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ASHT TIMES

THE NEWSLETTER OF THE AMERICAN SOCIETY OF HAND THERAPISTS

CONTENTS

Feature

An Overview on Pain and Graded Motor Imagery

By Susan W Stralka PT, DPT, MS

Graded Motor Imagery (GMI), as described by Butler and Moseley, is a rehabilitation technique used to retrain the brain for patients having pain, difficulty moving, difficulty initiating movement or fear of moving. The GMI rehabilitation program started with Moseley's interest in the role of the brain in chronic pain, as well as an article on delayed reaction time in left/right hand judgment task in patients with the diagnoses of hand pain.[1] Using positron-emitting tomography to image brain activation through blood flow measures, GMI is shown to sequentially activate distinct ordered stages of brain function.[2]

GMI consists of three sequential phases: left/right identification (also called laterality recognition task), motor imagery and mirror therapy. Even though the technique is delivered sequentially, the therapist may use a flexible approach, depending on the patient's needs. If symptoms occur in one of the sequential steps, the clinician may go back to the previous step to decrease the unwanted symptoms.

Recent neuroscience research, as well as improved functional imaging and cortical mapping, have shown the important role of the central nervous

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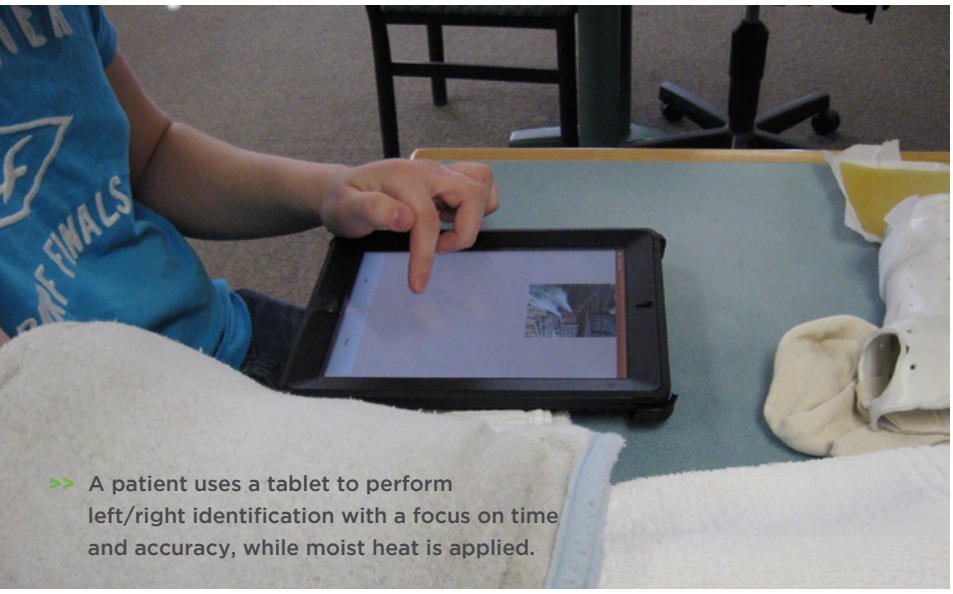


>> A patient uses a tablet to perform left/right identification with a focus on time and accuracy, while moist heat is applied.

GMI consists of three sequential phases: left/right identification (also called laterality recognition task), motor imagery and mirror therapy.

system (CNS) in the pathogenesis of many diseases. Reorganization in central somatosensory and motor networks causes altered processing of tactile and nocioceptive stimuli along with a change in the cerebral organizations of movement in patients with Complex Regional Pain Syndrome (CRPS).[3] Evidence has also revealed that therapeutic clinical changes are linked to cortical reorganizations.[4-7] Moseley and Flor discussed the link between brain changes with chronic pain and how therapists must use brain retraining in their treatment protocols.[8] Neurorehabilitative strategies, such as GMI and target cortical areas aim to restore impaired sensorimotor functions in patients with CRPS and cerebral vascular accidents (CVA). They have shown improvement in restoring impaired function, as well as reduction in pain.[9,10]

Background

Lundborg reported that strategies for treatment following nerve injuries must be aimed at retraining the brain so cortical representation returns to near-normal following the injury.[11] Merzenich et al and Byl suggested the brain has the ability to reorganize or change its input and output.[12,13] Pons and other neuroscience researchers recorded signals in primates from cortical areas corresponding to a finger that had been amputated years earlier; this cortical area responded to peripheral stimulation of an adjacent finger.[14] Flor used functional magnetic resonance imaging (fMRI) to demonstrate that the duration and extent of injury correlated with remapping of the brain.[15] Rosen reported on ways to activate and maintain the cortical hand representation after nerve repair.[16]

Pain

The brain considers multiple inputs when making a decision if nocioceptive input is dangerous to the body. Inputs include proprioception; interception (tissue injury from mechanical, thermal and chemical input); information from the five senses; and cognition (beliefs, feelings, memory and expectation).[17] The brain then evaluates all inputs and decides whether protective action is needed, which prompts it to respond. Pain also disrupts the body schema and the internal cortical representation of the involved limb, thus causing proprioceptive and sensorimotor abnormalities.[18-21] Clinical examples of protective responses from the brain would include muscle guarding, fear of movement, limping and stiffness, as well as motor dysfunctions, such as dystonia. Pain is 100 percent output of the brain and is a complex dynamic system that is individualized. No two people have the same pain.

Motor Priming

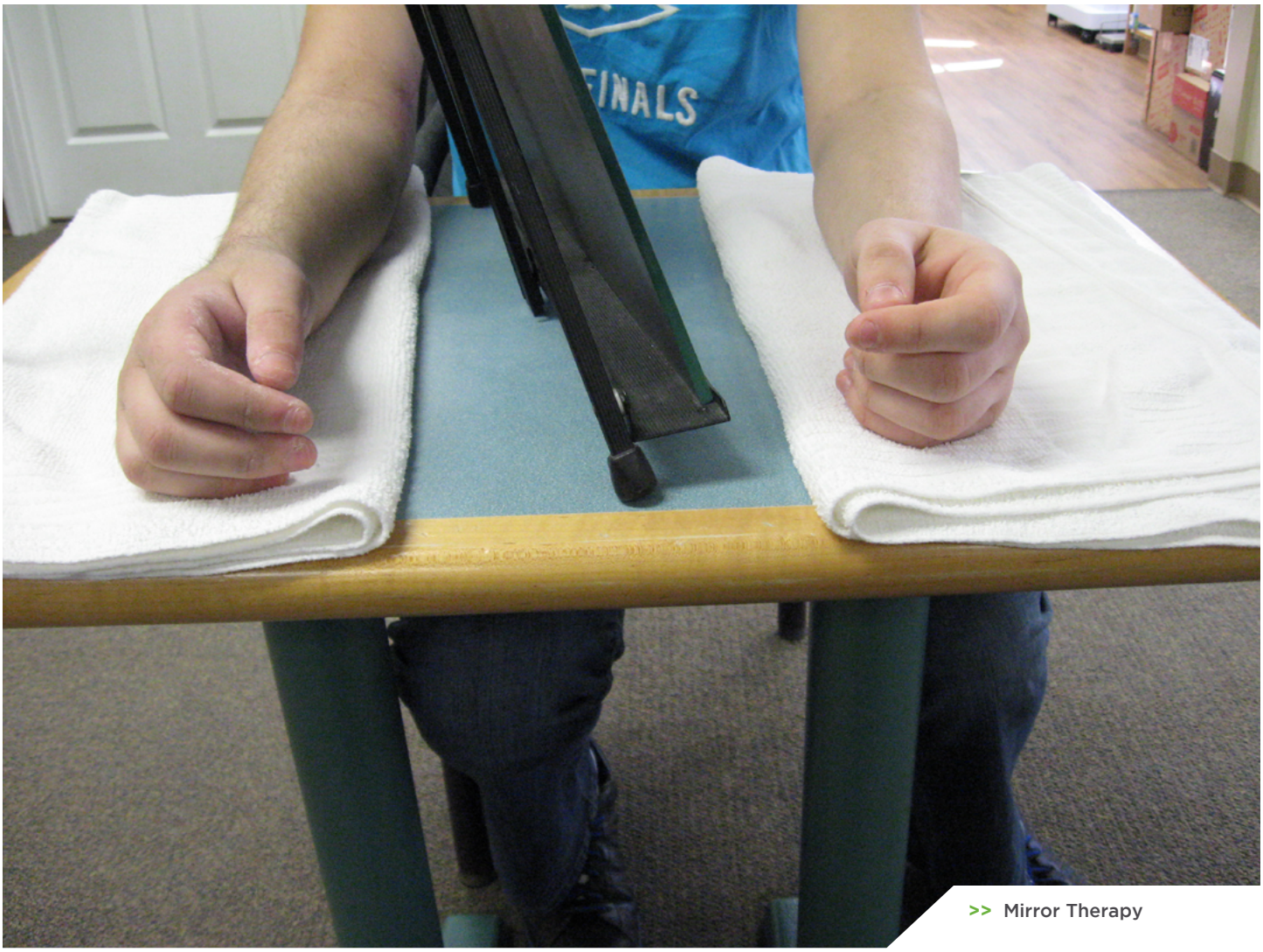
Priming, as described by Stoykov is a change in behavior based on previous stimuli.[22] The general theory is that the brain has been primed by prior activation and is generally more responsive to accompanying or subsequent training. Studies on brain mapping have investigated motor priming as a tool for inducing neuroplasticity and enhancing the effects of rehabilitation. Other research has studied priming as a way to facilitate motor learning. In 2011, an article by Pomeroy et al categorized priming as a restorative intervention that reduces impairment by targeting underlying neural mechanisms in neurological disorders.[23] Past research in neurophysiological studies have shown that intending to perform, image, observe or execute an action all activate the same brain areas.[24] Motor imagery and mirror therapy (two components of GMI) are used to prime subsequent movement. Early studies in sports medicine and sports science used mental imagery to enhance a sport activity. Much work is being done using mental imagery in the neuro rehabilitation field in stroke, spinal cord injury and Parkinson's disease.[25] This topic needs more research in justifying its use in all phases of stroke rehab. It has been reported that mental practice with physical practice is a way to perform brain repetitions when actual physical activity can't be carried out.

Description of GMI

Stage 1: Left and Right Identification — Research by Moseley and others have shown that patients following injuries have central nervous system reorganization, such as sensitization, which results in more easily evoked pain and disinhibition, and body perception changes, as well as movement dysfunction.[1] This causes the loss of ability to identify left from right and decreased speed. Determining left from right depends on an intact body schema and activates premotor cortices.[1] Left and right identification consists of showing the patient pictures (such as flash cards or fabricated cards made by taking a variety of hand pictures) or other body images and having the patient correctly identify pictures of right and left hands in various positions. Starting with the left and right identification stage is an important part of brain retraining for normal recovery. The goal of the training is to show improvement in accuracy of identification, as well as speed of identification. Swart et al reported that left and right identification focuses on the premotor cortex and motor imagery focuses on the primary motor cortex, both of which are integral parts of priming the system.[26]

Stage 2: Motor Imagery — With motor imagery the client first imagines the limb in a certain position, and then imagines the limb moving or performing an activity with the limb. Consider this phase as a way to exercise the brain before the rest of the body. It is important to start this phase by imagining a static position before imagining the limb moving. A Cochrane review on mental imagery reported that mental imagery and physical practice more effectively improved upper extremity function than physical activity alone.[27] Information from several research studies suggests that mental imagery may be very helpful, but indicates more studies are needed.

Stage 3: Mirror Therapy — Mirror therapy involves looking into a mirror and seeing the image of the uninvolved limb in the mirror, which looks as if it is the involved hand.[28] This creates the illusion that the injured hand is moving without pain and other symptoms.



>> Mirror Therapy

According to Rock and Victor, the brain was shown to prioritize visual input over proprioception input, so when the unaffected limb moves in the mirror image, it appears as though the affected limb is functioning normally.[29] Ramachandran was the first to report on using mirror therapy alone for treating phantom limb pain.[30] According to McCabe, mirror therapy is thought to provide strong positive sensory feedback into the motor cortex, suggesting that not all movements need to be painful.[10] Another theory is that mirror therapy may work because of increased attention to the limb, causing improved ownership,[31] however the exact mechanisms of mirror therapy are still not fully understood. The first step is to have the patient look at the image in the mirror that is the illusion of the involved hand. Then, the patient should move both limbs in a bilateral synchronous manner to feel the movement at the same time as observing the reflection of the normal limb moving.[10] McCabe reported on using mirror therapy

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Mirror therapy involves looking into a mirror and seeing the image of the uninvolved limb in the mirror, which looks as if it is the involved hand.[28]

Mirror therapy is thought to work by providing false, but congruent, visual feedback of the unaffected limb, restoring the normal pain-free relationship between sensory feedback and motor intention.

alone in treating CRPS and found that treatment was effective in patients with early CRPS (under 8 weeks) and intermediate (less than 1 year).[10]

Moseley suggests that the entire three stages of GMI be used because this is a sequential order that doesn't overwhelm the sensitized nervous symptoms and exacerbate symptoms.[1] This is a graded approach to cortical activation using techniques to activate cortical regions affiliated with movement preparation (priming) then slowly staging movement execution.

Pain and GMI

Pain is an output of the brain when the brain perceives danger and believes action is required. According to Melzack's neuromatrix theory, there is a combination of cortical mechanisms that, when activated, produce pain.[32] Many cortical areas can be activated and some cortical areas are involved more often than others. There is no one pain center. Pain is produced when an individual's specific cortical pain neuromatrix is activated. Butler and Moseley describe the pattern of neuron activation as a neurotag, which produces an output.[1] With persistent pain (or pain after the body has healed), the pain neuromatrix is strengthened by both nociceptive and non-nocioceptive mechanisms, causing less input to produce pain. The use of GMI clinically focuses on decreasing all inputs that imply the body is in danger, and the goal is to activate parts of the neuromatrix without firing a painful neurotag.

The member cells of one neurotag are also shared by other member neurotags. The activation of one neurotag may make activation of another neurotag easier. A clinical example of this would be a neurotag for distal radius fracture. That neurotag for healed distal radius fracture has shared member cells for a previous persistent pain problem. Just thinking about the event activates cells and memories of the original distal radius fracture, due to both sharing some of the same member cells. When member cells become easier to activate and spread symptoms outside of the injured area, this is called central sensitization. An example of this is when just thinking about moving the healed wrist causes pain. A complete article on the sharing of member cells can be found in *The Graded Motor Imagery Handbook*.[1]

The concept used in GMI for sequential firing of areas of the brain is to fire painless neurotags by using the preferred sequence of GMI. The body schema is strengthened by using right and left identification. Next, motor imagery is initiated (ideally before mirror therapy) so that areas of the brain can fire and cause remapping even before movement in a mirror happens. Lastly, bilateral or unilateral movements, along with symmetric active or passive movements, in front of a mirror help to reinforce that the limb can move without pain.

Recent research suggests that cortical reorganization is a contributing factor in many musculoskeletal and neurovascular consequences

of injury. The evidence points to CRPS having cortical involvement, including changes in motor cortex representation and body perception disturbances. Mirror therapy is another therapeutic technique to be used to assist in overpowering this sensorimotor incongruence. Mirror therapy is thought to work by providing false, but congruent, visual feedback of the unaffected limb, restoring the normal pain-free relationship between sensory feedback and motor intention. It is possible that mirror therapy alone may increase pain, but when the other components of GMI (right and left limb identification and motor imagery) are used first the patient may be more tolerant and have less pain symptoms. Mirror therapy and motor imagery programs aimed at restoring the integrity of neural processing in the sensory and motor areas have been shown to improve clinical symptoms and to restore cortical brain organization toward normal.

Summary

There is a shift from treating only peripheral symptoms to treating both the peripheral and central symptoms. The idea of using GMI to retrain the brain has been documented successfully for clinical use.

According to Butler and Moseley, the clinical approach of GMI 1) reduces the threatening input; 2) reduces or decreases the pain neuromatrix; 3) targets activation of specific components of the neuromatrix without activating the unwanted parts; and 4) upgrades physical and functional tolerance by graded exposure to threatening inputs across sensory and non-sensory domain.[1] The use and success of GMI is based on the therapist's knowledge of brain retraining and must be individually tailored for the patients. GMI is a part of a treatment where neuroscience education and rational must be understood by the patient. It is known that cognitive thoughts have an impact on pain and movement. Using GMI may provide a start for the rehabilitation process with the patient who believes movement means pain and avoids movement. GMI, when used sequentially, starts with the activation of cortical areas involved in thinking about movement without actually moving and then progresses the program with moving. Although there is evidence supporting GMI, more research with larger samples and similar patient diagnoses is necessary. ◆

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Susan W. Stralka, PT, DPT, MS, is a licensed physical therapist with many years of experience treating both musculoskeletal and neurovascular consequences of injury. She earned a Master's degree and a Doctorate in Physical Therapy at the University of Tennessee Health Sciences Center in Memphis, Tennessee (UTHSC), and she is often is guest lecturer there. She has a strong clinical background in treating neurological and musculoskeletal consequences of injury. Dr. Stralka is very active in the community, as well as with many other civic organizations. She has held numerous state and national offices with the American Physical Therapy Association (APTA) and the Arthritis Association. In 2009, Dr. Stralka was recognized by the Arthritis Association as Volunteer of the Year. In 2012, she received the Dorothy B Kauffman Professorship Award from the Hand Rehabilitation Foundation. Dr. Stralka has also presented on upper and lower extremity dysfunctions, as well as pain management both nationally and internationally. In March 2013, Dr. Stralka lectured in New Delhi, India, at the International Federation for the Society of Hand Therapist (IFSHT). In September 2013, she was the keynote speaker at the Brazilian Society of Hand Therapist in Gionia, Brazil. In November 2013, she spoke in the Department of Hand Surgery, Lund University, Malmo, Sweden. Dr. Stralka has written articles on a wide variety of topics related to physical therapy for many national publications and health journals.

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A MESSAGE FROM THE EDITORS

Barbra Koczan, PT, CHT, DPT

Romina Astifidis, MS, PT, CHT

We are excited and honored to be selected as the new editors of the *ASHT Times*. We both look forward to this new challenge and encourage active participation from all members to help provide content for the *ASHT Times*. This is possible in several ways. A member can nominate him/herself or a fellow member for the Member Highlight article; suggest a topic that he/she would like to read more about; and/or submit a research-based article or case study to be a feature article. We look forward to working with all members to create a quality publication that will provide timely and relevant information. Here is a little bit of information about us.

Romina Astifidis graduated from Loma Linda University in San Bernadino, California with her Master's degree in physical therapy. She spent the next 2 years of her career exploring all aspects of therapy, including home care, rehab and outpatient orthopedics. When an opportunity to apply for a job in a hand therapy arose she took it, and that led to her becoming a CHT. Romi is the director of Curtis National Hand Center/Medstar NRH Rehabilitation and has been actively involved in the hand therapy field as an adjunct professor, community educator, student clinical instructor, coordinator and author. She has been involved with ASHT in numerous roles, including profession relations and as the Education Division director. Romi still enjoys every aspect of hand therapy and spends her free time enjoying the outdoors, traveling and exploring different artistic mediums.

Barbra Koczan graduated from University of Maryland, Baltimore with a Master's degree in physical therapy. After practicing for several years in outpatient orthopedics, Barb became interested in hand therapy after observing a coworker who was a CHT. Her interest in hand therapy led her to leave general orthopedics in 2002 when she began her career in upper extremity rehabilitation at the Curtis National Hand Center/Medstar NRH Rehabilitation. Subsequently, she earned her CHT and then attained her DPT from Drexel University. She enjoys giving back to the profession — she acts as a clinical instructor, a case mentor to DPT students at several universities and has been a volunteer on the ASHT Education Division. Volunteer missions to Nicaragua and Honduras have helped her to incorporate her love for hand therapy with her love for travel. Outside of work, Barb is an avid scull and sweep rower.

Coincidentally, both Romi and Barb have held the position of editor of the *ASHT Times* in the past. Romi held the position from 2000 to 2002, and Barb from 2003 to 2005. ◆

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A MESSAGE FROM THE PRESIDENT

It is my honor to serve as the 2015 President of ASHT, and with the Board of Directors and staff, we are committed to providing the best value for your membership. In early January, the 2015 Board of Directors held their first meeting in Philadelphia, focusing on strategic planning. Although the temperatures were frigid outside, the passion of the ASHT board to support hand therapy practice through education, research and advocacy was hotter than ever!

ASHT is the only professional organization dedicated to advocating for the practice of hand therapy and supporting excellence in hand therapy. The many programs and services ASHT offers to members include support for career-long learning and networking opportunities with other professionals in hand therapy. I believe that being a member of ASHT will enhance your professional life, so that you can enrich the lives of your patients, clients, colleagues, students and communities.

Today, all hand therapists, like yourself, are concerned with the rapidly changing healthcare environment, including changes in service delivery and declining reimbursement. Therapists are required to produce "better" patient outcomes in a reduced amount of time within an episode of care. ASHT leadership is staying abreast of these changes and providing input to our parent organizations, The American Occupational Therapy Association (AOTA) and the American Physical Therapy Association (APTA), to make sure that the viewpoint of the occupational and physical therapists that practice in hand and upper limb therapy is known.

The ASHT Board of Directors has budgeted additional funding to the Legislation and Reimbursement Division to make sure that ASHT members have the latest information on critical issues that will impact the practice of hand therapy. The Legislation and Reimbursement Division is focused on updating resources for our members and maintaining regular communication via website updates, *Hands On* eblasts, special eblasts and e-Community posts. Under the direction of Marsha Lawrence, PT, CHT, this division is very busy providing educational resources that pertain to reimbursement and legislative issues. Take some time to review the updates on the ASHT website.

Members have the unique opportunity to serve as ambassadors for ASHT. I ask that you share your membership experiences with a colleague that is not a member. Encourage them to join. ASHT and therapists practicing in hand therapy will be stronger in numbers. Reach out to young people eager to develop their skills and knowledge in hand therapy. Educational programs dedicated to CHT preparation are demonstrating very good outcomes for the CHT exam pass rate. More experienced members can share their clinical wisdom with those just embarking on a career in hand therapy and contribute to practice resources or needs to strengthen the hand therapy position in the global healthcare arena. The larger the membership, the stronger the voice to spread the value of hand therapy to clients, referral sources, payers, legislators, regulators and the public. ◆

Members have the unique opportunity to serve as ambassadors for ASHT.

On the Road to Certification

One hand therapist prepares to achieve excellence, finding the resources he needs in ASHT.

By Kimberly Turner Quevedo, *ASHT Times* Editor Specialist

EUGENE BOEGLIN, DPT, OCS

As Evelyn Mackin, LPT, explained in the first Nathalie Barr Lecture in 1986, "Listening, explaining and touching the patient truly represents the art of hand therapy." This interaction with the patient is what motivated Eugene Boeglin, DPT, OCS to become involved in hand therapy. "The patients are motivated to get better," said Dr. Boeglin. "The hand, elbow and shoulder parts of a person's body are interesting areas to study because they are intricate. The complexity of the injuries requires a specific approach for each patient." He knew to treat patients effectively he had to increase his knowledge in hand therapy. Aiming to become a certified hand therapist (CHT), Dr. Boeglin joined the American Society of Hand Therapists (ASHT). "The member benefits far outweigh the dues," said Dr. Boeglin. "Every year I am impressed by the amount of benefits provided and they keep evolving and improving."

Learning More

Member benefits include everything from discounted courses and exam reviews to publications and discussions on current issues. Dr. Boeglin takes advantage of the multiple online resources ASHT provides. The resources include guidelines to G-codes, clinical resources in the various publications (like the *Journal of Hand Therapy* and the *ASHT Times*) and the ASHT Hand Therapy Review Course, which offers a structured study approach to upper extremity rehabilitation that may help prepare for the CHT exam. "The programming at the meetings is also helpful because not only do they have hand therapy programming, but they have people from the Hand Therapy Certification Commission come in and give talks about how to become a certified hand therapist," said Dr. Boeglin.

Of all the benefits, Dr. Boeglin values the ability to volunteer as one of his favorite. He serves as a moderator for ASHT's Journal Club chats. The sessions circle around discussions of a specific article in the *Journal of Hand Therapy*, particularly focusing on the research behind it. "We pick apart the research and teach people to break it down as far as the quality of the research and whether it should be used clinically or not," said Dr. Boeglin. "We teach them to be discerning leaders of research." The session allows for members around the country — even some international — to connect and discuss the validity of a submitted article. "Once, one of the authors of the article we were discussing, who was from Italy, came online and acted as a resource for any questions we had," said Dr. Boeglin. "The sessions are a tremendous learning experience."

Becoming Certified

With the wealth of knowledge ASHT provides, Dr. Boeglin is preparing to take the certification exam in the next few upcoming months. "Becoming a member of ASHT before becoming certified has been very beneficial because it has given me a sense of community and the feeling that I am not alone in my preparation," said Dr. Boeglin. "ASHT provides multiple resources to enable a hand therapist to become a CHT. It also helps me stay current on literature in my profession. It is a worthwhile investment." ◆

> "Becoming a member of ASHT before becoming certified has been very beneficial because it has given me a sense of community and the feeling that I am not alone in my preparation."
>
> **— Eugene Boeglin, DPT, OCS**

Feature

The Value of Volunteering for ASHT

FOREWORD SUBMITTED BY THE 2014 ASHT BOARD MEMBERS-AT-LARGE

Missy Thurlow, MBA, OTR/L, CHT has been a devoted volunteer with ASHT since 1999. She has been involved in distinct roles within the organization, including as a board member, treasurer, division member, vice chair, co-chair and chair of various ASHT conferences. Missy has committed hours of her personal time to create lectures and author chapters on diverse topics while representing ASHT. She is dedicated to the future of hand therapists, as seen by the numerous fieldwork students she mentors yearly.

On an organizational level, Ms. Thurlow has been instrumental in advancing the practice of hand therapy with ASHT. On a personal level, she lights up any room she enters and has friends everywhere. She gracefully networks and encourages others to follow in her footsteps. Her commitment to the profession and to the ASHT organization, while promoting excellence in hand therapy, has been immeasurable. As Missy reflects on her time and volunteer experience with ASHT (see page 11), it is apparent how much it has fostered her growth over the years. Furthermore, Missy's commitment and belief in the organization has fostered its growth. Thank you Missy, for your endless dedication; we need more of you in this world!

As Missy reflects on her time and volunteer experience with ASHT, it is apparent how much it has fostered her growth over the years.

Missy Thurlow, MBA, OTR/L, CHT

From Missy Thurlow:

"My volunteer experience with ASHT began in 1999 when I was asked by the vice president of ASHT, Lauren Rivet, to be the conference co-chair, along with Keri Landrieu, for the 2001 conference in Nashville, Tennessee. Little did I know that job would lead to my interest in doing more for ASHT. In 2001, we had a very successful conference, complete with an unforgetable party at the Wild Horse Saloon. It was a much-needed lift after the recent events of the World Trade Center terrorist attacks, and I admired the conference attendees for coming.

Following the 2001 conference, I was involved in being vice-chair and chair of several ASHT conferences in Phoenix, Arizona; Atlanta, Georgia; Los Angeles, California; Orlando, Florida; and San Francisco, California. It took more than a year of planning for each conference and required the work of highly dedicated Annual Meeting Committee volunteers and ASHT staff to pull it all together. We worked to provide as many continuing education units (CEU) as possible, while attempting to appeal to the various levels of attendess — new graduates, new CHTs and more seasoned therapists. I loved working with the physicians who would do cadaver dissections at the conference. The hand therapists who attended those symposiums were excited, especially when they saw surgery, relating it to what they treated daily in the clinic.

Over the years, I organized Read and Respond for the Education Division, which offered a chance to earn CEUs through reading an article in the *Journal of Hand Therapy* and answering questions. I found working with the Education Division to be rewarding. It was the beginning of new friendships and I always enjoyed seeing my Read and Respond question writers at ASHT conferences.

In 2008, I ran for an ASHT Board of Directors and became a Board Member-at-Large for 2 years. It was my goal to see what the board does and what kind of volunteering was involved at that level. I began to understand the inner workings of a group of individuals who wanted to make the best decisions for the organization. We worked as a team, but also often had many different ideas on how to achieve something. Ideas were formed and decisions were made, all with the best intentions of meeting ASHT's mission and vision. There were different personalities, some more vocal than others, but everyone's opinions were listened to and respected.

Following that position, I was elected to be Secretary/Treasurer-Elect for 1 year and then moved into the Secretary/Treasurer's position for 1 year. I have an MBA, but looking at the spreadsheets and financial statements and understanding them fully was another thing. We had a great staff at ASHT who patiently discussed each item and what it meant for the organization. I began to understand the costs of running an organization, funding a big annual conference and how important it is to continue to retain and promote growth in ASHT membership.

In 2012, I returned again to the ASHT board for a 2-year term as Board Member-at-Large. I have enjoyed working with a great, progressive Board of Directors and fellow BMALs, Jeanine Beasley and Mo Herman. Those girls rock! Our presidential line is exceptional and should see us through any difficulties in healthcare that may occur.

I have thoroughly enjoyed my years of volunteering with ASHT. I helped make decisions and have completed my time on the ASHT board for now. For the future, we need new folks who can take on some volunteer tasks, step forward to assist with the divisions and run for board positions to help ASHT continue to grow and be successful. We need you to volunteer! You will be glad you did." ✹

QUIZ

TEST YOUR KNOWLEDGE

Submitted by Emily Skoza, MSOT, OTR/L • ASHT Education Division Member

1. **During a Jobe's provocative clinical exam, a patient is placed in the following position except:**

   A. Forearm pronation

   B. Arm in 80 degrees of abduction in the scapular plane

   C. Thumb turned down

   D. Full shoulder internal rotation

2. **True or False: The preferred position for a passive median nerve gliding exercise is forearm supination because of the large distally oriented glide of the nerve.**

   A. True

   B. False

3. **List four potential patient psychological factors familiar to hand specialists.**

   1. _____

   2. _____

   3. _____

   4. _____

Find the answers on page 19.

Rising to the Challenge of Treating the Pediatric Patient in an Adult Hand Therapy Setting

Jill Peck-Murray, MOT, OTR/L, CHT

Have you ever been faced with the following scenario? A new prescription arrives and the diagnosis is listed as camptodactyly. Then, you notice that the patient's age is 3 months old. This can pose a challenge for even the most seasoned adult hand therapist. "I have a few tips for adult hand therapists to help them rise to the challenge of treating the pediatric patient," says Jill Peck-Murray, OTR/L, CHT who works at Rady Children's Hospital in San Diego and speaks nationally on pediatric hand therapy and splinting.

First, it is helpful to recognize that there are many diagnoses that are specific to children including camptodactyly, syndactyly, arthrogryposis, radial ray deficiencies, juvenile arthritis, cerebral palsy, and epidermolysis bullosa. One example, camptodactyly, is a congenital flexion contracture of the PIP joint. It responds well to serial static splinting. Diagnoses including fractures, tendon injuries, trigger thumb/fingers, and brachial plexus injuries will need a different approach with the pediatric patient compared to the adult patient. Every one of these conditions may require some conservative/pre-operative, and/or post-operative therapy including splinting, exercises, activities to encourage motion, or adaptations to encourage normal development and self care skills.

There are multiple issues related to the child's age. A good understanding of hand development is crucial for evaluation and treatment. For example, an infant's thumb may normally stay flexed into the palm but after age four months, it may indicate pathology such as thumb-in-palm deformity or flexor spasticity. Most therapists will remember that infants sit at 6 months, crawl at 7 months, and start walking about 12 months. The child with a brachial plexus injury or weakness in one arm should be encouraged to crawl and discouraged from standing and walking between the ages of 6-12 months. This opportunity for weight bearing on the involved arm during this time period will encourage strengthening of scapular musculature, elbow and wrist extension, and arch development. Other developmental and growth issues need to be addressed in therapy. Since children are growing rapidly, the best fitting splint will still require frequent splint adjustments or refabrication.

All aspects of therapy, including evaluation, treatment, home programs, and splinting will be more successful when tailored for the pediatric patient:

Evaluation: A kid-friendly environment can help establish good rapport and patient cooperation. Removing all distracting things from the room and setting out a puzzle or game before the child arrives will help the child focus on the tasks presented. A small child may not be able to sit in an adult size chair and table. An easy solution is to have the child sit on the parent's lap. A better alternative may be a booster chair or small size chair and table. The evaluation should be as brief as possible to maximize the child's cooperation.

Range of motion can be assessed with a goniometer (gator-shaped ones are available in the catalogs), but may be abbreviated using composite measurements or approximate measurements for ranges.

Strength can be documented by reporting the available active motion or the amount of weight lifted since children are often unable to cooperate with manual muscle testing. Grip and pinch strength can be documented with the dynamometer and pinch gauge. There are norms for pinch and grip starting at age 5 (DeSmet 2001, & 2006, Surrey 2001, and Mathiowetz 1986) but normal strength can often determined by comparing to the non-involved extremity.

Manipulative skills can be documented with a subjective description of the involved extremity including the ability to reach, grasp and release, push and pull, bilateral skills and weight-bearing skills. There are some adult standardized tools that can used with children including the Nine Hole Peg test, Purdue Pegboard test, Functional Dexterity test, Canadian Occupational Performance Measure (COPM), Quality of

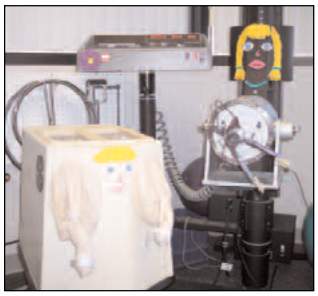

Figure 1

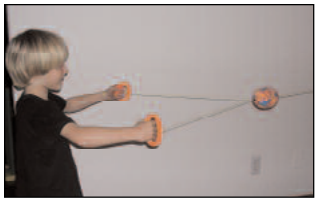

Figure 2

Figure 3

Challenge

Upper Extremity Skills test (QUEST), and the newly developed Shiners Hospital Upper Extremity Evaluation (SHUEE).

Therapists may document developmental skills using developmental assessment tools that have components to assess hand use such as the Peabody Developmental Scales II (PDMSII) and the Bruininks Oseretsky Motor Assessment 2 (BOT-2). Writing and drawing skills can be assessed using such tools as the Beery Developmental Test of Visual Motor Integration (VMI), Evaluation of Children's Handwriting (ETCH), and Wold Sentence Completion test.

Treatment: Therapy needs to be fun for kids! A board game

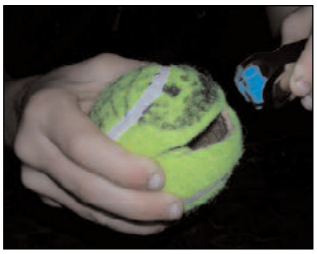

Figure 4

Figure 5

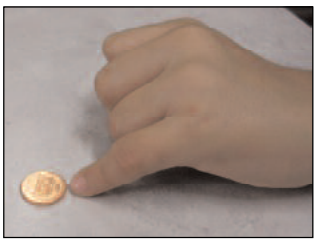

Figure 6

or puzzle may distract the child to allow the therapist to do a procedure like joint mobilization, scar massage, or modality. But how do you get a child to place their hands into a noisy, hot, fluidotherapy machine filled with circulating warm air and cornhusks? Try decorating it. Ours is named "Freddie" and we hide soft objects in him for kids to find. Our BTE machine is named "Betty" (Figure 1) and she helps kids get strong by "stirring large bowls of soup" (tool 701) or "turning a ferris wheel" (tool 181). Other modalities can be used as tolerated by children including heat and cold modalities, fluidotherapy, electrical stimulation, and iontophoresis. Ultrasound, however, is not recommended for children until they reach skeletal maturity due to the risk of damage to the growth plates.

Games like "zoom ball" (Figure 2) or "stick volleyball" (Figure 3) can be used to exercise shoulders, elbows, wrists and hands. To encourage supination,

Figure 7

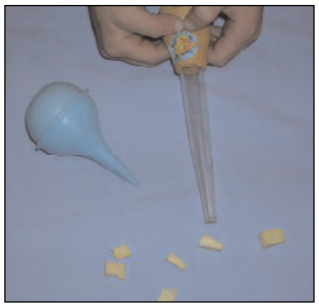

Figure 8

a tray can be carried with hand flat underneath to set up a tea party across the room. Another idea is using an empty toilet paper roll with a taped end to scoop rice and supinating to dump into a large dish. Small pegboards, stringing beads/cheerios onto pipe cleaners, or stacking blocks are good for grasp and release tasks.

Grip strengthening can be made fun by squeezing water from sponges into different size containers or squeezing tennis balls with a slits (Figure 4) to open the mouth to feed. Pressing felt pens or dowels of PVC pipe into theraputty strengthens finger flexors. Kids also enjoy finding objects hidden in the putty. Theraputty should only be used by children over age 3 and parents advised to use close supervision at home due to the problems with sticking to clothes, sofas, rugs, etc.

Finger extension can be encouraged by creating a rubber band ball (Figure 5), playing cats cradle game, yo-yo, or penny soccer (Figure 6). Pinch strengthening can be accomplished using pop beads (Figure 7), turkey basters (Figure 8), tongs, animal grabbers, finger frisbees (Figure 9), or clothespins/clips (Figure 10). It is helpful to make therapy fun with a game or competition to keep the child

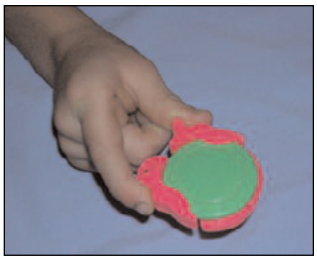

Figure 9

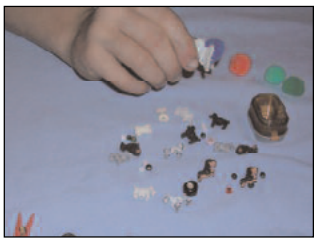

Figure 10

motivated and interested.

Home program: Simple, written instructions and pictures with a compliance grid can enhance home therapy. To help ensure good understanding of the home exercises, the child and parent should demonstrate these and sign an agreement to do them daily. Bringing the compliance grid to each therapy session is encouraged and it may be helpful to provide a small incentive prize for completion of the home program.

Splinting: Splinting is certainly a challenge on pediatric patients, especially infants. It was described by one adult therapist as similar to "changing a tire on a moving vehicle." Good planning for the splinting session can be helpful including having toys to keep the child busy between fittings. Children are often afraid of the warm splint material. Taking adequate time to make a well-fit paper pattern will eliminate the need for repeated fittings with the warm material. A decision about type and thickness of splint material depends on the size of the child and the needs for rigidity and drapability. To prevent self removal or choking hazards, splints for infants or small children may need to be

Figure 11

Figure 12

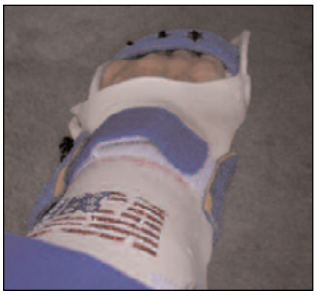

Figure 13

Challenge

designed to include proximal body parts for anchoring. For instance, a finger splint may need to be hand or forearm based. Working time and set up time should be considered carefully, since the splint needs to be fabricated quickly. The straps should be securely attached to prevent the child from choking on the splint or straps.

Methods to avoid self-removal (anti-Houdini devices) can be added to most splints. The use of shoelaces or ribbons (Figure11) when appropriate for the child's age, cord locks (Figure 12), or doubled over hook Velcro (Figure 13) may slow down the child's ability to remove the splint. If this is not sufficient, the splint can be wrapped in a sock, ace wrap, coban or tape.

Hopefully, these suggestions will help those who face the challenge of treating pediatric patients in an adult setting. If interested in more information on pediatric hand therapy or starting a pediatric hand therapy speciality group, contact Jill Peck-Murray: jpeckmurray@rchsd.org. Also, check the education section of this newsletter for a course co-sponsored by ASHT in Wisconsin in April, 2008. ■

Peripheral Nerves: Principles of Injury and Repair in the Upper Extremity

Dr. Steven H. Goldberg, Hand Surgery, Ltd, Milwaukee, WI

Anatomy Summary

Peripheral nerves have motor axons, sensory axons, or both. An axon is the long nerve fiber that transmits a motor signal from the spinal cord to the muscle, or sensory impulses from the periphery to the spinal cord and on to the brain. A collagenous tissue termed endoneurium surrounds axons. Within the nerve, axons are grouped into separate fascicles. For example, the median nerve has several groups of fascicles, one group containing motor axons to the thenar muscles, and several other fascicles that transmit sensation from the thumb, index, middle and half of the ring finger. Perineurium surrounds each fascicle and is a sheath composed of flattened, tightly apposed cells arranged in multiple layers. Perineurium resists longitudinal stress and retains the nerve's elasticity during elongation. It also serves as an extension of the blood-brain barrier and is critical for nerve function. Fascicles can be grouped together in bundles by a loose connective tissue layer referred to as the internal epineurium. The outer epineurium is the most superficial structure, surrounding multiple groups of fascicles and allowing both longitudinal and lateral excursion. The outer epineurium can comprise anywhere from 25-75% of the nerve's cross-sectional area, yet unlike the perineurium, few physiological sequelae result if it is removed.

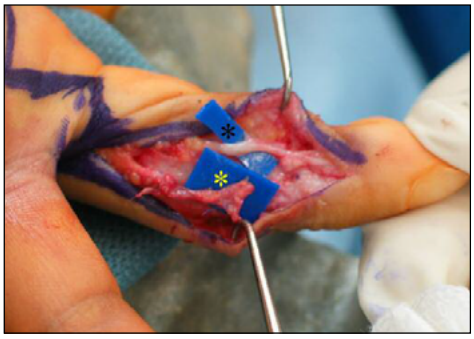

***Figure 1A** This patient suffered a near amputation of the fingertip. He developed chronic neuropathic pain. Approximately one year after injury he underwent surgery to treat the neuroma. The proper digital nerve is intact (black *). The dorsal branch of the digital nerve (yellow*) was found to have been lacerated with the development of a neuroma. There is no identifiable distal nerve segment, preventing a surgical repair.*

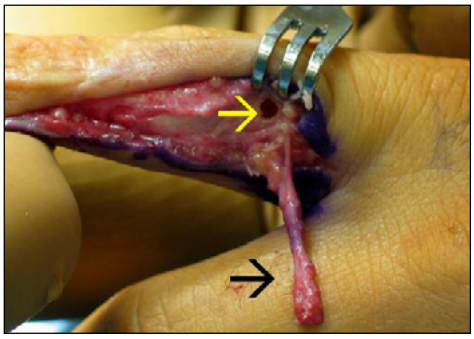

***Figure 1B** The dorsal digital nerve and neuroma (black arrow) are mobilized and will be implanted into a bone drill hole (yellow arrow) in the proximal phalanx. By placing the neuroma in bone, the nerve endings that are transmitting painful sensation will be less likely to be stimulated during daily activities and thus improve pain.*

Nerve Injury

A transected nerve undergoes a predictable pattern of degeneration termed Wallerian degeneration. Complete transection of the nerve is called neurotmesis.[1] New axonal sprouts emerge from the cut end of a regenerating nerve within approximately 24 hours. The rate of nerve regeneration is often quoted as 1 to 2 mm/day, with improved growth noted in children.[2] However, scar tissue and the severity of trauma can delay this process. If the sprouting axons do not reach the distal end of the cut nerve, a disorganized mass of free nerve endings called a

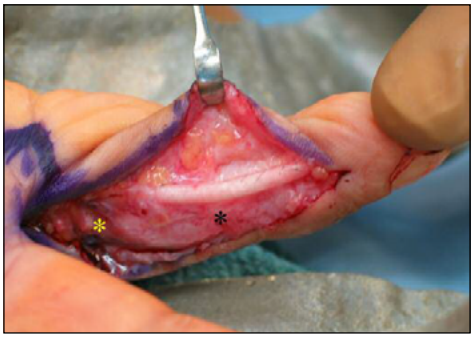

***Figure 1C.** The proper digital nerve is wrapped with a collagen conduit to limit adhesions and potential hypersensitivity or paresthesias from the surgical dissection. Not the absent dorsal digital nerve branch (black *) which is buried proximally (yellow *).*

Peripheral Nerves

neuroma is created. Neuromas can lead to pain, paresthesias, and dysesthesias in sensory nerves. In some cases, a neuroma can be treated by operative resection and subsequent nerve repair, or it can be moved to a less sensitive area and buried in a deeper tissue area out of the zone of injury (Figure 1).

Nerve Repair

Primary repair of a nerve is defined as a repair performed within the first week of injury.

A repair performed more than one week after injury is referred to as a secondary repair. Primary repair has been shown to be superior to secondary repair in both animal and clinical studies.[3,4] In sharp, clean wounds, primary repair is indicated. Minimal dissection is required because the nerve ends have not retracted and become imbedded in scar. Increasing time from the injury leads to increased scar formation and tethering of the retracted nerve ends, making mobilization and a primary tension-free repair more difficult.

Lacerated nerves can be repaired in several ways. Each cut end of the nerve can be directly sutured together (Figure 2) or, when needed, some type of intervening tissue or device can be used to bridge the gap between the nerve ends. Regardless of the type of repair, it is important to avoid nerve tension because the nerve's blood vessels are so small that a mild increase in nerve tension causes vessel collapse and loss of blood supply to the nerve. Because each pass of the suture needle and suture can injure the nerve and cause scar tissue formation, meticulous atraumatic microsurgical technique is important. The number of sutures depends on the size of the nerve; often two to three sutures for a digital nerve and up to ten to twelve for a larger peripheral nerve. It is also important to achieve proper rotational alignment. If the proximal and distal ends are rotated when they are brought together, a motor fascicle proximally could line up with a sensory fascicle distally, which would prevent healing. Thus, the same motor fascicles and sensory fascicles must be lined up across the repair site. To facilitate this rotational alignment, all repairs should be performed under magnification.

When the proximal and distal ends of a transected nerve cannot be reapproximated or tension is required to coapt the nerve ends, an additional procedure is necessary to decrease nerve tension. Four techniques to

Figure 2A. Stab wound to the forearm resulting in complete ulnar nerve laceration. Asterisks (*) show the ulnar nerve in the arm. Arrows show the flexor carpi ulnaris muscle laceration overlying the area of ulnar nerve laceration.

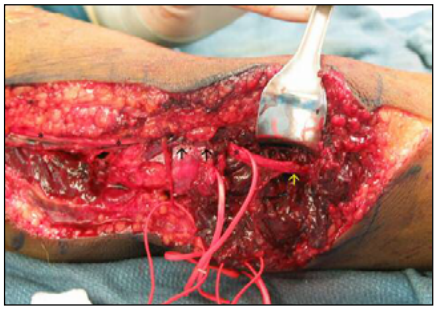

Figure 2B. The ulnar nerve (*) was transposed anteriorly and placed in a submuscular position (black arrows) to overcome the nerve gap and reduce tension on the primary repair (yellow arrow).

decrease nerve tension and overcome a nerve gap while still performing a primary repair include nerve stump mobilization, nerve rerouting and transposition (Figure 2C), joint positioning, and bone shortening. However these techniques are not ideal and nerve conduits have gained popularity as an alternative to these initial procedures. For example many nerves cannot be sufficiently mobilized or transposed, many joints do not tolerate prolonged immobilization, and bone shortening is only used in the setting of a fracture with associated nerve injury.

Bridging a Nerve Gap

When tensionless end-to-end closure is not possible, other options include nerve grafts, reversed vein grafts, and synthetic conduit tubes that are made of several different materials. A segment of nerve can be taken from another area of the body to add nerve tissue to bridge the gap that exists in the injured nerve. Some donor nerves include the lateral antebrachial cutaneous nerve, distal posterior interosseous nerve, or the longer sural or saphenous nerves. The disadvantage of using a normal donor nerve to fix the injured nerve is that the patient will lose function in the donor nerve

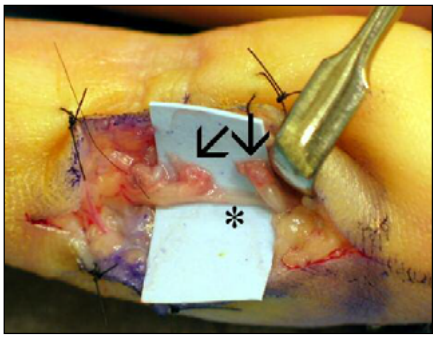

Figure 3A. This patient had a partial ulnar digital nerve laceration to the small finger. Arrows show the lacerated nerve fascicle and (*) shows the intact nerve fascicle. After trimming the ends, if the lacerated ends are brought together it will cause a kink in the intact fibers. Thus, a primary repair would risk decreasing function in the intact fascicle or require cutting the intact fascicle to match the length of the injured fascicle.

Figure 3B A synthetic collagen conduit has been wrapped around the intact fascicle and cut fascicles. This technique encloses the damaged fascicles, which directs nerve regeneration without detrimentally affecting the intact fascicle.

territory. However, in some instances it may be preferable to lose feeling in the forearm or foot to restore feeling to the hand.

Veins can also be harvested to serve as a bridge between the two cut nerve ends. Venous nerve conduits have been found effective in gaps up to three cm.[5] A vein from the arm or leg is harvested that has a slightly larger diameter as the nerve that is being repaired. The vein is longer than the gap between the two nerve ends so that each end of the nerve can be placed inside the vein. Each nerve end is then sutured to each end of the vein. While nerve grafts are still considered superior, and the clear choice for gaps over three cm, venous conduits lack donor site morbidity and have found clinical use in bridging smaller gaps in sensory nerves.

The newest method of bridging a nerve gap is by use of a synthetic nerve conduit (Figure 3). These conduits are composed of

Peripheral Nerves

either collagen or polyglycolic acid. Synthetic conduits are thought to have better structural integrity than venous conduits and therefore be less likely to collapse when bridging larger gaps. A bioabsorbable polyglycolic tube has achieved good to excellent clinical outcomes, but only in gaps three cm or less.[6] Synthetic conduits are used for both acute primary repair and for chronic secondary nerve injury where a neuroma is present (Figures 1 and 3). In this situation, a segment of nerve needs to be removed, leaving a gap between the two healthy nerve ends, which can be bridged by a conduit. Conduits can also be wrapped around intact nerves to reduce scar adhesions to the nerve. For example, when a patient has had a previous ulnar nerve transposition at the elbow for cubital tunnel and requires revision surgery, the conduit can be wrapped around the nerve to limit adhesions (Figure 1C).

Prognosis

In general, the age of the patient and the mechanism of injury are the most critical factors in recovery after nerve repair.[7] Major nerve injuries that occur more than 15 to 20 cm proximal to the denervated end organ are generally considered to have an uncertain prognosis. [8] Gaps of greater than five cm, delays of three months or more, age over 20 years, and the amount of blunt crush during the injury adversely affect outcome.

Primary nerve repair outcomes are generally good, particularly in purely sensory digital nerves where the distance from laceration to end organ is short. Few patients regain completely normal sensation. In one series of 107 digital nerve injuries, 39 of 107 (36.3%) regained static 2-point discrimination to at least 10 mm.[9] Median and ulnar nerves are often injured simultaneously and age is the most important determinant of outcome. Sensation is more reliably restored than motor function.

Nerve grafting procedures are also successful in restoring nerve function. The results of a study of 151 digital nerve grafts showed that 88% recovered pain and touch without hypersensitivity.[10] In the same review, 80% of 167 median nerve grafts recovered motion against gravity and pain and touch sensibility. Ulnar nerve results were slightly less favorable.[7]

In 2000, a multicenter study was published, including 98 patients with 136 nerve lacerations in the hand. The study prospectively randomized the patients into two groups: standard repair (either end-to-end or with a nerve graft), or repair using a polyglycolic acid conduit.[11] The authors concluded that improved sensation resulted when a conduit repair was used for nerve gaps of 4 mm or less, compared with end-to-end repair of digital nerves. Furthermore, they stated polyglycolic acid conduit repair had improved results over a nerve graft for larger nerve gaps and eliminates the donor-site morbidity of using a nerve graft for repair.

Rehabilitation

Many lacerations that transect nerves also involve tendons. There may be competing goals for the rehabilitation of tendons and nerves. Early motion has been shown to be beneficial for the healing of tendon, ligament, bone, and cartilage.[12] However, the effect of early motion on nerve repairs is not clear. Early motion may prevent nerve adhesions. Adhesions limit nerve excursion and smooth gliding, leading to unequal tension distribution along the nerve that in turn can lead to traction nerve injury and ischemia.[2] Traditionally, nerve repairs have been immobilized for three weeks.[13] There are two clinical studies comparing nerve injuries treated postoperatively with immobilization or early motion.[14,15] There was no adverse effect on nerve repair outcome with early postoperative mobilization.[15] Patients with early mobilization of nerve repairs had less stiffness, earlier return to work, less cold intolerance and equal sensation when compared to patients who were immobilized after surgery. Furthermore, several cadaver studies have examined the effect of passive range of motion on digital nerves repaired with and without a nerve deficit.[16,17] For digital nerve repairs, early interphalangeal joint motion appears safe, but a dorsal blocking splint to prevent metacarpophalangeal joint hyperextension may be important.[18] I prefer to use a hand or forearm dorsal blocking splint with 30 degrees of metacarpophalangeal flexion for full-time for three weeks, allowing active flexion and extension within the splint several times per day. The splint is only removed to shower. Formal therapy begins at three weeks postoperatively with full active range of motion being allowed. Passive metacarpophalangeal extension begins at four to six weeks. Hyperextension is avoided until eight weeks postoperatively. The dorsal blocking splint is worn during sleep or activity that would place the repair at risk for six to eight weeks.

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Peripheral Nerves

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TEST YOUR KNOWLEDGE

QUIZ ANSWERS

1. **B.** A Jobe's Test is a clinical exam to determine whether a patient is having symptoms consistent with a rotator cuff tear or impingement (specifically supraspinatus). The patient is positioned with the shoulder in 90 degrees of abduction and 30 degrees of horizontal adduction in the plane of the scapula and the shoulder in full internal rotation.

   Reference:

   Skirven TM, Osterman AL. Rotator cuff tendinopathies and tears: surgery and therapy. In: Skirven TM, Osterman AL, Fedorczyk JM, Amadio P, (Eds). Rehabilitation of the Hand and Upper Extremity. *6th ed. Philadelphia: Elsevier Mosby; 2011:88.*

2. **True:** During this study, a significant difference in distal median nerve gliding was noted between elbow extension and pronation (1.9 mm) and elbow flexion and supination (3.0 mm). A significant difference in proximal nerve gliding was noted between the active hook position (0.8 mm) and a full fist (1.3 mm), suggesting optimal proximal and distal median nerve gliding in forearm supination and a full composite fist.

   Reference:

   Echigo A, Aoki M, Ishiai S, et al. The excursion of the median nerve during nerve gliding exercise: an observation with high-resolution ultrasonography. J Hand Ther. *2008;21:221-8.*

3. Psychosocial factors are important considerations when a patient presents with noncharacteristic or nonanatomic symptoms. Awareness of biopsychosocial behavior frameworks and models along with biomedical approaches may help improve quality of life and overall health. Listed are four examples of psychiatric diagnoses and conditions that may be related to hand therapy.
   1. Factitious Disorder: A person acts as if he or she has an illness by deliberately producing or exaggerating symptoms.
   2. Clenched Fist Posturing: A condition in which the arm is healthy but all or one, two or three digits are tightly flexed. It is common for the index and thumb to not be involved.
   3. Factitious Lymphedema or Unexplained Swelling: Unexplained edema in the upper extremity that may be a result of a patient applying tape or a tourniquet to the extremity.
   4. Secretans Syndrome: Also known as peritendinous fibrosis or post-traumatic hard edema. It is a condition usually caused by the patient repeatedly striking the dorsum of the hand with a blunt object or striking it against a hard surface.

   Reference:

   Skirven TM, Osterman AL. Psychosocial Aspects of Arm Illness. In: Skirven TM, Osterman AL, Fedorczyk JM, Amadio P, (Eds). Rehabilitation of the Hand and Upper Extremity. *6th ed. Philadelphia: Elsevier Mosby; 2011:136.*

Viewpoint

What tools are you using for the Physician Quality Reporting System (PQRS)?

We use WebPT for our documentation and this guides us through the PQRS requirements. We are also looking at streamlining a questionnaire to address several of the PQRS options.

Barbara Fong, OTR/L, CHT
Danville, CA

We use EMR, BMI, Medication Dosage and Route Verification, Patient Specific Functional Score/DASH, or another outcome measure to assist in determining G-codes.

Pamela Witthaus, OTR/L, CHT
Tidewater Physical Therapy,
Gloucester, VA

We use QuickDASH and Patient Rated Wrist Evaluation (PRWE). DASH and QuickDASH become problematic if the patient is doing everything with the other hand; it doesn't accurately represent the injured hand and only has a few bimanual tasks.

Rebecca Turner, OTR, CHT, VT

Prior to PQRS increasing to nine measures, we were able to capture data by educating the therapists and including the measures on a paper billing sheet. The paper chase became too cumbersome and expensive to competently manage and ensure proper entry. We now use a cloud-based EMR and practice management program that automates the reporting based on how we document. There are a few options now, but none are perfect. However, we are happy with how ours is working out. We use Clinicient. Swallowing the cost and investing in the time to make the transition was scary and tough to initially get over, but I must say it is now paying off. It's like buying a house with a larger mortgage, but you know it is a better investment. After you have grown accustomed to the change and investment of time and money, you see the reward. Honestly, practice automation is the only way to have peace of mind with new and future reporting measures.

Dave Bullock, MPT, CHT, CLT, MTPT

We changed our registration form to collect the medication info right at the beginning. We also ask about fall history on the registration form. The therapist then discusses this with the patient. We document pain, location and treatment on all patients by using the PRWE or DASH on all upper extremity patients at evaluation, re-evaluation, and discharge.

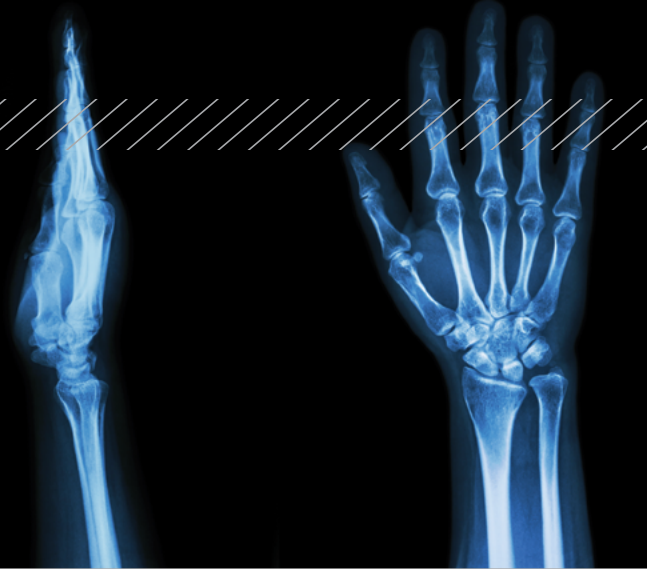
Ann Marie Feretti, Adv. MS, OTR/L, CHT
Bronx, NY

We use preventive care and screening for BMI, the fall risk assessment and plan of care, a medication profile, functional outcome measure and pain assessment prior to the start of treatment.

Krista Dennis, PT
Colorado Springs, CO

Feature

Ulnar Styloid Impaction Syndrome



By Wen-Yau Jennie Yen, PT, DPT, CHT, CLT

The ulnar side of the wrist is a complex area of multiple structures that can frequently produce symptoms. The understanding and management of ulnar-sided wrist conditions require knowledge of the anatomy and biomechanics of the distal radioulnar joint and ulnocarpal joints. The manifestations of ulnocarpal impaction syndrome have been well described. Excessive positive ulnar variance responds well to ulnocarpal decompression by recessing the ulna. However, some patients who may present with symptoms similar to ulnocarpal impaction syndrome may have a neutral or negative ulnar variance. The latter condition may present with radiographic evidence of chondromalacia of the proximal pole of the triquetrum and the ulnar styloid instead of chondromalacia of the proximal pole of the lunate and ulnar head, which is seen in ulnocarpal impaction.[1]

The tip of the ulnar styloid is covered by the meniscus homologue. In the presence of intact anatomy, when an excessively long ulnar styloid abuts against the triquetrum, the meniscus homologue will be interposed between the tip of the ulnar styloid and the triquetrum. In the early stages of ulnar styloid impingement sydnrome, the triangular fibrocartilage complex (TFCC) is intact, so this condition is considered as soft tissue impingement, rather than bone-to-bone impaction. TFCC wear-and-tear may occur as a result of the repetitive impaction of the ulnar styloid against the triquetrum. Ulnar styloid impaction syndrome occurs only when the TFCC has eroded fully exposing the tip of the ulnar styloid, which is then in direct contact with the triquetrum.[2]

A provocative test to distinguish ulnar styloid impaction syndrome from ulnocarpal impaction syndrome was developed by Leonard K. Ruby. The forearm is initially positioned in neutral rotation. The examiner maximally extends the wrist, then the forearm is maximally rotated into supination. If this maneuver reproduces the patient's pain, findings are considered positive for ulnar styloid impaction syndrome. Wrist extension brings the triquetrum dorsally relative to the forearm and, as the forearm is rotated into supination, the ulnar styloid is brought dorsally relative to the carpus. In this position, the impingement occurs between the ulnar styloid and the triquetrum. In contrast, forearm supination causes a recession of the ulnar head relative to the distal radius, so this would not be expected to cause pain by ulnocarpal impaction, however, if there is a torn TFCC, ulnocarpal impaction can be positive.[1] ◆

References:

1. Topper SM, Wood MB, Ruby LK. Ulnar styloid impaction syndrome. *J Hand Surg*. 1997;22A:699-704.
2. Zahiri H, Zahiri CA, Ravari FK. Ulnar styloid impingement syndrome. *Inter Orthop*. 2010;34:1233-1237.

LEGISLATION AND REIMBURSEMENT

The Legislation and Reimbursement Division is looking forward to a busy year! As determined by the bylaws vote, we will be joining forces with the Practice Division next year. In order to begin this transition, the Legislation and Reimbursement Division has been organized into four committees: communications, legislation, regulation and reimbursement.

The Communications Committee has worked closely with the ASHT staff, reorganizing the DMEPOS section of the website. The committee is updating the photos for the L codes and will be reaching out to ASHT members for photo submissions.

The Legislation Committee is working on the reintroduction of the Medicare Access to Rehabilitation Services Act, which started Jan. 26, 2015. This legislation permanently repeals the Medicare therapy cap. Since the 1997 Balanced Budget Act, Congress has acted 12 times to prevent implementation of an arbitrary cap on outpatient therapy services for Medicare beneficiaries. Without action, beneficiaries face a hard cap on services beginning April 1, 2015. The committee is also working on a permanent solution to the sustainable growth rate (SGR) with the House Energy and Commerce Subcommittee on Health. The SGR is a method used by the Centers for Medicare & Medicaid Services (CMS) to limit spending on services furnished under physicians' fee schedule, including therapy services. Without action, therapists could see a nearly 21-percent reduction in payment for services to Medicare beneficiaries. While there was strong bipartisan support for this legislation in the 113th Congress, it was delayed in part due to disagreements about how to pay for the projected nearly $119-billion cost. Ideally, Congress will address permanent repeal of the therapy cap as part of the SGR package.

The Regulation Committee has posted information on the 2015 PQRS changes, including links to CMS for more in-depth information. ICD-10 begins Oct. 1, 2015 and an introduction to the ICD-10 coding for hand therapists has been posted. Be on the lookout for coding practice on ASHT's Twitter feed in the near future (**@HandTherapyASHT**).

The Reimbursement Committee is working on resources for Medicare compliance. There is a DME documentation checklist listing the new medical record requirements to justify payment for orthoses, as well as downloadable templates featuring updated requirements for orthotics orders and proof of delivery statements on **asht.org/practice/legislative-reimbursement-resources**. ◆

Be on the lookout for coding practice in the near future @HandTherapyASHT.

You can determine who your Congressional representatives are on asht.org in the legislation and reimbursement section. This is the ideal time to write to them and **let them know** the impact that the Medicare Access to Rehabilitation Services Act can make on the delivery of care to your patients.

RESEARCH

The Journal Club chat is a great ASHT member benefit. It is a chance for members to participate in the critical appraisal of research design and clinical implications using a free, monthly online chat. After completing a short quiz, members earn one free CE hour.

Each month, a moderator guides participants through a Journal of Hand Therapy article. This is an easy way to learn more about the assessment of research. It is also a great way to acquire continuing education credits from the comfort of your home. To view upcoming dates, please visit the Journal Club page at **asht.org/research/journal-club.**

EDUCATION

Upcoming Educational Events

Hands on Orthotics Courses

May 16, 2015 • 8:00 a.m. – 4:30 p.m.
Midlands Orthopaedics
Irmo, SC

Visit **asht.org/education** to register or if you are interested in hosting a Hands on Orthotic Course at your facility.

Are you interested in presenting a topic for an ASHT webinar? We are looking for future instructors. Visit **asht.org/education** to download a webinar application today!

Hand Therapy Review Course

April 10-12, 2015
Washington University
St. Louis, MO
Registration ended March 23

Webinars

April 30, 2015 • 9:00 p.m. – 10:00 p.m. EST
Accessing a Painful System: "Scrub and Carry" Made Modern
Dianna Lunsford, OTD, M.Ed., OTR/L, CHT

To register, visit **asht.org/educationn/webinars/live/accessing-painful-system-scrub-and-carry-made-modern**

Need CEUs? Check out our extensive webinar library at **asht.org/education/webinars**.

PRACTICE

The ASHT Practice Division is off to a busy start in 2015. The division consists of two committees: the Practice Standards Committee, chaired by Karol Young, and the Business Practice Committee, chaired by Nancy Houghton. Both committees are already hard at work setting goals for the coming year.

The Practice Standards Committee plans to produce eight more topics in the popular Patient Education Resources series. There have been many excellent suggestions for future topics — keep them coming! Be on the lookout for four additional hand-outs in time for Hand Therapy Week in June. These can be used to increase awareness of our profession and perhaps your very own clinic or place of business.

The Business Practice Committee will create a Private Practice Toolbox to help mainly private practitioners in practice setup and management. These papers will be written in a question and answer format and will be available on the ASHT website. Topics will include subjects such as credentialing and set-up advice.

Practice Division volunteers are donating hours of free time to improve the value of being an ASHT member by providing support and guidance, and opening up additional avenues of learning and growth. If you are interested in serving on a Practice Division Committee, please visit the Volunteer Opportunities page on **asht.org**.

WELCOME **NEW** ASHT MEMBERS

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