It is a great honor for me to serve as the President of the AAHS this year. As President, I look forward to promoting the value and benefits of membership, expanding our membership, engaging members in the activities of the organization, and planning for what promises to be an outstanding meeting next January 6-9 at the beautiful Boca Raton Resort in Florida.

The central theme of my presidency is unity: promoting unity within the broad field of hand surgery, involving hand surgeons and hand therapists from the AAHS and all hand organizations to capitalize on our individual strengths and shared commitments and to work together for future of hand surgery. Perhaps the most rewarding aspect of my career has been my near 20 year collaboration with my Orthopedic hand partners and our hand therapists to help build a model, truly combined Orthopedic-Plastic Surgery hand service that centers around one of the top hand surgery training programs nationwide.

Like the majority of AAHS members, I am also an active, and actively contributing member of the “big brother” hand organization, the American Society for Surgery of the Hand. In these times of economic trial, I think it is valuable to ask the question that is often posed to me by my colleagues in the ASSH, who may not be members of the AAHS, “why do we need two hand organizations?” and “what does the AAHS have to offer?” Those are both valid questions that I struggled with myself many years ago as a new ASSH member, considering membership in the AAHS. Over the years, the answers have become cogent and powerful to me, as I believe they have to many of our members.

There are clearly benefits to the specialty of hand surgery in having two hand organizations. Within the AMA, dual representation by both the AAHS and the ASSH is important since the AMA is without question the most powerful organization promoting the priorities of physicians, including hand surgeons, and their patients. Between the AAHS and the ASSH, we have developed a

continued on page 2
“Hand Caucus” within the AMA that also includes hand surgeon delegates from other state and specialty societies so that issues important to the specialty of hand surgery can have a more effective voice within the AMA. In the American Academy of Orthopedic Surgery, hand surgery has dual representation in the Board of Specialty Societies, with important implications for funding, fellowship training, and setting the priorities of the AAOS. For organized Plastic Surgery, having the input and involvement of hand surgeon members of the AAHS and ASSH greatly enhances the scope and importance of hand surgery as a key reconstructive component of Plastic Surgery.

To me, the key raison d’être of the AAHS goes to the core concept of the organization: a truly open organization, open to any surgeon, regardless of specialty who is interested in hand surgery, whether or not they have completed a hand fellowship or hold a hand certificate, as well as any interested hand therapist, whether or not they hold a CHT. The involvement of hand therapists, not only as participating members, but also within the voting leadership of the organization, is unique. The most important function of the organization is to hold our annual meeting, in January, at a warm resort location, with an informal and inclusive approach, where open exchange is not only permitted, but encouraged, and where the most important interchanges are often held at the pool or on the beach. We do not compete with the ASSH or the ASHT meetings but instead are a welcome addition, enjoyed by all for its camaraderie and its content. We are the “little organization” that provides the “big tent of leadership.”

There is much that can be gained by increasing cooperation, collaboration, and unity between the major hand organizations, ASSH, AAHS, and ASHT, as well as with the larger umbrella organizations, AAOS, ASPS, ACS, and the AMA. Our collaboration and coordination with the ASRM and ASPN is now long-standing and much valued. Today, nearly the entire Board of Directors of the AAHS are not only members of ASSH, but are actively involved in the programs and missions of both organizations. I believe we have entered a new era of collaboration between AAHS and ASSH as well as ASHT. Last week I attended the American Academy of Orthopedic Surgeons Meeting as one of only a handful of plastic surgeons, representing the AAHS in the hand specialty day program, jointly sponsored by the ASSH and AAHS, and I was thrilled to do so. We also had the opportunity to continue the productive discussions we have had in recent years between the presidential lines of both organizations and have identified a number of specific areas of potential collaboration and joint efforts to pursue, which hold promise to advance clinical care, education, and research in the field of hand surgery.

I am very excited about these developments and hope to be able to share our progress throughout the upcoming year, as we continue to prepare for a great meeting in Florida next January 6-9, 2010. I hope that you already have it on your calendar! In the meantime, I welcome your thoughts on how to make the AAHS a more valuable and important organization to you.
The theme of this issue is complex hand injuries, and it follows up on two very interesting symposia at the recent AAHS meeting in Hawaii. The first symposium discussed the management of complex hand injuries; the second, and, to me, more interesting, discussed how we cover hand trauma today.

We certainly do not inhabit the ER’s of our predecessors. CMS, EMTALA, MOC, RRC and ACGME increasingly spell out the boundaries of what we must do, and what we cannot do. Increasingly, smaller hospitals do not cover hand trauma, and refer it to larger centers, regardless of severity. My own medical center, in southeastern Minnesota, now regularly gets referrals from communities in Iowa and Wisconsin, even larger cities, which formerly had hand coverage, but which no longer offer the service. Larger academic centers are not only getting pressed with increased volumes of trauma; they are also having to deal with the issue of decreased resident work hours; now a maximum of 80 hours per week and 30 hours at a stretch, but being proposed to drop to 56 and 16, respectively, while the same RRC’s that require the reduced work hours also limit the number of trainees. Most medical centers do not have enough trainees to cover all services 24/7 with such restrictions in duty hours; more permanent staff, PA’s and nurse practitioners will be needed to cover the shortfall. How all that will play out in a world of diminishing reimbursements is unclear, but it seems inevitable that trauma and the 24/7 coverage it requires will be restricted more and more to the larger centers.

What is our duty as hand surgeons to cover call? Can hospitals require us to cover, without considering the financial implications to those who serve on the voluntary hospital staff? Should hospitals pay for call? Again, one must ask: where will the money come from?

As hand surgeons, each of us will need to answer these questions for ourselves. Ideally, all would devote some effort to handling emergencies, but hospitals, the legal system, third party payers and regulatory agencies all need to play their parts as well. Daniel Labs addressed this issue recently in our journal (HAND (2008) 3:197–202). I commend his work to you, and request that we each consider how we can fulfill our proper role as hand professionals in the increasingly complex environment in which we find ourselves.
A must-have resource.
Purchase this special limited edition DVD and put the entire 2009 Comprehensive Hand Surgery Review Course at your fingertips. This invaluable resource includes faculty presentations of 15 topics covered on board examinations, the hand surgery certification examination and resident in-training examinations. Recorded during the AAHS 2009 Annual Meeting, it’s a resource you’ll turn to over and over again.

$175 per copy, includes shipping.
*This DVD will operate only in a computer’s DVD drive.

To place an order, fill out the form below and mail it with a check payable to American Association for Hand Surgery to the following address –
American Association for Hand Surgery
444 East Algonquin Road
Arlington Heights, IL 60005

Quantities are limited.
For additional information, please contact the AAHS Central Office at 847-228-9276.
The 2009-14 Challenge: Looking Ahead in AAHS

As our economy goes further into the tanker e.g. the present recession, I would bet we are all having discussions around the dinner table, in our clinical practices and with random strangers regarding expenditures. What do we value? Where can we cut? Where should we be putting our money, e.g., under the mattress?

Well, what about professional association memberships? As a physical therapist with a career-long devotion to academics and hand therapy, I re-evaluate my association memberships every year, but more so this go-around. Presently I am a member of the American Physical Therapy Association (APTA) (about $650), ASHT ($225), ASSH ($220) (Affiliate) and of course, AAHS. Each has value for similar but different reasons. APTA is my connection to the foundations of my profession and essential my role as a PT educator. ASHT is where I spend time teaching other hand therapists and presently serving as Research Division Director. I joined AAHS over 10 years ago for 2 reasons: 1) love the meeting venue; 2) have enjoyed the professional relationships that have developed over the years; and 3) have been enriched through volunteering for committees and BOD duties.

What sets AAHS apart from the pack? We need to carefully reassess this and not sit back on our laurels. Sure, we have the Vargas; sure, we have the best meeting, (who could turn down the beach and the friendships we have garnered over the years?) sure we support some seed money for research and on and on.

How do we let others know that? What can we do in the future to be enticing to therapists?

I would suggest some of the following:

1. Integrate therapists throughout the Annual Meeting programming. Specialty Day (Formerly “Hand Therapy Day”) is a worthwhile joint venture, but having therapy perspectives on panels throughout the meeting would enhance the value to the present content. (If I want to hear a bunch of talks

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HAND THERAPY AND AFFILIATES’ CORNER

The 2009-14 Challenge: Looking Ahead in AAHS

Employer: I am the Clinical Supervisor for the Outpatient Hand Clinic currently being developed at Crouse Hospital.

AAHS Involvement:

Sandy Robinson encouraged me to become an affiliate member, which I did in 2001. I have attended 2 annual meetings (so far), in 2001 and again in 2006. I particularly enjoy the learning environment at these meetings.

Best Part of My Job: The Syracuse area has a diverse population, so working with all kinds of people with different ideas and goals is what makes my job fun. I also like the “team” approach I have with hand surgeons and the way we are able to collaborate.

Major Accomplishments: I am a founding member of the “Hand Therapy Think Tank”, and this past fall we successfully held our first retreat in Ithaca, NY. Developing an unique approach to learning has been a great experience. I also gave my first lecture on a national level at the ASHT conference in Boston.

Clinical Specialties: I enjoy anything that is acute or post-operative that involves splint-making.

Greatest Professional Challenge: In NY state, OT’s have a difficult time with insurance coverage. Lobbying for outpatient OT hand therapy has been an ongoing struggle.

Three Words That Describe Me: Forthright, sincere, and optimistic.

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HAND THERAPY PROFILE

Lynn Festa, OTR/L, CHT

Personal: I was raised in Hamden, Ct. After college, I moved to the Los Angeles area and worked at the Long Beach Memorial Hand Center. In 1995, I relocated to Syracuse, NY, and in 2006, married Michael Nancollas, a hand surgeon here in Syracuse.

Some of my interests include open water swimming and kayaking in the summer, and cross-country skiing and snow shoeing in the winter. My husband and I also enjoy learning how to ballroom dance.


Employer: I am the Clinical Supervisor for the Outpatient Hand Clinic currently being developed at Crouse Hospital.

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from just therapists I have APTA and ASHT. So, don’t just add more “therapist-only” presentations.)

2. We appear to attract affiliate members with a keen interest in critical inquiry, not just therapists who join to fulfill “CEU” requirements through association sponsored. Let’s maximize on value to these members. AAHS is a great venue to open dialogues with surgeons and therapists about practice issues, for example, integrating outcomes measures across disciplines to measure what we do and show the world. Look at outcome of both surgery and therapy. When is post-op therapy of benefit? (Certainly not after every surgery!)

3. Brainstorm to do “co-branding.” Why us, rather than the generalist OT, PT, plastic or orthopedic surgeon? In the grand scheme of those who are in the potential arena to see our patients, we are a small and specialized few. In my private practice, I get a number of word-of-mouth referrals (I practice in a state that has Direct Access to PT) and referrals from primary care physicians. I am well positioned to refer patients to hand surgeons when needed. I believe over the next number of years, more therapists will be in similar positions. Patients come to me first because they are leery to see a surgeon; in some cases surgery has been recommended and they come to see me, the PT, for what they perceive as the “real story,” e.g., should they have surgery, what will the post-op course be. Perhaps algorithms developed by surgeons and therapists together could assist both of us in better directing care. AAHS is an organization that I feel is well positioned to do this. Let’s partner in thought and take advantage of the things both our professions, surgery and therapy do best and bring to the table for quality patient care.

*4. (for the therapist)
*5. (for the surgeon)

* Your turn to add to the list. What would you do to entice and retain affiliate members over the next 5 years? What do you see as the value in AAHS membership?

Christine Novak, PT, MS is leading a Task Force on Affiliate Members to look into our future. Please provide us feedback and what you see as value to our affiliate members. Where would you like to see our involvement in the AAHS in 5 years? Can you suggest affiliate membership to a colleague? Let us know. smichlovitz@gmail.com

ASSOCIATION NEWS

Military Hand Surgeon in Iraq

Dr. Eric Hofmeister, commander in the U.S. Navy based out of San Diego, Calif., is currently finishing up a seven-month deployment in Iraq in support of Operation Iraqi Freedom. Although deployed as a general orthopedic surgeon with the primary mission of “Damage Control Orthopedics”, he has been able to put his subspecialty skills to use, operating on and managing such things as dysvascular fingers, extensor tendon lacerations, pinning of fractures, and even assisted the otolaryngologist in the repair of partial facial nerve laceration.

Dr. Hofmeister (center) and Dr. Maurer (left) pictured with three local Iraqi physicians

Dr. Hofmeister (left) with Dr. Michael Hoffer (right), an otolaryngologist based out of San Diego, Calif., pictured with LCpl Arzapalooritz (center) following repair of his left facial nerve laceration.

Dr. Carter Maurer (left), stationed out of Bremerton, Wash., and Dr. Eric Hofmeister, repair an extensor pollicis longus tendon. The procedure allowed the Marine to stay in theatre.
Complex Procedures

The topic for this edition of Hand Surgery Quarterly is complex trauma. This is a rather broad topic, and before we look at specific examples, a few general coding principles are worth reviewing, especially when dealing with complicated surgery. First and foremost, be sure to code accurately for the procedures you perform. For some complex procedures, it may be perfectly appropriate to use multiple codes. For example, complex trauma cases often require several operative tasks to be accomplished in one sitting, and there is frequently no one code that accounts for everything. On the other hand, there are some codes that take into account procedural complexity, and therefore do not require more than one code to describe the whole procedure. Distal radius fracture surgery is an example of the latter case; the distal radius fracture codes have been revised and updated in the past few years to reflect changes in technology and approach. The distal radius code family now includes several variations that account for the number of articular pieces of the fracture and better distinguish between simple and more complicated fracture patterns; these codes include 25607, 25608, and 25609, which differ based upon the number of articular fracture segments. The code for a complex, three-part articular fracture (25609) reflects a relative work value unit that is larger than the one for a two or one part fracture; it is not necessary to add extra codes to 25609 in order to receive higher reimbursement because a higher RVU is built into the code itself.

Another example of a code that has complexity “built in” is the code for internally fixing a both-bone fracture of the forearm, either acutely or in the treatment of a nonunion. Individual codes for the treatment of a radius or ulna shaft fracture alone, exist, because certainly there are cases where only one forearm bone may require surgery. However, in the more common situation where both bones require operative care, the code 25575 is a single code that reflects operative management of both the radius and ulna, even when (as is commonly the case) separate incisions are used. This code incorporates a higher RVU so that it commands higher reimbursement, which reflects the greater amount of work performed. While it might be tempting to code a both bone open reduction internal fixation procedure with two separate codes, one for the radius alone and one for the ulna alone, you will likely be denied for this coding methodology since these two codes should not exist together. In addition to more prompt payment, use of the appropriate single code will yield better payment. While it might seem somehow that all the work required to manage a both-bone forearm fracture, including the use of two plates, two incisions, two exposures, and two separate closures, might somehow “deserve” more that one code, you should resist the logic that use of more codes is “better.” The table below will list procedure families in which single codes yield higher RVUs because they correspond to complex surgical procedures.

Now in light of the above discussion, it is also important to note that on some occasions, use of more than one code is appropriate. If the primary code does not reflect ele-

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<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25320</td>
<td>Capsulorrhaphy or reconstruction, wrist, open (eg. Capsulodesis, ligament repair; tendon transfer or graft)(includes synovectomy, capsulotomy and open reduction) for carpal instability</td>
</tr>
<tr>
<td>25337</td>
<td>Reconstruction for stabilization of unstable distal ulna or distal radioulnar joint, secondary by soft tissue stabilization (eg, tendon transfer, tendon graft or weave, or tenodesis) with or without open reduction or distal radioulnar joint</td>
</tr>
<tr>
<td>25440</td>
<td>Repair of nonunion, scaphoid carpal (navicular) bone, with or without radial styloidectomy (includes obtaining graft and necessary fixation)</td>
</tr>
<tr>
<td>25575</td>
<td>Open treatment of radial shaft fracture, includes internal fixation, when performed</td>
</tr>
<tr>
<td>25607</td>
<td>Open treatment of distal radius extra-articular fracture or epiphyseal separation, with internal fixation</td>
</tr>
<tr>
<td>25608</td>
<td>Open treatment of distal radius extra-articular fracture or epiphyseal separation, with internal fixation of 2 fragments</td>
</tr>
<tr>
<td>25609</td>
<td>Open treatment of distal radius extra-articular fracture or epiphyseal separation, with internal fixation of 3 or more fragments</td>
</tr>
<tr>
<td>25400</td>
<td>Repair of nonunion or malunion, radius OR ulna; without graft</td>
</tr>
<tr>
<td>25405</td>
<td>Repair of nonunion or malunion, radius OR ulna; with autograft (includes obtaining graft)</td>
</tr>
<tr>
<td>25415</td>
<td>Repair of nonunion or malunion, radius AND ulna; without graft</td>
</tr>
<tr>
<td>25420</td>
<td>Repair of nonunion or malunion, radius AND ulna; with autograft (includes obtaining graft)</td>
</tr>
</tbody>
</table>

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continued on page 8
ments of work performed, then by all means, be sure to use additional codes. For example, if two separate fractures are treated, one in the wrist and one in the forearm, then certainly more than one code should be employed. Remember that that multiple codes should reflect multiple, distinct procedures. Again, resist the temptation to use multiple codes just for their own sake; adding codes onto a single primary procedure just to add more codes is not appropriate and also will not increase your reimbursement. More likely, it will yield the same reimbursement but with a much greater delay. Surgeons may be inclined to add codes that merely reflect technical accomplishments that are part of the primary operation’s exposure (or closure), but this is neither a productive nor accurate way to code for your work.

When you do perform complicated procedures that involve multiple incisions and/or multiple distinct procedures, make sure that your operative dictation reflects these facts. Specifically, indicate that separate incisions were needed (and why) and note the use of bone graft (type and location), dissection through a previously scarred field, the presence of wound contamination or tissue devitalization, or anything else that accurately reflects the conditions during the surgery. If you use fluoroscopy in the operating room, you can add a code for this work, but you must dictate a separate report reflecting your interpretation and use of the fluoroscopy and also print a copy of the films and append them to the patient’s chart. When removing hardware, usually just one code applies unless you removed multiple bits of hardware through separate incisions. Removing a plate and 20 screws through one incision merits just one code (typically 20680); even though a bunch of screws and a plate were taken out, the procedure is described as a single event (removal of deep hardware) through one incision. If you have to take out four separate buried wires, and four separate incisions are required, then you can rightfully use four separate hardware codes.

The key principle is to be accurate with your documentation and use the codes appropriately. Simply adding extra codes to an operation, no matter how complicated the procedure, is not always the right thing to do and will usually hurt your reimbursement process if you pursue this coding approach for a procedure that already has a complex code descriptor. And also be aware that even when you perform complex procedures and code for them accurately, your reimbursement and processing time will depend specifically upon the details contained in your operative note, so remember: be detailed in your documentation!

In the table on page 5, some sample codes are listed that reflect the work done for more complicated procedures. Often, just use of the single code is all that is required to reflect a higher RVU for the work you have done. The most common add-on codes for complicated surgery would reflect debridement of open fractures, use of bone graft (unless the primary code specifically includes bone graft, which many do), the use of skin grafts, use of intra-operative fluoroscopy (performed and interpreted separately by the surgeon), and the coupling of separate distinct operations done at the same time through different incisions.
Aloha from Hawaii

Following in the tradition of the American Association for Hand Surgery (AAHS), the 2009 meeting at the Grand Wailea Resort in Maui, Hawaii was spectacular. The program was packed with many educational work sessions that began early in the day (6:00 am) and continued throughout the day. This new format allowed sufficient time to attend the educational sessions and provided a small amount of time of relaxation in the evening. The venue for the meeting was a sight to see. It was adjacent to the Grand Wailea Beach on the Pacific Ocean.

The program was hosted by Dr. Scott Kozin and his beautiful wife, Louise: they managed to keep everyone on track and while still entertaining their guests.

The 2009 meeting had three underlying themes. The first theme of the 2009 meeting was “Management and Rehabilitation of Complex Trauma” which kicked off the meeting. The Specialty Day Program, organized by Rebecca von der Hyde, MS, OTR/L, CHT was centered on this theme. Topics included amputations, replantation, nerve transfers and rehabilitation issues pertaining to complex upper extremity trauma. Feedback received from this program was very high.

The second theme was “Volunteerism”, with our invited

Joseph Danyo Speaker, Dr. Louis L. Carter, M.D., who gave a comprehensive and emotional presentation of his work in Africa. Volunteerism was also the theme for the combined AAHS/ASPN/ASRM Day, with Dr. Graham Gurmley, MD, as our invited lecturer, who shared his experiences in Cambodia and India with us. The medical diplomacy “Panel” also shared experiences in civilian and military environment and gave us some insight regarding some of the challenges associated with volunteerism.

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The third theme was “Standard of Care or Stretching the Indications” that was covered in the “Trauma pre-course”. There were many topics pertaining to this theme, including open reduction and internal fixation of scaphoid, clavicle and radial head fractures. Positive feedback was received on the post evaluations.

The Scientific Paper and Poster Sessions had a lot of basic science and clinical information. The Presidential Keynote Speaker was Dr. Dan Gottlieb, PhD, psychologist from Philadelphia. He shared with us his moving story on how he was involved in a near fatal automobile accident and became a quadriplegic. Despite his accident, he reminded us that we are in the “people business” and that we should maintain the humanistic quality to our approach in caring for our patients.

Dr. L. Scott Levin, MD, lectured on “Crisis in Hand Trauma Coverage” which emphasized the importance of addressing the traumatic hand injuries in a timely fashion and our responsibility to care for our patients. He addressed the shortage of physicians covering traumatic hand injuries and possible solutions to this crisis.

We were honored by the presence of Dr. Andy Koman, the President of the American Society for Surgery of Hand. He clearly understands the needs and challenges of the hand surgeon and therapist. He is a proven leader for the hand surgery and therapy community.

The AAHS social function featured “Jimmy Mac and the Kool Kats”. They connected immediately with the “baby-boomers” with their lively performance of old hits. There was a surprise musician that joined this band—the daughter of Dr. Mark Baratz. She surprised everyone when she started wailing on her tenor sax and blew everyone away, including the band members.

In summary, the 2009 meeting at the Grand Wailea was a big hit with a record attendance. This meeting will truly remain in our memories for a long time. Mahalo.

Sincerely,
Miguel A. Pirela-Cruz, MD, FACS
AAHS 2009 Chairperson

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AAHS 2009 Award Winners

Best Resident/Fellow Papers
Brian Carlsen, MD
Brad Palmer, MD

2009 AAHS Research Grant Awards

FIRST PLACE:
“The Effect of Overexpression of the Chemokines CCL-2 and CCL-22 on T Regulator Cell Trafficking and Transplant Tolerance in Rat Hindlimb Allotransplantation”
Principle Investigator: Damon S. Cooney, MD
Co-Investigators: Chris Chambers, PhD and Michael W. Neumeister, MD
Southern Illinois University School of Medicine, Division of Plastic Surgery
Springfield, IL

SECOND PLACE:
“A Functional and Histologic Comparison of Acellular Nerve Allograft and Cabled Nerve Autograft”
Principle Investigator: Peter Tang, MD, MPH
Co-Investigator: Victor Cabrera, MA
Columbia University Medical Center, Division of Orthopaedic Surgery
New York, NY

THIRD PLACE:
“Prospective Cohort Study of Functional Outcomes and Return to Work Following Distal Radius Fractures”
Principle Investigator: Jeffrey B. Friedrich, MD
Co-Investigator: Nicholas B. Vedder, MD
University of Washington, Division of Plastic Surgery
Seattle, WA

Outgoing President Scott H. Kozin, MD (right) presents Incoming President Nicholas B. Vedder, MD, FACS with the Presidential Gavel.

Dance hall

Research Grant Award Winners Jeffrey Friedrich, MD (center) with Michael Neumeister, MD (left) and Scott H. Kozin, MD (right)
The AAHS Board of Directors and the 2009 Annual Meeting Program Committee would like to thank the following companies for their support and participation:

- Accutome
- American Society of Plastic Surgeons
- Aptis Medical
- Ascension Orthopedics
- ASSI
- Auxilium Pharmaceuticals
- Axogen
- BioMet Trauma
- Cook Medical
- DePuy Orthopedics, Incorporated
- The Guatemala Healing Hands Foundation
- Hand Rehabilitation Foundation
- Hologic, Incorporated
- Integra
- La Federacion de Mano
- Leica
- Marasco & Associates, Healthcare Architects/Consultants
- Mast Biosurgery
- Medartis
- Med Link USA
- Medtronic
- Micrins Surgical
- Microsurgery Instruments Incorporated
- MMI
- Novadaq
- OrthoScan, Inc.
- OsteoMed
- Saunders, Mosby, Elsevier
- Schering Corporation
- Small Bone Innovations, Inc.
- Springer
- Stryker Trauma & Extremities
- Synovis Micro Companies Alliance
- Synthes
- Toby Orthopaedics
- Tornier
- TriMed, Incorporated
- ViOptix, Incorporated
Complex Trauma, Management and Rehab of the Hand

This hot-button topic is moderated by Scott Kozin, MD, Professor, Department of Orthopaedics, Temple University and Hand Surgeon, Shriners Hospital for Children, Philadelphia, PA. Joining him are: hand surgeons William Dzwierzynski, MD, FACS, Professor, Department of Plastic Surgery, Medical College of Wisconsin, Milwaukee, WI, Nicholas Vedder, MD, Professor of Surgery and Orthopaedics, Vice Chair of the Department of Surgery, and Chief of the Division of Plastic Surgery at the University of Washington in Seattle, Seattle, WA, and Jeffrey Yao, MD, Assistant Professor, Department of Orthopaedic Surgery, Stanford University Medical Center, Palo Alto, CA; and hand therapist Rebecca von der Heyde, MS, OTR/L, CHT, Washington University St. Louis, MO.

DR. KOZIN: The topic tonight is the complex trauma management and rehabilitation. There is extreme controversy regarding hand call and hand coverage whether it be by a plastic surgeon, orthopedic surgeon, or general surgeon. So I’d like to start the conversation with a comment from each of you regarding hand call at your institution?

DR. DZWIERZYNSKI: Hand call is covered by a CAQ qualified hand surgeons. We split the call between plastic surgery and orthopedic surgery.

DR. KOZIN: Nick, what is your hand call situation in Seattle?

DR. VEDDER: We have a unified hand surgery service between plastic surgery and orthopedic surgery, so there’s no distinction between the two but we’re all CAQ hand surgeons, that’s the qualification for getting on the unified hand service. We have a Hand Fellowship that’s comprised of both orthopedic trained surgeons and plastic surgeons. And we also have residents in orthopedic surgery and residents in plastic surgery, all taking part in this large system. We cover acute hand trauma for the entire Pacific Northwest as we are the only Level 1 trauma center for a quarter of the U.S. landmass. So it tends to be pretty busy. But between our group, and because we share call and work as one large team, it works out reasonably.

DR. KOZIN: What is the total number of people that take hand call?

DR. VEDDER: 7 faculty, 4 Fellows, and at any one time 4 residents.

DR. KOZIN: Bill, what about in Milwaukee?

DR. DZWIERZYNSKI: We have 8 CAQ qualified hand surgeons – 5 in plastic surgery, 3 in orthopedics – and we also have 2 Fellows.

DR. KOZIN: Jeff, what about at Stanford?

DR. YAO: Our system at Stanford is very similar. We have a combined program comprised of orthopedic hand surgeons and plastic surgeons. There are 7 hand surgeons that take call with 2 fellows and 3 residents that rotate through at a time. We similarly cover a large referral area from Los Angeles to Oregon, probably as far up as the southern coverage area of the University of Washington.

DR. VEDDER: We’re all speaking from the perspective of academic institutions, and the biggest challenge we have is that it seems we’re the only ones left taking hand call. The bigger problem is how to engage community hand surgeons in taking hand trauma call. I think that’s the biggest challenge that we face. How do we get the outlying hospitals, who may have an orthopedic surgeon or a plastic surgeon who is trained in hand surgery, on call, but yet they’re not interested in coming in during the middle of the night. I think the biggest problem we face as a nation in terms of emergency care, not just in hand surgery but also in neurosurgery, orthopedic surgery, and all types of surgery, is how to engage the community surgeons in taking call. As we grew up, we always saw this as part of our duty, but certainly the younger generation doesn’t necessarily see it as such.

DR. KOZIN: Nick I will tell you that in the Philadelphia area some of the large institutions with CAQ qualified hand surgeons have stopped taking call. Their reason is that the surgeons felt there was a considerable amount of dumping from other hospitals and they didn’t perceive adequate support from the hospital administration to stop the dumping or provide some type of a revenue source.

DR. VEDDER: It’s a huge problem. I think the bottom line though is that the hospitals generally do make money from hand trauma, and that there needs to be some kind of quid pro quo in union between the providers and the hospitals to take care of these patients. At least take care of the types of problems that they can manage at a level 3 or a level 2 trauma center. And then appropriately refer on the more complex stuff to the level 1 trauma centers. But because there is really a
very distinct separation between providers and the institutions, outside of the larger institutions, that doesn’t exist. I think that really is the key to making it work—realizing that we are in fact one medical care system and that we need to work together to do what’s best for the patients.

DR. KOZIN: Jeff or Bill, any comments?

DR. DZWIERZYNSKI: I think that is some of the problem with one of the largest hospitals in our area which has the largest percent of both orthopedic plastic surgeons and hand surgeons – does not take any, does not have a hand call and does not have a hand call schedule. But some of the smaller community hospitals do have hand call schedule and they may not be CAQ hand surgeons but they are people that I think for… are qualified to treat some of the simpler hand emergencies. Whether they’re a plastic surgeon or an orthopedic surgeon. Generally this area where we are, and we serve Wisconsin, Upper Peninsula of Michigan and Northern Illinois, does not really have requirements for CAQ but as a level 1 trauma center, we do.

DR. KOZIN: Jeff?

DR. YAO: Yes, this is absolutely a hot topic. In fact I was just a member of the Young Leaders forum this past December for the American Society for Surgery of the Hand and the issue with hand call coverage was one of the targeted topics that has been a big area of concern for academicians and community hand surgeons nationwide. At Stanford, we have a unique model for reimbursement which makes taking hand call a bit more palatable, but we recognize that most hospitals nationwide are not able to replicate such a model. I know that Scott Levin is heading up a task force looking specifically at these issues and has petitioned the American College of Surgeons for assistance in terms of lobbying for some sort of national change.

DR. VEDDER: But I think it really comes down to the reality that, as a physician, taking call is a duty, and if you choose not to do it, then you have to pay someone else to do it. And you either pay them directly or more likely you pay them indirectly. The indirect method is through the hospitals, so that the hospitals have to provide some additional support to the people who are taking call. And those who aren’t taking call, don’t get that support, or have to give in some other way. It’s a zero sum game, that’s the way I look at it.

DR. KOZIN: Scott Levin recently ran a symposium at the Joint portion of the Hawaii meeting and there really was consensus that there has to be some reimbursement for taking call. I think it will be an interesting year to see what happens with that task force that Scott’s leading and his relationship with the American College of Surgeons.

DR. VEDDER: I would just point out that this is a great example how the American Society for Surgery of the Hand, and the American Association for Hand Surgery are collaborating in this focus topic and also engaging the larger organization sector of the American College of Surgeons.

DR. KOZIN: Let’s move onto the clinical scenario. Bill, can you discuss your indications for both digital replants and then major limb replants?

DR. DZWIERZYNSKI: Well, I think each of these issues has to be taken separately and each patient which comes through the door has to be taken separately. The only contraindication for a replantation is “life over limb.” If the patient has a risk of dying from a prolonged procedure or risk of sustaining other significant morbidity, then the replantation is contraindicated. Otherwise you have to assess each patient and injury individually. We have to assess what is amputated and at what level, and we try to make an assessment of the quality of life the patient will have with or without the part. In that assessment we need to consider how long will they be off of work, and a lot is what is their psychologic profile, that is, how will they handle the loss or the replantation. This is a lot of information we need to assess in a little amount of time.

Major indications for replantation are things that are commonly quoted: number one is an amputation in a child. Children all have great potential. We don’t know if a child is destined to be a great musician and the loss of the distal end of the distal phalanx if this is going to preclude them from achieving their goal. So we’re very aggressive in children. We are also very aggressive in replanting thumb amputations. Even in severe injuries with little expectation of normal motion, a thumb as a post can be very functional, Sacrificing a toe to reconstruct an amputated thumb does have some major morbidities. We are also aggressive at trying to replant major limb amputations—again we’re looking at function. Even regaining useful elbow function in an upper arm replant offers significant increase in function. In younger patients, we may be more aggressive than in older individuals for major limb replants because nerve regrowth and function may be better.

To summarize, in digit replantation, we must look at the patient individually. If this is a single digit on a young woman or a child I am
very aggressive in replantation. If it’s a working person, such as a farmer who needs to get back to heavy work, we must be very clear to inform them that it may take up to 6 months for them to get back after a replantation. After an amputation revision they may be back to work in a week.

DR. KOZIN: Nick, there’ve been a lot of recent publications regarding the concept of single digit replant distal to the FDS, with some surgeries performed as an outpatient procedure. What are your thoughts?

DR. VEDDER: I think it may be indicated in some circumstances. I think even in the best circumstances, however, the sensory return that they’re going to get is not great. It will be susceptible to cold intolerance, and they’re often going to bypass that digit and go to the middle finger. So again, you really need to tailor your approach to the patient, just as you do with any complex trauma. For someone for whom the appearance is very important, it may be reasonable. On the other hand, if you take a construction worker who does manual labor, that digit is more likely going to get bypassed and get in the way. So I think you do need to tailor it to the patient, but in general, it would be the exception rather than the rule for us to consider a single digit replantation.

DR. KOZIN: Nick, you’re saying that only in exceptional circumstances you replant a single digit distal to the FDS?

DR. VEDDER: Yes, except in a child.

DR. KOZIN: Jeff, have you ever done a single digit as an outpatient procedure?

DR. YAO: I have not, and I would echo Nick’s comments. I rarely see an indication for performing a replant for a single digit distal to the FDS insertion. I see a large farming community here from the central valley of California, and these patients are very motivated to return to work as soon as possible. In the rare case where I have done a single digit replantation in this population, the patients have not been very happy. So I have been moving away from replanting any single digit amputation, including any amputation distal to the FDS.

DR. KOZIN: Another relative contraindication has always been avulsion injuries. Jeff, you were recently involved in replanting a child with an avulsion injury, is that correct?

DR. YAO: Correct.

DR. KOZIN: Can you tell us about that patient and your thought process?

DR. YAO: This is a 6 year old child who unfortunately had the equivalent of a ring avulsion injury when a jump rope was wrapped around the wrist of her non-dominant hand and the jump rope found its way out of the backseat window of a moving car and subsequently got wrapped around the rear axle. The jump rope led to a trans-metacarpal avulsion of the four fingers. The thumb was spared, all the tendons were avulsed from the muscles proximally, and the amputation was at the level of the superficial palmar arch. But given the patient’s age (6 years old), as Bill has indicated, for any child you do everything at all possible to salvage that part.

DR. KOZIN: If that patient was an adult, would you have still have attempted replantation?

DR. YAO: Of course, with any multiple digit amputation, I would try to replant it in any patient. However, avulsion injuries typically are very difficult to replant with a poor overall prognosis. In this case, although it was an avulsion injury, luckily for us and for the patient it was relatively clean at the amputation level. Although we had to reconstruct the palmar arch using vein grafts, the remaining tissues were amenable to replantation.

DR. KOZIN: Is the plan to be for a staged tendon reconstruction?

DR. YAO: We just brought her back to the operating room 3 weeks ago and went forward with nerve grafting. The plan for the next step is to perform tendon transfers to restore digital motion. We basically banked the extensors dorsally and the flexors volarly to try to ultimately preserve the ability to move forward with tendon transfers as a staged procedure. We plan to transfer the ECRL to the FDP’s to restore flexion. Unfortunately, with a large wound and insufficient soft tissue coverage dorsally, the extensor tendons were not salvageable. Therefore, our plan is to move forward with the tendon transfer to restore digital function and to rely on scar-tendonodesis type effects for extension.

DR. KOZIN: Nick, what does your team use for intra-operative and post-operative anticoagulation, and do you think anticoagulation improves survival?

DR. VEDDER: In a nutshell, it’s variable and without evidence.

DR. KOZIN: When you say variable, do you mean variable amongst your group?

DR. VEDDER: Amongst the group and in a single provider between patients. My personal approach to this has evolved over time. I used to use some type of anticoagulation, either Heparin or Dextran in almost all cases, yet currently I only use anticoagulations in cases where there’s a crush component or where you have an intra-operative thrombosis. In those cases I generally heparinize them for 5 days post-op.

DR. KOZIN: Therapeutic heparin?

DR. VEDDER: Yes. And what you need to avoid, of course, is giving them both heparin and an anti-platelet agent at the same time. I’ve seen some cases of life threatening near
exsanguination. So it is certainly not without risk and all of the studies to date have yet to show a clear benefit of any form of anticoagulation to my knowledge.

**DR. DZWIERZYNSKI:** Members of our team are varied in their use of anticoagulation. I use enoxaparin (Lovenox). This is based on some experimental studies done in our lab. I think Lovenox has several advantages, not the least is it can be given once or twice a day as a subcutaneous injection, and it has an advantage in that it can be easily continued as an outpatient. I usually start with a 40mg injection given in the operating room and continued daily while the patient is in the hospital. I base the length of treatment on the severity of the injury. If it is a crush or avulsion injury or a smoker, I continue the Lovenox for 2 weeks. If the injury is a clean amputation in a nonsmoker, I’ll give Lovenox in the hospital and then switch to aspirin upon discharge.

**DR. KOZIN:** Does the animal study show that it may be beneficial?

**DR. DZWIERZYNSKI:** The animal studies from our lab showed it was of benefit and I think Lovenox is a fractionated heparin. We can give it once a day or twice a day rather than as a continuous infusion.

**DR. VEDDER:** The unfortunate thing is that any laboratory study really cannot be directly applied to the clinical situation. I think we all remember the very promising studies with tissue factor pathway inhibitor over a decade ago in the lab, but then when we did the large-scale multi-center placebo-controlled clinical trial, it showed no effect.

**DR. DZWIERZYNSKI:** I agree, rats are often not the best model for thrombosis research. We can do a lot on rats that is not directly applicable to patients. Lovenox is essentially low molecular weight heparin. Several good human studies have shown heparin to be useful. Lovenox gives the convenience of once a day SC dosing and it can be continued on an outpatient basis.

**DR. VEDDER:** Just to clarify, Bill, you mentioned heparin in severe crush injury. Certainly that would not apply to major limb crush injury but only to digital crush injury, right?

**DR. DZWIERZYNSKI:** Yes, digital crush injury, yes, thank you.

**DR. YAO:** I use sub-therapeutic heparin for post-operative anticoagulation following replantation, although I agree there is no evidence to support any of it. However, the Lovenox sounds appealing to me. Bill, have you used the Lovenox clinically?

**DR. DZWIERZYNSKI:** Yes.

**DR. YAO:** Any problems?

**DR. DZWIERZYNSKI:** I have not had any problems. The dose is basically the same as we use for DVT prophylaxis, 40mg once or twice a day. Bleeding problems with this dose for prophylaxis is minimal.

**DR. KOZIN:** Becky, let’s assume that Bill or Nick or Jeff has performed a successful digit replant. From a rehabilitation standpoint, what information do you need to know from the surgeon and what is your current rehabilitation regimen?

**M.S. VON DER HEYDE:** To start with “what information”, I think we would like to have as much as possible. In my experience, it has been especially helpful to have information in terms of primary repairs versus any grafting procedures. This is especially true with regard to vein grafts, which are very important to share with your therapist, certainly if you’re asking them to splint the patient. I have found that vein grafts do not respond favorably to strapping pressure. Overall, it’s very important for us to know exactly what procedures were done and your perception of the integrity of the procedures.

**DR. KOZIN:** Does the type of internal fixation and tendon repair change your mobilization?

**M.S. VON DER HEYDE:** Interestingly enough I have a patient right now with a single digital replant that we did not splint; we just started mid-range, gentle active motion. This patient and his wife are wonderfully compliant and greatly concerned about circulation. Thus far, he has progressed well and actually has achieved tendon glide both in flexion and extension.

**DR. KOZIN:** Did the patient have rigid osseous fixation?

**M.S. VON DER HEYDE:** Yes, he has two K-wires in, crossed at the proximal phalanx; we started moving all joints as soon as he was stable. I believe I saw him about a week post-operatively and initiated mid-range, gentle composite flexion and extension. We left him out of a splint with the primary concern that the strapping might negatively impact his circulation. And he’s done well thus far. We have achieved tendon glide of both the flexors and extensors and have started to progress now that the finger is well perfused. We are optimistic about continuing towards more isolated tendon gliding, not necessarily aggressively, but in a progressive fashion. I think fixation is important, but my primary interest during the acute phase is circulation. I am highly interested in the surgeon’s assessment of circulation, at least for the first one to two weeks until the digit is stable.

**DR. VEDDER:** I would just comment, I think Becky is right about that patient, where they started early motion and they are doing very well. I think we microvascular surgeons are very conservative, and
probably over-conservative because we’re so worried about our microvascular anastomoses that we don’t get tendon gliding started early enough. We wind up with a functionless finger. I think we need to relax a bit and begin treating these like a tendon injury because that’s really the key factor for ultimate function, as long as we have stable skeletal fixation.

**DR. KOZIN:** If that is the new surgical goal during replantation, does that affect your choice of skeletal fixation and tendon fixation?

**DR. DZWIERZYNSKI:** I would say absolutely, we try for rigid fixation and…

**DR. KOZIN:** Rigid bony fixation?

**DR. DZWIERZYNSKI:** Yes. Rigid bony fixation. I’m a big fan of 90-90 intraosseous wires. With a replant you have great exposure. I-O wires are very cost effective, and allow more adaptability than plating. In an ordinary fracture, not a replant, I-O wires can be challenging, but with a replant, because of the great exposure, I-O wire fixation is a lot easier, and it provides very rigid fixation.

**DR. KOZIN:** Bill, how about tendon repair?

**DR. DZWIERZYNSKI:** I now use Fiberwire suture. I prefer a modified Kessler repair and I do a 4-strand repair with a looped 4-0 Fiberwire suture. I also use a 6-0 Prolene locking epitendon suture. I do the back wall first with the Prolene suture, then the core suture, then I continue running the epitendon suture. Doing the epitendon tendon first allows a more precise core suture and prevents “bunching up” of the tendon. I think the 4-strand Fiberwire repair is a nice, simple repair, a relatively quick repair, and it gives a repair that is capable of starting an early motion protocol.

**DR. KOZIN:** Jeff, can you comment on your skeletal fixation and tendon fixation?

**DR. YAO:** I agree that optimal fixation is really important; both the skeletal fixation as well as the tendon repair, if you have any plans of starting early range of motion. Unfortunately in many of my patients I see a lot of comminution where it’s very difficult to obtain a solid skeletal fixation and I’m stuck immobilizing the patients longer than I might like to because of that. But if the replant allows it, I really feel that the trans-osseous wires are a great form of fixation. I do tend to use a lot of longitudinal K wires or crossed K wires just in the comminuted situation, but if I can shorten and get good bone-against-bone opposition, then I will use a trans-osseous wire. As for the tendons, I do a very similar tendon repair. I use 4-0 Fiberwire suture, a modified Kessler 4-strand repair with a 6-0 epitendinous suture on the FDP. John Taras’ group showed that the 4-0 Fiberwire is just as strong as a 3-0 traditional polyester suture. I feel more comfortable performing a 4-strand repair with less suture bulk within the tendon with that suture.

**DR. KOZIN:** Jeff, if there’s an area of comminution, is there a maximum of shortening that you will accept to obtain better bony fixation?

**DR. YAO:** I don’t feel comfortable shortening more than a few millimeters, because then you may be dealing with issues of tendon imbalance at that point. So that’s why I find myself in that situation moving to more longitudinal or cross K wires to maintain some length but at the same time allow enough shortening to complete your vascular anastomosis and nerve coaptation.

**DR. KOZIN:** Nick how much will you allow shortening?

**DR. VEDDER:** I’ll shorten as much as I need. I have no qualms at all about shortening, especially if you can get a primary vascular repair, primary nerve repair, and primary bony fixation. It doesn’t bother me to shorten half a centimeter or more. I think it’s far more important to get primary repair of the vital structures. Again, I too would use a 4-strand repair just as you would for any primary tendon repair. And if it’s in Zone 2, do an epitendinous suture. As far as skeletal fixation, if you can achieve plate fixation without too much difficulty, I’ll do that, but otherwise I tend to use cross K wires just because it’s so much more expeditious. In terms of mobilization afterwards, I wouldn’t hold back on mobilization. I’d much rather treat a non-union later than have a stiff, functionless digit at a couple of months out.

**DR. KOZIN:** Becky, if the fixation is rigid and the tendon repair is 4-stranded, is there any difference in the post-operative regimen for a replanted digit versus a flexor tendon repair?

**M.S. VON DER HEYDE:** The biggest difference is that I want to empower the patient to consider circulation as the primary and optimal goal. I think they need to hear that explicitly from the surgeon and the therapist. When this goal has been achieved, I then adjust priorities depending on the amount of time elapsed since surgery. I would love to be Dr. Vedder’s therapist because I would rather not wait until the bone heals to glide the tendons. If a patient is referred four weeks following surgery, the bone is healed, and we are just starting to glide the tendons, the scar will be too significant to progress favorably. This scenario creates a very difficult therapeutic intervention for both patient and therapist. But if stable fixation has been achieved and circulation is good, I will progress in a manner similar to a flexor tendon repair to a certain extent. I think it’s a bit different than a flexor tendon repair because...
of the balance between the extensors and the flexors. It also depends on whether one or both of the flexor tendons were repaired. I will specifically ask the surgeon whether they would prefer that the replant is treated primarily to protect the flexors or extensors.

DR. KOZIN: Bill, do you try and repair both tendons or one tendon?

DR. DZWIERZYSKI: I will repair both tendons.

DR. KOZIN: Nick, how about your preference?

DR. VEDDER: That used to be my approach. However, nowadays, if it seems that repairing both is going to interfere with the motion of both, I’ll tend to resect the sublimis tendon and just repair the profundus.

DR. KOZIN: Jeff, how about your philosophy?

DR. YAO: I repair the FDS if it is just sitting there asking to be repaired. Otherwise, I have a low threshold to resect the FDS to decrease the amount of tendon bulk within the sheath to reduce any impairment of the FDP gliding, especially in Zone 2.

DR. KOZIN: Becky, is this important information to relay to the therapist?

MS. VON DER HEYDE: I think so. If you are considering the differential glide between the FDS and FDP it is important to tailor your exercise program accordingly. In the case of a single flexor tendon repair, this information might elucidate a difference between performance at the PIP and DIP in an isolated versus composite fashion, especially if you have bone shortening and you’ve lost some biomechanical advantage.

DR. KOZIN: What about nerve repair? Nick, are you still using suture, or using suture and glue? What do you prefer?

DR. VEDDER: I use 2 sutures per digital nerve and it works very expeditiously.

DR. KOZIN: What size suture?

DR. VEDDER: Usually 8-0 nylon.

DR. DZWIERZYSKI: I will use as few sutures as necessary, usually 2 or 3. If there is some boney shortening, this will allow a tension free repair on a good digit. If there is tension on the repair, I will use a nerve conduit. There has to be some caution in using a conduit, especially in a replanted finger: the conduits do have a lot of bulk. And if you’re putting this under fragile skin, I’ve had some problems with exposure of the conduit postop.

DR. KOZIN: Jeff, your thoughts?

DR. YAO: I’ve seen the same problem. Going back to your initial question, I do use two 8-0 or 9-0 nylon sutures, 180 degrees from each other. I have not used the nerve glues in a digital replant case. Regarding the conduits, I’ve gone away from using conduits in the digits because I have had some issues with flexibility of the conduit. So now I’m using more autograft and recently I’ve started using the human nerve allograft that has been re-popularized. Steve Moran just presented some good data using the nerve allograft.

DR. KOZIN: If you’re using autograft, what is your choice of donor?

DR. YAO: For the digits, I usually use the posterior interosseous nerve and if I need more graft I’ll go to the sural nerve or up to the medial antebrachial cutaneous nerve, and ultimately to the lateral antebrachial cutaneous nerve as well, if necessary.

DR. KOZIN: Becky, once the digit is regaining some sensibility, can you discuss what a therapist should do at that time?

MS. VON DER HEYDE: I think evaluation is very important, as sensory re-education is an integral part of the treatment plan. You can only progress sensory re-education with proper and progressive re-evaluation. Sensory re-education of the replanted digit takes a long, very careful approach. If you choose interventions that are not appropriate for the patient, they can become
frustrated very quickly. Tuning forks provide valuable baseline information and facilitate sensory re-education. As the patient progresses, threshold and innervation density can be evaluated with Semmes-Weinstein monofilaments and two point discrimination, static and moving. We move from general, gross sensory re-education towards stereognosis, based on sensory return.

DR. KOZIN: Okay. And what about the patient who develops cold intolerance? Is there anything a therapist can do for that?

MS. VON DER HEYDE: Education is always important, and there are certainly simple remedies. Sporting goods stores often carry quick and easy heat packs that patients can keep with them in case of cold weather, to be prepared for such situations. General cold intolerance, however, can be very difficult to deal with, especially for those that work outside. Assessing the tools used and opportunities for equipment modifications, including gloves, may help the therapist and patient determine a successful compromise between maintaining warmth and job performance. This becomes very patient-based and is a very challenging aspect of this rehabilitation.

DR. KOZIN: Nick, is there any surgery for cold intolerance?

DR. VEDDER: None that I’m aware of. I tell patients that it’s going to be really bad the first year and then get better every year after that, but it’s never going to go away, and that the best treatment is to keep your hand warm.

DR. YAO: I agree. I don’t know if cold intolerance ever goes away, but if it does, it takes at least a year.

DR. DZWIERZYNSKI: I agree, but there are some times that patients swear to you up and down that they will quit and the lure of demon tobacco drives them to start up again.

DR. VEDDER: I have a simple solution to that: I don’t replant smokers.

DR. KOZIN: Nick, a lot of patients are smokers prior to amputation, correct?

DR. VEDDER: Yes.

DR. KOZIN: How do you handle that scenario?

DR. VEDDER: Well, I tell them that the fact that they’re smoking significantly reduces their chance of successful replantation and that we’ll go to the O.R. and try to put it back on, but if we have intra-operative spasm or thrombosis it’s often not successful. And even if it is successful intra-operatively, the chance of it thrombosing postoperatively is much higher in my experience than non-smokers.

DR. KOZIN: Is smoking a confounding factor during surgery—and after surgery—with regards to vascular patency?

DR. VEDDER: Yes. Even if they’re not smoking postoperatively.

DR. DZWIERZYNSKI: I would agree it’s significant. There is a different quality to the artery of a smoker, even a young smoker. If I am going to replant a finger, the patient has to...
agree to quit smoking. If they say that they are not willing or incapable of quitting then I discuss with them amputation revision.

DR. KOZIN: And what I tell them is that I will take them to the O.R. and attempt to put it back on, but very often I will find it to be not replantable.

DR. DZWIERZYNSKI: Right.

DR. KOZIN: Jeff, any comments?

DR. YAO: To be honest, I haven’t noticed any significant difference in my outcomes whether the patient is a smoker or nonsmoker. But we do have an area in central valley of California where there’s a lot of other recreational drug abuse, with cocaine being one of them. For any of my patients with any co-morbidity, whether it be diabetes, smoking, cocaine use, etc, I warn them that their potential for successful replantation is reduced, but I haven’t really found that significant of a difference in my smokers compared to my nonsmokers.

DR. KOZIN: Are other recreational drugs a risk factor for thrombosis?

DR. YAO: Cocaine. We have a big methamphetamine use problem as well, but I don’t think that’s been shown to have an effect on vasospasm or a thrombosis.

DR. KOZIN: Nick or Bill, any experience with recreational drugs being a contributing factor for thrombosis?

DR. DZWIERZYNSKI: Cocaine is bad: it’s a potent vasoconstrictor. In our experience, we have not seen that many problems with marijuana and thrombosis, but definitely cocaine is a problem for thrombosis.

DR. VEDDER: Both cocaine and methamphetamine are terrible.

DR. KOZIN: Let’s move on to the next clinical scenario. Becky’s therapy team has treated our patient and gained excellent motion, but they have developed a nonunion with cystic changes at the nonunion site. What is your choice of bone graft, whether it be autograft, allograft, or bone substitute?

DR. KOZIN: In my opinion, if you’re going to operate, you want to give this bone its best chance of healing. That means combining adequate biology with rigid fixation. In a digit I typically use distal radius cancellous autograft. If it’s multiple digits or a large defect then I will use iliac crest autograft. For large segmental defects of a metacarpal, a tri-cortical piece of iliac crest autograft tends to work quite nicely. But for your standard phalangeal or metacarpal non-unions I think distal radius autograft is your best bet.

DR. VEDDER: I think for a digit you’re almost always able to get enough bone from the distal radius, and so that’s where I go. And I think that your chance of getting a union is better if you use autogenous graft.

DR. DZWIERZYNSKI: Totally agree. If you have a nonunion you need to go for the home run which is autologous bone graft, either distal radius, or iliac crest. Distal radius is easier to harvest and significantly more comfortable for the patient and usually the quantity is sufficient for most nonunions.

DR. KOZIN: How about when there’s a major limb replant and you’re left with a severe open wound across the forearm segment? The limb is perfused, but there is an open wound over the forearm. Has the wound VAC replaced free tissue coverage?

DR. KOZIN: I don’t think the VAC can replace free tissue coverage. I think the Wound VAC is a great technology, but if you have an open wound with exposed nerves, tendons or bone, the VAC is not going to get you satisfactory coverage. Early coverage remains the answer. The VAC may serve to temporize the situation so you’re not doing a free flap on the same night as your replant, or it may temporize until you can determine the quality of your bony or tendon soft tissue coverage. But we believe that early flap coverage is still the answer.

DR. KOZIN: Nick? 

DR. VEDDER: Yes, it all depends on whether you have what I call “white structures,” in other words bone, tendon, ligament, or nerve exposed. If you have white structures exposed, the wound by definition doesn’t have adequate vascularity and needs vascularized coverage. If you’re more proximal and it’s mainly muscle that’s a good situation where a VAC will work and you can create a skin graftable wound. Or, sometimes, you have a situation where you have enough vascularized fascia to pull over the white structures. But if you have truly exposed white structures, they need some kind of vascularized coverage, either a free flap or some kind of pedicle flap.

DR. KOZIN: What is your timing?

DR. VEDDER: Early, within a week generally, because certainly after that period of time those white structures will start to become mush and a tendon that’s mush is no good.

DR. YAO: I think the VAC is fabulous technology and I often find myself resisting the urge to overuse the VAC! I always tell my fellows and my residents, who have grown up with and trained with the VAC, to not push the indications. The VAC has been used more recently for coverage of exposed tibia, as well as other exposed white structures as Nick has indicated. I think that’s pushing the envelope a little bit. We just don’t want to forget our general principles in terms of radical debridement and revascularization to healthy tissue. And if that means you’re exposing white structures, appropriate soft tissue coverage (flaps) should still be the gold standard. I think in that situation, routinely relying on the VAC becomes a slippery slope.

DR. KOZIN: What about the groin flap? Many of us learned to cover wounds early with this technique. Do you still use the groin flap?

DR. VEDDER: Yes I do. Quite often.

DR. DZWIERZYNSKI: The problem with the groin flap is it keeps the hand in

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a dependent position and we have seen some problems with the hand being always dependent. We always tell our patients that we want their extremity to be elevated: of course, with a groin flap that is nearly impossible. If there is another alternative available, I would choose that over a groin flap. I would rather choose coverage with a lateral arm flap or an ALT flap if possible.

DR. YAO: I think a groin flap is still a great option, especially when you have degloving injuries to the thumb or multiple digits. I think it’s a great option to park multiple digits right into the groin.

DR. KOZIN: Becky, is there anything a therapist can do to promote digital motion while the hand is within the groin?

MS. VON DER HEYDE: We have done this, although it is not necessarily comfortable for the therapist or the patient. As therapists, we certainly have to have the wherewithal to evaluate in any situation, and ask the patient to move their fingers. As long as the repairs are strong enough to withstand it, we can have patients start moving their fingers while in the groin flap. It seems to be something everybody wants to avoid, but I think it’s something that needs to be discussed and attended to.

DR. KOZIN: You mean avoid going into the groin?

MS. VON DER HEYDE: Yes. I don’t necessarily think all patients get sent to therapy immediately after a groin flap. I think it’s often more of a “wait and see” type of approach as opposed to facilitating tendon glide as soon as possible.

DR. KOZIN: Nick, once you have done a groin flap, when will you divide and inset?

DR. VEDDER: Usually at 3 weeks, but as Becky says, I think it’s critical in the intervening period, beginning right away, to start digit range of motion. As long as you do that and get them up out of bed and in the shower and really moving, I think it’s still a very reasonable option. A perforator flap such as Bill suggested is another good alternative, but, again, you need to be out of the zone of injury, you need to have good vessels to plug into, and certainly there is a risk of microvascular failure whereas a groin flap is almost 100% reliable. I really do think the groin flap remains a workhorse flap for hand and upper extremity reconstruction.

DR. KOZIN: I want to move onto the patient that Jeff spoke about earlier—the 6 year old child that now has 4 viable digits and now needs tendon transfers. Jeff, can you discuss your approach to selecting donor tendons and timing of surgery?

DR. YAO: I think the best thing to do is just to sit down and identify which tendons you don’t have, which tendons you have, and which tendons are expendable. In her case both her wrist extensors are still available and in terms of restoring her digital flexion, I plan on transferring the ECRL to the FDP tendons at our next stage.

DR. KOZIN: Jeff, do you still use the principles of what’s in, what’s out, what’s available, and figure out the best surgical plan?

DR. YAO: Yes.

DR. KOZIN: Do you use your therapist in that selection process?

DR. YAO: Actually, that’s a great idea. I have not, but that’s a great idea.

DR. KOZIN: Becky, should he use a therapist?

MS. VON DER HEYDE: Well, of course, yes! We used to have a complex case clinic here in St. Louis where we would sit down with the patient and family beforehand and carefully discuss the postoperative course, surgeon and therapist together. We would even start the tendon transfer training on the opposite hand.

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American Association for Hand Surgery Calendar
For information contact: AAHS Central Office at 847-228-9276 or www.handsurgery.org

2009

July 24 – 25, 2009
AAHS Mid-Year Board of Directors Meeting
Lake Tahoe, CA

September 3-5, 2009
Annual Meeting – Combined of the ASHT & ASSH
San Francisco, CA

October 23-27, 2009
ASPS Annual Meeting
Seattle, WA

2010

January 6-9, 2010
AAHS 40th Annual Meeting
Boca Raton Resort and Club
Boca Raton, FL

March 10-13, 2010
AAOS Annual Meeting
New Orleans, LA

October 1-6, 2010
ASPS Annual Meeting
Toronto, ON, Canada

October 7-9, 2010
ASSH Annual Meeting
Boston, MA

2011

January 12-15, 2011
AAHS 41st Annual Meeting
Ritz Carlton Cancun
Cancun, MX

February 16-20, 2011
AAOS Annual Meeting
San Diego, CA

September 8-10, 2011
ASSH Annual Meeting
Las Vegas, NV

September 23-28, 2011
ASPS Annual Meeting
Denver, CO

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continued from page 20
before the surgery to increase understanding. In this case it would very important to educate the parents. Even if the therapist isn’t going to necessarily contribute to the decision-making process, it is nice to have a planning process that includes all parties.

DR. KOZIN: I do use our therapists because sometimes the surgeon will design a transfer that our therapists cannot rehab. So our therapists are very astute at knowing the in’s and out’s of rehab and provide valuable input.

Becky, do you think that you can strengthen a muscle that is weak from a nerve injury so that it becomes an available donor source?

M.S. VON DER HEYDE: Depending on the integrity of the neural structures and the level of innervation, I would certainly like to try.

DR. KOZIN: Bill, do you think that a muscle that has been re-innervated is ever an appropriate source as a donor for tendon transfer?

DR. DZWIERZYNSKI: I think it can be in certain select circumstances. A muscle is going to lose one grade of strength when you transfer it. So if you have a muscle starting at a grade 3, it’ll never be useful after transfer. Again, it depends what you have to work with too. If your sources are limited, if you have an extensive injury, you may have to use a muscle that’s already been repaired, or fixed. I try to use a undamaged muscle or tendon if I can, but it may not always be possible. Then I would use a previously repaired muscle if it is of sufficient strength.

DR. KOZIN: Nick you made a big point earlier about early rehab following replants by performing tendon repairs with 4 strands. Do you feel similar about tendon transfers, and what’s your preferred type of repair?

DR. VEDDER: With most tendon transfers you’re able to do a Pulvertaft weave which gives you an even better repair and allows you to be even more aggressive at early mobilization. So again, I’m quite aggressive at mobilizing tendon transfers, especially if I’m able to get a good Pulvertaft weave.

DR. KOZIN: Please define good. Does “good” refer to the number of passes or the girth of the tendons?

DR. VEDDER: It’s generally however many passes you can get, and how many sutures that you’re able to get in to hold those passes together. But in almost any case it’s going to be stronger than, for example, a primary end-to-end repair.

DR. KOZIN: Becky, is that important information for the therapist to know?

M.S. VON DER HEYDE: Absolutely. It’s very important to know the surgeon’s perception of the integrity of the repair, the tension on the structures, and how you think we should move forward. I’m not sure all therapists are versed in the number of weaves, or surgical technique per se, but the repair’s integrity is an important piece of information. The other important factor in this case is age.

DR. KOZIN: Becky, what about in a 6 year old that was treated by Jeff after a ECRL to FDP tendon transfer?

M.S. VON DER HEYDE: My experience with children with tendon transfers is that it’s so easy. The rehab of children is so much easier from a neuroplasticity perspective. A lot of the kids that I’ve seen with tendon transfers just seem to get it so much more quickly than the adults, and so I’m much more comfortable with a child to immobilize them and really put the brakes on for a little while as opposed to an adult who I think, especially as they get older, I think the rehab gets harder and harder. So I think for a child I might really put the brakes on and wait a little bit and make sure the repair is really strong before I let them go ahead and start playing or using the hand.

DR. KOZIN: And what’s a little bit?

M.S. VON DER HEYDE: Typically in an adult I’ll wait until three or four weeks post-operatively depending on how traumatic the injury was and the amount of scar tissue present. For a child, four weeks is often sufficient in my experience. If it is a very small child who doesn’t truly understand cause and effect, I might even wait until six weeks to implement play.

DR. YAO: That’s actually exactly what I plan on doing. I am being a little bit more conservative in my thinking and I plan to immobilize her 4 weeks despite the fact that I believe I’ll be able to get a good Pulvertaft weave. Actually, I wouldn’t mind hearing the opinions of my other panelists here to see how they feel about that. A 6 year old girl, she’s not that active but she is 6 nonetheless. Would any of you immobilize for less than 4 weeks and aggressively move these tendons transfers?

DR. VEDDER: I would be concerned about immobilizing for less than 4 weeks.

DR. DZWIERZYNSKI: I immobilize children because, as Becky said, children do well and they function great even after prolonged immobilization. If you immobilize 30-40 year olds, after 4 weeks you’ll be spending the next 4 months trying to get their motion back. Children and adults less than 20 years old are very adaptable and usually do well after immobilization.

DR. KOZIN: Jeff, from our standpoint it would depend on what you found at surgery. If you pulled on the FDP and there was good pull through then there is no harm in immobilizing for 4 weeks. If the pull through is limited and requires some form of tenolysis, and you have better pull after you really pulled, you have to consider early mobilization in a protected position.

Well, time to wrap. Bill, Nick, Becky and Jeff, I do appreciate all your input. Thank you.
Below is a list of AAHS members who have generously offered to teach their expertise in specific areas, letting 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, please contact the AAHS Central Office.

<table>
<thead>
<tr>
<th>NAME</th>
<th>EMAIL</th>
<th>PROCEDURE(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. D. Beckenbaugh, MD</td>
<td><a href="mailto:beckenbaugh.robert@mayo.edu">beckenbaugh.robert@mayo.edu</a></td>
<td>Technique of pyrocarbon arthroplasty of the thumb carpometacarpal; and metacarpophalangeal and PIP joints of the digits</td>
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</tr>
<tr>
<td>Kyle Bickel, MD</td>
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<td>Vascularized bone graft reconstruction for carpal pathology; complex fracture management in the hand and wrist; and arthroscopic wrist ganglion excision</td>
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<td>Endoscopic Cubital Tunnel Release</td>
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<td>Wide awake approach to hand surgery</td>
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<tr>
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<td>Susan Mackinnon, MD</td>
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<td>Nash Naam, MD</td>
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<td>SLAC wrist reconstruction; vascularized bone graft in treating scaphoid nonunions; ulnar shortening &amp; radial shortening; PIP &amp; MP joint arthroplasty; LRTT; arthroscopy of the CMC joint of the thumb</td>
</tr>
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<td>Daniel J. Nagle, MD</td>
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</tr>
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<td>Advanced wrist arthroscopy and small joint arthroscopy. Can also mentor a topic such as DRUJ problems, or wrist fracture.</td>
</tr>
<tr>
<td>Julian J. Pribaz, MD</td>
<td>j <a href="mailto:pribaz@partners.org">pribaz@partners.org</a></td>
<td>Soft tissue reconstruction; microsurgical reconstruction; spare parts surgery and extremity reconstruction</td>
</tr>
<tr>
<td>Michael Raab, MD</td>
<td><a href="mailto:mikeraab1@earthlink.net">mikeraab1@earthlink.net</a></td>
<td>Corrective osteotomy (volar or dorsal) of distal radius malunion with iliac crest bone grafting</td>
</tr>
<tr>
<td>Jaiyoung Ryu</td>
<td><a href="mailto:jryu@adelphia.net">jryu@adelphia.net</a></td>
<td>Wrist reconstruction; distal radius fracture; and scaphoid fracture/nonunion</td>
</tr>
<tr>
<td>David Slutsky, MD</td>
<td><a href="mailto:d-slutsky@msn.com">d-slutsky@msn.com</a></td>
<td>Use of volar wrist portals for wrist arthroscopy and arthroscopic repair of dorsal radiocarpal ligament tears; nonbridging external fixation of intra-articular distal radius fractures; nerve conduction studies for hand surgeons; and comparison of NCS and PSSD for the diagnosis of CTS</td>
</tr>
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<td>William Swartz, MD</td>
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<td>Tendon transfer and ulnar nerve</td>
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<tr>
<td>Thomas Tung, MD</td>
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<td>Congenital hand surgery</td>
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<tr>
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<td><a href="mailto:ezook@siumed.edu">ezook@siumed.edu</a></td>
<td>Fingertip reconstruction</td>
</tr>
</tbody>
</table>
Research Grant Guidelines and Application

Annual Research Awards will be made by the Research Committee of the American Association for Hand Surgery. These 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.

Awards and Eligibility

Up to three (3) grants in the amount up to $5,000.00 USD each will be made for a one year period. Grants are available to residents, fellows, therapists and AAHS members. Up to three (3) investigators may be included on a single application. One of the co-investigators must be an AAHS Active or Affiliate member.

Application

The application consists of three (3) parts:
- Investigator(s) demographic information
- Description of Research
- Curriculum Vitae for each Investigator

The application must be obtained from:

American Association for Hand Surgery
444 East Algonquin Road
Arlington Heights, IL 60005
www.handsurgery.org

The application must be received no later than November 1, 2009 in order for judging to be completed in time and the recipients to be announced at the Annual Meeting.

Guidelines

- The facility for research must coincide with the Principal Investigator's location for one (1) year following the receipt of the Award.
- The AAHS and Research Committee are required by the IRS to document disbursement of funds, as well as to maintain annual reports on the funded programs. Award recipients will be asked to provide financial and progress reports.
- The American Association for Hand Surgery must be acknowledged as the source of funding in any presentation or publication.
- It is expected that work supported by this grant be submitted for presentation at the Annual Meeting of AAHS within two (2) years of receipt of the Award.
- Yearly progress reports are requested. The final progress report should list publications which resulted from this initial seed funding.
- Funds must be returned to the American Association for Hand Surgery if the research is not undertaken within twelve (12) months of receipt of the Award.

Failure to follow these guidelines will disqualify the recipient from any further grant applications and from presenting any papers at the AAHS meetings for 3 years following such default.

Mail Grant Application To:

American Association for Hand Surgery
444 East Algonquin Road
Arlington Heights, IL 60005
Main- 847-228-9276 Fax- 847-228-9426
etfreeman@handsurgery.org
RESEARCH GRANT APPLICATION

1. TITLE: ____________________________________________________________

2. PRINCIPAL INVESTIGATOR: ____________________________________________

MAILING ADDRESS: ____________________________________________________

______________________________________________________________

TELEPHONE: (____) __________

STATUS:  □ Senior Classification    □ Junior Classification    □ Hand Therapist
         □ Private Practice       □ Part-Time Academic       □ Full-Time Academic
         □ Resident               □ Fellow

3. SECOND INVESTIGATOR: ______________________________________________

MAILING ADDRESS: ____________________________________________________

______________________________________________________________

TELEPHONE: (____) __________

STATUS:  □ Senior Classification    □ Junior Classification    □ Hand Therapist
         □ Private Practice       □ Part-Time Academic       □ Full-Time Academic
         □ Resident               □ Fellow

4. THIRD INVESTIGATOR: ______________________________________________

MAILING ADDRESS: ____________________________________________________

______________________________________________________________

TELEPHONE: (____) __________

STATUS:  □ Senior Classification    □ Junior Classification    □ Hand Therapist
         □ Private Practice       □ Part-Time Academic       □ Full-Time Academic
         □ Resident               □ Fellow
RESEARCH GRANT APPLICATION

A. PURPOSE OF PROJECT

B. BACKGROUND:
1. Review of literature
2. Your own past experience and preliminary data

C. METHODS AND MATERIALS:
Precisely describe the experimental model/design and evaluation of data. Where applicable, define patient selection and outline human investigation safety requirements.

D. REFERENCES:
List three to five pertinent references.

E. SIGNIFICANCE OF STUDY

F. COLLABORATION:
Define the role(s) of consultants, basic or clinical scientists and their percent of anticipated participation.

G. FACILITIES:
Describe institution/laboratory where studies will be done (must coincide with your location for 1 year following the award).

H. BUDGET:
Describe and itemize equipment, expendable supplies, animals and other expenses.

I. OTHER FUNDING SOURCES:
1) List all other financial awards available for this project or for closely related studies (source, amount, year).
2) State if other sources provide for salary or capital equipment.
3) Did you apply for another source of funding for this study? State date of application and source of funding

J. PREVIOUS RESEARCH EXPERIENCE

Note: Funds are not to be used for personal compensation of investigators, travel, payments of hospital costs, or major durable equipment purchase.

SPONSORSHIP: Research Grants are awarded to Members and Candidates for Membership of the AAHS or the Residents/Fellows sponsored by one of the above. If you are not a Member or Candidate for Membership, please have your sponsor sign and answer the question that follows.

Date: _____________ Sponsor: ____________________________________________

How long will Resident/Fellow be available to complete this study under your sponsorship?

________________________________________________________________________

A current curriculum vitae of each investigator MUST BE ATTACHED TO THE APPLICATION.