

# Outreach



Summer/Fall 2008  
Issue #22

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to Brachial Plexus Birth Palsy**

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# Outreach

Summer/Fall 2008

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UBPN, Inc. is grateful to the law firms of Miller, Curtis & Weisbrod, and Blume, Goldfaden, Berkowitz, Donnelly, Fried, & Forte whose generosity has made the publication and distribution of this issue of *Outreach* possible. Each of these firms has successfully represented numerous children with brachial plexus injuries, helping them financially to pursue happy, productive lives. Should you desire any information as to the legal rights of you or your children, or wish a referral to a law firm in your area that is experienced in representing children with brachial plexus injuries, contact either Les Weisbrod of Miller, Curtis & Weisbrod or John Blume or Carol Forte of Blume, Goldfaden, Berkowitz, Donnelly, Fried & Forte.

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### ***On The Cover:***

*Camp UBPN 2007 was held at Camp Berachah in Auburn, Washington. Campers enjoyed a variety of outdoor activities including a zip line. See a photo gallery of camp activities on pages 16 and 17 and the camp photo on the back cover and read the UBPN Camp Update on page 4.*



**OUTREACH** is a publication of the  
United Brachial Plexus Network, Inc.

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UBPN, Inc. is a national organization with international interests which strives to inform, support and unite families and those concerned with brachial plexus injuries and their prevention worldwide. Outreach is produced on a volunteer basis.

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# President's Letter: About Beginnings and Endings

*By Nancy Birk, UBPN President*

In early 1999, I received a phone call from Cathy Kanter, inviting me to come to a meeting in Denver with a few others to talk about forming an international organization for people with brachial plexus injuries.

We all flew in, at our own expense, from California, Texas, Ohio, Iowa and Arizona, to hole up in a hotel in the city, in a conference room graciously donated by the Marriott Corporation. We met for 10 days, 12 hours a day, breaking only for food, which we had ordered in.

We crafted a mission statement. We wrote guiding principles. We created a name (this proved to be the most difficult task of all), we formed a vision, and we left exhausted but galvanized by our shared beliefs and enthusiasm.

I have very much enjoyed working with the UBPN Board of Directors over the past ten years. I served as Secretary for the first three years, and when Cathy Kanter finished out her second term as President, I hesitantly took on that role. I was planning to take a retirement from my position at Kent State University and so this coincided with that and was the right thing to do at the time.



UBPN President Nancy Birk in Turkey

It has been a very busy six years since then, serving as UBPN's President. However, the time has come for me to step aside as President and let others take the leadership role. Cathy had told me that I would know when the time was right, and I feel that this is the right time both for me, personally, and for the organization.

I have confidence in our current Board of Directors and in the executive team. One of the most difficult aspects of working with such a dedicated group of individuals is that our dreams are many, and we must harness those dreams into a living reality. We have been hindered in our growth as an organization by a lack of resources, most of all because we are all volunteers with limited time. Our vision is, of course, to grow into an organization with paid employees and funding to support research and the needs of our community.

A leaving is always bittersweet. It is sad to leave behind work that I care about deeply and the team of people that have become as my family. It is a pleasure, however, to think about growing in new areas in my life. I have recently made some changes in my life that I am very excited about and I look forward to a new dimension in all that I do.

I also look forward to watching this organization grow and change and evolve. UBPN will always have a special place in my heart and my mind and my full support in every endeavor.

Thank you for allowing me to be a part of your lives,

Nancy Birk

## Camp UBPN Rescheduled for 2010

The UBPN Board of Directors is pleased to announce that the next Camp UBPN will be held in 2010. With the current costs of travel escalating at exponential rates, the Board determined that waiting a year will allow more families to save for the costs of camp. This extra year will also allow the organization to raise additional funds to subsidize camp activities and decrease its overall cost. We also hope to select a new, central camp location, which will make the camp more economical, while also allowing more families to attend.

## New UBPN Officers and Directors

UBPN is pleased to announce newly elected officers for the 2008/2010 term. Nancy Birk will be handing the gavel to our new president Richard Looby, who will lead UBPN ably and with a fresh vision. He will be assisted by Vice President Kim West, Treasurer Sabrina Randolph and Secretary Tanya Jennison and other members of the Board of Directors – Julia Aten, Courtney Edlinger, Christopher Janney, Karen McClune, Lisa Muscarella, Claudia Strobing, Amy Theis, and Judy Thornberry.

With the election of our new officers and board, several past members will be saying good-bye to their current UBPN responsibilities and moving on to other endeavors.

**Nancy Birk** has been with UBPN since the founding. At the start of UBPN, Nancy served three years as Secretary and then continued on to another six years as President. She will continue to serve in an advisory role as the Immediate Past President. Nancy's efforts on behalf of our community cannot be undervalued. She was not only President, but also UBPN's executive, office manager, donations coordinator, UBPN Outreach editor, and the list could go on and on. Nancy has been involved in every facet of UBPN's day-to-day existence. Her presence will be felt for years to come and her multi-tasking abilities are the envy of all.

Immediate Past President **Cathy Kanter** was a founding member of the organization and called for the initial meeting in Denver in 1999. She was also instrumental in the growth of Camp UBPN and its success over the years. Cathy and her family will continue to support camp through The Kanter Foundation.

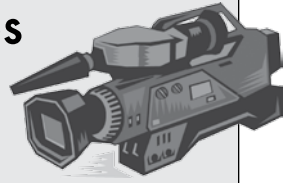
As In Touch chairperson **Kathleen Mallozzi** has been a tireless fighter for the cause in the medical and government communities. She was instrumental in having shoulder dystocia listed as a birth complication with March of Dimes. Her determination resulted in UBPN being invited to attend and present at the Conference on Revising the Social Security Disabilities Blue Book. She has spent years in communication with the Center for Disease Control, attempting to have brachial plexus injuries accurately recorded. This is only a small sample of the many efforts Kathleen has made on the behalf of our community. Her tenacity and courage will be missed by all!

**John Petit** has led the Technology Committee and has oversaw and guided our online efforts. We are moving into a new phase with our online communications, including a new web design, upgraded message boards and other improvements that will be the result of John's guidance and encouragement.

Please join us in appreciation for all those who work tirelessly for UBPN, both in the past and in the future.

## UBPN NEEDS YOUR HELP! Request for Photos and Videos

UBPN is currently in need of collecting quality photos and videos for awareness and



prevention efforts. We would like images that clearly depict what babies, children and adults with these injuries have to go through.

UBPN is looking for quality photos and videos that would help people understand the true impact of this injury. We are hoping to collect images that show babies with limp arms, children right after surgery, hooked up to machines, in casts, splints, or braces, receiving electrical stimulation therapy, etc. We are also looking for images that clearly depict paralysis, deformities, posturing of the arm, internal rotation, winged scapulas, contractures, etc.

Lastly, UBPN really hopes to hear from those of you who happened to capture your child's birth on video. These folks have a very rare and unique opportunity to assist with prevention efforts. Videos often clearly depict excessive traction being applied to the baby's head and the true cause of this injury. Unfortunately, due to hospitals banning video taping across the nation, capturing the truth on videos is a fading occurrence.

Only by coming together to create a stronger voice can we ever begin to make a difference for future babies.

If you have any questions or are interested in possibly contributing and helping with important awareness and prevention efforts, please contact Lisa Muscarella (UBPN BOD & Prevention Committee Co-Chair) at [Lisa@ubpn.org](mailto:Lisa@ubpn.org).

## Shop for UBPN!

UBPN is heading to the Amazon... Amazon.com to be exact. UBPN has opened an Amazon store featuring many items that will be of interest to the UBPN community. The direct link is <http://astore.amazon.com/unitbracplexn-20>. However, there is a direct link on the UBPN web site. It has sections that include books, toys, therapy items and utensils that will make life easier for those who struggle in a two-handed world. The books range from inspirational to medical, the toys from educational to therapeutic, and the therapy items from pain relief to strength training. The utensils are attractive and could be gifts for those family members with no injuries!



Best of all, UBPN gets a percentage of the sale on all products sold through Amazon from our affiliate site (even items not listed in our stores) because we are a 501c3 non-profit. The range starts at four percent but could go as high as 10 percent depending on the sales!

So look through our Amazon.com store site and if you were going to buy that one handed pepper grinder or salad spinner, use our site to make your purchase and support UBPN just by shopping.

We still offer our branded items (bracelets and magnets and pins) through the UBPN store.



## Attention Adult Injured!

UBPN is in the planning stages of camp 2010 and we need your input! We want to ensure that the educational programming at this camp will address the needs of the adult injured. As adults, TBPI or OPBI, there are unique needs experienced due to the brachial plexus injury that are frequently overlooked and remain unaddressed. We want to bring in experts and specialists to help address some of these issues.

In addition, being able to share and commiserate with others is invaluable! As adults, with the injury, you bring validation to the innumerable issues faced daily by those with this injury. The newly injured people, and the parents of newly injured, need to see that the injury is not life-ending. As successful adults, you serve as role models for those just learning about their injury.

In years past, we have had a low attendance rate of adult injured, although those that have come have truly enjoyed themselves and found it to be a life altering experience. We need to identify if our programming has been insufficient to attract the adults in our community and tailor some of the offerings at our next camp specifically for this group.

What can we offer at camp to ensure that it has value? What sort of programs do you feel would provide some benefit towards dealing with issues surrounding BPI? Are there issues outside of the programming that has prevented you from attending?

This is your opportunity to be heard. Please share you thoughts on wants and needs with us. You can email your suggestions to [info@ubpn.org](mailto:info@ubpn.org).

Thank you!

UBPN Board of Directors

## New Private Message Boards at UBPN

If you are feeling uncomfortable posting on the general boards for whatever reason, please come check out the new private boards. There are new adult OBPI, adult TBPI and teen BPI message boards. The adult boards give bpi people over the age of 19 a place to vent to other people who understand 100 percent. To become a member of the adult OBPI board send your UBPN screen name to [kathm@ubpn.org](mailto:kathm@ubpn.org) To become a member of the adult TBPI board send your screen name to [Courtney@ubpn.org](mailto:Courtney@ubpn.org). For the teen board you must be between the ages of 13 and 19 to become a member of the board. If interested, please send your UBPN screen name to [amy@ubpn.org](mailto:amy@ubpn.org) The teen board will be moderated for the safety of the teens.

## Looking for a Specialist?

The Medical Resource Directory project, located on the UBPN web site at <http://ubpn.org/medicalresources/> provides a comprehensive, regularly updated resource to aid families and individuals in their search for specialized care. Lists of BPI medical specialists including therapists are provided.

All known brachial plexus specialists/therapists were sent a questionnaire requesting information regarding their practice and experience with BPI. Responses continue to be submitted and changes are made as they are received.

# Arthroscopic Treatment of Posterior Glenohumeral Joint Subluxation Secondary to Brachial Plexus Birth Palsy

Scott H. Kozin, MD

## The Study

The purpose of this paper is to provide an update of our experience performing arthroscopic capsular release (ACR) for shoulder problems in children with brachial plexus birth palsy. We have performed over 80 procedures to date and have tabulated the results on 44 children. All 44 children had preoperative and postoperative clinical measurements and magnetic resonance imaging studies. We continue to offer ACR as a minimally invasive technique to achieve shoulder reduction. We are also following these children carefully after surgery to assess their outcome. Our ultimate goal is to provide the best care and treatment for children with brachial plexus birth palsy.

## Background Knowledge

Incomplete recovery after brachial plexus birth palsy often results in decreased movement and muscle imbalance about the shoulder. The internal rotators overpower the external rotators, which results in an internal rotation contracture (Figure 1). This constant position of internal rotation leads to early glenohumeral joint deformity by 6 months of age and



**Figure 1** Six-month old child with left brachial plexus palsy that posture in internal rotation. This position promotes abnormal shoulder development.

advanced deformity by 2 years. The deformity is characterized by increasing glenoid retroversion (the glenoid or socket tilts backward) and posterior humeral head subluxation (the humeral head rides out the back of the glenoid) <sup>2,4,9,10,13,16,22,24,25,26,30</sup>.

The treatment of the shoulder in children with brachial plexus birth palsy remains controversial. Tendon transfers about the shoulder improve motion, but fail to realign an abnormal glenohumeral joint <sup>5,14,31</sup>. The inability to re-align the joint may explain the loss in clinical improvement over time <sup>18</sup>. We routinely perform tendon transfers in children that lack motion, but have an aligned glenohumeral joint. Open or arthroscopic anterior capsulectomy (ACR) and subscapularis release can reduce the glenohumeral joint and promote remodeling over time <sup>11,23,24,27</sup>.

## Patient Population

Forty-four children underwent arthroscopic anterior release (ACR), partial subscapularis tenotomy, and +/- tendon transfers to realign the glenohumeral joint and improve motion in children. All children had clinical measurements and



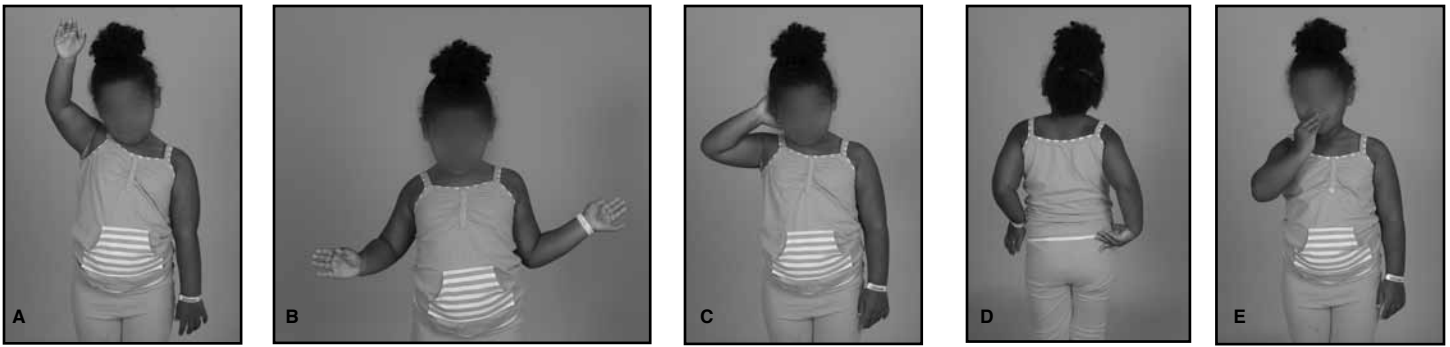
**Figure 2** Firm stabilization of the scapulothoracic joint to determine amount of glenohumeral joint external rotation. One hand is used to stabilize the scapular body and the other hand external rotates the shoulder.

magnetic resonance imaging (MRI) before and 1 year after surgery. Of the 44 patients, 28 children underwent isolated release and 16 children underwent concomitant tendon transfers. There were 28 girls and 16 boys with an average age of 2.7 years (range; 0.9 to 8.4 years). The brachial plexus palsy involved C5 and C6 in 36 children and C5, C6, and C7 in 8 children.

## Clinical Measures

Clinical measures included both passive external rotation with the arm adducted and the shoulder stabilized and active abduction of the shoulder (Figure 2). For global shoulder function, the Mallet classification system was used (Figure 3) <sup>6,14,29,31</sup>. The Mallet scale assesses global abduction, global external rotation, hand-to-mouth, hand-to-neck, and hand to-to spine active range of motion. Patients are scored on an ordinal scale from 1 (no function) to 5 (normal function). The Mallet classification has been shown to be a reliable instrument for assessing





**Figures 3** Mallet parameters to assess clinical outcome. 4 year-old female following right arthroscopic anterior release demonstrating Mallet parameters for shoulder function. A. Abduction B. External rotation C. Hand to neck D. Hand to spine E. Hand to mouth

upper extremity function in children with brachial plexus birth palsy<sup>1</sup>. Mallet scores were only recorded for age appropriate patients that could comply with testing via verbal cueing or enticement (n=21).

### **Surgical Technique<sup>20,23,24</sup>**

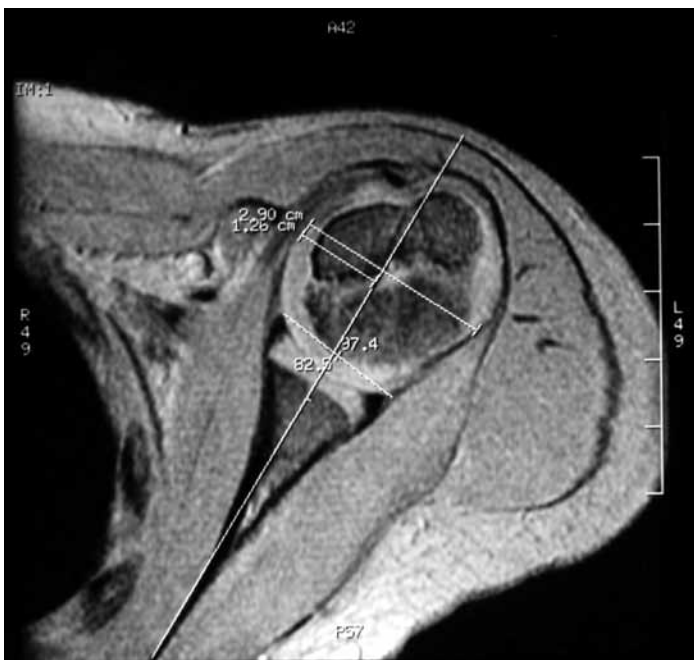
Arthroscopy is performed using a small 2.7-mm arthroscope. The thickened superior glenohumeral ligament, the middle glenohumeral ligament, and the upper one-half to two-thirds of the subscapularis are released. The upper, intra-articular portion of the subscapularis tendon is then released. The inferior capsule is also released. The release is continued until marked improvement in external

rotation is noted, often with a palpable clunk associated with glenohumeral joint reduction. In children with concomitant tendon transfers, the latissimus dorsi and teres major tendons are transferred to the superior-posterior rotator cuff and humerus following arthroscopic release. The children are placed in a shoulder spica cast. Casting is continued for 3 weeks after isolated release and 4-5 weeks after release with tendon transfer.

### **Magnetic Resonance Imaging**

In all patients, preoperative bilateral shoulder MRI scans and postoperative MRI scans of the affected shoulder were obtained to assess the quality of the glenohumeral joint reduction (Figures 4). An axial image inferior to

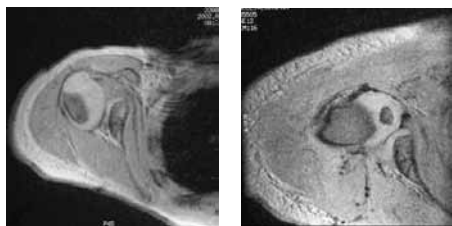
the coracoid apophysis and spinoglenoid notch was selected to standardize measurements<sup>13</sup>. Using this image slice, the glenoscapular angle (the degree of version) and the percentage of the humeral head anterior to the middle of the glenoid fossa (PHHA) was calculated for all scans<sup>2,3,13,15,28,30</sup>. The abnormal shoulder develops glenoid retroversion and humeral head subluxation (Figure 5). The deformed glenoid shape was also defined use the Classification of Glenohumeral Deformity Scale (GDS), which is a 4 point ordinal scales as follows: 1 - Concentric, round humeral head centered on concave glenoid of matching curvature; 2 - Flat, near complete loss of glenoid curvature; 3 - Biconcave, central apex defining



**Figure 4** MRI of normal shoulder. The white cartilage is readily apparent around the humeral head. The white glenoid cartilage is also readily visible. The lines for calculating the glenoscapular angle or version (- 7.5 degrees) and the percent of the humeral head anterior to the mid-glenoid (PHHA) or subluxation (43%) are drawn.



**Figure 5** MRI of abnormal shoulder. The white cartilage is readily apparent around the humer: Shoulder MRI of 4 year-old with -10 degrees of passive external rotation. The humeral head articulates with a posterior articular concavity that is markedly retroverted and measures 51°. The humeral head barely crossed the midline of the glenoid and the PHHA measures (.21 cm/2.7 cm) or 7.7%.



**Figure 6 and 7** Two-year old child with progressive loss of external rotation. MRI shows posterior humeral head subluxation.

anterior and posterior aspects of glenoid, with same version relative to scapula; 4 - Pseudoglenoid, central apex defining anterior and posterior aspects of glenoid but retroversion of posterior aspect increased relative to scapular center-line<sup>21,22</sup>.

## Results

MRI and Clinical Data at 1 year (n=44)

Assessing MRI data, there was a significant improvement ( $p < 0.0001$ ) in both retroversion and PHHA from preoperative to one-year following surgery (Figure 6 & 7). For average retroversion, preoperative measurements significantly improved from  $-34.2 (\pm 14.6)$  to  $-18.5 (\pm 12.5)$ . For average PHHA, preoperative measurements improved from  $19.4 (\pm 11.5\%)$  to  $32.8 (\pm 12.2\%)$ . The Glenoid Deformity Scale improved significantly ( $p < 0.0001$ ) from a preoperative average score of 2.9 ( $\pm 1.0$ ) to 1.98 ( $\pm 0.4$ ). Of the 19 patients with a type 4 pseudoglenoid deformity prior to surgery, only 1 had a persistent pseudoglenoid at one-year follow-up.

Examining the clinical data there was a significant improvement ( $p < 0.0001$ ) in external rotation and abduction ( $p < 0.01$ ) from preoperative to one-year measurements (Figure 8). Passive external rotation increased from  $-26.3 (\pm 19.5)$  degrees prior to surgery to  $+47.0 (\pm 16.8)$  degrees at one-year ( $p < 0.0001$ ). Active abduction improved from  $112.2 (\pm 27.5)$  before surgery to  $129.5 (\pm 37.9)$  degrees at follow-up ( $p < 0.01$ ). Those patients that underwent concomitant tendon transfers averaged  $149.7 (\pm 28.7)$  degrees compared to  $118.0 (\pm 38.0)$  degrees ( $p = 0.006$ ) for those with isolated release. In contrast, those patients that underwent isolated release did not have a statistical improvement in abduction ( $p$

$= 0.423$ ). Average aggregate Mallet scores significantly improved ( $p < 0.05$ ) from 12.7 ( $\pm 1.6$ ) prior to surgery to 17.1 ( $\pm 1.4$ ) at one-year follow-up. Specifically, statistical improvements were found in external rotation, 2.1 to 3.7; hand to neck, 2.4 to 3.8; and hand to mouth, 2.1 to 3.4. Changes in Mallet score for abduction and hand to spine were not significant.

## Discussion

Glenohumeral dysplasia following brachial plexus birth palsy occurs early and frequently. Van der Sluijs JA and colleagues<sup>26</sup> imaged 16 children (17 shoulders) less than one-year of age. In children less 5 months of age, a normal shoulder was found in 5 out of seven cases. However, in children older than 5 months of age, a normal shoulder was seen in only 2 out of 10. Prevention of deformity is the mainstay of early management. Maintenance of passive external rotation prevents an internal rotation contracture, which leads to posterior humeral head subluxation and glenoid retroversion. The gradual loss of passive external rotation is a sign of impending glenohumeral dysplasia<sup>14,21,30</sup>. Once external rotation becomes less than neutral with the scapula stabilized, glenohumeral deformity is inevitable and treatment is warranted<sup>13</sup>.

Tendon transfers about the shoulder have been shown to improve motion, but have a negligible effect on correction of any underlying deformity<sup>5,14,31</sup>. At best, tendon transfers may halt the progression of deformity that is associated with muscular imbalance. This inability to improve joint alignment may explain the loss in clinical improvement over time and raises concern about potential long-term joint sequelae<sup>18</sup>. Open or arthroscopic anterior capsulectomy and subscapularis release can reduce the glenohumeral joint and promote remodeling over time<sup>11,23,24,27</sup>. However, the role of joint reduction remains controversial as complications have been reported<sup>11,27</sup>. Open reduction is associated with excessive external rotation and dramatic loss of internal rotation and midline function. Van der Sluijs and colleagues<sup>27</sup> performed open release in 19 children. Eight developed a “severe, functionally disturbing external rotation contracture of the shoulder.” However, open reduction has been shown to promote joint remodeling and thus remains a sensible treatment modality, especially in the young child<sup>11</sup>. Preservation of a portion of the subscapularis muscle appears to be critical to maintain internal rotation.



**Figure 8** 6 year-old female status post left arthroscopic anterior release and tendon transfers demonstrating marked improved in abduction and external rotation. A. Abduction to 170° B. Easy hand to neck movement



Pearl in 2003 published an arthroscopic technique for contracture and subscapularis release in children with brachial plexus birth palsy<sup>21</sup>. The goal was to restore glenohumeral alignment and re-balance the joint using a less invasive procedure than formal open reduction. Forty-one children underwent arthroscopic release of the anterior capsule and subscapularis tendon. The mean age of the children was 3.5 years. Eighteen children were treated with arthroscopic release alone, while 23 children also underwent concomitant tendon transfer. The arthroscopic contracture release effectively restored passive external rotation in 40 of the 41 children. The single patient that did not achieve external rotation was 12 years of age with advanced glenoid deformity.

We assessed the ability of arthroscopic release to reduce glenohumeral joint subluxation<sup>24</sup>. Twenty-two children with an average age of 3.9 years underwent preoperative MRI, arthroscopic surgery with or without tendon transfers, and postoperative imaging in their spica cast.

Prior to surgery, the involved shoulder preoperative mean PHHA was  $15.6\% \pm 13.5\%$  and the mean glenoid version was  $-37^\circ \pm 15^\circ$ . After surgery and within the cast, the mean PHHA corrected to  $46.9\% \pm 11.2\%$  and the mean glenoid version improved to  $-8^\circ \pm 8^\circ$  ( $p < 0.001$ ). The immediate improvement in glenoid version was primarily attributed to reduction of the humeral head from the pseudoglenoid onto the native glenoid and secondary to the fast remodeling pliable pediatric cartilage<sup>19</sup>.

This report attempts to combine MRI and clinical findings in 44 patients. Twenty-eight children underwent isolated arthroscopic releases and 16 children underwent concomitant tendon transfers. We noted a significant improvement in external rotation both passive ( $-26.3$  degrees to  $+47.0$  degrees) and active via the Mallet parameters that assess external rotation (external rotation, 2.1 to 3.7 ; hand to neck, 2.4 to 3.7; and hand to mouth, 2.1 to 3.4). We also noted a significant improvement in active abduction (112.2 degrees to 129.5

degrees), especially in those patients undergoing concomitant tendon transfers compared to those children with isolated release (149.7 degrees compared to 118.0 degrees). With regards to internal rotation, we previously noted a loss in internal rotation and midline function after complete arthroscopic release of the subscapularis<sup>24</sup>. Therefore, we preserve the inferior and lateral muscular portion of the subscapularis.

Our results after arthroscopic release with or without tendon transfers are encouraging with improvements in imaging studies and clinical evaluations following surgery. The glenoid version and PHHA statistically improved after surgery consistent with better glenohumeral joint alignment. Remarkably, 18 out of 19 children with a pseudoglenoid deformity corrected to a concentric or flat configuration at follow-up with resolution of the pseudoglenoid component. The clinical improvements paralleled the MRI corrections. Parameters for external rotation significantly improved after arthroscopic surgery with clinical enhancements in objective measures and functional Mallet scores. The addition of tendon transfers at the time of arthroscopic release resulted in even better abduction, however, this combination risks impairment of midline function, which must be discussed with the family prior to surgery. Importantly, superior outcomes were associated with better preoperative clinical and MRI status. This indicates that early recognition of glenohumeral dysplasia and timely intervention will result in better shoulder motion and improved joint alignment.

#### Acknowledgment

The authors would like to acknowledge Linda Filipone, RN for her care coordination of children with brachial plexus palsy and for facilitation of this manuscript.

*References for this article are listed on page 30.*

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**Scott H. Kozin, MD** completed his hand and microvascular fellowship at the Mayo Clinic in 1992. He obtained board certification in 1994 and an added qualification in hand surgery in 1995. He specializes in pediatric upper extremity and leads the brachial plexus service at Shriners Hospital for Children in Philadelphia. He is active in numerous organizations and a board member of the American Society of Hand Surgery, American Association of Hand Surgery, Pennsylvania Orthopaedic Society, and Orthopaedic Overseas. He currently serves as an Associate Professor, Department of Orthopaedic Surgery, Temple University, Philadelphia, Pennsylvania.

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#### Shriners Hospital for Children

Shriners Hospital is staffed by nationally and internationally known professionals specializing in providing medical and rehabilitative expertise to children. Since 1926, Shriners Hospitals for Children, Philadelphia has been providing excellence in upper extremity service to children and adolescents with conditions such as brachial plexus birth palsies, syndactyly, missing thumbs, cerebral palsy, brittle bone disease and juvenile rheumatoid arthritis. The Upper Extremity Service at the Philadelphia Hospital specializes in brachial plexus birth palsy. A team approach is utilized with physician, therapist, and nurse coordinator working together to provide the best care possible. The upper extremity team manages all aspects of brachial plexus birth palsy including diagnosis, therapy, microsurgery, and reconstruction. Shriners Hospital for Children mission provides care at no cost to children under the age of 18, call Shriners Hospital for Children to schedule an evaluation at 800-281-4050, Ext. 4140.

# In Search of the Brass Ring: *Birth after a Brachial Plexus Incident*

*David M. Barrere, M.D.*

As you begin reading this article, it is my hope that the title did not mislead you into thinking we were about to embark upon a glorious adventure. Don't expect Indiana Jones or King Arthur as they quest for the Holy Grail - nor, should you expect a carnival tail, where the analogy of the "Brass Ring" has its origins. This is the quest for The Brass Ring as seen through the eyes of an Ob/Gyn.

First, a little background on me for credibility-sake. My name is David Barrere, Dave to my family and friends, but professionally, everyone calls me Dr. B. I am a graduate of The Ohio State University; I completed a four-year residency in obstetrics and gynecology in Cincinnati, Ohio; and, I have been certified by the American Board of Ob/Gyn. I practice in Cincinnati where I hold the position of Associate Professor of Ob/Gyn for the University of Cincinnati College of Medicine. Now that I've done my best peacock impression and have shown my professional feathers, more importantly, I am a husband to Melissa, and a proud father of a son, Graeme, and a daughter, Ashleigh.

During my residency years, my training experiences were vast - quite comprehensive, by most standards. By the end, my confidence was high; my ego huge. I succumbed to the power of my ego and I felt invincible. One day in May of 1998, a few weeks before graduation, I was abruptly brought back to reality.

As Chief Resident on the obstetrics service, my responsibilities included seeing patients in the clinic, making rounds on the high-risk patients, and supervising and teaching residents and

medical students that had been assigned to me. Having done nearly 700 deliveries during my residency, I spent little time in Labor and Delivery, leaving the majority of deliveries to the junior residents. For one reason or another, I found myself as the only available resident in Labor and Delivery one Friday afternoon.

A healthy young patient was about to deliver her first child. Her pregnancy was uncomplicated and labor was progressing quite rapidly. Pretty routine. The shoulder dystocia I was about to encounter was far from routine. The 45-seconds that passed before the baby was delivered seemed to take an eternity. Fortunately, both mom and baby were not harmed. Sweating, and hands shaking, I then faced questions like "Why did this happen?", "Why didn't you see this coming?" and "What happens with my next pregnancy?" All very valid questions.

With my ego now bruised, I hardly felt invincible. In fact, I kept asking myself "Why didn't I see this coming?"

## **Passage or Passenger**

A shoulder dystocia occurs when a size mismatch occurs between what the pelvis (the Passage) can accommodate, and the size of the baby (the Passenger). It's easy to assume that shoulder dystocia events only occur with larger birth weight babies. However, nearly half of events occur in average sized infants born to otherwise healthy women.<sup>1</sup>

Up to 27% of shoulder dystocia events will be complicated by some maternal and/or fetal injury.<sup>2</sup> Maternal injuries include soft tissue injuries to the vagina, bladder, urethra and rectum;

post-partum hemorrhage; and injuries to the pelvis (fractures of the coccyx or pubic symphysis rupture). Of those affecting the baby, shoulder injuries, clavicular fractures, and brachial plexus palsy are the most commonly registered birth injuries.<sup>3</sup> Fifteen percent of fetal injuries are permanent.<sup>4</sup>



## Assembling Jigsaw Puzzles and Reading Tea Leaves

Like most problems encountered in medicine, there are predisposing risk factors, and shoulder dystocia is no exception. However, there is no absolute risk factor or collection of factors that can reliably identify a baby at risk.

Risk factors need to be viewed as pieces of a large puzzle. As more pieces are assembled, we can see whether or not we like the picture that is developing. If we don't, we intervene. The following list includes risk factors taken into

consideration to suspect an impending shoulder dystocia event. Not all factors carry the same weight for consideration.

### Risk Factors

- Previous shoulder dystocia event
- Obesity
- Fetal macrosomia
- Maternal diabetes
- Prolonged deceleration phase / prolonged 2nd stage of labor
- Instrumented mid-pelvic delivery
- Post-date pregnancy
- Pitocin augmentation of labor
- Excessive maternal weight gain
- Advanced maternal age
- First pregnancy
- Misshapen or damaged pelvis
- Maternal short stature

### Previous Shoulder Dystocia Event

Shoulder dystocia recurrence rates have been reported to be as high as 16%.<sup>1</sup> This represents 7 to 10 times the risk compared to women without a previous event.

**Fetal Macrosomia – the BIG baby** As one would expect, larger babies are more at risk for shoulder dystocia than smaller babies. But, just what defines large?

Using ultrasound to predict fetal weight is accurate (to within +/- 10% of birth weight) in 75% of cases.<sup>5</sup> However, estimations of fetal weight tend to overestimate the weight of small babies

(birth weight less than 2500 grams), and underestimate the weight of large babies (birth weight greater than 4000 grams). For infants with birth weights more than 4000 grams, the accuracy of ultrasound falls to 60%.<sup>5</sup>

Although the diagnosis of fetal macrosomia is imprecise, “prophylactic” cesarean section may be considered for suspected cases with estimated fetal weights greater than 5000 grams (11 lbs.) in women without diabetes and greater than 4500 grams (10 lbs.) in women with diabetes.<sup>6</sup>

**Diabetes (both pre-existing and gestational)** Twelve percent of all macrosomic infants are born to women whose only risk factor was diabetes.<sup>7</sup>

On average, diabetics, both with pre-existing diabetes or those with gestational diabetes, tend to have larger birth weight babies as compared to the general population. Maintaining normal blood sugar levels by diet alone, or in combination with diabetic medications (Insulin, Glucophage, etc.) is of paramount importance in maintaining maternal and fetal health and

preventing macrosomia.

When the diagnosis of fetal macrosomia is made in a pregnancy that is complicated by diabetes, the risk for a shoulder dystocia event increases substantially. In these pregnancies, a disproportionate amount of weight is distributed into the chest and shoulders of the baby, rather than evenly throughout the body.

Although ultrasound can be useful, in one study, the presence of both diabetes and macrosomia accurately predicted only 55% of cases of shoulder dystocia events.<sup>8</sup>

## Prolonged Deceleration Phase / Prolonged Second Stage of Labor

While in his residency at Columbia University in the mid-1950's, Dr. Emanuel Friedman developed a labor curve to monitor the progression of women in labor. While observing more than 500 labors, Dr. Friedman identified four phases of labor: latent phase, acceleration, maximal slope, and deceleration – the last three collectively comprise the active phase.

To create a Friedman Curve, dilation and rate of descent are plotted against time. During latent phase, despite regular contractions, there is minimal cervical change. Once the active phase of labor begins, the rate of dilation averages at least 1.2 centimeters per hour for the labor with the first baby, and at least 1.5 centimeters per hour for subsequent labors. The rate of descent averages 1 centimeter per hour for all pregnancies.

Although no pregnancy fits this model precisely (and no one actually expects them to), a Friedman Curve can still potentially identify those pregnancies at risk for dystocia. Recent literature disputes the validity of the curve by today's medical standards, but nonetheless, the Friedman Curve is still an important gauge in monitoring labor.

When a Friedman Curve of labor shows either a rate of cervical change slower than expected or apparent arrest of dilation occurs, this can be of particular concern. Although progress occurs slowly, protracted, or drawn out labors, can potentially be demonstrating the body's struggle to deliver a large baby. These labors are at considerably more risk for a shoulder dystocia event as compared to a labor that follows the model of the Friedman Curve.

Together, latent and active phases of labor comprise the first stage of labor, which concludes when the cervix is completely dilated. The second stage then lasts until the baby is delivered; the third stage is the period of time until the placenta delivers.



# A Vaginal Birth after a Brachial Plexus Injury Birth

by Heather Brisman

Our first daughter was born in the summer of 2002 with a right obstetrical brachial plexus injury. When we got pregnant with our second, we agonized over the decision on whether to have a vaginal delivery or c-section as the majority of doctors were recommending. My husband and I decided together that we believed this is a totally preventable injury and although we were taking a chance of another SD, we would go vaginal, with a midwife in a birth center (last time I was in the hospital induced with pitocin and flat on my back with an epidural).



Camille and Clara

I know this is definitely not the choice of most people, but we felt it was the right choice for us. Most of those feelings came from the fact that we felt we did everything “right” and according to the book as far as the medical community is concerned and ended up with an injured baby. I just came to the conclusion that I didn’t want interventions like that and with the right midwife, who knew my history and was comfortable with it, we would proceed, albeit cautiously.

We took simple precautions of cutting sugar and most starches out of my diet and basically, eating really healthy (even though I didn’t have gestational diabetes with my first daughter, she was 9lbs 4oz). We also decided with the midwife to try to get “Mother Nature” moving at around 38 weeks with a number of “natural” methods.

Another precaution we took was to have a second, equally experienced midwife present at the birth. Everyone was hoping for the best, but fully expecting the worst. I was ready to change positions as directed or as I felt my body dictated and our midwife was very up on her shoulder dystocia maneuvers; we all felt fully prepared. I think this was key in a successful outcome. We were all in the right mindset.

I’m very happy to report that after a 2 hour, 45 minute labor (in which I walked/stood the entire time), I delivered another little girl (at just over 38 weeks, 7lbs 1oz this time) that was perfectly healthy with absolutely no problems. And I’m sure that all the OBPI parents can relate to the first words out of my mouth after her birth, “Are both of her arms ok?” Of course I cried when she said they were.

We’re currently expecting our third child in October 2008. We are following the same “game plan” as we did with our second child and are praying for another healthy outcome. I really believe that whatever decision you make for subsequent births after a birth injury, YOU have to feel comfortable with that decision and it has to be the right choice for you, not just your medical practitioner.

Most women push for one to three hours to deliver a baby, but women with epidurals can sometimes expect to push in excess of two hours. When these time frames are exceeded, it may be a warning sign for an impending dystocia.

## Forceps and Vacuum Extractors

Instrumented vaginal deliveries, or those requiring the use of forceps or vacuum extractors, are more likely to be complicated by shoulder dystocia events. A randomized clinical trial comparing forceps and vaginal deliveries showed that shoulder dystocia followed the vacuum assisted deliveries more of the time than it followed forceps delivery.<sup>9</sup> An explanation for this finding is that, unlike a forceps delivery, the vacuum extractor itself does not have to be accommodated between the baby’s head and the pelvic side-walls. Therefore, the vacuum could be more readily applied to a larger head.

Forceps or vacuum extractors can be important tools in cases where maternal exhaustion or physical limitations arise that result in the inability to push effectively. In these cases, the risk for shoulder dystocia is not as great. But, bear in mind, cases where the baby’s head is malpositioned and forceps are used to “redirect” the head, shoulder dystocia events are much more common.

The remaining risk factors either directly involve circumstances that may result in a smaller or more rigid pelvis, or are conditions that increase the likelihood of a macrosomic infant. Although studies have shown a statistically significant increase for macrosomia, these situations, when standing alone, are very minor risk factors for shoulder dystocia events.

- Unusual pelvic shapes / history of pelvic fractures
- Maternal short stature
- Post-term pregnancy (an overdue baby)
- Obesity (pre-pregnancy weight above 200 pounds)
- Excessive maternal weight gain (more than 35 pounds)
- Pitocin augmentation of labor
- Advanced maternal age (delivery on or after the 35th birthday)
- Primigravida (first pregnancy)

In any situation where you try to predict the future, you run the risk of being completely wrong as you plunge into the unknown. Personally, I don't put much stock in crystal balls, tarot cards, Ouija boards, palm reading or tea leaves. However, trying to assemble risk factors, or puzzle pieces if you will, I often wish I had any or all of them at my disposal in the hopes of shedding a little light onto the situation.

## The Game Plan

A typical day during residency began at 7 a.m. in the obstetrics conference room where the interesting cases from the previous day were presented for discussion. Often, these topics would lead into the discussion of frequently encountered emergencies and how they should be managed. Despite the safety we enjoyed in the conference room, it was a far cry from the real world. But, most would agree that it is best to have some sort of game plan in mind before tackling a problem. Today, computerized manikins or robots are used to practice and critique procedural skills. But again, the classroom pales in comparison to real life experience.

Medicine is a lot of rote memorization of facts and figures. Unfortunately, the most important point in dealing with an emergency cannot be taught in a classroom: staying calm. The "adrenaline rush" is of no real benefit in medicine. Often, it only leaves sweaty palms, a racing heart, and shaking hands. Time stands still and it appears as though things surrounding us are moving in slow motion. Our perceptions change.

When a shoulder dystocia is encountered, there are a series of steps, or maneuvers, that are implemented to help dislodge the baby's shoulder from behind the pubic bone. Broadly, they can be divided into non-invasive or invasive maneuvers.

### Non-invasive maneuvers

- McRobert's maneuver
- Suprapubic pressure
- Gaskin Maneuver

# The Cesearean Section Experience

*by Kim West*

My first child, a daughter, was born in September of 1998 with a right brachial plexus injury. She weighed 10 pounds 1 ounce. It was a traumatic event for both myself and my husband, and of course for our new baby. We immediately began our journey on the road of a brachial plexus injury – two surgeries, hours of physical and occupational therapy and other tasks that we parents are all well aware.

My instinct immediately after the birth and for several years after was to never have another child. Why would I want to risk that happening again? But five years later my husband and I decided that the benefits of another child far outweighed our fears and I became pregnant again.

I made two decisions early on. I knew that I would not return to my first obstetrician, whom I hadn't seen

for five years and I knew I wanted a cesarean section. I began discussions with my current OB/GYN about my birth plan. I was stunned when she would not commit to a c-section. She stressed that she would monitor the baby's size and my risk factors and if she felt it was risky to birth vaginally, she would then consider a c-section. I respectfully told her I needed a commitment to a c-section from the start. Since she couldn't give it to me I decided to interview another doctor who had been recommended to me by a friend.

My first visit to the second obstetrician was a total nightmare. When I left the office I was an emotional mess, crying and wondering why I had gotten pregnant. She stated that I had let my weight in my first pregnancy get out of control among other critiques that felt like personal attacks. I left feeling totally responsible for my daughter's injury again (I thought I had come to terms with much of the self-blame several years before.) She also bragged about her low c-section rate, which really disturbed me. I had asked her if she had had any experience with shoulder dystocia and if any of the events had resulted in a brachial plexus injury. Quite defiantly she said 'yes' and it 'wasn't something you could predict.' I was out of there like a shot!

Finally, I found Dr. Barrere. My first visit he took me in his office and we sat down and discussed what had happened during my first pregnancy and what I wanted for my second pregnancy. When I told him I wanted a c-section, he provided me with the pros and cons but said it was my decision and if that's what I wanted, that's how we would proceed. I had found my doctor! I can't say I ever felt totally fearless about the upcoming birth but having a confident and supportive doctor made it so much easier to face my fears.

Dr. Barrere scheduled a c-section two weeks before my due date and on August 20, 2004 I gave birth to an 8 pound 9 ounce little boy.

The pain from a c-section was not that difficult to bear. I had a healthy and non-injured child to enjoy and the pain from the surgery was a small price to pay. I really felt back to normal within two weeks. The second week I had a bout of mastitis, which was much worse than anything I had experienced with the c-section!

Truthfully, I have had some sadness that I will never experience a natural, vaginal birth without trauma. But I'm also confident that I've made the best choices for myself and my family. That's really what it comes down to – a personal choice that you can be comfortable with. Our family has been so blessed by the addition of another child and my daughter loves her brother dearly.



Zachary, Kim and Cameron West in 2004.

# The Psychological and Social Impact of Obstetric Brachial Plexus Injuries: A Call for Research

Knowledge about the acute and long-lasting physical affects of brachial plexus injuries has expanded greatly over the past 15 to 20 years. As a result of our expanded knowledge base, better treatment options have emerged for children and individuals affected by this injury. More surgical options are available for experienced surgeons to utilize when performing both primary nerve repairs and secondary muscle and tendon procedures. In addition, therapists have a broader array of therapeutic options and approaches at their disposal when working with children longitudinally. As a result, affected children are experiencing better physical outcomes than have ever been seen before.

Despite the large body of knowledge that exists pertaining to the surgical treatment strategies and physical outcomes in brachial plexus injuries, there is very little information available that addresses the impact of these injuries on the psychological and social development of children. Psychological and social adaptations play a critical role in how an individual “functions”, or interacts with their environment. The way an individual with a chronic illness or physical impairment interacts with their environment is influenced by a number of factors, including disease state, social support, and psychological responses. Function is dependent upon a healthy interaction and balance between all of these factors, regardless of the specific illness or physical disability of the individual. In contrast to brachial plexus injuries, there is a large body



of literature exploring the impact of psychological and social factors on function in children with congenital limb deficiencies. This literature does support a large role for psychological well-being and social support in healthy functioning for this population of children. It therefore seems appropriate to suggest the same may

hold true for children with brachial plexus injuries. However, there remains a general lack of research exploring this issue. As a result, we are yet to fully understand the interactions of those factors that are necessary for individuals with brachial plexus injuries to achieve their full functional potential.

It is the goal of the Brachial Plexus Injury Management Program at the Children’s Mercy Hospitals and Clinics, Kansas City, Missouri, to assist children with brachial plexus and peripheral nerve injuries in achieving the fullest recovery possible. As such, we must shed more light on the psychological and social impacts these injuries have on our children.



Our program has initiated a research agenda that is focused on the comprehensive assessment of all aspects involved in the rehabilitation management of obstetric related brachial plexus injuries. Our present study involves assessing the psychological and social affects that the injury has on an adolescent as viewed from both the adolescent’s and parent’s perspectives. It is our hope that the results of this present study will provide us with better insight into the broader effects of this injury that lie beyond the physical aspects of it. With this knowledge we hope to be

better able to provide a more comprehensive treatment plan, and subsequently a better functional outcome, for children afflicted with this injury.

If you would like more information regarding this study, or about the Brachial

Injury Plexus Management Program at the Children’s Mercy Hospitals and Clinics, please contact either Vicki Keck, RN at 816-234-3970, or Andrea Melanson, OTR at 816-234-3380.



*The Brachial Plexus Injury Management Program at the Children’s Mercy Hospitals and Clinics, Kansas City, is a comprehensive clinic for the evaluation of children that have sustained a brachial plexus injury. Each child is evaluated by the Brachial Plexus team and given an individualized plan of care. The team consists of two occupational therapists, a physiatrist, nurse practitioner, orthopedic surgeon, and plastic surgeon. The brachial plexus clinic is held on the 2nd and 4th Wednesday mornings for new evaluations or follow-up appointments. There is also a Thursday afternoon clinic held on the 4th Thursday of the month for those patients and families considering surgical options. For further information, please call Vicki Keck, RN at 816-234-3970 or Andrea Melanson, OTR at 816-234-3380.*



# Community Suggested Most Useful Splints

By Amy Theis

*Through our history with brachial plexus injuries, many people have tried various splints and braces to help with function, pain, and positioning. This article is an effort to show some of the many options that you or your loved one has to gain function, relieve the pain or gain a better positioning.*

## Resting Hand Splints

Many infants start out with resting hand splints to keep their hands in better positions and prevent contractures. While some think resting hand splints are for infants and children only they may be used during the day as well as at night in the teen and adult population too. Resting hand splints can be used to prevent contracture, ease pain, or simply rest the hand in a better position.

## Resting Hand with Finger Separator

A resting hand splint with finger separators is designed to keep the hand from going into a fist position. The idea behind the finger separators is to keep the alignment of the fingers in a natural position.

<http://www.rcai.com/epages/RCAI.storefront/48436145008922cc2740ac10034105f2/Product/View/39SRH>



## McKie thumb splint with optional supination/pronation strap

This splint keeps the thumb out of the palm of the hand.



When the supination strap is applied to this splint it pulls the hand into a position that allows one to collect change. When the pronation strap is applied it turns the hand palm down or in a position to type.

<http://www.mckiesplints.com/about.htm>

## Supination/Pronation Strap

Supination/Pronation straps are designed to assist with either turning the palm up or down. The straps are used when one wants to do an activity that requires on action or the other, or when a passive stretch is required.



## Theratogs

Theratogs are a neoprene suit designed to keep the body in alignment as well as to help with some of the issues associated with brachial plexus injuries. Some have used theratogs to help with unstable shoulders, winging scapula, a lack of supination/pronation, and weakened abdominal muscles.



## Neoprene Shoulder Support

This splint is made of neoprene (wet suit material) to support the shoulder in a comfortable manor. Neoprene is a material that tends to retain heat which might provide some pain relief.

## Figure 8 Shoulder Strap

A figure 8 shoulder strap can be used to hold the shoulders back which can relax the muscles of the back and relieve pain. It can also be used to hold the shoulders in a better position which may position the arms in a more neutral position.



## BREG Neutral Wedge



This is a sling that keeps the elbow at 90 degrees and the hand in a neutral position. This is a pain management device.

[http://www.breg.com/products/bracing/soft\\_bracing/upper\\_extremity/shoulder/default.html](http://www.breg.com/products/bracing/soft_bracing/upper_extremity/shoulder/default.html)

## Dynamic splints

Dynamic splints are those that have components designed to create or assist in motion. An example of a dynamic splint is one used to gain finger extension. It consists of rubber band components to pull the fingers up while allowing the individual the ability to grasp. The dynamic components allow for strengthening of both flexion and extension.



## "MP" Blocking Splint

The "MP" blocking splint is designed to hold the metacarpal phalange joint (the knuckle joint) in a flexed position. Holding the MP joint flexed may allow for better finger extension. The MP joint may hyperextend and cause the fingers to "claw" meaning the fingers are no longer able to be straightened all the way actively. By blocking the MP joint in flexion you no longer see the clawing and the fingers may be extended all the way.

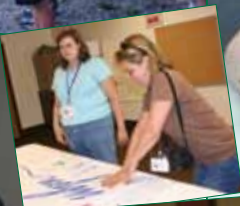
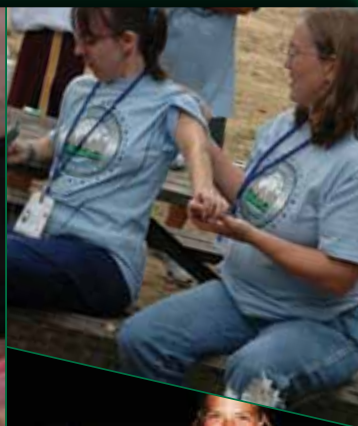


*continued on page 31*











## Botox® Questions and Answers

By Mica Hemingway

### What is Botox®?

BOTOX® is a purified form of the neurotoxin produced by an anaerobic (grows in the absence of oxygen) bacterium called *Clostridium botulinum*. Although there are seven serotypes of the botulinum neurotoxin (labeled A through G), only serotypes A and B are currently approved for clinical use in the United States. Serotype A is overwhelmingly chosen over Serotype B, as it has both a better-demonstrated safety record and a longer duration of treatment efficacy.

BOTOX® is manufactured by growing cultures of *Clostridium botulinum* in strict laboratory conditions, then harvesting, purifying, diluting and freeze drying the toxin. Your doctor purchases BOTOX® in sterilized vials, then uses saline to reconstitute the neurotoxin to a specific strength immediately before administering the treatment.

### How does Botox® work?

To understand how BOTOX® injections work, it is important to have a general understanding of how skeletal (voluntary) muscles contract. Skeletal muscles are linked to the spinal cord, and ultimately the brain, by a series of nerves. The brain controls the movement of skeletal muscles through specific nerve cells called motor neurons. The trigger for any muscle contraction is an electrical impulse.

When you move any of your skeletal muscles, instructions for this movement originate in the motor cortex area of your brain and then are carried as an electrical impulse –

known as an action potential – down the length of a motor nerve toward its linked muscle. When the action potential reaches the tip of the nerve ending, it stimulates the release of a chemical called acetylcholine, which spills into the tiny gap (neuromuscular junction) between the nerve ending and a special portion of the muscle called an endplate. When acetylcholine comes in contact with the endplate, it starts a chemical reaction that results in a muscle contraction.

For illustrative purposes, it is often helpful to think of acetylcholine as working in a very similar manner to the way gasoline works in a combustible engine. Gasoline (acetylcholine) is released in a very small amount into a combustion chamber (neuromuscular junction). It explodes (chemically reacts), which sets about a chain of events that lead to motion (muscle contraction).

BOTOX® inhibits muscle contraction by preventing the nerve ending from releasing acetylcholine. The action potential is carried from the motor cortex and down the motor nerve as usual, and its linked muscle remains perfectly healthy. However, because acetylcholine is not released into the neuromuscular junction, the movement command does not reach the muscle, and the muscle does not contract.

(Similar to the way a car cannot run without gasoline, even though all of its parts might be in perfect working condition.) The brain recognizes that

even though it is sending a movement command, the muscle is not responding.

Within a few months, the motor nerve

begins to sprout toward the unresponsive muscle to reestablish communication between the muscle, motor nerve and brain. Full muscle functionality is restored. Over time, the original nerve ending regains its ability to release acetylcholine, and the sprouts are retracted.

### How long before we see effects?

You may notice some weakening of the treated area in one week's time. On average, maximum benefit is reached at two weeks, and lasts approximately 3-4 months.

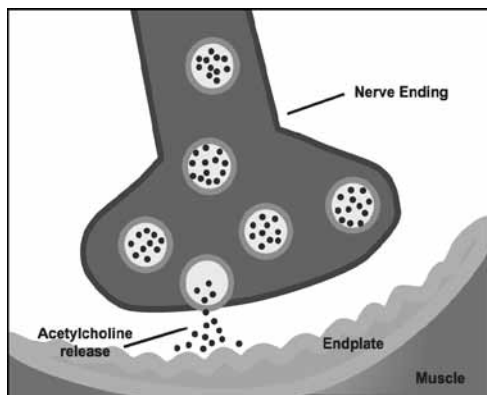
### Is Botox® safe?

There are minimal risks to BOTOX® therapy when administered by competent medical professionals. Although the diluted neurotoxin in BOTOX® is the same toxin that causes botulism in its concentrated form, the amount of the botulinum toxin in BOTOX® is well within the safe limit. Any toxic substance is only toxic at a certain level. For example, the aspirin you safely ingest to relieve a headache would be lethal if taken at a much higher dose.

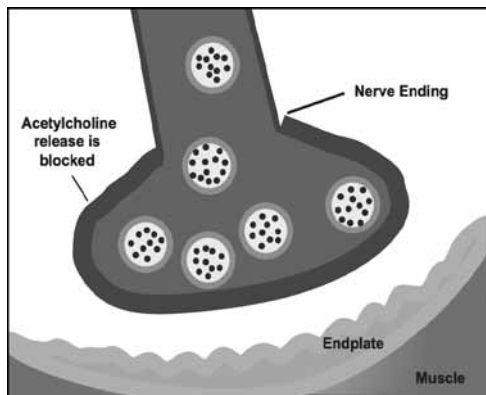
Recently, the tragic deaths of several children have made many parents fearful of BOTOX® therapy. In its investigation, the FDA found no defect in the BOTOX® product, and concluded the adverse reactions may be the direct result of overdosing. The most commonly reported use of BOTOX® among these cases was treatment of limb spasticity associated with cerebral palsy. None of the adverse reactions or deaths reported involved children receiving botox injections as part of a brachial plexus treatment regime.

Children who receive BOTOX®

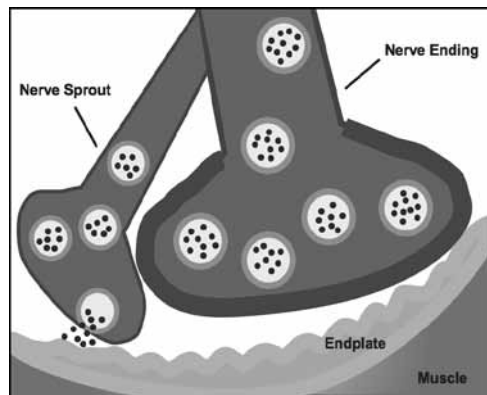
*“There are minimal risks to BOTOX® therapy when administered by competent medical professionals.”*



Before Treatment



After Treatment



New Sprouts Reestablish Communication

injections as part of their brachial plexus injury therapy regimes receive a maximum dosage of 10 Units/kilogram. However unlikely an adverse reaction is at this safe dosage, it is always important to watch for warning signs of an impending problem. If your child experiences difficulty breathing, eating, swallowing or talking, seek medical help immediately. Adverse reactions do not have to become tragedies!

### How is Botox® administered?

To minimize the emotional and physical discomfort of your child, most doctors administer BOTOX® injections under sedation. Once your child is sedated, the most common approach is to insert small electrodes into the target muscle. The electrodes are attached to a stimulating machine, which is used to confirm needle placement before the injections. After appropriate placement has been verified, the BOTOX® injections are then administered through the needle.

The entire process is relatively quick and done as an outpatient procedure. Once your child recovers from sedation and is cleared by the nurse, you are free to leave the hospital and resume your normal activities.

### How is Botox® used in the treatment of brachial plexus injuries?

Skeletal muscles can pull in only one direction. For this reason, they always come in antagonistic pairs or groups: for every muscle group that pulls the

body in one direction, there is a group to pull it the opposite way. When one muscle group in the set contracts, its opposing group relaxes to allow the movement. Because brachial plexus injuries upset this delicate equilibrium, two problems commonly arise: hidden or impaired recovery and joint contractures. Whether it is a muscle or muscle group that does not relax to allow an opposing movement, or a group that has no opposition due to its antagonist's paralysis, the culprit in both situations is usually a muscle (or muscle group) that is "always on."

The most common problem areas for hidden or impaired recovery are:

- Triceps that will not relax to allow the biceps group to flex the elbow.
- Internal rotators that will not relax to allow the external rotators to rotate the arm.

BOTOX® therapy not only offers the weaker muscles an opportunity to strengthen, but it can give the brain an opportunity to learn how to use the newly-innervated muscle group efficiently. In order to maximize the benefit from treatment in this situation, targeted physical therapy is imperative during the neurotoxin's effective period.

The most common problem areas for joint contractures are:

- a. Biceps (or biceps group) that will not relax, so that the elbow is constantly in a state of flexion.
- b. Internal rotators that will not relax so that the shoulder is constantly in a state of flexion.

In both instances, decreased passive range of motion is a precursor to joint contracture. Correctly and consistently performed passive range of motion (PROM) stretches are your child's single best defense against joint contractures. However, in situations where a muscle group is demonstrating a marked reduction in PROM, BOTOX® can significantly reduce the muscle strength and allow for more productive stretching. When BOTOX® is used to combat an impending or existing joint contracture, the child will be casted into maximum possible extension or external rotation for a period of 2-3 weeks following the injections. In order to maximize the benefit from treatment in this situation, a correctly and consistently performed passive range of motion (PROM) stretching routine should be implemented as soon as possible when the cast is removed.

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*Mica Hemingway lives in Maryland with her husband, Daniel, where they are raising their sweet spitfire of a little girl, Aria, who was bilaterally injured during her birth in August 2006. Since that time, Mica has spent much of her time drawing on her undergraduate and graduate training in science and technical writing to spread awareness and enhance understanding about brachial plexus injuries. It is her firm belief that education is the key to effective advocacy. She encourages everyone to seek out similarities rather than differences, and share information in the true spirit of helping one another.*

# Straight Talk From Those Who Live It Each Day: Young Adults Speak Out with Amy Theis

*In this issue's Straight Talk Panel, obstetrically injured Amy Theis interviews other young people with traumatic injuries, and they discuss their injuries and how they each are meeting life's challenges.*

**Could you each tell us about yourself and some things you enjoy doing in your free time?**

**Dustin:** I am Dustin, a 20 year old young man who lives in Wisconsin. I like hanging out with friends, deep conversations, bike rides (usually), chilling out at coffee shops, flirting with girls, helping others with emotional problems, shopping (style is an obsession), partying every once in awhile, videogames (Madden on Xbox, or real strategy games on the computer), food, exercising, hanging out with friends, making odd jokes in an attempt to be the next Dane Cook, and learning (unless it is forced upon me... Darn parents... haha).

Basically, what it comes down to is that I love/like things the same as I did before my Brachial Plexus Injury. I just cannot do some of them as well as I once did. I, for the most part, have gotten over it though, although I will

never quit trying to pass, run, etc. the same as I once did. And that is because I have been told that we truly lose when we give up. Until then, there is always a chance that it may happen.

**Joe:** My name is Joe Alsbury, and I am from Gardner, IL. My family lives in Coal City, Illinois. I have a younger sibling, Leland, who is 13, and I also have a younger sibling, Amber, who is 20. Amber resides in Arizona where she attends Arizona State University. Leland is a freshman in high school. I was injured in a 2000 auto accident, and now I have a RBPI. I am in the midst of starting my own business, and also in the process of starting up a partnership business with a close friend. My free time activities are taken up by my early morning weight- training schedule, watching college football, watching Professional football, and watching professional baseball. After a busy work day, and a baseball or football game

there isn't much time for anything else. I do enjoy playing Sony Playstation every now and again if the opportunity presents itself.

**Caralyn:** My name is Caralyn Cox, and I am 16 years old and have a RTBPI. I live in Chugiak, Alaska and am a junior in high school. In my free time, I enjoy hanging out with my friends, doing origami, reading, and anything else that I feel like at the time. In the summer I like to go camping with my family or hiking and four-wheeling.

**James:** My name is James Morgan. I am 14 years old and in the 10th grade at Mitchell High. I live in Bakersville, North Carolina. I like to fish, watch college football and my favorite team is the University of Georgia (go dawgs!) I also like to go to car shows.

**How old were you when you were injured and how did it happen?**

**Caralyn:** I had just turned 14 a couple of months before the accident. I was in a tubing/sledding accident. I went down my friend's driveway, with another friend, and she fell off and I sped up and hit the telephone pole at the bottom of the driveway. I was on one of those new fast inner-tubes that you can't control and all you have is handles to hang on to. Not safe!

**James:** I was 11 years old and I was riding my four-wheeler at my dad's work and I can't remember the rest.

**Joe:** My injury occurred June 23, 2000. I was riding in a van on my way to a family weekend vacation. We decided to take a back way that my Aunt knew. The last thing I remember was bending down to tie my shoes, and then it's 11 days later and I'm in a hospital bed.



Joe Alsbury with Amy Theis and Ellisa Kanter at Camp UBPN 2007.

From what I understand, we were headed East on Peotone-Beecher Rd and a white Cadillac ran a stop sign and T-Boned our van. I was ejected from the vehicle and had the vehicle roll back over onto me. This pushed my head into my



Dustin Trefren

left shoulder and my right shoulder was pressed the opposite way, having an effect of separating C6 through T2 and slightly severing C5. I broke my neck, my right femur, and added more scars to my body than I have ever desired.

**Dustin:** I was 18 years old when I was injured. I was on my way to college in Stevens Point when I crashed. I remember driving along and being bored as always, the drive was long and rather uneventful and I had gone on it many times before. I remember driving along and everything was fine. Then I remember looking down at my car's clock, and then glancing at my cell phone. I looked for just a moment, then looked up and saw a semi out in front of me. I freaked out and ducked down by the steering wheel; I didn't want to lose my head. I thought I was going to go under the trailer. Instead the car hit the side semi and then spun in a circle. I punched the piece of plastic next to the windshield that holds the roof up, causing me to break my wrist; this is where the brachial plexus might have been over-stretched.

I was still ok for the most part then. I thought, "Well hey; at least I am still alive." I then saw the second semi coming at me. I said a few choice words and prepared to pass on. It hit, I broke both legs, and also had a traumatic head injury.

The last thing I remember for the next few months is the helicopter touching the ground at Theda Clark, the hospital, and me being pulled out on a stretcher. That is how my brachial plexus injury happened. They say that I over-stretched the brachial plexus nerves causing them to function improperly. Brain damage may also play a part in my dysfunctional

left arm, along with muscle atrophy, and the brain having simply forgotten how to control the brachial plexus nerves.

***Could you explain how your TBPI has most impacted your life?***

**Caralyn:** It made me look at the world in a different way and at how I view people, realizing that there are a lot of disabled people in my life. Losing my arm has really slowed me down on some everyday activities, such as writing a paper or cutting and gluing, it has been a big struggle for me to overcome. I also miss being able to drive our 4-wheelers, I still can, just not as well as I used to be able to do. But I think the biggest impact/struggle I had and still am having, is asking for help. I have always been a very independent person and I still am but I just hate having to ask for help. I used to be able to do these things and now I'm struggling with them, but I am getting better at over coming them and asking for help before I break down.

**Dustin:** I can no longer run. I can't pick up my left arm unless I do so with my right arm. I cannot do as much work as I once did. I am unable to do well in sports. I am basically just much less able to take part in the recreational physical activities I once did. So I have found new things to enjoy.

**Joe:** My TBPI killed the old me. Everything that I stood for, everything I was about was destroyed June 23rd, 2000. Now I'm not saying that I am a bad person now. I'm just stating that my goals, my achievements, my awards, my mannerisms all died with my right arm on that June day. Now I could make a list a page long of my awards, and achievements since my accident. The problem is I am not the same person.

In many ways I am better. I use my brain to accomplish multiple activities now instead of my brawn. I also am very business-oriented now, whereas before I had no inkling into the topic whatsoever. Yet, in many ways, I feel that I have faltered. I'm not the star

athlete anymore; I'm in the worst shape of my life, etc. These things may sound petty to most, but I am not most. I hold these things in just as high a regard as the latter. You see I loved where the old me was headed. As for the me of now, I really can't see to far into the future. And that scares me more than anything I have ever encountered in my entire life.

**James:** Being used to having two arms up until I was 11 years old has changed my life a lot. Like sometimes, when I am doing something that used to take me 2 seconds to do and takes me an hour now, I sometimes get mad. I played football before, now I can't. I rode 4 wheelers before, now I can't, but maybe I will be able to ride again after my next surgery. Going to doctors and therapy and having surgeries takes up a lot of time and then there is the pain I have and it can get pretty bad sometimes.

***What is the one thing that you would like every one else to know?***

**Dustin:** This injury sucks. It takes so much away. What we must all do is to keep our heads held up high. We must find new things to do, new things to love, and we must realize that trying is the only way to improve things.

**Joe:** The more I age, the less I see this as an injury. I slowly am beginning to see it as a gift. When I do slow down and finally get to reflect on my life, I ask myself where would I be if this had not happened to me? Would I be able to handle the little curves life throws me everyday? Would I have broken down a long time ago and just given up? These are all things I wonder, but the great thing about my situation is that I have NEVER given up. I have NEVER let the small stuff keep me down.

I meet adversity with a smile and always seem to joke my way around it. I have learned to become creative. I have also learned that the way everyone else accomplishes their daily activities is nowhere near as fun as the way I accomplish mine. So I guess the one thing I want everyone to know is HAVE FUN. We're only here for a short time,



and we might as well enjoy what God has in store for us.

**Caralyn:** I'd like everyone to know that you never know what real pain is until you get hurt and that everything in life has consequences, good and bad.

**James:** The one thing I would like every one else to know is to never say "I can't", because you can do anything if you really want to.

***What would you like to tell your parents? How have they helped and what do you need them to relax on?***

**Dustin:** I would like to thank my parents for their help in encouraging me at the beginning of the healing process in which I have been active for the past two years.

Now, though, I would really like it if they did not feel the need to tell me what medical treatments I need, when I need them, and why. I am a decisive person in nearly all matters. I choose and buy the clothes I wear, the car I drive, the games I play, and nearly all the things I do. My parents though, seem to believe they are more aware of my need for physical rehabilitation, possible surgery, etc. than I am, and at times, I am not able to hide my dissatisfaction with their beliefs.

What it comes down to, is the fact that I will work out when I want to, I will get surgery if I would like to, or I will be a lazy bum if I damn well please. Because this is my life, not theirs, and therefore I must make my own choices or I might regret the things they tell me to do for the rest of my life. And if that were to happen, our relationships wouldn't do very well afterwards. Because if I make a mistake, that is my fault, I can deal with it. If they pressure me into making a grave mistake. I'm not sure if I could forgive so easily.

**Caralyn:** I'd like to tell my parents 'thank you' for everything you have done for me and are still doing.

My parents have helped me by supporting me in everything I've done and have never told me that I can't do something just because I have one hand. I've told them many times that I don't

always need help and now they wait for me to ask for help.

As far as relaxing, they're better then at the beginning because they've come to realize that I will be stubborn when it comes to me doing things on my own and for the most part, they're ok with that because it will not be too much longer and I will be on my own. So they don't need to relax unless they want to.

**Joe:** My folks did a damn good job with what they had, and the 'attitude' I gave them. Looking back now, I wouldn't have put up with half the crap I put them through, and they handled it superbly. My folks offer any help they can give. They have done wonderful things for me and made it possible for me to succeed in anything I have wanted to accomplish.

My mom needs to relax in general. She tries very hard to accomplish greatness, and for her, greatness is a challenge. She will accomplish greatness, but maybe not in what she thinks. To be honest, she has already produced one well- rounded young man with manners, and a giving heart, and kindness for all. She is shaping another this very minute. Does it get any greater than that?

My father has taught me that your actions speak louder than words will any day. He isn't, per say, my biological father, but in any definition of the word, that's what he is to me. Being very simple is a fantastic way to live, and if I accomplish in my lifetime what my father has in his, I will be a very, very well-rounded and liked human being. Thank you to my mom, Traci Alsbury, and to my father, John Curl. You both mean more than the world to me.

**James:** I would like to say to my parents "THANKS FOR ALL YOUR HELP"! They have helped me by reminding me to do stuff like my e-stim.



Caralyn Cox

And they can relax on that because I think they are getting tired of telling me, so I will try harder to not make them remind me all the time. And they worry a lot about how it is going to be in the future but I would like them to know that it will not be hard on me to get through my surgeries and all of the stuff I have to do to fix my arm.

***How has your injury affected your social life?***

**Caralyn:** My injury hasn't affected my social life much. I might get an awkward question on how I do things every now and then from a curious friend, but things are still the same, if not better.

**Dustin:** As a child, my social life revolved around sports. We played football, basketball, soccer, and many other games. My social life during high school still involved some sports, and other random games. I now cannot do many sports. I can neither run, nor use my left arm functionally. Therefore football and other physical sports are out of the question – the head injury also a worry. My physical activity generally consists of me exercising. Walking a lot at work is actually a pretty rigorous exercise, along with left arm exercises. So my social life no longer involves sports.

I now spend much more time at coffee shops. My injury also made me a kinder, more open person. I have now been called a social butterfly at the coffee

shop I go to because I always know at least a few people at the shop when I go there.

I believe that is all that has changed in my social life. Those things, and the fact that my girlfriend from back then left, it was for the better though. Staying in a relationship only because they stuck with you isn't a good idea if things aren't going well. Yes, they were nice, but if it doesn't work, ending things is better for both of you.

**Joe:** Not much. Actually if it has ever affected my life, it's been a great conversation starter. I never let it bother me because I feel that there is a large message that the public has no idea about. I can't save a TBPI by telling my story, but if it affects one woman's decision to express to their doctor that this can not and will not happen. I feel I have kept at least one child from experiencing being teased, or humiliated because they are different. We're all different, the majority of people don't have their eyes opened wide enough to see it.

**James:** In a way it has, but in a way it hasn't, I still hang out with the friends I always had but I am aware of my capabilities and the things I can and can not do.

***What is the hardest part about adjusting to life with an injury and can you tell us how severe your injury is?***

**Caralyn:** Everything about your life changes, especially when you lose your dominant hand, I ripped all 5 of the nerves out, with complete avulsions, and had no movement for the first 15 months after surgery, but now that I have movement, my life has become a little bit easier. It's surprising how much your life can become easier with just being able to move your elbow.

**Dustin:** Adjusting to this new life is rather odd. Everything changes and you must create new expectations for yourself. My brachial plexus injury is pretty severe in my opinion. My arm doesn't work, and can only be used to

type, and carry things at this point. I have heard that others also have bad pain though, and I do not suffer from that so my injury is not as bad as others.

**Joe:** Well, I guess adjusting is difficult. Yet, when your choices are either learn to do everything one handed or do nothing at all, your decision becomes pretty easy. As for severity of my injury, I consider what little use I have of the arm as total loss. I could do everything beforehand with my arm, and now since the injury, very little is accomplished with it. I really have no functioning use of my arm what so ever. For the small amount of mobility that is in my arm, it is of very little value to me.

**James:** Having to go to more and more doctor's appointments. At first it seemed to be pretty severe, but now I have got used to having the use of one arm. The reason it seemed so severe at first is because I thought to myself 'what am I going to be able to do with one arm?' My injury involves all the nerves. C5 and C6 were still attached to my spine but were injured, ruptured or whatever, and C7,C8 and T1 were torn out of my spine.

***Have you had any surgery? Would you have one/another one? Do you participate in therapy, if so what type?***

**Caralyn:** Yes, I have had surgery, only one time though, at the Mayo Clinic. I'm not sure if I want to have another surgery, because in the long run it might not help. The only surgery that the team at Mayo Clinic is looking at maybe in the future, is fusing my shoulder and/or wrist and cutting the



James Morgan

tendons in my fingers to make it more life like, but I can look at that kind of surgery in the future. I am actually not in any kind of therapy at the moment. I haven't had therapy in almost a year. But I used to go to OT, ST, and PT right after the accident.

**Joe:** I have had surgery. November of 2000, so it's been about 7 years. I will not have any more surgeries, unless they are attaching a whole new arm. I do not do therapy. I do lift weights and use what muscles I can in my routine.

**Dustin:** I have had many surgeries. I've had surgery to place a titanium rod in my right femur, to place a metal plate in my right wrist, to place a brain probe in my skull, to drain blood/fluids from my lungs, to test the nerves in my left arm, and to remove the metal plate from my left wrist. I would have another if it was necessary, or if I would see dramatic improvement. I participate in therapy. I have participated in physical (walking) therapy, and in occupational (arm) therapy. Neither of which was fun, but both were and are necessary to get the maximum physical recovery.

**James:** Yes, I have had two, and yes I would have another one because I would do anything to get at least some of the use back in my arm. I have had formal therapy, but mostly now, I do it on my own at home. I'm having a third surgery this spring, and I will be back in therapy.

***Has your TBPI changed your goals in life?***

**Caralyn:** Yes, it has. Before my accident, I always thought of doing Marine Biology, but now, I have found I would like to do Occupational Therapy and become a therapist. I find that it is a very interesting field and I'm hoping to go into when I am older.

**Joe:** As a matter of fact, my injury did change my goals. I had plans of being a professional baseball player. Maybe I wouldn't have made the big leagues, but I would have played in A ball until they told me they didn't want me anymore. I was a good ball player, but my dedication and heart would have

made me a great ball player and gotten me where I wanted to go. I am a little disappointed that I never got that chance, but my new goals are even larger. I may never reach my new goals, but I will enjoy the stretching exercises along the way. I am happy where I am, with what I'm trying to do. I look forward to my future. My past... well it's gone, and as far as I know, I can't change it. So I keep my head up and a smile on my face, because in the end, I know I will find happiness in whatever I do.

**Dustin:** My TBPI has in some ways changed my goals in life. It has taken me from the position in which I was in, one in which I was neither friendly nor blatantly rude, to one that has me caring for all others. I then planned on being a success in life, and would have done the best for myself. I now would like to do well in an area that involves helping others. I might be a doctor, a teacher, an accountant, or something even better. Back then, I wanted to be a doctor, or some other sort of professional who was required to have a master's degree or a doctorate. Now I'll be happy as long as finances are not a worry, and the job is not awful.

**James:** Some, I can name one off the top of my head like I wanted to play football every year until I graduate from high school but I only got to play until the 7th grade.

***Is there any advice that you can give other traumatically injured or others in general?***

**Caralyn:** Be strong and don't give up on yourself, when you get hurt, you may think that no one knows what you're going through, but there are others like you. Up here in Alaska I was the only one that doctors could find that had this injury over the past 20 years in Alaska, but I wasn't alone because the UBPN helped and just because you may be alone in your town, city, state it doesn't mean your alone in the world. Some people might think that you can't do anything because you're injured, but don't listen to them because you can do anything. Prove them wrong, show them, wow them. Don't listen to the negative, but think the positive. The first couple of times you may fail, but just get back up and try another way until you can do it. Just believe and try.

**Dustin:** For traumatically injured persons like myself, most others

neither notice or care if you have been injured and most don't judge you just because you have been. And no, it's not something to be proud of, but your still being here, smiling, laughing and living does show just how strong you are. For others, if you notice differences in people, does it really matter? Please don't point it out, jut let people be how they are and move on. Because it does really offend some people when you make a big deal of differences that it the end don't really matter. Because in the end, people are just people and we all have our own imperfections.

**Joe:** Don't quit. If you have a goal, no matter how far out of reach it is, go for it. Don't be afraid of trying new things either. We can accomplish more than anyone will have thought with determination and drive. Think smart, be safe and enjoy what you have, because tomorrow ... well you know.

**James:** Yes, if you get knocked down in life, just keep getting right back up.

***Thank you to all the young adults who openly shared their thoughts and experiences. We will all benefit and learn from what you have shared.***

## Consider a Donation to UBPN, Inc.

You can make a real difference in the lives of those dealing with brachial plexus injuries by making a tax-deductible donation. Your donations support communication, education and support services that directly help the brachial plexus community. With your help we can continue to reach infants and adults with this injury and to give support to their families. In addition, you may specify that your donation go toward a specific UBPN Program including camp, prevention or awareness.

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# The Brass Ring... *cont'd from page 13*

## Invasive maneuvers

- Delivery of posterior arm/shoulder
- Wood's screw maneuver
- Intentional clavicular fracture
- Zavanelli's maneuver
- Abdominal rescue
- Symphysiotomy

## McRobert's Maneuver and

**Suprapubic Pressure** Although there is no guaranteed best combination of maneuvers that are advocated to follow, however it is universally accepted and agreed that the first maneuver be non-invasive: the McRobert's maneuver.

One study described this maneuver as involving hyperflexion and abduction of the hips causing cephalad rotation of the symphysis pubis and flattening of the lumbar lordosis that frees the impacted shoulder.<sup>13</sup> Put more simply, the mother's legs are flexed at the hips sharply, "straightening" the pelvic outlet to provide more room in the pelvis to accommodate and free the impacted shoulder.

Suprapubic pressure may be used at the same time as the McRobert's maneuver to assist in dislodging the shoulder.<sup>14</sup> An assistant, using a clenched fist, pushes immediately above the pubic symphysis in the hopes of directly pushing the baby's shoulder down and under the pelvic rim.

There is controversy over whether or not an episiotomy is a useful adjunct in managing a shoulder dystocia, because the dystocia is typically not caused by obstructing soft tissue, but rather bone. However, to perform the invasive procedures, I have personally found it necessary to create more room to accommodate my hands. Therefore, I would advocate an episiotomy if the McRoberts maneuver and suprapubic pressure alone do not dislodge the shoulder.

## Gaskin Maneuver

The all-fours maneuver, sometimes referred to as the Gaskin maneuver, involves moving the mother into a hands and knees position.

This repositioning has been shown to effectively relieve shoulder dystocia in many cases. Even if utilizing an epidural, with assistance from those present for delivery, moving the mother to this position can frequently be achieved. This position takes advantage of gravity to move the baby's posterior shoulder down so it can be delivered

more easily. It allows a 1-2 cm increase in the sagittal diameter of the pelvic outlet, allowing more room for the baby to be delivered

## Invasive Procedures

### Delivery of the Posterior Shoulder

**and Arm** By delivering the posterior shoulder and arm (the uninvolved shoulder), the baby's entire torso may be pushed down below the pelvic rim. This, in a sense, decreases the diameter of baby that is "stuck" in the pelvis.

## References

- Gurewitsch, E. After shoulder dystocia: Managing the subsequent pregnancy and delivery. *Semin Perinatol.* 31: 185-195. 2007.
- Waters, P. Comparison of the natural history, the outcome or microsurgical repair, and the outcome of operative reconstruction in brachial plexus palsy. *J Bone Jt Surg.* 81A: 649-659. 1999.
- Gonik, B., et. al. Mathematical modeling of endogenous forces associated with shoulder dystocia: a comparison of endogenous and exogenous sources. *Am J OBGYN.* 182: 689-691. 2000.
- Gary, D., et. al. Cesarean section on request at 39 weeks: impact on shoulder dystocia, fetal trauma, neonatal encephalopathy, and intrauterine fetal demise. *Semin Perinatol.* 30: 276-287. 2006.
- Colman, A., et. al. Reliability of ultrasound estimation of fetal weight in term singleton pregnancies. *NZMJ.* Vol. 119. No. 1241. 2006.
- Rouse, D., et. al. The effectiveness and costs of elective cesarean delivery for fetal macrosomia diagnosed by ultrasound. *JAMA.* 276: 1480-1486. 1996.
- Casey, B., et. al. Pregnancy outcomes in women with gestational diabetes compared with the general obstetric population. *Obstet Gynecol.* 90: 869-873. 1997.
- Acker, D., et. al. Risk factors for shoulder dystocia. *Obstet Gynecol.* 66: 762-768. 1985.
- Bofill, J., et. al. Shoulder dystocia and operative vaginal delivery. *J Mat Fetal Med.* 6: 220-224. 1997.
- Hibbard, J., et. al. When mom requests a cesarean. *Cont OBGYN.* Vol. 51. No. 12. 38-50. 2006.
- Rice Simpson K, Creehan P, AWHONN. *Perinatal Nursing.* 2007(Ch. 7); 330.
- Demott, Kathryn. Gaskin Maneuver Is Gaining in Popularity. *OB/GYN News.* Nov 1, 1999.
- Meenan A, Gaskin IM, Hunt P, Ball C. A New (Old) Maneuver for the Management of Shoulder Dystocia. [Online]. <http://www.thefarm.org/midwives/dystocia.html>
- Rouse, D., et. al. Prophylactic cesarean delivery for fetal macrosomia diagnosed by means of ultrasonography: a Faustian bargain? *Am J Obstet Gynecol.* 181: 332-338. 1999.
- Lewis, D., et. al. Recurrence rate of shoulder dystocia. *Am J Obstet Gynecol.* 172: 1369-1371. 1995.
- Gonik, B. et. al. An alternative maneuver for management of shoulder dystocia. *Am J Obstet Gynecol.* 145: 882-884. 1983.
- Resnik, R. et. al. Management of shoulder girdle dystocia. *Clin Obstet Gynecol.* 23: 559-564. 1980.



**Wood's Screw Maneuver** By twisting the baby's shoulders, as if the baby was a large screw, the shoulders can be oriented into an oblique angle, helping to free and deliver them. I personally like to use a combination of delivering the posterior arm and the Wood's screw maneuver.

### **Intentional Fracture of the Clavicle**

The idea behind intentionally breaking the baby's clavicle to make the chest more "compressible" makes sense on paper. However, a baby's clavicle is very small and difficult to break without the potential for other unintentional fetal injury such as vascular injury or lung damage. This maneuver alone has minimal utilization.

A clavicular fracture can be an unexpected encounter when the non-invasive maneuvers are attempted. Fracture of the humerus (upper arm bone) has also been documented during delivery.

**Zavanelli's Maneuver** When the non-invasive maneuvers have failed, the baby's head can be pushed back above the pelvic girdle and a cesarean

section performed – this is Zavanelli's maneuver. Often thought to be associated with a high rate of mortality (most likely due to the passage of time and not the procedure itself), recent studies have shown little morbidity for either mother or child.

**Abdominal Rescue** Another surgical intervention involves making an incision in the uterus to help release the trapped shoulder. Two people working together, one through the abdomen and one from the vagina, work to free the baby and facilitate vaginal delivery. Again, the amount of time that passes before a surgical intervention is begun is paramount in the long-term morbidity and mortality of both mother and child.

**Symphysiotomy** A technique more common in Africa and the Middle East involved cutting the ligamentous attachments of the pubic bone (symphysis pubis). By making an area of the pelvis "unstable", pressure can be applied to "reshape" the pelvic anatomy, allowing for more room and delivery of the baby. Unfortunately, injury of the bladder or urethra can be easily

encountered with this procedure.

## **Uncharted Territory**

The question of what is best for a future pregnancy does not have one answer, or an easy answer. As previously mentioned, the rate of shoulder dystocia recurrence has been reported to be as high as 16%.<sup>1</sup> This might prompt the request for an elective cesarean section. While it seems like a simple solution, brachial plexus palsy can still occur with a cesarean section.

It is clear that c-section is not 100% protective of the occurrence of brachial plexus injury, however, the occurrence is much less with c-section than with vaginal birth.<sup>4</sup> The rate associated with vaginal delivery ranges from 0.047% to 0.6%, while the range for cesarean delivery is 0.0042% to 0.095%.<sup>4</sup> Five to ten times less likely to occur, but unfortunately, the risk remains.

With celebrities such as Britney Spears electing to have a c-section, elective cesarean delivery has become an option for patients. While not advocated in every situation, it can be a reasonable request for some.

During my residency in the mid-1990's, there was a huge push for vaginal births after c-section (VBAC) and for reducing the c-section rate. My residency director pushed for our c-section rate to be "single digits." Insurance companies pressured not only physicians and hospitals, but patients as well, often refusing the request for a repeat c-section. Once in practice, I can remember getting letters from the Ob/Gyn department heads for the hospitals in which I practiced, asking me to "endeavor to reduce my c-section rate....blah, blah, blah...." I would always laugh as I chuckled the letter into "File 13." As with all things medicine, the pendulum swings to where we now give patients the autonomy to decide.

I am often asked about my c-section rate. An arrogant answer would be 100% if you need one, zero if you don't. The hospital keeps statistics and provides physicians with this data on a quarterly

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basis. From my last “statistical analysis of the second quarter of 2007”, my c-section rate was about 35%. I’m neither proud nor embarrassed of this rate – it is what it is.

There are those that pride themselves on their low c-section rate and this has never made sense to me. While I was at Ohio State, one of my mentors said that “there were numerous vaginal deliveries he wished he could take back – but there was never a c-section that he regretted”. I understood what he meant, but it really didn’t sink in until years later when I began saying the same thing about my delivery experiences. He was talking about the Brass Ring.

Cesarean delivery performed on all women at 39 weeks would substantially reduce the occurrence of both transient and permanent brachial plexus injury, other forms of substantial physical trauma to the fetus, neonatal encephalopathy, and in some instances, long-term neurologic impairment, intrapartum death, and intrauterine fetal demise beyond 39 weeks.<sup>4</sup> Prophylactic c-section to prevent maternal or fetal injury is hotly debated. Statistics are thrown around such as 5,000 elective c-sections must be performed to prevent one case of CP. Other forms of birth trauma, while rare occurrences, would be still less with elective c-section; however, it is estimated that more than 1,000 c-sections would need to be performed to avoid one brachial plexus injury.<sup>10</sup>

Prophylactic c-section for macrosomia sets off its own sparks because of the potential for error with ultrasound estimation of fetal weight (only 60% accuracy for these pregnancies<sup>5</sup>). One study concluded that prophylactic cesarean delivery for fetal macrosomia diagnosed by means of ultrasound was a “Faustian bargain.”<sup>11</sup> However, most believe it seems reasonable to offer such a c-section to a woman who had a previous shoulder dystocia where an ultrasound examination documents an estimated fetal weight greater than that of the index pregnancy<sup>12</sup> (previous delivery with a shoulder dystocia).

## The Interview

Whether or not you chose to continue to see the same physician after a shoulder dystocia event, you should discuss what happened with the delivering physician. It’s important to ask what he or she felt happened and whether or not they think it could be prevented in future pregnancies. Since nearly half of shoulder dystocia events happen in otherwise healthy women without risk factors<sup>1</sup>, an honest answer may be “I don’t know.” It may be of use to refer to the previously outlined risk factors as a personal check-list.

If you chose to move onto another physician, interviewing new physician candidates is essential. The conversation should be very direct and candid. Most physicians can recall with crystal clarity the last time they encountered a shoulder dystocia, or for that matter, any other obstetric or gynecologic complication. For physicians who have been in practice for a number of years, it should come as no surprise to find most have been faced with complications from time to time.

But, it is of vital importance to know how the complication was faced; and even more so, to hear how the physician talks about what happened. Many physicians tweak or modify their procedural skills following a complication. Some even attend educational courses to re-evaluate their knowledge base or technical skills. To hear that a physician re-evaluated their skills and possibly used the event to try to learn and improve them shows a lot about the character of the physician. The following is a list of questions that I would recommend asking:

- When was the last time you encountered a shoulder dystocia?
- What maneuvers did you use to overcome the dystocia?
- What was the outcome of that event? Any maternal or fetal injury?
- What do you believe were the factors that led to the shoulder dystocia?

- Looking back, what would you change about that patient’s pregnancy, labor or delivery?
- Are you opposed to an elective or “prophylactic” c-section? If so, what criteria do you use in recommending a “prophylactic” c-section?
- What is your c-section rate? Does it bother you being that high?
- Knowing that I had a shoulder dystocia with my last pregnancy, what would you recommend for the course of this pregnancy?

If you encounter a physician who is reluctant to discuss past events, answer the above questions, or becomes defensive, move on. The physician is your technician and they should not hesitate to discuss their professional history.

During my residency, I was a bit of a cowboy. There wasn’t a procedure that I wouldn’t try for the experience. Over time, the “cowboy mode” I initially held, gave way to the more practical physician/technician mode. Being able to do the right procedure for the benefit of the patient. It’s no longer a test to see if I can do a procedure.

In my interactions with residents at the hospital, I try to teach a practical application rather than rote facts from text books. I try to teach “common sense” medicine. I have developed rules that I personally follow and try to pass onto my students. They have served me quite well.

### Dr. B’s Rules of Obstetrics

#### Rule #1 – Don’t Do Anything Stupid

#### Rule #2 – There Is Only 1 Rule

All my experiences aside, whether it be from residency or from private practice, it was my own two Brass Rings, Graeme and Ashleigh, that have made me a better physician. Being a father helps me to remain focused. Because of them, I keep my eyes on the prize.

The Brass Ring – not glory or accolades – a healthy mom and healthy baby.

# Former NFL Player Joins the Fight to Learn More About Preventing and Treating BPI

*Portions reprinted courtesy of [www.medicalnewstoday.com](http://www.medicalnewstoday.com)*



Lomas and Trey Brown

During the nearly two decades Lomas Brown Jr. was an offensive tackle in the National Football League, he used his 6'4" frame to protect quarterbacks from getting sacked and to create a path for running backs by knocking down defenders.

After Brown and his wife Wendy had four daughters, the former Detroit Lion was thrilled at the prospect of having a son who may someday follow in his footsteps. But when son Lomas Brown III, also called Trey, was born, the Browns instantly spotted something wrong.

"The first thing we noticed when he came out was that his arm was limp," Brown recalls. "Especially being an ex-athlete, you start thinking about some of the things that you know he may not be able to do that you were able to do."

Doctors told the Browns that Trey had damage to his brachial plexus due to a difficult delivery caused by the baby's broad shoulders.

For the Brown family, eight years have passed since Trey was born. In that time, he has gone through extensive therapy and has progressed well.

"He's doing a lot of different exercises, and he's met a lot of goals," Wendy Brown says. "Every time we take him in to the doctor, they always say that he's met his goal and that they're pleased with what has been happening with his arm."

Lomas Brown's goal for his son doesn't necessarily include athletic domination; he just wants him to live a good life and do the things he wants to do.

“What I hope is that he can just use his arm normally. Forget sports, football, all that,” he says. “I just want him to be able to use it normally. That’s a simple goal, and that’s the goal that I want him to achieve.”

Indeed, Trey is able to use his arm for everyday activities, including an activity that his parents thought unlikely when he was born: throwing a football in the yard with his dad. He is now able to do that with relative ease, and his parents think he will continue to tackle any other obstacles he encounters.

“I think he can do whatever he sets his mind to,” Wendy Brown says. “He is very much like his dad; he’s very strong, and he will definitely figure a way to do whatever he wants.

### Helping Others

It wasn’t enough for Brown to encourage his son, he wanted to help all those who are injured or may be injured. He now organizes several youth football camps, a golf outing and sells his own brand of BBQ sauce on his web site with proceeds going to brachial plexus research.

The former Lion’s offensive lineman, will be holding football performance enhancement camps for kids 7-18 years old. The camps will be held in the Grand Rapids, Lansing, Detroit and Adrian areas throughout the months of June and July of 2009. Former Lions players including Barry Sanders, Herman Moore, Robert Porcher, Chris Spielman, Luther Ellis, and many more will be attending the camps to coach and inspire the children.

The football camps are designed to help improve the kids’ skills, technique, knowledge of the game, as well as show them how to become a team player.

“I am excited to be teaching today’s youth the game that I have loved for all these years, while at the same time raising awareness for brachial plexus palsy and the continuous research efforts,” said Lomas Brown.

## Lomas Brown’s First Annual BPI Benefit Golf Outing

On July 27, former Detroit Lions great, Lomas Brown, hosted a brachial plexus injury research benefit golf outing at Quail Ridge Golf Club near Grand Rapids, Michigan. Eighteen teams came out to raise money for brachial plexus research. A bonus for those who attended was the chance to meet and play with several former NFL players including Brown, Luther Ellis, George Jamison, Eddie Murray, Eric Hipple, and Ickey Woods.

In addition to the golf and a delicious rib lunch, golfers had the opportunity to bid on several sports memorabilia items and home electronics, with proceeds also going to bpi research. After lunch, a representative of the University of Michigan spoke to the group about brachial plexus injuries and showed a video about Trey Brown’s treatment at the clinic. Lomas also spoke about the need for research and prevention of brachial plexus injuries. He eloquently stated that his family has been blessed with the resources for Trey to receive the best treatment but many families don’t know where to turn or have the money for all the necessary treatments.

UBPN was a hole sponsor and a foursome represented UBPN at the event.



UBPN was a sponsor of the first Lomas Brown BPI Benefit Golf Outing in Michigan.



Tables of sports memorabilia were up for auction with proceeds benefiting bpi research.



Former Cincinnati Bengal Ickey Woods.



# Most Useful Splints... *cont'd from page 15*

## Deviation/Gutter Splints

Deviation/Gutter splints are used to correct the hand from going into a deviated position. A lot of times on flexor or extensor muscle of the wrist are less innervated than the other and the hand tends to rest in an awkward position. In the case of ulnar deviation either the ulnar flexor or extensor (the little finger side) had a better nerve signal than the thumb side. This brings

the hand into a so to speak "crooked" resting position. In radial deviation, the hand rests towards the thumb side.

## Grasp Assist

The grasp assist is a mitten like splint with a long Velcro strap to allow the fingers to be wrapped around and object and stay in place with the use of the Velcro. This allows one to



use weights when they would otherwise be unable to grasp the weights. It can also be used to assist with holding other objects too; weights are just one example of what may be used with this mitt.

These are just a few of the many splints that can be used both for function and pain relief. If you have a favorite splint that might help someone else please send them to amy@ubpn.org.

# Arthroscopic Treatment of Posterior...References

1. Bae DS, Waters PM, Zurakowski D. Reliability of three classification systems measuring active motion in brachial plexus birth palsy. *J Bone Joint Surg Am* 2003; 85:1733-8.
2. Beischer A D, Simmons T D, Torode IP. Glenoid version in children with obstetric brachial plexus palsy. *J Pediatr Orthop* 1999;19:359-61.
3. Bokor DJ, O'Sullivan MD, Hazan GJ. Variability of measurement of glenoid version on computed tomography scan. *J Shoulder Elbow Surg* 1999;8:595-8.
4. Dunkerton MC. Posterior dislocation of the shoulder associated with obstetric brachial plexus palsy. *J Bone Joint Surg Br* 1989;71:764-6.
5. El-Gammal, T.A., Saleh, W.R., El-Sayed, A, Kotb, M.M., Imam, H.M. Fathi, N.A. Tendon Transfer Around the Shoulder in Obstetric Brachial Plexus Paralysis: Clinical and Computed Tomographic Study. *J Pediatr Orthop* 2006; 26:641-646.
6. Gilbert A, Whitaker I. Obstetrical brachial plexus lesions. *J Hand Surg [Br]* 1991;16: 489-91.
7. Greenwald AG, Schute PC, Shiveley JL. Brachial plexus birth palsy: a 10-year report on the incidence and prognosis. *J Pediatr Orthop* 1984;4:689-92.
8. Hardy AE. Birth injuries of the brachial plexus: incidence and prognosis. *J Bone Joint Surg Br* 1981;63: 98-101.
9. Hoffer MM, Phipps GJ. Closed reduction and tendon transfer for treatment of dislocation of the glenohumeral joint secondary to brachial plexus birth palsy. *J Bone Joint Surg Am* 1998;80:997-1001.
10. Hoffer MM, Wickenden R, Roper B. Brachial plexus birth palsies. Results of tendon transfers to the rotator cuff. *J Bone Joint Surg Am* 1978;60:691-5.
11. Hui JH, Torode IP. Changing glenoid version after open reduction of shoulders in children with obstetric brachial plexus palsy. *J Pediatr Orthop* 2003;23:109-13.
12. Jackson ST, Hoffer MM, Parrish N. Brachial-plexus palsy in the newborn. *J Bone Joint Surg Am* 1988;70:1217-20.
13. Kozin SH. Correlation Between External Rotation of the Glenohumeral Joint and Deformity after Brachial Plexus Birth Palsy. *J Pediatr Orthop* 2004;24:189-193.
14. Kozin SH, MD, Chafetz RS, Barus D, Filipone L. MRI and Clinical Findings Before and After Tendon Transfers about the Shoulder in Children with Residual Brachial Plexus Birth Palsy. *J Shoulder Elbow Surg*, 2006; 15: 554-561.
15. Mintzer GM, Waters PM, Brown DJ. Glenoid version in children. *J Pediatr Orthop*, 1996;6: 563-566.
16. Moukoko D, Ezaki M, Wilkes D, Carter P. Posterior shoulder dislocation in infants with neonatal brachial plexus palsy. *J Bone Joint Surg Am* 2004;86:787-793.
17. Newman, C.J., Morrison, L., Lynch, B., Hynes, D. Outcome of Subscapularis Muscle Release for Shoulder Contracture Secondary to Brachial Plexus Palsy at Birth. *J Pediatr Orthop* 2006; 26:647-651.
18. Pagnotta A, Haerle M, Gilbert A. Long-term results on abduction and external rotation of the shoulder after latissimus dorsi transfer for sequelae of obstetric palsy. *Clin Orthop* 2004;426:199-205.
19. Pirini S, Zeznik L, Hodges D. Magnetic Resonance Imaging Study of Congenital Clubfoot Treated with the Ponseti Method. *J Ped Orthop* 2001;21:719-726.
20. Pearl ML. Arthroscopic release of shoulder contracture secondary to birth palsy: an early report on findings and surgical technique. *Arthroscopy* 2003;19:577-82.
21. Pearl ML, Edgerton BW. Glenoid deformity secondary to brachial plexus birth palsy. *J Bone Joint Surg Am* 1998;80:659-67.
22. Pearl ML, Edgerton BW, Kon DS, Darakjian AB, Kosco AE, Kazimiroff PB, Burchette RJ. Comparison of arthroscopic findings with magnetic resonance imaging and arthrography in children with glenohumeral deformities secondary to brachial plexus birth palsy. *J Bone Joint Surg [Am]* 2003;85: 890-898.
23. Pearl ML, Edgerton BW, Kazimiroff PA, Burchette RJ, Wong K. Arthroscopic release and latissimus dorsi transfer for shoulder internal rotation contractures and glenohumeral deformity secondary to brachial plexus birth palsy. *J Bone Joint Surg Am* 2006;88:564-74.
24. Pedowitz DI, Gibson B, Williams GR, Kozin SH. Arthroscopic Treatment of Posterior Glenohumeral Joint Subluxation. *J Shoulder Elbow Surg* 2007;16:6-13.
25. van der Sluijs JA, van Ouwerkerk WJ, de Gast A, Wuisman PI, Nollet F, Manoliu RA. Retroversion of the humeral head in children with an obstetric brachial plexus lesion. *J Bone Joint Surg Br* 2002;84:583-7.
26. van der Sluijs JA, van Ouwerkerk WJ, de Gast A, Wuisman PI, Nollet F, Manoliu RA. Deformities of the shoulder in infants younger than 12 months with an obstetric lesion of the brachial plexus. *J Bone Joint Surg Br* 2001;83:551-5.
27. van der Sluijs JA, van Ouwerkerk WJ, de Gast A, Nollet F, Winters H, Wuisman PI. Treatment of internal rotation contracture of the shoulder in obstetric brachial plexus lesions by subscapularis tendon lengthening and open reduction: early results and complications. *J Pediatric Orthop B* 2004;13:218-224.
28. van der Sluijs JA, van der Meij, Verbeke J, Manoliu RA, Wuisman. Measuring secondary deformities in children with obstetric brachial plexus lesion: reliability of three methods. *J Pediatric Orthop B* 2003;12:211-214.
29. Waters PM, Peljovich AE. Shoulder reconstruction in patients with chronic brachial plexus birth palsy. A case control study. *Clin Orthop* 1999;364:144-52.
30. Waters PM, Smith GR, Jaramillo D. Glenohumeral deformity secondary to brachial plexus birth palsy. *J Bone Joint Surg Am* 1998;80:668-77.
31. Waters PM, Bae DS. Effect of tendon transfers and extra-articular soft-tissue balancing on glenohumeral development in brachial plexus birth palsy. *J Bone Joint Surg [Am]* 2005;87: 320-325.

# Designs Needed for New CafePress Endeavor!

UBPN is announcing a contest for designs to be used on various products to be featured in a CafePress online storefront. This store will offer apparel, ceramic mugs, kids and baby items, home décor, and other fun items.

The designs can be humorous, inspirational, cute, informative, or just eye-catching, but all should be related to brachial plexus injuries. If your design is chosen you will be awarded a prize along with bragging rights! Prizes may include a free T-shirt, a selection from the UBPN CafePress storefront or an item from our UBPN store.



The contest will have three age categories: 12 years and younger; 13 to 18 years old; and 19 years and older. All designs should be at least 8 x 10 inches in size, designed on a plain white background and must be original. No clip art will be accepted due to copyright laws. Selected designs will become the property of UBPN, Inc.

Get your creative juices flowing and send your designs to Judy@ubpn.org (please send high resolution graphics) or mail to UBPN Design Contest, 115 Fawn Lane, Blanchester, OH 45107 by October 1, 2008.

## Awareness Items For Sale!

### UBPN Gund Stuffed Puppy Dog – \$20

UBPN has teamed with Avon Products to offer these high quality GUND puppies. Extremely soft and adorable, these puppies would make wonderful gifts for any occasion. (Not available from local Avon representatives).



### Ribbon Car Magnet – \$5

This is a new item for UBPN and the UBPN community helped pick the design and colors. It will be metallic silver and blue. Funds raised will go toward the Camp UBPN Sponsorship Fund. The center part of the ribbon magnet can stay with the ribbon or it can be removed to use as a separate magnet.



### Reaching Out 4 BPI Bracelet – \$4

Also a new item, these great silicone bracelets have debossed text that says REACHING OUT 4 BPI on the top portion of the bracelet and on the opposite side ubpn.org. A blue bracelet is available for adults. A youth-size (which will also fit small adult wrists) will be a marbled blue, aqua and white (see photo.)



### UBPN Jewelry Ribbon Pins – \$5

The UBPN Bell Pin is a long-standing tradition. Made of die-struck pewter with nickel plating for a shiny silver appearance, this pin is not only a beautiful accessory but could provide an opportunity to bring awareness to an admirer!



### UBPN Ribbon Pins – \$10 for 20 pins

These handmade ribbon pins are an economical way to show your support and bring awareness to the brachial plexus cause. Packaged in quantities of 20, these pins are an ideal way to show your support and help your friends and family show support as well!



### Zipper Pulls – \$1

These **new items** can be used on zippers on coats, jackets, backpacks, suitcases – anywhere that you want to draw attention to the cause! They are easy to grip and will assist those with a brachial plexus injury with the difficulty of zipping. We are pleased to add an item that is useful to those with bpi's and also a great way to raise awareness. Please be sure to indicate on the order form which pull you prefer.



## Awareness Items Order Form

### UBPN Gund Stuffed Puppy Dog

Quantity \_\_\_\_\_ x \$20 = \_\_\_\_\_

### Ribbon Car Magnet

Quantity \_\_\_\_\_ x \$5 = \_\_\_\_\_

### Reaching Out 4 BPI Bracelet

Quantity \_\_\_\_\_ x \$4 = \_\_\_\_\_

\_\_\_\_\_ Adult \_\_\_\_\_ Youth

### UBPN Jewelry Ribbon Pin (Each bag includes 20 pins)

Quantity \_\_\_\_\_ x \$5 = \_\_\_\_\_

### UBPN Ribbon Pins

Quantity \_\_\_\_\_ x \$10 = \_\_\_\_\_

### Zipper Pulls

Stop Quantity \_\_\_\_\_ x \$1 = \_\_\_\_\_

Ribbon Quantity \_\_\_\_\_ x \$1 = \_\_\_\_\_

All prices include shipping. Total \$ \_\_\_\_\_

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