

Winter 2021 Volume 7, Issue 1

Inside this issue:

Welcome Home:
Successful COVID
Recovery Following
Neuro-Rehabilitation

Barrow Neurological Institute
Neurologist Co-authors study
with Researchers in Wuhan

Virtual Symposium at
Barrow Rehab

Telehealth Becomes Critical
During Pandemic

Technology Advancement

Physiatry Corner

Publications

International Influence

Renovation Update

Rehabilitation Services
Programs
Overview and Outcomes
Calendar Year 2019

Welcome Home: Successful COVID Recovery Following Neuro-Rehabilitation

This past spring, I had the opportunity to meet Karl on his first day in the Barrow Neuro-Rehabilitation Center. He was lying in bed as I entered his room and I introduced myself and welcomed him to the rehab unit. He said, "I'm lucky to be alive" as the tears immediately welled up in his eyes. His extreme weakness



became evident as his hands trembled when he lifted them from under the covers. He mentioned that he saw himself in the mirror for the first time and did not recognize himself because of his 45 lb. muscle mass weight loss. It was reassuring to him he would gain strength and endurance from his participation from the therapy activities. It was from that point on that I witnessed a strong perseverance and determination.

Karl told me of his wife and family and how much he had missed them; after all, it had been 55 days since he was admitted to the hospital. His course of COVID-19 was very complicated when the ventilator was no longer effective and he was nearing 100% chance of mortality. He was emergently put on ECMO to do the work of his lungs. After 16 days on the ECMO machine, he started showing signs of improvement.

Karl made it known to the therapists that he wanted as much therapy as the day would allow and consequently he grew with strength on a daily basis. He was very self-disciplined and challenged himself both emotionally and physically. His improvement of strength and endurance was measurable each day as

Continued on next page

Barrow Neurological Institute Neurologist Co-authors Study with Researchers in Wuhan

Dr. David Wang with Barrow Neurological Institute worked with doctors in Wuhan, China to analyze patients' records from the original outbreak. The most common symptoms were fever and cough. But Wang said researchers found COVID-19 appeared to impact the nervous systems of more than a third of hospitalized patients.

"It's important for doctors to consider that these additional symptoms could indicate COVID-19 when diagnosing and treating patients."

—David Wang, DO

For further information on this, please go to:

<https://www.barrowneuro.org/about/news-and-articles/press-releases/study-covid-19-patients-have-had-strokes-other-neurological-ailments/>

Welcome Home continued

he continued his journey of recovery under the guidance of his therapists.

After two weeks of intensive rehabilitation, his discharge day arrived and Karl agreed to a press conference for the media. His physicians spoke of his illness in detail, revealing his brush with death. Karl then took his turn at the microphone and reported that his physician group had given him a second chance and thanked them “for not giving up on me”.

He exited the conference room to his family waiting outside. Spontaneously kneeling down to greet his three small children; no longer trembling from weakness, but demonstrating his strength from love for his family, who were the reason for his determination to survive.

Please refer to the link below for more of the story from CNN where he and one of his physicians, Dr. Ross Bremner from Norton Thoracic Institute at St. Joseph’s Hospital and Medical Center of Phoenix, were interviewed by Sanjay Gupta.

<https://www.cnn.com/2020/05/27/health/coronavirus-ecmo-patient/index.html>

Virtual Symposium at Barrow Rehab

Following 15 years of hosting individual Acquired Brain Injury and Spinal Cord Injury symposiums, Barrow Neuro-Rehabilitation at Barrow Neurological Institute hosted the first annual combined Acquired Brain Injury & Spinal Cord Injury Symposium on October 10-11, 2020. The guest faculty spanned across the continent and participants spanned across the globe. The conference was hosted virtually following the outbreak of the COVID-19 pandemic

and the feedback received was extremely positive. Next year’s October symposium will again be virtual and will include Acquired Brain Injury and Spinal Cord Injury topics.

Watch www.barrowneuro.org for details.



“Education is important to us because it broadens our knowledge, which opens our minds to new perspectives, ideas and beliefs.”

—Dr. Andrew Ducruet

Telehealth Becomes Critical During Pandemic

The COVID-19 Public Health Emergency created the opportunity to expand on the use of telehealth in providing healthcare information and services. The Barrow Outpatient Neuro-Rehabilitation services of occupational therapy, physical therapy, and speech therapy modified the delivery of skilled therapy services through the use of Zoom and WebEx platforms. Since March 2020, outpatient neuro rehab has scheduled over 850 patient telehealth treatments with a completion rate of 76%. The addition of telehealth has allowed patients to continue to receive weekly therapies, maintain connections with their therapists and ultimately progress towards their functional goals.

Many patients are at an increased risk of contracting COVID-19 due to age, medical history and other factors, and so leaving their home to attend therapy sessions in a clinic is not ideal or even recommended.

“We were going to cancel therapy because of COVID. My husband would not have been able to continue to work with his therapists if we weren’t able to do therapy over the phone. He was making so much progress in therapy, and we were able to continue with our therapists online.”

The transition to telehealth services has allowed for implementation of safe social distancing while progressing towards therapy-related goals. The past six months has shown the therapist’s ability to redesign the methods of providing quality care through their commitment, collaboration and creativity.

Technology Advancement

Returning to Functional Swallowing with Biofeedback:

The Speech/Language Pathologists at Barrow Neuro Rehabilitation are excited to have a new biofeedback device which is used in therapy for swallowing difficulties. Traditional swallowing therapy involves repetitious exercises of the lips, and front/back of the tongue while incorporating the act of a swallowing. These exercises, though very effective, are more challenging in determining the success of each session.

The Synchrony allows patients and clinicians to view real-time feedback of swallowing exercises, which is paramount to the rehabilitation of swallowing disorders. The device provides visual and auditory feedback to facilitate swallow behavioral change, allows the patient to visualize the swallow activity and provides information on what is being accomplished through swallowing tasks. This treatment is one of the most supported methods of swallow rehabilitation in the research to date and allows for better visibility of exercise progress. The patient can see the results immediately rather than “I wonder if I am doing it right” as was the case before.

Robotics Expansion:

Barrow Neuro-Rehabilitation recently acquired additional Indego Robots to add to the repertoire of robotics for use in gait training. The Physical Therapists now have multiple devices from which to choose depending on the clinical picture. These highly trained Physical Therapists, using robotics as an adjunct to therapy, continue to meet the goal of providing the best possible care to our patients.

Barrow Neuro-Rehabilitation also continues to be a beta site for multiple robotic partnerships, trialing and researching new products are providing feedback for product improvement and optimization. These win-win relationships allow our patients, clinicians and partner scientists to continue to push the industry toward successful patient focused solutions.



Medical Memory Plays Critical Role in Family Communication:

The pandemic has challenged healthcare workers in unimaginable ways, and providing status updates and communication with families is but one small but very important link. The use of Medical Memory has aided the healthcare workers in being able to communicate regularly throughout the day with family members who have been restricted in visitation. Schedulers provide the therapy schedule on a daily basis; physicians provide important health updates, nurses provide shift reports and therapists provide recorded sessions of the patient. This information is recorded and e-mailed to a designated family member who can then distribute to other family members. Medical Memory is a HIPPA compliant technology solution that records, securely shares and replays interaction with a patient and has helped in reducing the stress on a family member who cannot always be present.

Virginia Prendergast, Director of APN & EBP for Barrow Neuroscience, who spear-headed the launch of the expanded use of Medical Memory in the hospital setting to improve communication with families during the pandemic reports:

“Record, replay, retain: Evidence shows that patients often forget important details of their healthcare information. Patients can replay recorded Medical Memory visits to help them remember critical aspects of their interactions with their providers.”

Physiatry Corner

The Department of Neuro-Rehabilitation is supported by five Physiatrists. Dr. Christina Kwasnica, who specializes in complex brain injuries and spinal cord injuries; Dr. David Jung, specializing in stroke and brain injuries; Dr. Matthias Linke who recently completed all of the requirements for Board Certification in Spinal Cord Injury Medicine; Dr. Joseph Ostler, specializing in acquired brain injuries and Dr. Candyce Williams, specializing in spinal cord injuries.

To review in more detail; please go to www.barrowneuro.org; Department of Neuro-Rehabilitation.



Christina Kwasnica, MD
Brain and Spinal Cord Injury Specialist



David Jung, MD
Stroke and Brain Injury Specialist



Matthias Linke, MD
Spinal Cord Injury Specialist



Joseph Ostler, MD
Brain Injury Specialist



Candyce Williams, MD
Spinal Cord Injury Specialist

Publications

- Rubin, E., Klonoff, P.S., Perumparaichallai, R.K. (2020). **Does self-awareness influence caregiver burden?** *NeuroRehabilitation*, 46 (4), 511-518.
- Perumparaichallai, K., Lewin, R.K. & Klonoff, P.S. (2020). **Community Reintegration Following Holistic Milieu-Oriented Neurorehabilitation up to 30 Years Post-Discharge.** *NeuroRehabilitation*, 46 (2), 243-253.

Neuro-Rehabilitation Medical Director, Dr. Kwasnica, Teams with Barrow Neuro-Rehab Clinicians and ASU Engineering Students on Soft Robotic Publication

- Kwasnica, Christina MD, Biemond, Albert ; Beltran, Amanda ;Maruyama, Trent; Polygerinos, Panagiotis; Zhang, Wenlong; Sridar, Saivimal; Qiao, Zhi; & Rascon, Alvaro. **Evaluating Immediate Benefits of Assisting Knee Extension with a Soft Inflatable Exosuit.** *IEEE Transactions on Medical Robotics and Bionics*, vol. 2, no. 2, pp. 216-225, May 2020

This work studies the changes in gait patterns in healthy participants compared to impaired participants when knee extension in the swing and initial stance phases is assisted by a soft inflatable Exosuit.

Perspective

“Happiness is letting go of what you think your life is supposed to look like, and celebrating it for everything that it is.”

— Stroke Survivor’s wife while in Neuro-Rehabilitation

International Influence

Prior to the COVID-19 outbreak, Barrow Neuro-Rehabilitation presented at two separate conferences in China. The first invitation was to Nate West, Manager of OP Rehabilitation Services, who presented to the Hong Kong Hospital Authority in Hong Kong China in December 2019. As their keynote speaker, his lectures included:

- *Principles of Recovery...Where do robotics fit? A Paradigm Shift*
- *Research, Clinical Guidelines, and Motor Learning*
- *Keys to successful Implementation...an Administrative and Clinical Perspective*



“...The biggest takeaway for me was how fortunate we are to have these clinical advancements at our fingertips...”

—Nathan West, DPT



Nate reflected on his trip by stating “Although so many robotic advancements and technologies are coming from areas in Asia, I was surprised to see how few had made it into the hands of those treating clinically. The biggest takeaway for me was how fortunate we are to have these clinical advancements at our fingertips. That we can use these tools to more effectively and efficiently help our patients recover from life changing injuries or impairments is a blessing for us and our patients!”

The second invitation was to Trent Maruyama, Program Manager, Technology, Barrow Neuro-Rehabilitation; to speak at the Global Partnership Summit (GPS) on the *Clinical Application and Implementation of Rehabilitation Robotics at Barrow Neuro-Rehabilitation*, which was in conjunction with the Global Rehabilitation Assistive Technology Conference. Renowned speakers from across the globe participated. Trent presented on the exploration, vetting, and implementation of robotics as part of the patient’s treatment program.

Both of these invitations represent the collaborative relationships that have developed on the international level. Barrow Neuro-Rehabilitation continues to push boundaries for incorporating robotics and technology into the plan of care of neurologically impaired patients; a strong commitment to provide the best quality of care to our patients.

Renovation Update

The stained glass lobby located near the entrance of the Barrow Neuro-Rehabilitation Center is currently under renovation. This location will house a staircase connecting floors one and two and overlook the new Neuroplex which is currently underway across the street. The stained glass lobby entrance will be a major connection between the Creighton Medical School and the campus. The staircase includes a body supported track system for rehabilitation patients to practice stairs and ambulation. The project will be completed at the beginning of 2021.

COMING SOON
UNDER CONSTRUCTION



Rehabilitation Services Programs Overview and Outcomes Calendar Year 2019

Barrow Neuro-Rehabilitation Center Inpatient Rehabilitation Facility



696

Total Patients
Discharged



81.6%

Neuro mix
(stroke, brain, spine)



82.6%

D/C to the
community



Patient Satisfaction

97% Satisfied with the program
97% Likely to **recommend**

Outpatient Neuro-Rehabilitation Services



25,862

Total Visits



Patient Satisfaction

95% Overall **satisfaction** with care
97.4% Likely to **recommend**

Center for Transitional Neuro-Rehabilitation (CTN)



43

✓ Admits
✓ Discharges



88%

Returned to work or
school – full or part time



95%

Able to meet
goals they set



Patient Satisfaction

100% Positive experience