2013 Vol. 84, No. 4

ATLANTA Medicine

JOURNAL OF THE MEDICAL ASSOCIA[illegible] ATLANTA

Physiatry

Spotlight: Pediatrics

Defending our Georgia owners for more than 30 years

Founded by Georgia physicians, we know how to protect you

- The best Georgia attorneys
- Georgia peer physician claims review
- Industry leading Patient Safety
- Doctor2Doctor® peer support
- Consistent dividends*
- Owners Circle® rewards program

MagMutual®
Good medicine deserves the best defense

Medical malpractice insurance for Georgia physicians

Call **1-800-282-4882** or visit **MagMutual.com**

*Dividend payments are declared at the discretion of the MAG Mutual Insurance Company Board of Directors.
Since inception, MAG Mutual Insurance Company has distributed more than $120 million in dividends to our policyholders.
Insurance products and services are issued and underwritten by MAG Mutual Insurance Company and its affiliates.

contents

Vol. 84, No. 4, 2013

Dr. Tania Barroso and patient Nathan J. Leslie at the Veteran's Medical Center in Atlanta

3 PRESIDENT'S MESSAGE
The Benefits of Synergy
By Lisa Perry-Gilkes, M.D.

5 PHYSIATRY
Welcome to the Wonderful World of Physical Medicine and Rehabilitation
By Maurice Sholas, M.D., Ph.D

6 **Introduction to Pediatric Rehabilitation**
Physicians making children functional in spite of disability
By Maurice Sholas, M.D., Ph.D

10 **Traumatic Brain Injury: Bringing Back Function and Quality of Life After Injury**
By Tania Barroso, M.D.

16 **Spinal Cord Injury: State of the Art Interventions for Recovery**
By John Lin, M.D.

18 **Understanding and Treating Spasticity**
By Joshua Vova, M.D., FAAP, FAAPMR

22 **How are Rehab Docs Made?**
By Hassan H Monfared, M.D., Gina Bell, B.S.

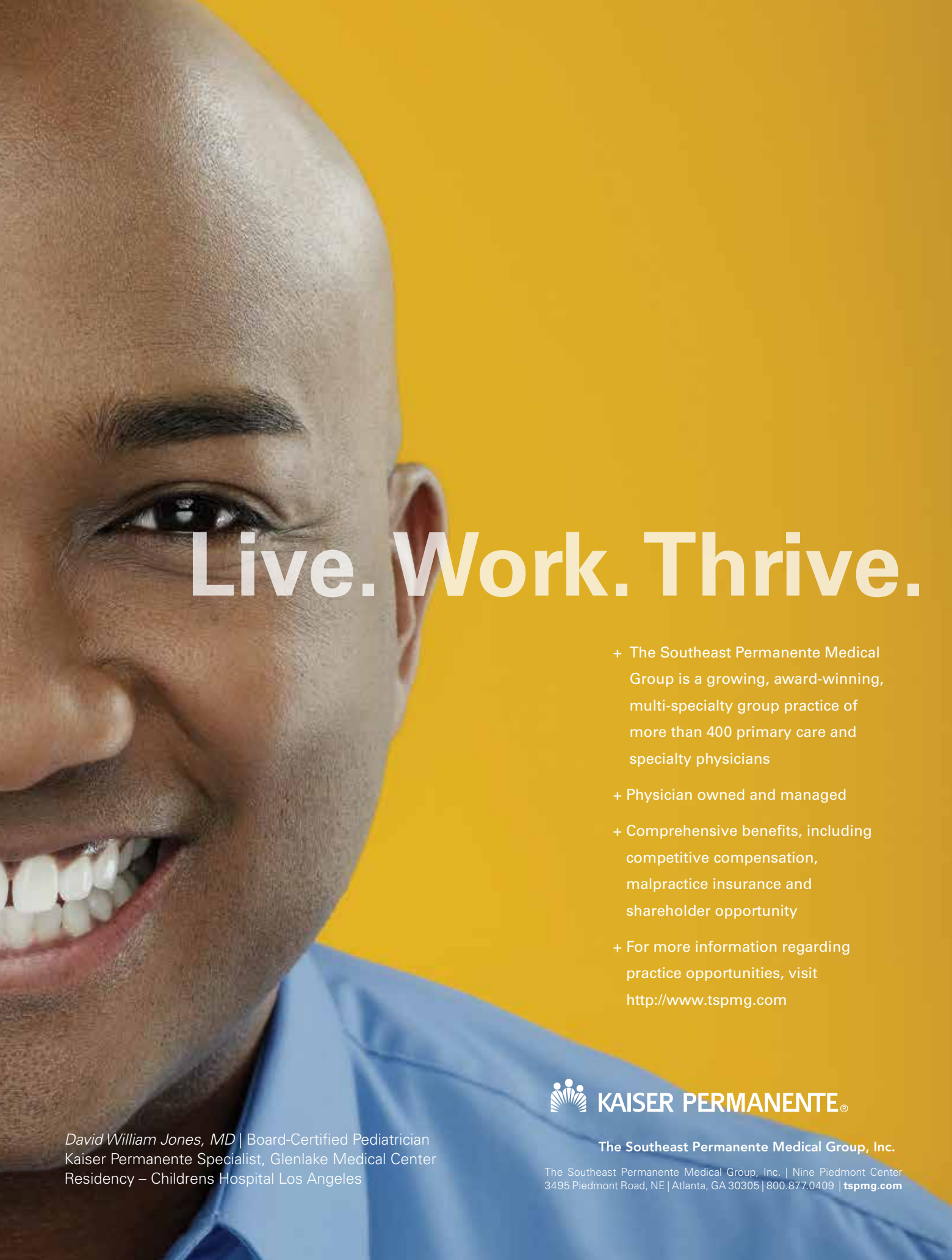
26 SPOTLIGHT
Pediatric Medicine
By Helen Kelley

32 MAA BOARD
Welcome MAA Board Members

MEDICAL ASSOCIATION OF ATLANTA Est. 1854

For information about ATLANTA Medicine magazine, contact the Medical Association of Atlanta.

1150 Lake Hearn Drive, STE 130, Atlanta, GA 30342, Phone: 404-881-1020
FAX: 404-872-0601 or email: info@maa-assn.org



Live. Work. Thrive.

+ The Southeast Permanente Medical Group is a growing, award-winning, multi-specialty group practice of more than 400 primary care and specialty physicians
+ Physician owned and managed
+ Comprehensive benefits, including competitive compensation, malpractice insurance and shareholder opportunity
+ For more information regarding practice opportunities, visit http://www.tspmg.com

David William Jones, MD | Board-Certified Pediatrician
Kaiser Permanente Specialist, Glenlake Medical Center
Residency – Childrens Hospital Los Angeles

KAISER PERMANENTE®

The Southeast Permanente Medical Group, Inc.

The Southeast Permanente Medical Group, Inc. | Nine Piedmont Center
3495 Piedmont Road, NE | Atlanta, GA 30305 | 800.877.0409 | **tspmg.com**

The Benefits of Synergy

As the business of medicine changes, you might ask what does membership in your county medical society offer that is relevant? Gone are the days when it was required to be a member of the medical society to have hospital privileges. Medicine is no longer homogeneous in practice style, workforce nor delivery method.

What MAA offers now as it has since its inception is synergy: "The interaction of elements that when combined produce a total effect that is greater than the sum of the individual elements, contributions."

Lisa Perry-Gilkes, M.D., MAA President

Today, as the world of healthcare is rapidly changing, it is even more important for physicians to work together to guide the direction of healthcare. Never before has this been more complicated and convoluted.

Your medical society is a resource for information and a venue to affect change at a nominal fee.

Through membership, you have the opportunity to attend four quarterly meetings on timely topics that affect you daily regardless of your practice mode and MAG's House of Delegates. Our most recent combined legislative dinner with speaker Dr. Ben Carson was attended by more than 450 physicians, spouses and legislators.

In recent years, there has been a movement afoot under the gold dome to require Georgia physicians to accept Medicare/Medicaid as a condition of licensure. Because of the work of the members of MAA through MAG House of Delegates and our legislative work, state licensure is not tied to acceptance of any insurance plans. Your county medical society was the catalyst to protect physicians' rights for all physicians in the state.

More than that, there is a collegiality among our members that is rare. You have the opportunity to interact with physicians from all over our large county, share ideas and goals, meet entire families and enjoy the company of your colleagues in many venues such as our annual Braves game skybox.

This year as president, I offer a "lagniappe" – just a little unexpected something to put a cherry on top of our events and gatherings. So stay active for your lagniappe!

In closing, September is Women in Medicine month, so I tip my hat to our female members and to Dr. Cassandra Pickett Durham, the first woman in the state to get a medical degree in 1870 from the "Reformed Medical College." She was later known as "Doctoress in Medicine," when she practiced in Preston, Ga. You go girl! ■

Advanced Certifications. Better Results.

12 Atlanta Region Therapists Earn Advanced Certifications

Physicians recognize advanced training in the field of medicine means better results. That's why BenchMark focuses on supporting and encouraging clinicians to receive advanced training in manual therapy and board certification in orthopaedics.

Studies show these highly skilled practitioners use fewer visits and fewer procedures, saving patients time and money. They also get measurably better results.

Only BenchMark has more than 31 physical therapists in the Atlanta-region with either board certification as an Orthopaedic Certified Specialist (OCS) or advanced certification in manual therapy (MDT). We're proud to congratulate the following 12 therapists who join this prestigious list:

Steven Baptiste, PT, DPT, OCS - **Lawrenceville**
Anita Boyd, PT, DPT, OCS - **Alpharetta**
Jennifer Cazeaux, PT, DPT, OCS - **Smyrna/Vinings**
Megan Herzwurm, PT, DPT, OCS - **Buckhead**
Micah Hilton, PT, DPT, OCS - **Riverdale**
Aaron Honeycutt, PT, DPT, OCS - **East Point**
Erica Hosken, PT, DPT, OCS - **Morrow**
Caroline Lawless, PT, DPT, OCS - **Suwanee**
Tim Lonergan, PT, DPT, OCS - **Woodstock**
Danielle, Lorenz, PT, DPT, OCS - **Lawrenceville**
Grace Mollohan, PT, DPT, OCS - **Marietta**
Trevor Davidson, PT, DPT, OCS, MDT - **Alpharetta**

Use our central scheduling number and we'll do the rest: **855.734.2248.**

BenchMark® PHYSICAL THERAPY

Welcome to the Wonderful World of Physical Medicine and Rehabilitation

By Maurice Sholas, M.D., Ph.D.

Rehabilitation physicians are medical doctors, also called physiatrists, who have completed training in the specialty of Physical Medicine and Rehabilitation (PM&R). Emphasizing a collaborative and "team concept," physiatrists work to restore maximum function lost through injury, illness or disabling conditions. This necessitates an expertise in non-operative musculoskeletal medicine and applied concepts of neurology.

In the end, the goal of a physiatrist is to treat the whole person, not just the problem area, and explain the medical problems and treatment/prevention plan to the patient. Therefore these specialists have a global perspective that can be of benefit to both the patients and the other physicians on their healthcare team.

The spectrum of settings in which physiatrists practice is varied. Some are outpatient consultants who specialize in pain management and musculoskeletal medicine. Patients, from high-level athletes to more typical people with overuse and/or age-related pathology, can receive episodic services to maximize their abilities and improve their comfort and quality of life.

Other physiatrists are in a hospital setting as admitting or consultant care providers. Patients with acquired physical disabilities from traumatic brain injury, spinal cord injury or catastrophic illness have the consequences of their disability managed to minimize mortality and morbidity. Finally, some physiatrists focus on the continuum of life with a chronic disability – providing direction for medications, orthotics (braces), prosthetics and durable medical equipment to allow a patient to be successful in their community re-entry.

Physiatrists are trained in a four-year residency program. Some choose to do subspecialty training in one to two years of fellowship training, but all physiatrists are physicians of function who collaborate with patients, other physicians and medical professionals.

The cover of this issue features Dr. Tania Barroso and Nathan J. Leslie. Physiatrists inside and outside of the Veterans Affairs Hospital system are on the front lines of the teams providing expert care to wounded warriors back from defending our freedoms at home and abroad. Physiatrists work closely with neurosurgeons, orthopedic surgeons, neurologists and primary care doctors to select the best possible intervention and deliver it at the most opportune time. ■

Maurice Sholas, M.D., Ph.D. is the Medical & Practice Director for Rehabilitation Services at Children's Healthcare of Atlanta. He is one of 191 board-certified Pediatric Rehabilitation Medicine specialists in America. His professional focus is providing care to children with acquired or congenital physical disabilities. Dr. Sholas received an M.D. and Ph.D. from Harvard Medical School. He completed his residency training at the University of Texas HSC – San Antonio and fellowship training at the Rehabilitation Institute of Chicago. Dr. Sholas is active with Leadership Atlanta and the Medical Association of Atlanta.

COURTESY OF CHILDREN'S HEALTHCARE OF ATLANTA

Introduction to Pediatric Rehabilitation

Physicians making children functional in spite of disability

By Maurice G. Sholas, M.D., Ph.D.

Dr. Maurice Sholas works with spinal cord injury patient Sherrod Pressley.

Many of us fell in love with our profession while watching famous TV Doctors. Serious portrayals, like those on "Grey's Anatomy" or "ER", bring to life the real drama of helping patients cope with life altering health issues. Comedic portrayals, like those on "Scrubs", shine light on the ironic aspects of the patient-doctor relationship. No matter the approach, all remind the viewer that doctors help patients on their journey through life.

As medicine has advanced, physicians and surgeons have become better able to provide more advanced treatment options for a variety of children and adolescents with catastrophic diagnoses. As a result, previously terminal findings have become more chronic conditions. Similarly, patients previously considered a success to simply be alive have the opportunity to seek out a better quality of life.

That evolving reality lead to the creation of the specialty of Pediatric Rehabilitation Medicine — officially recognized by the American Board of Medical Specialties in 2005. Specialists in Pediatric Physical Medicine and Rehabilitation (PM&R), called Pediatric Physiatrists, are specially trained to diagnose, manage and treat acquired or congenital physical disabilities in children. Most commonly, this includes injuries and the sequela of diseases of the musculoskeletal and neuromuscular systems.

Pediatric physiatrists are tertiary care sub-specialists who generally practice out of hospitals, private clinics or rehabilitation centers. They offer comprehensive, non-surgical treatment programs that help address the needs of the whole patient from a context of maximizing function. This approach of maximizing function can be applied to the non-disabled population as well through sports medicine.

The crux of Physiatry is the promotion of teamwork to address the functional concerns of a patient in a manner that is appropriate to their family, community and life context. As such, physiatrists coordinate a team consisting of: nurses,

physical therapists, occupational therapists, speech-language pathologists, psychologists, neuropsychologists, prosthetists, orthotists, child life specialists, social workers and case managers. Pediatric physiatrists can serve as a very useful referral for primary care pediatricians and other specialists who provide care to children with special healthcare needs who have congenital or acquire physical disabilities.

Examples of congenital diagnoses that are treated by Pediatric Physiatrists include: cerebral palsy, spina bifida, brachial plexus lesions, muscular dystrophy and torticollis. The goal of the physiatrist is to manage the consequences of the patient's disability. Thus, if a patient's condition causes them to have muscle spasticity, the physiatrist uses medications like baclofen, botulinum toxin injections or specialized permanent nerve blocks to ameliorate these symptoms and promote easier care and comfort or better functional independence.

Another opportunity for physiatry management comes in using technology to maximize function. Physiatrists are experts at matching children with appropriate communication devices, braces (orthoses), prosthetic devices, wheelchairs, mobility devices or durable medical equipment essential in addressing caregiver or patient needs unique to this vulnerable population. Pediatric physiatrists blend non-operative musculoskeletal medicine with applied neurology to optimize the life trajectory for children born with physical disabilities.

Acquired conditions that are treated by pediatric physiatrists include: traumatic brain injuries, encephalitis, spinal cord injuries, pediatric burns, strokes and limb deficiency. In addition, they treat children who are deconditioned after oncological diagnoses (cancer rehab), cardiac anomalies (cardiac rehab) and those following complex musculoskeletal surgery.

Once the trauma team or the primary treating physicians stabilize the patient, the physiatrist works in a coordinated manner to restore function and optimize independence in patients as varied as those with brain tumors and others post complex spine and limb surgery. What makes the pediatric physiatry input unique is that it incorporates evidence-based medical care with functional optimization via therapy. Ultimately, this manages the child's discoordination, poor endurance, altered cognitive status and altered functional independence following life-threatening insults. Pediatric physiatrists are critical in assisting patients and families to redefine and restore their definition of normal following a physical impairment.

In addition to working with a team of nurses, therapists and para-medical professionals, pediatric physiatrists work with primary care doctors, neurologists, neurosurgeons, orthopedic surgeons, oncologists, rheumatologists and many other specialists. The patients of focus often are medically complex and require input across the spectrum of medical specialties – thus care coordination and "big picture" planning are of high value.

COURTESY OF CHILDREN'S HEALTHCARE OF ATLANTA

Diana Duemig, a physical therapist who works within Children's Healthcare of Atlanta, Comprehensive Inpatient Rehabilitation Unit, provides help to Kaleb Webb.

Two prime examples of physiatrist-led collaboration are pediatric cardiac rehabilitation and spasticity management. Cardiopulmonary rehabilitation involves optimizing function in those affected with heart or lung disease. Considerable efforts are made to manage a cardiac patients' disease process under the direction of a cardiologist or cardiothoracic surgeon. Once that acute process is optimized, the physiatrist crafts a program that makes the child functional in spite of the limitation of their cardiopulmonary system – allowing them to rise from the proverbial couch and re-enter school, vocational interests and avocational activities.

Spasicity is a neurological finding resulting from damage to the central nervous system. Using medication, modalities, manual medicine and physical interventions, physiatrists participate in the care of children with these neuromuscular conditions to decrease this type of hypertonicity. Depending on the case, PM&R physicians may prescribe physical therapy to relax the muscles and improve strength.

For decades, adults who require rehabilitation have had access to Medical specialists who help them focus on function. Now that level of expertise is available to children and adolescents. Rehabilitation, the recovery of previously mastered skills, in addition to habilitation, the acquisition of new skills not previously mastered, are cornerstone concepts in pediatric physiatry.

In addition to understanding the disease process leading to disability, physiatrists appreciate the context under which interventions have to exist to be successful. These medical sub-specialists provide care in a collaborative manner that emphasizes practicality and teamwork. Practice models include inpatient and outpatient management as well as consultation.

Physiatrists can assist with studies that help identify a diagnosis, like when they perform electromyography or nerve conduction studies, but more often they focus on patient management for those children with the most complex diagnoses. Interventions can be medication optimization or procedural of coordination of care. Children with special healthcare needs are well-served by having a pediatric physiatrist among the specialists providing care for them.

For more information on physiatry and its subspecialty areas like pediatric rehabilitation medicine, go to www.aapmr.org/patients/Pages/default.aspx. ■

COURTESY OF CHILDREN'S HEALTHCARE OF ATLANTA

Maurice Sholas, M.D. works with cerebral palsy patient, Kaleb Webb along with Shawna Arsenault, M.D. a pediatric physical medicine and rehabilitation fellow.

Frequently Asked Questions About Physiatry: What Can a Pediatric Physiatrist Treat?

Physiatrists are trained to diagnose and treat a number of different injuries and illnesses. From minor aches and pains to chronic diseases, physiatrists have the in-depth knowledge required to effectively treat many medical conditions. In particular, physiatrists often treat:

- muscle injuries and sprains
- chronic pain
- neck pain
- tendonitis
- arthritis
- osteoporosis
- multiple sclerosis
- brain injuries, including stroke
- spinal cord injuries
- traumatic brain injuries
- brachial plexus
- cerebral palsy
- muscular dystrophy
- spina bifida
- spasticity problems
- limb deficiencies

What Tests Are Performed by Pediatric Physiatrists?

To get a better picture of your pain, physiatrists rely on imaging tests to help make accurate diagnoses and treatment decisions. In particular, physiatrists rely on electrodiagnostic studies to provide information about how your nerves and muscles are working inside of your body. Electrodiagnostic studies can locate areas of weakness and numbness, or pain and cramping. Common electrodiagnostic studies include:

- EMG (Electromyography)
- NCV (Nerve Conduction Velocity)

What Procedures Are Performed by a Physiatrist?

Botulinum toxin injections

Provides targeted relief of symptoms for the treatment of neck pain and abnormal head position in cervical dystonia. It is also used to treat spasticity, torticollis and muscle imbalance in brachial plexus lesions. In specific cases, this medication can be used to treat excessive sweating and excessive drooling as well.

Epidurals

Epidural treatment usually involves a series of injections repeated at regular intervals. Epidural steroid injection is a medical procedure that involves the administration of a dose of anti-inflammatory medication into a small space in your back or neck. This treatment has brought relief to many patients who suffer from pain caused by local inflammation, such as bulging discs, arthritis or ligament strain.

Nerve conduction/electromyography testing

Also known as EMG testing, this two-part electrodiagnostic test is used to study nerve and muscle function, and it can provide your doctor with specific information about the extent of nerve and/or muscle injury. The test consists of a nerve conduction study and a needle exam for muscle testing. The nerve conduction study entails stimulating the nerves at different points with small electric shocks, artificially activating them so their function can be measured. The needle exam involves inserting very fine needles into several muscles to determine normal and abnormal electrical signals given off by the muscles. EMG testing usually takes anywhere from 30 to 90 minutes, depending on the condition being tested and findings of the study.

Joint lavage procedures

These arthroscopic techniques wash loose tissue debris and inflammatory agents away from the interior of a major joint, such as the knee. Although the lavage procedure is a short-term solution, it may assist in relieving the symptoms of those suffering from osteoarthritis for a number of years. Joint injections are performed for diagnostic and therapeutic purposes, and they can be used in two ways – for aspiration, which involves removing fluid for testing or drainage, and fluid injection, in which medications such as corticosteroids are injected into a joint to medicate areas affected by inflammatory arthritis.

Phenol/Alcohol Nerve Blocks

These focal interventions decrease spasticity by chemically cutting a nerve that is supplying an overactive muscle. In addition, nerve blocks can produce pain relief by temporarily stopping the transmission of pain signals. Medicine is injected directly around a nerve or into the spine to block the pain.

Trigger Point Injections

Often when a muscle is knotted, blood cannot circulate through the tissue to nourish it. Some of the tissue will eventually degenerate and form small nodules called trigger points. Trigger points can occur anywhere in the body and cause serious pain. By injecting a trigger point with medicine, pain is reduced and movement is increased.

What Should I Expect When I or My Child Sees A Pediatric Physiatrist?

At your first appointment, your physiatrist will take a detailed medical history from you and will ask you to describe your symptoms in detail. You will be asked how your symptoms have affected your quality of life and your physical function. Your physiatrist will also perform a physical exam, which may include palpation or massage of particular areas of your body. Diagnostic tests can also be performed in order to locate any muscles or nerves that may be functioning irregularly. By performing these exams, your physiatrist will be able to get a better picture of your injuries and pain.

Your physiatrist may come up with a treatment plan right away. Physiatrists offer comprehensive treatment programs that address the whole body, not just the areas affected by pain or stiffness. Treatment programs typically involve:

- medications
- therapeutic interventions
- exercise
- patient-centered, comprehensive care plans

Traumatic Brain Injury

Bringing Back Function and Quality of Life After Injury

By Tania Barroso, M.D.

The rate of Traumatic Brain Injury (TBI) has increased tremendously over the past decade. This is mostly because of injuries sustained in sports and on the battlefield by our brave military personnel. It has been called "the silent epidemic," since there has been very little knowledge and lack of screening protocols in the past, which led to frequent missed brain injuries and, hence, to lack of appropriate management. The good news is that this has directed us to an increase in awareness followed by improvements in the tracking, identification and treatment of brain injuries.

As a physiatrist working with veterans, I have been challenged by the complicated nature of these injuries in our military population. Their brain injuries are usually complex, compound and accompanied by numerous comorbidities such as PTSD and chronic pain. Fortunately, new breakthroughs and focused rehabilitation programs are now in place to meet the needs of patients with brain injury, not only for our veterans and service members, but also for the general community.

What is TBI?

TBI, also known as acquired brain injury, occurs when a sudden trauma disrupts the normal function of the brain. The effects of TBI can vary in duration and severity. Thankfully, the majority of brain injuries are of the mild range, but for many people with severe TBI, long-term rehabilitation is often necessary to maximize function and independence. Even with mild TBI, the consequences to a person's life can be overwhelming.

TBI Symptoms and Sequelae

TBI can cause a host of physical, cognitive, social, emotional and behavioral effects, and its outcome can range from complete recovery to permanent disability or death.

Symptoms vary according to the severity of the injury and the stage of recovery. Mild TBI symptoms may be difficult to identify because the patient may look normal and act coherent. Nonspecific symptoms, such as headaches and fatigue, can easily be ignored and overlooked. Typically, signs and symptoms manifest quickly after injury, but sometimes symptoms may be delayed by weeks and even months. Seizures, dizziness, vision problems, attention deficit and personality disorders can all result from mild TBI and last for many years. Severe TBIs can result in paresis, aphasias, spasticity and contractures. Emotional and behavioral symptoms may include depression, anxiety and personality changes.

Epidemiology

The Centers for Disease Control and Prevention (CDC) states that there are 1.7 million TBIs each year and that TBI is a contributing factor to a third (30.5 percent) of all injury-related deaths in the United States.[1] It is a leading cause of death and disability around the globe, and the impact on society and economy is huge.

It is important to understand that these numbers underestimate the true incidence of TBI because first, they do not include military-related TBIs, second, they do not include brain injuries diagnosed and treated in the outpatient settings, and third, they do not include mild brain injuries that were missed or where the patient did not seek medical care.

Military-related TBI

In the military, brain injury has become known as the "signature wound" and one of the invisible injuries of the wars in Iraq and Afghanistan. Since Sept. 11, 2001, more than 2.5 million service members have been deployed to Iraq and Afghanistan in Operation Enduring Freedom, Operation Iraqi Freedom and Operation New Dawn. More than 250,000 cases of TBI in the military have been reported between the years 2000 and 2012. The most common cause of military-related TBIs are blast explosions. Most of these injuries are classified in the mild spectrum, although the long-term consequences are anything but mild.

What is unique to military-related brain injury is the complexity of its relationship to PTSD, depression, drug abuse and suicidality. It is extremely difficult to determine whether their symptomatology is a result of PTSD or from a mild TBI because they frequently overlap. There are still knowledge gaps and uncertainty when it comes to the treatment of these co-occurring conditions.

Congress initiatives, such as the National Research Action Plan and the Defense and Veterans Brain Injury Center, were created to develop more research in these areas and to improve access to mental healthcare for veterans, service members and their families. All service members are being evaluated for brain injury when they return from combat tours in order to diagnose TBI early and treat it more effectively.

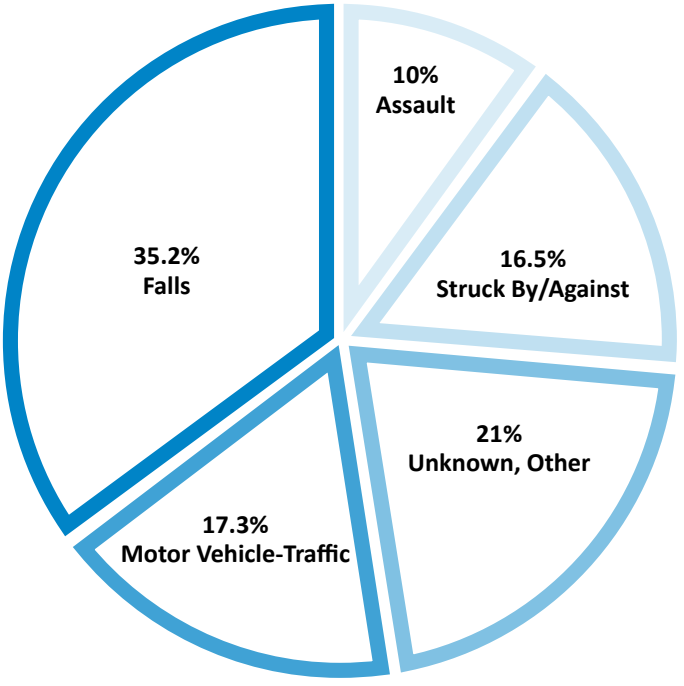
Sports-related TBI

Sports-related TBI has also become a popular topic in the medical community and on social media over the last few years. Repetitive concussive impacts have been linked to long-term devastating consequences, such as dementia and chronic traumatic encephalopathy. An initial cognitive and physical rest period, followed by a gradual increase in physiologic and cognitive stress in asymptomatic athletes, is the hallmark of the management. Continued education to the general public is essential to properly identify concussed individuals and direct them to appropriate medical care.

Causes of TBI

In the civilian sector, the leading cause of sustaining a TBI is through falls.[1] This is followed by motor vehicle crashes, stuck by/against events and assaults. Blasts are a leading cause of TBI for active duty military personnel in war zones.[2]

Figure 1 Most Common Causes of TBI



Source: CDC, www.cdc.gov/traumaticbraininjury/causes.html

Severity of TBI

The severity of a TBI injury may range from mild to severe. Although the severity level has prognostic value, it does not necessarily predict the likelihood of functional recovery. Tools to measures severity include the Glascow Coma Scale (GCS), duration of coma and the length of posttraumatic amnesia (PTA).

It is important to understand that mild TBI, unlike moderate or severe TBI, often cannot be corroborated with objective diagnostic tools, and MRI and CT scans may be completely normal. New and exciting research on the development of blood biomarkers and eye-tracking devices for diagnosing brain injury is getting closer. Hopefully, it will serve as a standard diagnostic tool in the future. Early diagnosis leads to better intervention, therefore better recovery and treatment outcomes.

Severity of Traumatic Brain Injury

	GCS	PTA	LOC
Mild	13 - 15	<1 day	0 - 30 minutes
Moderate	9 - 12	>1 to <7 days	>30 min to <24 hours
Severe	3 - 8	>7 days	>24 hours

Source: CDC, www.cdc.gov/nchs/data/icd9/Sep08TBI.pdf

Rehabilitation After TBI

There is no doubt that a brain injury can drastically change a person's life. The majority of mild TBI patients recover within three months with minimal treatment. Serious brain injury survivors acquire a mix of lifelong impairments, but with hard work and the support of their loved ones, they can regain some abilities lost to their injuries.

Brain tissue healing begins as soon as the patient is stabilized. The brain can rewire and grow new neural pathways among its territories through plasticity, which is the process through which a healthy area of the brain assumes the functions of an injured area. However, these processes alone are not enough to enable a patient to resume his or her pre-injury potential. For the best outcome, a patient must participate in a specialized rehabilitation program.

To achieve maximum quality of life, a brain injury patient must learn ways to work around his or her new deficits. Brain rehabilitation aims to help patients relearn lost life skills and teach them compensatory strategies for long-term functional deficits. Some people may be able to return to their premorbid level of functioning, and some may need lifetime care. It is of utmost importance that the rehabilitation team incorporates efforts among family, employers and friends to improve community integration outcomes.

Rehabilitation can take place in various settings. Possible settings include inpatient rehabilitation hospitals, outpatient rehabilitation, home-based rehabilitation, comprehensive day program and independent living center. A rehabilitation program is determined based on the needs of the individual. Ideally, rehabilitation services should begin as soon as the survivor is medically stabilized, but patients benefit most from rehabilitation when they have reached a level of 3 or 4 on the Rancho Scale, which means they are starting to interact and become aware of their surroundings.

Services include physical therapy, physical medicine, occupational therapy, psychiatric care, psychological care, speech and language therapy and social support. Patients may need evaluations for bowel and bladder control, speech abilities, swallowing abilities, strength and coordination, ability to understand language, mental and behavioral state and social support needs.

As to cognitive rehabilitation, neuropsychological assessment through standardized tests that measure cognitive function are performed as early as possible and repeated throughout the rehabilitation course in order to monitor their progress. Areas assessed include attention and concentration, verbal memory, visual memory, executive function, language, motor function, neurobehavioral function and validity. These evaluations are useful in targeting areas for cognitive rehabilitation and identifying intervention strategies to optimize treatment outcomes. Cognitive skills can be relearned with a structured rehab plan of strategies and repetition.

Behavioral and emotional changes are very common in TBI. They are usually most distressing to caregivers, family and friends of the patient. Behavioral disorders can include apathy, aggression, irritability, impulsivity, poor social skills, substance abuse and several psychiatric diagnoses. Pharmacologic therapies can be extremely helpful in helping control these symptoms, but environmental controls also play an important role, especially in agitated patients.

Brain survivors may have a variety of physical problems, such as contractures, paresis and possibly other bodily injuries associated with the trauma that impairs their mobility. Physical therapists are key to help overcome these physical impairments.

Social interaction is also addressed in rehabilitation. When the patient is ready, the survivor is slowly reintroduced into the community and social skills are tested.

Celebrating 20 Years as a health system

At WellStar, our work in the community begins with our vision to deliver world-class healthcare. The more than 1.4 million residents who live in Bartow, Cherokee, Cobb, Douglas and Paulding counties depend on WellStar physicians, nurses and healthcare providers each and every day for routine care all the way to the most advanced lifesaving procedures. As we celebrate our 20th year of operating as Georgia's largest not-for-profit health system, we reflect on the many lives we have touched, the medical advancements we have introduced and the escalating regional and national recognitions that continually come our way. We look forward to celebrating more years with you and thank you for believing in what we are accomplishing on your behalf.

WELLSTAR®

wellstar.org ★ 770-956-STAR

CELEBRATING 20 YEARS

The vision of WellStar Health System is to deliver world-class healthcare through our hospitals, physicians and services. Our not-for-profit health system includes WellStar Kennestone Regional Medical Center (anchored by WellStar Kennestone Hospital), WellStar Cobb, Douglas, Paulding and Windy Hill hospitals; WellStar Medical Group; Health Parks; Urgent Care Centers; Health Place; Homecare; Hospice; Atherton Place; Paulding Nursing Center; and WellStar Foundation.

We believe in life well-lived.

The Role of Pharmacology in TBI Management

There are a wide range of TBI neurologic and medical complications that are addressed by the physiatrist in the acute and post-acute stages. Particular attention must be paid to the use of medication that may adversely affect cognitive functioning.

Seizures can be seen in the first 24 hours (immediate), in the first two to seven days (early) and/or after seven days (late). The use of phenytoin has been shown to be effective during the first week after a TBI. If there is no seizure after one week, continued use is not warranted.

Balance disorders can be treated with medications, surgery, dietary modifications, vestibular balance rehabilitation therapy and visual therapies. Medications for dizziness should only be used on a short-term basis to minimize negative effects in rehabilitation therapies.

Post-traumatic headaches are seen in 30 percent to 50 percent of patients with mild TBI,[3] with tension-type headaches being more common than the migraine-type. Treatments for post-traumatic headaches are similar to that of primary headache.

Spasticity is a common problem among patients with brain injury. Spasticity is a velocity-dependent increase in tone. This means that the faster a patient attempts to move, the more resistance to that movement occurs. Physical therapy and early intervention is important to prevent development of contractures due to spasticity. Anti-spasticity medications include tizanidine, clonidine, dantrolene, diazepam and baclofen. Local injection therapy includes motor point blocks and Botox.

Arousal may fluctuate during the day in persons with TBI. Dopaminergic agents (amantadine and bromocriptine) are the most commonly used drugs to improve arousal and fatigue.

Attention issues are frequently treated with methylphenidate, which has been shown to improve attention, reaction times and processing speeds.

Agitation and aggression are problematic behaviors common in TBI and may be very stressful, especially for the caregivers. Environmental controls are essential for reducing the triggers for agitation. Benzodiazepines are avoided due to the potential negative effect on brain recovery. Anxiolytics, mood stabilizers, antipsychotics and antidepressants are preferred.

Memory is best addressed with the use of compensatory strategies and services. Cholinergic medications such as donepezil and rivastigmine improve arousal and attention, which indirectly help with memory because they improve the ability to learn.

TBI-related depression and emotional ability are treated with antidepressants. SSRIs are first-line because they are generally believed to be neutral with respect to cognitive functioning.

TBI occurs in 1.7 million Americans annually. TBI rehabilitation includes a variety of services that are individualized to the patient's needs. Proper diagnosis and early intervention are vital to successful outcomes.

Management of TBI symptoms and complications requires an experienced professional in the appropriate setting. Environmental, psychosocial and pharmacologic interventions are useful in the rehabilitation of cognitive, emotional and behavioral issues after TBI. ■

References

1. Faul M, Xu L, Wald MM, Coronado VG. Traumatic brain injury in the United States: emergency department visits, hospitalizations, and deaths. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2010.

2. Department of Defense and Department of Veterans Affairs (2008). "Traumatic Brain Injury Task Force". http://www.cdc.gov/nchs/data/icd9/Sep08TBI.pdf..

3. Post-traumatic headache: neuropsychogical and psychological effects and treatment implications J Head Trauma, Rehabil 1999

4. www.Brainlinemilitary.org

5. Up-to-Date Advances in Rehabilitation: Review Issue Traumatic Brain Injury: A Review of Practice Management and Recent Advances. J Physical Medicine and Rehabilitation Clinics of North America, 2007; 18: 681-710

6. www.traumaticbraininjury.com

7. Braddom, Randall. Physical Medicine & Rehabilitation. Philadelphia: Saunders Elsevier, 2007

8. Frontera, Walter. Essentials of Physical Medicine and Rehabilitation. Philadelphia: Saunders Elsevier, 2008

Tania Barroso, M.D. practices physical medicine and rehabilitation at the Veteran's Medical Center in Atlanta. A native of Puerto Rico, she obtained her B.A. and M.D. with honors from the University of Puerto Rico in 2006. She completed her physical medicine and rehabilitation residency at Emory University from 2007 to 2010. She is a diplomate of the American board of PM&R and a member of the American academy of PM&R. She is currently an associate professor for the Emory University Residency Training Program.

SERVING GEORGIA'S HEALTHCARE COMMUNITY WITH **ABSOLUTE** EXPERTISE

State Bank has deep local roots and decades of experience serving the financial needs of physicians and the healthcare community, personally and professionally. Our healthcare experts take the time to get to know your needs then skillfully apply this understanding to create custom solutions. Combining the personal attention of a smaller bank with the resources of a larger one, they can absolutely help you run your practice more effectively.

If your practice needs an expert banker, call: 800.414.4177.

Jean Holloway
Director, Private & Professional Banking
404.239.8664

STATE BANK
& Trust Company

Absolutely.℠

June Carlson
Vice President, Private & Professional Banking
404.239.8663

www.stateBT.com

MEMBER FDIC Equal Housing Lender

Spinal Cord Injury: State of the Art Interventions for Recovery

By John L. Lin, M.D., FACP, FAAPMR

As a subspecialty of rehabilitative medicine, spinal cord injury medicine has evolved extensively since its first historical description 5,000 years ago by the Egyptian physician Imhotep on a papyrus as "an ailment not to be treated."

More than 2,000 years ago, Hippocrates treated spinal injuries with traction and recognized the correlation of spinal cord injury and paralysis. Galen deduced that respiratory dysfunction in animals corresponded with high spinal cord transection. The middle ages saw the evolution of spinal manipulations in reducing thoraco-lumbar dislocations. By Renaissance, surgical refinement brought forth treatments with laminectomy. The year 1860 saw descriptive details of incomplete hemiparetic spinal cord injury by Brown-Sequard and introduction of the term "quadriplegia" in 1881.

Despite the increasing medical knowledge by the turn of 20th century, mortality from spinal cord injury reached 95 percent, with four in five succumbing within two weeks of a cervical injury. It was not until the second half of the last century that progression of spinal cord medicine has taken a significant leap forward with the introduction of halo in managing high cervical injury, along with other spinal orthotics, improved bladder management in decreasing mortality due to reflux nephropathy, evolution of bladder surgical interventions, functional electrical stimulation for paralytic muscles and transcutaneous electrical stimulation for afferent dysesthesia as well as enhanced imaging with computed tomography and magnetic resonance imaging amongst other technological advances.

Nevertheless, the last decade has witnessed geometric growth in advances of spinal cord medicine, from researches in regeneration and neuroprotection to promotion of neuroplasticity. Other advances include functional electrical stimulation, advanced electronic/computer assisted mobility and assistive devices and novel implanted organ function augmentation devices, in addition to the myriad of pharmacological agents treating secondary co-morbidities as well as enhanced understanding of spinal cord medicine through multi-center collaborations.

Although stem cell transplantation has been a well-recognized research front for spinal cord injury, decades of hard work has yet to result in the panacea that was once sought. Initial studies involving amphibian models demonstrated ependymal regeneration. Mammalian models were less robust in inducible regeneration, although it was noted that lifelong proliferation and differentiation of spinal tissues occur in uninjured rodent models.

Around the world, multiple sources of stem cells have been studied. These include autologously derived bone marrow progenitor cells, fetal neural tissues and allelic human embryonic stem cells. The latest of these clinical trials in the U.S. was the oligodendrocyte progenitor cell implantation trial involving several spinal cord injury model system centers. Without any breakthrough regeneration and recovery, the trial has ceased to enroll further subjects since the second half of 2012, although follow through for post-injection evolution of complications continues.

Though not technically stem cell in nature, other cell therapies and surgical implantations are also noteworthy. The autologous incubated macrophage implantation attempted to

minimize secondary spinal cord injury at the cellular level from forming intra-spinal scar tissues that are thought to be prohibitive of neurological regeneration. In addition, hope was to have macrophage derived growth factor stimulate neuronal regeneration. Lack of funding and subject recovery ceased further trial enrollment in 2006.

The discovery of potential regenerative ability of olfactory ensheathing cells lead to trials in Portugal, Australia, and Russia. Despite early encouraging anecdotes in non-controlled observations, no success has been duplicated under the rigor of scientific methodology. Other trials, too, including peripheral nerve derived Schwann cell transplantation and omental transplantation have not proven to be efficacious.

Still, other non-cell therapy based interventions have garnered enthusiasms since the methylprednisolone trials of 1980s, undaunted by the lack of success of GM-1 ganglioside and 4-aminopyridine. These treatments aim at halting the secondary spinal cord injury associated with the molecular level of chemical releases and physiological sequelae of primary assault causing spinal cord injury.

The most publicized of these is undoubtedly the hypothermia treatment received by a national football league player from Buffalo, N.Y., who sustained a tetraplegic injury during a kickoff tackle. Although touted as a significant advancement and re-awakening of a decades-old intervention due to the significant neurological recovery of the football player in subsequent months, the much vaunted hypothermia received much criticism in the medical/scientific community, both for the haphazard administration by the medical staff as well as for the lack of scientific evidence and medical safety of the intervention. However, other neuroprotective agents under trial today such as basic fibroblast growth factor infusion continue to engender interest and promise. Enrollment of the latter continues yet at Grady Hospital's trauma center.

Non-pharmacological interventions for spinal cord injury have entered the fray over the last decade. These mostly come at the heels of suggestive feline and rodent models. The most widely studied are the body weight supported resistive treadmill ambulation with robotic assistance. Data showing improved gait, decreased supportive staff assistance and some improved spasticity for motor incomplete syndrome with potential for ambulation using assistive devices such as a walker reflects the growing popularity of this intervention. Data on gait or neurological improvement for motor-complete patients are unproven, although effects on secondary endpoints, e.g. cholesterol and glycemic markers, are being investigated.

An anecdotal case presentation over the last year has fueled the speculation on the effect of epidural spinal stimulation on signal conduction through the injured spinal cord and possible effect on neuronal recovery. This, along with functional magnetic stimulation, reflects the continued interests in advances in neurological recovery using non-pharmacological interventions.

Despite the lack of significant progress in neurological recovery, technical advances continue to improve the quality of life for persons living with spinal cord injury. Recovery in rehabilitation medicine may not always reflect physiological changes, but rather, functional adaptations, psychological normalization and social re-integration. To that extent, improved computer technology has brought environmental/computer control to those with high-level tetraplegia using the eye gaze system. Those with ventilator dependence have seen non-invasive ventilation and diaphragm pacing systems replace permanent ventilation. Non-functional tetraplegics now have tongue control drive possibilities for power wheelchair control. Paretic limbs have seen improved and accelerated functional return with devices such as functional electrical stimulation coupled with computational resistance to maintain muscle bulk and minimize atrophy.

Implantable sacral nerve stimulators improve urinary function. External neuro-electrical stimulator of the peroneal nerve during active gait cycle improves ambulation and minimizes contact orthotics that may lead to skin pressure ulcers. Most intriguingly, wearable robotic devices such as exoskeletons are making the transition from military applications to aiding paraplegics in ambulation. While mostly still in pre-market stages, the next years will witness persons with paraplegic spinal cord injuries walk without the use of their spinal cord.

In summary, it is an exciting time to be involved in spinal cord medicine. Advances on multiple fronts, scientifically, technically, functionally and even accessibility-wise, such as through the evaluation and adaptation of the Americans with Disability Act by the European Union, ultimately lead to better lives for persons with spinal cord injury and a society with equality and independence for all. ■

John L. Lin, M.D., FACP, FAAPMR is a staff physiatrist in the Spinal Cord Injury Program at the Shepherd Center. Dr. Lin is board certified in physical medicine and rehabilitation, spinal cord injury medicine and internal medicine and is a graduate of Medical University of South Carolina and Emory University. He completed a dual residency in internal medicine and rehabilitation medicine at Temple University Hospital in Philadelphia, where he also served as the chief resident in his final year. Dr. Lin is an assistant professor at Emory University School of Medicine and has served as Associate Residency Program Director for the Department of Rehabilitation Medicine at Emory. He has also served as the director of Spinal Cord Injury Service and as a primary-care physician at the Atlanta Veterans Administration Medical Center.

COURTESY OF CHILDREN'S HEALTHCARE OF ATLANTA

Dr. Joshua Vova and occupational therapist Terri Stewart work with Tamaruis Stinson, an acquired brain injury patient.

Understanding and Treating Spasticity

By Joshua Vova, M.D., FAAP, FAAPMR

The most common accepted definition of spasticity was characterized in 1980 by James Lance, who defined it as "a motor disorder characterized by a velocity dependent increase in (muscle tone) with exaggerated tendon jerks, resulting from hyperexcitability of the stretch reflex.[1]" In addition to increased muscle tone and hyperactive reflexes, spasticity can also contribute to weakness and poor coordination[2].

Spasticity results from an imbalance between the excitatory or inhibitory input from the alpha motor neurons and causes an increase in activation of the antagonist muscle due to damage to the central nervous system. Spasticity can also cause secondary changes to occur to muscle, tendon and collagen tissue properties such as stiffness, fibrosis and atrophy[3]. Potential causes of spasticity include: spinal cord injury, traumatic brain injury, cerebral palsy, stroke, neoplastic syndromes and multiple sclerosis.

Uncontrolled spasticity may interfere with mobility, exercise, range of motion and activities of daily living as well as cause chronic pain and contribute to contractures and/or pressure sores[4]. However, there are some positive effects associated with spasticity. It may may help maintain muscle tone in patients who are unable to ambulate, help support cirruclatory function, may prevent formation of deep venous thrombosis and may assist in ambulation or transfers[5].

When managing spasticity, the clinician must balance both the positive and negative effects of increases in muscle tone. Typically, spasticity does not increase over time. However there are external factors that can effect tone such as: infection, impaction, pressure sores, pain, deep vein thrombosis, increased intracranial pressure, stress, fatigue, sleep deprivation, environmental changes or even psychological factors.

Treatment of spasticity can be non-pharmacologic, pharmacologic or surgical. There are several factors that may influence the approach in treating spasticity: severity, chronicity, severity, distribution, locus of injury and co-morbidiites[6].

Spasticity may not necessarily develop immediately after an upper motor neuron injury, it may takes weeks or months to occur. Spasticity may improve as neurological recovery takes place. Spasticity of short-term duration may require a less aggressive approach than the patient who has had

long-term issues and have developed soft tissues changes and contractures. However, one must address spasticity reduction immediately in order to maximize recovery during the period of CNS plasticity in the rehabilitation process.

An interdisciplinary team to design a treatment plan will often consist of physical therapists, occupational therapists, orthotists, physiatrists, neurologists, orthopedic surgeons and or neurosurgeons[4].

Non-Pharmaologic

The cornerstone of treating all patients with spasticity is physical and occupational therapy. The goals of therapy are to help improve and maintain range of motion around a joint and strengthen muscles to improve function[4]. When muscle become spastic, there is an imbalance of the muscle forces aroud a joint, which can lead to contracture and deformity. Techniques such as stretching, motor learning, strengthening exercises and constraint-induced therapy are often used to improve the properties of the muscle tendon units.

Serial casting can also be utilized to immobilize a spastic limb in a stretched position. Serial casting uses a series of casts in order to stretch the muscle and improve the passive range of motion. By using a cast, the muscle remains under slow, constant tension, which can modulate the muscles response to sensory stimulus and has also shown to improve the length and number of muscle fibers (sarcomeres), as well as the amount of connective tissue[7]. Other possible techniques to help improve spasticity include kinesiotaping, which utlizes proprioceptive feedback and tension to influence moverements, vibratory stimulation and electircal stimulation[4].

The use of orthotics, or braces, are frequently utilized in the treatment plan of spasticity. The goals of orthotics are to reduce pain, prevent contracture, improve function, compensate for loss of strength and sensation and reduce spasticity. An appropritely fitted orthotic can help to modify tone and reflexes to help a patient improve function and prevent deformity[4]. Decisions reguarding orthotic care are often a collaborative process between the physcian, therapist and orthotist to determine the appropriate design to help a patient accomplish a function and prevent further deformity.

Pharmacologic

Oral medications have demonstrated proven efficacy by inhibiting excitatory neurotransmitters or enhancing inhibitory neurotransmitters at the level of the spinal cord[3]. Oral medications provide some advantages in the treatment of spasticity. They are noninvasive, not permanent and have proven to be clinically effective. However, some may be accompanied by side effects, including weakness and drowsiness, that may limit their effectiveness.

Many of the excitatory cortical spinal pathways that lead to spasticity are believed to be influenced by Gamma-aminobutyric acid (GABA), which is the main rationale for some of the pharmacologic options of treatment[5]. There are currently two recognized GABA receptors: $GABA^A$ and $GABA^B$. Benzodiazepines, medications like diazepam (Valium®) and clonazepam (Klonopin®) are the most common and oldest class of medications utilized medications to treat spasticity. Benzodiazepines act near the $GABA^A$ receptor to hyperpolarize the cell membrane and thus cause a presynaptic inhibition of polysynaptic and monosynaptic reflexes[2-4].

However, the effect that these medications have on the central nervous system is a limiting factor. These medications have the potential to cause sedation that can exacerbate potential cognitive deficits. Benzodiazepam overdose may also lead to somnolence, coma or death. These medications also carry the risk of physiologic addiction as well as a life-threatening withdrawal syndrome if they are abruptly weaned or discontinued. There also has been clinical evidence to demonstrate that these medications may interfere with neurologic recovery after brain injury and stroke, limiting their use as well[5].

Baclofen is a $GABA^B$ agonist. Baclofen acts both presynaptically and postsynaptically by crossing the blood brain barrier and acting at the spinal cord. Because of these properties, it is recommended for spasticity that is a result of cerebral and spinal cord origin[2].

Potential side effects can also include sedation, confusion, dizziness and nausea. Baclofen can also lower seizure threshold in patients who have seizures. Abrupt withdrawal can also lead to seizures, mental status changes or cardiovascular collapse. Gabapentin (Neurontin®) is an anticonvulsant with a chemical structure very similar to GABA. Although most commonly used now for neuropathic pain, it has shown some efficacy for decreasing spasticity at very high doses.[5] Its side effects include ataxia, headaches, tremors, somnolence, fainting and nystagmus[2, 3].

Another class of medications that has been used in treating spasticity is the imidazolines, alpha-2 adrenergic agents. These include the medications clonidine (Catapres®), which is known as a blood pressure medication, and tizanidine (Zanaflex®). These medications are believed to inhibit presynaptic afferents at the level of the spinal cord as well as inhibit the release of glutamate, an excitatory neurotransmitter[2]. These agents are less utilized than the other medications mentioned above due to side effect profile and clinical efficacy[3, 5]. Potential side effects include hypotension, sedation, dizziness, hallucinations, fatigue and hepatotoxicity[2, 3].

Dantrolene sodium is the only medication utilized for spasticity that does have its sight of action within the central nervous system but instead works directly on the muscle peripherally[3]. Its mechanism of action is to block calcium release from the sarcoplasmic reticulum that results in decreased contractility of the muscle. Some clinicians feel that this may be better tolerated for patients who

have spasticity of cerebral origin because it does not act centrally; lethargy and fatigue remain known side effects[2].

Because it limits muscle contraction in all muscles, generalized weakness can also be a potential side effect. The major concern regarding dantrolene is that it has significant higher risks of hepatotoxicity compared with the other medications discussed. Risks for hepatotoxicity with dantrolene are increased at higher doses and in women older than 40[3].

Injectable Treatments

Injectable medications also play a significant role in spasticity management. There is an abundance of literature supporting their efficacy for treatment. Neuromuscular blocks are used to restore the balance between agonists and antagonist muscles. The spastic muscle can be come shortened and contracted as noted above. However, the antagonist muscle can become over lengthened and weakened, further contributing to the imbalance. There are several injectable medications that can be employed to provide neuromuscular blockades. Botulinum toxin will decrease spasticity by working directly on the muscle[8]. Alcohol and phenol produce their effect through direct neural destruction[9].

The FDA first approved botulinum toxin in 1989 for use in blepharospasm. Commercially, there are three different types of botulinium toxin A available and one type of botulinum toxin B. When injected into a muscle, botulin toxin interferes with the release of acetylcholine at the neuromuscular junction. This will cause the muscle to become weaker, allowing the patient to potentially exert more control over the muscle, strengthen antagonist muscles and/or tolerate orthotics/casting.

It is strongly recommended that localization of muscles to be injected utilize a localization technique such as EMG, electrostimulation or ultrasound[8]. Failure to utilize localization techniques even in experienced physicians can decrease accuracy by 25 percent to 50 percent in lower extremities and 40 percent to 70 percent in upper extremities[10]. Injections can only be repeated after three months to reduce the risk of systemic effects and antibody formation. Four to 10 percent of patients will develop antibodies to botulin toxin over time, reducing the effectiveness of repeat injections[5]. To maximize effectiveness and limit potential complications, I strongly recommend that a patient is referred to a physician who is knowledgeable on dosing, types and frequency of side effects and methods of localizing muscles for injections. Potential side effects can include bleeding, infection, pain, undesired weakness, swallowing problems, breathing problems and a flu-like illness[8].

Phenol and alcohol are neurolytic agents that are employed to reduce spasticity. The mechanism of action is reducing neural transmission by chemically denaturing nerve fibers. It requires the clinician to be able to localize the nerve using electrostimulation and/or ultrasound and slowly injecting the nerve directly until response to the stimulation abates[4].

The effects of phenol and alcohol have a longer duration of action than botulin toxin, but there are the risks for potentially more side effects. Injections can be very painful and especially in children require sedation. Other risks include dysesthesias, blood vessel sclerosis, compartment syndrome, venous thrombosis and skin necrosis[11]. Commonly, these injections are used in conjunction with botulinum toxin. Due to dosing imitations of botulinum toxin, multiple injection sites may limit efficacy of the medication. The clinician can use phenol or alcohol to target larger muscles (i.e. adductors and hamstrings) that would normally require large doses of botulinum toxin and focus their botulinum toxin injection sites[9]. Failure to recognize these limitations may result in under dosing of medication and subsequent failure of the treatment plan.

Surgical Treatment

Intrathecal Baclofen Pump. Intrathecal baclofen is used to treat spasticity by surgically implanting a mechanical device that directly infuses baclofen through a catheter into the intrathecal space around the spinal cord. Flexibility of the site of catheter implantation allows this to be an effective strategy for treating both upper and/or lower extremity spasticity.

This strategy is utilized when spasticity is refractory to the methods discussed above. The advantage is that higher concentrations of baclofen can be directly infused into the area of action around the spinal cord without the systemic side effects that accompany the oral medication. This allows for either a consistent dose of medication to be delivered or flexible programming based on a patient's needs[12].

Although the initial implantation of the device requires a surgical procedure, adjustment to dosing and medication refills can be done noninvasively in a physician's office. As with all medications, dosing requires an experienced physician to avoid potential side effects from overdose. In addition, risks from the surgical implantation include infection, headache from cerebrospinal fluid leak, catheter migration, disconnection or blockage[13].

Selective Dorsal Rhizotomy. Selective Dorsal Rhizotomy is a surgical intervention that targets lower extremity spasticity. This procedure is performed by a neurosurgeon who will perform a laminectomy orlaminotomy and selectively separate the L2-S2 motor and sensory nerve roots. Electrical stimulation of the individual sensory nerve roots is performed, and the ones that demonstrate abnormal patterns of sensory feedback are selectively ablated[14]. The goal is to maintain a balance between reductions of spasticity and preservation of function.

Potential risks of this surgery include hyperesthesia, loss of bladder function and loss of previous ability to walk. Typically, in order to have the most benefit from

this procedure, candidates for selective dorsal rhizotomy have to demonstrate some form of independent ambulation prior to surgery and not have any damage to the basal ganglia in the brain. Following this procedure, a patient must be able to participate in an extensive rehabilitation program usually requiring therapy four to five times a week for three to six months to maximize functional return.

Orthopedic Surgery. Orthopedic intervention for spasticity is mainly used to correct the effects of spasticity or balance the forces caused by the spastic muscles. Over time, spasticity may cause muscle and soft tissues contracture or bony deformity. By releasing muscles that cause a deformity, a more favorable balance can be achieved. Orthopedic surgeons may functionally lengthen a short muscle by tenotomy, lengthening the tendon alone or intramuscular lengthening of the fascia around the muscle. They may also consider transferring a muscle to compensate for a weaker antagonist muscle. Bones may also be repositioned or reshaped to help maintain motion[15].

COURTESY OF CHILDREN'S HEALTHCARE OF ATLANTA

Occupational therapist Terri Stewart works with Tamaruis Stinson, an acquired brain injury patient.

The care for individuals with spasticity may be a complex process. Although the neurologic condition is usually static, the changes to muscle, bone, tendon and ultimately function over time is a dynamic process that needs to be actively managed. Appropriate management of the patient with spasticity requires a multidisciplinary team of experienced physicians and allied health professionals who are able to work together. ■

References

1. JW, L., The control of muscle tone, reflexes, and movement: Robert Wartenberg Lecture. Neurology, 1980. 30: p. 1303-1313.
2. Zafonte, R., L. Lombard, and E. Elovic, Antispasticity Medications. American Journal of Physical Medicine & Rehabilitation, 2004. 83(Supplement): p. S50-S58.
3. Watanabe, T.K., Role of oral medications in spasticity management. PM R, 2009. 1(9): p. 839-41.
4. Ronan, S. and J.T. Gold, Nonoperative management of spasticity in children. Childs Nerv Syst, 2007. 23(9): p. 943-56.
5. Thibaut, A., et al., Spasticity after stroke: Physiology, assessment and treatment. Brain Inj, 2013. 27(10): p. 1093-105.
6. Gormley, M.E., Jr., C.F. O'Brien, and S.A. Yablon, A clinical overview of treatment decisions in the management of spasticity. Muscle Nerve Suppl, 1997. 6: p. S14-20.
7. Preissner, K.S., The effects of serial casting on spasticity: a literature review. Occup Ther Health Care, 2002. 14(2): p. 99-106.
8. Lim, E.C., A.M. Quek, and R.C. Seet, Accurate targeting of botulinum toxin injections: how to and why. Parkinsonism Relat Disord, 2011. 17 Suppl 1: p. S34-9.
9. Gooch, J.L. and C.P. Patton, Combining botulinum toxin and phenol to manage spasticity in children. Archives of Physical Medicine and Rehabilitation, 2004. 85(7): p. 1121-1124.
10. Chin, T.Y., et al., Accuracy of intramuscular injection of botulinum toxin A in juvenile cerebral palsy: a comparison between manual needle placement and placement guided by electrical stimulation. J Pediatr Orthop, 2005. 25(3): p. 286-91.
11. Akkaya, T., et al., Neurolytic phenol blockade of the obturator nerve for severe adductor spasticity. Acta Anaesthesiol Scand, 2010. 54(1): p. 79-85.
12. Krach, L.E., R.L. Kriel, and A.C. Nugent, Complex dosing schedules for continuous intrathecal baclofen infusion. Pediatr Neurol, 2007. 37(5): p. 354-9.
13. Zdolsek, H.A., et al., Intrathecal baclofen therapy: benefits and complications. J Intellect Dev Disabil, 2011. 36(3): p. 207-13.
14. Hurvitz, E.A., et al., Functional outcomes of childhood dorsal rhizotomy in adults and adolescents with cerebral palsy. J Neurosurg Pediatr, 2013. 11(4): p. 380-8.
15. Sussman, M.D. and M.D. Aiona, Treatment of spastic diplegia in patients with cerebral palsy. J Pediatr Orthop B, 2004. 13(2): p. S1-12.

Joshua Vova, M.D., FAAP, FAAPMR, is a pediatric physiatrist. He graduated from University of South Florida Medical School in 2000 and completed his residency in pediatric at Jacobi Medical Center in New York. Following his pediatric residency, he completed a residency in physical medicine and rehabilitation at the Rehabilitation Institute of Chicago and a fellowship in Pediatric Rehabilitation Medicine at The Children's Hospital in Denver. Dr. Vova currently serves as a pediatric physiatrist at Children's Healthcare of Atlanta and fellowship director for the Pediatric Rehabilitation Medicine fellowship through Emory University and Children's Healthcare of Atlanta.

Original members of the American Board of Physical Medicine, 1947 [7]

How are Rehab Docs Made?

By Hassan H Monfared, M.D.*, Gina Bell, BS**

Physical medicine and rehabilitation (PM&R), also referred to as Physiatry, is a medical specialty concerned with diagnosis, evaluation, and management of persons of all ages with physical and/or cognitive Impairments and disability. This specialty involves diagnosis and treatment of patients with painful or functionally limiting conditions, the management of comorbidities and co-impairments, diagnostic and therapeutic injection procedures, electrodiagnostic medicine and emphasis on the prevention of complications of disability from secondary conditions.[1]

History

Frank H. Krusen, M.D., is considered the founding father of PM&R.[2] While Dr. Krusen and a few others began practicing physiatry in 1938, it was not recognized as a medical specialty until 1947.[2] From its beginning, PM&R was founded on some basic tenets, including the provision of care that focused on individual patients to ensure restoration of physical, psychological and social functions to the most optimal level possible.[3]

In 1945, Robert L. Bennett, M.D. founded Emory University's Physical Medicine Department and was appointed Professor and Chairman.[4] At this time, Dr. Bennett was also the Director of Physical Medicine at Georgia Warm Springs Foundation (GWSF) and split his time between GWSF and Emory.[4]

Definition and Scope of Physical Medicine and Rehabilitation

Physiatrists are trained in the diagnosis and management of impairments of the neurologic, musculoskeletal (including sports and occupational aspects), other organ systems and the long-term management of patients with disabling conditions. Physiatrists provide leadership to multidisciplinary teams concerned with maximal restoration or development of physical, psychological, social, occupational and vocational functions in persons whose abilities have been limited by disease, trauma, congenital disorders or pain.[1]

Demographics

There are 77 residency programs in the United States.[1] The number of residency positions in PM&R has remained relatively stable at approximately 1,200 positions during the last decade. In 2008, students from United States allopathic medical schools filled 56.2% of positions, 25% came from osteopathic schools and 18.6% were international medical graduates, a bulk of whom are U.S. citizens.[5]

The field of PM&R has 45 fellowship programs: 18 spinal cord injury medicine, 18 pediatric rehabilitation medicine, 9 pain medicine and traumatic brain injury has recently received accreditation through the American Board of Medical Specialties (ABMS).[1] Some fellowships are accredited by other specialties, such as sports medicine, hospice and palliative medicine and neuromuscular medicine.[6]

Duration and Scope of Education

Physicians seeking specialization in the field of PM&R must complete four years of graduate medical education, three years of which must be physical medicine and rehabilitation training. Of these three years, no more than six months can be elective.

During one of their four years, fundamental clinical skills will be developed; this year of training must be from an accredited transitional year program or include at least six months in an accredited training program in family medicine, internal medicine, emergency medicine, obstetrics-gynecology, pediatrics, or surgery, or any combination of these patient care experiences. The remaining months of this year may include any combination of accredited specialties or subspecialties.

Training programs may provide either three or four years of training. A training program with a three-year duration period is responsible for 36 months of physical medicine and rehabilitation training and for assuring that residents appointed at the PGY-2 level have received satisfactory training in fundamental clinical skills. A training program with a four-year duration period is responsible for the quality of the integrated educational experience for the entire training program, including 12 months of training in fundamental clinical skills, which may not include more than four weeks of physical medicine and rehabilitation.[1]

Rotations

A minimum of 12 months of inpatient experience is required. Because patient acuity may vary significantly by hospital, the expectation for an average daily census of eight patients (with a range 6 to 14) may be averaged over the experiences for the whole 12 months. In settings with a census greater than 14, programs need to provide additional support.

Dr. Robert Bennett, Emory University, School of Medicine 1955 Chairman of the Department of Physical Medicine & Rehabilitation[8]

Two months of clinical experiences may include inpatient pediatric rehabilitation and pediatric rehabilitation consults, but must include outpatient management of the common disabling disorders of children, including cerebral palsy and muscular dystrophy.

It is required that the residents complete 200 electrodiagnostic consultations. The therapeutic and diagnostic injections include those for spasticity management, as well as joint, soft tissue, and axial injections. ■

Table 1: Sample PM&R Residency Rotation

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
PGY-2 Year	Gen Rehab	TBI	SCI	TBI (2)	Consults/ Outpatient	Stroke
PGY-3 Year	Peds	Cards & P&O	Consults	EMG	VA	Outpatient SCI
PGY-4 Year	VA2	Med Rehab	Spine	Sports	Elective	Pain

Legend

Gen Rehab: General Rehabilitation Unit
TBI: Traumatic Brain Injury Unit
SCI: Spinal Cord Injury
Consults/Outpatient: Consultations & Outpatient Clinic
Stroke: Stroke Unit
Peds: Pediatrics (Inpatient Unit and Outpatient Clinic)
Cards & P&O: Cardiac Rehab & Prosthetics & Orthotics
EMG: Electromyography Testing Clinic
VA: VA Health Care System
Med Rehab: Medical Rehab (rheumatology, orthopaedics, pain medicine)
Spine: Outpatient Spine Clinic
Sports: Sports Medicine Clinic
Pain: Pain Management Clinic

Roosevelt Warm Springs Institute for Rehabilitation [9]

References

1. Accreditation Council for Graduate Medical Education. http://www.acgme.org
2. Opitz JL, Folz TJ, Gelfman R, Peters DJ. The history of physical medicine and rehabilitation as recorded in the diary of Dr. Frank Krusen: Part 1. Gathering momentum (the years before 1942). Archives of physical medicine and rehabilitation. Apr 1997;78(4):442-445.
3. Brandstater ME. Physical medicine and rehabilitation and acute inpatient rehabilitation. PM & R : the journal of injury, function, and rehabilitation. Dec 2011;3(12):1079-1082.
4. Ditunno JF, Jr., Verville RE. Dr. Robert L. Bennett: pioneer and definer of modern physiatry. PM & R : the journal of injury, function, and rehabilitation. Feb 2013;5(2):83-89.
5. Massagli TL. From novice to expert: obstacles and opportunities for residency programs. PM & R : the journal of injury, function, and rehabilitation. Feb 2010;2(2):87-90.
6. Smith BS. Special certification in physical medicine and rehabilitation: yesterday and tomorrow. Archives of physical medicine and rehabilitation. Mar 2006;87(3):317-319.
7. Kinney CL, DePompolo R. "Rehabilitation ... a key word in medicine": the legacy of Dr. Frank H. Krusen. PM & R : the journal of injury, function, and rehabilitation. Mar 2013;5(3):163-168.
8. Medicine EUSo. Images from the History of Medicine (NLM): Robert L. Bennett, M.D. 1955.
9. GVRA: Roosevelt Warm Springs. http://gvra.georgia.gov/warmsprings/

Dr. Hassan Monfared is the Program Director for the Emory PM&R Residency Program and Assistant Professor at the Emory University School of Medicine, Department of Rehabilitation Medicine; he is also a staff Physician at the Atlanta VAMC in GERI/EXTENDED CARE/PM&R. Dr. Monfared completed his internship and residency at MetroHealth Medical Center, Case Western Reserve University in Cleveland, Ohio and his fellowship at the Cleveland Clinic Foundation in Cleveland, Ohio. Before joining Emory University, Dr. Monfared worked at the University of Alabama at Birmingham, School of Medicine, as an Assistant Professor and Faculty physician in The Department of Anesthesiology and Physical Medicine and Rehabilitation for several years. He is board certified in physical medicine and rehabilitation and pain medicine; his area of clinical interest is interventional pain management mostly focused on spine.

Concord
A COMMUNITY PHARMACY

30 YEARS OF HISTORY SERVING ATLANTA'S MEDICAL COMMUNITY

At Concord Pharmacy, your patients' well-being is our top priority. We work closely with physicians to optimize your patients' personal health strategy.

- HARD TO FIND/SPECIALTY PHARMACEUTICALS -
- SPECIALTY COMPOUNDING - PAIN MANAGEMENT - FERTILITY -

LAKE HEARN PAVILION
404-781-2229

EMORY MIDTOWN HOSPITAL
404-523-4908

CARLTON'S
770-394-3233

AUSTELL
770-819-1584

NORTHSIDE DOCTORS CENTER
404-252-2280

NORTH FULTON HOSPITAL
770-664-5428

PEACHTREE DUNWOODY MEDICAL CENTER
404-250-9656

LAWRENCEVILLE/TERRACE PARK
678-990-8920

MEDICAL QUARTERS
404-252-3607

ELLIJAY RIVERSIDE DRUGS
706-635-5151

JOHN'S CREEK
678-417-0122

LAWRENCEVILLE
770-338-0971

www.concordrx.com

Pediatric Medicine

Protecting the health of Georgia's children and teens is at the forefront of efforts by not only physicians and researchers, but also parents, teachers and legislators.

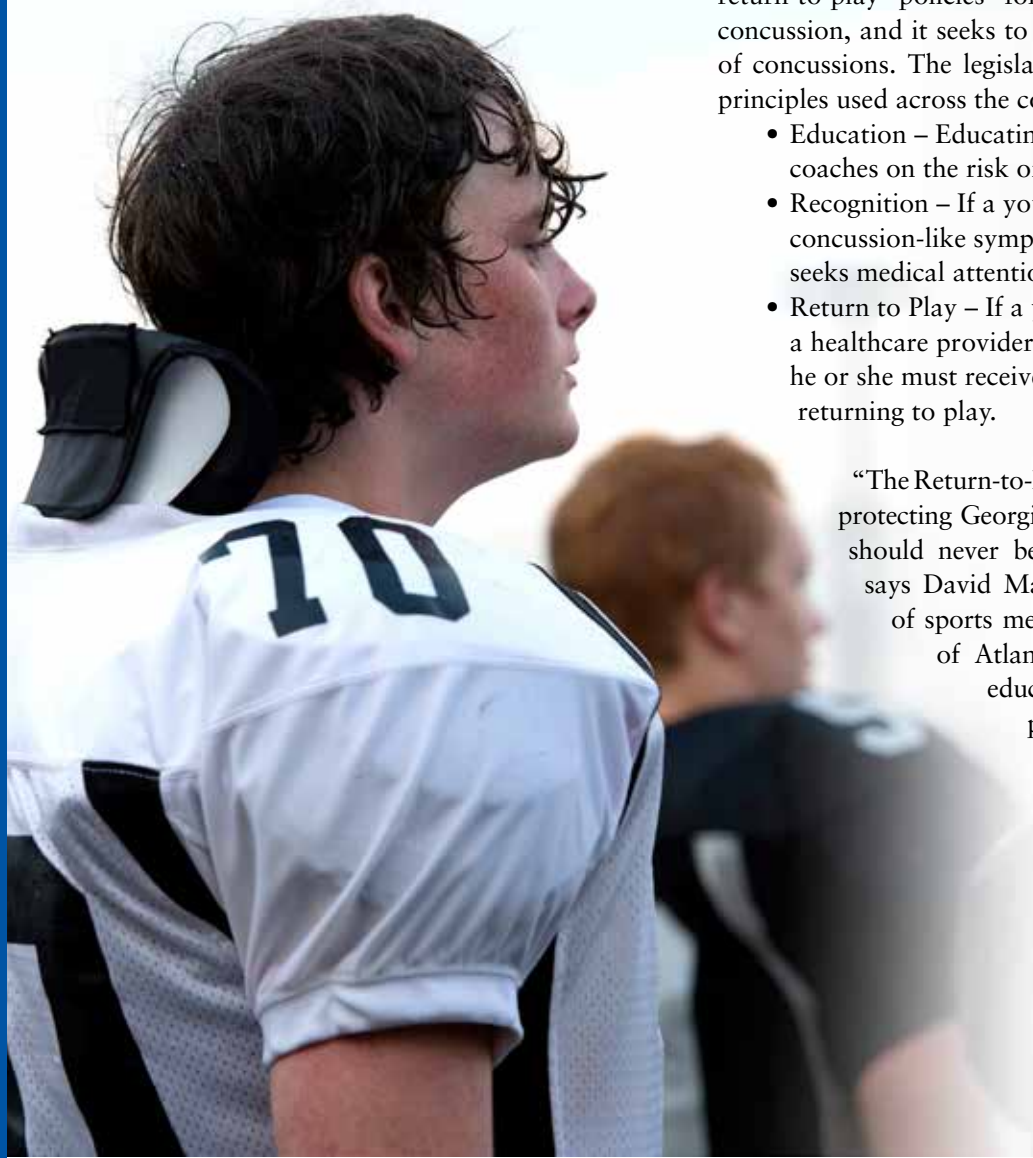
By By Helen K. Kelley

Every year, millions of children and teens experience head injuries. The fact that there are millions more unreported or unrecognized concussions makes this issue even more concerning. Consider these figures reported by Children's Healthcare of Atlanta last year:

- In 2012, Children's Healthcare of Atlanta saw more than 1,400 concussion patients.
- During peak sports season in September, more than 200 concussion patients came through Children's Healthcare of Atlanta's emergency departments and urgent care centers – a 33 percent increase from 2011.

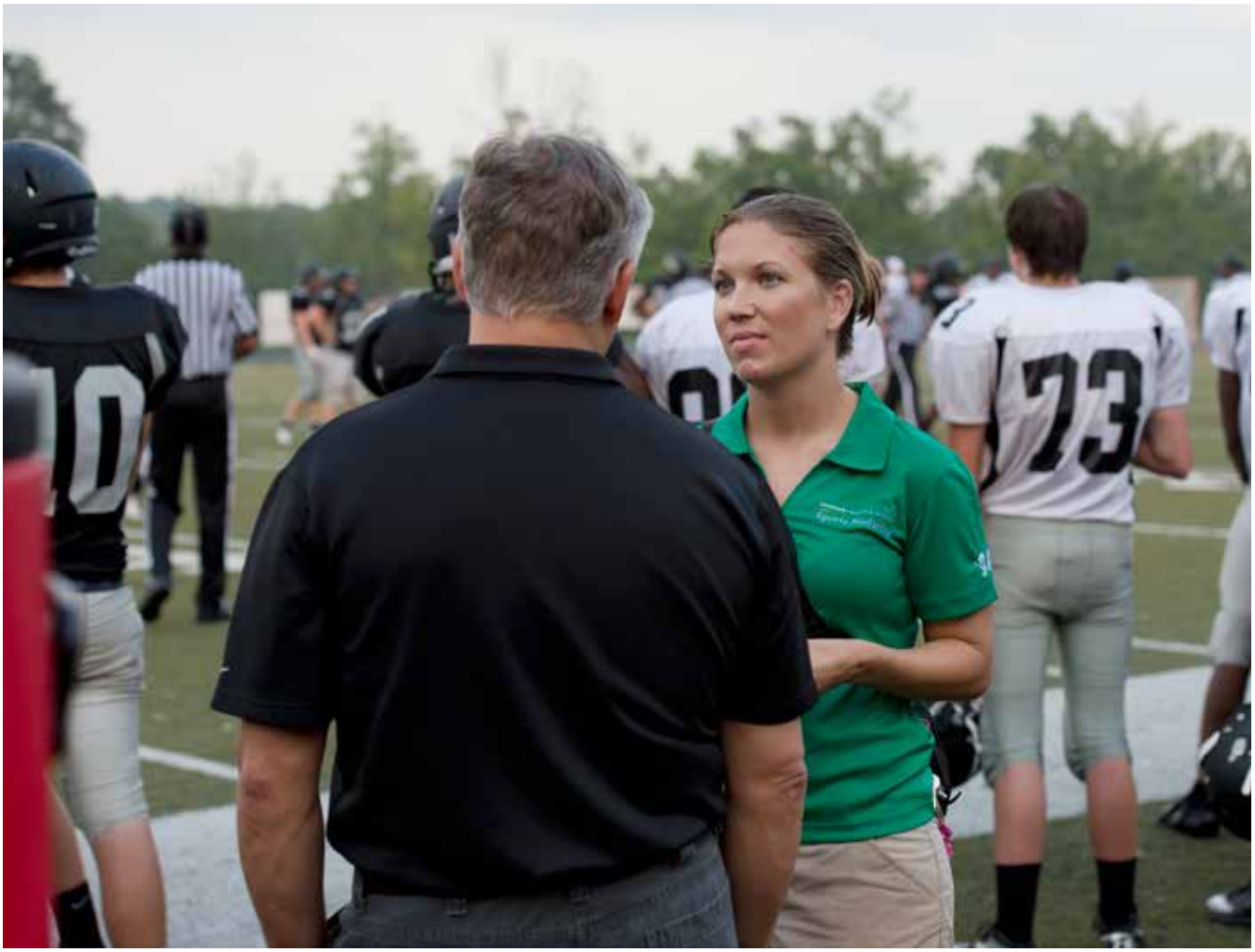
On April 23, 2013, Gov. Nathan Deal signed the Return to Play Act of 2013 into law. The legislation includes return-to-play policies for young athletes who get a concussion, and it seeks to educate the public on the risks of concussions. The legislation is based on three guiding principles used across the country:

- Education – Educating parents, athletes and coaches on the risk of concussion
- Recognition – If a youth athlete exhibits concussion-like symptoms, ensure he or she seeks medical attention.
- Return to Play – If a youth athlete is deemed by a healthcare provider to have suffered a concussion, he or she must receive medical clearance before returning to play.



"The Return-to-Play Act will play a critical role in protecting Georgia's young athletes. Concussions should never be overlooked or downplayed," says David Marshall, M.D., medical director of sports medicine at Children's Healthcare of Atlanta. "This legislation will help educate everyone from healthcare providers to parents on the risks, symptoms and proper treatment of concussions. While kids often think it's important to return to play, our multidisciplinary team of experts in the Concussion Program at Children's Healthcare of Atlanta is also focused on return to learn – making sure these children get the cognitive rest they need to return to both school and sport."

The Return to Play Act, recently signed into Georgia law, seeks to protect young athletes who experience concussions.



David Marshall, M.D. and trainer discuss Georgia's new Return to Play Act on the playing field.

Children's Healthcare of Atlanta has a comprehensive section on pediatric concussion on its website, including a tool kit of resources for physicians to use when diagnosing and managing concussions in children and teenagers. For more information, log on to www.choa.org/concussion

The "grown-up" effects of childhood obesity

The facts regarding childhood obesity are stunning. According to the CDC:

- Childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years.
- The percentage of children aged 6-11 years in the United States who were obese increased from 7 percent in 1980 to nearly 18 percent in 2010. Similarly, the percentage of adolescents aged 12-19 years who were obese increased from 5 percent to 18 percent over the same period.
- Overweight and obesity are the result of "caloric imbalance" – too few calories expended for the amount of calories consumed – and are affected by various genetic, behavioral an environmental factors.

"Certainly childhood obesity has become a problem over the years. It can have long-term ramifications, including the early development of more 'adult' diseases," says Jeff Hopkins, M.D., of Northside Pediatrics and Adolescent Medicine. "In our practice, we're seeing more and more children with adult onset diabetes, elevated cholesterol levels, sleep apnea and joint issues such as arthritis."

Overweight and obese children are often caught up in a vicious cycle of lack of exercise and unhealthy eating that Hopkins calls a "snowball effect."

Children's Healthcare of Atlanta has a comprehensive section on pediatric concussion on its website, including a tool kit of resources for physicians to use when diagnosing and managing concussions in children and teenagers.

The increased survival of preterm infants has created a new set of challenges for long-term child health and development, and injuries are now the leading cause of death for children in the United States, suggesting a crucial need for increased attention to prevention.

"These kids need to move around more, but because of their size, are having more difficulty moving around," he explains. "In fact, families, in general, are more sedentary than ever before. They eat out more frequently than they should because fast food is relatively inexpensive. Healthy foods are more expensive – healthy meals require more money, more effort to prepare … more everything."

However, there is some positive progress toward helping children and families affected by obesity. Hopkins says that more parents are becoming aware of the problem and are willing to make lifestyle changes for the sake of their children and the whole family.

Programs such as Children's Healthcare of Atlanta's "Strong 4 Life" teach physicians and other healthcare providers how to communicate with parents and educate them about how to adopt a healthy lifestyle, such as incorporating several servings of fresh fruit and vegetables into daily meals and snacks or limiting their children's time in front of the television or playing video games.

"There is some good news, and we're actually seeing some improvement on the childhood obesity front," says Hopkins. "Parents are realizing that this is a real problem and the child it affects is theirs, not just some child down the street. They want to work with their pediatrician to come up with a healthy plan that helps the whole family succeed."

Dr. Jeff Hopkins of Northside Pediatrics and Adolescent Medicine
PHOTO COURTESY OF NORTHSIDE PEDIATRICS AND ADOLESCENT MEDICINE

Training program helps physicians identify kids with FAS

Every year, between 1,000 and 5,000 infants in the U.S. are born with Fetal Alcohol Syndrome (FAS), and another 3,000 to 15,000 infants with Alcohol-Related Neurodevelopmental Disorder (ARND). Fetal alcohol exposure is one of the leading preventable causes of birth defects and developmental disabilities.

Catherine Dragstedt, M.D., chief of pediatrics for The Southeast Permanente Medical Group (TSPMG), is working closely with the Center for Health Research – Southeast (CHR/SE) on a continuing education program that raises awareness of FAS/ARND and improves the ability of pediatricians to identify children with these conditions.

"Our main objective is to help practitioners to identify the cardinal characteristics of children with fetal exposure to alcohol," Dr. Dragstedt says. "We want to ensure that these children are referred for early intervention, which can significantly help improve the quality of their health and their lives."

In developing the program, Dr. Dragstedt worked with CHR/SE Investigator Craig Hansen, Ph.D., and Claire D. Coles, Ph.D., a national FAS expert with Emory University. In addition, Dr. Hansen has developed a computer algorithm that helps identify children with FAS by

identifying key information from their electronic medical records. He plans to implement this algorithm across other Kaiser Permanente Regions as a means of developing a registry of children with FAS.

Children with FAS often have conditions such as learning disabilities, attention-deficit hyperactivity disorder (ADHD), poor impulse control, anxiety and depression, as well as cardiac, limb, vision, hearing, dental and cognitive disabilities and significant memory problems, including poor comprehension of money and time. These conditions can lead to difficulty functioning in society, educational difficulties, legal difficulties and a higher incidence of risk-taking behaviors, including drug and alcohol use and abuse. Without screening, their underlying condition may be overlooked, so that their symptoms may be attributed to ADHD, immaturity, lack of ambition, poor parenting or deliberate oppositional behavior.

According to Dr. Dragstedt, the majority of these children with these conditions remain undiagnosed.

"It's very important that we identify children with Fetal Alcohol Disorders as early as possible to ensure they receive appropriate medical care, education and social services early in life," she says. "This increases their chances for good health and independent living as adults."

Child health research lags behind adults, with long-term societal consequences

In a recent article in JAMA, pediatric leaders call for a renewed commitment to child health research through innovative strategies, unique partnerships, creative use of emerging technologies, enhanced training of child health researchers, a culture of participation in clinical trials and advocacy for children and child health research.

The article, "The Transformation of Child Health Research: Innovation, Market Failure, and the Public Good," is written by Barbara J. Stoll, M.D., the George W. Brumley, Jr. Professor and Chair of the Department of Pediatrics in Emory University School of Medicine and Children's Healthcare of Atlanta; David K. Stevenson, M.D.; and Paul H. Wise, M.D., M.P.H., from Stanford University School of Medicine.

Improving positive outcomes in child health is a necessary step for advancing public health generally, say the authors, but this will depend on elevating the status of children in society and on having the political will to provide adequate financial support.

Over the past few decades, pediatric medicine has realized a remarkable record of accomplishments, including prevention and successful treatment of acute infectious diseases and transforming previously fatal diseases into more manageable chronic conditions, but long-term outcomes are still less than optimal, the authors assert.

"The impressive increase in survival from childhood disease and injury has pushed us to look beyond survival to consider long-term outcomes and the consequences of pediatric health and disease on society as a whole," says Stoll. "Research has shown that adult chronic diseases may begin in childhood, and also that societal factors play a large role in health and disease in children and adults."

The increased survival of preterm infants has created a new set of challenges for long-term child health and development, and injuries are now the leading cause of death for children in the United States, suggesting a crucial need for increased attention to prevention. ■

"New perspectives about pediatric origins of adult disease, social determinants of health and long-term effects of early exposures and interactions suggest that the poor health of children (reflected in rates of prematurity, obesity, behavioral and developmental problems, etc.) can be a harbinger of poor adult health," say the authors, who recommend several key steps to transforming child health, including:

- Pediatric research should be informed by the changing epidemiology of childhood illness, the need to monitor both survival and long-term outcomes, and the increasing recognition of pediatric origins of adult chronic disease.
- Expansion of clinical sites for pediatric research networks, including the Neonatal Research Network funded by the National Institute of Child Health and Human Development.
- Creative use of new technologies, including new genetics, imaging and bioinformatics tools and expanded electronic health records to integrate health information and create new multi-institutional research opportunities.
- Increased financial support for trainees and young faculty to create a continual pipeline of clinical and laboratory scientists focused on advancing child health.
- Financial and regulatory incentives and investment opportunities to help confront powerful market forces that skew research priorities and drug/device development away from pediatrics.
- Development of innovative partnerships that include traditional academia, industry and government funders to jointly promote an agenda for children that includes child health research.
- Continued advocacy on behalf of children to promote an agenda that includes attention to child health research.

MEDICAL ASSOCIATION OF ATLANTA
EST. 1854

The Pulse of Atlanta Medicine

2013-2014 Board of Directors

Officers

Lisa Perry-Gilkes, M.D. President
Hayes Wilson, M.D. President Elect
Quentin Pirkle M.D., Treasurer
Maurice Sholas M.D., Secretary
Rob Schreiner M.D., Chairman of the Board

Directors

Robert Albin, M.D.
Larry Bartel, M.D.
Thomas Bat, M.D.
Sara Caceres, M.D.
Larry Cooper M.D.
Rutledge Forney, M.D.
John Goldman, M.D.
Matt Gwynn, M.D.
John Harvey, M.D.
Brian Hill, M.D.
Michael Hilton, M.D.
Mark Hutto, M.D.
Albert Johary, M.D.
Paul King, M.D.
Deborah Martin, M.D.
Cody McClatchey, M.D.
Dickie McMullan, M.D.
Dorothy Mitchell-Leef, M.D.
Elizabeth Morgan, M.D.
Bidemi Olaniyi-Leyimu , M.D.
Ali Rahimi, M.D.
Alan Redding, M.D.
Gary Richter, M.D.
Randy Rizor, M.D.
William Silver, M.D.
Barry Silverman, M.D.
Sumayah Taliaferro, M.D.
Earl Thurmond, M.D.
Steve Walsh, M.D.
Charles Wilmer, M.D.

Join the MAA today!
For membership information, contact David Waldrep, Executive Director at 404-881-1020.

The Medical Association of Atlanta (MAA) is a non-profit association dedicated to the advancement of organized medicine in Atlanta.

The Medical Association of Atlanta's Sponsors

PLATNIUM

THE DOCTORS COMPANY

The Doctors Company is fiercely committed to defending, protecting, and rewarding the practice of good medicine. We are the nation's largest medical malpractice insurer, with 73,000 members, $4 billion in assets, and over $1 billion in surplus.

Learn more at
www.thedoctors.com

KAISER PERMANENTE
The Southeast Permanente Medical Group, Inc.

With more than 400 primary- and specialty-care practitioners, The Southeast Permanente Medical Group (TSPMG) is part of Kaiser Permanente's integrated health care delivery system. Our physicians are connected through one of the largest electronic medical record systems in the U.S., helping us lead the way in improving clinical practice and overall health care quality.

physiciancareers.kp.org/ga

MagMutual®
Good medicine deserves the best defense

As the Southeast's largest mutual professional liability insurer, MAG Mutual empowers physicians to focus on delivering quality care by leading the way in proactive patient safety resources, unrivaled claims defense and expert risk management services.

www.magmutal.com

GOLD

VITAS Innovative Hospice Care®

VITAS Innovative Hospice Care® is the nation's leading provider of end-of-life care. VITAS serves patients and families in the 24 county Atlanta Metropolitan area, providing care for terminally ill patients, in their homes, inpatient hospice units as well as in hospitals, nursing homes, assisted living communities, and residential care facilities.

www.vitas.com

SILVER

Amerigroup
myamerigroup.com/ga

Arnall Golden Gregory LLP
www.agg.com

Bank NY Mellon
www.bnymellon.com

Cbeyond
www.cbeyond.com

Shandy Creative Solutions
www.shandycreative.com

Habif, Arogeti, & Wynne, CPAs
www.hawcpa.com

HealthSystems
www.healthsystems.net

Favorite Healthcare Staffing, Inc.
www.favoritestaffing.com

Northside Hospital
www.northside.com

Owen, Gleaton, Egan, Jones & Sweeney, LLP
www.og-law.com

Pfizer
www.pfizer.com

Piedmont Hospital
www.piedmonthospital.org

Private Wealth Counsel LLC
www.PWCadvisors.com

Saint Joseph's Hospital
www.stjosephsatlanta.com

Southern Protective Group
www.southernprotectivegroup.com

Suntrust
www.suntrust.com/medical

Welcome MAA Board Members

The Medical Association of Atlanta is proud to have Drs. Goldman, Morgan and Rahimi join the 2013-2014 Board of Directors.

If you are interested in serving on the association's board or getting involved with one of the committees, please contact David Waldrep at 404-881-1020 or dwaldrep@maa-assn.org.

Ali R. Rahimi, M.D. MPH FACC, is a cardiologist with The Southeast Permanente Medical Group and Kaiser Permanente of Georgia. Dr. Rahimi's graduate training was at the Medical College of Georgia and Emory University, with residency in Internal Medicine at Yale University and a fellowship in Cardiovascular Medicine at Beth Israel Deaconess Medical Center in Boston. Dr. Rahimi has a special interest in cardiovascular imaging, preventive cardiology, health policy and performance improvement. As Director of Cardiovascular Quality, he uses Kaiser Permanente's unique model of integrated care to promote healthy heart initiatives while also developing programs to ensure that members are receiving high-quality cardiovascular care and outcomes.

John A. Goldman, M.D., MACR, FACCP, CCD, is a former Clinical Professor of Medicine at Emory University School of Medicine in Atlanta. He is President of Medical Quarters and Chief of Rheumatology at St. Joseph's Hospital in Atlanta. Is in solo rheumatology, immunology and osteoporosis practice in Sandy Springs, Ga. He has been named a Master of the American College of Rheumatology (MACR), a Fellow of the American College of Physicians, and a Certified Clinical Densitometrist.

Elizabeth Morgan M.D. is a board-certified plastic surgeon from Virginia. After attending Harvard Medical School and the Yale School of Medicine, along with residencies at Yale, Tufts University and Harvard, she practiced in Virginia until family took her to New Zealand and then Beverly Hills in California. Dr. Morgan returned to the South in 2010, when she opened her own Atlanta practice.

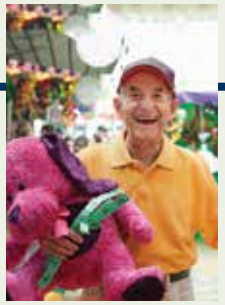
The Art of Medicine

DEBRA JANSEN

www.debjansenphotography.com

Cancer can be a long journey

For many survivors it begins here





Northside Hospital Cancer Institute is proud to have helped so many survive cancer. In fact, Northside diagnoses and treats more breast, gynecologic and prostate cancers than any other hospital in Georgia and has some of the best survival outcomes in the country for both related and unrelated bone marrow transplants.

In 2010, the National Cancer Institute (NCI) chose Northside to be a Community Cancer Center, the only hospital in metro Atlanta to be selected, giving patients access to expanded research opportunities and state-of-the-art cancer care.

The Best Hope for a Cure

Transplanting healthy marrow is the best hope for patients with leukemia, lymphoma and other life-threatening blood and solid tumor diseases. The Blood and Marrow Transplant Program at Northside is one of the largest clinical transplant programs in the Southeast and has survival rates among the best in the nation for related and unrelated transplants.

A Premier Hospital for Women's Health

As Georgia's leader in women's health, treating more cases of gynecologic (cervical, ovarian and uterine) cancer than other community hospital in the state, Northside offers comprehensive services including specialized surgery, groundbreaking procedures and less-invasive treatments, ranking in the top 5% in the nation for robotic GYN procedures.

One out of every eight women will be diagnosed with breast cancer. Northside's Breast Care Program diagnoses and treats more breast cancer cases than any other community hospital in the Southeast, bringing patients unparalleled expertise and a commitment to the latest technology. Northside was the first hospital in Atlanta to offer 3D Mammography.

Caring for the Whole Patient

The journey of cancer goes beyond medical treatment. Northside recognizes that the quality of life is just as important as clinical excellence. That's why Northside is committed to caring for the whole patient, integrating support and survivorship programs to improve the lives of each patient. **For more information please contact us at (404) 300-2800.**

When we say Northside Hospital offers a lifetime of care, we mean a long, long lifetime.