Santa Fe, New Mexico

2010 Learning Objectives

The purpose of this meeting is to provide an update in the basic and clinical sciences underlying neurosurgical practice through lectures, discussions, interactive sessions with neurological surgeons, neurologists, neuroradiologists, and other allied health personnel.

Upon completion of this program, participants should be able to:

- Review the current state and future possibilities for medical simulation, especially with regard to surgical education.
- Analyze options and outcomes for patients needing spinal surgery.
- Discuss options for surgical and nonsurgical management of CNS neoplasms.
- Discuss the role regionalization of care may have in the management of disease conditions that require subspecialty care or intensive resources.

Jointly sponsored by



American
Association of
Neurological
Surgeons

Notes

New Mexico

47th state in the Union - January 6, 1912

Borders: Colorado, Oklahoma, Texas, Arizona; international border: Mexico

Population: 1,928,384

Population of Santa Fe (Capital city): 62,203

Population of Albuquerque (largest city): 484,246

Official State Symbols

Cookie: Biscochito

Insect: Tarantula Hawk Wasp

Bird: Roadrunner

Mammal: Black Bear

Gem: Turquoise

Grass: Blue Gamma

Flower: Yucca

Vegetables: Chile & Pinto Bean

Fossil: Coelophysis

Fish: Cutthroat Trout

Tree: Pinon

The Western Neurosurgical Society

2010 Officers and Committees

OFFICERS

President - David W. Newell, MD
President Elect - Austin Colohan, MD
Vice President - J. Paul Muizelaar, MD, PhD
Historian - Randy Smith, MD
Secretary-Treasurer - Charles Nussbaum, MD
Past President - Lawrence Shuer, MD

COMMITTEES

<p><u>Program</u></p> <p>Mark Linskey, MD, Chairman Michael Lawton, MD Linda Liau, MD, PhD Nate Selden, MD, PhD Howard Yonas, MD</p> <p><u>Membership</u></p> <p>Marvin Bergsneider, MD, Chairman Thomas Scully, MD Allen Efron, MD Srinath Samudrala, MD</p> <p><u>Awards</u></p> <p>Austin Colohan, MD, Chairman W. Ben Blackett, MD John Bonner, MD Steve Giannotta, MD</p> <p><u>Site Selection</u></p> <p>Grant E. Gauger, MD, Chairman David Pitkethly, MD Jeff Rush, MD</p> <p><u>Web Master</u></p> <p>Randy Smith, MD, Chairman Charles Nussbaum, MD</p>	<p><u>By-Laws</u></p> <p>Richard Wohns, MD, Chairman William L. Caton, III, MD</p> <p><u>Audit</u></p> <p>Moose Abou-Samra, MD, Chairman Jeff Rush, MD John Slater, MD</p> <p><u>Nominating</u></p> <p>Lawrence Shuer, MD, Chairman Moustapha Abou-Samra, MD W. Ben Blackett, MD Kim Burchiel, MD Gerald Silverberg, MD John Slater, MD</p> <p><u>Local Arrangements</u></p> <p>Paul Turner, MD, Chairman Paul Muizelaar, MD, PhD Charles Nussbaum, MD Tom Scully, MD Howard Yonas, MD</p> <p><u>CME</u></p> <p>Jeff Rush, MD, Chairman Charles Nussbaum, MD</p>
---	--

2010 Exhibiting Companies

AESCULAP[®]

Implant Systems

www.aesculapimplantsystems.com

866-229-3002

ANULEX

TECHNOLOGIES

www.anulex.com

952-224-4000



BRAINLAB

www.brainlab.com

+1708.409.1343

Codman

a *Johnson & Johnson* company

www.codman.com

1-800-225-0460



COVIDIEN

www.covidien.com/biosurgery



**GLOBUS
MEDICAL**

www.globusmedical.com



Eisai

www.eisai.com

210-692-1100

KLS martin L.P.

www.klsmartinusa.com

800-625-1557

Thank You Exhibiting Reps
The WNS Appreciates you!

LANX[®]

www.lanx.com
303-443-7500



Medtronic

www.medtronic.com



NATIONAL NEUROSURGICAL & ORTHOPEDIC
OPTIMUM CARE CONTINUUM

www.noc2healthcare.com
615-712-9574



www.osteomed.com
1.800.456.7779



www.swsurgicalonline.com
480-515-1680

stryker[®]

www.stryker.com
1-800-253-7370



Targeting Solutions in Neurosurgery.
www.vycormedical.com
631-244-1435



zimmer | spine



L. Philip Carter, M.D.
February 6, 1939 - July 6, 2010

When I heard Phil had died, I simply did not believe it. In the past, Phil had beaten his cancer so many times, so valiantly. He epitomized the notion that individuals bring their own brand of courage to change the course of their illness. I thought he'd always keep defying the odds.

In 2009, the Western Neurosurgical Society, one of the most senior and prestigious neurosurgical organizations in the world, elected Phil to be its 55th President. This was a great honor and a mark of just how widely admired he was by the members of his chosen profession. He had honored me by asking, almost one year ago now, if I would introduce him at his Presidential Address to this annual meeting. Phil had shared with me that this Presidency was one of the crowning achievements of his long and prestigious career. I was happy for him, and with him. I remember we joked about how infrequently we get to climb to our greatest heights at the end of our days.

There was a reason Phil was chosen by the WNS to be its President. It was because he was so widely and deeply admired by his colleagues. He epitomized what we all look for in a surgeon: a humble, gentle steadfast love of his profession and what it can offer to both patients and practitioners.

Let me give you an example, an illustration of what Phil stood for, and what I feel is often sorely lacking in medicine now. Phil had a gift for helping out younger surgeons - like me, when I first came to work for him 20 years ago. When you're starting out, you want to try challenging cases, and stretch yourself technically; but you also don't want to make a mistake. So I would ask Phil: "How would you like to do a MCA aneurysm case on Thursday?" "Sure," he'd say, "I'd love to." He had this special way of helping you, of being there with you, of sharing the case, but never making you feel foolish. And you always knew the case would go well when Phil showed up. He'd share cases until you stopped asking him for help. And then I might go a year before asking him again and he'd be right there, if I needed him. If I called him to come down, he'd drop everything, and show up in the OR, all smiles.

Phil also had this way of easily bridging history in a personal way. He started his career in medicine in the Air Force, as a General Medical Officer posted to Otis Air Force Base on Cape Cod. He told me that one night he was looking through the patient guest register and came across an unusual entry. It was dated August 7, 1963. A young white female, age 35, had been rushed by ambulance from Hyannis in premature labor. An emergency C-section was performed. The woman gave birth to a boy, who was named Patrick, born 5½ weeks premature. In the register, next to every patient's name, were the names of all the guests or family who had signed in. However, the entry for Patrick's mother contained no name - just age and gender. Next to the

woman's entry, there was only one guest listed, again, no name, just initials, hastily scrawled. The initials simply read "CIC" - Commander in Chief. The baby's name was Patrick Bouvier Kennedy. The President and First Lady's son died on August 9th, two days later, at Boston Children's Hospital.

Phil shook his head as he told this story. He asked: "Can you imagine what that woman went through, losing first her son, and then her husband, three months later, to assassination? And still, somehow, she managed to go on. How does a human being go on?" I was struck that Phil felt, just by looking through that old register, a sense of connection to the thread of human suffering, of human courage in the face of frailty. And that is what he displayed in the face of his own struggle with cancer.

Phil did his neurosurgical residency at the BNI under the tutelage of the legendary John Green. He was part of that "neurosurgical bridge generation" - that generation who were taught by the figures who trained under the original fathers of neurosurgery.

Phil experienced what would be the soaring heights of the field; namely, the advent of microsurgery and computerized and magnetic resonance tomography. Phil worked and trained under the pioneering Gazi Yasargil, the father of neurosurgical microsurgery. He later teamed up with Robert Spetzler at the BNI. Together they made it one of the premier neurovascular programs in the world. It would set a standard that few programs have ever approached. Phil loved neurosurgery. He especially felt privileged to be a part of what it stood for. He enjoyed the characters in it, and I don't think anyone loved the operating room more than he did.

Phil again was a part of the great sweep of history when he became Chairman of Neurosurgery at the University of Oklahoma. A little more than a year after he took over the helm of the program, on April 19, 1995, Timothy McVeigh would detonate a truck full of explosives in front of the Alfred P. Murrah Federal Building in Oklahoma City. McVeigh would kill 168 people, including 19 children under the age of six, and injure more than 680 people. The blast was so enormous that it destroyed more than 300 buildings within a 16 block radius and damaged another 200 buildings nearby. Very few neurosurgeons in history have had to stand at their post under such devastation and destruction. Phil was in charge of overseeing the triage of the victims of the blast, of operating on dozens of them, of witnessing first-hand the carnage of what was, at that time, the worst act of terrorism ever carried out on US soil, until September 11, 2001.

Again, I think Phil was shocked by so much violence, and what it had done to hurt so many innocent people. When Timothy McVeigh was executed in 2001, Phil was once again anguished over how much the people in Oklahoma City had to overcome in order to continue on with their lives. He felt honored and responsible for helping a city to heal.

The last time I saw Phil, we were alone. It was typical of Phil that he was asking me how I was doing, while he was the one in the ICU. Finally, I got the conversation around to him. He shared with me how he had gone through one particularly dark night in the hospital when he was feeling fearful. He said: "I'm scared because I know what's happening to my legs. They're not working well. I was wondering about the podium." He was a little hazy with medication at the time so I asked, "What podium are you talking about?" "At the Western," he added, "when I give my Presidential address. They may need to get rid of the podium if I am stuck in a wheelchair." I shrugged my shoulders and said: "Well, the wheelchair worked for FDR when he was President!" Phil smiled and looked at me with this big grin. "Well," he said: "then let's hope I don't end up in a wheelchair. That would mean four terms as President of the Western, since FDR was named President for a consecutive four terms." Then he mused: "I'm sure we'd have to change the Society's by-laws to accommodate something like that!"

If the by-laws had needed to be changed, they would have been for Phil. He defined the term "gentlemanly, respectful," and I would even add, "loving leadership." He will be desperately missed by all of us for his inspiration, friendship and mentorship in Neurosurgery.

Notes

The Albuquerque International Balloon Fiesta began in 1972 with 13 balloons launching from a shopping mall parking lot. It is now the earth's largest ballooning event with over 500 balloons, and the most photographed event in the world.

2010 Guests

John F. (Sean) Mullan	Society- Cloward Award
Chris C. Wood	Society- Ablin lecture
J. Doayne Farmer	Special lecturer
Justin Dye	Resident Award
Isaac Yang	Resident Award
Carter E. Beck	Applicant
Jeff W. Chen	Applicant
G. Michael Lemole, Jr.	Applicant
Michael Muhonen	Applicant
Rod J.Oskouian, Jr	David Newell
J. Adair Prall	Applicant
Peter Shin	Applicant
Emun Abdu	Resident guest
Iman Feiz-Erfan	Phil Carter
Marc Malkoff	Mark Linskey
Stephen Ritland	Shokei Yamada
Bob Shafa	Marc Mayberg
Alex Valadka	Mark Linskey
Farrokh Farrokhi	Charles Nussbaum
Manuel Ferriera	Laligam Sekhar
Steven Ojemann	George Ojemann
Norbert Roosen	Society
Richard Simpson	Society
Martina Stippler	Paul Turner

An MRI of Kim Peek, (the man with an incredible memory who inspired the 1988 film Rain Man), revealed that his brain had a malformed cerebellum and was missing the corpus callosum.

CONTINUING MEDICAL EDUCATION ACCREDITATION

This Activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the AANS and the Western Neurosurgical Society. The AANS is accredited by the AACME to provide continuing medical education for physicians.

The AANS designates this educational activity a maximum of 10.75 AMA PRA Category 1™ credits. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Joint Sponsorship Disclaimer

The material presented at the 2010 Western Neurosurgical Society Annual meeting has been made available by the Western Neurosurgical Society and the AANS for educational purposes only. The material is not intended to represent the only, nor necessarily the best, method or procedure appropriate for the medical situations discussed, but rather it is intended to present an approach, view, statement, or opinion of the faculty, which may be helpful to others who face similar situations.

All drugs and medical devices used in the United States are administered in accordance with the Food and Drug Administration (FDA) regulations. These regulations vary depending on the risks associated with the drug or medical devices compared to products already on the market, and the quality and scope of the clinical data available.

Some drugs and medical devices demonstrated or described on the print publications of the Western Neurosurgical Society and jointly sponsored by the AANS have FDA clearance for use for specific purposes or for use only in restricted research settings. The FDA has stated that it is the responsibility of the physician to determine the FDA status of each drug or device he or she wishes to use in compliance with the applicable law.

Neither the content (whether written or oral) of any course, seminar or other presentation in the program, nor the use of specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used, or the materials exhibited by the Western Neurosurgical Society and jointly sponsored by the AANS, or its Committees, Commissions, or Affiliates.

Did you know....

During World War II, the first atomic bombs were designed and manufactured at Los Alamos.

DISCLOSURE INFORMATION

The AANS controls the content and production of this CME activity and attempts to ensure the presentation of balanced, objective information. In accordance with the Standards for Commercial Support established by the Accreditation Council for Continuing Medical Education (ACCME), speakers, paper presenters/authors and staff (and the significant others of those mentioned) are asked to disclose any relationship they or their co-authors have with commercial interests which may be related to the content of their lecture. The ACCME defines “relevant financial relationships” as financial relationships in any amount occurring within the past 12 months that create a conflict of interest.

Speakers, paper presenters/authors and staff (and the significant others of those mentioned) who have disclosed a relationship* with commercial interests whose products may have a relevance to their presentation are listed below.

Name	Disclosure	Type of relationship
James Ausman	Future Health Care Strategies Somanetics Corp.	President, Stockholder Stockholder
Kim Burchiel	Medtronic	Grants/Research Support
Michael Lemole	Porex Lanx Codman-Depuy	Consultant Stockholder Honorarium
Peter Shin	Blackstone Orthofix	Consultant
Iman Feiz-Erfan	Depuy	Consultant
Stephen Ritland	Medtronic, Johnson & Johnson	Consultant
Michael Lawton	Mizuho America	Royalty
David Newell	Life Sciences Discovery Fund/State of WA Cerevast, Flat Lox	Grants/Research Support Stockholder
Isaac Yang	NIH, UCSF	Grants
Allan J. Hamilton	Karl Storz endoscopy Bio-Sim corp. Siemens, Cancer Centers of America Cook	Grants Stock Honorarium Other financial/material
Carter Beck	Medtronic	Stock, Consultant
Marvin Bergsneider	Codman, Medtronic	Grant/Research Support
Linda Liau	Northwest Biotherapeutics, Agios	Grant Support
Nathan Selden	Oregon Bioscience Initiative, Cameron	Grant Foundation
Richard Wohms	US Radiosurgery Symbion, NOC2 Rainier Technology	Stock, Board Member Consultant Advisory Board member
Marc Malkoff	NIH D-Pharm	Grant Grant
Howard Yonas	Neurologica	Stock

Relationship refers to receipt of royalties, consultantship, funding by research grant, receiving honoraria for educational services elsewhere, or any other relationship to a commercial interest that provides sufficient reason for disclosure.

Speakers, paper presenters/authors and staff (and the significant others of those mentioned) who have reported they do not have any relationships with commercial interests:

Jeff Chen	John F. (Sean) Mullan	J. Adair Prall	Alex Valadka
Justin Dye	Michael Edwards	Bob Shafa	Jeffery Rush
Laligam N. Sekhar	Lawrence Shuer	Rod J Oskouian, Jr.	C. C. Wood
Austin Colohan	Mark Linskey	J. Paul Muizelaar	Paul Turner
Moustapha Abou-Samra	Michael Muhonen	Charles Nussbaum	Emun Abdu



Dr. George Ablin 1923-1999

In 2000, the members of the Western Neurosurgical Society inaugurated a new lectureship designed to honor, in a tangible and enduring manner, one of the Society's most outstanding members. In its long history, the Society has had no more devoted contributor than Dr. George Ablin. He brought to the group stunning ability and experience, especially in matters of local, national, and international organization, in which he had few peers. He contributed through service in many areas including a memorable term as President. He was a wise and thoughtful counselor whose advice concerning many professional and personal questions always included a careful analysis, given with words of encouragement. There was no more active and engaged participant in all of the Society's affairs.

George Ablin was raised in Chicago, received his B.S. and M.D. from the University of Michigan, interned at Charity Hospital, New Orleans, Louisiana, did his residency at the University of Wisconsin, later was Instructor at the University of Michigan, and also became a Clinical Professor at California State University, Bakersfield. Dr Ablin was Board Certified in Neurological Surgery, A Fellow of the American College of Surgeons, and a Diplomat of the National Board of Medical Examiners.

Dr Ablin began practice in neurosurgery in Bakersfield, California, in 1953, was President of the Kern County Medical Society in 1984, and was very active in the California Medical Association in various leadership positions. He was Treasurer of the California Medical Review Board and received Distinguished Service awards from the Congress of Neurological Surgeons and the American Association of Neurological Surgery. He was named Honorary President of the World Neurological Society and in 1989 he was selected as the Kern County Physician of the Year. George was the devoted father of seven children, three of whom became physicians.

George combined an exceptionally perceptive understanding of others, including hundreds of fellow neurosurgeons, with warmth and gentleness and lively humor. He loved his colleagues and friends, and he loved this Society. With this permanent lectureship, the members of the Western Neurosurgical Society honor George Ablin his cherished wife, Millie.

This year's Ablin Speaker was supported by a generous gift from the Ablin Family.



2010 Ablin Lecturer

Chris Wood, PhD

Vice President for Administration, Santa Fe Institute

Dr. Chris Wood received his PhD from Yale University in 1973. Following a postdoctoral appointment at Walter Reed Army Institute of Research in Washington DC, he returned to Yale as a faculty member with joint appointments in the Departments of Psychology, Neurology, and Neurosurgery. Chris left Yale in 1989 to lead the Biophysics Group at Los Alamos National Laboratory, a position he held until becoming the Santa Fe Institute's Vice President in 2005. At Los Alamos, Chris' group was responsible for a wide range of biophysical and physical research, including protein crystallography, quantum information, and human brain imaging. During 2000-2001, Chris served as interim director of the National Foundation for Functional Brain Imaging, a collaboration involving Harvard / Massachusetts General Hospital, University of Minnesota, and a number of academic and research institutions in New Mexico devoted to the development and application of advanced functional imaging techniques to mental disorders. Chris' research interests include imaging and modeling the human brain, computational neuroscience, and biological computation.

What Kind of Computer is the Brain?

While most scientists agree that the brain “processes information” and many would claim that the brain “computes” in one sense or another, the precise meanings of “information processing” and “computation” in those claims are unclear. In this talk I will address the questions “Does the brain compute?” and “If so, what and how?” The theory of computation is mainly expressed as abstractions that are independent of any particular physical realization. However, once an abstract computation is actually implemented it becomes a physical phenomenon and the physical substrate, silicon or brain tissue for example, matters tremendously. I will focus in particular on the question of whether “computational primitives” exist for the brain that are analogous to binary arithmetic and Boolean algebra, which are the “computational primitives” of the digital architectures in our laptops and desktops with which we are far more familiar.

Ablin Lectures

- 2000 Arthur L. Day, MD Professor of Neurosurgery, University of Florida
“Unruptured Intracranial Aneurysms and Sports Medicine in Neurosurgery”
- 2002 Tom Campbell, JD, PhD, Professor of Law, Stanford University
Former Congressman
“Is Freedom Possible in Medicine”
- 2003 Frederic H. Chaffee, PhD, Director, WM Keck Observatory, Hawaii
“The WM Keck Observatory at the Dawn of the New Millennium”
- 2004 Gerald Kooyman, PhD, Research Professor, Scripps Institute of Oceanography, San Diego
“Emperor Penguins: Life at the Limits”
- 2005 Lt. Col. Rocco Armonda, MD, Neurological Surgeon, U.S. Army, Bethesda, Maryland
“The Modern Management of Combat Neurotrauma Injuries: Battlefield to the Medical Center”
- 2006 August Turak, Spiritual and Business Consultant
“Spirituality and the Neurosurgeon”
- 2007 Donald Trunkey, MD, Internationally Renowned Trauma Surgeon
“The Crisis in Surgery with Particular Emphasis on Trauma”
- 2008 Michael Bliss, PhD, Emeritus Professor, University of Toronto
“Working Too Hard and Achieving Too Much? The Cost of Being Harvey Cushing”
- 2009 Michael A. DeGeorgia, MD, Professor of Neurology, Case Western Reserve University, Cleveland, Ohio
“Struck Down: The Collision of Stroke and World History”

In 2009 - 54,789 papers were published using the word “brain.”



Ralph B. Cloward 1908-2000

In 2002, the Western Neurosurgical Society established a Medal and Lecture to honor one of its most innovative and pioneering members, Ralph Bingham Cloward. With the gracious support of the Cloward family, this award honors both Ralph and his devoted wife, Florence.

Ralph Cloward was born in Salt Lake City, Utah, in 1908. He completed his undergraduate studies at the Universities of Hawaii and Utah and his medical education at the University of Utah and then at Rush Medical School in Chicago. He interned at St Luke's Hospital, Chicago, and then trained to become a neurosurgeon under Professor, Percival Bailey, at the University of Chicago. He began his practice of neurology and neurosurgery in the Territory of Hawaii in 1938.

His academic accomplishments include visiting professorships at the University of Chicago, University of Oregon, University of Southern California, and Rush Medical School. He was Professor of Neurosurgery at the John A Burns School of Medicine at the University of Hawaii. He is the author of numerous papers and book chapters and has lectured and operated all over the world.

Dr Cloward's pioneering contributions encompass many areas of neurosurgery, but his enduring interest was the spine, where he devised three major operations. He first performed the posterior lumbar interbody fusion in 1943, reporting it in the Hawaiian Territorial Medical Association in 1945 and publishing it in the Journal of Neurosurgery in 1953. His unique approach for treating hyperhydrosis was reported in 1957. Independently, he conceived an anterior approach to the cervical spine, devised instruments for its implementation, and published his classic paper in the Journal of Neurosurgery on anterior cervical discectomy and fusion in 1958. He designed over 100 surgical instruments which continue to be used today by practicing neurosurgeons.

Throughout his career he educated the international community of neurosurgeons in the performance of the operations he devised. He contributed his time generously to patients who have been healed by his operations in the US and throughout the world. Hundreds of thousands of patients have benefited both directly and indirectly from his technical genius, insight, and enthusiasm as a teacher. Ralph loved the Western Neurosurgical Society and it's fitting that the WNS can now honor him with this Medal.



2010 Cloward Award Lecturer

Sean Mullan, M.D., B.Ch., B.A.O., D.Sc. (Hon.), F.R.C.S., F.A.C.S.
Professor Emeritus of Neurosurgery, University of Chicago
Honorary President, World Federation of Neurosurgical Societies

Dr. Mullan was born in County Derry, Northern Ireland, graduated from St. Columbus College, Derry, Ireland and Queen's University, Belfast, Ireland where he received his M.B., B.Ch. and B.A.O., and was a Londonderry University Scholar. His internship was at Royal Victoria Hospital (Belfast), and his residencies in General Surgery included tours at Claremont St. Hospital (Belfast), Middlesex Hospital (London), Musgrave Park Hospital (Belfast), Belfast City Hospital, and Guys Hospital (London). He completed General Surgery at the Royal Victoria Hospital. Neurosurgical residencies were at Royal Victoria Hospital, and the Montreal Neurological Institute.

Upon completion of his residency in 1955, Dr. Mullan was appointed Assistant Professor of Neurological Surgery at the University of Chicago, Associate Professor in 1959, Professor in 1963, and Chairman, Section of Neurological Surgery, from 1967 until 1992. Dr. Mullan also was acting Chairman of the Department of Surgery from 1970 to 1972 and Director of the Brain Research Institute at the University of Chicago from 1964 to 1984.

National committee activities have been extensive, both in the United States and abroad. Dr. Mullan served as President of the Society of Neurological Surgeons, Vice President and Program Chairman for the AANS, and Vice President of the American Academy of Neurological Surgery. He has served in leadership in the World Federation of Neurological Surgeons, and the National Institutes of Nervous Disease and Blindness. He was on the Editorial Boards of the Journal of Neurosurgery and Archives of Neurology; and he also served as examiner for the American Board of Neurological Surgery.

Author of the book Essentials of Neurosurgery, as well as over 180 papers and book chapters, Dr. Mullan's clinical interests are many and varied -- ranging from head injury, diagnostic procedures, treatment of involuntary movement disorders, and brain tumor care. Cerebral vascular issues are a special interest, including aneurysm thrombosis, carotid cavernous fistula treatment, and use of isotopes clinically in pain management procedures. Pain procedures interests also include balloon compression for Trigeminal Neuralgia, and originating the lateral C2 level cordotomy. Dr. Mullan also has a deep interest in the neurophysiology of clinical problems.

Dr. Mullan and his wife, Vivian, live in the Hyde Park area of Chicago. They have two sons and one daughter.

CLOWARD AWARD

- 2003 George Ojemann, MD Professor of Neurosurgery
University of Washington
“Investigating Human Cognition during Epilepsy Surgery”
- 2005 Donald Prolo, MD Clinical Professor of Neurosurgery
Stanford University
“Legacy Giants in the Treatment of Spinal Disorders: Ralph Cloward and Marshall Urist”
- 2006 Martin Weiss, MD, Professor of Neurosurgery,
University of Southern California
“A Historical Walk through Pituitary Surgery”
- 2007 Charles Wilson, MD, Past Chairman, Department of Neurosurgery
University of California, San Francisco
“The Future of Neuroscience”
- 2008 Peter Jannetta, MD, Past Professor and Chairman,
Department of Neurosurgery, University of Pittsburg
“Vascular Compression in the Brainstem: Main Streaming Neurosurgery”
- 2009 L. Nelson Hopkins, MD, Professor and Chairman of Neurosurgery
University at Buffalo, State University of New York
“Neurosurgeons and Stroke: From Prevention to Treatment”

SCIENTIFIC PROGRAM

Saturday, October 9, 2010

Day 1, Session I

Moderators: Charles Nussbaum, Marvin Bergsneider

- 7:30–7:35 **Welcome, David Newell**
WNS President 2010
- 7:35–7:45 **Tribute to L. Philip Carter, MD, FACS**
President WNS 2009-10
Allan Hamilton
- 7:45–8:00 1 **“A Novel Technique for Sacro-iliac Fusion: Case Series”**
Carter E. Beck (Member Candidate)
- 8:00–8:05 Discussion
- 8:05–8:20 2 **“A Novel Endoscopic-Assisted Surgical Procedure for Correction of Sagittal Synostosis in Infants Under 2 Months of Age”**
Michael G. Muhonen (Member Candidate)
- 8:20–8:25 Discussion
- 8:25–8:40 3 **“Gamma Knife Radiosurgery as a Treatment Option for Trigeminal Neuropathy”**
J. Adair Prall (Member Candidate)
- 8:40–8:45 Discussion
- 8:45–9:00 4 **“Advanced Corpectomy Techniques”**
Rod J. Oskouian, Jr.
- 9:00–9:05 Discussion
- 9:05–9:20 5 **“5-ALA Fluorescence Guidance in the Resection of Cerebral Gliomas: A Single Institutional Experience”**
Jeff W. Chen (Member Candidate)
- 9:20–9:25 Discussion
- 9:25–9:40 6 **“Outpatient Anterior Cervical Discectomy and Fusion: Indications & Clinical Experience in Consecutive Series of 390 Patients”**
Peter Shin (Member Candidate)
- 9:40–9:45 Discussion
- 9:45–10:00 7 **“An Introduction to the Endoscopic, Endonasal Skull Base Approach”**
G. Michael Lemole, Jr. (Member Candidate)
- 10:00–10:05 Discussion
- 10:05–10:35 **Break - Visit Exhibits**

SCIENTIFIC PROGRAM

Saturday, October 9, 2010

Day 1, Session II

Moderators: Austin Colohan, Moustapha Abou-Samra

10:35–10:50 8 *“What will you do with the rest of your life?”*

James Ausman (Member)

10:50–10:55 Discussion

10:55–11:10 9 *“The Art and Science of Medical Simulation-the Practice of Practicing Neurosurgery”*

Allan Hamilton (Member)

11:10–11:15 Discussion

11:15–11:45 **Special Lecture**

“Market Dynamics and the Meltdown of 2008”

J. Doyne Farmer, PhD, Santa Fe Institute

11:45–11:50 Introduction of Ablin Lecturer

David Newell

11:50–12:20 **Ablin Lecture**

“What Kind of Computer is the Brain?”

Chris Wood, PhD, Vice President for Administration,
Santa Fe Institute

Did you know.....

The term “dura mater” comes from Latin meaning “hard mother.”

SCIENTIFIC PROGRAM

Sunday, October 10, 2010

Day 2, Session III

Moderators: Mark Linskey, Howard Yonas

8:00–8:15 10 ***“Intraoperative CT Registration and Electromagnetic Neuronavigation for Transsphenoidal Pituitary Surgery: Accuracy and Time-Effectiveness”***

Bob Shafa (Guest)

8:15–8:20 Discussion

8:20–8:35 11 ***“Closed Therapy of Thoracic and Lumbar Vertebral Body Fractures in Trauma Patients: A Prospective Series”***

Iman Feiz-Erfan (Guest)

8:35–8:40 Discussion

8:40–8:55 12 **Resident Award – Clinical Science**

“Frontal Burr Hole through an Eyebrow Incision for Image-Guided Endoscopic Evacuation of Spontaneous Intracerebral Hemorrhage”

Justin Dye, UC Los Angeles

8:55–9:00 Discussion

9:00–9:15 13 **Resident Award – Basic Science**

“Immune Cell Infiltrates Distinguish Low Grade from High Grade Astrocytomas: Evidence of Distinct Tumor Immunological Microenvironments that Reflect Tumor Biology”

Isaac Yang, UC San Francisco

9:15–9:20 Discussion

9:20–9:25 Introduction of Cloward Lecturer, John Bonner

9:25–10:00 **Cloward Lecture**

“Some Neurosurgical Fossils”

Sean Mullan, MD

10:00–10:30 **Break - Visit Exhibits**

SCIENTIFIC PROGRAM

Sunday, October 10, 2010
Day 2, Session IV

Moderators: Paul Turner, Richard Wohns

- 10:30–10:45 14 ***“Constraints: Tensile Elements of the Back and Medialized Screw Placement in the Lumbar Spine”***
Stephen Ritland (Guest)
- 10:45–10:50 Discussion
- 10:50–11:05 15 ***“Long Term Results of Cerebral Revascularization for Aneurysms, Tumors, and Ischemia”***
Laligam Sekhar (Member)
- 11:05–11:10 Discussion
- 11:10–11:25 16 ***“Epoxyeicosatrienoic Acids (EETs) Promote Axon Outgrowth in Cultured Peripheral Neurons”***
Emun Abdu (Guest, Resident, OHSU)
- 11:25–11:30 Discussion
- 11:30–11:40 Introduction of President, Kim Burchiel
-
- 11:40–12:10 **Presidential Address**
- “The Making of a Neurosurgeon, Past, Present and Future”***
David Newell

Santa Fe is the second oldest city, as well as, the highest and oldest capital in the United States.

SCIENTIFIC PROGRAM

Monday, October 11, 2010
Day 3 , Session V

Moderators: Mark Linskey, Paul Muizelaar

7:30–10:00 Mini Symposium –

Regionalization of Neurosurgical Care

Pediatric Neurosurgery – Michael Edwards (Member)
Neurotrauma – Alex Valadka (Guest)
Stroke – Marc Malkoff (Guest)
Cerebrovascular Neurosurgery – Michael Lawton (Member)

10:00–10:30 **Break - Visit Exhibits**

Monday, October 11, 2010
Day 3, Session VI

Moderators: Charles Nussbaum, Lawrence Shuer

10:30–10:45 17 ***“Altitude Sickness - How High is Too High?”***
Jeff Rush (Member)

10:45–10:50 Discussion

10:50–11:05 18 ***“Destructive Procedures for Control of Cancer Pain: The Case for Cordotomy”***
Kim Burchiel (Member)

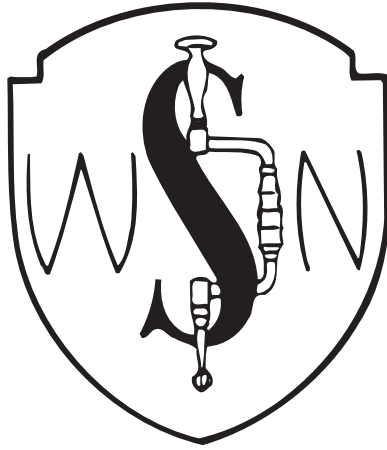
11:05–11:10 Discussion

11:10–11:25 19 ***“Ultrasound Enhanced Lysis of Intracerebral Hemorrhage”***
David Newell (Member)

11:25–11:30 Discussion

11:30 Meeting Adjourn

57th Annual Meeting to be held September 10-13, 2011
Grand Hyatt Kauai Hotel & Spa - Island of Kauai



Abstracts

In 2005, Santa Fe became the first U.S. city to be chosen by UNESCO as a Creative City, one of only nine cities in the world to hold this designation.

1. ***“A Novel Technique for Sacro-iliac Fusion: Case Series”***

Carter E. Beck, MD, Montana Neurological Associates - Missoula, MT

We present a novel surgical technique for sacro-iliac fusion. The first five consecutive patients who underwent the procedure are described. The procedure involves the placement of a titanium cage filled with rBMP within the S1 joint from a paramedian posterior approach. The operation may be performed bilaterally in about 1 hour. The surgical morbidity is minimal. The fusion rate appears to be 100% in this preliminary series. The patients all reported satisfaction with the procedure.

2. ***“A Novel Endoscopic-Assisted Surgical Procedure for Correction of Sagittal Synostosis in Infants Under 2 Months of Age”***

Michael G. Muhonen, MD, Children’s Hospital of Orange County - Orange, CA

Surgical correction of sagittal synostosis is classically performed after 3 months of age, with a lengthy scalp opening, removal of the fused suture, and remodeling/morcellization of the surrounding bones. Many variations of the open procedure are currently utilized. Some surgeons utilize small incisions, and an endoscope to assist in the procedure, followed by placement of the child in cranial molding orthotics post-operatively.

In 12 patients, under the age of 2 months, we have used a modification of the endoscopic technique to repair sagittal synostosis, and perform extensive cranial remodeling. Two small incisions are made along the sagittal suture. Using a wide, lighted retractor, an endoscope, a cranial drill, and monopolar suction-cautery, the fused suture is removed. Barrel-stave osteotomies are placed in the anterior occipital, parietal, and posterior frontal bones bilaterally, down to the level of the skull base. The bone edges are extensively cauterized using endoscopic guidance. No drain is placed.

All patients have achieved immediate normalization of head shape. None have required a second procedure for re-stenosis, or poor cosmetic appearance. Average blood loss was 30cc, and 50% of the patients required a blood transfusion. The average length of hospitalization was 1.5 days. None of the patients required a cranial molding orthotic post-operatively.

The mean follow-up of 1 year shows there to be normal head growth, resolution of frontal bossing in all patients, and persistent normalization of head shape. A query of the families showed all to be very satisfied with the cosmetic outcome. This less-invasive technique would be difficult to perform in older infants, owing to the thickness of the bone. However, it should be considered as a surgical option in infants less than 3 months of age.

3. *“Gamma Knife Radiosurgery as a Treatment Option for Trigeminal Neuropathy”*

J. Adair Prall, MD, Deedra Fry, RN, Terri Young, RN, and Joseph Henderson,
Medical Physicist, South Denver Neurosurgery
Rocky Mountain Gamma Knife Center - Denver, CO

Background: Microvascular decompression, percutaneous destructive procedures, and more recently, radiosurgery, have been used to treat trigeminal neuralgia for many years. For patients with purely neuropathic pain, however, treatment options have been more limited. Blockade of the sphenopalatine ganglion (SPG) for neuropathic facial pain has been utilized by pain specialists in the past, and some centers have treated the SPG radiosurgically to prolong the benefit experienced by some patients. We sought to evaluate this concept in a small group of patients at our center.

Methods: Fifteen treatments in 14 patients were performed over a 13 month period. Some patients had SPG blocks before attempting treatment with the Gamma Knife (GK). A sphenopalatine ganglion target was used with maximum dose of 87Gy. Patients were seen in early follow-up by a neurosurgeon, and telephone follow-up (6-12 months post-GK) was performed by nurses from the radiosurgery center. Telephone interviews were scripted and included questions about level of facial pain (resolved, much better, slightly better, same, worse), satisfaction with the treatment, and new deficits.

Results: Follow-up was achieved in all patients short-term, but in only 10 patients for the entire follow-up period. Two patients (20%) were greatly improved, one was slightly better (10%), and the rest were unchanged, except for one whose pain worsened. Early improvements almost always returned to baseline with 6-12 months.

Conclusions: In our review, treatment with GK radiosurgery did not provide durable improvement in trigeminal neuropathic pain, even in cases when SPG blocks before treatment were successful. Details of levels of improvement, satisfaction and new deficits will be discussed.

4. *“Advanced Corpectomy Techniques”*

Rod J. Oskouian, MD, Swedish Neuroscience Institute - Seattle, WA

Objective: Traditionally, anterior approaches for thoracolumbar pathology were used. The transpedicular/costotransversectomy technique is now commonly used to perform corpectomies from a posterior approach. We analyzed our results to see if there was a difference in outcomes by comparing transpedicular corpectomies to standard anterior thoracolumbar corpectomies.

Methods: We performed thoracolumbar corpectomies in 30 patients between 2008 and 2010. The authors reviewed medical records and follow-up date, clinic visits, radiographs, or telephone interviews. Neurological outcome, complications, operative times, revision surgery rates, and estimated blood loss (EBL) were evaluated.

Results: Twenty patients received transpedicular corpectomies, and ten patients underwent anterior thoracolumbar approaches. Single-level transpedicular corpectomies appear to be comparable to anterior-only corpectomies in terms of EBL, operative time, and complication rates. There was a slightly higher complication rate, EBL, and operative time with anterior-posterior corpectomies. The transpedicular corpectomies had similar recovery of neurological function compared to anterior approach corpectomies.

Conclusions: The transpedicular corpectomy appears to have a comparable morbidity rate to anterior-only corpectomies.

Betsy Cushing, daughter of Harvey Cushing, was married to Jimmy Roosevelt, son of US President Franklin D. Roosevelt.

5. ***“5-ALA Fluorescence Guidance in the Resection of Cerebral Gliomas: A Single Institutional Experience”***

Jeff Chen, MD, PhD, Joseph Sherrill, MD, David Adler, MD,
Francisco Soldeville, MD and Julio Ordonez, MD
Legacy Emanuel Hospital - Portland, OR

Introduction and Rationale for Study: The resection of cerebral gliomas is difficult because of the infiltrative nature of the tumors and the difficulty in defining the borders. This is particularly difficult with recurrent gliomas that have been previously treated with radiation and/or chemotherapy. An increase in the extent of resection has been shown to occur with the use of 5-ALA intraoperative fluorescence (Stummer et al., 2006). This also affects the recurrence rate (Stummer et al., 2000). We report our single institutional experience with 5-ALA fluorescence guidance in 8 patients with gliomas.

Methods: An IND was obtained from the FDA to use 5-ALA (from DUSA pharma) as an adjunct in the surgical resection of cerebral gliomas. The patients had pre-operative MRIs that were consistent with the diagnosis of glioma. Informed consent was obtained and the patients were given 5-ALA orally at 10mg/kg (n4) or 20 mg/k/ (n=4) 3 hours before the brain was to be visualized. The anesthetic technique used was either general endotracheal anesthesia or awake with Presedex. Tumor was visualized with a Zeiss Pentero microscope with excitation wavelength of 400-410nm and observed at 635nm. Specimens were obtained, fluorescence was graded and compared to the pathologic grading. All patients had post-operative MRIs within 72 hours of surgery. Post-operative liver function tests/LDH were followed.

Results: In our 8 patients, the following pathology was encountered: grade IV glioma (n=4), grade III glioma (n=1), grade III oligodendroglioma (n=1), grade II glioma (n=2). All of the tumors demonstrated bright fluorescence except one of the grade II gliomas. Two of the eight patients had recurrent tumors. Some subtleties were seen in the fluorescence of re-operated gliomas. The immediate post-operative scans demonstrated > 95% resection of the area of MRI enhancement. Post-operative elevation in LFTs and LDH were transient and clinically insignificant.

Conclusions: 5-ALA is a safe and useful adjunct that may be used to maximize the resection of gliomas.

6. ***“Outpatient Anterior Cervical Discectomy and Fusion: Indications and Clinical Experience in Consecutive Series of 390 Patients”***

Peter Shin, MD, MS, MBS, Richard N. Wohns, MD, Seth S. Joseffer, MD
South Sound Neurosurgery - Puyallup, WA

Objective: To assess the safety and efficacy of outpatient anterior cervical discectomy and fusion (ACDF).

Methods: We retrospectively reviewed the records of 390 consecutive patients who underwent outpatient ACDF between September 2002 and September 2007 to assess the safety and efficacy of outpatient anterior cervical surgery. The mean age of the patient sample was 46; 56% were female and 44% were male. Indications for surgery consisted of cervical radiculopathy or myelopathy. Charts were reviewed to define patient demographics and medical comorbidities. Operative data, including levels treated, surgery time, time to discharge, and intraoperative complications were collected. Clinical outcomes were collected using the PhDx Clinical Outcomes Database. Need for hospital transfer from the ambulatory surgical center, emergency room visits, and subsequent hospital admission in the perioperative period were determined from patient records. Complications, patient satisfaction, and outcome were ascertained through review of notes from the first postoperative visit.

Results: There was no mortality and no major complications. Out of 390 patients, operation was carried out at 1 level in 223 patients, at 2 levels in 143, and at 3 levels in 24. Pain was present in 99%, motor deficit in 31%, and myelopathy in 14%. Twenty-five percent were hypertensive, 5% were diabetic, and 2% had coronary artery disease. The incidence of hospital transfer for ACDF related complications was <1%. At the time of the first postoperative visit, 92% of patients believed that they were improved and only 1% of patients had transiently increased radicular weakness.

Conclusion: Outpatient ACDF is safe and efficacious in selected patients.

7. *“An Introduction to the Endoscopic, Endonasal Skull Base Approach”*

J. Michael Lemole, Jr., MD, Arizona Health Science Center - Tucson, AZ

The endoscopic, endonasal approach to the anterior skull base has been gaining in popularity in recent years. The driving force behind many skull base techniques is the minimization of brain retraction through maximized bony exposure. This can be facilitated by attacking surgical targets through naturally-occurring, traversable spaces. The nasal space and sinuses offer just such an air-filled corridor to the anterior skull base. Modern endoscopic imaging and significant advances in specialized surgical instrumentation have made it possible to access this region with a minimal external footprint, yet maximal therapeutic impact.

The indications for this surgical method generally include pathology of the anterior skull base; from the cribriform plate to the clivus in the sagittal plane. While the carotid arteries and optic nerves generally confine the techniques to the midline, creative attempts have been made to exploit more lateral corridors. Newer techniques have drastically reduced the incidence of cerebrospinal fluid leak and extended the technique routinely into the subdural space. While sellar pathology predominates for most cases, virtually all types of pathologies can be addressed, from tumors to CSF leaks to vascular lesions.

Mastery of the endonasal skull base approaches requires an exquisite understanding of skull base and nasal anatomy. In addition, there is a significant learning curve associated with the use of endoscopic visualization for bimanual microsurgery. Our experience has demonstrated that the greatest programmatic and clinical success is achieved when neurosurgery partners with rhinology subspecialists. This allows for maximal exploitation of the nasal space, whether for mobilization of a nasoseptal flap or mobilization of the turbinates.

This presentation will focus on the pertinent surgical anatomy and will showcase some of the potential clinical applications for this surgical approach.

8. ***“What will you do with the rest of your life?”***

James I. Ausman, MD, Carolyn R. Ausman - Rancho Mirage, CA

People are living 20-40 years longer than their parents in the USA. Society is programmed for retirement at ages 65-70. Is retirement physiologically and biologically healthy?

A survey of several hundred scientific publications spanning medical, sociologic, psychology, imaging, economic, historical, large surveys of this subject, and other literature was made to develop the basis for this paper and a subsequent television series on this subject. Information from interviews with over 200 people, economists and psychologists supply additional data.

The changing role of the family leader throughout the history of civilizations will be described. The development of the concept of retirement will be traced. Physiological evidence will be presented showing the value in continued engagement in life activities, socialization, & stimulation to affect the physiology of the human species and its molecular organization. Continued brain development with these activities leads to neurogenesis throughout life and enhanced branching of dendrites and synaptic connections. Physical activity not only enhances multi-organ function but also produces neurotropic factors that enhance brain growth and activity. Retirement will become the disease of the 21st century that will be a leading cause of neurodegeneration and death. The orientation of the Boomer population will be described as it moves into maturity. Specific challenges faced with aging will be briefly discussed including: divorce, loss of a spouse, illness, financial stress, volunteering, reirement, caregiving, the stresses between partners with retirement and changing life patterns, and many others. Most do not have the funds to support this extended life. What are the choices? What are the thoughts of Generations X and Y to retirement and planning for the future.

The talk will stimulate answers to “What will you do with the rest of your life?”

9. ***“The Art and Science of Medical Simulation—the Practice of Practicing Neurosurgery” (Or “Is This a Simulation or Does the Future Really Look Like This?”)***

Allan J. Hamilton, MD, University of Arizona - Tucson, AZ

High-fidelity simulation scenarios training (HFSST) is a widely accepted part of educational and professional training in both military and civilian settings. It has seen broad and successful application especially in situations where successful outcomes depend upon training individuals and/or teams to deliver calm, calculated, predictable responses even under stressful, life-and-death conditions. This kind of training once may have seemed relevant to only training fighter pilots but now has gained a solid foothold in surgical education. Increasing public and government demand for demonstration of technical surgical competence in the acquisition of new surgical skills has also placed demands for bringing surgical simulation from the laboratory classroom into the hospital boardroom and even the courtroom. The historical background of surgical simulation will be reviewed as will its relevance

to delivering improved technical and clinical outcomes. The current applications of HFSST in the field of neurosurgery will be discussed and critical trends in short-term future of surgical simulation will be highlighted.

10. ***“Intraoperative CT Registration and Electromagnetic Neuronavigation for Transsphenoidal Pituitary Surgery: Accuracy and Time-Effectiveness”***

Bob Shafa, MD, Paula Eboli, MD, University of California, Los Angeles
Marc Mayberg, MD - Swedish Neuroscience Institute - Seattle, WA

Objective: To assess the feasibility, anatomical accuracy and cost effectiveness of frameless electromagnetic (EM)-guided neuronavigation in conjunction with portable intraoperative CT (iCT) registration for transsphenoidal adenomectomy (TSA).

Methods: A prospective database was established for 208 consecutive patients who underwent TSA using iCT/EM, and compared to a retrospective cohort of 65 consecutive preceding patients who underwent fluoroscope-assisted TSA by the same surgeon. All patients in both groups had trans-nasal removal of pituitary adenomas or neuroepithelial cysts using identical surgical technique with an operating microscope. The iCT/EM patients had a portable iCT scan performed immediately prior to surgery for registration to the EM navigation system, which did not require rigid head fixation. Pre-existing (non-navigation protocol) MRI scans were fused to the iCT images to enable three-dimensional navigation based upon MRI data. Accuracy of the navigation system was determined in the first 50 iCT/EM cases by visual concordance of the navigation probe location to 5 pre-selected bony landmarks. For all patients in both cohorts, total operating room time, incision-to-close time and relative costs of imaging and surgical procedures were determined from hospital records.

Results: In every case, intraoperative registration using iCT images was successful and pre-operative MRI images were fused to iCT without affecting navigation accuracy. There was 100% concordance between probe tip location and pre-determined bony loci in the first 50 iCT/EM cases. Total OR time was significantly less in the iCT/EM cases (mean=108.9 +/- 30.7 min; N=65; p<0.001). Similarly, incision-to-close time was significantly less for the iCT/EM cases (mean=61.3 +/- 18.2 min) versus the fluoroscopy group (mean =121.1 +/- 30.7 min; N=65; p<0.001). Relative overall costs of iCT/EM and intraoperative C-arm fluoroscopy were comparable; increased costs for navigation equipment were offset by savings in operating room costs for shorter procedures.

Conclusion: The use of iCT/MRI guided neuronavigation for transsphenoidal surgery is time-effective, cost-efficient, safe, and technically beneficial.

11. ***“Closed Therapy of Thoracic and Lumbar Vertebral Body Fractures in Trauma Patients: A Prospective Series”***

Iman Feiz-Erfan, MD, Andrea Gomex, Bonnie L Strohschein,
Tammy R.Kopelman, Mariopa Medical Center - Phoenix, AZ

Introduction: The failure rate of closed therapy for thoracic and lumbar vertebral body fractures (TLVBF) in trauma patients has poorly been evaluated prospectively using computer tomography (CT) as the main imaging modality.

Methods: Between 2007-2008, all trauma patients with a CT diagnosis of acute TLVBF undergoing closed treatment by the senior author (IFE) were prospectively evaluated. Failure of closed therapy was defined as progressive deformity, body collapse or pseudoarthrosis with or without symptoms by 3 months of follow up. A modified Arbeitsgemeinschaft fuer Osteosynthesefragen (AO) classification was applied to classify the body fractures into A1 and non A-1 fractures. Fractures were followed using CT imaging.

Results: A total of 109 patients (68 male, 41 female; mean age 43 years) were enrolled. Follow up was available in 54 patients with 91 fractures. Of these, 66 were A1 fractures, and 25 were non-A1 fractures. All had rigid bracing applied with flat and upright X-ray films ruling out overt instability. None had spinal cord injury. Thirteen patients (24%) FAILED CLOSED THERAPY. This equaled 13 failed body fractures (14%) out of 91 total broken bodies. Five failed radiographically only (asymptomatic), and 8 failed radiographically and clinically (symptomatic). A1 fractures had a 4% failure rate, non A-1 fractures failed at 40%.

Discussion: Failure of closed therapy TLVBF in the trauma population is not insignificant. Non-A1 fractures had a much higher failure rate when compared to A1 fractures. We recommend close follow up of particularly non-A1 fractures that are treated in closed fashion using CT as the preferred imaging modality.

The earliest known piece of art that displays eyeglasses is a portrait painted by Tommaso da Modena in 1352.

12. ***“Frontal Burr Hole through an Eyebrow Incision for Image-Guided Endoscopic Evacuation of Spontaneous Intracerebral Hemorrhage”***

Justin A. Dye, MD, Neil A. Martin, MD, University of California, Los Angeles
Los Angeles, CA

Introduction: Surgical evacuation of spontaneous intracerebral hemorrhage (ICH) is controversial even though clot removal is believed to have a pathophysiologic benefit. The goal of this paper is to present a novel, minimally invasive surgical technique to evacuate spontaneous ICH through an eyebrow incision and frontal burr hole.

Methods: Five patients with spontaneous ICH underwent surgical evacuation over a period of four years (12/05-11/09). Hematoma volumes were calculated using the length x width x height divided by two formula. In this technique, an incision is made at the superior margin of the eyebrow and a burr hole is made in the supraorbital bone lateral to the frontal sinus. Using stereotactic guidance the endoscope sheath is fixed in place at a depth 2/3rd of the way along the long axis of the hematoma. This is the first of two points where suction is applied to the hematoma. The endoscope sheath is then pulled back to a depth 1/3rd of the way along the long axis of the hematoma. Once 75-85% of the hematoma has been collected no more suction is applied. The endoscope is then introduced through the sheath to assist in hemostasis. Lastly, a burr hole cover is secured in place and the incision is closed cosmetically.

Results: The mean preoperative hematoma volume was 68.58cc (30.2-153.9). The mean postoperative hematoma volume was 13.2cc (7.1-24.1). The average percentage of hematoma evacuated was 76.5% (49-87.2). None of the patients experienced re-bleeding. There were no operative mortalities.

Conclusion: This technique is safe, effective, and cosmetically appealing. It is intended for anterior basal ganglia hemorrhages, which usually have an elongated ovoid shape. It allows for optimal trajectory to the long axis of the hematoma. It makes it possible to evacuate the vast majority of the hematoma with only one pass, minimizing the amount of damage to normal brain and is a safe and effective procedure when compared to dural-expansion and is associated with significant cost-savings in total charges, operative time and length of stay.

13. ***“Immune Cell Infiltrates Distinguish Low Grade from High Grade Astrocytomas: Evidence of Distinct Tumor Immunological Microenvironments that Reflect Tumor Biology”***

Isaac Yang, MD, Michael E. Sughrue, Seunggu J. Han, BS, Tarik Than, MD, Margaret R. Wensch, PhD and Andrew T. Parsa, MD, PhD
University of California, San Francisco
San Francisco, CA

Introduction: The glioma microenvironment is composed of a variety of cell types, including infiltrative inflammatory cells that are dynamic in nature, potentially reflecting tumor biology. Here, we demonstrate that characterization of the intratumoral inflammatory infiltrate can distinguish high grade from low grade glioma.

Methods: 91 patients with high and low grade gliomas (LGG) at UCSF were analyzed. A systematic neuropathology analysis was performed. All tissue was collected at the time of initial surgery prior to adjuvant treatment. Immune infiltrate not associated with necrosis or hemorrhage, were analyzed on serial 4-micron sections. Analysis was performed for 10 consecutive high-power-fields and in 3 separate regions (total 30 x 0.237 sq. mm). Using immunohistochemistry for markers of infiltrating cytotoxic T-cells (CD8), monocytes (CD56) and macrophages (CD68), the inflammatory infiltrates in the tumors were graded quantitatively.

Results: Glioblastomas exhibited significantly higher perivascular CD8+ T-cell infiltration (29% vs. 62%, $P=0.0005$) than LGGs. Conversely, LGGs had correlating CD8+ T-cell infiltrates. Perivascular (49%) and intratumoral (89%; $p=0.004$) CD56+ cells were more commonly associated with GBM. CD68+ cells also were more prevalent in the perivascular and intratumoral space in GBM. In the perivascular space, all GBMs exhibited CD68+ cells versus 86% of LGG ($p=0.0014$). Intratumorally, CD68+ infiltrate was also more prevalent in GBM when compared to LGG (97% vs. 86%, $p=0.0003$). CD3+, CD20+, and HLA+ infiltrates did not differ between GBM and LGGs.

Conclusion: Our analysis suggests a significantly distinct immune profile in the microenvironment of high grade and low grade tumors. Distinct patterns of intratumoral and perivascular immune infiltrates may prove useful for distinguishing high and low grade gliomas. Collectively, our data supports the premise that high grade gliomas are focally immunosuppressive.

14. ***“Constraints: Tensile Elements in the Back and Medialized Screw Placement in the Lumbar Spine”***

Stephen Ritland, MD, Arizona Neurosurgical & Spine - Flagstaff, AZ

Objective: Medialized screw placement or placement through the pars to the pedicle has been studied and pioneered by Richard Hynes as a biomechanically and surgically sound alternative to conventional screw trajectories. It offers a uniquely anatomic screw placement with regards to the segmental neuromuscular anatomy of the lumbar spine. The present study defines a technique and surgical anatomic details that enable a fully anatomic approach to lumbar fusion with regards to preserving neurovascular and muscle integrity.

Methods: Instituting the approach in surgery involved minor changes to a long used anatomic approach to optimize exposure and screw placement under the segmental multifidus. Modification to surgical technique and retractors to optimize exposure for the placement technique is described with illustrations of anatomic details derived from surgical dissection, complemented with cadaver dissection. Technical challenges encountered in visualizing and completing screw placement intraoperatively and placing fixation in two years and more than 200 cases are discussed.

Summary: Medialized screw placement provides a naturally anatomic approach to lumbar fixation. It can be accomplished with no compromise of neurovascular or tendinous integrity of the segmental back muscles. Spinous process muscle detachments are appropriate in some cases to allow midline bony removal to correct lordosis or optimize preservation of articular processes for posterior fusion and are appropriately balanced against tendinous integrity of the segmental back muscles. Care is necessary to preserve the artery of the pars and the medial branch of the dorsal lumbar ramus with placement of the upper screw.

Conclusion: A medialized screw approach provides an anatomic lumbar fixation with minimal muscle displacement and with the potential for no compromise of neurovascular elements to the segmental lumbar spine muscles.

“Arbor vitae” (a portion of the white matter of the cerebellum) is Greek for “tree of life”

15. ***“Long Term Results of Cerebral Revascularization for Aneurysms, Tumors, and Ischemia”***

Laligam N. Sekhar, MD, Dinesh Ramanathan, MD, Louis Kim, MD and Basavaraj Ghodke, MD
University of Washington, Seattle, WA

Object of Study: The long term status of cerebral bypasses and the patient outcomes have not been adequately studied. In this study, we report a late follow up results of bypasses and patient outcomes.

Patients and Methods: All patients who underwent bypasses for aneurysms, basal tumor and ischemia from 1/2005 to 12/2009 were reviewed with respect to clinical information, and radiographic studies, and outcome. All the patients were followed by periodic clinical examination (or telephone interview), and cerebral angiography and/or CT angiography.

Potential risk factors such as hypertension, smoking, age, use of dural substitutes, or having a salvage procedure during the perioperative period were evaluated as predictors of late follow up occlusion using multivariate logistic regression (exact). There were a total of 101 patients with 128 bypasses – 27 intracranial (in situ 18, intracranial to intracranial (IC-IC) short graft 5, and IC-IC long graft 4), and 101 extracranial to intracranial (EC-IC) (low flow 26, high flow 75) bypasses. Of the 101 EC-IC bypasses, 28 were for ischemia, 63 for aneurysms, and 10 for tumors. Four patients (4%) underwent correction of problems related to their grafts within 30 days (4 within 24 hrs). At the end of 1 month, 26/27 intracranial bypasses, 25/26 low flow EC-IC bypasses, and 72/75 high flow EC-IC bypasses were patent.

Results: The median late follow up was 742 days (34 – 1495 Days). None of the patients suffered a stroke; however, 9 patients (9%) suffered transient ischemic attacks (TIAs) in the ipsilateral or contralateral hemisphere. During the follow up period, no radiologic abnormality was observed in 17/18 in situ bypasses, 3/3 short IC/IC bypasses. All of the IC/IC long bypasses were occluded, generally accompanied by spontaneous collateral enlargement. All low flow EC-IC bypasses, and 67 of 72 (93%) flow EC/IC bypasses were patent. Asymptomatic occlusion occurred in 5 of 72 EC-IC high flow bypasses, and in 3 of these, the collateral vessels were seen to have enlarged. Symptomatic stenosis along the bypass graft was observed in 7 bypasses (5%), and was successfully repaired by surgical (6), or endovascular interventions (1). Aneurysm formation was observed with one short IC/IC bypass (beyond the bypass), and 2 EC/IC low flow bypasses (in the bypass), and one high flow bypass (SVG, post stenotic aneurysm). None of the risk factors evaluated were found to be significantly predictive of graft occlusion ($p = 0.20$). 84/101 (84%) of the patients had mRS (0-3) at 2-4 months postoperatively, whereas at late follow up 91 patients (91%) of the patients had a mRS of 0-3.

Conclusion: In this follow up study of patients with bypasses, regular surveillance was important in detecting problems, and correcting them. No patient suffered a stroke. Further long-term follow-up is necessary

16. ***“Epoxyeicosatrienoic acids (EETs) Promote Axon Outgrowth in Cultured Peripheral Neurons”***

Emun Abdu, MD, Oregon Health & Science - Portland, OR,

Donald A. Brunn, MD, Dongren Yang, PhD, UC Davis School of Veterinary - Jun Yang, PhD, Ahmet Bora Inceoglu, Bruce D. Hammock, PhD, College of Agricultural & Environmental, UC Davis - Davis, CA

Nabil Alkayed, MD, Oregon Health & Science University - Portland, OR

Pamela J. Lein, PhD, UC Davis School of Veterinary - Davis, CA

Introduction: Little is known about peripheral nerve regeneration following an ischemic or traumatic insult and therapeutic options are limited. Epoxyeicosatrienoic acids (EETs) are cytochrome P450 arachidonic acid metabolites shown to decrease infarct volume in experimental stroke models. EETs are rapidly metabolized by soluble epoxide hydrolase (sEH), and inhibition of sEH increases the therapeutic efficacy of EETs. In CNS neurons, sEH is expressed primarily in axons. Drawing on these understandings of the CNS, we ask whether sEH is expressed in the peripheral nervous system (PNS), and whether EETs promote axonal growth.

Methods: We used immunohistochemistry to localize sEH expression in primary peripheral neurons derived from embryonic superior cervical ganglia and dorsal root ganglia (DRG). We quantified axonal length using morphometric analysis in sensory neurons (DRG) that were treated with a mixture of various EETs isomers and sEH inhibitor (AUDA-1709). Mass spectroscopy was used to detect levels of ecosanoids in the presence and absence of AUDA-1709.

Results: Diffuse sEH immunoreactivity was revealed throughout the cell body and processes of both neuronal cell types with significantly brighter fluorescence in axons relative to dendrites. Morphometric analysis of DRG neurons exposed to a mixture of EET isomers (0.01 -0.3 μ M) caused a dose-dependent increase in axonal outgrowth. Co-exposure with AUDA-1709 further enhanced EETs- induced axonal growth. Addition of AUDA-1709 alone significantly increased axonal growth relative to vehicle controls. Mass spectroscopy performed in DRG neurons exposed to EETs, in the absence or presence of AUDA-1709, indicated that EETs levels were significantly higher and the inactive DHET metabolite levels significantly lower in cultures treated with the sEH inhibitor.

Conclusions: EETs enhance axonal outgrowth and this effect is more pronounced with the concomitant inhibition of sEH. It is possible that inhibitors of sEH may be of therapeutic use in promoting peripheral nerve regeneration following injury in which axon retraction has occurred.

17. ***“Altitude Sickness – How High is Too High?”***

Jeffery L. Rush, MD - Breckenridge, CO

There are three well defined forms of altitude sickness: acute mountain sickness (AMS), high altitude cerebral edema (HACE), and high altitude pulmonary edema (HAPE). Altitude related problems usually don't begin unless you have gone from sea level to 5000'. More problems are seen at moderate altitude between 5000' and 8000' while in excess of 25% of travelers are affected with altitude sickness at 8000' to 14000'. The percentages are even greater at very high altitude above 14000' and extreme altitude above 18000'. Many western ski areas and some of the most beautiful areas in our National Park system are often over the critical altitude level of 8000'. As we become more adventurous with skiing, mountain climbing, back packing, and hiking, we often get into "thin air".

The physiologic changes that altitude causes in humans will be reviewed. Also, the presentation will document the pathophysiology of altitude sickness, the presenting symptoms, differential diagnosis, and current available treatments. While mild acute mountain sickness will usually resolve on its own in a few days, high altitude cerebral and pulmonary edema are true medical emergencies, mandating medical attention to prevent fatalities. Emphasis will be placed on prevention since a few simple precautions can substantially reduce the problems with altitude sickness for most of us.

The brain of a honey bee is about 1 cubic millimeter in size and contains 950,000 neurons

18. ***“Destructive Procedures for Control of Cancer Pain: The Case for Cordotomy”***

Kim Burchiel, MD, Ahmed Raslan, MD, Justin Cetas, MD and Shirley McCartney, MD
Oregon Health & Science University - Portland, OR

Introduction: Historically, destructive procedures for cancer pain were the main line of treatment therapy. However, the use of high dose opioids has essentially replaced such procedures. Recognition of the limits of medical therapy to treat cancer pain effectively is growing, while conversely, in regions with limited access to pain medications, the importance of destructive surgical techniques is increasing. A critical evaluation of the evidence for destructive techniques is warranted and the authors review current evidence underlying these procedures.

Methods: A US National Library of Medicine PubMed search for “ablation”, “DREZ”, “dorsal root entry zone”, “cingulotomy”, “cordotomy” “ganglionectomy”, “mesencephalotomy”, “myelotomy”, “neurotomy”, “neurectomy”, “rhizotomy”, “sympathectomy”, “thalamotomy”, “tractotomy” AND “pain” was undertaken. The search was then limited to human, English, cancer pain and reports with more than one patient.

Results: One hundred and twenty papers were identified and reviewed based on the selection criteria described. Only “sympathectomy” was supported by class I or II studies (2 class I papers and 1 class II paper) identified for cancer pain. All other procedures were supported by class III studies of variable quality. Cordotomy, in particular, was the most extensively studied and reviewed procedure. Given the large number of patients studied, the consistent results, and the multiplicity of reports, cumulative evidence suggests that cordotomy may play an important role in the treatment of cancer pain, even though the contemporary evidence quality for individual studies was relatively low.

Conclusion: Destructive procedures for cancer pain may play more than a historic role in the management of cancer pain. Cumulative evidence from even the poorest quality studies suggests that some procedures, such as cordotomy, should be included in the armamentarium available to the neurosurgeon today. To renew appropriate interest in these procedures, evidence and studies that meet today’s evidence-based research criteria are warranted.

Manatees “see” with 3,000 hairs on their bodies to help them maneuver in murky waters. Each hair is connected to 20-50 nerve fibers.

19. ***“Ultrasound Enhanced Lysis of Intracerebral Hemorrhage”***

David Newell, MD, Mohsin Shah, MD, Daniel F. Hanley, MD
Seattle Neuroscience Institute - Seattle, WA

Object: The objective of this study was to evaluate the safety and efficacy of ultrasound in combination with tissue plasminogen activator (tPA) delivered through a microcatheter directly into spontaneous intraventricular (IVH) or intracerebral (ICH) in humans, to facilitate evacuation of the hemorrhage.

Methods: A total of 33 patients presenting to Swedish Medical Center, in Seattle, Washington, with ICH and IVH were screened between 11/21/2008 and 07/13/2009 for entry into the study. Entry criterion included the spontaneous onset of intracranial hemorrhage >25cc and or intraventricular hemorrhage producing ventricular obstruction. Nine patients (ages 38-83, average =63, 6 male, 3 female) who met entry criterion were consented and entered into the trial. A ventricular drainage catheter and an ultrasound microcatheter were stereotactically delivered together, directly into the IVH, or ICH. Tissue plasminogen activator, and 24 hours of continuous ultrasound were delivered and gravity drainage was performed. In patients with intraventricular hemorrhages, a total of 3 mg of tPA was injected, and in patients with intraparenchymal hemorrhages a total of 0.9 mg tPA was injected, in three doses over 24 hours.

Results: All patients had significant volume reductions of the treated hemorrhage. The mean percentage volume reduction after 24 hours of treatment, compared to the pre-treatment stability scans, as determined by CT were 59% + 5 (SEM) for ICH, and 45.1% + 13 (SEM) for IVH (1 ICH patient was excluded from analysis due to catheter breakage). There were no intracranial infections and there were no significant episodes of re-bleeding by clinical or CT assessment. There was 1 death by 30 days after admission. Clinical improvements as determined by an increase in the National Institutes of Health Stroke Score (NIHSS) were demonstrated at 30 days in 7/9 patients. The rate of hemorrhage lysis was compared between 8 patients who completed treatment, and cohorts of patients treated using identical doses of tPA and catheter drainage without ultrasound for IVH and ICH (courtesy of MISTIE and CLEAR studies). Compared to MISITE/CLEAR data we observed a faster rate of lysis during the first 24 hours of treatment for IVH ($p=0.046$) and for ICH ($p=0.074$) in the patients treated with sonolysis + tPA.

Conclusions: Lysis and drainage of spontaneous ICH and IVH with reduction of mass effect can be accomplished rapidly and safely by sonothrombolysis using stereotactically delivered drainage and ultrasound catheters through a burr hole. A larger clinical trial with catheters specifically designed for brain clot removal is warranted.



ORGANIZATIONAL COMMITTEE

Frank M. Anderson*
Edwin B. Boldrey*
Howard A. Brown*
Herbert G. Crockett*
John Raaf*
Rupert B. Raney*
David L. Reeves*
C. Hunter Sheldon*

FOUNDING FATHERS

Robert B. Aird*	Theodore Magoun*
Frank M. Anderson*	Edmund J. Morrissey*
Edwin B. Boldrey*	Henry W. Newman*
Howard A. Brown*	Nathan C. Norcross*
John D. Camp*	Robert H. Pudenz*
Herbert G. Crockett*	John Raaf*
Henry M. Cuneo*	Robert W. Rand
Edward M. Davis*	Aidan Raney*
Robert S. Dow*	Rupert B. Raney*
John D. French*	David L. Reeves*
Hale A. Haven*	Augustus S. Rose*
O.W. Jones, Jr.*	C. Hunter Sheldon*
Edward K. Kloos*	W. Eugene Stern
Lester B. Lawrence*	Frank Turnbull*
Kenneth E. Livingston*	Karl O. Von Hagen*
Frank W. Lusignan*	Arthur A. Ward, Jr.*
Ernest W. Mack*	Delbert Werden*
	Ward W. Woods*

*deceased

DECEASED SOCIETY MEMBERS

(expired while a member, non-officers or founders)

Kenneth H. Abbott	Lester B. Lawrence
Eben Alexander, Jr.	Grant Levin
James R. Atkinson	Frank W. Lusignan
Thomas S. Bennett	John S. Marsh
Irvin H. Betts Jr.	Robert Morelli
David Brown	Richard Newquist
John D. Camp	William A Newsom
Norman L. Chater	Hal Pittman
Cyril B. Courville	John C. Oakley
John B. Doyle	Carl W. Rand
Charles W. Elkins	Aidan Raney
Attila Felsoory	Nat D. Reid
Robert D. Fiskin	Ted Roberts
Anthony Gallo	Adolf Rosenauer
Leslie Geiger	Alan W. Rosenberg
John W. Hanbery	Robert L. Scanlon
Hale A. Haven	Harry F. Steelman
William Hyman	A. Earl Walker
O. W. Jones	W. Keasley Welch
Alexander Johnson	William Wright
John C. Kennady	Eric Yuhl
Peter A. Lake	Edward Zapanta
James Lansche	

PAST SECRETARY-TREASURERS

Herbert. Crockett*	1955, 1956, 1957
Ernest W. Mack*	1958, 1959, 1960
Samuel W. Weaver*	1961, 1962, 1963
James R. St. John*	1964, 1965, 1966
Robert W. Porter	1967, 1968, 1969
William A. Kelly	1970, 1971, 1972
John S. Tytus	1973, 1974, 1975
Theodore S. Roberts*	1976, 1977, 1978
Ulrich Batzdorf	1979, 1980, 1981
John A. Kusske	1982, 1983, 1984
W. Ben Blackett	1985, 1986, 1987
Francis E. LeBlanc	1988, 1989, 1990
Melvin L. Cheatham	1991, 1992, 1993
Grant E. Gauger	1994, 1995, 1996
Randall W. Smith	1997, 1998, 1999
Moustapha Abou-Samra	2000, 2001, 2002
Hector E. James	2003
Austin R. T. Colohan	2004, 2005, 2006
Jeffery L. Rush	2007, 2008, 2009

PAST HISTORIANS

Henry M. Cuneo*	1962-1966
Ernest W. Mack*	1967-1971
Donald B. Freshwater*	1972-1976
George Ablin*	1977-1982
Gale C. Clark*	1983-1984
Robert Rand	1985-1990
Frank P. Smith*	1991-1995
John C. Oakley*	1996-1999
John P. Slater	1999-2002
John T. Bonner	2002-2008

*deceased

PAST MEETINGS OF THE SOCIETY

- | | |
|---|---------------------|
| 1. Biltmore Hotel, Santa Barbara, CA | Nov 25-26, 1955 |
| 2. Timberline Lodge, OR | Dec 9-11, 1956 |
| 3. Holiday Hotel, Reno, NV | Sept 29-Oct 1, 1957 |
| 4. Del Monte Lodge, Pebble Beach, CA | Oct 19-22, 1958 |
| 5. La Valencia Hotel, La Jolla, CA | Sept 27-30, 1959 |
| 6. Del Monte Lodge, Pebble Beach, CA | Oct 23-26, 1960 |
| 7. Bayshore Inn, Vancouver, BC | Oct 29-Nov 1, 1961 |
| 8. Camelback Inn, Phoenix, AZ | Oct 28-31, 1962 |
| 9. El Mirador Hotel, Palm Springs, CA | Oct 20-23, 1963 |
| 10. Fairmont Hotel, San Francisco, CA | Oct 18-21, 1964 |
| 11. Olympic Hotel, Seattle, WA | Oct 3-6, 1965 |
| 12. Hotel Utah, Salt Lake City, UT | Nov 6-9, 1966 |
| 13. Kona Kai Club, San Diego, CA | Oct 15-18, 1967 |
| 14. Mauna Kea Beach Hotel, Kamuela, HI | Nov 16-19, 1968 |
| 15. Del Monte Lodge, Pebble Beach, CA | Oct 15-18, 1969 |
| 16. Bayshore Inn, Vancouver, BC | Oct 4-7, 1970 |
| 17. The Broadmoor, Colorado Springs, CO | Oct 31 -Nov 3, 1971 |
| 18. The Skyline Country Club, Tucson, AZ | Oct 29-Nov 1, 1972 |
| 19. Airport Marina Hotel, Albuquerque, NM | Sept 16-19, 1973 |
| 20. Santa Barbara Biltmore Hotel, CA | Oct 27-30, 1974 |
| 21. Mauna Kea Beach Hotel, Kamuela, HI | Sept 28-Oct 1, 1975 |
| 22. Harrah's Hotel, Reno, NV | Sept 26-29, 1976 |
| 23. La Costa Resort Hotel, Carlsbad, CA | Sept 18-21, 1977 |
| 24. The Lodge, Pebble Beach, CA | Oct 8-11, 1978 |
| 25. Camelback, Inn, Scottsdale, AZ | Sept 23-26, 1979 |
| 26. Mauna Kea Beach Hotel, Kamuela, HI | Sept 21-24, 1980 |
| 27. The Empress Hotel, Victoria, BC | Sept 20-23, 1981 |
| 28. Jackson Lake Lodge, Jackson Hole, WY | Sept 12-15, 1982 |
| 29. Hotel del Coronado, Coronado, CA | Oct 2-5, 1983 |
| 30. The Broadmoor, Colorado Springs, CO | Sept 9-12, 1984 |
| 31. Silverado Country Club & Resort, Napa, CA | Sept 22-25, 1985 |
| 32. Maui Intercontinental, Wailea, Maui, HI | Sept 28-Oct 1, 1986 |

PAST MEETINGS OF THE SOCIETY

33. Banff Springs Hotel, Banff, AB	Sept 6-9, 1987
34. The Ritz-Carlton, Laguna Niguel, CA	Sept 11-14, 1988
35. The Lodge, Sun Valley, ID	Sept 10-13, 1989
36. Mauna Lani Bay Hotel, Kawaihae, HI	Sept 9-12, 1990
37. The Pointe, Phoenix, AZ	Sept 22-25, 1991
38. The Whistler, Whistler, BC	Sept 20-23, 1992
39. Mauna Lani Bay Hotel, Kawaihae, HI	Sept 19-22, 1993
40. Le Meridien Hotel, San Diego, CA	Sept 18-21, 1994
41. Salishan Lodge, Gleneden Beach, OR	Sept. 9-12, 1995
42. Manele Bay, Island of Lanai, HI	Sept 14-17, 1996
43. Ojai Valley Inn, Ojai, CA	Sept 20-23, 1997
44. Silverado Resort, Napa, CA	Sept 12-15, 1998
45. Coeur d'Alene Resort, Coeur d'Alene, ID	Sept 18-21, 1999
46. Mauna Lani Bay Hotel, Hawaii, HI	Sept 9-11, 2000
47. Ocean Pointe Resort, Victoria BC (Cancelled)	Sept 15-18, 2001
48. Delta Victoria Resort, BC	Oct 12-15, 2002
49. Hapuna Beach Prince Hotel, Kamuela, HI	Sept 20-24, 2003
50. Rancho Bernardo Inn, San Diego, CA	Sept 11-14, 2004
51. Squaw Creek Resort, Lake Tahoe, CA	Sept. 17-20, 2005
52. Semiahmoo Resort & Spa, Blaine, WA	Sept. 16-19, 2006
53. Mauna Lani Bay Hotel, Kawaihae, HI	Sept. 8-11, 2007
54. Hotel Captain Cook, Anchorage, AK	Aug. 16-19, 2008
55. Sun River Resort, Bend, OR	Sept. 11-14, 2009

FUTURE MEETINGS

Grand Hyatt Kauai Resort and Spa, Koloa, HI	Sept. 10-13, 2011
Broadmoor Hotel, Colorado Springs, CO	Sept. 7-10, 2012

PAST VICE-PRESIDENTS

John Raaf*	1955	Robert W. Rand	1980
Frank Turnbull*	1956	Theodore S. Roberts*	1981
Howard A. Brown*	1957	Ulrich Batzdorf	1982
Rupert R. Raney*	1958	George Ablin*	1983
Edmund J. Morrissey*	1959	George A. Ojemann	1984
C. Hunter Sheldon*	1960	Gale C. Clark*	1985
Ernest W. Mack*	1961	Robert Weyand	1986
Hale A. Haven*	1962	Robert Florin	1987
Frank M. Anderson*	1963	John A. Kusske	1988
Edwin B. Boldrey*	1964	Basil Harris	1989
Herbert C. Crockett*	1965	W. Ben Blackett	1990
Karl O. Von Hagen*	1966	Ronald F. Young	1991
Samuel W. Weaver*	1967	Edward Reifel	1992
Chester B. Powell*	1968	Grant E. Gauger	1993
Peter O. Lehman*	1969	Ralph F. Kamm	1994
Charles W. Elkins*	1970	Steven L. Giannotta	1995
Nathan C. Norcross*	1971	Randall W. Smith	1996
James R. St. John*	1972	Gail A. Magid	1997
Edward K. Kloos*	1973	Donald Prolo	1998
Ralph B. Cloward*	1974	Lawrence Shuer	1999
Thomas K. Craigmile*	1975	John C. Oakley*	2000
Lyman Maass*	1976	L. Philip Carter*	2001, 2002
Gale C. Clark*	1977	William L. Caton III	2003
William A. Kelley	1978	Gerald Silverberg	2004
Byron C. Pevehouse*	1979	Kim Burchiel	2005
		John Adler	2006
		Philip Weinstein	2007
		Betty MacRae	2008
		Linda Liau	2009

*deceased

PAST PRESIDENTS

David L. Reeves*	1955	William A. Kelly	1980
John Raaf*	1956	Byron C. Pevehouse*	1981
Frank Turnbull*	1957	Robert W. Rand	1982
Howard A. Brown*	1958	Theodore S. Roberts*	1983
Rupert R. Raney*	1959	Thomas K. Craigmile*	1984
Edmund G. Morrissey*	1960	Ulrich Batzdorf	1985
C. Hunter Sheldon*	1961	Gale C. Clark*	1986
Ernest W. Mack*	1962	Lyman Maass*	1987
Hale A. Haven*	1963	Gordon B. Thompson	1988
Frank M. Anderson*	1964	George Ablin*	1989
Edwin B. Boldrey*	1965	Robert Weyand	1990
John R. Green*	1966	Basil Harris	1991
Arthur A. Ward, Jr.*	1967	W. Ben Blackett	1992
Lester B. Lawrence*	1968	Francis E. LeBlanc	1993
John D. French*	1969	Ronald F. Young	1994
Chester B. Powell*	1970	John A. Kusske	1995
Robert W. Porter	1971	Melvin L. Cheatham	1996
Henry M. Cuneo*	1972	Robert Florin	1997
Edward K. Kloos*	1973	Frank P. Smith*	1998
W. Eugene Stern	1974	Ralph F. Kamm	1999
Ralph B. Cloward*	1975	Steven L. Giannotta	2000
James R. St. John*	1976	Donald J. Prolo	2001, 2002
Eldon L. Foltz	1977	Grant E. Gauger	2003
John Tytus*	1978	Randall W. Smith	2004
Donald B. Freshwater*	1979	John P. Slater	2005
		Moustapha Abou-Samra	2006
		Kim Burchiel	2007
		Gerald Silverberg	2008
		Lawrence Shuer	2009
		L. Philip Carter*	2010

*deceased

PAST RESIDENT AWARD RECIPIENTS

Linda M. Liao, UCLA **	1997
Sean D. Lavine, USC	1998
SooHo Choi, USC	1999
Michael Y. Wang, USC	2000
Odette Harris, Stanford	2001
Raymond Tien, OHSU	2002
Michael Sandquist, OHSU	2003
Iman Feiz-Erfan, BNI	2004
Johnathan Carlson, OHSU	2005
Mathew Hunt, OHSU	2005
Kirash Golshani, OHSU	2006
Edward Chang, UCSF	2006
Jonathan Miller, OHSU	2007
Kenneth Liu, OHSU	2007
Justin Cetas, OSHU	2008
Edward Chang, UCSF	2008
Zachary Litvack, OHSU	2009
Kiran Rajneesh, UCI	2009

**WNS Member

57th Annual Meeting



September 10 – 13, 2011

Grand Hyatt Resort & Spa
Island of Kauai

