



**Atrium Health**

Carolinas Rehabilitation



# Within Your Reach

Carolinas Rehabilitation  
2020 Spring Newsletter



# Table of Contents

Letter from President and Chief Medical Officer .....	1
---	---

## Highlights

Department Excellence .....	2
-----------------------------	---

Faculty & Residency .....	3
---------------------------	---

Research .....	4
----------------	---

## Clinical Breakthroughs

Inpatient Rehabilitation: A New Solution for Post-Acute Cancer Care .....	5
---	---

Routine Doppler Ultrasound Can Prevent Pulmonary Embolisms, Without Raising Costs .....	6
---	---

New Clues on Why Exercise Promotes Neuroplasticity .....	7
--	---

## Feature Story

Atrium Health's Carolinas Rehabilitation Receives American Hospital Association's 2019 Quest for Quality Prize .....	8 - 9
--	-------

## Patient Stories

Members of Carolinas Rehabilitation's Adaptive Sports and Adventures Program Compete in 2019 IWWF World Disabled Waterski Championships .....	10 - 11
---	---------

Cyclists Journey Across States to Raise Awareness for Adaptive Sports Programs ..	12 - 13
---	---------

A Family That Stays Together Heals Together .....	14 - 15
---	---------

Building a Wheelchair Ramp Helped Save This Teacher's Life .....	16 - 17
--	---------

## Carolinas Rehabilitation Locations

Inpatient Rehabilitation Facilities .....	18
---	----

Outpatient Rehabilitation Facilities .....	18
--	----



A letter from the

## **President and Chief Medical Officer**

For more than 65 years, the region's most complex cases have found a better chance of recovery at Carolinas Rehabilitation. And this year was no exception.

In this issue of Within Your Reach, you'll find some of our biggest and brightest accomplishments of 2019, including improvements in care, research breakthroughs, national achievements, inspiring patient stories and exciting developments.

One of our most outstanding achievements was receiving the American Hospital Association's 2019 Quest for Quality Prize. This noteworthy award is the result of an extraordinary 10-year journey spent continually improving the quality of our care. We made these changes not because we had to, but because we knew it was the right thing to do and we wanted to honor our commitment to provide the best possible care to our patients.



Another highlight was receiving board approval to replace our flagship rehabilitation hospital in Charlotte, NC, located on the campus of Atrium Health's Carolinas Medical Center. This state-of-the-art hospital – set to open in 2022 – is being thoughtfully designed so we can better care for those with the most challenging medical, physical and cognitive needs. This innovative space will also help us to extend our reach beyond the Southeast region. Suffice to say, it's an exciting time in our program.

We appreciate this opportunity to introduce you to our team and patients. Please do not hesitate to contact us directly if we can provide you with additional information.

Sincerely,

**Robert G. Larrison Jr., FACHE**  
President, Carolinas Rehabilitation  
[Robert.Larrison@AtriumHealth.org](mailto:Robert.Larrison@AtriumHealth.org)

**William L. Bockenek, MD, CPE**  
Chief Medical Officer, Carolinas Rehabilitation  
Chair, Department of Physical Medicine and Rehabilitation,  
Atrium Health's Carolinas Medical Center  
[William.Bockenek@AtriumHealth.org](mailto:William.Bockenek@AtriumHealth.org)



### Carolinas Rehabilitation

- First rehabilitation hospital in the nation and first hospital in NC to win the 2019 American Hospital Association Quest for Quality Award
- EQUADR<sup>SM</sup> PSO at 5+ million patient days and 40 subscribing members participating nationally
- SUR Utilization ratios of Foley catheters and central lines were both below national averages
- Hand hygiene compliance remains one of the highest amongst Charlotte, NC facilities
- ALL free-standing inpatient hospitals received Gold-level or Silver-level awards from NCDOL for injury on the job
- ASAP (Adaptive Sports and Adventures Program) had 5 skiers at the 2019 World Disabled Waterski Championship, with 5 medals for the 3 skiers

### Carolinas Rehabilitation & Atrium Health Pineville Rehabilitation Hospital

- 2019 Best Doctors in America (Business NC/Charlotte Business Journal/Castle Connelly) for Dr. William Bockenek and Dr. Vu Nguyen
- 2019 Top Doctors (Charlotte Magazine) for Dr. Vu Nguyen and Dr. Vishwa Raj
- Physician Faculty have leadership positions in many PM&R based national and international organizations such as the American Academy of Pediatrics (AAP), ISPM&R, ACRM, Congress of Rehabilitation Medicine and the Organization of Program Directors Associations
  - **William Bockenek, MD: AAP** - Program for Academic Leadership, Director; Delisa/Frontera Text, Editor
  - **Vishwa Raj, MD: ACRM** - Cancer Rehab Group, Chair; ISPMR - Cancer Rehab Group, Chair
  - **Vu Nguyen, MD: AAP** - Board of Trustees, Education Committee Chair; CME Committee Chair; ISPMR-US Representative; OPDA PM&R Representative
  - **Mark Hirsch, PhD:** elected as Fellow of the American Congress of Rehabilitation (1 of 9 selected) in 2019
- Awarded the 2019 Business of the Year by Montcross Area Chamber of Commerce

### Subspecialty

#### Cancer Rehabilitation

- Approval for first Cancer Rehabilitation fellow
- New cancer rehabilitation clinics located within the Department of Supportive Care and Survivorship at Levine Cancer Institute II

#### Pediatric Rehabilitation

- Dr. Tobias Tsai named 2019 Top Doctors (Charlotte Magazine)
- Pediatric Rehab initiated post care team rounds to showcase their teamwork and update patients/families
- Initiated 3x week interdisciplinary huddle to assist in reducing length of stay

### Dr. Raj Promotion to Full Professor

Congratulations to Dr. Vishwa Raj, Medical Director, Vice-Chair of Clinical Operations in PM&R, and Chief of Cancer Rehabilitation at Atrium Health's Levine Cancer Institute for the academic promotion to Full Professor of Physical and Medicine and Rehabilitation.

Annually, Atrium Health's Faculty Advancement Committee assesses individuals/body of scholarly work and contributions focused on education, research, clinical science and leadership. The detailed process requires an accounting of all academic activities that have occurred during the candidate's career, multiple references obtained from prominent faculty at academic institutions nationally/internationally and letters of support for the promotion. The specific criteria among other things include stature and recognition of the candidate's work at Atrium Health regionally/nationally/internationally, role as a thought leader in the field of study and ongoing commitment to Atrium Health's mission and citizenship.

In his announcement on October 24, 2019, Dr. William Bockenek, Chief Medical Officer of Carolinas Rehabilitation and Chair, Department of PM&R at Carolinas Medical Center shared, "Dr. Raj was successfully promoted to Full Professor beginning January 1, 2020, based on his academic/scholarly achievements during his career (which has occurred solely at Atrium Health since completion of his residency in 2007) and fulfillment of the promotion criteria."

Dr. Raj has extensive publication history and frequent requests for visiting professorships, presentations and leadership workshops. His involvement and participation in various committees includes the International Society of PM&R (ISPMR), American Congress of Rehabilitation Medicine (ACRM), American Medical Rehabilitation Providers Association (AMRPA) and American Academy of PM&R (AAPMR). Additionally, Dr. Raj has been an ABPM&R Board Examiner and has been lobbying for rehabilitation services in Washington, DC, since 2012. More locally, Dr. Raj has been extremely active within Carolinas Rehabilitation as a member of the Medical Executive Committee, chair of Quality Assurance and Improvement Committee and a member of the Cancer Committee within Atrium Health's Levine Cancer Institute.

### Residency

- ABPMR Board passing rate for residents >95% for Part I and II over 5 years; 100% in Part I and II for 2019 graduating seniors
- ACGME re-accreditation with zero deficiencies
- Resident Physician National Leadership:
  - o **Jordan Sestak, MD:** Special Olympics, NC Clinical Director
  - o **Trevor Tyner, DO:** AOCPMR, Southeast Regional Representative
  - o **Kirstin Weider, DO:** AOCPMR Resident Education Committee, Chair
  - o **Paul Weaver, DO:** AAPMR PHiT Ambassador
- **New Grants:**
  - o Six; Other Active Grants: 5
  - o Peer Reviewed Publications: 19
  - o Book Chapters: 8
  - o Poster Presentations: 14
  - o Platform Presentations: 28
  - o Course Director for National Meeting (AAP): 1
  - o Session Director for National Meeting (ACRM): 1



## Highlights | Research

The Research Division within the department of PM&R at Carolinas Rehabilitation, under the strong leadership of Dr. Vu Q. C. Nguyen, achieved many academic accomplishments and awards for research and scholarship for 2019. These achievements serve not only to distinguish individuals within the department of PM&R at Carolinas Rehabilitation for their scholarly accomplishments, but also speak volumes of the research supports provided by the Division of Medical Education and Research at Carolinas Medical Center and Atrium Health.

- **The PM&R Research Division achieved 77 conference presentations and publications, including:**

- 24 peer reviewed international papers, book chapters, 9 abstracts
- 27 conference presentations at the Annual Conference of the ACRM, AAP, AAPM&R, ISPRM, AMRP and others

About 30% of these scholarly achievements were accomplished by PM&R Resident Physicians and a strong PM&R attending research mentorship. All residents participate in research studies and clinical trials, and a significant number of physician faculty are involved in national and international research and education leadership positions (e.g., ACRM, ISPRM, AAP, AAPMR).

- **PM&R faculty and resident physicians authored a record number of important scientific presentations:**

- 10 presentations were delivered at the Annual Meeting of the AAP and at the prestigious World Congress of the ISPRM held in Kobe, Japan.
- 14 presentations and 5 important business meetings were chaired by PM&R faculty at the 2019 ACRM Annual Conference, held in Chicago, the world's largest rehabilitation research event.

- **Investigator initiated clinical trials, awards and honors for our field leading rehabilitation research, leadership and innovation such as:**

- **Most Promising QI Resident and Fellow Award** for the team led by Dr. Ana Michunovich, with significant contributions to the scholarly content by Resident Physicians Dr. Jordan Sestak, Dr. James Kult and Dr. Jenny Smith, and faculty mentors Dr. Judy Campbell, Dr. Vu Q. C. Nguyen and Dr. Mark A. Hirsch. The prestigious award was given during the Center for Faculty Excellence, CMC 2019 QI Resident & Fellow Poster Reception for their project titled "**The resilient resident: A longitudinal study assessing burnout in physical medicine and rehabilitation resident physicians and the efficacy of implementing a resiliency curriculum.**"
- **Dr. Shanti Pinto** was selected by the ISPRM Scientific Committee and the AAP Program Committee from among thousands of abstract submissions to receive the **Best Paper Award**. The award will be presented during the 2020 ISPRM World Congress and AAP Annual Meeting for her abstract titled "Mild traumatic brain injury is associated with increased dual task cost during ambulation." The Best Paper Award recognizes and seeks to encourage young researchers while strengthening all investigation in the field of PM&R.



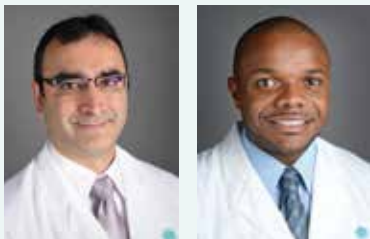
Additionally, **Dr. Shanti Pinto** and co-investigators **Dr. Mark A. Newman** and **Dr. Leon Chandler** were selected as recipients of a prestigious Foundation for PM&R: The Richard S. Materson ERF New Investigator Research Grant for their movement science study titled "Properties of the electronically augmented timed up and go test (EATUG) among adults with traumatic brain injury."

- Principal Investigator **Dr. Mark Newman** and team of **Dr. Mark A. Hirsch** and **Dr. Vu Q. C. Nguyen** received a **Merz Neurosciences Investigator Initiated Grant Award** for their movement science study titled "Upper extremity injection of Xeomin® and changes in gait related mobility in adults after stroke."
- **Dr. Mark Hirsch** was appointed as **Fellow of the American Congress of Rehabilitation Medicine** (1 of 8 recipients in 2019). The Fellow of ACRM designation recognizes active members with an outstanding record of professional service to ACRM who have also made contributions of national significance to the field of medical rehabilitation.
- Faculty **Dr. Vishwa Raj**, **Dr. Mark A. Hirsch** and **Dr. Vu Q. C. Nguyen** presented at **invitation-only special sessions** including one titled "Exercise and neuro-plasticity in Parkinson disease: From neurons to neighborhoods" during the annual World Congress of the International Society of Physical Rehabilitation Medicine held in Kobe, Japan on June 10, 2019.



## Inpatient Rehabilitation: A New Solution for Post-Acute Cancer Care

By Vishwa S. Raj, MD and Terrence M. Pugh, MD



Over the last several years, cancer has evolved from a terminal diagnosis to a chronic or curable medication condition. As treatments have advanced, so too

have the protocols for which care is delivered. Many of these patients spend a significant amount of time in the acute care setting, but challenges still exist in providing the longer term rehabilitative and medical care these individuals so desperately need. This raises a challenging question: What's the most efficient way to care for patients who still need medical supervision but don't need acute care?

At Carolinas Rehabilitation, we've found that inpatient rehabilitation facilities (IRFs), skilled nursing facilities (SNFs) and long-term care hospitals (LTCHs) are part of the answer. These facilities deliver medically-supervised cancer treatment as well as the physical therapy, occupational therapy and/or speech therapy for the cancer patient – but at a much lower cost.

We published a paper in the American Journal of Physical Medicine and Rehabilitation (“Inpatient Care for the Cancer Survivor: Opportunities to Develop and Deliver Standards for Care”) that offers a roadmap of how inpatient rehabilitation can help your patients now and play an integral role in oncology care's future.

### Which Inpatient Rehabilitation Option Fits Your Patient?

The appropriate inpatient rehabilitation setting is determined partly by a patient's medical supervision and rehabilitation needs:

- **IRFs** can meet medical and functional needs by providing therapy services plus physician supervision for patients who require less medical oversight. These facilities have shown many benefits for cancer patients, including statistically significant improvements in Functional Independence Measure scores.
- **SNFs** are an option when patients can't tolerate the intensity of therapy at an IRF and have medical supervision needs that can be satisfied by a clinician rounding three times a week. SNFs typically deliver 60 to 90 minutes of rehabilitation therapy per day and can deliver more intensive therapy when warranted.
- **LTCHs** focus on medically complex conditions, including cancer and its comorbidities. LTCHs are a match for cancer patients who need significant medical attention and have medical needs that outweigh their ability to participate in therapy.

### How to Navigate Complex Regulations

When considering inpatient rehabilitation care, it is important to understand the regulations that must be considered when trying to provide appropriate access for patients. Here are three examples:

- **60% of IRF patients must have 1 of 13 compliant diagnoses – which don't include cancer.** But appropriate coding can overcome this. For example, brain tumors can be considered nontraumatic brain injuries. Cancer patients can also be accommodated under the 40% of noncompliant diagnoses.
- **At SNFs, treatments like radiation or chemotherapy can make costs exceed Medicare reimbursement allowances.** Still, these facilities might accommodate more cancer patients as legislative changes alter the overall patient mix.
- **Regulations governing LTCHs are particularly stringent,** which means only a select population of cancer patients can access these facilities.

### Cost-Effective Care

Nonetheless, there's a reason to be optimistic: Inpatient rehabilitation is a more cost-effective way to concurrently deliver oncology and rehabilitation care. The opportunity to collaborate provides a unique opportunity to provide value in healthcare delivery. In situations where reimbursement may be “bundled,” healthcare systems could use acute care to address patients' immediate medical issues and inpatient rehabilitation to continue the rehabilitative and oncological treatments. This could decrease the care burden for acute care hospitals, improve patients' performance status and allow for management of comorbidities in ways that reduce readmissions.

### Help Us Shape the Future of Cancer Rehabilitation

At Carolinas Rehabilitation, we're leading a conversation not only about inpatient rehabilitation, but about how to structure the oncology continuum as cancer patients live longer. We're excited to trade ideas with you about inpatient rehabilitation and the future of cancer rehabilitation care.

### Read the paper in American Journal of Physical Medicine and Rehabilitation.

To learn more email Dr. Raj at [Vishwa.Raj@AtriumHealth.org](mailto:Vishwa.Raj@AtriumHealth.org) or Dr. Pugh at [Terrence.Pugh@AtriumHealth.org](mailto:Terrence.Pugh@AtriumHealth.org).

# Routine Doppler Ultrasound Can Prevent Pulmonary Embolisms, Without Raising Costs

By Shanti M. Pinto, MD



During my residency at an inpatient rehabilitation (IPR) center, we used Doppler ultrasound to screen almost every new patient for venous thromboembolism (VTE), even if they didn't have symptoms. We wanted to identify VTE before patients suffered a life-threatening pulmonary embolism.

But we wondered if the screening was worthwhile because it seemed expensive and turned up relatively few VTEs.

This question has been echoed by many providers looking for efficient ways to prevent pulmonary embolism. My colleagues and I are uncovering the answer: We published a 2018 paper showing that routine Doppler ultrasound improves outcomes and is cost-effective.

### Proactive Screening for Deep Vein Thrombosis

There's controversy among rehabilitation providers about whether patients should be screened for deep vein thrombosis (DVT) at IPR without showing symptoms. To answer this question, we examined the electronic medical records of 2,312 patients at an IPR facility that specializes in patients with brain injury, spinal cord injury and stroke. This facility takes a proactive approach: using Doppler ultrasound to screen patients for lower-limb DVT as part of the admission process.

### Early Diagnosis Improves Outcomes

Our first goal was to see if earlier DVT diagnosis affects patient outcomes.

Of the patients in our study, 145 (6.6%) were found to have DVT during admission. Those patients were immediately prescribed anticoagulants unless contraindicated. Another 37 patients (1.7%) were diagnosed after showing DVT symptoms later in IPR.

The patients diagnosed with DVT on admission were:

- **Far less likely to suffer pulmonary embolism**, which affected 3.7% of patients diagnosed on admission. Pulmonary embolism affected 48% of patients who weren't diagnosed until they showed DVT symptoms.
- **Significantly less likely to need acute hospital care**: 12% of patients diagnosed on admission were readmitted to the hospital for acute care, compared to 35.1% of patients who were diagnosed later in IPR.

- **Spending less time in IPR**: Patients diagnosed at or upon admission spent an average of 18.96 days in IPR, versus 26 days for patients diagnosed later.

### Why Doppler Ultrasound Is Cost-Effective

Shorter stays, fewer pulmonary embolisms and fewer acute-care transfers are better for patients and reduce the cost of care. We wanted to see how prevalent VTE needs to be for these cost savings to offset Doppler ultrasound's costs.

We built a statistical model comparing the cost of IPR at a hypothetical facility where initial Doppler ultrasound is routine, to the cost of care at a facility that uses a clinical strategy to diagnose DVT after symptoms are found. Our study posited a 6.7% probability that initial screening uncovers VTE – a conservative estimate.

The costs were almost identical: \$20,265 per admission when Doppler ultrasound is routine versus \$20,269 per admission when a clinical strategy is used instead. And that overestimates the cost of routine screening because our model doesn't include the price of hospital readmission. (That information wasn't available in the literature or at the center we studied.)

More generally, our analysis suggests that routine Doppler ultrasound becomes cost-effective when the probability of VTE is 6% or higher. The higher the rate of DVT, the more cost-effective it becomes because more VTEs are found.

### Advancing Evidence-Based Care

Doppler ultrasound is now a standard part of admission at Carolinas Rehabilitation. Our study confirmed this is a sound approach here and at other leading centers. This marks the latest step in making sure our practices are based on solid evidence. We hope our findings inspire more centers to embrace routine Doppler screening – we want to help as many patients as possible, no matter which healthcare system they visit.

### Read the paper in the American Journal of Physical Medicine and Rehabilitation.

To learn more about the Doppler ultrasound technique and the difference it can make, contact Dr. Pinto at [Shanti.Pinto@AtriumHealth.org](mailto:Shanti.Pinto@AtriumHealth.org).

## New Clues on Why Exercise Promotes Neuroplasticity

By Mark Hirsch, PhD, and Mark Newman, PhD



No one knows exactly how exercise-based treatment enhances motor recovery in patients living with Parkinson's disease (PD), but it has been widely suspected that brain-derived neurotrophic factor (BDNF) plays a key role. That's why we completed the first meta-analytic study of neurotrophin release during exercise in people with PD and confirmed that BDNF increases with exercise and may be responsible for improved brain function.

This discovery sheds new light on the mechanisms behind exercise-based treatments and opens the door to potential therapies that could boost BDNF and ameliorate symptoms of PD and other neurodegenerative diseases.

### Increased BDNF Levels = Motor Skills Improvement

For the study, we collaborated with Erwin van Wegen, PhD, from Amsterdam University Medical Center and Patricia Heyn, FGSA, FACRM, from the University of Colorado's Anschutz Medical Campus to investigate whether BDNF changes were consistent across human PD studies. Our meta-analysis pooled data from two randomized controlled trials on high-intensity exercise among PD inpatients and outpatients.

A total of 100 patients participated in these studies, including 52 ambulatory patients with mild to moderate idiopathic PD severity. These patients underwent a treatment regimen that included high-intensity, stationary cycling exercise and physical therapy.

We found that BDNF levels increased in these patients, and that these increases correlated with improved motor skills. Our meta-analysis showed a significant heterogeneous summary effect size (mean difference of -5.53) improvement on the motor examination portion of the Unified Parkinson's Disease Rating Scale. This exceeds the minimum clinically important difference and confirms that exercise affects the dopaminergic pathways. These findings were published in *Translational Neurodegeneration*.

### Pursuing Therapies That Amplify BDNF

We identified that exercise is a "volume control" that can "turn up" BDNF levels and potentially promote neuroplasticity. The next challenge is to develop a broader range of therapies to amplify BDNF levels in patients at all stages of PD. We are pursuing this at Carolinas Rehabilitation, by working to further illuminate the neurological mechanisms that explain how exercise benefits PD patients. In addition, we are participating in an international Amsterdam Movement Science Innovation planning grant to develop pilot studies that will further investigate the effect of exercise on neurotrophins.

### World-Class Research Team

This critical work illustrates how Carolinas Rehabilitation does more than provide world-class clinical care – we also make seminal scientific contributions via translational laboratory research. Our physical medicine and rehabilitation research team includes renowned experts in brain injury, spinal cord injury, stroke, Parkinson's disease and related neurodegenerative disorders. Our experts use a "neurons to neighborhoods" approach that starts with a bench science evaluation of what happens at the molecular level in a patient's brain and continues to the bedside and beyond. For example, we also evaluate broader factors that may determine recovery from injury or trauma such as patients' social networks and how their communities can support healing after hospital discharge.

It's all part of how our researchers work to help patients recover physically, cognitively and psychosocially, so they can enjoy a better quality of life and get back to participating in their communities.

### Read the paper in *Translational Neurodegeneration*.

To learn more about "Exercise-induced increase in brain-derived neurotrophic factor in human Parkinson's disease: a systematic review and meta-analysis," email Dr. Hirsch at [Mark.Hirsch@AtriumHealth.org](mailto:Mark.Hirsch@AtriumHealth.org) or Dr. Newman at [Mark.Newman@AtriumHealth.org](mailto:Mark.Newman@AtriumHealth.org).



## Atrium Health's Carolinas Rehabilitation Receives American Hospital Association's 2019 Quest for Quality Prize

**Atrium Health's Carolinas Rehabilitation** has received one of the most prestigious awards in healthcare, the American Hospital Association's (AHA) Quest for Quality prize, for its leadership and innovation in improving quality, advancing health in communities and providing access to exceptional quality, safe and patient- and family-centered care. Carolinas Rehabilitation is the first rehabilitation hospital in the country to receive the AHA's Quest for Quality prize.

"This is truly a special moment for Atrium Health," said **President and CEO Eugene A. Woods**. "The team at Carolinas Rehabilitation empowers our patients to function at their best, to get back home and back to living their fullest life. The unique environment they create radiates hope and demonstrates that nothing is impossible when you have the love and support of others."

Carolinas Rehabilitation was acknowledged by the AHA for its exemplary achievements in engagement with community partners to address social determinants of health and empowering its workforce to excel, innovate

and improve access for all patients. Most notably, Carolinas Rehabilitation's EQUADR<sup>SM</sup> network was recognized by the Quest for Quality prize committee for its ability to collect data and report rehabilitation-specific quality outcomes, leading to the exchange of best practices to improve care. EQUADR<sup>SM</sup> is the first Agency for Healthcare Research and Quality (AHRQ) listed rehabilitation-specific Patient Safety Organization in the world. A first-of-its-kind platform now adopted by 38 rehabilitation hospitals and health systems, EQUADR<sup>SM</sup> has contributed to preventing over 1,000 harm events, avoiding nearly \$10 million in preventable harm costs.

"Through leadership, partnerships with community organizations, innovation and workforce collaboration, we have made exceptional strides in quality and safety to improve the value of care we provide to our patients."

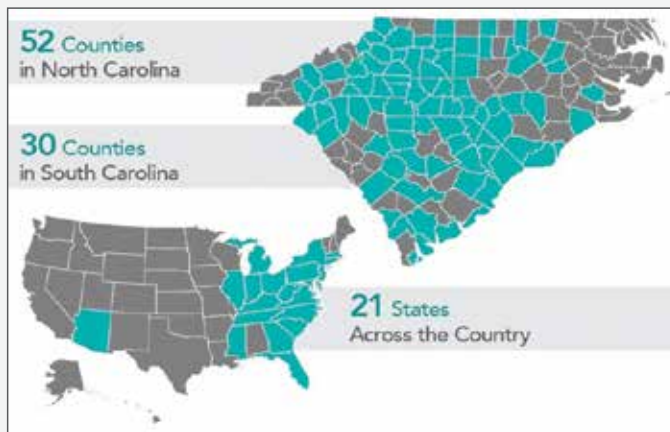
- William Bockenek, MD, CPE

Carolinas Rehabilitation’s virtual patient observation monitoring program, which serves as a telemetry unit enabling direct, real-time communication with patients and visitors, was recognized for its innovation and contribution to a 43% decrease in the number of falls and significant associated cost savings.

“Within the last decade, Atrium Health’s Carolinas Rehabilitation has committed to being a highly reliable organization, leading to groundbreaking initiatives and tools to drive focused improvement,” said Carolinas Rehabilitation President Robert G. Larrison Jr., FACHE. “Through various initiatives, committees and programs, Carolinas Rehabilitation’s physicians and frontline teammates are empowered to continuously improve the quality of care, patient experience and health outcomes.”

Carolinas Rehabilitation is one of the largest nonprofit rehabilitation providers in the nation with 179 inpatient beds among four adult rehabilitation hospitals throughout the greater Charlotte area in addition to a 13-bed unit at Atrium Health’s nationally recognized pediatric hospital, Levine Children’s Hospital. Last year, Carolinas Rehabilitation admitted approximately 3,500 patients from more than 82 North Carolina and South Carolina counties and 21 states.

Additionally, Carolinas Rehabilitation’s community-based clinics cared for 36,000 unique patients with more than 270,000 patient encounters.



### Patient Origin

“Carolinas Rehabilitation represents our organization’s commitment to quality, safety and patient experience across the Atrium Health footprint,” said Chief Medical Officer of Carolinas Rehabilitation **William Bockenek, MD, CPE**. “Through leadership, partnerships with community organizations, innovation and workforce collaboration, we have made exceptional strides in quality and safety to improve the value of care we provide to our patients.”

For more information on the American Hospital Association’s Quest for Quality Prize, visit [aha.org/about/awards/quest-for-quality](https://www.aha.org/about/awards/quest-for-quality).





### Members of Carolinas Rehabilitation's Adaptive Sports and Adventures Program Compete in 2019 IWWF World Disabled Waterski Championships

Congratulations to Carolinas Rehabilitation's Adaptive Sports and Adventures Program (ASAP) members Eli Hager, Chuck Wesson, Robbie Parks, Gregg Stokes and Marco Bungert for helping the United States Adaptive Waterski Team bring home the gold! Hager, Wesson, Parks, Stokes and Bungert helped make up the 14-member USA Adaptive Water Ski Team, winning the gold medal at the 14th Barbara Bolding/Jim Grew Fund Disabled Water Ski World Championships, July 25-28 in Skarnes, Norway.

Three of the five ASAP skiers, Wesson, Hager and Stokes, came home with individual medals:

- Eli Hager finished 3rd in Tricks and 3rd Overall in Seated Men's Division
- Gregg Stokes finished 3rd in Slalom and Trick, and 2nd in Jump in Standing Men's and 2nd Overall in Standing Men's
- Chuck Wesson finished 3rd in Seated Men's Jump

According to USA Water Ski & Wake Sports' website, more than 40 athletes from 11 countries participated in the championships. The US team members earned a total of 26 individual medals, including eight gold medals, 10 silver medals and eight bronze medals.

When people with disabilities want to learn a new sport or hobby, they often turn to adaptive sports.

With the help of community-based organizations, and specialized equipment, people of all ages can learn or re-learn practically any activity imaginable – from bowling, water skiing and rugby to sailing, hunting and cycling. First used in the 1950s as a tool to help injured war veterans, **adaptive sports** are fairly commonplace in today's rehabilitation efforts. In fact, rehab professionals say sports and recreational activities are a vital part of a successful rehabilitation program, especially for those with a new disability. Whether someone is born with a disability or has a life altering illness or trauma later in life, adaptive sports offers an outlet for people to gain confidence and live an active, healthy lifestyle. Throughout its decades-long history, the **Adaptive Sports and Adventures Program (ASAP) at Carolinas Rehabilitation**, part of Atrium Health, has helped fuel countless stories of triumph in the face of seemingly impossible odds.

## The Gift of Independence

Jennifer Moore, LRT/CTRS, with Atrium Health, serves as the coordinator of ASAP. She's been involved with the program since the 1990s and regularly works with the 5 ASAP skiers. "All of the skiers represented ASAP and the United States with pride and determination," she said.

The program offers fellowship but its main goal is to help participants of all ages develop skills so they can stay active and live as independently as possible. From blindness to paralysis and amputations, each participant's story is as varied as the disability they must overcome. ASAP provides the community and the resources to help people move beyond their disabilities.

## Sports and Recreation as Rehabilitation

Benefits include:

- Reduced stress levels
- More independence
- Greater educational/employment success
- Reduced dependency on medication
- Fewer secondary conditions (i.e. diabetes, hypertension)

To learn more about Eli Hager, Chuck Wesson, Robbie Parks, Gregg Stokes and Marco Bungert, visit [usaadaptivewaterski.org/team](http://usaadaptivewaterski.org/team). To learn more about ASAP, call 704-355-1062 or visit [AtriumHealthFoundation.org/ASAP](http://AtriumHealthFoundation.org/ASAP).



**Pictured: Eli Hager**



## Cyclists Journey Across States to Raise Awareness for Adaptive Sports Programs

In January 2019, Atrium Health and Navicent Health entered into a strategic combination, bringing benefits to surrounding communities from the Carolinas to Georgia. Together, the two healthcare systems are improving access to world-class services, expanding care and providing an economic benefit to new communities in addition to our existing service areas. Navicent Health now serves as a regional hub for Atrium Health in central and south Georgia – carrying out the mission of the system to improve health, elevate hope and advance healing – for all.

As one of many combined efforts to integrate our initiatives as teammates, nearly a dozen disabled and able-bodied cyclists, along with five volunteers, from Atrium Health and Navicent Health teamed up to participate in Ride4Rehab, a cycling journey raising awareness for adaptive sports programs. Beginning Monday, October 28, 2019, the cyclists departed Atrium Health's Carolinas Rehabilitation in Charlotte on their journey to Navicent Health's Rehabilitation Hospital in Macon, GA. Made up of military veterans, civilians and supporters, the cyclists trekked 270 miles with the goal of raising awareness for veterans and athletes that are injured, wounded and/or paralyzed, and demonstrating that despite having an injury they can continue to live an active and healthy lifestyle.





“This bicycle ride was such a neat opportunity to pull our two health systems together focusing on our patients’ rehabilitation and adaptive sporting programs,” said Aaron Harper, Atrium Health’s HR Program Manager - Military & Veterans Affairs, Office of Diversity & Inclusion. “What impressed me the most was how quickly our Navicent Health and Atrium Health teammates unified their efforts, how we all became family as we biked 270 miles in 18 hours, but most importantly, how we all truly embraced our mission of health, hope and healing for all through this ride and beyond.”

The trip was also the perfect time to continue bringing together two teams, from Atrium Health and Navicent Health, to learn from each other and find ways to work together, better, to best serve our communities.

“Ride4Rehab is truly about celebrating integration of two teams coming together for our communities,” said Gina Tipton, Chief Administrative Officer of Rehabilitation Hospital, Navicent Health. “It is our vision that this starts the networking and foundation for Rehabilitation Hospital, Navicent Health to develop and support an adaptive sports program. Our teammates in Charlotte have an amazing Olympic-level program and we are honored they are sharing their plans and talent with us. Ride4Rehab is a way for us to bring awareness and lay the groundwork to develop a program under our Charlotte teammates’ guidance for the people of central Georgia.”

Throughout its decades-long history, the **Adaptive Sports and Adventures Program (ASAP) at Carolinas Rehabilitation**, part of Atrium Health, has helped fuel countless stories of triumph in the face of seemingly impossible odds. Rehab professionals say sports and recreational activities are a vital part of a successful rehabilitation program, especially for those who are newly disabled. Whether someone is born with a disability or they become disabled later in life, adaptive sports offer an outlet for people to gain confidence and live an active, healthy lifestyle.

### A Family That Stays Together Heals Together

All the Tyler family wanted to do for Thanksgiving in 2018 was spend time together. But their trip from Fort Mill, SC, to Pennsylvania almost permanently split them apart.

As they were driving through West Virginia, Michael Tyler, the father, choked on a snack and passed out at the wheel. Sixteen-year-old Michael Jr. and his 14-year-old sister Hannah screamed from the backseat. Lorraine, the mother, tried to steer the car safely off the highway. But the car lost control and barreled into two trees.

To this day, the next few minutes remain fuzzy. Michael and Lorraine only remember firemen cutting them from their seatbelts. Michael and Michael Jr. were rushed to a hospital in Morgantown, WV, while Lorraine and Hannah were airlifted to a hospital in Charleston, WV.

It would be three weeks later, on the Atrium Health campus in downtown Charlotte, before they were all together again. With Michael Jr. transferred to Levine Children's Hospital and his parents to Carolinas Rehabilitation (Hannah was healthy enough to return home), it marked the first time a child and both his parents all had inpatient rehabilitation at the same time at the two hospitals.

"We go to church together. We go on vacation together. We fight together. We laugh together. We cry together," Lorraine said. "It was great to be together as a family again."

For Michael Jr., the reunion was incredibly poignant. Since the accident, he'd been with his father in West Virginia but hadn't seen his mother, who'd already been sent to Charlotte. "I would call her every day when we were apart and see how she was doing," said Michael Jr. "When I saw her, it was just the greatest moment ever."

The Tylers had a lot to be grateful for. All four family members had survived what could have been much worse. Hannah broke her leg and needed a blood transfusion.

For the Tylers, getting the right medical care was only part of getting better.

Lorraine broke her heel and ribs and suffered a small tear in her aorta. Michael broke both heels and his knees. After multiple surgeries, Lorraine and Michael both needed intense rehabilitation.

But Michael Jr. suffered the worst injuries. In addition to a head injury and broken wrist, he needed a stent implanted in his heart and three feet of his small intestine removed.



“Michael needed a lot of rehabilitation,” said **Tobias Tsai, MD**, the medical director of the pediatric inpatient rehabilitation unit at LCH. “He had very extensive traumatic injuries so he needed to get some practice on moving around again, and work on his strength and his movement.”

### Coordination keeps the family close

For the Tylers, getting the right medical care was only part of getting better. Now that the family was together again, they wanted to see each other as much as possible.

That meant coordinating therapy sessions, with Michael and Lorraine completing their rehab in the morning so they could visit with their son later in the afternoon. It also meant the physicians and therapists from both LCH and Carolinas Rehabilitation keeping in constant communication.

“We did everything we could to make them feel welcome once they were here and keep the family together,” said Dr. Tsai.

Even if it meant bending the rules a little – like letting Michael and Lorraine room together. “They told us, ‘We normally don’t do co-eds, with male and female in the same room. But you’re married, so that’s okay,’” said Lorraine.

Being near family can improve recovery, explained **Vishwa Raj, MD**, medical director at Carolinas Rehabilitation. “Staying together helped their outcomes because it decreased the stress levels, they had more of a support system, and I think their mood and energy levels were much better,” said Dr. Raj.

### Moving forward together

All the coordination paid off. Despite missing out on Thanksgiving, the family was reunited at their own home in time for Christmas.

While they are hopeful of putting the accident behind them, there are some lessons they also hope to carry forward, says Evan Santiago, an older brother who wasn’t in the accident and has been taking care of the family along with his sister Crystal.

“We’ve realized the fragility of life and that life is temporary. You could lose your family, your whole family the next day,” said Evan. “I feel like those moments with my brother and sisters and my mom and dad are just more special now.”



### How are the Tylers doing now?

The family is feeling stronger and hopeful, looking forward to the day they can all get back to the activities they love most.

Michael Jr. is no longer wearing a neck brace and cast and is currently attending speech and occupational therapy. His head injury still needs to be monitored, and there’s a chance he may need an additional heart surgery. He hasn’t returned to school yet, but he works with a homebound teacher provided by his high school so he can stay caught up with his classmates.

Michael has taken his first steps, and the swelling in his feet has come down dramatically. He’s looking forward to returning to work again soon.

Lorraine is doing well: Her aorta and ribs have healed. She currently uses a knee scooter. She will begin physical therapy soon toward her goal of walking and driving again in the near future.

Hannah is completing her last few sessions of physical therapy. She has returned full-time to school and is back to her passion of singing with her church.

## Patient Stories

### Building a Wheelchair Ramp Helped Save This Teacher's Life

In March of 2017, Cleveland County Schools' science teacher Bruce Bridges was helping a group from his church build a wheelchair ramp at an amputee's home when he bumped his leg. Not thinking much of it, Bruce assumed the painful leg injury would heal up quickly.

Unfortunately, the pain persisted. So eventually Bruce went to the hospital, where he was diagnosed with osteosarcoma — a common form of bone cancer that begins in the cells making up the bones.

It's a good thing Bruce was out in the world giving back. Because it was this fateful bump that helped him discover his cancer in time — and promptly get the care he needed.

Now cancer-free, Bruce wasn't done giving back to the community as he rode in the 2019 **24 Hours of Booty** charity fundraiser ride in Charlotte. More than 1,200 cyclists and 200 walkers rode and walked for 24 hours straight to raise funds for Atrium Health's **Levine Cancer Institute**, **Levine Children's Hospital**, The **LIVESTRONG** Foundation and Queens University of Charlotte.

#### Battling bone cancer

When Bruce first came to the hospital with his painful leg, doctors found that his cancer was progressing rapidly. Given the circumstances, he was given a tough choice: remove the bone and face a 50% chance the cancer returns or amputate the leg and reduce the chance of relapse down to 15%.

Although it was a difficult choice, Bruce weighed his options and opted for amputation.

So hardly a month after his diagnosis, **Jeffrey S. Kneisl, MD**, a surgeon with Levine Cancer Institute specializing in rare and complex sarcomas, performed the amputation. After adjusting to life with just one leg in the hospital for a couple weeks, Bruce was referred to Atrium Health's Carolinas Rehabilitation where he could begin his recovery.



“I want to inspire others that in spite of the disease we are fighting and the handicaps it may bring, we won't let it keep us from the things we like to do.”

#### Powering through rehabilitation

“By participating in 24 Hours of Booty, I want to help provide the same care that I experienced to other people who are battling cancer,” said Bruce.

In his case, his dedicated care team at **Carolinas Rehabilitation** have played a crucial role in helping him get back to doing the things he loves, like gardening, traveling and inspiring his seventh grade students at Crest Middle School in Shelby, NC.

At Carolinas Rehabilitation, Bruce worked with cancer rehabilitation physician **Terrence Pugh, MD**, and physical therapist Joanna Lankford. With the help of a new prosthetic leg, together they sketched out simple goals for Bruce — like relearning how to walk up stairs and walking on uneven ground.

“Joanna and Dr. Pugh inspired me to accomplish these goals I set,” said Bruce. “Joanna tirelessly showed me that I could overcome these obstacles, and Dr. Pugh always had time to listen to my concerns and make suggestions to solve whatever came up.”

While Bruce was quick to praise his care team, Joanna and Dr. Pugh knew just how big a role Bruce himself played in his rehab success.

“Bruce bought into the rehab process from day one,” said Dr. Pugh. “He worked hard to reach the goals that he’s attained and that’s why he’s where he is today.”

“He was always determined that his amputation wouldn’t slow him down,” added Joanna. “And he worked hard to make that the case.”

Since leaving rehab, Bruce worked tirelessly to help other patients reach the same outcomes he’s reached, serving as an encouraging peer mentor for other patients recovering from amputations. He also stayed involved with Carolinas Rehabilitation, and even brought Dr. Pugh and Joanna into his classroom to share their experiences with his seventh graders.

Bruce’s dedication to other patients and survivors culminated in his 24 Hours of Booty ride.



## Riding to live

“For the last couple of years, we’ve had fundraisers for the LCI 24 Hours of Booty team,” explained Joanna. “Dr. Pugh and I decided it would be so meaningful to raise money for a former patient — so we immediately thought of asking Bruce if he’d be interested. After all, Bruce is determined, motivated, inspiring and a diligent worker.”



Bruce hadn’t been on a bike since the amputation. But once he decided to participate in 24 Hours of Booty, he quickly got to work preparing – and biked at least 2 miles nearly every day.

“We’re so excited to support Bruce and know that his efforts and determination will inspire us – as they always have,” said Joanna.

As the day of the race approached, Bruce had one simple goal in mind.

“I want to inspire others that in spite of the disease we are fighting and the handicaps it may bring, we won’t let it keep us from the things we like to do,” he said. And on July 26, he did just that.







**Atrium Health**

---

Carolinas Rehabilitation

**Carolinas Rehabilitation**

877-REHAB51 or 877-734-2251

**[AtriumHealth.org/For-Providers/Rehabilitation](https://www.AtriumHealth.org/For-Providers/Rehabilitation)**