

Winter  
2014

# HAND SURGERY

Q U A R T E R L Y

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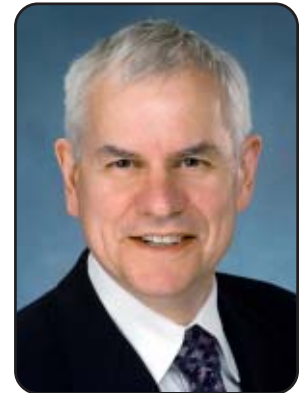
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## MESSAGE FROM THE PRESIDENT

### Missed the plane for Hawaii this January?

I hope not. We have excellent education in hand surgery and therapy lined up with great front edge of the wave speakers. You will learn all the latest tricks in Dupuytren's treatment with collagenase, needle aponeurotomy (with and without fat grafting), and manipulation of cords with digit widget, splinting and stretching. The latest in wide awake hand surgery and true active movement in flexor tendon repair. What about actually fixing boutonniere or working splints that allow movement with at 3 days after repair with extensor tendon with relative motion splinting, or chronic paronychia busting with gentian violet? Great tips in hand surgery and hand therapy from the best? Bill Magee will give a heartwarming talk of interest to all. All this and more in the paradise setting of Kauai.

If you did miss the boat, you can come to the Bahamas next year, which will be awesome as well.



Donald H. Lalonde, M.D.

### Reverse Fellowship in Kumasi Ghana; Great Opportunity for AAHS and ASSH Surgeons and Therapists

Neil Salyapongse was teaching hand surgery to one of the very few hand surgeons in West Africa in September (see a summary of his trip in this issue.) Details on how to get involved are available on the website: <http://handsurgery.org/volunteerism/kumasi.cgi>. He went as part of our new reverse fellowship program designed to send the teachers to the fellows to avoid the brain drain of traditional fellowships. Since I went there before Neil to set up the fellowship, they have started having one of the physiotherapists regularly attend the hand surgery clinics for the first time ever. The time is ripe for a surgeon and his therapist to help start hand therapy in West Africa, where it is sorely needed.

(continued on page 6)

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**AAHS**  
ANNUAL MEETING  
January 8 - 11, 2014

Grand Hyatt Kauai Resort & Spa  
Kauai, Hawaii

*Simple Solutions Welcome*

  
In Collaboration With  
Chinese Hand Surgeons  
[www.handsurgery.com](http://www.handsurgery.com)

**ANNUAL MEETING SCHEDULE AT A GLANCE ON PAGE 2**

# 2014 AAHS ANNUAL MEETING

In Collaboration With  
Chinese Hand Surgeons

January 8 – 11, 2014  
Grand Hyatt Kauai Resort & Spa, Kauai, Hawaii  
*Simple Solutions Welcome*



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## WEDNESDAY, JANUARY 8, 2014

- 6:30 am-8:00 **Continental Breakfast**  
Grand Promenade
- 6:30 am-7:45 **Instructional Courses**  
Grand & Kauai Ballrooms
- 8:00 am-8:05 **President & Program Chair Welcome**  
Grand Ballroom I
- 8:05 am-8:20 **Invited ASHT Speaker**  
Grand Ballroom I
- 8:10 am-8:20 **Vargas Award Presentation**  
Grand Ballroom I
- 8:30 am-9:15 **Panel: Things that Therapists Know**  
Grand Ballroom I
- 9:15 am-10:00 **Panel: Dupuytren's**  
Grand Ballroom I
- 10:00 am-10:30 **Coffee Break**  
Grand Promenade & Garden
- 10:30 am-11:45 **Panel: Tendon Injuries**  
Grand Ballroom I
- 11:45 am-12:15 **Invited Guest Lecture: Jim Bo Tang, MD**  
Grand Ballroom I
- 12:30 pm-5:00 **Hands-On Surgeons Development Workshop** Kauai Ballroom I
- 12:30 pm-5:00 **Hands-On Therapists Development Workshop** Kauai Ballroom II & III
- 5:00 pm-6:00 **Mentors Reception**  
Gazebo Grand Lawn
- 6:30 pm-8:30 **Welcome Reception**  
Grand Promenade & Garden

## THURSDAY, JANUARY 9, 2014

- 6:00 am-8:00 **Continental Breakfast with Exhibitors**  
Grand Promenade & Garden
- 6:15 am-7:45 **MOC Instructional Course**  
Grand Ballroom III
- 6:30 am-7:45 **Instructional Courses**  
Grand & Kauai Ballrooms
- 8:00 am-8:10 **President & Program Chair Welcome**  
Grand Ballroom I
- 8:10 am-8:15 **ASSH President Welcome**  
Grand Ballroom I
- 8:15 am-10:00 **Concurrent Session 1: Arthritis/Trauma**  
Grand Ballroom I
- 8:15 am-10:00 **Concurrent Session 2:Tendon/Congenital**  
Grand Ballroom III
- 10:00 am-10:30 **Coffee Break With Exhibitors**  
Grande Promenade & Garden
- 10:30 am-11:45 **Concurrent Session 3: Microvascular/ Flaps** Grand Ballroom I
- 10:30 am-11:45 **Concurrent Session 4: Dupuytren's/ Tumor** Grand Ballroom III
- 11:45 am-12:15 **Presidential Address: Donald H. Lalonde, MD** Grand Ballroom I

- 12:15 pm-1:00 **Invited Guest Speaker: William P. Magee, Jr., MD** Grand Ballroom I
- 1:00 pm-2:30 **Lunch Symposium: Auxilium Pharmaceuticals** Grand Ballroom I
- Lunch Symposium: AxoGen, Inc.** Grand Ballroom III
- 2:30 pm-4:30pm **Hands-On Skills Lab: Supported by MircoAire** Kauai Ballroom II-IV

## FRIDAY, JANUARY 10, 2014

- 6:00 am-8:00 **Continental Breakfast with Exhibitors**  
Grand Promenade & Garden
- 6:30 am-7:45 **AAHS/ ASPN Instructional Courses**  
Grand & Kauai Ballrooms
- 8:00 am-9:15 **Concurrent Session 5: Wrists/DRUJ**  
Grand Ballroom I
- 8:00 am- 9:15 **Concurrent Session 6: Nerve**  
Grand Ballroom III
- 9:15 am-9:45 **Coffee Break with Exhibitors**  
Grand Promenade & Garden
- 9:45 am-11:00 **Panel: My Best Trick(s)**  
Grand Ballroom I
- 11:00 am-11:10 **Hand Surgery Endowment (HSE)**  
President Report Grand Ballroom I
- 11:15 am-11:45 **Danyo Lecture: Elisabet Hagert, MD, PhD**  
Grand Ballroom I
- 11:45 am-12:15 **Joint AAHS/ ASPN Panel: Radial Nerve Transfer vs. Tendon Transfer**  
Grand Ballroom I
- 12:45 pm-1:30 **Annual Business Meeting (AAHS Members Only)**  
Grand Ballroom I
- 12:45 pm-2:00 **Lunch with Exhibitors**  
Grand Promenade & Garden
- 1:30 pm-5:45 **Comprehensive Hand Review Course**  
Kauai Ballroom II-IV
- 7:00 pm-10:00 **Annual Meeting Luau**  
Ilima Garden

## SATURDAY, JANUARY 11, 2014

- 6:00 am-8:00 **Continental Breakfast with Exhibitors**  
Grand Promenade & Garden
- 6:30 am-7:30 **AAHS/ASPN/ASRM Instructional Courses** Grand & Kauai Ballrooms
- 7:45 am-8:00 **AAHS/ASPN/ASRM President's Welcome**  
Grand Ballroom I
- 8:15 am-9:30 **AAHS/ASPN/ASRM Panel: Hand Transplant vs. Prosthetics**  
Grand Ballroom I
- 9:30 am-10:00 **Coffee Break with Exhibitors**  
Grand Promenade & Garden
- 10:00 am-11:00 **AAHS/ASPN/ASRM Joint Outstanding Papers** Grand Ballroom I
- 11:00 am-12:00 **AAHS/ASPN/ASRM Joint Presidential Keynote Lecture: Peter Galpin, MD, FACS** Grand Ballroom I

Hand  
Surgery  
Quarterly  
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Winter  
2014

## FROM THE EDITOR'S DESK



Thomas Hughes, MD

### Simulating the Surgical Experience

The changes in resident education have been coming fast and furious. While we are all probably aware of the 80-hour workweek, and the "Core Competencies"; fewer have heard of the new Milestone program for residency program evaluation and the requirement to use surgical simulation in training programs. While various oversight groups have made these changes to improve the training of our future colleagues, few of these organizations have looked closely at how costly these requirements are, how they detract from more traditional teaching modalities, and how effective they are at training competent physicians.

To that end, the American Academy of Orthopaedic Surgery (AAOS) held their Simulation Summit II this past November in Chicago. While many generations of orthopaedic residents have been

trained using sawbones to simulate fracture care, the orthopaedic community lags far behind our general surgery colleagues in the use of surgical simulation. A speaker who was an expert in urologic simulations presented very sophisticated models of soft tissue surgeries including prostatectomy and inferior vena cava repair laproscopically. Additionally, Virtual Reality (VR) simulators have been developed in many fields.

In orthopaedics, the VR options are more limited and newer. The majority attempt to teach basic arthroscopy (Figure 1) and fluoroscopy skills. There are variety of very advanced simulators, however, the cost is still an issue. One system I looked at was \$97,000 for a single station Another, low cost option is being marketed by the Sawbones Company. It is in the \$3,000 range, but is far less sophisticated (Figure 2). One program developed a compartment syndrome model using an orange and a blood pressure cuff (Figure 3). (FYI, I would like to disclose that I have no conflicts or involvement in any of these simulation companies).

Most importantly, there is little data yet available on how effective these techniques are at improving surgical skills and ultimately surgical outcomes. Some preliminary data from general surgery does show that after simulation experiences PGY 1 residents can perform at the level of a PGY3 resident that has not had the simulation training. The more complicated VR systems can give significant feedback about how the surgeon has performed. It can show how much cartilage damage was done by the surgeon



Figure 1. The VIRTAMED virtual reality arthroscopy simulator.

during the arthroscopy, can measure surgical times and efficiency of movement. This allows comparisons and evaluation of resident progress.

There may also be an opportunity to use these VR and simulation techniques to teach new surgical techniques to established surgeons. This certainly makes more sense than reading about a new procedure, never being mentored in the techniques, and then dealing with the complications afterwards (think "endoscopic carpal tunnel syndrome").

So it is very likely that future CME may involve surgical simulation or virtual reality. It may not be at this year's annual meeting in Kauai, but it will be there eventually.



Figure 2. The Sawbones FAST Arthroscopy Training Workstation.



Figure 3. A simple Compartment Syndrome Model

# HAND THERAPISTS CORNER: The Difficult Task of Managing Focal Dystonia in the Hand

Saba Kamal, OTR, CHT

## INTRODUCTION

### What is Focal Dystonia?

Dystonia is a movement disorder that causes the muscles to contract and spasm involuntarily. The neurological mechanism that makes muscles relax when they are not in use does not function properly. Opposing muscles often contract simultaneously as if they are 'competing' for control of a body part. The involuntary muscle contractions force the body into repetitive and often twisting movements as well as awkward, irregular postures.

There are multiple forms of dystonia, and dozens of diseases and conditions include dystonia as a major symptom. Dystonia may affect a single body area or be generalized throughout multiple muscle groups. Dystonia affects men, women, and children of all ages and backgrounds. Estimates suggest that no fewer than 300,000 people in North America are affected. Dystonia causes varying degrees of disability and pain, from mild to severe. There is presently no cure, but multiple treatment options exist and scientists around the world are actively pursuing research toward new therapies. Although there are multiple forms of dystonia and the symptoms of these forms may outwardly appear quite different, the element that all forms share is the repetitive, patterned, and often twisting involuntary muscle contractions.

## DIAGNOSING DYSTONIA

At this time, there is no single test to confirm the diagnosis of dystonia. Instead, the diagnosis rests in a physician's ability to observe symptoms of dystonia and obtain a thorough patient history. In

order to correctly diagnose dystonia, doctors must be able to recognize the physical signs and be familiar with the symptoms. In certain instances, tests may be ordered to rule out other conditions or disorders. The kind of physician who is typically in the best position to diagnose dystonia is a *movement disorder neurologist*.

The dystonia diagnostic process may include:

Patient history, Family history, Laboratory studies such as blood and urine tests, and analysis of cerebrospinal fluid, electromyography (EMG) or electroencephalography (EEG), Genetic testing for specific forms of dystonia, Other tests and screenings intended to rule out other conditions or disorders

To accurately describe the form or type of dystonia that an individual has, at least four specific pieces of information must be accounted for: The age at which the symptoms started, how the body is affected, what is known about the cause, if the dystonia occurs with symptoms of additional neurological disorders

If an individual develops symptoms prior to approximately age 30, it may be referred to as *early-onset*. If symptoms develop after the age of 30, it is called *late-onset* or *adult-onset*. In this article we will be discussing late onset dystonia: *Hand dystonia (writer's cramp)*

### How is the body affected by Dystonia?

When dystonia affects only one part of the body, it is called *focal dystonia*. Other types of dystonia include: Segmental dystonia, Multifocal dystonia, Generalized dystonia, Axial dystonia, Hemidystonia, *Task-specific dystonia*, *Paroxysmal dystonia*

## CAUSE

The cause of dystonia is not yet known because scientists have not yet identified the precise biochemical process in the body that triggers the symptoms.

On the other hand, dystonia can occur as a result of trauma, certain medications, and mutated genes. The mutated DYT1 gene or physical trauma *can cause* dystonia, but these explanations do not address the true origin of the dystonia and what happens inside the body to produce the symptoms.

Cause may be characterized as *primary, secondary, or dystonia-plus*.

**Primary Dystonia:** The dystonia is the only neurological disorder that the person has. Primary dystonias include some genetic forms (such as DYT1 dystonia in which a gene has been identified) and forms for which a cause is not usually found (such as most focal dystonias).

**Secondary dystonias:** Cases that can be attributed to drug exposure, trauma, or another disease or condition. Secondary dystonias include insults to the brain caused by certain kinds of tumors, infections, stroke, metabolic conditions, and toxins.

**Dystonia-plus:** Sometimes dystonia occurs along with symptoms of other neurological disorders or has a particular quality that resembles another disorder. These forms may be put in a category called dystonia-plus.

## THERAPEUTIC MANAGEMENT OF FOCAL DYSTONIA

Writing, playing music becomes a challenge when dealing with dystonia. In theory, patients with focal dystonia could be treated

(continued on next page)

by inhibiting the opposing muscles thus allowing function to occur.

This has been attempted in the past with relaxation techniques or even Botox, however, with limited success.

We at Hands-On-Care were able to treat a patient of Focal Dystonia (musician's dystonia) by providing a proprioceptive input to the opposing muscles thus assisting it in providing inhibitory stimulus thereby controlling the movement. The cause of dystonia is not precisely understood. Misfiring of neurons in the sensorimotor cortex, a thin layer of neural tissue covering the brain is thought to cause unwanted contractions. The source of this misfiring may be a result of impaired inhibitory mechanisms during muscle contraction. When the brain tells a given muscle to contract, it simultaneously silences muscles that would oppose the intended movement. In dystonia, it appears that the ability of the brain to inhibit the surrounding muscles is impaired leading to loss of selectivity.

### Background:

Focal dystonia is a neurological condition that affects a muscle or group of muscles in a specific part of the body causing involuntary muscular contractions and abnormal postures such as twisting and repetitive movements or abnormal postures. For example, in focal hand dystonia, the fingers either curl into the palm or extend outward without control. In high level musicians, focal hand dystonia is referred to as musician's dystonia. When called upon to perform an intentional activity, the muscles fatigue very quickly and some muscle groups do not respond (causing weakness) while others over-respond or become rigid (causing micro-tears under load). The symptoms worsen significantly with continued use, especially in

the case of focal dystonia

Treatment has been limited to minimizing the symptoms of the disorder as there is no successful treatment for its cause. Reducing the types of movements that trigger or worsen dystonic symptoms provides some relief, as does reducing stress, getting plenty of rest, moderate exercise, and relaxation techniques. Various treatments focus on sedating brain functions or blocking nerve communications with the muscles via drugs, neuro-suppression or denervation. All current treatments have negative side effects and risks.

While research in the area of effectiveness of hand therapy intervention for dystonia remains weak, there is reason to believe that rehabilitation will benefit patients with dystonia. Hand therapy can be utilized to manage changes in balance, mobility and overall function that occur as a result of the disorder. A variety of treatment strategies have been employed to address the unique needs of each individual. Potential treatment interventions included in the past have been splinting, therapeutic exercise, manual stretching, soft tissue and joint mobilization, postural training, bracing, neuromuscular electrical stimulation, constraint-induced movement therapy, activity and environmental modification.

### CASE STUDY

The case study we are presenting is of a musician patient with a 20 year history of Focal Dystonia, diagnosed first as Lateral epicondylitis due to pain in the forearm as a result of the inability of the extensor muscle to inhibit contractions. He was eventually diagnosed with Focal Dystonia and treated with a wide range of treatments including Botox. He self referred himself to our clinic for treatment. Treatment started with stretching of forearm, splinting and eccentric strengthening of the proximal shoulder/ postural muscles. While the shoulder strength improved, we worked on calming pain/ tenderness with myofascial release/ US/ Estim. This was then combined with taping of the volar wrist to provide the inhibitory feedback to the extensor muscles.

Taping was done by keeping the wrist in slight flexion; tape was applied to volar wrist in flexion allowing movement to neutral position only. This position allowed stretching of the extensors muscles as recommended hourly.

The patient was seen 1x week for 5 weeks. Taping was started in the 3rd week, patient was provided with cover roll and leuko tape and trained to tape himself and all precautions for skin care were given. Patient was instructed to stretch extensors every hour while

*(continued on page 22)*



## From the President (continued from page 1)

We have started having a teaching roster for AAHS surgeons and therapists in Kumasi Ghana, and we have openings for you to go there to teach hand surgery and therapy. If you are interested, please contact me at [labtrio@nbnet.nb.ca](mailto:labtrio@nbnet.nb.ca).

### Mission Statement for AAHS; Working Together to Advance Global Hand Care and Education

This is who we are and what we do. We have a great meeting in January in a warm place where new ideas and new speakers are welcomed. Our mission works hand in glove with the mission of the Hand Surgery Endowment which is "To promote global hand health."

### New Opportunities for AAHS Members to Speak at International Meetings

Eighteen members of AAHS taught a precourse the day before

the Brazilian Hand Society meeting in Rio de Janeiro in April 2013. A similar event will occur with an AAHS precourse to be held Oct 15, 2014 before the Argentinian Society for Surgery of the Hand meeting, in Buenos Aires. There is great interest and opportunity for our younger members to teach with the older members at these international meetings. Those of you who are interested in speaking at future precourses please contact Dr. Julie Adams at [adams854@umn.edu](mailto:adams854@umn.edu); Dr. Don Lalonde [labtrio@nbnet.nb.ca](mailto:labtrio@nbnet.nb.ca); or Dr. Mark Baratz [baratzme@upmc.edu](mailto:baratzme@upmc.edu).

### Want to volunteer overseas?

AAHS is making it easier for you than ever. All you need to do is contact us and we will give you all the information you need so you can see your choices. We will also set you up with a mentor who has been there and done that so you feel comfortable if this is your first shot at it.

## CONGRATULATIONS

### 2014 AAHS Research Grant Recipient

**Donald Lalonde, MD,  
Dalhousie University,  
New Brunswick, Canada**

*"A Randomized, Controlled Trial Comparing Combination Therapy of Ibuprofen + Acetaminophen versus Hydrocodone + Acetaminophen for the Treatment of Pain after Carpal Tunnel 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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## Calendar of Events

### 2014

#### January 8-11, 2014

AAHS Annual Meeting  
Grand Hyatt Kauai  
Resort & Spa, Kauai  
Hawaii

#### May 18-21, 2014

XIX FESSH Congress  
Paris, France

#### October 16-18, 2014

Congress Asociacion  
Argentina de Cirugia  
de la Mano  
Buenos Aires, Argentina

### 2015

#### January 21-24, 2015

AAHS Annual Meeting  
Atlantis Resort  
Paradise Island, Bahamas

#### June 17-20, 2015

XX FESSH Congress  
Milan, Italy

### 2016

#### January 13-16, 2016

AAHS Annual Meeting  
Westin Kierland Hotel  
Scottsdale, Arizona

## CODING CORNER: FINGER ARTHRITIS

This edition of the Hand Surgery Quarterly features a round table discussion on finger arthritis. Most hand surgeons prefer to treat this condition conservatively with splint immobilization and corticosteroid injections before considering surgical intervention. Reimbursement for corticosteroid injections includes any type of local anesthesia and the Evaluation/Management (E/M) service as long as it is not a significant, separate service.

For corticosteroid injections of the finger joints, CPT 20600 is reported. When an injection is performed on the same day that an E/M service occurs, however, modifier -25 can be appended to the E/M code to reflect an unplanned corticosteroid injection during initial visits or follow-up visits. However, an E/M visit cannot be billed for planned injections.

According to the 2013 Complete Global Service Data for Orthopaedic Surgery, global days

are not associated with corticosteroid injections into the finger joints. However, a procedure note should be included within the patient's medical record for documentation of anatomic location, site preparation, local anesthetic administration, drug dosages, and patient reaction.

Coding for most finger arthritis surgeries is straightforward. When performing an arthrodesis of the metacarpophalangeal joint, two codes may be utilized: CPT 26850 and CPT 26852. Both codes reflect the work of a metacarpophalangeal joint arthrodesis, but CPT 26852 is appropriate when autograft from another body area is incorporated.

Arthrodesis of the proximal and distal interphalangeal joints shares the same set of codes. When performing an interphalangeal joint arthrodesis without autograft, use CPT 26860. This code includes services such as the insertion of synthetic bone substitutes, arthrotomy and capsular repair of the



**Eon K. Shin, MD**

interphalangeal joint, and release of the volar plate and collateral ligaments. For each additional joint fused in the same operative setting, use CPT 26861.

When autografts are incorporated into interphalangeal joint arthrodeses, CPT 26862 should be utilized. This code reflects the additional work required to harvest bone graft from a separate anatomic location. Each additional joint fused in the same setting is reported by using CPT 26863.

Use CPT 26530 for metacarpophalangeal joint arthroplasty. Synovectomy of the metacarpophalangeal joint, release of the volar plate and collateral ligaments, insertion of a wire for joint fixation, and reconstruction of the extensor mechanism are all included within this global service package. Most hand surgeons, however, will likely use CPT 26531 for implant arthroplasty of the metacarpophalangeal joint. This code reflects the additional work required to insert a joint prosthesis.

Similarly, CPT 26535 and CPT 26536 should be used for proximal interphalangeal joint arthroplasties. Since most hand surgeons insert silicone or possibly pyrocarbon implants for finger arthroplasties, CPT 26531 and CPT 26536 will most frequently be utilized for metacarpophalangeal and proximal interphalangeal arthroplasties, respectively.

### Corticosteroid Injection

20600	Arthrocentesis, aspiration and/or injection; small joint or bursa (eg, fingers, toes)
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### MCP Arthrodesis

26850	Arthrodesis, metacarpophalangeal joint, with or without internal fixation
26852	Arthrodesis, metacarpophalangeal joint, with or without internal fixation; with autograft (includes obtaining graft)

### PIP/DIP Arthrodesis

26860	Arthrodesis, interphalangeal joint, with or without internal fixation
26861	Arthrodesis, interphalangeal joint, with or without internal fixation; each additional interphalangeal joint
26862	Arthrodesis, interphalangeal joint, with or without internal fixation; with autograft (includes obtaining graft)
26863	Arthrodesis, interphalangeal joint, with or without internal fixation; with autograft (includes obtaining graft), each additional joint

### MCP/PIP Arthroplasty

26530	Arthroplasty, metacarpophalangeal joint; single, each
26531	Arthroplasty, metacarpophalangeal joint; with prosthetic implant, single, each
26535	Arthroplasty, interphalangeal joint; single, each
26536	Arthroplasty, interphalangeal joint; with prosthetic implant, single, each
26556	Transfer, free toe joint with microvascular anastomosis

# Panel Discussion: Finger Arthritis

**Moderator:** Marco Rizzo, MD, Mayo Clinic, Rochester, Minnesota

**Participants:** Steven Haase, MD, University of Michigan, Ann Arbor, Michigan

Jerry Huang, MD, University of Washington Medical Center, Seattle, Washington

John Lubahn, MD, Hand, Microsurgery & Reconstructive Orthopedics, Erie Pennsylvania

Kristin Valdes, OTD, OTR, CH, Venice, Florida

**Marco:** Thank you all for participating. As moderator I thought I could throw out some statements and thoughts for discussion and we could build off of those. As we're focused primarily on finger arthritis I thought we could work our way from proximal distal starting with the MP joint. As you know, rheumatoid arthritis is much more common than osteo. In terms of non-operative intervention, I would like to see what people's thoughts are. As I look at my own practice I find that I use Voltaren Gel more and more. John have you been using Voltaren much or no?

**John:** Yes. Particularly for.....maybe a 50 year old construction worker with an isolated middle or an index finger, MP joint that's arthritic, sure.

**Marco:** My patients have reported back to me that it works quite good and.....Steve, Kristin have you had a good experience with it?

**Steve:** I haven't tried it. I may have just learned something new already on this conference call. My non operative interventions for MCP arthritis have essentially been splinting for rest—all my patients with any kind of mild to moderate hand arthritis get a good resting splint, for evening or night time wear at least. I'll also offer patients corticosteroid injections; I've been using Dexamethasone lately. I'll do that occasionally if it provides substantial relief, and if the patient is not yet ready for surgical intervention. I don't really draw the line at any particular number or interval of injections.

**Marco:** Is it a 40mg dose?

**John:** That's what I use.

**Steve:** I use 0.5 mL of 4 mg/mL dexamethasone, mixed with 1 mL of 1% plain lidocaine. I rarely inject the entire amount. I think overall I tend to use a lower dose and a smaller amount for most things, having seen some problems with steroids.

**Marco:** Yes. What kind of problems have you seen? Skin changes?

**Steve:** It's mostly been anecdotal, but when I talk to my partners and other colleagues that have used higher doses—things like Kenalog-40—they've seen more atrophy of the soft tissues and more of the so-called "flare reaction", where patients get a worsening of the pain for a day or two after injection. I have almost never seen that; I think a lower dose seems to keep me away from that.

**Marco:** Kristin do you see flushing and things like that or skin changes with some of the injections or no?

**Kristin:** Well, I'm the token therapist on the panel, so I am seeing people for splinting and, believe it or not, I also do recommend that they ask a physician for the Voltaren; because, again anecdotally, I am seeing people that really report that they have good symptom relief from it. And in fact, some people tell me that that's how they make it through the day. I definitely do a night splint, sometimes day splinting as well to support the joints if someone has flare and also work on joint protection, education, and symptom relief through modalities mainly.

**Marco:** Perfect.

**Marco:** Jerry, we'd welcome your thoughts about the Voltaren. Have you used it much or are you pleased with it?

**Jerry:** Yes, I've used it a couple times. I have a few patients who are worried about the GI effects of systemic NSAIDs as well as long term effects on their kidney. So I have used it for, in particular, on patients with thumb CMC arthritis, who find it quite helpful. I will often prescribe topical Voltaren, but then defer to their PCPs for refills or consideration of supplementing Voltaren with other oral NSAIDs.

**Marco:** Ok. You inject quite often?

*(continued on next page)*



*As we're focused primarily on finger arthritis I thought we could work our way from proximal distal starting with the MP joint.*

**-Marco Rizzo**



**Jerry:** As far as injections, I mostly tell patients the injections are really meant to be a band-aid, if they are here for a really bad flare up that's above their tolerable level of pain. Those are the times the injections will be helpful. I also usually tell them once you get beyond three or four injections, there is research supporting detrimental effects of corticosteroids on articular cartilage. Beyond three or four injections you can potentially accelerate the process side.

**Marco:** John do you have a different approach to rheumatoids and osteos with regard to injections and is your approach on that pretty standard?

**John:** Well no I probably inject rheumatoids as much or more before you leave topicals, occasionally people can't afford full care and whatever and we have a pharmacy that'll compound ibuprofen or almost anything you want as a nonsteroidal and so for those there is Aspercreme you can get over the counter.

Just anecdotally lately I've had some patients say that Biofreeze really helps them. I don't totally understand that but it's like DP or 10's or any sort of counter-irritant.



*I stuck with the dexamethasone, because I see that it actually works just as well in my hands.*

**-Steve Haase**

Helps a lot of people; but I'll inject rheumatoids probably as much or more than I would particularly with an isolated joint.

**Marco:** Yeah our pharmacy is mixing ketoprofen now with different types of Vanicream. It's amazing what they can mix together now a days. Gabapentin and ketamine.

**John:** I think they even put [phenamil].....Well if somebody's really got a horrible pain problem.

**Marco:** I think in my experience Biofreeze doesn't seem to work as well as the Voltaren. I believe the going rate on Voltaren is \$48 or \$42 for a tube. There is also Solaraze which is a 3% concentration which can be very effective, but it's very expensive.

**John:** Pharmacies here like to package three of those large little tubes for about \$75.

**Marco:** That's a reasonable rate.

**John:** Which is not bad because it lasts quite a while.

**Marco:** I agree with you John regarding injections. In rheumatoids I inject as much as non-rheumatoids. I prefer a lower dose steroid much like what you describe. I use 10mg/ml Kenalog.

**Steve:** That's exactly what I used up until about 2 years ago when we had a bad batch of Kenalog that I couldn't push through a 27-gauge needle. Of course, the pharmacy denied all knowledge of a problem, but then they did recall the drug about 2 months after I stopped using it. I stuck with the dexamethasone, because I see that it actually works just as well in my hands.

**Marco:** Does anyone use celestone?

**John:** One of my partners does.

**Marco:** I know there was a shortage due to the fact that they were holding it for infants with lung problems. But I've used that in the past as well.

**Jerry:** Have you noticed the same efficacy with Dex versus Kenalog? My partners will do Dexamethasone only for trigger and DeQuervain injections, and only use Kenalog for intra-articular injections. In my experience, Kenalog appears to be more effective. I am wondering what other's experiences are with that.

**Steve:** Well, having switched completely to dexamethasone for the last couple years, I have found it to be just as effective as I recall Kenalog-10 was, but I haven't studied my outcome rigorously.

**Marco:** Any additional comments on injections and Voltaren or topicals at this point?

**John:** No but just that people come back for more of it so it's got to help them.

**Marco:** Yes. Absolutely.

**Jerry:** Are you putting patients who are on Voltaren, on oral NSAIDs as well or do you do the Voltaren only and worry about additive side effects?

**Marco:** I think you can mix and I don't have any restrictions. Voltaren is an adjunct to me. However, if you read the insert on the Voltaren it's quite scary about things like cross reactivity with other medications and side effects such as patients on Coumadin. But I haven't seen any problems with compounding effect.

**John:** I had one patient tell me that she got an upset stomach with it but in hindsight she was probably using more than she should have.

**Marco:** Moving on to the splinting. Kristin I appreciate your thoughts. What's your preference, what do you think, what kind of splint works best for arthritis for the MP joints?

**Kristin:** Probably a static night splint, made out of the plastic material. Because it puts the joint at rest for the most part. But during

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the day I find that people don't like the harder orthotic material and that they really prefer the neoprene device. Even though it doesn't provide as much support, I think again it's more the fact that hard material gets in the way of daily activities.

**Marco:** For a single joint do you prefer hand-based or form-based?

**Kristin:** For a single joint I definitely prefer hand-based. Then try to keep out as many joints that are noninvolved, it keeps the rest of the hand free.

**Marco:** And for the rheumatoids primarily forearm based?

**Kristin:** Yes, for the rheumatoids predominantly forearm based. Sometimes what I will also do is, even though I'm making it out of the hard plastic material, I will align the digitals and make sure that they have almost "little gutters" that each lie in; and that way it keeps the fingers from being in the ulnar drift position and maintain better anatomical alignment.

**Marco:** Is there still a rule for dynamic splinting in rheumatoids perioperatively?

**Kristin:** Not so much. I use static night splinting for pain relief and deformity correction even perhaps if their digits have as much as a 20 to 30 degree drift. And I've put them in a static night splint for a period of at least a month if not longer; and people have really good relief with that and actually have better alignment. Some patients are sorry that they haven't had a trial of splinting earlier in their onset. But I will have to say that the other thing is I just don't see as much of it as I used to - just because of the oral medication that's so prevalent these days. I've been a therapist for many years and I just don't see the amount of rheumatoid deformities that I used to years ago.

**Marco:** You know the DMARDs have really changed a lot of the real



*So it's almost more as symptoms dictate and that is what I tell them when I give directions for the splint.*

**-Kristin Valdes**

severe deformities that we used to see. Even though at a center like ours we still see quite a bit of rheumatoids, and some folks who are just not responding to the medications, I think they've really changed the overall volume; would everyone agree? John, Jerry, Steve?

**John:** 100%.

**Steve:** Very much so yes.

**Jerry:** I agree. I really don't see a large volume of rheumatoids in my practice, since the rheumatologist do such a great job managing these patients with DMARDs. I still routinely place patients following MP arthroplasty, especially rheumatoid patients with preoperative ulnar drift to help with coronal alignment. I also find dynamic outrigger splints helpful in the first few weeks to help patients with active extension. For post-traumatic or osteoarthritis, I do mostly static extension splinting.

**Marco:** In terms of splinting, again Kristin do you recommend 6 months of splinting? Indefinite period of splinting, or do you say, "Ok try it for 6 months and depending on how things go. What are your formal recommendations?"

**Kristin:** When I first give it to them I tell them - if it bothers them, they shouldn't wear it, but for the most part I tell them that they need to wear it indefinitely. I say wear it as their symptoms dictate. So if they are having a bad day or a flare, that would be an evening they would need to wear it. But if there is a day when they're not having problems and they feel like they want to go without it, they can do that. So it's almost more as symptoms dictate and that is what I tell them when I give directions for the splint.

There was actually just a study, which has never been done before, on the use of paraffin for people with arthritis. And it found that they had greater relief of pain, as well as range of motion. So again that's something that a lot of times I'll recommend. People can go to Walmart or to Target and buy a home unit; so I always recommend that. I usually do a trial in the clinic and if they like it, then I recommend they try it at home. Again, anything that they can do to improve range of motion and get pain relief usually improves hand function overall.

**Marco:** Once daily?

**Kristin:** As needed. Usually at least once a day but occasionally if I have somebody who will tell me that their hands are really painful, they can do it a few times during the day.

**Marco:** Ok. Interesting.

**John:** I had sore knuckles and have gone over to the therapy department and put my hand into paraffin and it feels great. I have had people say that it didn't do anything for them. Like Kristin said, give them a trial first before they buy one.

**Marco:** Sure.

**John:** They're only about \$35. That's about what they cost here at Target or Walmart or Kmart.

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**Kristin:** Right.

**Marco:** Do you think there's a different between the paraffin and the corn that folks are using?

Kristin, is it the same idea in your perspective?

**Kristin:** No I think the paraffin and the theory behind it is that they can tolerate a higher degree of heat because it's specific gravity. The paraffin it's actually set at about 132 degrees; so I think that's the benefit of the paraffin.

**John:** So when they mix it with the mineral it only gets so hot right? They can't burn themselves?

**Marco:** Yeah.

Kristin: Exactly. Even though there are some people who still don't tolerate it very well. If that's the case, I'll put saran wrap on their hand first and then dip it, and that seems to work. I've never had somebody say it's too hot after I do that.

**Marco:** Well thank you. Is it safe for me to say that an arthrodesis for the MP joint of the fingers is not an ideal plan A for arthritis?

**Steve:** I agree.

**Marco:** Yeah.

**John:** I think a construction worker makes sense.

**Marco:** One of the complaints I get are that patients are a little bit frustrated with the lack of dexterity with the abduction of the finger.

**John:** I've had one recently and the man didn't really seem all that happy with it although he'd had an arthroplasty and it would have broken 3 or 4 years.

**Marco:** Well that's the dilemma we can all appreciate.

**John:** You wouldn't have been happy either.

**Marco:** Now the arthroplasty for osteos, I think that the modular implants do much better than they do for the PIP's from my experience. What do you think Jerry or Steve?

**Jerry:** We do have a skewed population at Harborview with the large majority of MP arthritis from post-traumatic arthritis, with some osteoarthritis. In this population, we recommend arthrodesis for the IF MP joint, due to the enormous stresses on the joint for lateral pinch. Otherwise, I agree. Most patients would prefer surgery that preserves some motion. I do have a discussion with patients about concerns for progressive ulnar deviation deformity for the IF and MF MP joints though.

**Marco:** Yeah.

**Jerry:** My preference has always been doing MP arthroplasty, even the ones that have developed ulnar deviation deformity over time, following their arthroplasty. Most of those patients are quite happy, being able to maintain some degree of MP arc of motion. In general, they are happier than patients who have had MP arthrodesis. It's important to set patient expectations though and have that discussion about potential coronal deformity and implant failure.

**Steve:** I think I'm right with you. I don't see a great volume of osteoarthritis in the MP joint, but when I do I've typically gone with a surface replacement arthroplasty. I have not ever done an MCP arthrodesis in the fingers. And I've seen patients pretty universally satisfied, even in patients where the bone stock is not great. I did have one patient with pretty remarkable subsidence that required revision, but she is still content with the motion we were able to preserve, and with the pain relief. So I have not had to go an arthrodesis.

**Marco:** John, additional thoughts?

**John:** I agree I guess and the younger patient was really good [bone stuck] but in an older individual with osteopenia boy.....feel like going 'still works'.

**Marco:** You're pretty happy that's

what I was going to lead into.

**John:** If it breaks you can take it out and leave them with a reception or....put a new one in.

**Jerry:** Agree.

**Marco:** Are you concerned about silicone and border digits John at all or is that not an issue.

**John:** I'm concerned about anything in a border digit.

**Marco:** Yes.

**John:** Again I think.....I look at the bone [stock] and if there's osteopenia I do silicone. If they've got healthy bone stock I'd probably go with pyrocarbon or one of the metal on plastics.

**Marco:** Sure.

**John:** Plastic on metal I guess.

**Marco:** In terms of rehabbing following MP arthroplasty, have you been fairly satisfied with the motion afterwards?

**Kristin:** I am definitely satisfied with the motion but again bearing what type of arthroplasty they have, is that one of the things that I've learned as a younger therapist is the more motion they have, the less stability they have. So with working on getting more motion at the small finger and your ring finger and if we would get 50 degrees in motion that the MP joint of the index finger with the old silicone arthroplasty that was what we were hoping for, because with them present too much then they would have laxity and then the joint would be unstable again. So I think the advancement of the new arthroplasties have allowed people to have better motion than they used to years ago. I think that's an advantage of having the newer arthroplasty; I'm seeing people have more motion and they are happy with it.

**Marco:** What is your preference for the surgical approach?

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**Steve:** When I've done pyrocarbon implants, I've typically done a tendon-splitting approach and I've been happy with that.

**Marco:** John when you do a rheumatoid what's your approach? Do you prefer to go ulnar to the extensor tendon or radial?

**John:** Almost always release the ulnar intrinsic and reconstruct the radial side.

**Marco:** The soft tissue balancing is so critical in those cases. Jerry, your thoughts? Does anyone in the panel do intrinsic transfers? I don't personally, I prefer just the release.

**Jerry:** In rheumatoid patients with severe ulnar drift, I routinely perform ulnar intrinsic releases and centralize the extensor mechanism. If there is severe ulnar subluxation of the extensor mechanism, I prefer going ulnar and releasing the ulnar sagittal bands and imbricate the radial sagittal band at the end of the procedure. For post-traumatic MP joints, I prefer tendon splitting. I have not done cross intrinsic transfers.

**Marco:** And I know John Stanley reported his longer term outcomes of MP arthroplasty and one of the variables that lead the long better longevity is the cross intrinsic transfer, but certainly it's debatable.

**John:** You know every now and then you get a patient with Lupus or something like that where the joints are way off - particular if the joint surfaces are still pretty good, and the muscles still look pretty good. I've done them and anecdotally got enough that I could probably pull a few and show them in a conference, but I wouldn't do them on one of those stiff rheumatoids. I don't think it's going to accomplish anything.

**Marco:** Personally, I'm reticent to do the modular implants on the rheumatoids unless they have very good bone stock and they're very well controlled disease. I'm more inclined to do the silicones in those

patients; and we can talk more about that but in terms of rehab and recovery, you place them in a post-op splint for how long and when do you start motion, and how do you proceed?

**Steve:** Since I don't see a large volume of rheumatoid patients in my practice, I'll defer to the others on this one.

**John:** Well long ago I did the old traditional dynamic splint with the outrigger, but now I just do a static splint for about 3 weeks and then gradually start to move them with a removal. I wouldn't say I would never use an outrigger. Maybe somebody who was only deviating I might put something on to dynamically hold them more radially but for the most part a static splint works pretty well.

**Jerry:** Yes. I have been placing patients into a plaster splint in full extension for about a week or so. I have still been writing referrals for a static splint as well as dynamic outrigger. I think a lot of this is for coronal soft tissue balance that's really helpful. I probably would do a short arc of motion 0 to 30 for the first 4 weeks. I agree with what Kristin mentioned. I really want to make sure they're quite stable and there are no concerns of destabilizing with too much motion. And I'm ok not getting compete MP flexion. The goal is to achieve 50-60 degrees of MP flexion. The dynamic outrigger is used in the daytime for 4 weeks total. Static splinting for 4 weeks except for therapy and then another 4 weeks of night-time splinting and between activities.

**Marco:** I'm inclined to agree. You know I like the static splinting for 3-4 weeks even, much like what you described John. I still do use dynamic splinting on occasion so it's still an important consideration but less and less utilized. I've gone and visited a few places now and there's such a wide variability on how people do post-operative



*.. long ago I did the old traditional dynamic splint with the outrigger, but now I just do a static splint for about 3 weeks ...*

**-John Lubahn**

management. I don't know if I'm over treating some of these or under treating. Most people don't immobilize for more than 4 weeks though. Some started moving very early; much like what you're describing as well Jerry. So with protection of course. It's hard to really study this. Kristin, what do you think works best for post-op?

**Kristin:** Again I think it depends somewhat on the patient. I always do static splinting and if they have some deviation then I will put a dynamic component and maybe a rotational component on it as well. It also depends on how much laxity there is, but typically yes, I usually start with the dynamic day splint and then the static night splint. But you have to consider the cost factor and that requires 2 orthotic devices and that can be expensive even for somebody's 20% that can be higher than what a lot of people want to go.

**Marco:** Yes. That's a good point. In terms of the risk in these patients as the rheumatoids in particular. John, if they have a lot of radial deviation, but no pain at the wrist, what would you recommend? How do you address?

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**John:** Is it somebody that has MP problems to and you're going to address both?

**Marco:** Yes. They have a lot of radial deviation and the traditional ulnar deviation of the hand that we see.

**John:** I think the real dilemma is when they've got radial deviation and a fairly painless functional wrist.

**Marco:** Exactly.

John: MP joints then.....that's a real dilemma....gosh in an elderly individual who's knuckle really hurts and their wrist doesn't hurt at all and I know it's going to be a, biomechanically, lousy construct I'll still do the MP's but in a younger individual, which you almost never see anymore, I would do a radioscapulunate fusion.

**John:** I just put a couple of screws across, and I've had pretty good success with those. I don't do a long pin down the middle. I don't do a plate at the top. I just do a stable the proximal role.

**Marco:** That's such a good point. The ones who are symptom free, it's often hard to convince them that anything should be done. Bob Beckenbaugh taught me a simple Z-lengthening of the ECRL that you could do. In addition, you could frankly just release the ECRL and of course there's the well-known Clayton transfer where you take the ECRL and try to bring it over to the ECU. As a word of caution I've tried to transfer at times, and sometimes the ECU tendon is pretty volar so it's not always so easy to reach it and feel like you've got a satisfying reconstruction and those cases I've released the ECRL. Generally speaking it seems to be ok although I've had some where the radial deviation persist. It's always, to me, I think a little bit more comforting when they have symptoms at the wrist and you can make a legitimate argument for doing something like the partial wrist fusion like you said John.

**John:** The transfer makes a lot of sense when balance is tough and I always worry about overcorrecting it.

**Marco:** That's true and I think that in some cases, revision cases I find that the soft tissues for the centralizations can be quite limiting in terms of what you have and quite dissatisfying. You tighten the ligaments on the radial side and I'd be interested in hearing what the panel's preferences are. Of course you can do it through drill holes or K-Wire holes, or you could just anchor it and then plicate on itself you know. Put a suture and anchor it at its insertion at the metacarpal and then grab a good bite of it and hog it down. But I think that one of things I sometimes will do, although this is almost the last resort is I'll suture the central tendon at the base of the index finger dorsally through a K-Wire hole and anchor it there so it doesn't slide off so much. You can plicate the tendon too. You can tighten it so as to help keep the MP joint more extended as well; but I say that with caution because if you do too much you can obviously limit their MP flexion.

What I find to be the key to success with some of these is, how disease free are they distally? You know, if they're PIP's and DIP's are not so diseased I think they clearly do much better than if they have concomitant disease in those other joints as well.

Finally, I'm interested in everyone's opinion but I don't know that the arc of motion changes much in these patients – it just shifts from more flexed to extended. But the patients seem to like that. They like the ability to have their hands opened up, even though the true functional improvement is debatable. They're so frustrated with the flexed posture that they've had for so long, they seem to welcome the extended posture.

**Steve:** Well that's certainly been our

experience in Michigan with the rheumatoid population. And I've seen that with the osteoarthritis as well. They may not get outstanding range of motion, but they have a lot less pain and are very satisfied patients.

**Marco:** Jerry what are your thoughts on that?

**Jerry:** Well I agree with others that their total arc of motion is often no different than preoperative total motion. The main benefits are the pain relief as well as more finger extension. With regards to ADL's I think it's really made a big difference for them. Cosmetically, they also like having their hand flat and extended. Sometimes, you can see a substantial increase in range of motion post-operatively.

**Marco:** John what do you tell patients about recurrence in terms of what to expect 5-10 years down the line?

**John:** I tell them that depending on how active they are, the implants will fail and how well their disease is controlled - they may need revision. I don't know how accurate that is with [dmarks] if they get it under control.

**Marco:** Well certainly a point of discussion. Any final thoughts on the MP joint as we move distal?

**Marco:** Ok. Well let me put out a statement for the PIP joint to say that the fusion is a good procedure for the PIP joint, arthritis. Would everyone agree or disagree?

**John:** Is it rheumatoid or in general?

**Marco:** In general.

**John:** I recently had a construction worker who just would not let me do it and I did an implant on him. I think I agree with you from the surgeon standpoint.

**Steve:** I would agree with that, too. However, I think it's a hard sell for most patients to take away motion when they really want their finger

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to just be “normal” again. For the osteoarthritis patient, when I’ve been able to talk someone into it, they’ve been happy. But it’s hard to talk them into it. When they hear about all the arthroplasty possibilities, even though we try to paint the picture as a little more uncertain, with questionable implant longevity, they like the idea of maintaining motion; it’s very hard to convince them otherwise.

**Jerry:** I think that osteoarthritis patients mostly a really good functional arc of motion, so their presenting chief complaint is usually their pain. I think that’s the toughest population to counsel. I think even if you paint a very grim picture as Steve had mentioned, I think they still would prefer take the chance. Because despite the complications in the literature, I think most patients will choose an arthroplasty knowing that there’s a chance of failure and possibility of a revision to a fusion.

**Marco:** I think you’re touching exactly on an issue that I wrestle with as well. Study after study shows that it’s hard to prophesize how much motion can be obtained. The PIP is such an unforgiving joint. And so I tell the patients, “Look your pain reliefs pretty predictable but I can’t predict how much motion you’re going to have. You could argue some motion obviously is better than no motion, but the specter of failure down the road and reoperation down the road is pretty heavy with the PIP joint.” And you’re right, it’s a tough sell to the patient. A fusion is quite scary to them. I don’t have a lot of tricks on how to optimize range of motion after PIP arthroplasty. We’ve tried a wide variety of different rehab protocols. John do you have any thoughts. Obviously there’s a lot of variability and the pathologies that we see.

**John:** I think it’s got to be just collagen and a lot of individual

biochemistry. It’s just anecdotally I let the father of the head nurse on the orthopedic floor a few years ago who was in his 70’s. He’d had a couple of MI’s and he’d had a really painful arthritic small fingered PIP joint. He had a total knee that worked well and he just wanted an implant and I put a metal on plastic one in and that was really lucky I got a great result. He lived about 3 years. He had about 70 or 80 degrees of flexion and it didn’t hurt him. He only lived here 4 more years, but the average heavy laborer I’m convinced that implant would have failed probably at 5 years so. Was your question more therapy?

**Marco:** Oh no I certainly have appreciated that. You know I saw one back just this week, 6 years out and an index finger off. And then this is another topic of discussion which I’d like to open up, is the index finger PIP. I did a PIP implant with pyrocarbon, and she loves it. She’s got a stable implant, stable x-rays, excellent range of motion to 90 degrees.



*For the index finger, I am currently recommending PIP joint fusion. In the other digits I have been pretty happy with arthroplasty but I think it really comes down to patient expectations.*

**-Jerry Huang**

**John:** The next patient’s got a 30 degree fracture, plus it’s from 30-60  
**Marco:** Exactly.

**John:** You’re sitting there thinking, well it used to be crooked, it used to be off to the other side. Now it’s nice and straight and it doesn’t hurt anymore. Why don’t you like it?

**Marco:** And I think that with a patient is critical for those because I think that just have to make sure they’re realistic. I’ve learned to try to temper their expectations. Patients are not typically unhappy because of pain. They hate it because we didn’t achieve their desired expectations with regard to motion. What do you think Steve?

**Steve:** I think you’re correct. I’ll just put in a plug for silicone with the PIP as well. I’ve done that most recently in an elderly lady with a fair bit of dementia who really didn’t want a fusion. She’s doing great; I’ve replaced 3 or 4 PIP’s, at least a couple on each hand. She often would forget to wear her splint, and forget to observe her postoperative restrictions, but ended up doing well anyway. Her pain relief is excellent. So I think that in the patient with poor bone stock, who’s got terrible pain and doesn’t want to live with it anymore, even in a fairly unhealthy patient or a very elderly patient, I think it can give them several years of pain reduction and pretty good function.

**Jerry:** For the index finger, I am currently recommending PIP joint fusion. In the other digits I have been pretty happy with arthroplasty but I think it really comes down to patient expectations. I had a patient that was in her 60s with severe osteoarthritis in her IF PIP joint with ulnar deviation deformity. After discussion of PIP arthroplasty vs. fusion, she wanted to proceed with arthroplasty as she wanted to preserve motion. She did

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great for 2 years with no pain and excellent functional arc of motion. But at 2 year follow up, it was a routine follow up with no complaints of pain. She did note increased swelling for a few months. Her radiographs showed complete subsidence of the implant on the proximal phalanx as well as a periprosthetic fracture with pistoning of the implant. We ended up converting to a index PIP fusion. Interestingly enough she came back for her middle finger and despite the index MP failure ,really left it up to me as what I thought was ideal for her. She was not unhappy or upset with the fact that index finger had failed, but I think it was the initial expectation that there is potential for failure.

**Marco:** That's encouraging. Oftentimes when I discuss with patients I say, you know I always want to try to figure out what's the answer to the question if it fails, what are my options and revision versus fusion? We looked up a series of fusions after failed arthroplasty and we found that even though we couldn't get predictably as good a fusion rate as we would with primaries as you would expect, that a good percentage patients who did not heal remained quite satisfied. Even as they developed a pseudarthrosis, we serendipitously backed into a result where there was a jog of motion and pretty good pain relief. I don't know if everyone's experience has been similar with that.

**John:** Sometimes they just reset them and leave them.

**Marco:** Jerry? What's your preference? Kwires?

**Jerry:** I frequently use 90-90 wiring....part of the reason I like doing that because I feel like for rotational alignment, it is much easier for me; I can do fine adjustments even after placement of the hardware. For a patient with poor bone quality where I'm worried

about the wire actually cutting through or for revisions, I've been doing tension band wiring.

**Marco:** John do you have a preferred method for fusion?

**John:** My fellowship wrote about interosseous wires where you do a loop around in a kwire to hold it and.....I think I've involved Peter Sterns and do tension band. It's probably my preferred technique. Occasionally I'll put a screw across. Has everyone taken the self assessment exam? How did they answer the question on how much flexion defused the PIP joint in the index?

**Marco:** Yes. 40 to 60, was 40 one of the answers?

**John:** Yeah it was.

**Marco:** Yeah I used 40.

**Marco:** I noticed Peter's article. He fuses them pretty straight.

**John:** I would have said 0 to 20.

**Marco:** That's a good point.

**John:** Cut it down to 40, I've got people....I think they individualize it. What do they do for a living?

**Marco:** That's a good point. Steve what do you think?

**Steve:** I'll have to recuse myself since I wrote that question. I was going for the textbook answer, but I agree. I think you have to individualize it for the patient; and I think the correct answer was 40. But it may get thrown out if all the smart people didn't agree that was a good answer.

**John:** I forget it. If you take it this year it tells you right away how you did.

**Marco:** That's a good point.

**Jerry:** I'm thinking individual. Patients want to go back and play golf or racquet sports, a little bit more flexion is preferred. But I had a patient with post traumatic small finger PIP joint, fixed at 80 degrees and she wanted an almost completely straight even though it's her small finger.

**John:** Somebody plays the piano or something.

**Jerry:** Yes. She's a classic pianist and that's what she wanted to be able to do is to play the piano again.

**Marco:** I've seen a handful of these patients who come back with a fixed swan neck deformity following arthroplasty. And when I first saw one, maybe 8 years ago, I was looking at the possibility of fusing these in a better more functional position because these patients are quite frustrated. But the caveat is that most of them are pain free, and an implant, especially one that's been previously cemented is challenging to remove. A reasonable alternative to fusion that Bob Beckenbaugh taught me is a superficialis hemi-endsis on these patients and maybe V-Y lengthening of the extensor. And this effectively functions like a soft tissue fusion where you can put them in a more functional position. We've looked at a series of these and we've been pleased. The patients are pretty happy and it's a much simpler solution for an otherwise potentially complicated surgical problem. I don't know if anyone has any experience with things like that.

**Steve:** I've had no experience with that. I guess now I know where to send them, if I see that.

**Jerry:** Yeah I'll be sending them over to Rochester as well!

**Marco:** I just threw it out as a lesson that I've learned and something I've been encouraged about. Finally, I think we could touch briefly on the DIP joint. You know one of the things that, obviously I think in my opinion motivates patients for surgery is the deformities. They're not in as much pain as they are frustrated with the deformity. How do you talk a patient through that Steve in terms of their proposed treatment options?

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**Steve:** I would agree it's not usually a big focus of pain; although certainly pain enters into it. Usually when I approach these patients I advise them that pain is really the main indication for wanting to intervene unless the deformity is severe, because it's difficult to deliver a perfect result. My approach has varied a little bit over the years. My partner's a minimalist and from him I've learned that you could just use a couple of K-wires. More recently I've gone to a headless screw, despite the fact that it doesn't usually allow me to get much flexion at the joint. Most of my patients really want it to be almost completely straight so that doesn't seem to be a problem. They're tired of having crooked fingertips; they'd rather have it straight. So I think that sometimes a headless screw can deliver that. In my experience I've used more of those in the last couple years than I have before.

**Marco:** Do you have preference on them? Do you like the Acutrak mini fusion screw?

**Steve:** I've been using the Acutrak fusion despite some of my frustrations with it not truly being a cannulated set, and being a little concerned when I take the K-wire out and try to get the screw in the same spot. It's always that moment of panic where the finger is kind of flopping around, and you feel like you've lost your alignment. But I find that once it starts to compress a little bit you can make minor adjustments and then compress it a little more, and it really does do well in my limited experience.

**Marco:** You know Kevin Runfree presented at the academy a couple years back a technique that involved just percutaneously placing the screw (retrograde) across the joints. And not doing any carpentry at the DIP joint; I haven't had the courage to do that. I tend to still denude the cartilage Has anybody

had any experience with just the percutaneous, the compression screw?

**John:** I had a couple where it kind of gabbed and I might as well have just done that and it worked out ok.

**Marco:** It seems like the non-unions don't invite so much trouble as you would expect.

**John:** If you've got a good solid screw they don't but if you had a couple of kwires.

**Marco:** Jerry what's your preference about managing surgically in terms of technique.

**Jerry:** For technique, I think it really is patient preference. For the most part I do feel fusion in full DIP extension with a single screw gives stable fixation. In our hospital, we do have approved SBI 2.0 and 2.5 mm headless cannulated compression screws. More and more implant device companies are making smaller and smaller compression screws. I believe Synthes has a 2.4 mm screw as well. That's my preference. If a patient wants 20 degrees of flexion or very small bones, then I'll use K-wires. I keep it pretty simple.

**John:** You can get 20 degrees with a cannulated screw

**Marco:** That's a good point John. Do you have any problems with the nail? I haven't knock on wood but I worry about some of the screws irritating the nail.

**John:** You have to use the small one.

**Marco:** Yes.

**Jerry:** I have also seen patients where the 2.0 mm screw is bigger than their medullar canal, so for some of those I use Kwires to be safe.

**Steve:** Yes. Before the smaller screws were out, several years ago, I tried it with just a mini-Acutrak, and I got scared away from the screws for a while until smaller ones were available.

**Marco:** Yes. But for the thumb I think sometimes Kwires work better. It allows more variability in position and have a long talk ahead of time with them. We hash out what's better. And the nice thing about Kwires is that they're more forgiving. If you're not happy with the position you can redo it and tweak it. Screws are less forgiving and it's hard to make some changes. Although I've had success with both, and it's a pretty darn predictable outcome for IP fusions. I think most patients are quite happy

One last thing about hemiarthroplasty's for the PIP. I don't know if anyone has.....I've done a few now. I went to the IFSSH meeting in 2010 and saw there was a presentation from a fellow in Switzerland who presented hemiarthroplasty's with pyrocarbon as a means to obviate some of the frustrations with the distal component and also preserved bone stock, and hopefully minimize some of the catastrophic loosening that we see.

**John:** I've done a couple in MP joints.

**Marco:** Have you been pleased with that?

**John:** Yes I have. Worked out ok. Haven't done any MP PIP joints.

**Marco:** I've done a handful. I've been pleased so far. One patient I did a year and a half ago on her left side asked me to do her index and long on the right. And she's recovering now, just recently two months out. But she's got a little bit more pain on the right now. Maybe because I did both fingers but....anecdotally I am hopeful that she'll be fine. She loves her left side. Now again the same business with no real improvement with in motion, and it's more of a pain relieving endeavor. Makes the surgery much more simple and it does preserve bone stock for future surgeries if need be.

**Steve:** It was a good discussion. Thank you Marco.



# 2014 AAOS Clinician Scholar Program

The AAHS will again sponsor a participant for the 2014 AAOS Clinician Scholar Program.

The AAOS/OREF/ORS Clinician Scholar Development Program (CSDP) is an annual program seeking applicants in their PGY2-PGY 5 residency years, in fellowships, and Junior Faculty through year three who have the potential/desire to become orthopaedic clinician scientists. Up to 15 participants are selected to participate in the 1.5 day CSDP training workshop. CSDP topics include the following:

- ♦ Overview of the Clinician Scientist (Scholar) Timeline
- ♦ Peer Review Process
- ♦ Grant Writing 101
- ♦ Navigating the National Institutes of Health
- ♦ Resources of the NIH Intramural Research Program
- ♦ Collaborating with Scientists
- ♦ Career Training for Basic Scientists and Clinical Scientists
- ♦ Establishing a Mentor
- ♦ New Initiatives and Alternate Approaches
- ♦ The Orthopaedic Research Society (ORS) in the Development of the Clinician Scientist
- ♦ The Orthopaedic Research and Education Foundation (OREF) in the Development of the Clinician Scientist
- ♦ OREF from an MD Perspective
- ♦ Role of the Department of Defense (DoD)/Defense Advanced Research Projects Agency (DARPA)
- ♦ The Surgeon Scientist: A Chairman's Perspective
- ♦ A Personal Perspective: Balancing it All

Notice of applications will be sent to AAHS members as soon as they are available.

## From the 2012 AAHS Sponsored AAOS Scholar

*Participation in AAHS sponsored events greatly helped shape my career so far. I vividly remember when I first met Dr. Steve McCabe during one of the meetings and how approachable he was, and motivated me to be a clinician scientist. Participating in the Clinician Scholar Development Program as an AAHS sponsored candidate was yet another one of the wonderful educational opportunities I cherish. It was great to learn from established clinician-scientists who had many tips and pearls of being productive as scientists, but also successful as clinicians. Meeting residents and fellows who shared similar interests and sharing our struggles and success certainly made me feel that I was on the right track. The connections I made by participating in the program has been invaluable part of my research and clinical career so far, and I wish that residents and fellows consider this program to enrich their experience as clinician-scientists.*

**- Min Park**

Visit the AAHS Website: <http://handsurgery.org>



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# AAHS Job Board



To include your job posting on the AAHS website and in the next issue of Hand Surgery Quarterly, please visit <http://handsurgery.org/job-board.cgi>.

## Orthopaedic Hand Surgeon in Westchester County, New York

**Date Available: Immediate**

Description: Specialty Orthopaedics is a five surgeon and two PA orthopedic group with specialists in joint replacement, sports medicine, foot and ankle, and spine surgery. We are a university affiliated private practice 25 minutes north of New York city.

Our offices are state of the art and have full EMR and imaging capabilities. We are recruiting a hand surgeon to join our practice and serve as Director of Hand Surgery at a regional university affiliated hospital.

Contact:

Mary Grogan

Specialty Orthopaedics, PLLC

600 Mamaroneck Avenue, Suite 101

Harrison, New York 10528

office (914) 686-0111

fax (914)686-8964

[www.SpecialtyOrthoNY.com](http://www.SpecialtyOrthoNY.com)

[SBZDOC@aol.com](mailto:SBZDOC@aol.com)

## Orthopedic Hand Surgeon Opportunity in Indianapolis, Indiana

**Date Available: Open**

**Location: Franciscan Physician Network**

Description: Franciscan Physician Network (FPN) - Central Indiana is seeking a Board Certified/Board Eligible Orthopedic Hand Surgeon to join its growing orthopedic group.

The ideal candidate will be fellowship trained in hand surgery. This position is a blend of General Orthopedic and

Orthopedic Hand Surgery. Franciscan Physician Network, Central Indiana Region, is based in Indianapolis and is a partnership of over 225 physicians and advanced-practice providers work Franciscan St. Francis Health. A career with the Franciscan Physician Network offers work-life balance and the following:

Competitive compensation plan including income guarantee, with bonus incentives; Generous start-up bonus; Relocation allowance; CME stipend plus 5 paid days; Full benefits package, including health, life, dental and vision; Retirement options.

Franciscan Physician Network has more than 750 physicians at 260 practice locations, who care for more than three million patients annually. This organization brings together, under one name, the many physician groups associated with Franciscan Alliance's hospitals and various access points all across the system.

Franciscan Alliance is one of the largest Catholic Health care systems in the Midwest and has a number of nationally recognized Centers of Health Care Excellence.

As the nation's 13th largest city, Indianapolis offers everything you could want in a large, metropolitan city, together with the friendly environment expected from a small community. Locals, as well as visitors from around the world, flock to Indianapolis to see:

The host of the 2012 Super Bowl; The world-famous Indianapolis 500 and the

Allstate 400 at the Brickyard NASCAR race; The Children's Museum of Indianapolis - the largest children's museum in the world; Indianapolis Zoo and White River Gardens - the only accredited combined zoo, aquarium and botanical gardens; Indianapolis Museum of Art - one of the largest general art museums in the nation; Indianapolis Symphony Orchestra at the Hilbert Circle Theatre; Countless national and local theaters and dance troupes, such as Indiana Repertory Theatre, American Cabaret Theatre, American Cabaret Theatre, Indianapolis Civic Theatre, Dance Kaleidoscope and more

Contact: Jamaul Riley

Physician Recruitment Specialist

Franciscan Physician Network

[jamaul.riley@franciscanalliance.org](mailto:jamaul.riley@franciscanalliance.org)

1040 Sierra Drive, Suite 1200

Greenwood, Indiana

317-528-8776

## Orthopaedic Hand Surgeon

**Date Available: Immediate**

**Location: The University of Texas**

**Health Science Center, San Antonio**

Description: The nationally recognized Department of Orthopaedic Surgery is seeking an individual for a full-time faculty position at the Assistant or Associate Professor level. Academic rank will be commensurate with past experience. Responsibilities will include involvement in clinical service, teaching and research activities. Employment within the Department of Orthopaedics at UTHSCSA offers a competitive salary and an attractive benefits package. The applicant must be board certified/board eligible with fellowship training. A Texas License will be required. The University of Texas Health Science Center at San Antonio is an equal employment opportunity/affirmative action employer. All faculty appointments are designated as security sensitive positions.

Contact: Robert H. Quinn, MD

Chair and Residency Program Director  
Department of Orthopaedics - MC 7774

7703 Floyd Curl Drive

San Antonio, Texas 78229-3900

[QuinnR@uthscsa.edu](mailto:QuinnR@uthscsa.edu)

## HAND SURGERY ENDOWMENT

The Hand Surgery Endowment has adopted a primary mission to promote global hand health. The Endowment's initiatives to support this mission include providing research grants, supporting international volunteerism activities in collaboration with Guatemala Healing Hands Foundation and Health Volunteers Overseas, and granting the AAHS Vargas International Hand Therapy Teaching Award. The HSE Board of Governors hopes to expand on its offering in the years ahead.

Please consider making a contribution to HSE and its primary mission to promote global hand health at <http://handsurgery.org/endowment>. Contributions are tax deductible and donors are acknowledged annually for their generosity at the AAHS Annual Meeting.

**DONATE ONLINE**

# A Report from Ghana

Neil Salyapongse, MD

The following is an excerpt from the September 2013 issue of *KATH HVO Hand Surgery* from Dr. Salyapongse on his trip to Ghana. To read the full report please visit the AAHS website: <http://handsurgery.org/multimedia/files/2013/KATH-Report-2013.pdf>

"A surgeon may not always be right, but a surgeon is always certain," or so one of my mentors was fond of saying. By that measure, my decision to head to Ghana as part of the Health Volunteers Overseas Program was incredibly un-surgeon-like. I knew that the decision felt "right"; here was a program at a teaching hospital with fledgling residencies in orthopedics and plastic surgery. My partners at the University of Wisconsin are, without exception, regular participants in international collaborative surgical programs. My parent organization, the American Association for Hand Surgery (AAHS) declared last winter that one of our focuses would be on Global Hand Health. Despite this, doubt more than certainty crept into my mon-

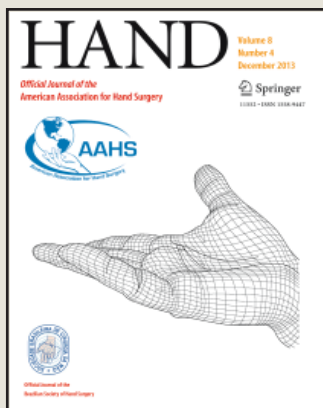
key mind whenever I contemplated making this trip. I wondered whether I could bring any useful knowledge (would my experience and skillset be too esoteric and technology-driven); I doubted I could teach anything beyond what their professors already knew (they are fully trained in European models); lastly, despite having travelled a bit internationally, I feared the unknown of a new country. Blame too many adventure stories as a youth.

Nevermind that Kumasi is a city of roughly 2 million, that the teaching hospital (Komfo Anokye Teaching Hospital, or KATH)



houses 1000 beds, and that a recent report on internet connectivity suggested that Africa (and it seems Ghana) will "leapfrog" ahead in connectivity since it relies heavily on unwired, mobile broadband. Experience would soon prove which pre-conceived beliefs held true and which I would need to change.

## Download HAND on Your Mobile Device



*HAND* is the official journal of the American Association for Hand Surgery. *HAND* is an international peer reviewed journal which combines multidisciplinary expertise from surgical, medical, hand therapy and other specialties to advance the quality of care and health of patients with hand and upper extremity pathologies.

Download the *HAND* journal mobile app! The app is available to AAHS members for download on Apple devices in the App Store by searching for "HAND Journal" or "AAHS Journal", or by scanning the QR code below, and provides instant access to all current and past issues of the journal.

Once the app has downloaded to your device, you will need to login with your personal AAHS username and password once for authentication (contact the AAHS administrative office to obtain your personal username and password).

Members can use the app functions to browse volumes and full text articles, search for work by specific authors, and more.



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# LEADERSHIP PROFILES

## JONATHAN ISAACS, MD



Jonathan Isaacs, appointed this year as Junior Member at Large on the AAHS Board of Directors, has been an active member in the Hand Association since completing his hand and microsurgery fellowship at Duke University. After being introduced to the AAHS by Dr.

Wyndell Merritt, Jonathan recalls being immediately drawn to the diversity and creativity that distinguished the AAHS from other organizations. His involvement soon evolved to serving on the editorial board for HAND and participating on the membership and annual meeting program committees. Most recently he was asked to serve as Vice-President on the Board of Governors for the Hand Surgery Endowment.

Jonathan's interest in education and research extend beyond the Hand Association. He has been on faculty of the Department of Orthopaedics within the Virginia Commonwealth University Medical Center in Richmond, Virginia since 2002 and now serves as Chief of the Division of Hand Surgery. He runs the Orthopaedic Microsurgery Lab and has published multiple scientific and clinical papers primarily on nerve regeneration. These efforts were honored with the Herman M. and Vera H. Nachman Distinguished Research Professorship which he holds. Though nerve is his primary interest, he has published multiple manuscripts and chapters on other hand and wrist topics most notably as Co-Editor of the text *Arthritis and Arthroplasty: The Hand, Wrist, and Elbow*. He is involved in several other medical societies including the ASPN, ASSH, and the Virginia Orthopaedic Society where he just completed a term as president.

Though active in medical organizations, teaching, and research, Jonathan maintains a full time clinical practice within the VCU Health System. He enjoys all

*He enjoys all hand and wrist surgery but has specifically focused on microsurgical reconstruction and peripheral nerve surgery including brachial plexus.*

hand and wrist surgery but has specifically focused on microsurgical reconstruction and peripheral nerve surgery including brachial plexus. He recently established the Upper Extremity and Peripheral Nerve Center at VCU. His efforts have been recognized by his peers within the University and Richmond community with several

*(continued on next page)*

## ROBERT J. SPINNER, MD



Dr. Robert Spinner is the current secretary of the American Association for Hand Surgery. He has been a member of the AAHS since 2008. His father, Morton, was a hand surgeon. Rob was born and raised in North Woodmere, New York. He was graduated

from Woodmere Academy in Long Island. He received an undergraduate degree in Humanities & Science from MIT, a Master's degree in Greek and Latin Literature from Christ Church College, University of Oxford, and his medical degree at the Mayo Clinic.

Rob completed two residencies: first in orthopedics at Duke and then in neurosurgery at Mayo. As part of his training, he completed a 1 year peripheral nerve fellowship with David Kline in New Orleans. He received the Congress of Neurological Surgeons (CNS) Cushing Fellowship to visit several sites of excellence in peripheral nerve surgery. He stayed at Mayo where his practice is limited to peripheral nerve surgery. He is board certified in both Neurologic Surgery and Orthopedics. At Mayo, he is the Burton M. Onofrio Professor of Neurologic Surgery and a Professor of Orthopedics and Anatomy. He serves as Chair of Research in the Department of Neurologic Surgery. He is Chair of Mayo's Academic Appointment and Promotions Committee as well as the Visiting Medical Student Clerkship Program. He has enjoyed the many opportunities to mentor students, residents, fellows and young faculty.

Rob has a close working relationship with Allen Bishop and Alex Shin as part of a busy, multidisciplinary Brachial Plexus Clinic. Rob's main academic interests are related to peripheral nerve tumors and tumor-like conditions. Major interests include the mechanisms of tumor formation and propagation whether related to benign conditions such as intraneural ganglia; or perineural spread of malignant lesions. He has active intramural and extramural funding related to basic science research in nerve

*(continued on next page)*

*Major interests include the mechanisms of tumor formation and propagation whether related to benign conditions such as intraneural ganglia; or perineural spread of malignant lesions.*

**ISAACS**

awards including the VCU Physician Champion award and multiple listings as one of the "Top Docs" in Hand Surgery by Richmond Magazine.

Jonathan's wife, Christine, is the Chief of the Division of Generalist within the Obstetrics and Gynecology Department at VCU. They have two beautiful daughters, Sophia (8) and Olivia (6) that keep them plenty busy when not at work. When not "enjoying being a Daddy", Jonathan enjoys biking along the James River which runs thru Richmond.

**SPINNER**

regeneration. His classical background has facilitated research in the history of medicine.

He is a clinical councilor for the American Association of Clinical Anatomists and the liaison for the American Association of Neurological Surgeons (AANS) to the American College of Surgeons. He was President of the American Society of Peripheral Nerve in 2012-2013 and the Sunderland Society in 2008; Chair of the Peripheral Nerve Task Force of the joint sections of AANS/CNS from 2009-2011; and a

member of the Mayo Clinic Alumni Association Board of Directors from 2003-2009.

Rob enjoys reading, traveling and quiet time with his family. His wife Alex, a French Canadian, is a hematologist and Associate Dean of Student Affairs at Mayo. Their two boys Max (9) and Noah (7) are big baseball enthusiasts.



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## Hand Therapist Corner (continued from page 5)

working on shoulder/postural strengthening 2 time / day and taping 23/7 to the wrist.

**Results:** By the 4th visit patient was able to report progress with decreased pain in the forearm. By 5th visit patient was able to write legibly and sign himself in, and play the guitar some without contractions which he had not been able to do in 20+ years.

### CONCLUSION

In this case study, Leuko taping proved to be an effective treatment modality for focal dystonia. Leukotape provided proprioceptive feedback (the sense of the orientation of one's limbs in space) to allow function.

The position-movement sensation was originally described in 1557 by Julius Caesar Scaliger as a "sense of locomotion". Much later, in 1826, Charles Bell expounded the idea of a "muscle sense" and this is credited with being one of the first described physiologic feedback mechanisms. Bell's idea was that commands are carried from the brain to the muscles, and that reports on the muscle's condition would be sent in the reverse direction.

With Leuko taping input is used to inhibit function while maintaining flexibility and the ability to perform functional activities. We concluded with this case study that some forms of focal dystonia may be

treated by providing such inhibitory proprioceptive sensation via Leuko taping due to its rigid yet flexible properties. Further studies are indicated at this time as to the long term efficacy of this treatment method.

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