

HAND SURGERY

Q U A R T E R L Y

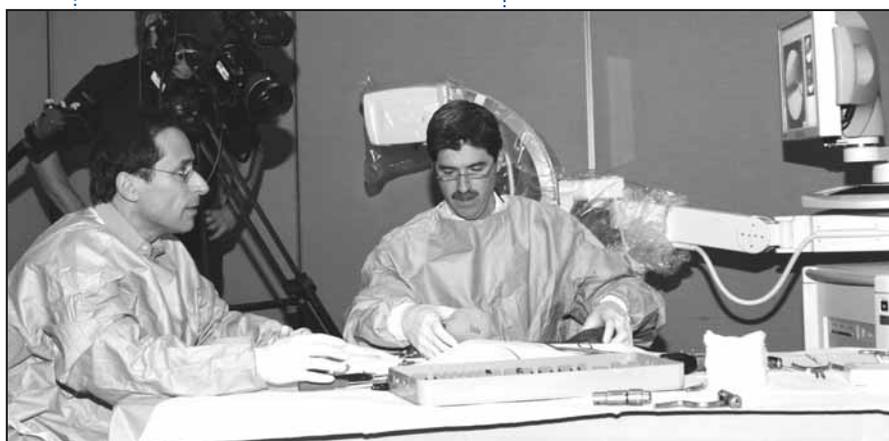


2006 AAHS ANNUAL MEETING

Meeting in Tucson a Huge Success

The 2006 AAHS annual meeting in Tucson, Arizona was educational, fun and an outstanding success with the highest attendance in many years. There were 359 attendees including 144 active members, 27 affiliate members, 14 international members, 10 candidate members, 71 non-mem-

gram on the Challenges of Nerve Compression and in the afternoon, the Bioskills Workshops. The Challenges of Nerve Compression consisted of outstanding didactic presentations from a diverse group of speakers with expertise in nerve compression and related topics. The panels on Work-Related Issues, Medical-Legal Issues and Opting Out of Medicare stimulated a lively discussion among the panel members and audience. The Bioskills courses and Cadaver dissections included



Mark Cohen, MD (left) and Mark Baratz, MD shared their expertise at the AAHS meeting.

ber physicians, 35 non-member allied health and 50 resident/fellows. For all those that attended, they were treated to an exceptional program with outstanding presenters and lecturers.

The program started early on Wednesday January 11, 2006 with the Special Topics Day, which began with a comprehensive pro-

demonstrations of a variety of operative procedures on trauma and reconstructive techniques. We thank all of the course sponsors for organizing these outstanding presentations. Wednesday night's Welcome Reception gave everyone the opportunity to renew old friendships and to meet new acquaintances.



Keynote Speaker
Jeff Lichtman, MD, PhD and outgoing
President Susan Mackinnon, MD

Thursday began early, with five instructional courses starting at 7:30 am. The early time did not discourage the participants, however, who filled the rooms. The program then continued with an outstanding panel, moderated by Mark Baratz, MD, on Challenging Wrist Pain, followed by an excellent panel on Challenging Nerve Cases, lead by Allen Van Beek, MD, which stimulated a lively discussion among the panel members. The Invited Speaker Jeff Lichtman, MD, PhD educated and entertained us with an exceptional talk on Studying Axon Growth and Regeneration in Fluorescent Mice. His videos of regenerating axons were truly amazing! The scientific sessions gave all the opportunity to hear 30 papers in the sessions on Wrist, Arthritis, Trauma, Hand and Nerve. On Thursday afternoon, the Comprehensive Hand Review Course that was organized by Peter Murray, MD was exceptional. He once again brought together an outstanding

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Destination: New Zealand

Next year, the International Federation of Societies for Surgery of the Hand (IFSSH) will be holding its annual meeting in Sydney, Australia. As usual, AAHS will be an integral party of the activities. Carrying on a tradition begun in 1992, when IFSSH met in Paris, AAHS will be sponsoring a special meeting in association with IFSSH. This time, we have chosen as partners the New Zealand Hand Society as partners. The dates will be Wednesday through Friday,



PETER C. AMADIO MD

March 7-9, 2007, just before the IFSSH, which begins on Sunday, March 11. The location, Queenstown, NZ, was selected not only for the quality of its accommodations but also for the truly unique quality of the surroundings. Situated on the shores of a 2000 foot deep, miles long, crystal clear glacial lake in the center of the New Zealand Alps, Queenstown is surrounded by snow capped mountains and is known for its "adventure tourism", including jet boating, parasailing, hang gliding, and bungee jumping. But there is much more. This is the place where much of "The Lord of the Rings" was filmed. The castles and monsters were very real, and you can see it all around Queenstown. An 1890's era gold mining town, complete with boardwalk and mountain stream through the center of town, where you can pan for gold, championship golf courses with spectacular views, and some of the best

wine country anywhere complete the surroundings.

Of course, no AAHS meeting would be complete without state of the art clinical content, and this meeting is no exception. Dubbed the First Pan Pacific Hand and Upper Limb Trauma Symposium (because we hope that there will be many more) the course will feature a series of invited talks as well as free papers. Already, we have faculty committed from the US, New Zealand, Japan, China, Korea, Italy, and the UK, with more being added regularly.

The social activities will also be world class. The opening reception will feature a tasting of the local wines, many unavailable in the US (a great pity). There will be a dinner at a venue reachable only by gondola, and the closing banquet will feature a competition that must be seen to be believed.

Then it will be on to Sydney, by direct flight from Queenstown, and another spectacular venue.

Please don't miss this once-in-a-lifetime opportunity. New Zealand is on the way to Sydney, after all, and there are convenient daily flights leaving in the early evening from the West Coast. I recommend traveling to LA or San Francisco the weekend before (March 3-4), with a restful sleep at a local B and B or hotel, then a pleasant day of sightseeing, biking, hiking, or otherwise relaxing, followed by a short trip to the airport for your flight onward to New Zealand. After a meal and a sleep on the plane, you will arrive in New Zealand in the morning (two days later—remember the date line!). Arriving then in New Zealand, you will have a day or two before our meeting starts to see a bit of the rest of that fascinating island nation. Consider one of the many famous "tracks", or hiking trails, of which two near Queenstown, the Routebourn and

Milford, are world famous. Or visit Christchurch, a university town that looks more like Oxford or Cambridge than, well, Oxford or Cambridge. Or Dunedin, the most Scottish city south of the equator.

The weather should be great. This will be late summer—the vines will be ripening, the days warm, the evenings cool. Just perfect for refreshment and restoration in the midst of a long journey.

So please join me and, I hope, one or two hundred of your closest friends in Queenstown next year. Additional information is available elsewhere in this issue.

G'day! **H**

HAND SURGERY QUARTERLY

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Hand Surgery Quarterly is a publication of The American Association for Hand Surgery and is published strictly for the members of AAHS. This publication is designed as a forum for open discussion and debate among the AAHS membership. Opinions discussed are those of the authors or speakers and are not necessarily the position, posture or stance of the Association.

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Hand Treasures of the Caribbean

What an honor and a thrill to serve as President of the American Association for Hand Surgery. It is difficult at this time to remember any bad experience in the years of service to this Association on its various committees and board positions. Having been nominated and elected by the membership of AAHS is in retrospect an incredible honor. I serve as an example to any and all of the membership of this great organization as to what might be achieved if one offers their talents to the running and future of this organization. All along the path, the membership and camaraderie that naturally develops is

perhaps its greatest reward. Having had the opportunity to work with the past presidents, get to know them, and watch them work their magic, has been extraordinary. How can I possibly compare.

The 2006 annual meeting in Tucson at the Loews Ventana Resort was a remarkable success. Those of you who were fortunate enough to have attended came away much richer. Congratulations for a job well done to Chris Novak, the Program Director, and certainly to our past President, Susan Mackinnon, who participated so unselfishly in the program to enhance its great quality. This was one of the best attended annual meetings in recent memory, and of course, the financial stability of this organization is largely dependent on that attendance. Our Central Office again came to the table and performed admirably, making the mechanics of this meeting so painless.

The program began with a Specialty Topic Day, which consist-

ed of a comprehensive course in "Challenges of Nerve Compression", which was an overwhelming success. The results of the survey of the membership were extremely positive regarding the panels and discussion groups. There were cadaver demonstration courses/biomechanic workshops, which gave the participants the opportunity for hands on experience with expert surgeons. The meeting included twelve instructional courses, four panels, and two invited lecturers. Peter Murray, M.D. organized the outstanding faculty for the Board Review Course, which again was a standing room only affair. And finally, thank you to Julianne Howell, the Program Chair for the Therapy Program, which met this year on Saturday. Another job well done.



RONALD E. PALMER, MD

No meeting occurs without problems and minor hitches. Your administration is working hard to recognize what the shortcomings or problems might be and how we might go about solving those in the future. We are fortunate that Central Office and Laura Downes Leeper work so well with the Administration to work through problems and ensure continued improvement. Of course, no problem can be corrected if it goes unrecognized. So as a member of the AAHS, we need your input and don't hesitate to advise us of problems that you may have had that we can work to improve.

The mission of our organization is to continue to offer high quality education in hand surgery. This year we continue by co-chairing Specialty Day at the annual meeting of the American Academy of Orthopaedic Surgery in Chicago, Illinois this March. Thanks to our representative in the development of that program, Neil Ford Jones. I know all rooms in Chicago have been sold out for some time and

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Spring 2006

American Association for Hand Surgery 2006 Officers and Board



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FROM THE PRESIDENT

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Specialty Day in hand surgery looks to be a remarkable success. We continue to work on improving the online CME component offered on the AAHS web site. We are working toward CME credits for the AAHS members in this educational experience. This is but another member benefit.

AAHS is sponsoring a meeting at Mayo Clinic in Rochester, Minnesota on April 28 through the 30th of 2006. This meeting is entitled "Advances in Adult Brachial Plexus Reconstruction, A Surgical Skills Course". Thank you to Alexander Y. Shin, M.D., Alan T. Bishop, M.D., and Robert J. Spinner, M.D. the co-chairs of this meeting. They have assembled an absolutely superb international faculty for this meeting and I encourage everyone to consider attending this unique surgical skills course.

Dr. Alan Freeland and his Committee for the Hand Surgery Endowment have developed their strategic plan and are proceeding remarkably successful in a positive direction. They have been able to raise at least \$40,000 to better sup-

port the activities of the Endowment. At the annual meeting in Tucson, Dr. Freeland announced that the Endowment had contributed \$10,000 to AAHS to move forward with the online endeavors of our organization. The Administration and the Endowment Committee are working to improve ways in which the Endowment can accomplish their mission to help lower the cost for our annual meeting and continue to help pay for the high quality of medical education the organization is providing.

At last year's annual meeting of AAHS in Puerto Rico, the presidential line of AAHS along with Terry Light, the then President of ASSH, along with representatives from the ASHT, Manus Canada, the Mexican Society for Surgery of the Hand, the Guatemalan Society for Surgery of the Hand, and the Puerto Rican Society for Surgery of the Hand, met to begin discussion on the formation of an organization for hand surgery of the Americas. Largely because of the continued efforts of our past president, Dick Berger, a larger delegation met in Tucson. An organizational meeting occurred, which resulted in the election of officers in preparation to prepare

the bylaws for the organization and plans for the first meeting. That first meeting is scheduled to occur in conjunction with our next annual meeting of the AAHS in Puerto Rico. That organization's name is LaFederation De Mano. We are hoping to have that meeting on Wednesday afternoon highlighted by an invited lecturer, Eduardo Zaneolli, III. Everyone should plan on attending, if you are able to come to the Puerto Rico meeting. The organization then plans on having its future meetings independent of AAHS and other organizations.

I just returned from Washington, D.C. in an effort associated with AAOS. Our organization was asked by AAOS to be part of an effort to lobby our members of Congress to solicit Congress to appropriate \$533.7 million dollars in fiscal year 2007 for the National Institute of Arthritis and Musculoskeletal and Skin Disease (NIAMS). This would be a 5% increase over fiscal year 2006. This is a particularly ambitious effort as there is actually scheduled to be a 3% budget cut. This effort as stated was sponsored by AAOS and to me seemed to be a roaring success. Patients accompanied the physicians to the offices of the members of Congress from their state and helped a great deal in securing the ear of the various Senators and Congressmen.

This brings me to perhaps the most important task for me this year, which is the 2007 annual meeting of AAHS to be held in Puerto Rico at the Westin Del Mar. Of course, the reason the 2005 meeting was in Puerto Rico was because of the hurricanes, which forced us from Sanibel. Dr. Dick Berger and his group, including the Central Office, were able to make a remarkable recovery and put on a tremendously successful meeting, considering the circumstances. We learned something about Puerto Rico in our working to correct the small inconveniences that occurred. This year's meeting at the Westin Del Mar is closer to San Juan and the airport. The beach is directly

The Hand Surgery Endowment
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outside the door and there is an array of recreational activities available at the resort. These include two world-class golf courses, tennis, three pools, a spa, a casino, and much, much more. I am incredibly fortunate that Lee Osterman and Jorge Orbay have agreed to co-chair the program for a committee for the upcoming annual meeting. Aviva Wolfe and Brian Adams have agreed to co-chair the therapy day, which will return to Wednesday as in years' past. The theme of the therapy day is "Rapid Recovery". Dr. Bob Beckenbaugh will be my keynote speaker and I can tell you this is going to be something you will not want to miss. My brother-in-law, Bob Jamieson, happens to be one of the senior veteran national news correspondents for ABC Nightly News. He has agreed to come to Puerto Rico and his topic will be "Interviewing Doctors on Medical Issues and Why Reporters Are So Hard on Physicians". He assures me this will be an entertaining and informational talk. Finally, Dr. Richard Kogan, a psychiatrist from New York City, will be giving another invited lecture discussion. Actually, Dr. Kogan is not going to discuss our members' psychiatric questions, but is himself a concert pianist, who discusses various composers in his presentation as he plays a number of their works. I am told that this 90-minute presentation is extraordinary and will result in a standing ovation. I am hoping to schedule this when you and your family will be able to take advantage of this remarkable presentation. I have barely touched on the educational activities that will occur with the meeting. Certainly, you will be hearing about these in the future reports in this quarterly. Although considering the quality of the Co-chairmen, I am sure there is little question of the quality of the educational venue that will be presented.

Don't miss Puerto Rico in 2007. There will be "Hand Treasures of the Caribbean." **H**



Incoming President Ron Palmer, MD, outgoing President Susan Mackinnon, MD and Alan Freeland, MD

Dear Friend and Colleague,

Annual dues pay for administration. Registration fees pay for the Annual Meeting. For the past ten years, the Hand Surgery Endowment (HSE) has supported and implemented the American Association for Hand Surgery (AAHS) educational, research, and humanitarian outreach initiatives through your generous voluntary donations, while dues and registration fees have remained stable.

The HSE has supported the Vargas International Hand Therapy Teaching Award, the Presidential Guest Speaker, Resident and Therapist Best Paper Awards, and Best Poster Award. Our thrust in 2005 was to provide year round value to our members and the public. Toward that end, we donated \$10,000 toward Internet development for public education regarding hand, wrist, and upper extremity injuries and afflictions; continuing education for our members; and development of our link where patients can find our members by name or geographic location. Our website, www.handsurgery.org, is easily accessible directly, and from the front page of "Google."

We are looking into additional opportunities for service and educational exchange to help local physicians and medical personnel serve disadvantaged and vulnerable populations in the third world.

Strengthen the AAHS for current and future generations of members and our patients. Keep the AAHS affordable, valuable, and attractive. Be a shareholder and invest in the future.

Eighty percent of our members have contributed to the HSE over the last 10 years. I hope that as many of you as possible will join me in the "President's Circle" with a donation of \$1000 or more. No donation is too small or too large. Every name on the "Donor Wall" is treasured. Every donation is appreciated. Each dollar counts. Every gift is completely tax-deductible. Keep the tradition going. Keep our profession and the AAHS strong and on the forefront of innovation, advancement, and public service.

Thank you for your generosity and support,

Alan Freeland, MD
President, HSE

HAND

Official Journal of the American Association for Hand Surgery

“You ask, why another journal? I have more than I can read now.”

I will try to explain the desire and reasons for the development of and the goals for its success. The President of the Association, Dr. Susan MacKinnon and the Board of Directors of the American Association for Hand Surgery (AAHS) perceived that the existing journals related to hand surgery were progressively less clinically relevant to its members by becoming more “Hard Tissue” and research oriented. This initial dialogue amongst the Board of Directors evolved into a collaborative planning process that has come to represent a complementary vision and goal for a successful publication and to further the educational mission of the Association. This process led to a proposal for a new journal to build on the need for a hand journal that was clinical-oriented and reader friendly.

I was also asked to work with the Board of Directors and consider becoming the Editor-in-Chief. The collective efforts and planning behind the new journal also provided the basis for the partnership with the publisher, Springer. The title, *HAND*, was established for the journal and a modern and exciting cover was chosen. An editorial review board of 25 plastic, orthopedic and general surgeons doing hand surgery and hand therapists have been selected and will be replaced on a rotating basis. I have accepted the Editor-in-Chief position and once the journal is off the ground, Associate Editors will also be chosen to become part of the

Editorial Board.

HAND will start with quarterly publications and advance to bi-monthly as submissions reach an appropriate number. The first issue is scheduled to launch in June 2006. All articles related to the upper extremity and post operative care and rehabilitation of the hand will be considered for publication, but clinically related articles will be given preference. Research submissions and reviews of current state of the art judged relevant to the Association members and readers will also be considered. In addition, Letters to the Editors, View Points, Brief Communications, and Case Reports will also be considered for publication. All submissions will be blinded to reviewers and will be accepted, accepted with minor changes, accepted with major changes, or rejected. A conflict of interest declaration will be required. We invite you to submit your contribution for publication in the journal. For information on how to organize your manuscript for submission, please contact Ms. Yvonne Chan via email at Yvonne.chan@springer.com.

To ensure the high quality of the articles being published, the journal will be submitted to all the major indexing services for evaluation at the end of the year. *HAND* will undergo a review process with each service and if it is accepted for inclusion for indexing, there will be greater assurance that the article will be read and cited, achieving greater exposure for both the author and Association.

HAND will be published in both online and print formats. Please look forward to the following online features in the near future:

- **Editorial Manager®:** Web-based manuscript handling system for online submission, peer-review, and tracking
- **SpringerLink:** Springer’s premier interactive database that offers

electronic content of more than 1,200+ journals

- **Online First™:** Articles published in their electronic form online prior to appearing in the print journal
- **SpringerLink Alert:** Automatic e-mail notices on upcoming publications and tables of contents

The goals for *HAND* are a readable, clinically applicable journal for the busy hand surgeon. AAHS members will automatically receive the journal upon publication as a benefit of membership. I encourage you to submit your creations to *HAND* and welcome any comments and suggestions you may have for the journal.

Dr. Elvin Zook
Editor-in-Chief

Lending a Hand Getting Ready for Second Year

Last year, the American Society for Surgery of the Hand and the American Association for Hand Surgery kicked off the Lending a Hand program, designed to bring a hand surgeon into the classroom of every first year medical student. The goal is to raise awareness of the specialty of hand surgery early, to attract the brightest students to the field. Over 133 hand surgeons volunteered to participate in the program. This year, we want to be ready to reach even more schools. If you are interested in participating in the program, please email Dawn Briskey dbriskey@assh.org in the ASSH Central Office with the name of a school near you. For more information, visit the Lending a Hand pages (http://www.assh.org/AM/Template.cfm?Section=Lending_a_Hand2) of the ASSH website. **H**

AAHS Mentoring Program Continues to Gain Momentum

A new program was introduced at the end of last year, featuring AAHS members who have offered to teach their expertise in specific areas. Please take advantage of their academic generosity (see listing below). It is designed to let our members continue

to learn the way we were taught, as residents and fellows, in the clinic and operating room with a surgical mentor. For more information, including to register as a mentor, please contact the AAHS Central Office. **H**

AAHS Mentor Volunteers

NAME	EMAIL OR PHONE	PROCEDURE(S)
R. D. Beckenbaugh, MD	*	Technique of pyrocarbon arthroplasty of the thumb carpometacarpal and metacarpophalangeal and PIP joints of the digits
Richard Berger, MD, PhD	*	Wrist surgery
Allen Bishop, MD	*	Brachial plexus reconstruction, carpal vascularized bone grafts and microvascular free tissue transfers
James Chang, MD	*	Dupuytren's; thumb reconstruction; flexor tendon surgery; trapezial excision arthroplasty; and medial epicondylectomy
Kevin Chung, MD	*	Rheumatoid and congenital
E. Gene Deune, MD	*	Congenital hand anomalies and upper and lower extremity reconstruction for deficits due to trauma, cancer resection or neurological disorders (i.e. brachial plexus)
Scott H. Kozin, MD	*	Pediatrics
Don Lalonde, MD	*	Wide awake approach to hand surgery
W. P. Andrew Lee, MD	*	Post traumatic hand reconstruction; mini incision carpal tunnel release
William Lineaweaver, MD	*	Business practices
Susan Mackinnon, MD	*	Ulnar nerve surgery
Nash Naam, MD	*	SLAC wrist reconstruction; vascularized bone graft in treating scaphoid nonunions; ulnar shortening & radial shortening; PIP & MP joint arthroplasty; LRTI; arthroscopy of the CMC joint of the thumb
Daniel J. Nagle, MD	*	Wrist arthroscopy and endoscopic carpal tunnel release
Michael Neumeister, MD	*	Basilar joint arthroplasty; peripheral nerve decompression
Jorge Orbay, MD	*	Wrist fractures mentorship
A. Lee Osterman, MD	*	Advanced wrist arthroscopy and small joint arthroscopy. Can also mentor a topic such as DRUJ problems, or wrist fracture.
Julian J. Pribaz, MD	*	Soft tissue reconstruction; microsurgical reconstruction; spare parts surgery and extremity reconstruction
Michael Raab, MD	*	Corrective osteotomy (volar or dorsal) of distal radius malunion with iliac crest bone grafting
Jaiyoung Ryu	*	Wrist reconstruction; distal radius fracture; and scaphoid fracture/nonunion
David Slutsky, MD	*	Wrist arthroscopy and arthroscopic repair of dorsal radiocarpal ligament tears; intra-articular distal radius fractures
Thomas Tung, MD	*	Brachial plexus
Joseph Upton, MD	*	Congenital hand surgery
Elvin Zook, MD	*	

* For current email and phone numbers, AAHS members are asked to access the online directory at www.handsurgery.org

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Quarterly

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faculty on a variety of important hand surgery topics that held everyone's interest long past quitting time.

The program resumed on Friday morning at 7:30 am with five extraordinary instructional courses, which were once again filled to capacity. The meeting continued to a packed room—standing room only!—with an outstanding panel on the Challenges of Complex Hand Trauma, moderated by Nick Vedder, MD. Following a break with the exhibitors, Susan Mackinnon, MD presented an enlightening Presidential Address on Mentoring and Resident Education. As the invited Joseph Danyo Lecturer, Peter Amadio, MD presented an outstanding lecture on Three Decades of

Tendon Research: The Search for the Perfect Slide. His talk was excellent and compelling including the video on the association between the tenosynovium and the median nerve in nerve compression. The scientific sessions once again educated all on the latest research with 35 papers on Trauma & Microvascular, Tendon & Tumor, Distal Radius Fractures & Wrist and Fractures & Congenital and Basic Research. On Friday afternoon, the panel on Operative Pearls from My Surgical Practice provided the audience with the opportunity to listen to six outstanding surgeons. For those who missed this panel, these surgeons gave the audience the unique opportunity to hear the



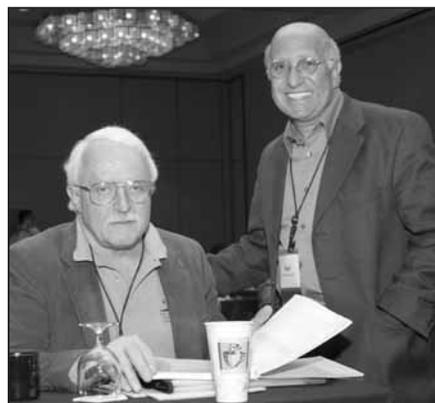
Program Chair Christine Novak, PT, MS (left) with one of the scientific program panel moderators, Nick Vedder, MD.

operative pearls that have contributed to their excellent patient outcome... truly a panel that should not have been missed. Friday night the reception and silent auction in support of the Hand Surgery Endowment was remarkable. This was very successful for the Endowment and the other big winner was Bill Swartz, MD who outbid everyone for the football signed by the MVP Hines Ward of the Superbowl champion Pittsburgh Steelers. We thank all who attended, contributed and supported the Hand Surgery Endowment, which is truly a worthy cause for our organization.

In keeping with our tradition of collaboration with the American Society for Reconstructive



One of the highlights of the AAHS/ASRM/ASPN Combined Day featured a panel discussion on composite tissue allografts. L to R: ASRM President Chris Pederson, MD, AAHS President Susan Mackinnon, MD, ASPN President Maria Siemionow, MD, PhD, and W. P. Andrew Lee, MD



Robert Russell, MD (above, at left) and Nash Naam, MD confer between presentations; Richard Berger, MD (at right) demonstrates a point about wrist instabilities to an attentive audience.





**Presidents' Invited
Lecturer Colonel Mark Bagg, MD**

Microsurgery and the American Society for Peripheral Nerve, our combined program on Saturday morning began with 5 exceptional instructional courses. Even the early start at 6:30AM did not deter the attendees because the rooms for these courses were filled. The panel on Composite Tissue Allograft was very educational and timely. The Presidents' Invited Lecturer was Colonel Mark Bagg, MD who presented an informative look at the Extremity Injuries in the Global War on Terrorism. The morning program concluded with the presentation of the outstanding nerve papers selected from each of the three organizations. The day was completed by an outstanding Hand Therapy Day organized by Julianne Howell, MS, PT, CHT, who brought together a fantastic faculty who gave us the challenge, "Hand Surgeons & Therapists—What evidence do you have to do that?"

For those who came, I hope that you found the meeting to be educational and enjoyable. I encourage everyone to attend the 2007 meeting in Puerto Rico, which I am sure will be outstanding. My own assessment of the meeting was that it was enormously successful and I thank all of the presenters, faculty, moderators and panel members without whom the high quality of the meeting would not have been achieved. On a personal note, I am very grateful to the AAHS Central Office, the Program Committee and Susan Mackinnon, who were all very instrumental in ensuring the success of this meeting.

*Christine B. Novak, PT, MS
AAHS 2006 Program Chair*



In between sessions, members enjoyed lots of camaraderie and some well-earned R & R.



**2006
Day at
the Links
Results**

**First Place Team,
won in scorecard playoff
(66) (-6)**
Joseph Disa, MD; Jeffrey
Friedman, MD; Gabriel
Kind, MD; and Damon
Spiegel

Longest Putt #9
Michael Neumeister, MD
Closest to the Pin #3
Chad Gordon, MD
Longest Drive #18
Helga Toriello

The American Association for Hand Surgery would like to thank the following sponsors:

**SBI
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Special thanks are extended to the sponsors of the Cadaver Demonstration Courses:

**KMI, Integra, Ascension Orthopedics,
Hand Innovations, and SBI**

The AAHS Board of Directors and the 2006 Annual Meeting Program Committee would like to thank the following companies for their support and participation:

Allergan, Inc.	KCI
American Society of Hand Therapists	KMI
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Arch Surgical	Medartis, Inc. *
Ascension Orthopedics, Inc	* Proud sponsor of the badge lanyards
ASPS	Medlink USA
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AAHS 2006 Award Winners

Resident Papers

Best Clinical Paper:

Cesar J. Bravo, MD

Report of total joint replacement of the PIP joint with a pyrolytic carbon implant

Best Basic Research Paper:

Justin Michael Sacks, MD

Anatomic relationship among median nerve thenar branch, superficial palmar arch and transverse carpal ligament

Research Grants

Drs. Steven C. Haase and Kevin C. Chung

University of Michigan

A prospective study of surgical outcomes of volar, fixed-angle plate fixation of unstable distal radius fractures

Drs. Justin M. Sacks, Maryam F. Hariri, and W. P. Andrew Lee

University of Pittsburgh

Topical FK-506 ointment prolongs hind-limb allotransplantation

Drs. James Chang and Alphonsus Chong

Stanford University

Bioreactors in tissue engineering of intrasynovial tendon grafts

Vargas International Hand Therapy Teaching Award

Donna Pendleton, MS, PT, CHT and Lorna Ramos, MA, OTR/L

Destination: Romania

What Evidence Do You Have to Do That?

The moderator for this discussion is **Julianne Howell, MS, PT, CHT**, Clinic Manager, Samaritan Hand Therapy Specialists, Corvallis-Albany, OR. She is joined by many of the participants from the discussion at the annual meeting in January, including **Peter Amadio, MD**, Professor of Orthopedic Surgery, Mayo Clinic College of Medicine, **Joy MacDermid, BScPT, PhD**, McMaster University, Hamilton, Ontario, Canada; **Wyndell H. Merritt, MD, FACS**, Clinical Professor of Surgery, Virginia Commonwealth University/Medical College of Virginia, Richmond, VA; **Sue Michlovitz, PhD, MS, PT, CHT**, Finger Lakes Physical Therapy, Ithaca, NY; **Sandy Robinson, OTR, CHT**, Clinical Director, Hand Management Center of St. Joseph's Hospital, Elmira, NY; and **Mark Walsh, PT, DPT, MS, CHT**, Co-owner and President, Hand & Orthopedic Physical Therapy Associates, Levittown, PA.

Ms. Howell: At the recent Hand Therapy Day, in Tucson, our panel members were asked to review the evidence base on the role of specific interventions for the non-surgical management of carpal tunnel syndrome, DeQuervain's tenosynovitis and trigger finger. The interventions reviewed included injection, iontophoresis, ultrasound, splinting and nerve mobilization.

Dr. Amadio, what have you found in the evidence-base regarding the use of injection in non-surgical management of carpal tunnel syndrome and tenosynovitis?

Dr. Amadio: I think the evidence is pretty good that there is a role for injection. People can argue about what, or how big, that role is, but there's pretty good evidence that injection treatment can reduce temporarily the symptoms of carpal tunnel syndrome. There's also some evidence that injections can have some longer lasting effect, but I think that evidence is a lot weaker and seems to be more the case for patients with fairly mild carpal tunnel syndrome, of the same kind that can get better on its own. It's not as clear in those cases whether there is incremental benefit to support injections. To me, the injection has a couple of benefits that are supported by the evidence. One is for transient symptom relief, which may be especially helpful in patients with intermittent symptoms and an acute exacerbation, but who otherwise can live with their symptoms. The second indication supported by the lit-

erature is to confirm the diagnosis. If you do inject the carpal tunnel and the symptoms get better, then the diagnosis is indeed carpal tunnel syndrome, as opposed to some other cause of hand pain or numbness.

Ms. Howell: Dr. Merritt, could I ask you take the evidence-base position against the use of injection in the non-surgical management of CTS and tenosynovitis?

Dr. Merritt: If my role is to make a case against steroid injection for carpal tunnel syndrome, it would be to state that it is a temporary measure that is irrational and potentially harmful. As Dr. Amadio states, the benefit is well shown to be temporary, although in mild cases and in people that have acute inflammation, it may produce a cure. Steroid injection would seem to be irrational in that it is an anti-inflammatory agent. In surgical specimens, inflammation is not present usually, including studies of Dr. Amadio showing fibrosis and connective tissue proliferation but no acute inflammation.

That being said, steroid injection does work! Therefore, the role of steroid is probably not as an anti-inflammatory agent as much as an agent that will reduce collagen proliferation and perhaps shrink the amount of tissue present around the nerve. A few years ago, Sud and Freeland suggested that biochemical and histological findings in carpal tunnel syndrome may represent ischemia-induced reperfusion injury

with cytokines, like interleukin-6 and free oxygen radicals. Steroid injection would still conceivably reduce this response. From a rational point of view you might think an anti-inflammatory agent would be unsuccessful; from a literature study point of view, it is successful in about 85% of patients, usually for several months.

However, one must recognize that steroid injection can be quite harmful. Susan MacKinnon and others clearly demonstrated years ago in mice that intrafascicular injections cause a tremendous amount of intraneural fibrosis and permanent damage to the nerve with any steroid, although dexamethasone was the least damaging in their study. In my own experience, steroid injection is most useful when there is a diagnostic dilemma. In fact, McCabe, et al demonstrated that steroid injections more accurately predicted the outcome of carpal tunnel syndrome than an electromyographic and nerve conduction study, Katz hand diagram, Tinel and Phalen testing or two-point discrimination. However, the risk and temporary benefit rules against



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POSITIONED THROUGH
OUR ORGANIZATION,
UNLIKE ANY OTHER
PROFESSIONAL
SOCIETY, TO
COLLABORATE ON
EVIDENCE-BASED
RESEARCH.**

**JULIANNE HOWELL, MS,
PT, CHT**

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injection use as a routine diagnostic measure. My indications for steroid injection include patients who have transient inflammation, such as a rheumatoid flare, people who wish to postpone surgery, and in the unoperated hand in patients who



I THINK IT'S WORTH TRYING TO GET A MORE HOMOGENOUS GROUP OF PATIENTS THAT'S RELEVANT TO WHATEVER INTERVENTION YOU'RE LOOKING AT. FOR MOST OF THESE NON-OPERATIVE MODALITIES, IT'S GOING TO BE EARLIER, LESS SEVERE DISEASE.

PETER AMADIO, MD

have bilateral symptoms when operating on the worst hand. If a patient, who might be a malingerer, gets relief after an injection and returns to work, then I am more comfortable operating if symptoms recur, provided that patient was unaware of the expected benefit of injection. When injection is unsuccessful in such a patient, one should be cautious about operating on that patient.

Ms. Howell: Dr. Michlovitz, just how extensive is the evidence-base on the use of the modalities, ultrasound and iontophoresis to non-surgically manage patients with carpal tunnel syndrome?

Dr. Michlovitz: The evidence for ultrasound was through two

studies. One study was done by Ebinbichler, who provided ultrasound to patients with CTS in a way, and in dosages, that most of us wouldn't typically use in a clinical capacity. They compared sham ultrasound to 20% duty cycle pulse ultrasound. Treatment was for 15 minutes 5 days per week for 2 weeks and then twice a week for another month after that. The patient population had symptoms for an average of about 6 to 8 months, and mild or moderate carpal tunnel syndrome. The investigators found that with the group receiving actual ultra-

sound, the symptoms were reduced and nerve conduction seemed to have improved.

In another study, patients had carpal tunnel syndrome for a much longer duration and continuous wave ultrasound was used rather than pulse ultrasound. Ultrasound did not have a positive effect. I think there is some support for using ultrasound in a pulse mode for early symptoms of carpal tunnel syndrome. The effects maybe due to an alteration in microcirculation as a result of the ultrasound.

But I would question the practicality of coming in for 15 treatments over 6 weeks when, with early carpal tunnel syndrome, there may be other interventions that can be just as, if not more, effective.

Ms. Howell: Dr. Michlovitz, what can you tell us about the evidence-base for the use of either of these modalities in the tenosynovitis population?

Dr. Michlovitz: As far as I'm aware, it has not been studied. There may have been a couple of anecdotal case reports for the use of both of those modalities and in treating DeQuervain's tenosynovitis and in treating trigger finger.

Ms. Howell: Thank you, Dr. Michlovitz. Ms. Robinson, is the evidence clear regarding the use of splinting in the non-surgical management of patients with carpal tunnel syndrome or tenosynovitis?

Ms. Robinson: The evidence base is reasonably solid for the use of splinting in the carpal tunnel patient. Clinically, we would probably all agree that it is a first line treatment because it is non-invasive, cost effective and, if the diagnosis is correct, I think most of our patients benefit somewhat from splinting, but often are not cured. There was a Cochran review that was published in March of 2003 that reported controlled clinical trials as well as biomechanical studies that clearly support the benefit of neutral wrist splinting for carpal tunnel syndrome. There are at least four randomized clinical trials that have been reported. Probably the strongest one was reported by Gerritson in *JAMA* in 2002, where

they looked at splinting compared to a surgery group and found at 3 months a 54% success rate with splinting alone. Akalin also has an RCT in the *American Journal of Physical Medicine* in 2002, which showed 72% success rate with splint only. The problem comparing studies is the significant variability in duration and intensity of symptoms and the broad range of outcome measures used.

One of the most interesting studies that I came across in reviewing the literature was done by an Italian group looking at an innovative hand brace which does not do neutral wrist splinting but attempts to open the carpal tunnel area up. They looked at 40 patients for four weeks splinting at night, 40 controls received no treatment. Using the Boston Carpal Tunnel questionnaire, all of the splinted patients improved both in symptoms and function.

We have at least four reasonably good high-level studies showing the efficacy of splinting and there are many retrospective chart reviews, non-RCT's, and many articles all of which show at least short term benefit with splinting.

Dr. Walsh: What's the longest duration of benefit, and how effective is splinting for a cure?

Ms. Robinson: That point isn't clear in the literature because most of the studies are cut off in the neighborhood of three months. Some of the longest studies were done for one year. Clinically, we often see patients returning two years later with recurrent symptoms who had initially done well with splinting. The studies that are published have not followed patients long enough to conclude that we're actually "curing" the problem with splinting.

Dr. MacDermid: We just published a study in the *Journal of Investigative Medicine* where we had a conservative trial looking at conservative management versus conservative management plus Vitamin A. There were no differences in the treatment groups but we followed that group for a year and a half to see who actually progressed to surgery. If you think about our particular pop-

ulation, we're in a tertiary hand care center in Canada so patients have probably been managed by their family doctor for at least a year before they get a referral. They probably waited at least a year to see us, and they've probably had at least one course of conservative management. Then we give them another course of conservative management. So under those circumstances I would expect the probability of response to be fairly low. But despite that, there was a percentage that did do okay and did not go on to surgery, but they had much lower symptom severity scores at baseline and they improved fairly quickly. The patients who went on to surgery had higher symptom severity scores to start with, and if you reevaluated them 3 weeks later there was no change.

Dr. Amadio: I would agree with that assessment. Basically the way I deal with splinting in my own practice is that I offer it to almost everybody. I really don't expect very much from it except in patients as Dr. MacDermid described; patients who have intermittent symptoms, and/or relatively mild symptoms, or perhaps more recent onset of symptoms. I give them a trial for about a month and if there isn't any improvement in a month, I don't expect that there's going to be any improvement with any further splinting. I don't really think that you burn a lot of bridges or waste too much time by trying something for a month or so. And as she said, there are some patients who obtain close to complete relief. I certainly have noticed that there are some patients that get very long lasting relief from symptoms from splinting. And I'll see some patients sometimes 5 or 10 years later that come back but now the symptoms are worse or more constant. But in the meantime, they've been very happy and they've gotten along quite well with intermittent splinting. I don't think that I've done those patients a disservice by not offering them an early operation when something as simple as nocturnal splinting has been able to manage their symptoms for such a long period of time.

Dr. Merritt: I was intrigued by a study presented at the last international hand meeting in which an English group pointed out that delay before carpal tunnel surgery did not generally produce problems as far as they were concerned. In their system, there is often a delay before elective carpal tunnel surgery, averaging close to a year. The intriguing aspect was that about 20% of their patients apparently got well during the delay and did not have surgery. So, one speculates that these individuals would have benefited from a splint and might never need surgery.

Ms. Robinson: Most of the studies include the whole spectrum of carpal tunnel patients, from those early patients with less constant symptoms to the severe patient with constant symptoms. I would certainly agree with what Dr. Amadio and Dr. Merritt have expressed in terms of a group of patients that seem to do very well with splinting. They likely represent the lowest symptom severity group.

Ms. Howell: I would agree, from my own practice, that after beginning splint use, some patients experience relief of their symptoms. I think we all intuitively believe that the patient who experiences symptom relief after splinting probably has intermittent and/or less severe symptoms, but the truth is, we just don't know. I also believe that dosage, the type and fit of the splint, as well as the severity and longevity of the patient's symptoms, may all play a role in the outcome.

Dr. MacDermid: The other point I think that's really useful to remember when we talk about effectiveness, and this is true for the injections as well, is that you have to remember the goal of why the intervention was introduced when evaluating whether it was effective or not. And as we talked about, sometimes an intervention is actually used to make a diagnosis, sometimes it's used for symptomatic relief until some other event happens, and sometimes it's used as a cure. And so it's really only fair to evaluate an intervention based on what initial

reason the intervention was being used for.

Dr. Walsh: I have two quick comments. One patient population we see quite frequently in our practice for the use of temporary splinting is pregnant women. And my other question is, does anybody differentiate based on some of the carpal tunnel pressure studies that have been done by Cobb, Szabo et al, with regards to placing the splint dorsally rather than volarly, and whether or not this would actually make a difference in the results?

Dr. Michlovitz: Dr. Walsh, I'm assuming you're referring to Cobb's study where he showed the external pressure on the palm increases carpal tunnel pressure?

Dr. Walsh: Correct.

Dr. Michlovitz: I'd be concerned about sending somebody to work with a splint if it's a volar-placed splint and they're spending time all day using a mouse or their hand on the computer keyboard or resting their hand on their mouse. I'd be concerned about additional external pressure.

Dr. Amadio: When I prescribe splinting, I don't really prescribe it during the day but only at night. So pressure on the palmar side isn't going to be much of an issue. But it's an interesting thought. For those who use splints during the day, for whatever reason, there may be some rationale for using something that's dorsally based instead of palmarly based. I'm not aware of anybody, at least no one in my practice here in Minnesota, who uses daytime splinting. Is anybody aware of people using dorsally based



I THINK THERE IS SOME SUPPORT FOR USING ULTRASOUND IN A PULSE MODE FOR EARLY SYMPTOMS OF CARPAL TUNNEL SYNDROME. THE EFFECTS MAYBE DUE TO AN ALTERATION IN MICROCIRCULATION AS A RESULT OF THE ULTRASOUND.

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splints clinically for daytime splinting, and seen if it made a difference?

Ms. Robinson: The only difference that I've seen is in patient tolerance. People who are using splints when they're on a computer seem to toler-

ate the dorsal splint better than the volar splint.

Dr. Merritt: One practical reason daytime splints are poorly tolerated is because so many of the splints have wrist extension, which is more functional but puts more pressure on the nerve. The splint needs to be in perfectly neutral position for it to be most effective.

Dr. MacDermid: There was a nice biomechanical study that looked at the position of the shoulder with and without wrist splints on. It showed quite clearly that people use different elbow and shoulder postures if they have a wrist splint on and that those are not ergonomically good positions. It implies that you're potentially putting people at more risk for other

arm problems if they wear a splint too much at work.

Dr. Michlovitz: I'd like to add one more thing about wearing splints. Many of the patients that I see in my practice are referred from family practice physicians, nurse practitioners, or physician's assistants working in general orthopedists office. These patients who have carpal tunnel syndrome come in already wearing a prefabricated splint that holds the wrist in extension. I remove the metal bar from the splint and pro-

vide a different support, e.g. thermoplastic insert in the prefab splint to bring their wrist into a neutral position. I send the patient home with the bar and tell them they can eat their yogurt with that in the morning. If a prefabricated splint is used, the wrist should be positioned in a way to minimize carpal tunnel pressure.

Ms. Howell: I may be the only one in this group who requests CTS patients to wear their wrist neutral-commercially-made splint 24 hours/day for duration of 10-21 days. First, I am not aware of any of any splint-imposed shoulder or elbow problems, although I do speak to my patients about watching for that possibility. Secondly, it is not uncommon for patients who have been splinting only at night to have a dramatic change in their symptoms as well as their Semmes Weinstein monofilament scores after wearing the splint 24/7 for a 10-21 day period. My observation has been that the patients who have intermittent symptoms appear to respond most consistently and retain this response after the splint is discontinued.

I think we all agree that although the details vary, the evidence-base is quite healthy regarding the use of splinting in CTS. Dr. Walsh, could you tackle the evidence-base regarding the use of nerve gliding or nerve mobilization for management of the non-surgical carpal tunnel patient?

Dr. Walsh: Somehow, I feel like I've gotten one of the controversial topics to discuss. There are only two pieces of literature that even talk about the use of nerve mobilization or nerve gliding as far as treatment is concerned. Rozmaryn et al (JHT 1998), in a study with a patient population with carpal tunnel, divided them into two groups. Both groups received conservative measures of equal amount, but one group got tendon and nerve gliding exercises. These exercises utilized what's considered to be the distal components of an upper limb nerve tension test which is analogous to the straight leg raise test in the lower extremity. What she found is that about 70% of

the patients that were in the experimental group reported significant relief in their symptomatology and 71% in the control group required surgery as compared to 43% in the experimental group. The other study done was by Seradge et al (1995 JHS). He took a group of about 286 factory workers, industrial workers and put them through a series of what he called carpal tunnel decompression exercises. But if you look at those exercises fairly closely once again you'll notice that basically they're made up of components of the upper limb tension test. He found that there was a decreased incidence of carpal tunnel in that group of factory workers of about 45%. Those are the only two studies that I'm aware of that have specifically taken patient populations and looked at the effectiveness of using nerve mobilization or nerve gliding in order to try to treat those patient populations. The one thing that you run into or the problem that you run into with all of this is that there are no studies that clearly delineate any kind of dosage, duration or frequency in which to do neural mobilization. These two studies didn't use the same protocol so it's difficult to make a determination as to how often, how much and how intense you perform these exercises.

That being said, I think we also have to consider that when we're looking at evidence, we have to consider some of the basic science evidence that is out there. There is evidence in cadaver models (Wright 1996, 2001) that there is a certain amount of excursion that our nerves go through within our upper extremity as we move. And there have been some studies that have looked specifically at patients with carpal tunnel (Nakamichi 1995 and Valls-Sole 1995) and have demonstrated that there is a decrease in the mobility of the excursion of the nerve at the level of the carpal tunnel. One can make an argument for the fact that we need to address the ability of the nerve to move within its tissue bed. So that being said in our practice, our conservative measures with regards to patients with carpal tunnel is basically a 2 pronged approach, which is to place



MOVEMENT AT THE WRIST CAUSES STRAIN CHANGES AS HIGH AS THE BRACHIAL PLEXUS, AND LIKEWISE MOVEMENT AT THE SHOULDER CAUSES STRAIN CHANGES IN THE MEDIAN NERVE AT THE WRIST... [SO] IT BEHOVES US TO ADDRESS THE UPPER EXTREMITY IN ITS ENTIRETY.

MARK WALSH, DPT, MS, CHT

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them into their splint, and we use a dorsal splint for night time. That is followed up with instructing the patient in a series of nerve gliding exercises that they perform at home; that's done on the second visit. We have a third and final visit which is a follow up, usually somewhere around 3 to 4 weeks post-intervention to see if there's been any change and to make any alterations that can be made and make sure that the patient is performing exercises correctly.

Now, we haven't don't any kind of controlled study to look at the effectiveness of that in our practice, but anecdotally it appears to be of some benefit. But then again we don't know if it's just the splinting that's creating the situation or whether it's the other intervention as well.

Dr. Merritt: Dr. Walsh, you are describing these exercises preoperatively, not postoperatively?

Dr. Walsh: Yes. We're speaking from a conservative pre-operative management basis.

Dr. Merritt: Would these studies suggest that mobilization beginning a few days following carpal tunnel surgery would be beneficial?

Dr. Walsh: I say that it would absolutely be beneficial. At their first post operative visit, we teach them both tendon and nerve gliding exercises anticipating that the normal fibrotic process that occurs through wound healing could potentially minimize the excursion of the nerve through the carpal tunnel. Limitation of that excursion could potentially set the patient up for the possibility of what I refer to as micro traction injuries if the nerve itself is not going through its full excursion as the wrist and fingers go through their full motion.

Dr. Merritt: That makes sense, because while the fibrosis of idiopathic carpal tunnel syndrome might conceivably cause some nerve adherence, the fibrosis of surgery most certainly leads to scar adherence, so I usually mobilize patients four or five days postoperatively.

Ms. Robinson: Dr. Walsh, I would like to ask you a question regarding your conservative management. When you are setting up a nerve gliding program, are you including the entire upper extremity or are you doing just distal nerve gliding?

Dr. Walsh: Unlike Rosemaryn, that used the distal components for nerve gliding, we incorporate the entire upper extremity. The reasoning is simply based on the fact that there are numerous cadaver studies that have looked at putting force buckle transducers (Kleinrensink 1995 and Lewis 1998) on various cords in the brachial plexus and on the proper nerves within the upper extremity. Then they have taken the extremity through a range of motion. It has been documented that movement at the wrist, believe it or not, causes a strain change as high as the brachial plexus, and likewise movement at the shoulder causes a strain change in the median nerve at the level of the elbow and the wrist. And a result of those studies, I think it behooves us to address the entire

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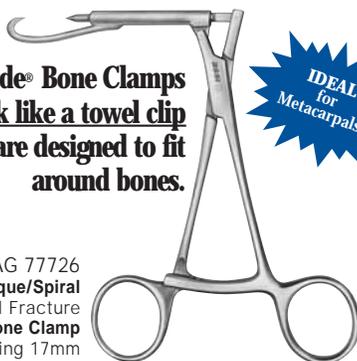
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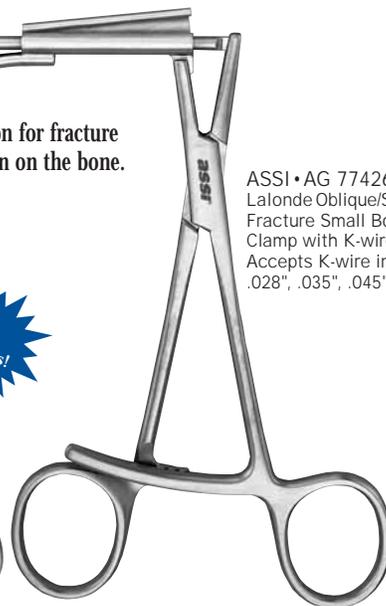


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extremity and not just focus on a specific segment of an arm.

Ms. Robinson: I totally agree. Thank you.

Dr. Michlovitz: Dr. Walsh, a number of years ago, Szabo et al (1994 JHS) published a cadaver-model study that looked at the excursion of the median nerve through the wrist. Just flexing and extending the digits provided excursion of the nerve through the carpal tunnel. I was wondering if you felt that this is sufficient gliding gained by just moving the fingers instead of going through the entire upper extremity maneuvers.

Dr. Walsh: I'm familiar with Szabo's work but based especially on the work of Wright, who looked at both the ulnar and the median nerves and their excursion through the upper extremity, you get a greater amount of

excursion when you include the entire extremity than you do if you limit yourself to just finger or wrist motion. That is why we address the entire extremity. The total excursion that the nerve goes through is increased when you incorporate the elbow and the shoulder into the process.

Ms. Howell: Dr. Walsh, what guides you when you are deciding how much range of motion or tension to place on a patient's nerve during neural mobilization?

Dr. Walsh: You're asking a great question. We know that strains of anywhere between 4% and 6% at

least in our rabbits and rats begins to effect the circulation of the nerve.

Ms. Howell: Is there a patient response that would suggest that the nerve is under tension or maybe even exceeding beneficial levels of mobilization?

Dr. Walsh: We can't measure those strain rates and there's no way for us to know what those strain rates are when we move someone's extremity. My guideline has been the onset of provocation of their symptoms and/or paresthesia as the end point at which I would apply tension. That tension should only be left on for a short period of time, usually no more than 5 to 10 seconds, and then that tension is released. So, everything is sub-threshold to barely at threshold and nothing greater. I don't think that the nerves are able to tolerate any strains that are much higher than that on a continual basis.

Ms. Howell: From my experience, in some CTS patients, a splint quiets their symptoms by limiting median nerve excursion, and subsequently enhancing the circulation of nerve. Since you splint only nocturnally, am I right to think that you use nerve mobilization as a form of con-

trolled exercise to enhance flexibility throughout the pathway of the nerve to decrease what you called micro-trauma?

Dr. Walsh: Well the splint certainly is going to minimize some of that tension. Again, we're going to run into the problems that Dr. Macdermid talked about where I'm talking about using the entire extremity and they're using a splint and altering mechanically what they're doing with their extremity. But there are some other little tricks that you can use. I haven't particularly used them in carpal tunnel patients, but I have used them in my patients that have painful brachioplexopathy. I used tape across certain joints as a form of proprioceptive input to remind them not to, for instance, extend their elbow beyond a certain point. The tape is put on the anterior aspect of the elbow so that when they extend, hopefully they get cutaneous sensation from the tape pulling to remind them of their nerve tension endpoint.

Ms. Howell: Yes. Do you find many carpal patients need that?

Dr. Walsh: No, I haven't found that to be the case. I typically place them in a splint which they primarily use



**THE PROBLEM
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USED.**

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for nocturnal symptoms. In the daytime, they perform the nerve mobilization. I tend to think of these as more like a nerve tension exercise in comparison to a nerve gliding exercise. They need to be taken to that end range if they're going to effect a change in some way that will involve excursion of that nerve.

Ms. Howell: Dr. MacDermid, from my experience it seems that quite often a patient is referred to hand therapy after they've had an injection or have been night splinted. From my perspective I think it is difficult to sort out which intervention or combination of interventions may be the key ingredients for success. With that in mind, how can we gather some of this evidence base if we have so many variables?

Dr. MacDermid: I think one of the important things to remember about clinical trials is they really weren't designed, nor are they very good at picking out minute differences between things. Frequently in rehab, you do a little bit of this and often many of the modalities are not used as curative, but they're used, for example, to condition tissue before you stretch it. When you try to look at any one of the components of a multi-modal intervention in isolation, it will have a very, very small effect by itself. It's very difficult unless you see thousands of patients in that clinical trial to pick out that very small difference. One of the things that I think rehab has done that's shooting themselves in the foot is to try to use clinical trials to sort out those small questions. Clinical trials are much more effective where there are fundamental differences in treatment approaches. In surgery, it's the same problem. Clinical trials are not the best way to find out whether using two screws is better than using three screws. Biomechanical studies are good for that, but clinical trials are not good at picking out very small treatment effects. You really have to have a significant treatment effect that will be obvious given all the biological variation and how people respond to intervention.

The first thing I think we really

need to look at is how trials are designed and try to stick with the important questions. When you're looking at whether an intervention is effective, I think it gets back to a common theme we talked about earlier. Why are you using an injection: why are you using a splint? I think you need to define the objectives of why an intervention is being used, and then describe the whole program and the effectiveness of that program. How many studies do we see in our literature that have thousands of patients and how likely is it that we'll find somebody to fund us to test those thousands of patients? With some of the smaller dosing issues, such as whether it should be used two times a week or three times a week, a clinical trial is a difficult way to sort that out.

Dr. Merritt: There is another aspect, which is to recognize carpal tunnel syndrome as a "clinical syndrome." We must recognize that the diagnosis is basically a clinical impression. There are false-positive and false negative results with electromyographs and nerve conduction studies, as well as individual variations among electromyographers. The clinician must make the diagnosis, realizing the cause may be multifactorial. Symptoms can be produced by conditions other than median nerve compression at the wrist, such as hypothyroidism, myasthenia gravis, syringomyelia, multiple sclerosis, diabetes, and myofascial dysfunction. I think many times conservative management is most successful for symptoms caused by something other than compression of the median nerve, although conservative management may provide successful treatment for patients with mild median nerve compression. So, I believe this adds a lot to the confusion in terms of trying to make a clinical judgment or a statistical analysis regarding these patients. As McCabe has pointed out at our 2006 meeting, electromyographic and nerve conduction studies, used as the golden standard for carpal tunnel syndrome diagnosis, has its fallacy. So this adds to the need for thousands of patients to make an accurate significant analysis for

small variations in management, as Dr. MacDermid points out.

Dr. MacDermid: The other thing we haven't talked about is education, which is probably one of the more substantial things. So it's important how much overall time you spend with the person, how much of that goes to telling them how they should be doing their activities differently and what goes into that education program. Those elements are often not controlled. In many of the recurrent carpal tunnel (RCT) patients that we see, it's often not even described what specific education or elements of education we're attempting to get across to the patient, much less whether they were effective in getting them across or not.

Dr. Merritt: Right.

Ms. Howell: I think AAHS hand surgeons and hand therapists are uniquely positioned through our organization, unlike any other professional society, to collaborate on evidence-based research. So if I may, I would like to take advantage of the talent and clinical experience present on this call tonight to make a special request. For the next few minutes, could we collaborate by getting down to some specifics of how we could hypothetically design a study that would evaluate a program for conservatively managing carpal tunnel syndrome?

Dr. Amadio: Well, I'll get started briefly. The first thing is that there's no magic bullet. In other words, we're never going to get to final answers. As Dr. MacDermid said, you need thousands of patients and looking at many different variables to try to address major issues. The best we're going to be able to do is

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THERE IS ANOTHER ASPECT, WHICH IS TO RECOGNIZE CARPAL TUNNEL SYNDROME AS A "CLINICAL SYNDROME." WE MUST RECOGNIZE THAT THE DIAGNOSIS IS BASICALLY A CLINICAL IMPRESSION.

WYNDELL MERRITT, MD

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pick off at the corners and gradually try to nibble away. Small- to medium-sized studies, of a couple of hundred patients, are hopefully doable for lots of places with carpal tunnel syndrome patients followed for over a year or two. The studies would be prospective, randomly assigning patients to this versus that, for example, dorsal splint versus palmar splint for daytime wear or nighttime wear, to see if there's a difference. I don't know that you necessarily need to have giant numbers of patients because, practically and clinically speaking, if you can't see an effect with a couple hundred patients, it's probably not clinically important.

I think those studies would be very useful. You say okay, with a well-controlled small study, with 100 patients, there was no difference, so it's probably not worth our effort to go down that road very much farther. Then you compare some other this versus some other that. Everybody can contribute a little bit. If people think about it in terms of taking this one little variable and looking at it to this extent, I think that would be very helpful. Practically speaking, it's impossible to examine all variables looking for the big bang.

The other point I would make is that if it's this hard to do it for a condition that's probably the most common hand condition and probably one of the more common clinical conditions, since carpal tunnel syndrome affects 4% or 5% of the general population, what are the chances

that we're going to get a definitive answer for things that are less common? We're always going to be dealing with some uncertainty in medical practice. But certainly for a common condition like carpal tunnel syndrome, or other things in the upper extremity, such as epicondylitis or rotator cuff tears, let's just pick some simple thing and do a prospective study. If there's no difference, that is worth reporting. Even if it's a negative study, it is useful to say there's no difference between these two things. So if you like dorsal versus palmar, do whatever you want because it doesn't really make any difference one way or another. Then go on to the next thing. Just by taking these little things—doing a study, reporting it, writing it up, getting it published so that everybody else can take advantage of the work that you did—we'll incrementally get it done. And the more people that do these little studies, the faster we'll accumulate a large body of knowledge.

Ms. Howell: Thank you, Dr. Amadio. You make an excellent point. I would think that hand surgeons and therapists are in the perfect position to ask the whys, define their objective and measure the outcome. Dr. MacDermid, if we were to take on a study involving conservative management of CTS, what advice would you offer?

Dr. MacDermid: I think one of the first elements, and you spoke about it clinically, but one of the most common mistakes I see people make in conducting clinical trials is obtaining appropriate sample sizes because it is so hard to obtain patients. You tend to get anybody you can beg, borrow and steal to put in your study. The problem is that you end up putting in a lot of people who are not likely to be responsive to your intervention. Sure, you get your sample size, but you actually don't have an effective sample size since a lot of people are not contributing any information. For example, and I see this a lot in the distal radius fractures literature looking at rehab post-fracture, studies are limited to people who have only non-



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Commonly Performed Procedures

In keeping with the topic of *HSQ* this quarter, "Show me the evidence for that," this issue of the Coding Corner will address a variety of small procedures that are commonly performed. Specifically, we will look at the codes for trigger finger release, DeQuervain's surgery, ganglion excision, local mass excision, and foreign body removal from the hand.

Trigger finger surgery corresponds to code 26055, which describes tendon sheath incision for release of a trigger finger. Note that for percutaneous release of the A1 pulley, there is no different code. DeQuervain's tendon sheath release is coded with 25000. Although much less common, release of the FCR tendon sheath for chronic FCR tendonitis would be coded with 25001.

Ganglion surgery is generally coded according to where the gan-

Trigger Fingers, DeQuervain's Tendinitis	
26055	Tendon sheath incision (e.g. for trigger finger)
25000	Incision, extensor tendon sheath, wrist
25001	Incision, flexor tendon sheath, wrist
Ganglions	
25111	Excision of ganglion, wrist (dorsal or volar); primary
25112	Excision of ganglion, wrist (dorsal or volar); recurrent
26160	Excision of lesion of tendon sheath or joint capsule, hand or finger

glion is located. For the most common area, the wrist, removal of a dorsal or volar ganglion corresponds to code 25111. Note that for a recurrent ganglion, code 25112 would apply. Excision of ganglions that occur in the finger (mucous cyst or a ganglion of the tendon sheath) are coded with 26160. Be aware that for a solid mass excision, such as for an epidermal inclusion cyst or giant cell tumor of the tendon sheath, different codes apply. For excision of a mass that is subcutaneous, code 26115 is appropriate. For a deeper mass (subfascial or intramuscular), code 26116 is correct. Radical resection of a malignant tumor is coded with 26117. For masses in the wrist and forearm, code 25075 corresponds to a superficial location, and code 25076 corresponds to excision of a mass in a deep (subfascial or submuscular) location. Radical resection of a wrist or forearm mass is coded with 25077. Excision of a mass of the elbow or upper arm is coded with

Masses	
26115	Excision, tumor or vascular malformation, soft tissue of hand or finger; subcutaneous
26116	Excision, tumor or vascular malformation, soft tissue of hand or finger; deep (subfascial or submuscular)
26117	Radical resection of tumor (e.g. malignant neoplasm), soft tissue of hand or finger
25075	Excision, tumor, soft tissue of forearm and/or wrist area; subcutaneous
25076	Excision, tumor, soft tissue of forearm and/or wrist area; deep (subfascial or submuscular)
25077	Radical resection of tumor (e.g. malignant neoplasm), soft tissue of forearm and/or wrist area
24075	Excision, tumor, soft tissue of upper arm or elbow area; subcutaneous
24076	Excision, tumor, soft tissue of upper arm or elbow area; deep (subfascial or submuscular)
24077	Radical resection of tumor (e.g. malignant neoplasm), soft tissue of upper arm or elbow area

24075 if the lesion is subcutaneous, and 24076 if the mass is deep. For radical excision of a malignant tumor of the elbow or upper arm, 24077 is appropriate.

Foreign body removal corresponds to a variety of codes, depending upon where the foreign body is located. Removal of a foreign body in muscle or a tendon sheath corresponds to code 20520. For a deep location or complicated removal, code 20525 is appropriate. Note that for a foreign body that requires arthroscopy for removal, a different set of codes apply: 26070 is for arthroscopy of the CMC joint; 26075 is for arthroscopy of the MCP joint; and 26080 is for arthroscopy of the IP joint. Exploration of the wrist joint or forearm for foreign body removal corresponds to code 25248. Removal of a foreign body from the elbow joint corresponds to 24000. If a synovial biopsy is performed in the process of

foreign body removal from the elbow, code 24101 is correct.

Lastly, it should be mentioned that for removal of an implant from the finger or hand, code 26320 is correct. Removal of a wrist prosthetic implant is coded with either 25250 (partial) or 25251 (both components or complicated).

You Code It

A 26-year-old male presents for excision of a ganglion on his dorsal wrist. He had the lesion removed 7 years ago but it returned last year. He also notes that he sustained a metal splin-



LEON S. BENSON, MD

CODING CORNER

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ter in his index finger on the same hand six months ago and continues to have pain there. You decide to proceed with removal of the ganglion and attempted foreign body removal of the index finger. Upon exploration, the splinter is found to rest in the insertion of the profundus tendon.

Solution:

Code 25112
20525-51 **H**

Foreign Bodies

20520	Removal of foreign body in muscle or tendon sheath; simple
20525	Removal of foreign body in muscle or tendon sheath; deep or complicated
26070	Arthrotomy; with exploration, drainage, or removal of loose or foreign body; carpometacarpal joint
26075	Arthrotomy; with exploration, drainage, or removal of loose or foreign body; metacarpophalangeal joint, each
26080	Arthrotomy; with exploration, drainage, or removal of loose or foreign body; interphalangeal joint, each
25248	Exploration with removal of deep foreign body, forearm or wrist
24000	Arthrotomy, elbow, including exploration, drainage, or removal of foreign body
24001	Arthrotomy, elbow, with synovial biopsy and with joint exploration, with or without biopsy, with or without removal of loose or foreign body
26320	Removal of implant from finger or hand
25250	Removal of wrist prosthesis; (separate procedure)
25251	Removal of wrist prosthesis; complicated, including total wrist

HAND THERAPY PROFILE



Christine L. Burridge MS, PT, CHT/CHT ('Chris')

Personal: Born in St. Louis, MO, and raised in northwestern Pennsylvania until mid high school, when my family returned to St. Louis. Upon completion of college, I enjoyed three years in beautiful Colorado, but discovered I was not as adept at skiing as I had hoped, and returned to Missouri. I still reside in the St. Louis area, with my supportive (and patient) husband, Matt, and our two energetic boys, ages 7 and 9. My athletic adventures now are limited to tennis and occasional assistant coaching for baseball and volleyball.

Christine L. Burridge MS, PT, CHT/CHT

Education: BS in Physical Therapy from University of MO-Columbia, 1983, and Hand Therapist certification 1991.

Employer: I am currently co-owner of two hand and physical therapy outpatient clinics since 1993 with my business partner and mentor, Ann Kammien MS, PT, CHT/CHT. We are proud to be part of a network of seven hand therapy offices, certified with both MS, PT, CHT and OT's, which offer our patients perspectives and varied skills from each discipline. After college I worked at a major Denver hospital in both out- and in-patient care, and I still feel that excellent experience helped shape my career path. Upon returning to St. Louis in 1986, I was fortunate to meet and train with Ann Kammien and another mentor Cheryl Caldwell DPT, professor at Washington University, Physical Therapy Department. Their dedication and drive is contagious and challenging!

AAHS Involvement: Affiliate member since 1992; attended meetings in Phoenix, Kona, and Tucson. I enjoy the newsletter, especially the round table discussions, and frequently include the topics in our staff meetings.

Best Part of My Job: Being a part of the patients' successes and helping them return to their favorite activities.

Major Accomplishments: Opening, maintaining, and growing our private practice for the past 13 years, especially in the ever changing environment of healthcare. Striving to contribute to the profession, (and sharing my love for hand therapy,) through being a Clinical Instructor and Student Coordinator, for the past 20 years.

Clinical Specialties: All aspects of upper extremity rehabilitation, from trauma to arthritis.

Greatest Patient Challenge: I find working with complex multiple injured patients to be the most challenging, but also most rewarding.

Three Words That Describe Me: Caring, committed, and enthusiastic. **H**

Hand Therapy Day 2006 Tucson

Julianne Howell, MS, PT, CHT

This year marked the 20th anniversary of AAHS Hand Therapy Day! Therapist and surgeons gathered on Saturday afternoon to enjoy a catered luncheon, to network with colleagues and to participate in a thought provoking afternoon program. Our theme was "Hand Surgeons & Therapists - What evidence do you have to do that?" During the first half of the afternoon our faculty was assigned the task of sharing their techniques, rational and experience in using a pre-selected intervention for conservative management of Carpal Tunnel Syndrome, DeQuervain's and Trigger finger. Each faculty member was asked to defend and debate the use of these interventions by using the most current evidence-base. Joy McDermid then pulled the information together for us and made practical suggestions for how we could use the evidence-base on a daily basis. She also gave insights into how surgeons and therapists could work together to gather meaningful evidence base regarding non-surgical management of our CTS and tenosynovitis patients. A few of the highlights from this afternoon discussion can be read in the "Around the Hand Table" section of this newsletter.

"To move or not to move an extra-articular hand fracture "early" - was the topic for discussion during the last half of the Hand Therapy Day program. Our distinguished faculty defined "early" as before 3 weeks post fracture and restricted the discussion to

phalangeal and metacarpal extra-articular fractures managed open or closed, without rigid fixation. Each faculty member was asked to defend their clinical practice based on their synthesis of the best available clinical evidence to date. Lynne Feehan noted that the evidence-base most importantly neither supports nor refutes the use of "early" motion in extra-articular metacarpal and phalangeal fractures. Dr Freeland and Dr Ryu overviewed evidence-base as well as their surgical management of these fractures. Maureen Hardy reviewed the practical side of therapy management of these inherently stable extra-articular metacarpal and phalangeal fractures. She suggested that a few reasons why therapists may be afraid to encourage surgeons to allow early mobilization of a closed fractures to include the lack of precise clinical practice guidelines and poor understanding of fracture healing. The afternoon ended with therapist and surgeon panelists working together to challenge each others fracture management in a case study format.

I would like to give special thanks to everyone who volunteered their time and talent to make the 20th annual Hand Therapy Day successful: Peter Amadio, MD; Wyndell Merritt, MD, FACS; Joy McDermid, BScPT, PhD; Sue Micholwitz, PhD, MS, PT, CHT; Sandy Robinson, OTR, CHT; Jane Fedorcyck, MS, PT, ATC, CHT; Gail Groth, OTR, CHT, MHS; Lynne



Gail Groth, OTR/L, CHT, MHS (right), with Vargas International Hand Therapy Teaching Award co-winner Lorna Ramos, MA, OTR/L, who will be traveling to Romania with co-winner Donna Pendleton, MS, PT, CHT (not pictured).



Members enjoy one of the social events at the annual meeting.

Feehan, MS, PT, CHT, MSc, PhD candidate; Alan Freeland, MD; Maureen Hardy, MS, PT, CHT; Jaiyoung Ryu, MD, FACS; and Mark Walsh PT, DPT, MS, CHT.

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displaced fractures, which in my mind those people don't need therapy anyway. You don't want to target people who are not going to respond to your intervention; you want to define inclusion/exclusion criteria effective for the population

needing this intervention. Then, your comparison group should have some kind of difference that's clinically important. It should be a question of some substantive nature that should really make a difference to people. Next, you need to have a number of centers collaborate. If each center enrolls 10 patients, and you have 10 to 15 centers, you can have a reasonable sample size in a fairly short time-frame. For that reason, you want to have outcome measures that different centers can collect. "Self report" is one of the most obvious. I think the symptom severity scale is an excellent

instrument, since it's more responsive than other instruments in carpal tunnel and it is easy, it makes clinical sense, and patients like it because it's asking about the symptoms that they're complaining about. Then you can debate about what you might add to that, but that would be a minimum and a few simple measures of impairments that would be reasonable for multiple centers to accomplish.

Finally, you have somebody organize the randomization strategy to keep it clean because most centers don't know how to randomize and how to blind and all those kinds of issues. You really need somebody to coordinate that portion of the study.



CLINICAL TRIALS ARE MUCH MORE EFFECTIVE WHERE THERE ARE FUNDAMENTAL DIFFERENCES IN TREATMENT APPROACHES.

JOY MACDERMID, BScPT, PhD

Dr. Michlovitz: I'd like to make a comment. It ties together what we were talking about earlier about the effectiveness of injection and other anti-inflammatory modalities and conditions that may not be inflammatory in nature. The success in interventions using iontophoresis and using splinting occur when the symptoms are relatively short in duration. Do you think it would be important to look at the length of duration of symptoms when you stratify people in the study for splinting or for other modalities?

Ms. Howell: Yes, my understanding of the progression of any nerve compression syndrome leads me to believe that the level of the patient's symptoms within the continuum from intermittent to constant, is an important variable of which we must be mindful.

Dr. Amadio: I think this goes to the point that Dr. Macdermid was making, that you want to make sure that you've got a relatively homogenous group of patients that's relevant to whatever it is you're looking at. So if you're looking at splinting and somebody's got bad thenar atrophy and constant symptoms and absent 2-point discrimination, you're probably wasting your time trying a splinting trial. On the other hand if somebody's got relatively early onset intermittent symptoms, well, that's something to look at. One kind of splint versus another, or one kind of splint versus no splint to see what the natural history might be, or other modalities, nerve gliding and so forth. And so I think it does make a difference in probably both of those things, duration of symptoms and severity of symptoms. And if you break apart from severity, not only how bad it is at its maximum but how continuous it is. In other words does it come and go, is it only there when they wake up in the morning, or wake them up at night, or is it constant during the day or whatever. I think it's worth trying to get a more homogenous group of patients that's relevant to whatever intervention you're looking at. And for most of these non-operative modalities it's going to be

earlier, less severe disease. And I think the more valid the study design is, the more applicable it's going to be to real clinical situations.

Ms. Howell: I would think that we would have to have some way to classify the symptom level of patients with CTS that participate in a study. Can we rely on patient self-report or should we have some additional way to measure severity such as nerve studies, Semmes Weinstein monofilaments or two-point discrimination or neural tension?

Dr. Amadio: Well I think you can rely on patient report. I don't think that you necessarily need it, but if you really want to make sure that everybody agrees that these patients have carpal tunnel syndrome you may need nerve conduction studies in addition to the clinical symptoms. But as Dr. Merritt mentioned earlier on, it's a syndrome, it's a clinical syndrome. So if they have the characteristic nocturnal awakening, shake their hands, numbness in the thumb, index and middle fingers and so forth, I think that that's probably carpal tunnel syndrome unless proven otherwise. And if you really wanted to try to lock it down you could get electrodiagnostic testing. But on the other hand with people with these early intermittent symptoms, the electrodiagnostic test could well be normal and the patient could still well have clinical carpal tunnel syndrome. So I think as long as you have clear, logical criteria that's probably okay.

Ms. Howell: For purposes of a study, would you suggest that symptom level be classified by definition or by patient self-report scores?

Dr. Amadio: For something such as the nocturnal paresthesias, if their hands go numb in the median nerve distribution while holding a book or holding a telephone or driving a car or whatever it is, they're fairly characteristic symptoms. Most of the studies have shown that physical examination doesn't really help you very much in making a diagnosis of carpal tunnel syndrome because the physical signs have lots of false posi-

tives and false negatives. In making a diagnosis, the thing that seems to correlate the best—and since it is a syndrome, it makes sense—is this characteristic symptom pattern of both the kind of symptoms and the anatomical distribution of the symptoms.

Dr. Merritt: My interest has been in the group of patients who have failed conservative or surgical management. Currently, we are doing a study of these patients, supported by the Southeastern Plastic and Reconstructive Surgery Society. When you look at reports by Nancolles, Higgs, Jaeger and most recently Ralph Manktelow, fifty to eighty percent of patients complain of some recurrent symptoms, with about half of them having significant functional impairment. These studies are usually done by survey. The question is, do these people really have recurrent compression of the median nerve at their wrist, or do they have something else? Surveys don't answer that question, and our hope is to re-examine these patients and come to a conclusion whether this is muscular in origin, repeat median nerve compression or something else. Today's public assumes that anytime they have hand pain, it is probably carpal tunnel syndrome, so the accuracy of surveys is questionable, in my opinion. The patients I see with failed carpal tunnel syndrome usually do not have recurrent median nerve compression, and Manktelow's study shows that those with reoperation for carpal tunnel syndrome had the worst outcome.

Dr. Amadio: Well I think that's an important point, because to say this is typically a population in the 40's and 50's, there's some more garden variety age and sometimes even older, and the same people also have another very common condition, osteoarthritis of the thumb CMC joint which can cause pain in that general area, symptoms with similar kinds of activities, and certainly its important to make sure that we have a good understanding that the symptoms are indeed coming from

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An invitation to all members and invited guests, their partners and families to the

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carpal tunnel syndrome and not from some other condition.

Ms. Howell: Basically we're back around to that age-old problem of making sure the diagnosis is right.

Dr. MacDermid: Self report measures are wonderful for evaluating change in individual patients. But they

don't identify the source of symptoms, since that's a separate process. People who have multiple conditions will change on a self report measure. You can't expect them to go to zero—as a carpal tunnel patient will not after carpal tunnel surgery even if it is 100% effective—or go to a very low score on a self report measure if they have other co-morbid conditions in that hand.

Dr. Amadio: I think that's right.

Ms. Howell: Before closing, would anyone like to make additional comments?

Dr. Merritt: I would make a plea for people to examine the forearm, arm, shoulder and neck at the time of examining the hand when dealing with CTS, because there are proximal inflammatory conditions of muscles, etc. that can reproduce the symptoms. Again, it is important to recognize that CTS is a clinical syndrome that is not necessarily equivalent to median nerve compression at the wrist, although we think of it in those terms. There are many different conditions other than median nerve compression at the wrist that can cause the same symptomology. So the key is to try to find that out before you operate on patients, rather than afterwards. I would like to emphasize the value of doing Semmes Weinstein monofilament measurements on patients, because this is a useful diagnostic test and also a very comfortable way to monitor the patient after surgery should there be any difficulty, particularly in the severe carpal tunnel patient who may have delayed recovery. Often during the paresthesias of nerve recovery, Semmes Weinstein testing can show better sensation proximal to the fingertip, which will reassure the surgeon and the patient.

Dr. Amadio: Right.

Dr. Merritt: So often Semmes Weinstein monofilament measurement is not done preoperatively, and as Melvin, et al, pointed out many years ago, the electromyographic and nerve conduction study characteristically continues to show delayed conduction for at least a year after carpal tunnel release in asymptomatic patients, so it is not a good postoperative method of monitoring the patients compared to Semmes Weinstein monofilament sensory measurements.

Ms. Howell: Thank you, Dr. Merritt, I would agree with you on that.

I would like to thank everyone for sharing their expertise, clinical insights and for participating in this discussion. **H**

2007 Application for Research Grants

The AAHS Research Grant Awards were established to further the purpose of the Association as stated in its Bylaws and to foster creativity and innovation in basic and/or clinical research in all areas pertinent to hand surgery.

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Grant Application

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The AAHS and the Research Committee are required by the IRS to document disbursement of grant funds. Award recipients will be required to sign a letter of acceptance and submit a progress report once each year. The AAHS must be acknowledged as the source of funding in any presentation or publication. A final report must be submitted at the completion of the study. It is expected that the results of the funded research be submitted for presentation at an Annual Meeting within two years of the receipt of the award.

Funds must be returned to the AAHS if the study is not undertaken within twelve months of the receipt of the award.

Failure to follow these guidelines will disqualify the recipient from any further grant opportunities and from presenting any papers at the AAHS Annual Meeting for a period of three years following such default.

Mail Grant Proposals to

Michael Neumeister, MD
American Association for Hand Surgery
20 North Michigan, Suite 700
Chicago, IL 60602



Outcomes, Numbers for Preop Pictures

Data, data, data. We have computers which can process vast amounts of data, but the first major sticking point is usually data input. What type of data are you going to want to analyze? How are you going to get it into the system? These are straightforward

questions if you plan to look at data which is normally represented by numbers, such as demographics (age, sex), range of motion (degrees, TAM, fingertip to distal palmar crease distance), injury specifics (ASIF fracture type, time interval between injury and surgery, wound classification) and so on. However, many hand problems present muddy data because they are too complex for simple summary. The data is anatomic: graphical, not numeric, and hard to sort into ordered boxes because of the branching anatomy of the hand. Dupuytren's contracture represents one of these areas, with two major obstacles to data analysis. The first is that patterns of involvement are

so variable that common classification schemes oversimplify the data. For example, Tubiana's elegant and useful classification describes the disease with a single global value obtained by adding together the angles of contracture of both the metacarpophalangeal and proximal interphalangeal joints. It represents the functional effect of contractures spanning several joints, but is too simplified for some types of critical analysis. The second obstacle is lack of classification, because neither the palmar surface anatomy of the hand nor Dupuytren's disease has a complete descriptive terminology for zones of involvement. The patient has a cord in the palm, a nodule at the base of the finger. I can use many programs to draw the areas of involvement, but in this digital age, I should be able to document quantitatively, to represent the anatomic disease as data, so that it can be interpreted by analytic software. How to do this? I'm glad that you asked.



CHARLES EATON, MD

The first step in collecting data is establishing data boundaries, and in this case, the boundaries involve the palmar surface anatomy of the hand. Let's tidy up the terminology by defining the 9 common zones of involvement of Dupuytren's disease, which I'll call Eaton zones (Figure 1). Some of these areas are previously unnamed.

The main zones can be broken down further based on a combination of surface and skeletal anatomy (Figure 2).

And finally, a computer-friendly version of the diagram to represent all of the zones (Figure 3).

There are programs to let you draw on your computer screen, and record the exact coordinates of each pixel, but I really want to record the location in each zone. There are many ways to do this, but because the internet speaks the *lingua franca*

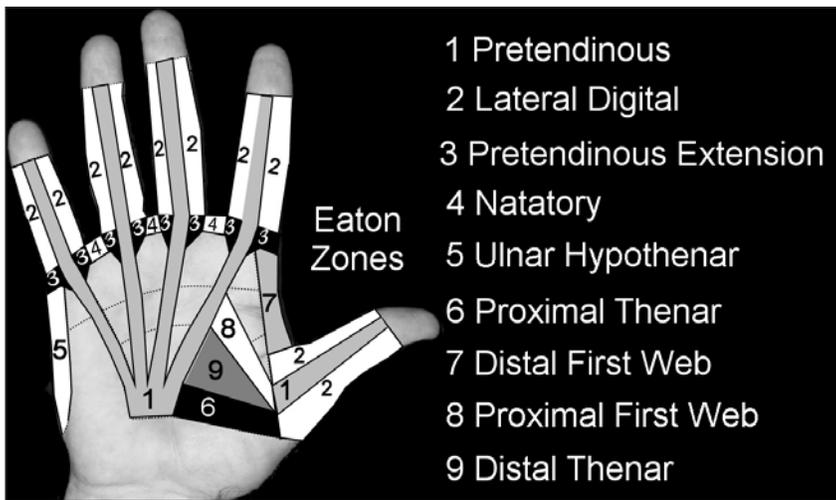


Figure 1

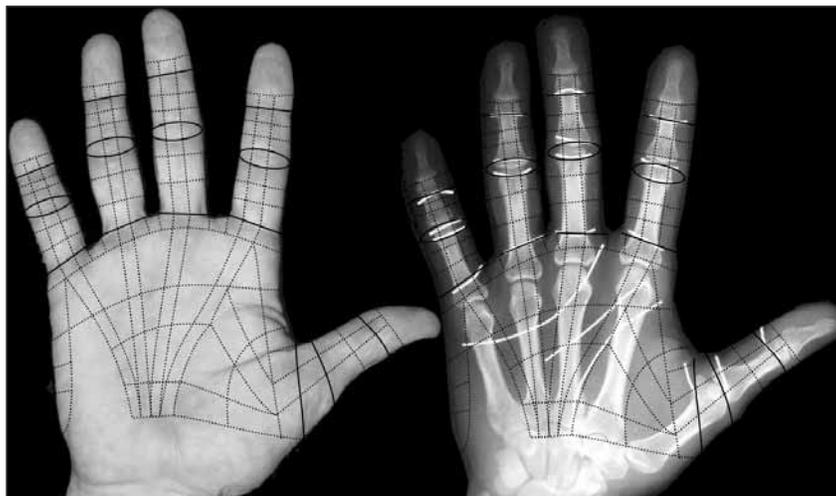


Figure 2

DIGITAL HAND

continued from page 25

of data exchange, I approached this problem as a web project, using HTML and Javascript. This could be done many other ways, but the point is to show proof of concept: digital data entry for a non-digital disease of the hand.

Figure 3

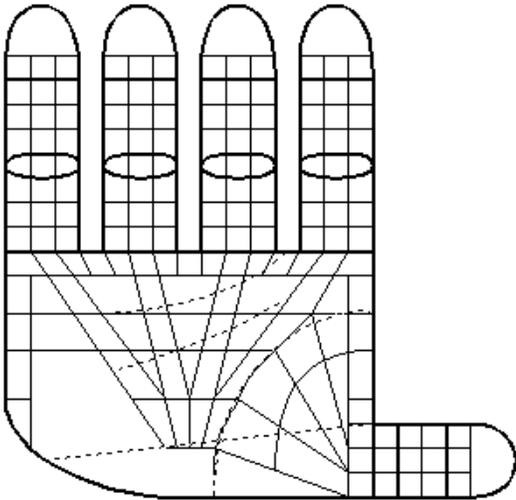
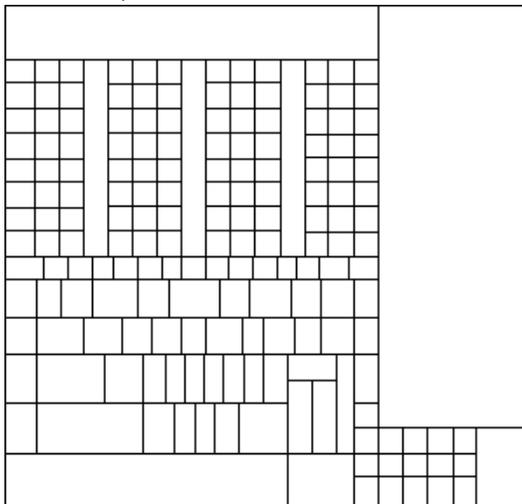


Figure 4



Following this direction, the first step is to chop up the diagram into pieces that will fit together as a table on a web page. Paint Shop Pro (<http://www.jasc.com>) has an image slicer function which will do this (with a little patience) and generate the code for the web page: This is the layout of the 180 rectangular sections which will make up the final data grid overlaying the previous diagram (Figure 4).

Part of the code generated to accompany this looks like this:

```
<TR><TD ROWSPAN="1" COLSPAN="53" WIDTH="214"
HEIGHT="31"><IMG NAME="rbd0" SRC="rbd_1x1.gif"
WIDTH="214" HEIGHT="31" BORDER="0"></TD> <TD
ROWSPAN="20" COLSPAN="5" WIDTH="85" HEIGHT="242"><IMG
NAME="rbd1" SRC="rbd_1x2.gif" WIDTH="85" HEIGHT="242"
BORDER="0"></TD>...
```

Then, the diagram can be used as a template to make alternate images to represent, in this case, cords and nodules from Dupuytren's disease. We'll use dotted lines for cords (Figure 5) and circles for nodules (Figure 6), and digitally chop these diagrams into the same little rectangles:

Then, a little Javascript is added to the web page to make the diagram dynamic. I'm an amateur programmer, and use the "monkey see, monkey do - cut and paste from someone else's web page and see if it works" method of programming. I've written this column to prove that anyone can tackle a task like this - if I can do it, you can, too. The goal is to be able to simply point and click on a diagram and output discrete data points. I've set this up so that when the user clicks on a rectangle, the web page code records the location and swaps the image of that location, so that each section of the diagram changes appearance when clicked. Part of the code looks like this (real programmers should brace themselves):

```
var Didwhat = new Array("none", "nodule", "cord");
function RRR(V,A,P,W) { var N=V.value; N++; if (N>=A.length) N=0;
V.value=N;document.getElementById(P).src = A[N]; showit();}
function showit() { document.dform.sbox.value=""
if (document.dform.Nrbd_1x1.value == 1) document.dform.sbox.value+
="0-nodule ";
if (document..... and so on.
```

Figure 5

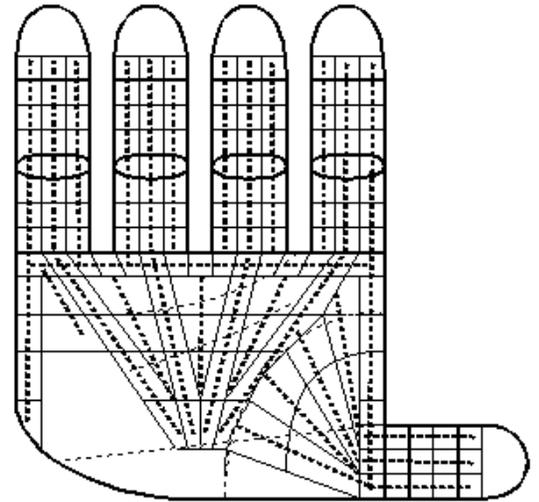
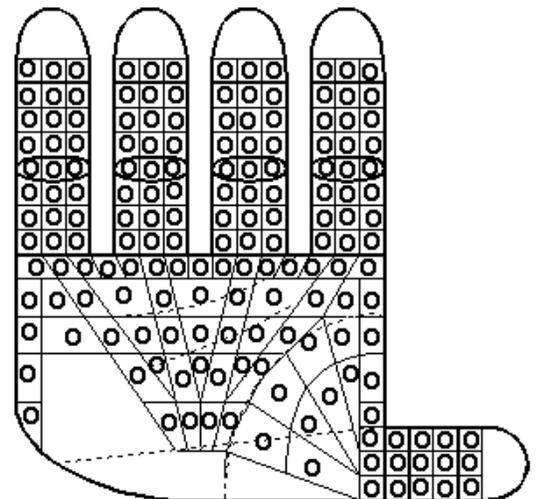


Figure 6



The end result is a dynamic data entry diagram which loads on a web browser and can be accessed on line. Each little rectangular section of the diagram responds visibly to a mouse click. Click once, and the section's image switches to the nodule icon; click again, and it switches to the cord icon, once more, and it clears back to blank. At the same time, the page records a data pair (location-finding) for each location, which can be either displayed or imported directly into another program such as a database.. Here's a screenshot of the final web page in action: a point and click documentation of a hand with a ring finger pretentious palmar-digital cord with nodules in the palm and a small finger central palmar nodule with a short proximal cord (Figure 7). Simply click to draw the disease on the form and it sorts out that there are 3 nodules, at zones 106, 118 and 131, and cords involving zones 60, 69, 78, 93, 120, 129, 143 and 157. The "zone numbers" are raw data – arbitrarily assigned in the step of creating the table grid, and will be renamed to a more intuitive convention – but the point is that these data-pair numbers document the pathology more exactly than the narrative. And, using this approach, all graphical data is entered in one step: drawing on the diagram enters the data, saving time and avoiding transcription errors inherent in interpreting either dictation, handwritten notes or paper diagrams. The goal is reproducible, standardized, clearly defined data collection without increasing the burden of effort involved with data entry.

Range of motion and lateral span measurements can be entered separately and directly as numbers in standard web page data input fields, and immediately processed for outcome prediction. In 1980, McFarlane analyzed his early results of fasciectomy for Dupuytren's in 69 patients and came up with a statistical predictor of residual PIP contracture based on the digit involved, the number of rays involved (N), the preop contractures of the MCP and PIP joints and an error factor (E), published in *J Hand Surgery* 5(6) 1980 608-616. For the index, middle, and ring fingers, the formula derived was

$$\text{LogePIP(postop)} = 0.053 \text{ PIP(preop)} + 0.18N + E$$

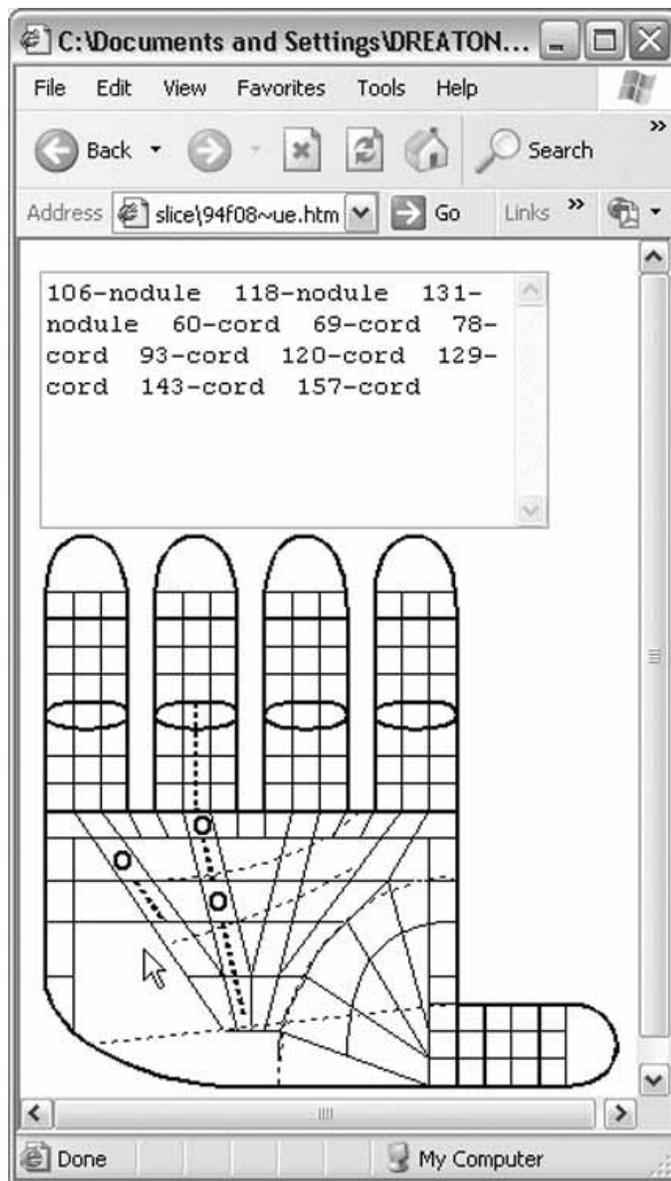
and for the small finger, the formula derived was

$$\text{LogePIP(postop)} = 0.016 \text{ MCP(preop)} + 0.026 \text{ PIP(preop)} + 0.275N + E$$

This formula can be incorporated into the electronic form to provide an instant statistical prediction of outcome based on range of motion measurements. As more data is analyzed, new predictive formulas can be developed.

The final data entry page can be accessed at www.e-hand.com/dup/dupeval.htm. It's neither pretty nor complete, but does demonstrate proof of concept. This is the direction that hand surgeons should consider in terms of collaborative effort. Insurance and legal forces

Figure 7



are irresistibly pushing us to electronic medical records, and we lack adequate tools for the task for our specialty. Narrative descriptions of the hand tend to be both wordy and imprecise. Hand drawn diagrams can be scanned, but harvesting data from them can be very labor-intensive. Hand surgeons need to develop standard methods such as this to electronically document the true core of our practice as data, so that we can collaborate on difficult problems such as Dupuytren's, and have the ability to compare apples with apples. Electronic diagram based data entry may provide the means to bring the specialty of hand surgery into... the present. It can be done. The incentive and responsibility for this task is entirely in the hands of hand surgeons.

H

American Association for Hand Surgery Calendar

2006

April 28–30, 2006
Brachial Plexus Course,
hosted by AAHS
Mayo Clinic
Rochester, MN

July 14–16, 2006
Mid-Year Board of Directors'
Meeting
The Broadmoor Hotel
Colorado Springs, CO

September 7–9, 2006
American Society for
Surgery of the Hand – 61st
Annual Meeting
Washington, DC

2007

January 10–13, 2007
37th Annual Meeting
The Westin Rio Mar Beach
Resort
Rio Grande, Puerto Rico

July 12–14, 2007
Mid-Year Board of Directors'
Meeting
Silverado Resort
Napa, CA

2008

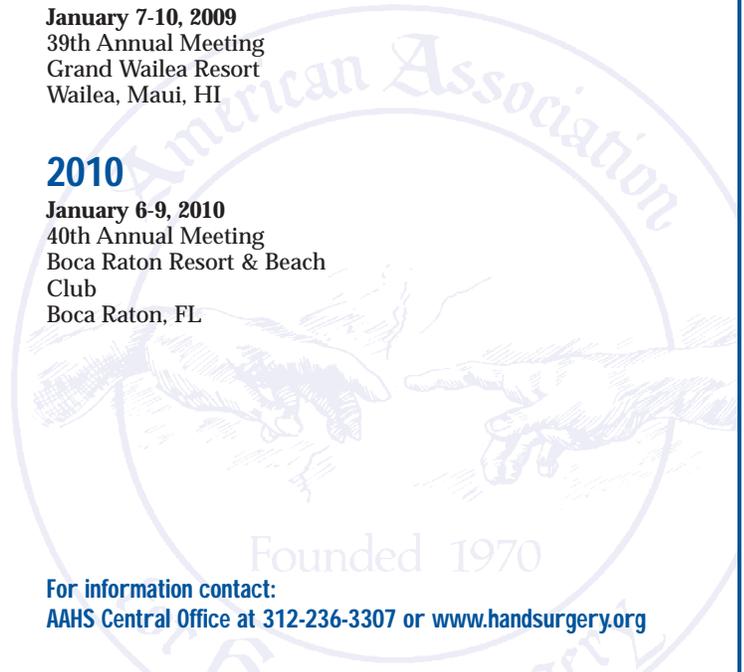
January 9–12, 2008
38th Annual Meeting
The Westin Century Plaza
Hotel & Spa
Beverly Hills, CA

2009

January 7–10, 2009
39th Annual Meeting
Grand Wailea Resort
Wailea, Maui, HI

2010

January 6–9, 2010
40th Annual Meeting
Boca Raton Resort & Beach
Club
Boca Raton, FL



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