The Hand Surgery Endowment—What It Can Do For You

by Robert R. Schenck, MD

With the advent of managed care, capitation, PHOs, HMOs, health care reform, malpractice litigation, fee reduction, mergers, and loss of autonomy, it is becoming increasingly difficult for physicians and therapists to be able to afford needed educational activities. At the same time, demand remains high for health care professionals who continue learning throughout their careers. This enables hand surgeons and therapists to diagnose conditions more accurately, utilize advanced surgical techniques, remain knowledgeable about new and more effective treatments. How can we bridge the gap between shrinking financial resources and the educational imperative?

The Hand Surgery Endowment will be used to meet this need by expanding both the depth and accessibility of AAHS' educational programs.

Purpose of the Hand Surgery Endowment

The Hand Surgery Endowment is a new organization created to promote the educational activities of the American Association for Hand Surgery. The goals of the Endowment include increasing the skills and knowledge of AAHS members and others through educational symposia, instructional courses, and fellowship awards, which will in turn promote the highest levels of quality patient care. As a 501(c)(3) organization, contributions to the Endowment are tax deductible for the donor.

Ways the Endowment Can Help You

Sponsorship of Guest Lecturers and Panels, to share the cost of providing the following programs at the AAHS Annual Meeting or Educational Symposia. This will reduce the cost for surgeons and therapists to attend.

- Annual Meeting Lecture Programs, including Presidential Guest Lecturer, Keynote Speaker, Program Chairman's Invited Lecturer

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Ensuring the Future of Hand Surgery

As I stare into the proverbial tea cup trying to find the tea leaves in the dark swirl so as to be able to read them, I am struck by the absence of any leaves at all. In the rapidly changing world of medical reimbursement, there seem to be no solid positions to link to. Payments to physicians, hospitals and other medical providers are dropping rapidly, affecting the mechanics and the quality of health care delivery and the quality of health care delivery to our patients. Similarly, funding for research and education has essentially ceased both from government sources and from the private sector (read home-managed care organizations).

Such reductions in payments to you, the practitioner and researcher, reduces your discretionary funds. If by chance, you are employed by a health management organization, you have already seen this erosion. The loss of personal discretionary funds is, unfortunately, passed directly through to your professional activities—such as the Hand Association and all it stands for—education and research.

AAHS, in an effort to continue to bring you the benefits that your professional development requires, has looked to other sources of revenue—so as to become less dependent on the annual dues. One such source is the Endowment for Hand Surgery.

The Endowment, through its interest payouts, will provide an income stream to fund research and educational missions currently paid from yearly income, thereby freeing up funds for such activities as the Annual Meeting and administrative expenses. However, the Endowment has to generate a “critical mass” of principle to ensure a steady cash flow. Hence this “paid political” appeal to each of you.

To be sure, the more senior of you, the membership, are encouraged to make substantial gifts from your more mature and stable practices. But, the younger of you are also needed to become members of the Endowment. Remember, if each of the 500-odd members, who have not yet acted, pledge $25.00 each year for 10 years, $125,000 will be added to the coffees. Compounded, that translates to almost $200,000.00! All for only $25.00 a year. Consider what $50.00 per year would do.

Please read Bob Schenck’s detailed report on the Endowment and respond to his solicitation to the fullest of your ability. I understand that each of you, like me, is besieged by worthy organizations with similar appeals, but consider what hand surgery and especially The American Association for Hand Surgery has provided for you in professional education and enrichment and respond appropriately. Endow the Endowment for Hand Surgery!

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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Web Site to Go On-Line

The American Association for Hand Surgery, with the help of its Central Office staff, continues to upgrade its membership services and is positioning itself in this new information age to meet the challenges of the 21st century by improving its use of technology. The Ad-Hoc Committee on Electronic Communications, under the leadership of Rod Rohrich, has worked to develop an AAHS public web site which will also have a membership only chat room and password secured section. The Central Office is working with Alta Serve, Inc. to develop the web site which will be on line by July 1, 1997. The new web site address is: handsurgery.org.

Members and the public will be able to access the site to obtain a great deal of AAHS information, including, among other things, the Membership Roster, Hand Surgery Quarterly, Annual Meeting and Symposium registration, Annual Meeting abstract submission, research grant applications, membership applications, and an AAHS event calendar. The password protected section will contain valuable information for the organization's volunteer leadership and members such as the AAHS bylaws and procedure manual, meeting minutes, expense reimbursement forms, and other governance documents intended for member use only. The chat room will allow members to talk to each other, to ask questions, to present different cases, or to make plans socially. The Internet web site will also serve as a way to inform the public about hand surgery and AAHS members, and may someday play a role in practice development. A public section on how to select a hand surgeon is planned. We hope many young surgeons and hand therapists who are not members will "hit" on our web site and become interested in AAHS membership.

The AAHS web site is the first element of a multi-phase Internet media service plan. Ultimately, we will be able to reduce the costs of reaching our members, improve the efficiency of our communication, and enhance the growth of our organization through the Internet. The Electronic Communication Committee and the Central Office staff are to be congratulated on completing this project on budget and on time. I look forward to discussing this with you further at our annual meeting in Scottsdale, Arizona, January 7-10, 1998.

ROBERT C. RUSSELL, MD

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Application for Research Grants

Annual research awards will be made by the Research Committee of the American Association for Hand Surgery. 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

Grants will be made for a one year period to three investigators. Grants are available to all AAHS members. One of the investigators must be an active or affiliate member of the association.

Grant Application

Applications may be obtained from:
American Association for Hand Surgery
444 East Algonquin Road, Suite 150
Arlington Heights, Illinois 60005

Applications (original plus four copies) must be received by the committee chair no later than Friday, September 13, 1997, in order for the judging to be completed in time and the recipients to be announced at the Annual Meeting.

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

William Lineaweaver, MD
NC104 SUMA
Stanford, CA 94305

Endowment

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- Discussion Panels with invited experts.
- Workshops and Instructional Courses
  - Bioskills Workshops, to teach the latest techniques of hand surgery, particularly those that need eye-hand coordination in learning new procedures such as arthroscopy, endoscopy, and internal and external fixation of fractures.
  - Instructional Courses, to help fund the costs of experts to teach at these courses and publish educational materials for both those attending and those unable to do so.
  - Hand Therapy Workshops, to assist nationally recognized experts both to give lectures and to allow hands-on learning of new treatment materials and techniques, such as specialized splinting.
- Fellowships and Awards
  - The Vargas Award, to sponsor a hand therapist fellowship for an Affiliate Member to travel to a developing foreign country, to lecture and give hands-on instruction in basic and advanced therapy techniques. The Endowment can not only sponsor the award for travel expenses, but also contribute to the cost of providing educational materials for these foreign nationals.
  - Fellowships, to allow young hand surgeons to travel for a short time period to centers of learning in hand surgery and sharing their experiences with those attending the Annual Meeting.
Educational Resources

- **Resource Guides**, to provide educational materials for both hand surgeons and therapists.
- **Audio-Visual and Film Library**, to increase availability of learning resources concerning new techniques of hand surgery and therapy.
- **Telemedicine**, to support the development of closed circuit television and teleconferencing so that educational symposia will be widely accessible, and at a lower cost, to hand surgeons and therapists, allowing an interactive learning experience both nationally, and ultimately, internationally.

**How You Can Help the Endowment**

Wonderful as these ways are for The Hand Surgery Endowment to help the Association’s goals, there remains finding the means to carry them out. The Endowment has been approved by the IRS as a 501(c)(3) tax exempt organization to receive money, in the form of gifts, pledges, wills and bequests. The Endowment has been structured so that 90% of gifts will be used to grow income, and it is from this income that money will be gained to fund the wonderful projects above. Everything the Endowment has been created for, is to help you benefit from the sharing of hand surgery knowledge in an affordable manner.

The Hand Surgery Endowment needs the support of every member of the Association. There are two ways in which you can contribute to the Endowment. One way is to support the Endowment through a bequest. This planned giving designates a contribution to the Endowment as part of your estate. For more information about this method of giving, please complete the form below and send it to the Hand Surgery Endowment address.

Another way of contributing to the Endowment is through a gift/pledge. There is a giving level you can feel comfortable with. Whatever that level is, I urge you to respond today. Simply copy the gift/pledge form below and forward it along with your contribution to the address listed on the form below.

To paraphrase one famous political statement (originally made by Oliver Wendell Holmes), “Do not ask what The Endowment can do for you, Ask what you can do for your Endowment”!

Thank you for your gift/pledge and support.

☐ **Yes, I want to help the Endowment. Here is my tax deductible gift/pledge of:**

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Please make out checks to The Hand Surgery Endowment and mail with a copy of this form to:

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Flexor Tendon Injuries

The purpose of this discussion is to illuminate several important aspects of flexor tendon repair and healing. Our moderator for the discussion is Daniel P. Greenwald, MD, Director of the University of South Florida Hand Fellowship 1994-97, Tampa Florida, whose research interests are flexor tendon healing and hand biomechanics. The panelists are Neil Jones, MD, Professor and Chief of Hand Surgery, University of California, Los Angeles, Jennifer J. Jones King, OTR/L, CHT, Coordinator of Hand/Burn Therapy, Tampa General Hospital, W. P. Andrew Lee, MD, Chief of Hand Service, Division of Plastic Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, and A. Lee Osterman, MD, Professor, Hand and Orthopedic Surgery, The Philadelphia Hand Center and Thomas Jefferson University, Pennsylvania.

Our panel will be asked to comment on their approach to various problems in flexor tendon repair and rehabilitation, from the type of suture technique used to the type of postoperative regimen most often prescribed. We will discuss avoidance and treatment of complications, as well as special circumstances, in an effort to develop a set of practical guidelines for this often difficult spectrum of problems.

Dr. Greenwald: The purpose of today’s discussion is to explore flexor tendon injury and repair. We’ll focus on the surgical and post-surgical care of tendon lacerations and ruptures, starting with the simple and moving to the more complicated.

Let’s start with the isolated FDP injury. First of all, does the location of the laceration or the Verdan Zone influence the type of repair that is used? What techniques are we currently using in terms of configuration of suture, suture type, and presence or absence of an epitendon stitch? Dr. Lee, why don’t I start with your opinion on those two issues.

Dr. Lee: I have not been varying my techniques of tendon repair according to the zone of injury. I use a four-strand core repair, either a modified Kessler suture reinforced with a horizontal mattress suture, as described by Tajima and Strickland, or a modified Becker’s repair with two rows of loaded criss-cross sutures as described by May and Greenwald.

Dr. Greenwald: Are you using epitendon sutures in every case?

Dr. Lee: I do. I think the studies have shown conclusively that the epitendon sutures add significantly to the strength of tendon repair.

Dr. Greenwald: And the material that you like to use? Nylon? Tevdek? What are you currently favoring?

Dr. Lee: I use either a 3-0 or a 4-0 braided nylon, such as Surgilon, for core sutures and I use 6-0 prolene in a running lock fashion for the epitendon suture.

Dr. Greenwald: Dr. Osterman, your comments on this?

Dr. Osterman: Well, relative to the Verdan Zone, I don’t generally change repair, except in Zone I, when it’s pulled off the bone. But assuming it’s tendon to tendon, I don’t alter my technique in the profundus relative to zone. I use a suture plan described by Strickland in several recent articles, which is a four strand repair that essentially uses a Kessler type grasping suture and then a simple mattress suture to give you the four strands across the repair site. My core suture is generally a 3-0 suture. I use a braided synthetic, like Ethibond and Ticon. I generally use an epitendon stitch followed by a locked epitendon circumferential stitch of 6-0 nylon.

Dr. Greenwald: Is that placed first or at the end of your repair?

Dr. Osterman: It depends on how it lays out. Sometimes, it is easier to do the back wall first and then do your core sutures. But sometimes if it’s sitting out there on Broadway, I will use the epitendon suture last.

Dr. Greenwald: Dr. Jones?

Dr. Jones: Well, to your first question, does the location matter? I think it does. If it’s in Zone I, then obviously it will require a different repair, probably re-insertion into the distal phalanx. If it’s in Zone V, I don’t think you need to do a fancy repair, and you can probably do any mattress suture configuration. But in Zones II, III and IV, I’d use the same suture. I use a modified Kessler technique for the core suture. If I’m going to put somebody through a very careful, active flexion, post-operative protocol, then I’ll use a four strand technique and use a modified Kessler followed by a second core mattress suture. I use a 4-0 braided nylon, and then a running 6-0 nylon for the epitendon suture. Sometimes I place the epitendon suture first, sometimes I place it last.

Dr. Greenwald: When you’re working in Zone I, and you have to do a re-insertion, how are you attaching tendons?
Dr. Jones: If there’s a stump of the profundus tendon left that can be used, then I won’t re-attach the tendon to bone. I’ll do a tendon-tendon juncture using virtually the technique that I use in Zones II, III and IV. So, I’d use a 4-0 braided nylon for the core suture and I might also use an epitelen suture. If there’s only a ragged end on the distal phalanx, I’ll probably re-insert the tendon into the bone, using a Brunner suture through a button, either on the nail plate or on the tip of the finger just distal to the nail.

Dr. Greenwald: Dr. Osterman, is that about how you would do it as well?

Dr. Osterman: I’ll use a mini Mitel anchor in select cases, particularly in the thumb, the index and the long finger for the distal re-insertion into bone. I would only caution that if you do use an anchor, you want to put it in slightly obliquely, so as to avoid injury of poking through into the nail plate or into the nail bed. In the ring and small finger, I’ll tend to use the pull-out technique over a button described by Dr. Jones. I use a 2-0 prolene which I take through drill holes, tie over the button, and then at the appropriate interval, usually five to six weeks, will go ahead and remove that. If you do have any stump of the profundus left, I put some small epitelen type sutures in, even though there may not be enough stump to do a direct end-to-end repair. These reinforcing sutures act like a security blanket.

Ms. King: Are we finishing up on Zone I? There are a few ideas for Zone I injuries that differ from other zones on the flexor tendon injuries. The wrist could be dorsally blocked at 30 degrees and the MP’s also at 30 degrees, but with a separate dorsal blocking splint that’s finger-based over the DIP joint itself in 20-30 degrees of flexion. Having that second splint taped onto the middle phalanx allows passive motion of the DIP joint. So many of these dorsal blocking splints have greater MP flexion than 30 degrees. But reducing MP flexion will allow a hook fist, a modified hook fist, within the splint for greater excursion between the profundus and superficialis.

Dr. Greenwald: I think the Mitel anchors are very good for some cases of insertion, and I agree that there is a significant learning curve. We now know we have to go obliquely and take care of how far dorsally to penetrate.

Based on our long history of dealing with these injuries, Zone II injuries can be the most problematic. One of the difficulties is getting exposure and placing our stitches in such a way as to not interfere with glide. Dr. Lee, can you tell me something about your approach to the Zone II tendon injury?

Dr. Lee: There are two choices for extending the skin incision for flexor tendon repairs. For the straightforward laceration I use the standard Brunner zig-zag incision. However, in cases where I suspect that hematoma or infection may be a problem, or that tenolysis or reconstruction may be needed in the future, I prefer to use the mid-lateral incision for exposure. This way, if a problem develops in the future, the tendons or the silicon rod would less likely be exposed through the incisions.

Dr. Greenwald: So, differential gliding becomes important. We will talk more about that in the next segment when we talk a little about therapy. Dr. Osterman, tell us how you respect the pulleys, and if there’s something we should know besides the importance of the A2 and A4 pulleys, which we all have read about.

Dr. Osterman: Well, a couple of things. My initial exposure depends on the laceration site. If there is a simple transverse laceration, I will tend to develop that with midlateral exposures proximal and distal to the laceration. If there is an oblique laceration, I’ll incorporate that and then use a Brunner type approach. What I always tell the fellows when I’m working is that I’m going to repair the pulley system. Now, I can’t always repair the pulley system. But just making that statement raises everybody’s level of consciousness, for want of a better term, to respecting the pulley system.

Dr. Greenwald: Yes.

Dr. Osterman: While the A2 and A4 pulleys are important, all of the pulleys play a role. Thus, while A2 and A4 are critical for full finger flexion, the others, particularly in the compromised situation of injury, may take on added importance, particularly if the A2 or A4 have been violated to some degree. I try to work between the annular pulley windows, as have already been described. If, however, my finished repair impinges on a pulley, I will resect a little bit of that pulley. I’ll extend the DIP joint, and if I see the tendon hanging up under the pulley, and I can’t repair over it, then I may resect a small portion of the pulley, but never more than one half centimeter, with critical evidence to maintain the A2 and A4. One difficulty that influences the repair is tendon retrieval when it’s not obvious in the finger wound.

Dr. Greenwald: Yes.

Dr. Osterman: Ineffective tendon

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In a Combined Injury, the Outcome is Often Determined by How Early One Can Achieve Motion.

W. P. Andrew Lee, MD

Dr. Greenwald: I use that technique also. I think that works quite well.

Dr. Jones: Yes. That's an effective technique.

Dr. Greenwald: Since we're talking about pulleys, we can talk about some of the mechanisms of tendon healing. Dr. Jones, how important do you think it is to close the sheath? Are you doing that, and do you think that has any major effect on how people do after repair?

Dr. Jones: At one stage there was a vogue for closing the sheath. I think it's easier to do by a medical artist than it is by a surgeon. Most flexor tendon repairs that I do, no matter how good they are, always bulge slightly. Therefore, I find it very difficult to close the sheath. I don't think it makes any difference in my results, so I don't routinely close the sheath at all. In regard to the pulleys, I would agree with what Dr. Osterman said. But again, I look at the repair when the finger is positioned into full extension or full flexion. If there's any impingement of the tendon repair on the pulley, then I'll resect a millimeter or two millimeters of that pulley. Obviously, the A4 pulley is quite narrow and it's very difficult to remove very much of it. But with the A2, I'll sometimes excise up to 50% of the A2 and not be too concerned about it.

Dr. Greenwald: As you remove sections of the pulley, do you think it's important to do this in an oblique fashion, or are you satisfied with the way it slides without transverse excision?

Dr. Jones: Graham Lister has talked about creating L-shaped incisions, to produce this funnel effect. Personally, I have not found it to be effective. I just take out a window so that in full extension and in some flexion, there's no impingement of the repair on the pulley.

Dr. Greenwald: Given that the theoretical benefit of closing the sheath is outweighed by the physical difficulty in doing so in most cases, are there any other adjunctive treatments that we can use to maximize healing and minimize adhesions? We've heard a lot in the past about hyaluronic acid, etc. Most of those have been used in tissue culture and not a lot's been done in vivo. Do you have any feelings about that, Dr. Jones?

Dr. Jones: I haven't used any pharmacological agents either into the sheath or systemically.

Dr. Greenwald: Dr. Osterman?

Dr. Osterman: I don't use any pharmacological agent at the time of surgery. Post-operatively, I will put these patients on some Motrin. There have been some studies that suggest that it may have some effect on scar as well as its known anti-inflammatory effects. It is more or less an empiric experiment rather than truly scientific.

Dr. Greenwald: For how long?

Dr. Osterman: Generally, between two and three weeks. More important than post operative medication, and the thing that's changed over the course of my career of doing these things, is the role that mechanical stress plays in maximizing tendon healing. And that's what we're going to talk about in terms of the post-operative rehabilitation. A stressed tendon gains and maintains its tensile strength and develops less extrinsic adhesions. Overall, I believe these mechanical factors are much more important than any medicine.

Dr. Greenwald: Thank you, Dr. Lee, do you have any comments on that topic?

Dr. Lee: In a situation at high risk for adhesion formation, I've used either ibuprofen or indomethacin. I would also like to add a couple of thoughts about the tendon retrieval method.

Dr. Greenwald: Please.

Dr. Lee: I have also found very help-
ful the skin hook technique for tendon retrieval described by Morris and Martin. Furthermore, it can often be difficult to place sutures after the tendon has been delivered back into the digit. Thus, if the MacGruber technique were used for tendon retrieval in the palm, I place the sutures first when the tendons are widely exposed in the palm. And then, instead of pulling on the tendon directly, I pull the pre-placed suture through the pediatric catheter into the digit.

Dr. Osterman: I do that as well. I would only add that if they’re in the sheath, don’t pull them out of the sheath. For example, if you open up the palm and they’re curled up, next to the lumbral, you wouldn’t pull them out of the sheath to place those sutures, or would you?

Dr. Lee: No, I would leave the tendons in the sheath.

Dr. Greenwald: OK. Let’s move on and talk a little bit about therapy before we talk about more complex injuries. Dr. Lee, how soon after surgery should we begin therapy? And then, after each of the panelists gives a comment on that, we’ll ask Jenny King to comment on what type of therapy she prefers.

Dr. Lee: For Zone II injury, I like to begin therapy within 48 hours.

Dr. Greenwald: Dr. Osterman?

Dr. Osterman: The same.

Dr. Greenwald: Dr. Jones?

Dr. Jones: The same.

Dr. Greenwald: Ms. King, tell us about beginning therapy after 48 hours. Tell me what some of the important things are that you look for, how much conversation you like to have with your surgeons before you plan your therapy, and what you found to be the most effective?

Ms. King: Well, I’m very pleased to hear 48-hours, because it needs to start at least by then. When I first started treating flexor tendon injuries, immobilization protocols and the early passive mobilization protocols were considered state-of-the-art. Over the years, it’s changed. My methods have changed a great deal. It used to be that the wrist was flexed down 45 degrees and the MPDs were flexed at 70 degrees. Now that has widely opened up. Especially in a Zone IV or Zone V injury, we bring the wrist closer to neutral. By three weeks, I like to see the wrist in neutral for all tendon zones, because I think that gives better tendon glide. The force of the tendon is greater distally if the wrist is in more extension and you can get more differential glide. I have a lot of curiosity about these early active motion programs, where they actually start active range of motion before day three. Over the years, I’ve found that some of the patients that cheated a little bit actually got a better result than some of the ones that either over-protected themselves or I over-protected them. And I’m finding that if I have them do some passive place and active hold exercises at a much earlier time, they’re gliding better.

Dr. Greenwald: Dr. Osterman, do you place your patients on early active range of motion protocols?

Dr. Osterman: Our center is looking at several post-operative rehabilitation protocols: standard dynamic mobilization; two, an Indiana wrist protocol described by Nancy Cannon; and three, a full, active program. And we’re currently comparing those three rehabilitation techniques. The preliminary data from the six surgeons in our group using those techniques is all protocols have comparatively good results. I was glad to hear Ms. King mention place-and-hold, because we find it helpful very early.

Dr. Greenwald: Dr. Jones?

Dr. Jones: I hate to be pedantic, but I think we need to agree on some definitions. All of the rehabilitation protocols since the 70s have used early controlled passive mobilization, but this has been passive flexion and active extension, meaning that you don’t actively contract the tendon-muscle unit that you’ve just repaired. Whereas, if you’re really talking about active flexion protocols, then this means that you activate the flexor muscle-tendon unit that you have just repaired.

Personally, I don’t think that “place and hold” really does anything, and if you’re going to use an active flexion protocol, you have to activate the repaired flexor tendon and move it from an extended position into a flexed position.

Dr. Greenwald: Dr. Jones, do you believe in that technique? Are you using it?

Dr. Jones: Yes, but I’ll come to that in a moment. When I do a flexor tendon repair, I sort the patients into three groups. If you have a child or non-compliant patient, then you can forget about all these protocols. You just immobilize them in a cast for three and a half weeks.

Dr. Greenwald: Just to be clear, that’s a full immobilization protocol?

Dr. Jones: That’s correct, full immobilization.

Dr. Greenwald: OK.

Dr. Jones: There’s another group at the other end of the spectrum that demands the full active flexion protocol. These are very compliant, very intelligent patients, who can come to our hand therapists as opposed to another therapist, and are prepared to come two or three times a week, maybe sometimes even five times a week for three weeks. These patients I will put in an early active flexion protocol. Finally, there’s a gray group in the middle, and I put them in an early controlled passive mobilization protocol. I can explain these two if

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you’d like. But this is the way I think about the post operative therapy.

Dr. Greenwald: Dr. Lee? Your thoughts?

Dr. Lee: I agree that the patient’s compliance, understanding, and motivation are the principal determining factors for their eventual success. We utilize a mobilization program that, as Lee alluded to, was devised by Nancy Cannon and Jim Strickland. It qualifies under the place-and-hold category, in that the patient first passively flexes the digits and actively extends the wrist at the same time. The way we have our patients then hold the digits is to feel in their opposite, uninjured hand, the lightest muscular contraction necessary to bring the fingers into flexion, and to use that same minute amount of force or active contraction to hold the digits after passive flexion.

Dr. Greenwald: Dr. Jones, you said a moment ago, you would be willing to describe some of these techniques. Why don’t you start with that, and we’ll talk then about complications?

Dr. Jones: Let me start with the one that I use for most patients and that’s what I call early controlled passive mobilization. I never put the patient in a splint that flexes the wrist. The wrist is always at neutral. I don’t understand why some protocols bring the wrist down into 30-45 degrees of flexion. It doesn’t make any sense. Again, the MP joints only have to be flexed down maybe to 50 degrees at the most, because most patients have sharp lacerations and there’s no segmental defect in the tendon. So, intraoperatively, the wrist is placed into neutral and the MP joints into 50 degrees flexion. You also look to see where the tendon juncture is positioned relative to the pulleys, how much tension is on the repair and if there’s any gap. Once I’m happy with the position, then the hand is immobilized in a dorsal block splint for 48 hours and they are then seen by the therapist. The splint is removed, and they are put in a lightweight plastic splint with hooks on all four fingers. So, even if we’re only repairing tendons in a single finger, we put hooks on every finger. A palmar pulley or bar is placed so that you get DIP joint flexion. The splint, instead of coming out to the tips of the fingers as in most protocols, only comes out to the PIP joints. This was described by Silfverskiold and this has made a dramatic improvement in my results. Patients don’t get flexion contractures at the PIP joints, because they can actively extend to zero degrees at the PIP joints. All four fingers are hooked up by elastic bands to the forearm. So, you get good DIP joint flexion, and you get good active extension at the PIP joints. Basically, the patient actively extends the fingers ten times every hour. At night, it’s very important that they have another component added to the dorsal block splint, which is actually a palmar splint to hold the middle and distal phalanges in extension, again, to prevent PIP joint flexion contractures. I would use this protocol for probably 70% of my patients, those in the middle group.

Dr. Greenwald: And the duration of this regimen for your patients?

Dr. Jones: We use this regime for three and a half to four weeks and then I start active flexion at the PIP and the DIP joints.

In the patients that are very compliant, very intelligent, and are prepared to come to our hand therapists, then at 48 hours, they’re put into the same splint that I just described only out to the PIP joints, and hooks are put on all the fingers and they go through that same protocol. In addition, every four hours and sometimes even up to every two hours -- they will actively flex the finger from the extended position at the PIP joint down as far as they feel resistance.

To start with, in the first few days, it may be only just a jog of motion. But as the swelling goes down (and we use Coban tape on the fingers to get the swelling down very quickly), they will begin to actively flex down towards the palm twice every four hours, sometimes twice every two hours. They will note where the finger comes to a certain-point on a particular day and then the next day, they’ll try and go just a little bit further so that by four weeks, they should actually have achieved full active flexion from a position of 50 degrees at the MP joint down to the distal palmar crease. This is what I think is an active flexion protocol. I don’t think “place and hold” moves the tendon one iota. Obviously, you must have a tendon repair that is strong enough to withstand the force of active flexion. We and other groups have done it just using a modified Kessler of 4-0 braided nylon, but the technique probably has to be stronger, maybe a 3-0 suture and maybe a four strand technique to prevent dehiscence.

Dr. Osterman: I agree with Dr. Jones, that “place-and-hold” doesn’t do a whole lot for excursion. But it does apply load across the tendon and therefore strengthens the repair site. And that’s the reason that we use “place-and-hold” and have been happy with it.

Dr. Lee: The holding part adds to the tensile strength of tendon repair, but it is the placing which achieves tendon excursion. As we know, each ten degrees of IP joint motion produces 1.0 to 1.5 millimeter of tendon excursion.

Dr. Greenwald: Dr. Osterman, how do you handle the majority of your patients?

Dr. Osterman: I also agree with Dr. Jones that it’s really important to emphasize a lack of PIP joint flexion contracture. The use of the splint cut off at the PIP joint is helpful in that regard. As helpful as that is, awareness of the PIP’s contractile problem and making sure that it doesn’t develop is equally impor-
Update on Flexor Tendon Wound Healing: The Role of Growth Factors and Their Therapeutic Implications

Post-traumatic tendon adhesions represent one of the most difficult problems shared by hand surgeons, therapists, and their patients. While we have learned of the benefits of early controlled mobilization and dynamic splitting regimens, none of the many biochemical agents previously tested have lead to direct clinical applications. Growth factors, also known as cytokines, are proteins released by one cell that may mediate various effects on surrounding cells. Several growth factors, specifically transforming growth factor-β [TGF-β] and basic fibroblast growth factor [bFGF], have been found to play pivotal roles in the process of wound healing. TGF-β stimulates an aggressive inflammatory response and, in some cases, may lead to pathologic scar formation. Alternatively, bFGF has been found to stimulate angiogenesis in multiple models, thereby creating neovascular channels for the recruitment of inflammatory cells and fibroblasts.

Duffy and Seller in the laboratory of Drs. Richard Gelberman and Charles Hergrueter first implicated a role for growth factors in flexor tendon wound healing. In their canine model, bFGF as well as epidermal growth factor [EGF] and platelet-derived growth factor [PDGF] were thought to be present in varying amounts in uninjured and healing flexor tendons. Our laboratory at Stanford used the technique of in situ hybridization to examine levels of TGF-β and bFGF mRNA in a rabbit model. TGF-β and bFGF mRNA were over-expressed after Zone II flexor tendon transaction and repair in intrinsic tenocytes, but most markedly in inflammatory cells migrating from the extrinsic tendon sheath. This localization data provided evidence that signals for wound healing may evolve from both intrinsic and extrinsic sources.

Interestingly, repairing the overlying tendon sheath after flexor tendon repair seemed to decrease gene expression for TGF-β.

What are the eventual therapeutic implications of this research? First, we believe that both intrinsic and extrinsic mechanisms of flexor tendon wound healing exist, offering possibilities for biochemical modulation. Dermal scar formation and glomerulonephritis have been successfully limited by antagonistic antibodies to TGF-β. A similar approach is being investigated in our laboratory using the rabbit flexor tendon model. We routinely repair the tendon sheath in our patients when technically possible, partly based on our biochemical observation that TGF-β is thereby down-regulated. While a growth factor "magic bullet" is not likely to exist, hand surgeons may one day be able to infiltrate substances at the time of surgery which will enhance healing and limit scar formation to improve post-operative outcomes.

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Important because even though the splint only goes to a certain level, some patients will posture their finger in 30 degrees of flexion. The therapy protocol should avoid that by nighttime PIP joint neutral splinting. We do include all of the fingers, including the non-injured digits with the laceration, with the exception of the index finger if an ulnar finger is involved. The emphasis has been to go away from flexed positions of the wrist, both in the active protocol and also in the Nancy Cannon protocol, as mentioned by Dr. Lee. We tend to use a more neutral position of the wrist. I do think that Dr. Jones’ point about matching the rehabilitation technique to the individual patient is important. In a child under age 13, I will place the wrist into about 30 or 45 degrees of flexion, position the MP joints down at 80 degrees, leave the palm open, and allow the child to move the fingers actively within that relatively protected position of the dorsal blocking splint. Also in that instance, we use a more passive protocol, the so-called Duran technique. Other tricks in dealing with children include drawing little faces on the hand and having the child try to “Hold this finger on the face.” That’s started at about three weeks. The only other thing that I thought I wanted to add is that in rehabilitating the isolated profundus, it is critical to allow active motion of the sublimis and the PIP joint. I would rather sacrifice one profundus and ensure that I don’t lose good PIP joint motion. Thus, we will do early active motion of the sublimis PIP joint in a profundus re-attachment.

Dr. Greenwald: Dr. Lee? Any comments?

Dr. Lee: The only thing I will add is that in our protocol, in addition to the place-and-hold, the patient also uses the tenodesis effect in order to achieve additional tendon gliding.

Dr. Greenwald: So, Ms. King, you’ve heard how these different surgeons continued on page 12
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are handling these injuries. And you work with a number of hand surgeons here in the Tampa area. Give us some ideas of what some of the pitfalls are that you run into as you take care of these people and try to institute these different protocols. And also, if you can, tell me what you think is working the best.

You said earlier that the active protocols seem to be the best.

Ms. King: I can concur with what was said previously, that there are patient factors. I like the active protocol, and I’ve been very pleased with the recent outcomes. But there are a number of patients on whom I have recently not used that protocol, either by way of education, or they were just so swollen from a crush injury or other comminuted injuries, making them inappropriate candidates for early active motion. We needed to wait for some of the inflammation and edema to go down so that there was less drag on the tendon and that sort of thing.

Dr. Greenwald: That’s a very good point. And it leads right into one of the other questions in a paragraph down the line from what I sent you as panelists. When we see the isolated, almost surgical injury, it’s almost gratifying to repair, and those patients tend to do well. But what do we do when we see a dirty injury, something that’s got much more damage than you would see with a typical sharp laceration? Dr. Lee, what are you doing with complicated injuries where there’s more damage than just the tendon, and that damage may involve some tearing or raggedness of the tendon so that you may have even a small segmental loss?

Dr. Lee: I think if the damaged or frayed parts can be adequately debrided and still permit primary repair, that would be my first choice. If a significant segmental cap exists to preclude direct repair, the options range from no repair, tendon transfer, to delayed reconstruction, depending on the tendon, the digit involved and the location of injury.

Dr. Greenwald: Dr. Osterman? How do you handle complicated repairs? Give us some of your thoughts on this broad field.

Dr. Osterman: If we’re looking at basically a dirty wound with frayed tendon, I don’t think there’s any reason that you can’t successfully debride most tendons and still obtain a primary repair, unless you’re talking about major segmental loss, which is unusual. And so we will do a primary repair. We usually will not, in these dirty wounds, insert rods. If we can’t for some reason repair the tendon, we concentrate our efforts on getting control of the wound and then operatively reassess the situation. If the wound is now clean, and the tendon irreparable, we may insert a rod then.

Dr. Greenwald: Dr. Jones, often these injuries are more complicated than even that. And we see bony injuries and we see injuries of multiple tendons, including tendons on both sides of the digit, meaning the flexors and the extensors. Share with us, if you can, some thoughts on your algorithms for treating very complicated injuries where multiple tendons and multiple sides of the digit are involved.

Dr. Jones: In terms of complicated injuries, obviously if you’re going to move the flexor tendons, then you need to have rigid stabilization of any fracture. If there’s good intermeshing of the bony fragments and there’s no segmental loss, then we’ll use 90-90 intrasosseous wiring described by Neil Zimmerman, or low profile mini-plates. They are pretty strong and allow an early flexion protocol. If there is a concomitant extensor tendon and bone injury and flexor tendon injury, then this is similar to a replantation situation. Therefore, I would back off from an active flexion protocol and would use a House and Duran type rehabilitation. If you move these patients too quickly, then the flexor tendon repair may do well, but the extensor tendon will gap or in fact rupture, and you’ll lose extension at the PIP or DIP joints.

Dr. Greenwald: Dr. Osterman?

Dr. Greenwald: Dr. Lee, tell us about your thoughts on the complicated injury, particularly when the extensors are also involved.

Dr. Lee: Well, I think when structures in addition to flexor tendons are involved in what’s called a combined injury, the outcome is often determined by how early one can achieve motion. From everything we know about flexor tendon repair, the later we move, the more adhesion there will be, and a poor outcome there will be. So, I think the goal in any combined injury, whether it involves flexor tendon, extensor tendon, or bone injury, is to achieve secure fixation to permit early motion. In the case of bone, rigid fixation with plate and screws. In the case of tendons, secure repairs with the multi-strand technique.

Dr. Greenwald: Dr. Osterman?

Dr. Osterman: In the combined injuries, what’s changed over my career is that all structures are repaired: bone stabilized, flexor and extensor tendons repaired, nerves sutured and then some early motion rehab is started. I do not use a 90-90 wiring, as Dr. Jones does, but tend to use the modular small plate fixation. We use H plates and other types of plate fixation in both a replant situation or a severe combined injury. We tend to
emphasize different arcs of motions for different fingers. In an index finger, we emphasized an extensor arc to maintain its pointer function. If I have the same injury in the index and in the small finger, I emphasize an extension protocol in the index and accept less than full flexion. By contrast, in the small finger, I'll emphasize more of a standard flexion protocol, accepting some extension lag from the extensor tendon injury.

**Dr. Greenwald:** I think those are excellent points. Now we should discuss special considerations for say, the competitive athlete. What do you think about the competitive athlete? How do you change your protocol for the competitive athlete, Dr. Osterman?

**Dr. Osterman:** I recommend intensive therapy. We will have him seen on a daily basis. Depending on the sport and the ultimate desires of the athlete, if I can keep them out for ten to twelve weeks, I try to do that.

**Dr. Greenwald:** Dr. Lee, is that about your time frame as well for turning people loose without restrictions?

**Dr. Lee:** I think twelve weeks is about right. I would say that the therapists deserve great credit for the improvement in outcome, but I also think that the advances made in surgical techniques with multi-strand core suture repair and epitendon repair allow the therapist to begin motion protocol earlier.

**Dr. Greenwald:** I agree with that. And I think that the research has shown that there is certainly an element of technique which is important for outcome. Since we are talking about therapists, we should talk to our therapist. Ms. King, you've heard us talk about the complex injury and the patient with high demands, such as the competitive athlete. Give us your thoughts on what you're seeing and how you're handling patients who have had complex injuries.

**Ms. King:** Well, initially in these complicated injuries I try to educate the patient. That's the other part of all of this that we've neglected to talk about, which is how to educate the patient, and how important it is to make him the primary, core person in all of this. Patients need to have a lot of diagrams and a lot of reading material—written information—so that they can become an active participant in this. Splinting, certainly, is vital to these complex injuries, and early motion. We must decide, as Dr. Osterman said, which finger to have what function attached to.

We must educate the patient that his index and his long finger are going to be his primary dexterity fingers and that strength actually comes from the ulnar side of the hand.

**Dr. Greenwald:** More aggressive therapy can lead to an increase of tendon rupture after repair. Dr. Lee, how do you handle the tendon that ruptures during therapy in, say, the first three weeks after repair?

**Dr. Lee:** I'll take them back to the operating room as soon as I can, and see if I can achieve a primary repair of the ruptured tendon.

**Dr. Greenwald:** Dr. Osterman and Dr. Jones, do you agree with that?

*continued on page 14*

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**American Association for Hand Surgery Calendar**

- **May 24-28**
  7th Congress of the International Federation of Societies for Surgery of the Hand
  Vancouver Trade and Convention Centre
  Vancouver, British Columbia, CANADA

- **May 28-30**
  IFSSH Post-Congress Tour
  Victoria, CANADA

- **June 2000**
  January 5-8
  30th Annual Meeting
  Loews Miami Beach
  Miami Beach, FL

**Other Meetings**

- **1998**
  American Society for Reconstructive Microsurgery
  January 11-15, 1998
  The Phoenixic Resort Scottsdale, AZ

- **1999**
  American Academy of Orthopaedic Surgeons Annual Meeting
  March 19-23, 1998
  New Orleans, LA

- **1999**
  American Society for Surgery of the Hand Annual Meeting
  September 10-13, 1997
  Denver, CO

- **1999**
  ASPRS/PSEF/ASMS Annual Meeting
  September 20-24, 1997
  San Francisco, CA

**For information contact:**
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Phone: (847) 228-8758; Fax: (847) 228-6609

**November 21-23**
Carpal Tunnel Syndrome: An In-Depth Review
Sheraton Bal Harbour
Bal Harbour, FL

**1998**
January 7-10
28th Annual Meeting
The Phoenixic Resort Scottsdale, AZ
Dr. Osterman: I think if you identify the rupture, you ought to repair it. Operatively, you might change your suture or its configuration and more likely, you would alter your postoperative rehab protocol.

Another point I would emphasize in talking about postoperative tendon ruptures is that if the patient looks too good in therapy, that's the person you have to be scared of. If you see a repair at four or five weeks showing you almost full digital motion, instead of padding the patient and yourself on the back, you should splint that patient longer. They're not forming a lot of adhesions and if they stress that tendon, you're more likely to see a rupture. So, go slower with the patient who looks too good. By contrast, with the patient who doesn't look good you can start resistance a little bit earlier than you would in the standard patient.

Dr. Jones: I would agree. I'd take the patient back and re-repair the tendon, and I would put them back into exactly the SAME protocol. If you look at the Northern Ireland series, they had a 10% rupture rate using early active flexion. And even out of that 10% rupture rate, they still achieved good to excellent results in 70% of the re-repairs with the same therapy protocol.

Dr. Greenwald: What do you when you're confronted with the patient who has had a neglected laceration or a neglected rupture? What kind of time frames are important for developing your algorithm for treatment? We'll stay with Dr. Jones.

Dr. Jones: I tend to see a lot of tendon injuries several days later and I don't think it changes my thoughts too much. I'll repair a tendon, probably up to maybe eight or even ten days after the injury, and still put them into these protocols and use the same techniques. Harold Kleinert talked about delayed primary repair, and his definition was any time that you could repair the tendon by opening the incision by just spreading it apart with your fingers. A skin incision will probably heal itself within maybe eight, ten, twelve days, after that it would no longer be a delayed primary tendon repair.

Dr. Greenwald: Dr. Osterman, please comment for us on what you think a window of opportunity is for the neglected or delayed repair?

Dr. Osterman: I would agree with Dr. Jones on the timing. Beyond eight to ten days, it gets very difficult because of shortening of the muscle tendon unit, edema, changes in the sheath, and other associated factors. I also think it depends on the patient you're seeing. If this is a patient who has failed to come not because of a neglected diagnosis, but because the patient neglected to come, then you have a compliance problem. You might not do anything in that patient.

Dr. Greenwald: And that becomes a compliance issue?

Dr. Osterman: Every now and then, you get lucky and may have a tendon that doesn't retract, even though it's been two months. I think you can repair those. That will happen once in a blue moon. It's important for the surgeon to identify if the vinculae are intact to the tendon stumps level of laceration. That's a different vascular situation than if they are destroyed by the injury and retraction. My own prejudice is that the tendon repair is weaker and the prognosis slightly poorer if the vinculae are lost.

Dr. Greenwald: Sometimes our best efforts are met with less than stellar results. When do you tell your patient that they are a candidate for tenolysis? And I'd like to start with Ms. King.

Ms. King: I personally don't like to see the tenolysis occur before six-continued on page 20
enlargement, and the FDP, digital nerves, and palmar arch are assessed and found to be intact. The FDS tendon stumps are retrieved and repaired, the wound is closed primarily, and a splint is applied. Code 26350 describes this procedure in its entirety. The exploration of other structures is included in this code.

**Other Procedures Coded Separately**

If other procedures such as nerve repairs or fracture reductions are performed, it is appropriate to code separately for these, as they are not considered part of global tenorrhaphy codes. Moreover, the tenorrhaphy codes include straightforward wound closure. Closure requiring complex repair, skin grafts, or flaps is coded in addition to the tenorrhaphy.

In the above example, if, in addition to the FDS tenorrhaphy, a common digital nerve and a lumbrical muscle are repaired, and the five-centimeter wound is ragged, confused, and contaminated, requiring extensive debridement and complex closure, the procedure is coded 64834 Common digital neurorrhaphy 26350-51 FDS tenorrhaphy 26591-51 Repair of intrinsic muscle 13132-51 Complex repair (includes debridement) 64830 Microdissection of nerve

**Secondary Procedures**

Tenolysis procedures, like tenorrhaphies, are coded separately for each tendon. They are global also, and they include surgical exposure of the tendon, tenolysis and/or tenosynovectomy, neurolysis required for surgical exposure, uncomplicated wound closure, and application of any traction device for postoperative therapy.

If in the above example, after vigorous postoperative therapy, tenodesis of the FDS and FDP require tenolysis of both tendons within the palm, code:

26440 Tenolysis FDS
26440-51 Tenolysis FDP

The coding of staged tendon grafting procedures is relatively straightforward, and these codes are also global. Code 26390 describes the excision of the flexor tendon(s), including exposure and tenolysis, incision or resection of tendon sheath and/or pulleys, placement of the rod or tube, and uncomplicated wound closure. One does not code separately for tendon excision (26170 or 26180), for example, as this is part of the global code 26390.

The second stage replacement of the rod or tube with a tendon graft is coded 26392. This code includes surgical exposure and removal of the rod or tube, preparation of proximal and distal tendon ends (or distal phalanges), obtaining the tendon graft, proximal and distal tendon repairs, and uncomplicated wound closure. Since “tendon graft” is included in the descriptor for code 26392, one does not code separately for obtaining the graft (20924).

**Procedures**

15580 Cross finger flap
26356-51 FDS tenorrhaphy, Zone II
26356-51 FDP tenorrhaphy, Zone II
26735-51 ORIF proximal phalangeal fracture

- Both tendons are repaired in Zone II and this is described with two codes.
- The tenorrhaphy codes include exploration and extension of the

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You-Code-It

A saw injury to the index finger results in transection of both the FDS and FDP at the level of the proximal phalanx, as well as an open fracture of the proximal phalanx and a soft tissue defect. The wound is debrided, an open reduction internal fixation of the fracture is performed, both flexor tendons are repaired primarily, and the defect closed with a cross finger flap from the middle finger. The donor site of the flap is closed with a full thickness skin graft.

- Although the tenorrhaphy codes include straightforward wound closure, they do not include a cross finger flap.
- The cross finger flap code, 15580, is global and includes skin grafting the donor site. One does not code separately for skin grafting (15240).

Raymond V. Janevicius, MD is an HSQ Associate Editor and a member of the AMA CPT Advisory Committee.
30 Days in Thailand

A Report from the 1996 Vargas International Hand Therapy Teaching Award Winner

By Lynne M. Feehan, MSc(PT)

THAILAND: November 5 to December 3, 1996

Last year in Palm Springs, I was honored to receive the first Vargas International Hand Therapy Teaching Award. This award allowed me to travel to Thailand to teach hand therapy. I spent 4 weeks in Thailand, with 2 of these weeks travel-

ing and teaching with Dr. Somprasong Songcharoen from Jackson, Mississippi. Dr. Songcharoen was born in Thailand, and was integral to the success of this trip. Not only did he coordinate much of the itinerary, he was a wonderful teacher and facilitator. His presence created opportunities and opened doors for therapists in Thailand that would not have been realized without him.

While in Thailand, we were able to spend time at a number of different facilities in Bangkok and Chiang Mai, we gave some courses and many lectures, we were able to work with a number of clinicians, and we were asked to consult on a number of U/E problems.

We spent the first few days at the Industrial Rehabilitation Centre (IRC), in the outskirts of Bangkok. The IRC is a huge facility, meant to help persons who have suffered work related injuries. The staff and residents all live at IRC. Almost all the residents are at least 1 year post injury, and have had little to no access to rehabilitation prior to their admission. Most of the residents have sustained fairly extensive injuries; one third are amputees, one third are what can only be described as upper extremity disasters, and the rest are a mixture of other traumatic injuries. IRC provides an extensive medical rehabilitation service, as well as social service and vocational re-training programs. The clinicians at IRC are wonderfully skilled and resourceful. Their clinical challenge is the “stiff hand” all delayed intervention. I saw more stiff hands in a few days than I have seen throughout all my years in clinical practice.

While we were at IRC we offered a three day course on hand rehabilitation. The course was attended by 60 people, mostly therapists and some physicians/surgeons. The course consisted of lectures, demonstrations, and workshops on clinical evaluation and splinting. We also spent three days consulting and teaching one-on-one in the clinical setting, offering whatever clinical assistance and advice that we could in a short time.

During our second week, we spent time with surgeons, PMR doctors, residents, and medical students, introducing many of them to the role of hand therapy. There are very few therapists in Thailand; and for a variety of reasons there is limited access to the therapists that are available.

We spent two days at the Mahidol University hospital, a large, inner city, public hospital. We gave some lectures, Dr. Song, did some surgery, we toured the wards, and went to some out-patient clinics... and everywhere we went, hundreds of people crowded the hallways waiting patiently to be seen. The public hospital system is sorely underfunded.

We then spent a day at the Siriruci 2 hospital, a large private hospital that sees many traumatic industrial hand injuries. We saw a number of rehab patients, gave a series of lectures, and Dr. Song did some surgery. The private hospitals are better funded; however, there
are still very limited rehabilitation services available.

We spent our last day together, attending the International College of Surgeons conference in Bangkok. We both gave a lecture at the conference. At this point Dr. Song and I parted company, and I flew to Chiang Mai.

I spent two days at Chiang Mai University with the faculty and students of the OT/PT schools. I gave a course to the third and fourth year students, I toured the facilities, and met with the Dean and faculty to discuss their curriculum and opportunities for clinical training and post-graduate education. The primary problem is not the level of education or training of the therapists, nor is it the quality of clinical work they do... but as usual it's the lack of numbers and lack of funding. In a country with a population of 60 million, there are only 20 OT's and 60 PT's graduating each year. The OT school has had to use the same 20 pieces of thermoplastic splinting material for 3 years now.

I spent my last working day, at the McKean rehab center, which was started 80 years ago by the Christian foundation as a leprosy village. It has since grown into a huge modern rehabilitation center that sees more than just leprosy patients. I saw a couple of hand patients while I was there, and again, the problem was that therapists were being asked to intervene when it was almost too late.

My time in Thailand was not all work, of course. I was able to spend a few days at the beginning and on the weekends sightseeing in Bangkok and Chiang Mai. Everywhere I went, I was escorted by my various hosts. I was so fortunate to learn so much about Thai history, culture and the Buddhist faith from the Thai people themselves. Most of the Thai people are Buddhist, and there are many wonderful Buddhist temples scattered everywhere. The temples are extremely ornate, with many beautiful and massive images of Buddha. As well, the Thai people have great respect for their king. There are images of the King everywhere, and some of the most beautiful places I visited were the various palaces of the royal family.

At the end of my trip, I was also able to spend 5 days on my own exploring the mountains and hill tribes of northern Thailand. I hiked through some spectacular countryside, I stayed two nights in some very isolated and beautiful hill tribe villages, I rode on some ele-

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Scenic Vancouver Backdrop for International Meeting

The 7th Triennial Congress of the International Society for Surgery of the Hand, hosted by the Canadian Society for Surgery of the Hand, will take place in Vancouver, May 24-28, 1998. This Congress, like others before it, will provide a unique opportunity for Hand Surgeons from around the world to exchange knowledge and experience in a wide range of topics. Our theme, "The Future at Hand", focuses our attention on the next century, and all of the exciting changes it will bring.

Dr. James Roth and his organizing committee are working hard to provide a stimulating, and enriched scientific session, with over 100 invited speakers already confirmed. Paper presentations, Posters, Debates, Symposia and Instructional Courses will provide each participant with up to date information on the challenges facing Hand Surgeons today.

Pre Congress Meetings include: Canadian Society of Plastic Surgery, May 20-23, Victoria; American Society for the Peripheral Nerve, May 22-24, Vancouver; VI International Wrist Investigators, May 24, Vancouver; and Surgical Rehabilitation of the Upper Limb in Tetraplegia, May 20-23, Cleveland, Ohio.


Our Social Program highlights the majesty of the Pacific Northwest. Tours to Victoria and its beautiful gardens, or a day of skiing at world famous Whistler ski resort are all planned. Hiking, fishing, golfing, air tours are all available. A seven-night Alaska Cruise, either pre- or post-congress has been arranged. The final Gala promises to be a memorable and magnificent affair.

For more information on attending, contact the Congress Secretariat:
Events by Design
601-325 Howe Street
Vancouver, BC, Canada
V6C1Z7
PH (604) 669-7175
FAX (604) 669-7083
e-mail: 74117.273@compuserve.com
Web Site: www.med.ubc.ca/hand/hands.html

DATES TO REMEMBER

November 14, 1997
Abstract Submission Deadline

January 15, 1998
Early Registration Deadline

April 16, 1998
Hotel Reservation Deadline

May 24-28, 1998
ISSSFH Congress Dates

30 Days in Thailand
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phant's and did some river rafting on a bamboo raft. I also spent a couple of days exploring in the Golden Triangle region of Thailand.

I did many exciting things while in Thailand, and I met many wonderful clinicians who inspired me with their ability to do so much with so little. Dr. Songcharoen and I were able share some of our specialized knowledge and skills, and left behind 250 pounds of donated supplies and textbooks. There are many barriers to rehabilitation in Thailand, and it is our hope that we were able to open some of the doors for them. I know my life has been touched by this experience forever.

None of this would have been possible if it was not for the membership of AAHS and their vision to develop the Vargas International Hand Therapy Teaching Award. I would like to thank the membership for this opportunity, and specifically Maureen Hardy, whose dedication and hard work helped bring this vision to a reality. I look forward to hearing the details of many such teaching experiences in the years to come. Thank you.
Dialogue Key to Outreach Program

by Ronald E. Palmer, MD

The American Association for Hand Surgery has identified one of the organization’s major responsibilities is to educate primary care physicians regarding appropriate care of hand problems. In order to accomplish this, a separate ad hoc committee was formed in 1995. This is the Committee on Outreach to Primary Care Physicians. Among the goals identified by the committee was to develop a dialogue with primary care physicians, providing them with educational opportunities in the field of hand surgery and specifically the primary care of hand injuries and its conditions.

A number of benefits can come to the members of AAHS by achieving these goals. By better educating primary care physicians on the initial care of hand problems, the primary care physician will be better able to assess and evaluate the condition and initiate conservative treatment. Secondly, appropriate referrals by primary care physicians would be improved.

Since its conception, the Committee has been involved in a number of educational activities with state family practice organizations, such as The American Academy of Family Practice, The American College of Occupational and Environmental Medicine, and The Academy of Emergency Room Physicians. The Committee has developed instructional courses for these organizations and has compiled (as a result of lectures given in those instructional courses) nine didactic core lectures. The lectures cover basic topics in hand surgery ranging from finger fractures to carpal tunnel syndrome.

The symposiums and instructional courses that have been given have been very successful and well attended. There appears to be a great deal of interest by primary care physicians in learning more about primary care of hand disorders.

The Committee on Outreach to Primary Care Physicians would like to solicit help from the membership of AAHS. The lectures currently available to Association members are listed on the order form above. The Committee is asking members for additional recommendations for core lectures and volunteers to author those programs. We also feel that the instructional courses given at the various academies have been helpful; however, these academies are inundated with requests to present instructional courses and symposiums. We would like to encourage the membership of AAHS to notify or contact any members of the appropriate academies involved in primary care that may be interested in a symposium or instructional course offered by our Association.
teen weeks. I've seen in recent literature that twelve weeks is a good time to go ahead. But I just feel that more time should be spent on the scar remodeling and softening the tissues and trying to get the available excursion. It also gives you more time to work on some other modalities like neuromuscular electrostimulation or employ some biofeedback techniques, especially if there's a nerve injury involved. If you find that if there are median and ulnar injuries involved, and these people have insensitive hands, you have a much harder time isolating the muscles and getting a grip. If you can wait for the nerve to regenerate a little bit longer, you have a better chance of having a successful tenolysis.

Dr. Greenwald: Dr. Lee?

Dr. Lee: I have found that it's often not until six months or so after the initial repair when I'm ready to go back in for tenolysis. I like for the edema that resulted from the original injury to completely resolve, and any residual pain to go away. And obviously, I want to be sure that the patient has significantly better passive mobility than active mobility before tenolysis can be performed.

Dr. Greenwald: Dr. Osterman?

Dr. Osterman: I'd like to emphasize what Ms. King said. We looked at post-operative tendon remodeling in 70 patients with a variety of simple and complex injuries. If you had, for example, a fracture or an associated digital nerve injury, that did tend to alter when the patient reached maximum improvement. While the majority of patients had reached their maximum results by four months, 30% required six to seven months. What you have to do is not pick a fixed time, but in fact assess the overall conditions: one, the skin conditions that Dr. Lee alluded to; and two, the fact that they are plateaued in therapy. We look at their improvement over the course of two to three weeks of therapy. If we see they've hit a brick wall, and we've done all of the blocking resistant techniques that we can do, the skin is supple, passive motion is almost fully regained, that would be the time that we would consider tenolysis. The optimal time when these conditions occur is usually around the sixth month. I don't think you should do a tenolysis in almost anyone before four months.

Dr. Greenwald: Dr. Jones, do you agree with those comments?

Dr. Jones: I tend to agree with what's been said. Personally, I would not do a tenolysis before four months.

Dr. Greenwald: Well, again, I'd like to thank you all for participating. You made my job and my life very easy this evening.