MESSAGE FROM THE PRESIDENT

I must reflect on the remarkably successful meeting in Red Rock, Nevada. President Steven McCabe and program chairs, Randy Bindra and Georgette Fogg, created a truly superb meeting with a number of “firsts.” We initiated the Guest Society program with Brazil who brought 88 professionals to the meeting. The introduction of two-minute papers allowing many more people to experience an active participation in the program was very successful. Finally, the debates were highlighted by the audience’s real time voting using.

Multiple instructional courses and panels integrated our therapy colleagues, in addition to Brazilian surgeons, and several others from outside of the USA. Added to these were two Maintenance of Certification courses covering flexor tendon injuries and carpal tunnel compression.

The program was also highlighted by our invited lectures including James Chang presenting exciting future technologic advances; Dr. Srinivasan from M.I.T. looking at the science of haptics; and Dr. Terry Light telling us how books are replaced now by digital education. The Presidential Address by Dr. McCabe featured his longstanding interest in evidence based medicine.

Overall, 473 professionals registered and when combined with the attendance of ASRN and ASRM, over 900 were in attendance. I am pleased to report that the American Association for Hand Surgery is doing well. This year a record 120 applications for membership were approved and another 130 applications are in progress.

Our journal Hand is now on very solid footing, financially sound, and showing a progressive increase in article submissions. The Journal is also available to AAHS members through our website. This organization is indebted to the efforts of Drs. Michael Neumeister and Donald Lalonde in making this Journal successful.

In addition, the AAHS website www.handsurgery.org continues to be upgraded, as well as the Hand Surgery Quarterly. Under the leadership of Dr. Thomas Hughes, the Quarterly now includes input from hand therapists; a coding corner; panel discussions; and news (continued on page 6)
FROM THE EDITOR’S DESK

A Mandate for All?

This past March the Supreme Court has addressed one of the key pieces to the Obamacare Legislation, the constitutional viability of the “Mandate Provision”. This provision, which requires all individuals to obtain medical insurance coverage, is in question and places the entire health bill at risk. Without the mandate, funding for this bill is inadequate without another source to help assist in the coverage of the uninsured of this country.

While this Supreme Court hearing may be music to many of our ears, it does not mean that there is truly reason to celebrate. While the health care reform bill is far from perfect, it did make an attempt at reforming our healthcare system which continues to consume a greater and greater percentage of our county’s GNP. Given the increasing costs of care, and the increasing cost of medical technologies, the government will continue to look for solutions to this difficult problem. Few of us would endorse the current plan, but what alternatives have been provided. Should the Supreme Court strike down this provision and lead to the elimination of the Health Care Reform Act, some other plan will not be far behind. And as our costs continue to spiral, these plans will offer fewer and fewer palatable choices for physicians.

Therefore, we should look at this deliberation as a second chance to help to mold healthcare reform. We need to engage our professional societies and support their legislative efforts to shape the reform. We need to speak with our Senators and Representatives about the goals physicians have for the future of medicine. Finally, we need to engage our patients and help them to understand these goals as well. It is with these patients that we have the greatest influence, as they are the ones making healthcare decisions for themselves when they purchase insurance, choose to receive care, and vote.

Let us educate them to help to conceive a better health care system for all involved.

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http://handsurgery.org/members/

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- Access HAND, the official Journal of the AAHS. This is the best way to gain full access.
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The first day of the AAHS conference is always Specialty Day, a day focused on Hand Therapy, but also with a choice of courses for surgeons throughout the day. Trauma: Playing the Hand You’re Dealt was the theme for this day, filled with instructional courses, panels, and an afternoon workshop that focused on Trauma, yet covered the more common “stiffness” that we all battle to prevent or resolve with any level of injury.

In between the scheduled talks we had Steve McCabe, MD welcome us to the annual conference and James Chang, MD speak as our invited guest speaker. Over the last year Dr. McCabe, AAHS President, worked diligently to bring us all together for yet another fantastic conference. I had the pleasure of working with Dr. McCabe over the last year to plan Specialty Day, along with Randi Bindra, MD as the program chair. Both of these surgeons combined their talents to make this year’s conference as educational and innovative as possible.

To help follow our theme, Dr. Chang enthralled us with his lecture, addressing the present and future of hand reconstruction through cutting edge research. What a pleasure it was to have Dr. Chang share his experience and expertise with us at the start of the AAHS 2012 Scientific Meeting.

This year’s Specialty Day had two workshops scheduled simultaneously in the afternoon. One was an ORIF course for surgeons and the other was a splinting course for therapists. As a therapist, I can attest to the casual, welcoming feel in this energetic, enthusiastic forum that offered an agenda, but allowed an open range of ideas to be exchanged. Workshops tend to do this - they allow people to bring down their guard, to share ideas and ask questions. They also allow one to learn in more than one way; through lecture, visual capture, and hands-on. Also, the workshop allows groups to move through the information on various levels and at different speeds, so all can build on their current level of knowledge.

I believe becoming a member of a professional organization is part of being a professional in your field, and involvement within that organization helps to build support, and secures the profession you value.

With this type of forum, how can you go wrong?

Throughout the conference, therapists were encouraged to take advantage of the time that was available during breakfast, lunch, and coffee breaks to meet other hand professionals. In addition to these times, there were social events scheduled to allow more opportunity to mingle with others.

On specialty day, there was an early reception for newer hand therapists to meet with the seasoned therapists and board members. Following this reception was the official welcome reception which allowed additional time to visit with old friends and meet new friends.

Some of those who attend this conference want to become more involved in this organization, but don’t know how to take the next step. I would encourage anyone who wants to share their expertise through speaking, serving on committees, writing articles (for the newsletter), sharing research, or any other areas that would complement the AAHS to send an e-mail to express your interest to me at gannfogg@comcast.net or to the Administrative office. I believe becoming a member of a professional organization is part of being a professional in your field, and involvement within that organization helps to build support, and secures the profession you value.
Given that the topic for this issue features distal radioulnar joint instability, we will focus on Current Procedural Terminology (CPT) codes for related procedures in this Coding Corner edition.

Most CPT codes for distal radioulnar joint (DRUJ) instability are fairly straightforward and are enumerated in the table below. When performing an open arthroscopy of the wrist for repair of the triangular fibrocartilage complex, CPT 25107 should be used. While it may seem appropriate to combine this code with CPT 25671 for percutaneous stabilization of the distal radioulnar joint using Kirschner wires, 25671 can only be used independently with a closed reduction of the DRUJ. If the DRUJ is reduced by closed means and simply immobilized, CPT 25675 is used. However, if the DRUJ requires an incision for open reduction of the joint, CPT 25676 is used. When a ligament reconstruction is performed to stabilize the DRUJ, consider using CPT 25337.

For treatment of Galeazzi fracture-dislocations, CPT 25525 or 25526 are typically utilized. These procedures should not be unbundled to code for radial shaft fixation, triangular fibrocartilage complex repair, and DRUJ pinning. For open treatment of the radial shaft fracture with concomitant closed reduction of the DRUJ, CPT 25525 is utilized. When the triangular fibrocartilage complex is also repaired, CPT 25526 is utilized.

Ulnar styloid fractures are often addressed in the setting of DRUJ instability. CPT 25651 should be used for simple percutaneous fixation, while CPT 25652 should be used for open treatment, for example with tension band wiring.

### Distal Radioulnar Joint

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25107</td>
<td>Arthroscopy, distal radioulnar joint for repair of triangular fibrocartilage complex</td>
</tr>
<tr>
<td>25337</td>
<td>Reconstruction of unstable distal radioulnar joint</td>
</tr>
<tr>
<td>25525</td>
<td>Open treatment of radial shaft fracture, with internal and/or external fixation and closed treatment of dislocation of distal radioulnar joint, with or without percutaneous skeletal fixation</td>
</tr>
<tr>
<td>25526</td>
<td>Open treatment of radial shaft fracture, with internal and/or external fixation and closed treatment of dislocation of distal radioulnar joint, includes repair of triangular fibrocartilage complex</td>
</tr>
<tr>
<td>25651</td>
<td>Percutaneous fixation ulnar styloid fracture</td>
</tr>
<tr>
<td>25652</td>
<td>Open treatment of ulnar styloid fracture</td>
</tr>
<tr>
<td>25671</td>
<td>Percutaneous fixation distal radioulnar dislocation</td>
</tr>
<tr>
<td>25675</td>
<td>Closed treatment of distal radioulnar dislocation with manipulation</td>
</tr>
<tr>
<td>25676</td>
<td>Open treatment of distal radioulnar dislocation, acute or chronic</td>
</tr>
</tbody>
</table>

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2012 AAHS RESEARCH GRANT RECIPIENT

Timothy S. Johnson, MD
The Pennsylvania State University, College of Medicine
“Platelet-rich Plasma and Tendon Adhesions”

The AAHS Annual Research Grants were established to foster creativity and innovation in basic and/or clinical research in all areas pertinent to hand surgery. One (1) grant in the amount of $10,000 will be made for a one (1) year period. All AAHS members and candidates for membership are eligible to apply. Residents and fellows sponsored by an AAHS member are eligible to apply as well. Details and an application can be found on the AAHS website: www.handsurgery.org.
of upcoming events and information of interest to all our members.

I should outline our goals for the next twelve months. We are fortunate to have a wonderful management group, PRRI and an energetic Board led by President-elect Donald Lalonde. We plan to take advantage of every opportunity to increase the exposure of the AAHS. Our information booth drew considerable interest at the recent ASSH annual meeting and we plan to be visible at the AAOS, Philadelphia Hand Surgery and Therapy symposium, and the annual meeting of the ASHT—just to name a few.

Spearheaded by Donald Lalonde, we are excited to develop a greater interaction with our therapists and all allied personnel involved in the care of hand and upper extremity problems. The AAHS will sponsor a surgeon to participate actively at the annual ASHT meeting and we hope that this will lead to the possibility of future combined ASHT-AASH regional workshops.

The committee structure of the AAHS has been reorganized and, following a solicitation to all members to which we received an overwhelming response, have added many members to the committees. Throughout the year, we hope to report on their activities.

The Hand Surgery Endowment remains active and we hope to increase the endowment to allow it to continue to support our missions overseas.

It is not too early to mention the 2013 Annual Meeting to be held January 9-12 at the Waldorf Astoria Naples Grande Hotel in Naples, Florida. My program Chair is my colleague Dr. David Ring and we can assure you it will be a very productive 4 days, both academically and socially. Our Guest Society for 2013 will be the Argentine Association of Hand Surgery. And we have 4 dynamic speakers committed to the meeting including Drs. Eduardo Zancolli Jr. from Buenos Aires; Dr. James May, former AAHS President; Dr. Diego Fernandez from Berne Switzerland; and noted author Carl Hiaasen who has written extensively about Florida.

I look forward to a dynamic year and an exciting 2013 Annual Meeting.

Jesse B. Jupiter MD

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Jeff: This is Dr. Jeffrey Greenberg from The Indiana Hand to Shoulder Center in Indianapolis. We have an excellent panel gathered here tonight that is going to cover the topic of distal radioulnar joint Instability and the problems of the distal radioulnar joint. Joining me tonight for this interactive discussion is Dr. Brian Adams from the University of Iowa, Dr. Richard Berger from the Mayo Clinic, Dr. David Bozentka from the University of Pennsylvania and Jennifer Thompson, an occupational therapist from Pro in Wilmington, Delaware.

In the past problems of the distal radioulnar joint including instability were frequently referred to as “black box problems” or problems that couldn’t be elucidated because it was such a unknown area. In recent times, we have really gotten a better hold on the detailed anatomy and biomechanics which have made it much easier for us to apply detailed examination techniques, provocative maneuvers and diagnostic imaging which has really helped us make specific diagnoses and formulate specific treatment plans.

As we enter the discussion specifically on distal radioulnar joint instability, let’s talk briefly about some of the more recent developments in the anatomy of this small area that frequently gives hand surgeons and orthopedists a difficult time.

So, Dick, if you would, why don’t you just briefly summarize some of the anatomic elements about the distal radioulnar joint, specifically as they relate to stability of this joint.

Dick: Understanding the anatomy of the distal radioulnar joint, as with any joint, is critical to understanding what happens when something goes wrong. We will start with the skeleton. The distal radioulnar joint is part of a bi-condylar forearm joint that includes the proximal radioulnar joint as well as the distal radioulnar joint. The distal radioulnar joint is made up by the articulation of the radius via the sigmoid notch and the ulnar head. One of the critical elements in this relationship alone is that the radius of curvature of these two curved surfaces is mismatched by as much as 4 millimeters, with the convex ulnar head having a smaller radius of curvature than the larger concave sigmoid notch. This is necessary in order to allow the pivot of the radius around the ulna, which is how we pronate and supinate. If you take away that translation within the distal radioulnar joint, you are going to dramatically reduce the amount of rotation that is allowed. Up to thirty percent of the constraint of the distal radioulnar joint is attributable to the simple articulation of the ulnar head with a sigmoid notch. If you take away the ulnar head, then that stability of the articulation is going to be significantly reduced. Building outward from the skeleton, we have the entire triangular fibro-cartilage complex, or TFCC. The stabilizing elements of the TFCC have been studied extensively, and the most critical stabilizing aspects of this are the distal radioulnar ligaments. These are differentiated into deep and superficial components. The deep components are discreet ligaments that traverse the distance between the dorsal and palmer rims of the sigmoid notch and converge to insert into the region on the ulnar head which we call the fovea, which is a non-articular depression at the base of the styloid process. Moving superficially we see as the more superficial fibers that begin to form a deep cup which it has the styloid process at the apex. Both of these elements contribute to the stability to the distal radioulnar joint in different ways. The isometric action of the radioulnar ligament complex is carried out at the fovea and tensioning that progresses at different rates during pronation and supination occurs through the more superficial fibers. There are also elements of stability that are added by other soft tissues including the joint capsule., which becomes an important stabilizer as we reach terminal positions of forearm rotation. The dorsal joint capsule becomes progressively more important in stabilizing pronation and the volar joint capsule becomes progressively more of a stabilizer as

(continued on next page)
we reach terminal supination. A number of structures contribute secondarily to DRUJ stability, including the ulnocarpal ligaments, the extensor carpi ulnaris tendon subsheath, and we can’t forget about the stabilizing effect of the interosseous membrane, both the central ligamentous region, as well as the reinforcing fibers very near the distal radioulnar joint. Finally, the dynamic stabilizers include the pronator quadratus, particularly the deep head. It has a postural functional element to it, much like the paraspinous muscles. It is almost always active and has slow onset long duration firing muscle fibers, distinctly different than the dynamic pronation effect of the superficial head of the pronator quadratus. Finally, the brachioradialis has a potential role as a dynamic stabilizer against the effect of gravity of the radius on the ulna in certain positions. Stability of the DRUJ is contributed to by each of the skeltal and soft tissue elements, both statically and dynamically. So, all of these combined in both static, hard tissue, and soft tissue as well as dynamic soft tissue stabilization of the distal radioulnar joint.

Jeff: Dick, that was a great summary and I think you would agree that if we could summarize the anatomy with regards to stability is that the distal radioulnar joint from a boney standpoint is relatively unstable, similar to the shoulder, and it’s stability is greatly affected and influenced by a complex network of the soft-tissue elements.

Brian: I might add that similar to the labrums of the hip and gleno-humeral joint as well as many other joints, there are substantial extensions of the sigmoid notch rims by fibrocartilage lips, particularly on the volar side, which contribute to DRUJ stability.

Jeff: So, Brian, what you are describing, would be analogous to the acetabular or glenoid labrum. Not a true labrum, but a similar structure of soft tissue cartilaginous extension which blends into the supporting ligaments.

Brian: Yes.

Jeff: David, getting on to the clinical scenario, describe for us what a typical patient with either acute or chronic distal radioulnar joint instability might describe to you as you consult with them in the office.

David: The typical patient with DRUJ instability will complain of ulnar sided wrist pain. The symptoms are usually aggravated by rotational type activities. Patients will complain of weakness, particularly with grasp. They will have difficulty pushing themselves up from a seated position. If they have a dorsal instability pattern they will often notice a prominence of the distal ulna dorsally and develop pain particularly when performing activities when the forms is positioned in pronation. With a volar instability pattern, patients they tend to have problems lifting and grasping with the forearm in supination. Again, it is the rotational activities, particularly at end range which cause most of the discomfort.

Jeff: Brian, are there any particular historical elements that would help you distinguish acute versus chronic instability of this joint?

Brian: First, I would like to emphasize that volar instability, which is often not recognized by physical examination because it is more difficult to identify, should be considered while taking the history. A key feature is pain and a feeling of instability while lifting in supination. Lifting in supination places tremendous stress on the soft tissues of the distal radioulnar joint because there is no skeletal support when the radius and ulna are parallel as opposed to the radius being draped over the ulna in pronation.

Dick: I agree completely with Dave and Brian. What I found in my own practice is that only about 50% of the patients actually recall a specific event or a specific time when their symptoms began. The other 50% experience a more insidious onset. We should search for some type of trauma or specific event but don’t be surprised or disappointed if we can’t find that. Almost universally these patients also present what the history of sensing a click when they rotate their forearm. We don’t really know what that click comes from. It is not pathognomonic because you can have clicks with other conditions, but it is one of those elements that is almost universally present when somebody does have demonstrable DRUJ instability, chronic or acute.

Jeff: So, the historical elements, as well as the exam findings, in patients can frequently be fairly subtle, which is why I think making this diagnosis can sometimes be difficult. One of the exam findings that has not really been touched on is trying to exaggerate the instability and pointing out the fact that in...
**Highlights from HAND**

HAND continues to evolve into one of the leading peer-reviewed publications focusing on “clinically-oriented” Hand Surgical articles. In the third and fourth issues of HAND for 2011 (Volume 6, Issue 3 & 4) a number of provocative original articles, unique case reports, and insightful review articles are presented. A sample of the original article topics include:

- Multi-center analysis of Artelon® CMC joint implants.
- Outcomes on operative management of distal ulna fractures.
- Analysis of multimedia messaging of wrist radiographs.

- Trends in pediatric upper extremity burn injury management.
- New technique for metacarpal intramedullary fixation.
- Rehabilitation of flexor tendon ruptures after volar plating.
- Functional outcome survey of elderly distal radius fractures.
- Complex fracture patterns in perilunate dislocations.
- Review of toe-to-thumb transfers.

Two cutting edge articles have been published particularly focusing on Dupuytren’s contractures:

- Kevin Chung’s group has attempted to provide outcome data on alternative techniques in the management of Dupuytren’s contractures. A meta-analysis was performed including 277 articles in an effort to evaluate the efficacy of needle aponeurotomy and collagenase injections versus open partial fasciectomy. Among other findings, they identified a recurrence rate range of 12-39% with a mean follow-up period of 1.5-7.3 years for partial fasciectomy. This was in contrast to a recurrence rate range of 50-58% for needle aponeurotomy and 10-31% for collagenase injections. The most common complication was skin tears for the alternative techniques versus nerve injury and infection for open partial fasciectomy.

- Eon Shin and Neil Ford Jones present a less-invasive technique for open partial fasciectomy utilizing multiple segmental fasciectomies. Although a number of previous surgical techniques have been previously presented, the authors contend utilizing multiple small incisions a partial fasciectomy can be achieved while minimizing post-operative pain and maximizing return of motion. They review their experience with 34 digits performed in 14 patients reviewed with a follow-up of at least 2 years after being treated with segmental fasciectomies. Joint extension was increased to 2.2° short of full extension at the metacarpophalangal joint and 4.1° at the proximal interphalangeal joint by final follow-up. Patients rated a good or excellent outcome in 91.2% of cases. No recurrences were noted during the follow-up period in the operative digits.

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the normal wrist, the distal radioulnar joint is stable at the end range of pronation and supination. It is important in these patients to examine not only the affected wrist, but also the uninjured asymptomatic normal wrist to compare not only the laxity in the joint, but also the compare whether there is reproduction of any symptoms at the extremes of forearm rotation.

**David:** I think it is also important to determine whether a patient has evidence of generalized ligament laxity which will affect your treatment recommendations as well.

**Brian:** Looking for a remote history of injury is very important. Patients may present in their late teens or early 20s, with a history of a forearm fracture or distal radius fracture as a child. In a small percentage of patients the skeletal remodeling that occurs actually makes the skeletal alignment worse rather than better. DRUJ instability may present several years later, and may be unidirectional or bidirectional.

**Jeff:** That is a very good point. Would somebody like to comment on the diagnostic imaging modalities that are important to use when we evaluate these patients.

**Brian:** Standard X-rays are certainly very important to look for evidence of old injury causing skeletal malalignment. Standard x-rays are not typically accurate to assess direction or severity of instability unless the instability is severe. Obtaining films of the opposite limb will help in identifying subtle but important differences. It is particularly important to include the entire forearm to assess skeletal alignment. Degenerative changes can also be identified.

**Dick:** Brian, I agree completely because there are those situations where even carpal alignment or malalignment can lead you to a suspicion for DRUJ instability that may or may not be there. For example, an ulnocarpal sag that may occur with a VISI deformity can give you the clinical impression that there is a prominent ulna dorsally. The DRUJ may be fine, but the problem may be more in the ulnocarpal relationship and getting those plain radiographs will help with that as well.

**David:** If I am concerned about the sigmoid notch being deficient, I will get a CT scan. I’ll order the study with the forearm positioned in neutral, supination as well as pronation. The study will help document the diagnosis by evaluating the position of the ulnar head relative to the radius as well as to assess the architecture of the sigmoid notch to ensure that it is adequate bony contour in order to maintain the ulnar head.

**Jeff:** David, that would obviously be a study that you would get subsequent to plain x-rays. I think we all agree that for evaluating the joint, for evaluating boney alignment including secondary or superimposed carpal malalignment and potential arthrosis and to assess ulnar variance plain x-rays should be assessed first.

**David:** I agree and the CT is also helpful to assess the extent of arthrosis as well.

**Jeff:** What about the role of MRI in patients with distal radioulnar joint instability?

**Brian:** I would add to get the maximum information from the CT scan it is important to align the limb properly in the scanner gantry. Both limbs are placed longitudinally in the gantry to avoid the difficulty of reading the scans taken at an obliquity to the long axis of the joint. It is also important to obtain scans in neutral, supination, and pronation, and in the same degrees of rotation. In other words, if the injured side has reduced motion, then match the normal side to the injured side regarding positions of pronation and supination.

**Jeff:** I think that is a very good point that the CT scan should simultaneously match in each extremity to make appropriate comparisons. Can somebody address the role of MRI in evaluating these patients with either chronic or acute distal radioulnar joint instability?

**Dick:** I will fairly routinely obtain a high resolution MRI of the affected extremity for a couple of reasons. One is to make sure that we are ruling out other things that can influence a patient presenting with a painful joint, other than the primary disruption of the stabilizers of the distal radioulnar joint. It gives you a wonderful opportunity to evaluate the soft tissues associated with the ulnocarpal joint, the lunotriquetral joint, the extensor carpi ulnaris and the distal radioulnar joint. It also gives you a very non-invasive means of being able to evaluate the course and the attachment points of those important stabilizers including the radioulnar ligaments, and it even provides you with additional information regarding the orientation of the sigmoid notch and the ulnar head. I know it seems like we are ordering a lot of tests on these patients, but to me, the evaluation of the distal radioulnar joint is not necessarily a linear “if yes then we will do this”, if no then we will do that” type of algorithm. It is more like a jigsaw puzzle. As we piece this information together with the history, the exam, the plain imaging and the CT scan and the MRI, we tend to get a more complete picture of the patient’s problem as we develop potential solutions.

**Brian:** Overall, I find a high quality MRI scan to be very helpful, and in fact, I believe it provides information that arthroscopy cannot because it can assess structures external to the joint capsule. I am especially interested in looking at the ulnocarpal joints and the peripheral attachments of the TFCC because injuries to these structures...
have substantial influence on the treatment options. As Dick mentioned earlier, the ulnocarpal ligaments contribute substantially to DRUJ stability. Furthermore, I like to assess the ECU subshesh, which is also a major contributor to stability.

**Jeff:** Those are good points Brian. Can you also comment on the use of gadolinium arthrography in the MRI imaging studies?

**Brian:** I think it really depends on your goals for the MRI and the quality of the MRI available. Optimally, it would be best to obtain an MRI scan with and without arthrography. Gadolinium can actually make interpretation somewhat more difficult, particularly in a chronic injury where there is no perforation because scar tissue has bridged the tear. In acute injuries, it can be more helpful, particularly for small lesions.

**Jeff:** Very good. What are the conservative treatments, if any, for patients with distal radioulnar joint instability?

**David:** If a patient has an acute dislocation, I typically treat the patient with above elbow immobilization. After reduction of a dorsal dislocation, I will place the forearm in supination, which is the position of stability. I will immobilize the patient in the position of stability for approximately 6 weeks. If a patient has sustained a volar dislocation, I will immobilize the forearm in pronation for approximately six weeks then progress their exercise program.

**Dick:** I’ll take a little different tact with that and David. I don’t disagree with what you are saying, but perhaps another perspective on this is I’ll tend to look at the association between the joint capsule and the ligaments that have been identified as commonly disrupted during a dislocation. It is almost like there is an opposing stabiliza-

- Richard Berger, MD

Conservatively I include the wrist and elbow and I have adopted a radial approach, Munster orthosis that avoids direct pressure to the ulnar head while controlling forearm rotation. The age of the patient, avocation and/or sport are all important factors to consider along with the particular pathology involved.

**Jeff:** Jennifer, can you just elaborate on your concept of a radial approach and elaborate a little bit on some of the splinting techniques, comparing a Munster type versus a traditional long arm above elbow splint to control forearm rotation?

**Jennifer:** I am referring to the thumb/radius, or in the anatomic position of the skeleton, the lateral aspect of the forearm when I describe a radial approach Munster orthosis. This design, as with a traditional Munster orthosis that is ulnar based, includes the wrist and extends proximal to above the humeral condyles. A traditional long arm orthosis includes both the forearm in pronation or a neutral rotation, that we verify that the relationship between the radius and the ulna is as anatomically reduced as possible. So, I will typically obtain a post reduction or post casting CT scan. If the soft tissues aren’t close to where they need to be to heal properly (such as if you have a diastases between the radius and the ulna indicating that the foveal attachment of the TFCC remains spatially disassociated), I don’t believe this is likely to heal properly.

**David:** I would agree that the post-reduction CT is often helpful. In many of these patients, the size of the forearm makes an accurate assessment difficult on physical exam. If you are planning to immobilize the patient for that extent of time, we need to be certain the joint is appropriately reduced.

**Brian:** I would like to get Jennifer’s input on different splinting techniques, particularly in the younger skeletally immature patient. Since many of the surgical procedures violate the ulnar neck with drill holes or fixation devices which could injure the physis, I try to avoid these procedures until skeletal maturity. Thus I try splinting techniques and I am interested to know if there particular methods that are most effective?

**Jennifer:** I think we need to consider the pattern of instability. Particularly do we include the elbow and/or wrist or do we simply provide compression dorsally or volarly to the ulna, independent of the radiocarpal and elbow joints?

It is important that regardless of whether we put them in a position of rotation or a neutral rotation, that we verify that the relationship between the radius and the ulna is as anatomically reduced as possible.
wrist and elbow and is posterior/ulnar in approach and extends further proximal to the mid humerus level. I prefer the Munster design as it allows elbow flexion and extension and is lighter in weight. It is important to note both control forearm rotation but do not block it entirely.

**Brian:** Jennifer, do you have any particular techniques that are best for sports participation as I find this type to be the most symptomatic in my skeletally immature patients?

**Jennifer:** I use a shorter orthosis fabricated with a lighter weight, perforated material which may or may not include the wrist. I find that when splinting these patients the ulnar head can be sensitive, therefore, a thinner, less rigid orthosis or perhaps even a strap inside the orthosis is more tolerable. Frequently I find the best option is to fabricate two orthoses, one orthosis which is more conservative and will immobilize both the wrist and forearm and one orthosis that will control the instability while allowing participation in the sport. Insurance allowances may or may not impact this as well.

**Jeff:** I have actually had success in some of those same kind of patients that Brian describes with actually just a elastic ulnar compression wrap. It won’t eliminate their instability, but it mitigates some of their symptoms just with a circumferential elastic wrap for some of their more vigorous activities.

**Jennifer:** Additionally, I find it helpful to have the patient bring in any required sporting equipment such as gloves and/or sticks to ensure the fabricated orthosis will allow for participation in the activity.

**Jeff:** I would like to move on to discuss the groups of patients that cannot eliminate their instability with conservative care. They have positive findings on exams for instability. This is a sub-acute injury. What is the first step towards treating these patients?

**Brian:** It is important to use all of the information from the history, our examination and imaging studies in developing a surgical plan. For example, if the injury was within the last 6 months then we can anticipate that the local soft tissues could have greater integrity, particularly the TFCC, ulnocarpal ligaments, and the ECU subsheath; whereas, if the instability has been present for a couple of years and it has been progressive then we can expect those tissues are less likely to be amenable to repair. So, we should not be set on one particular approach for all cases, but rather recognize there will be a spectrum of soft tissues injuries and severity, with variable tissues available for repair or reconstruction.

**Jeff:** That is a really important concept to understand. We can’t really fit all these instabilities into one bucket. And there are different buckets. All the preliminary studies and preliminary findings in our patient encounter have to be considered so we do make an appropriate surgical plan. Dick, can you comment on the use of arthroscopy for diagnostic purposes in patients with instability?

**Dick:** One of the dilemmas and benefits of arthroscopy is that it gives you an unparalleled view into the closed space of a joint. It’s beneficial because we can look for obvious disruptions of structures that are within the view of the arthroscope. We can look for other problems that may be either associated with the patient’s symptoms, or contributing to the patient’s symptoms. For example, looking at associated injuries of the lunotriquetral ligament and the ulnocarpal ligaments. The dilemma with arthroscopy is that it just gives you a view inside that space. We can’t see beyond the inner surface of the joint. And one of the major stabilizers of the distal radioulnar joint is the complex of the radioulnar ligaments; both the dorsal and the volar deep ligaments. With standard radiocarpal arthroscopy, we cannot directly visualize these ligaments. I have found arthroscopy of the distal radioulnar joint to be difficult and not particularly helpful, even for just the purposes of diagnostics. I find that my ability to assess the status of the radioulnar ligaments is not enhanced with distal radioulnar joint arthroscopy. Others may have a different experience with that, but I’ve just largely stopped doing it. I depend more on an indirect assessment of the status of the radioulnar ligaments with the arthroscopy by evaluating the tension of the TFCC. I look for a trampoline sign indicating there is adequate tension in the TFCC. If so, I conclude that the radioulnar ligaments are likely to be intact. I look into the styloid recess with a probe and attempt to displace the TFCC. If it behaves like a rubber sheet, this indicates that there is probably some deep dissociation of the radioulnar ligament complex.

**Brian:** I would like to again mention that we cannot forget about skeletal alignment as it must

(continued on next page)
be restored for any sort of soft tissue repair or reconstruction to be effective. It doesn’t mean that skeletal realignment alone will always be enough to restore stability, but it is an essential component of the reconstruction.

Dick: I agree completely with Brian. Additionally, one of the other things that we have at our fingertips in the operating room as we’re preparing for arthroscopy is the ability to perform an examination under anesthesia. Many of these patients are quite tender and they tend to exhibit guarding behavior. When we have them anesthetized, we can get a much better assessment of the displacement of the joint in multiple positions, and you can compare the injured side with the contralateral side before you prep the patient.

Jeff: Those are excellent additional points. And Brian, your comment about the skeletal alignment relates back to the so-called bucket that I mentioned. There are patients with a skeletal malalignment, have other elements that might be contributory to their instability as opposed to the patient with anatomic alignment, where their instability is solely due to soft tissue deficiency. Dick, you mentioned a number of provocative maneuvers that you could perform during your arthroscopic evaluation that hopefully will correlate with your pre-operative information. In our hypothetical patient with normal skeletal alignment you have determined that there is absence of a trampoline sign or excessive laxity in the triangular fibrocartilage or a deficient foveal attachment. This is our hypothetical patient that has instability secondary to soft tissue abnormalities. What is your next step in restoring stability to this joint?

Dick: Jeff, you mentioned an excellent point; making sure that everything that we’re addressing arthroscopically correlates and corresponds to the physical examination and the imaging studies that we’ve done leading us to the operating room pre-operatively. We will all find abnormalities or something that isn’t typical in many of the joints that we arthroscopically, regardless of whether it corresponds with the patient’s symptoms or not. So we need to have the discipline to make sure that we address those findings that correlate the most with the patient’s presenting symptoms and signs in the clinic. But let’s assume that we have that situation where there’s true instability of the distal radioulnar joint, regardless of chronic or acute, I typically do not definitively treat these arthroscopically. I believe that if we have some peripheral laxity issues with the TFCC but the DRUJ itself is stable, we can perform arthroscopically assisted procedures. But to me we need to anchor that TFCC, in particular the radioulnar ligaments, back to that foveal attachment, or whatever tissue is responsible for the instability. And I think that to me, that has to be done in an open fashion. I’ve done arthroscopically assisted suture placement that ultimately will be used with anchoring the radioulnar ligament complex back to the fovea in an open procedure. But the only way at this point in time with the technology available that I use in the operating room, to repair an unstable DRUJ is to convert to an open procedure for the reattachment of the radioulnar ligaments back to the fovea. I think we need to differentiate between a superficial lesion that may be painful, that may have some influence in the superficial tension of the TFCC, but if we actually can demonstrate a true foveal dissociation or disruption of the stabilizers between the radius and the ulna, to me that’s an open procedure and nothing that I would attempt to do arthroscopically.

Jeff: Dick, I too have that same bias where I think that painful triangular fibrocartilage lesions that don’t have associated instability can be treated very successfully with pure arthroscopic techniques. But I also, in the patients with instability, prefer an anatomic open approach with anchoring the tissue back down to the fovea. Brian or David, any comments regarding this particular topic?

David: No, I would agree with everything that’s been discussed. I use an open technique to treat DRUJ instability. Although arthroscopic techniques have been described for DRUJ stabilization, in my hands, the arthroscope is used diagnostically and to assist in the repair of the painful superficial tears.

Brian: The only time I find a full-open repair technique is not necessary is in cases of ulnar styloid nonunion with wider displacement, which is essentially equivalent to a TFCC foveal detachment. I’m a proponent of resecting the nonunion and repairing the TFCC fibers back to the fovea. In this situation, as Dick mentioned, arthroscopically assisted placement of sutures is very helpful. I use a straight ulnar approach with transosseous sutures, in which the sutures are guided arthroscopically and then passed through the holes under direct vision. Any other time, I chose a direct open TFCC repair.

Jeff: Jennifer, one of us has performed an open repair and you’re getting our patient at the two week timeframe after we’ve taken out our sutures. What would be your treatment plan at this point and time?

Jennifer: Ideally I would discuss the case with the surgeon and/or obtain an operative note to gain a better understanding of the pathology and corrective procedure. The compliance of the patient also needs to be taken into consideration here. Generally speaking I will (continued on next page)
This allows me to assess the position to avoid undue stress on neutral to supinated forearm strengthening isometrically in a ten weeks. Initially, I prefer to strengthen, generally at eight to improve I will then initiate mobilization and desensitization if the surgeon feels it is safe to do so. As shorter forearm design if the point I will alter the orthosis to a long term use, therefore, at this date of surgery. An above experience, within six weeks from the forearm and wrist AROM, in my approval of the surgeon I will begin forearm and wrist mobilization and desensitization for easy access to the scar to radial approach sincethis orthosis allows for corrective procedure. ideally I would discuss the case with the surgeon and/or obtain an operative note to gain a better understanding of the pathology and corrective procedure.

- Jennifer L. Thompson
symptomatic since you are tightening up an arthritic joint.

**Jeff:** Those are all very good points. Brian, given the patient with chronic instability that you’ll explore and find tissue that’s not usable, what would be your preferred ligament augmentation to stabilize an unstable joint?

**Brian:** For over a decade now I’ve been using what is often referred to as an anatomic ligament reconstruction using a tendon autograft. I haven’t changed the technique much over this time frame, which may indicate that it is effective. However, I think it’s very important to recognize its limitations, most of which we’ve already covered and relate to skeletal problems. Although it is not truly an anatomic reconstruction as it does not exactly reproduce the radioulnar ligaments, it is probably as close as we can achieve by a surgical procedure.

**Jeff:** Dick or David, any other comments related to ligament augmentation reconstruction?

**Dick:** I agree completely with Brian, I’ve been using his technique as well, and I do believe that the Adams Procedure is as close as we can get to an anatomically and physiologically reproducible solution. It also addresses where many of these patients actually do have multi-directional instability. In my experience it’s been rare where there’s been an isolated intra-substance injury to just the dorsal or just the palmar radioulnar ligament. More often than not, those isolated injuries are associated with intra-articular distal radius fractures or avulsion fractures where if you reduce the fracture, you’ve re-established the mechanical stability of the joint. Most of the soft tissues injuries are foveal dissociations, where both the dorsal and the palmar radioulnar ligaments are disrupted. And the technique that Brian developed has addressed both of those ligaments with the isometric foveal insertion.

**Brian:** I’d like to give Dick credit for recognizing very early after I introduced this technique that it actually tightens and augments the ulnocarpal ligaments as it attempts to reconstruct the palmar radioulnar ligament. By passing around these ligaments on their palmar aspect, it pulls them back into their normal continuity with the fovea.

And as we know, the normal ulnocarpal ligaments are indirectly attached to the ulna through the palmar radioulnar ligament. I believe the retensioning of the ulnocarpal ligaments is a key factor in its success.

**Jeff:** That’s a good point. And it just emphasizes how a reconstruction that was introduced by you, that’s been adopted by a lot of us, and adopted with successful results, correlates with our understanding of the anatomy and the biomechanical contributions of that anatomy to the joint instability. Jennifer, can you comment? Do you see any differences in the post-operative rehabilitation in patients who have had repairs of chronic versus acute instability?

**Jennifer:** In my experience I do not see many differences with regard to the post-operative rehabilitation of patient’s who have undergone repair for an acute versus chronic instability. I think in those patient’s with a chronic instability there may be a greater potential for comorbidities such as elevated pain levels and ROM losses due degenerative joint changes which can impact the post-operative rehabilitation.

**Jeff:** Brian how do you modify your post-operative plan for the patients with ligament reconstructions versus anatomic repairs?

**Brian:** It’s essentially the same as what I described before for a TFCC repair. As Dick pointed out, I think you have to test your reconstruction in the operating room. Perhaps it’s more critical in the reconstruction than for an acute repair because there is probably more injury to the
I would agree that we need to address these problems in an algorithmic, rather than a cookbook fashion to ensure the optimal outcome.

- David Bozentka, MD

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LEADERSHIP PROFILE: Jeffrey Greenberg

Dr. Jeff Greenberg was recently elected as a junior director-at-large to the AAHS Council at the most recent meeting in Las Vegas. Dr. Greenberg has been a member of the AAHS since 2009. He expressed interest in being a more involved member and was actively recruited to the Council by his good friend and colleague, Dr. Brian Adams.

Dr. Greenberg’s roots are in Brooklyn, New York, where he was raised. He commuted into Manhattan to attend Stuyvesant High School. He left New York City to attend Grinnell College in Grinnell, Iowa, where he met Nancy, his wife of 31 years. After he successfully defended his Master’s thesis at Ohio State he went to medical school at George Washington University followed by an orthopaedic residency at SUNY Upstate Medical Center in Syracuse. It was there, influenced by Andy Palmer, John Mosher and John Fatti, that he developed his interest in hand surgery. After residency, he completed his hand and microvascular fellowship at the Indiana Hand Center (now named Indiana Hand to Shoulder Center) in Indianapolis, Indiana.

Dr. Greenberg has been with the Indiana Hand to Shoulder Center in Indianapolis since 1993. He has a great interest and love for teaching and education and is currently the Fellowship Director and Vice-Chairman for the Hand Surgery Department coordinating and actively participating in educational activities both didactic and clinical. He holds a clinical teaching appointment with the Department of Orthopaedic Surgery at Indiana University School of Medicine.

Dr. Greenberg’s practice encompasses traumatic and reconstructive surgery of the entire upper extremity. He performs arthroscopic and open reconstructive techniques of the shoulder, elbow, wrist and hand, including acute trauma, sequelae of traumatic injuries and acquired problems.

Dr. Greenberg remains academically active and has given numerous presentations at national and international meetings. He has a number of peer-reviewed publications as well as book chapters. His area of interest is in wrist reconstruction, and he is currently working on projects including radiocarpal and distal radio-ulnar joint arthroplasty. He is on the Upper Extremity Advisory Panel for Stryker Orthopaedics, a consultant with Acumed, an AO faculty member and Consultant Editor for the Journal of Hand Surgery and Journal of Bone and Joint Surgery. In addition to his clinical practice, he tries to incorporate volunteer efforts and has made mission trips to India, Honduras and Northeastern Arizona.

Dr. Greenberg’s wife, originally from Chicago, is an educator as well. She has been dancing her entire life and has taught ballet, jazz, and modern dance for 27 years. They have two daughters, Ryann, age 22, a senior at Wittenberg University in Springfield, Ohio, and Sawyer, age 19, a freshman at the Savannah College of Art and Design.

Aside from travel to the southwest (Scottsdale is his favorite winter location), visiting his children at college, seeing movies and eating fine meals with his wife, Dr. Greenberg’s outside interests are golf and woodworking. He works hard on maintaining his low single digit handicap and is an active member of Crooked Stick Golf Club in Carmel, Indiana. He loves to volunteer his time and is the Chairman of the marshal committee for the upcoming BMW Fed Ex PGA golf tournament which will be held at Crooked Stick in September. Dr. Greenberg is fortunate to live in close proximity to the largest woodworking school in the United States. The Marc Adams School of Woodworking is 30 minutes south of Indianapolis. Jeff has developed a great friendship with Marc and has taken 3-4 weeks of classes every year for the past nine years. He has received his “Masters in Woodworking” certification and continues to take classes to further develop his skills. He loves to spend time in his recently constructed workshop attached to his house. Most of his works are done as gifts and range from small turned objects and boxes to larger jewelry boxes and decorative items to stand-alone fine furniture. He has had many of his woodworking pieces published in the “Touch of Humanity” section of the Journal of Hand Surgery.
The entire annual meeting program, including abstracts, posters and photos is available on the AAHS Website: www.handsurgery.org
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