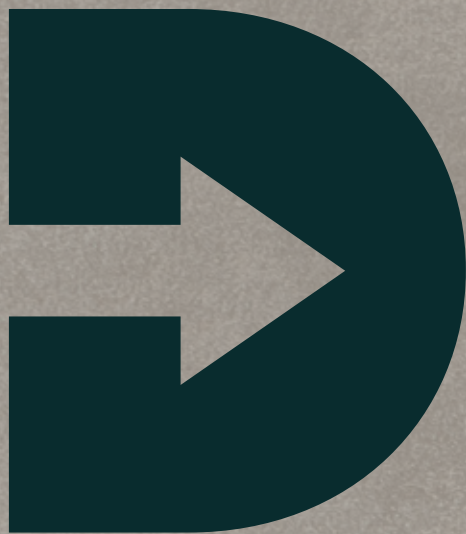


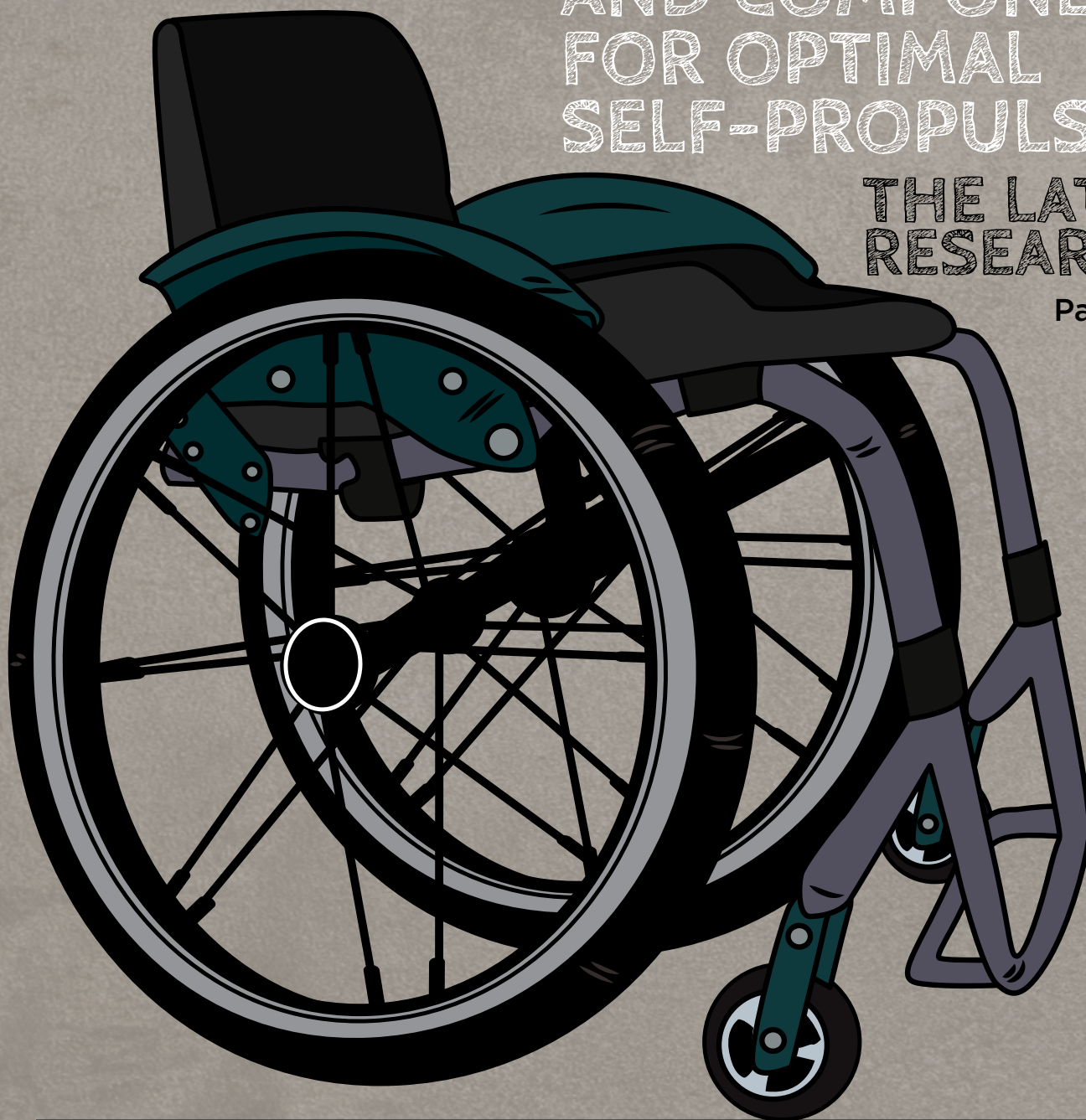
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5815 82nd Street, Suite 145, Box 317, Lubbock, TX 79424

P 800.976.7787 | www.nrnts.org

For all advertising inquiries, contact Amy Odom at aodom@nrnts.org.

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Amy Odom, BS

CLINICAL EDITOR

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EDITORIAL ADVISORY BOARD

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IN THE TWINKLING OF AN EYE

Written by: GERRY DICKERSON, ATP, CRTS®

In February 2000, Simon Margolis and I took a course titled "Ethical Decision Making: Principles and Practice (Advanced)" at ISS in Vancouver. The course was taught by Alister Browne, PhD, from the University of British Columbia Vancouver Hospital and Health Sciences Centre. To say this was an awakening for both of us is an understatement. Browne spoke about a myriad of issues far, far outside the typical "Don't Lie, Don't Cheat, Don't Steal" elements of a typical ethics course. It was a higher level than most of us will ever need to deal with, and it changed the way both of us thought about a great many things.

"AND YOU, MY EXTENDED CRT FAMILY, IF WE SPENT ANY TIME TOGETHER, HAVE PROBABLY HEARD ME SAY, 'IN THE TWINKLING OF AN EYE, EVERYTHING IS DIFFERENT.'"

COVID-19, "IN A TWINKLING OF AN EYE, EVERYTHING IS DIFFERENT."

Browne spoke about end of life decisions, helping people live at risk, advanced directives, harm, futility, cost, conflict, and many other topics. There are too many to list here, but the first thing Browne said has played over in my head every day since. My wife, and my now adult children, will tell you they heard it several times a week. My extended family and friends will tell you they heard it often. And you, my extended Complex Rehab Technology (CRT) family, if we spent any time together, have probably heard me say, "in the twinkling of an eye, everything is different."

COVID-19, "In a twinkling of an eye, everything is different." Our world is upside down. New York City, ground zero for COVID-19, the city I have worked in for more than 40 years, is unrecognizable. It looks like the opening scene for a movie about the apocalypse.

The streets are empty. Stores are closed. The sounds of traffic are replaced by blaring sirens bringing the sick to the hospital and the sounds for refrigerated trailers running, running to keep the bodies of the deceased cool until they can receive a proper burial. Even the trailers are not enough. The city has taken to "temporary" burial on Hart Island, also known as a potter's field, a place used traditionally to bury individuals without family or the funds for a traditional burial.

Schools and colleges are closed. The traditional rights of spring are canceled. No graduation, no prom, no spring sports. All the things we looked forward to when we were in school. "In the twinkling of an eye ..."

March Madness, canceled. What happens to the dreams of some of those college hoop standouts? The NHL and the NBA at best postponed. The WNBA and NFL had virtual drafts, which seemed to go pretty well. "In the twinkling of an eye..."

Weddings, religious services and town council meetings all canceled or moved online. For those of us who celebrate Easter, it was most likely the first time in your life that you did not gather with family to honor the day. "In the twinkling of an eye..."

Community youth sports programs, baseball, softball, soccer, lacrosse. All the sports that signaled the beginning of spring and summer are canceled or are close to being canceled. "In the twinkling of an eye..."

Funerals for those who lost the battle with COVID-19, and funerals for those who died for other reasons, all canceled. Friends, family and loved ones died alone with no chance to say goodbye. "In the twinkling of an eye..."

The greater CRT family struggles with finding solutions, both immediate and long term. The big nationals, NSM and NuMotion, along with larger regionals and small mom and pops have made extraordinary efforts to service clients and to keep the lights on. NRRTS, NCART, CTF, VGM, AAHomecare, AOTA, APTA have gone to great lengths to navigate, without a compass, this pandemic.

There is a great deal of work being done behind the scenes that many may not be aware of. Special recognition needs to be made to a number of people. Some names you may know, some you may not. The following is, by no means complete: Weesie Walker, Amy Odom, Annette Hodges, the NRRTS Board of Directors; Cathy Carver and the

entire Clinician Task Force; Don Clayback and Mickae Lee and the NCART Board of Directors. The list is much more extensive; however, these are the CRT family members who I interact with the most during this time. They are extraordinary.

NRRTS will include special COVID-19 stories in a future issue of DIRECTIONS. We will publish a compilation of the CRT Heroes. If you have a story, or a comment, (whether it's industry related or personally related), please forward to Amy Odom (aodom@nrts.org), at the NRRTS office for inclusion.

As I write this, the worst seems to be over. In the greater Tri-State area where I live and work, hospital intensive care unit admissions and the death rates are down. Federal, state and local governments are in the process of discussing plans to reopen the economy. Fingers crossed!

If you, as a NRRTS Registrant, are experiencing financial hardship during this pandemic, please reach out to Amy Odom, and she will work with you on a solution for registration.

Also note that NRRTS is offering a discount on our education. Use the code "marchmadness" and receive 30% off our education. NRRTS Registrants receive it at no charge!!!

Finally, no looking back for quotes from past issues of DIRECTIONS this time. Only hopeful prayers for the future.

Stay safe and healthy.



CONTACT THE AUTHOR

Gerry may be reached at GDCRTS@GMAIL.COM

Gerry Dickerson, ATP, CRTS®, is a 40-plus year veteran of the Durable Medical Equipment and Complex Rehab Technology industries. Dickerson, president of NRRTS, works for National Seating & Mobility in Plainview, New York. Dickerson is the recipient of the NRRTS Simon Margolis Fellow Award and is also a



RESNA fellow. He has presented nationally at the RESNA Conference, ISS and the National CRT Conference and is a past board member of NCART.



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A GOAL OBTAINED IN THE TIME OF PANDEMIC

Written by: ROSA WALSTON LATIMER

In New York City, at a time when life was in a tailspin trying to cope with the spread of a pandemic, Andrea Dalzell, BSN, RN, was experiencing the personal satisfaction of beginning the job she had been seeking for two years. "I finished nursing school, passed my boards, and began searching for a job that most nurses would see as the ideal, entry-level job in a hospital, working directly with patients," Dalzell said. "I am now working as a med-surg nurse treating non-coronavirus patients in a major medical center. Finally, I can realize my goal of providing a voice within the health care system to help others with disabilities." Dalzell is one of approximately 20 registered nurses working in patient care in the United States who use a wheelchair.

"I'VE ACCOMPLISHED SOMETHING THAT THE WORLD TOLD ME I COULDN'T."

Dalzell, who lives in Brooklyn, New York, was diagnosed at age 5 with transverse myelitis, a neurological condition that causes inflammation of the spinal cord, and lost her ability to walk by the time she was 12 years old. "While I was in high school, I decided I wanted to become a doctor to help change the way people with disabilities are treated in the health care system," Dalzell said. "After I earned degrees in biology and neuroscience at the College of Staten Island, I began auditing some medical school classes. During this time, I realized doctors treat the disease and nurses treat the patient. I knew I wanted the personal experience of treating patients, and that nursing was the path of my future."

A nursing career might seem unattainable for someone who uses a wheelchair, but Dalzell was willing to meet the challenge. "I wanted to be the person who could enter a patient's room and potentially change their mindset about future possibilities." This "seated" registered nurse is aware of the need for a voice for individuals with disabilities within the health care system. "I believe it is a misconception that because you treat someone with a disability, you get to speak on their behalf," Dalzell said. "Too often, there exists a lack of understanding and knowledge of what a patient with disabilities needs in certain situations. I always question 'Who is speaking for me?' and, in turn, I am concerned about who is speaking for my peers. I hope by example, I can influence others with disabilities to seek a career in health care."

Although she has often encountered doubt from others, Dalzell is confident in her abilities. She admits her pursuit of a nursing career hasn't always been easy, yet she remained focused and committed to her goal. "I've accomplished something the world told me I couldn't," Dalzell said. "We've all been told that at some time or another, and we react in different ways. For me, that's fuel for my fire. Tell me I can't

do something, and I'll show you how well I can." Knowing she would need to be well prepared to enter the job market, Dalzell earned additional certifications in advanced cardiovascular life support and pediatric advance life support. She recognized her potential limitations for performing CPR, took up boxing to build up her strength to do chest compressions, and earned that certification with ease.

Dalzell was crowned Ms. Wheelchair New York 2015 and has been featured in O Magazine and on local NYC television. In recognition of her advocacy work and leadership, she received the Cindy Loo Disability Rights Advocate Award in 2015 as well as the 2016 CUNY Emerging Leader of the Year award. Dalzell was recently featured in the Raw Beauty Project, a New York arts project celebrating women with disabilities and educating viewers to redefine perceptions and beauty. She also inspired the addition to the Apple Watch to track "pushes" for wheelchair users instead of steps and was featured in an Apple Watch commercial. "Filming that commercial was one of the best experiences of my life!"

No doubt, working as a med-surg nurse in a major medical center in New York City is another "best experience" in Dalzell's life. "A medical-surgical nurse is what I consider the frontline nurse. This nurse can handle anything that comes to her unit, whether it be a psych patient, a patient who is on a ventilator or a patient who had surgery. If this job opportunity can happen here, at this time, it is a validation for everyone with a disability across the nation that there is a place



Andrea Dalzell (front, left) with her nursing classmates and instructor, College of Staten Island



Andrea Dalzell (right) working with Cure Medical colleagues at the Boston Abilites expo

for us in the workplace," Dalzell said. "I believe the disability unemployment rate is almost triple that of the non-disabled population. As I've learned during the two years since I finished nursing school, it can definitely be a challenge for a person with disabilities to find meaningful employment, but it can happen. We must be especially diligent in increasing our knowledge and experience. We cannot allow others to define who we are and what we are capable of."

Upon completion of nursing school, Dalzell's goal was to go straight into a hospital setting, but that didn't happen. "I went through 76 interviews for acute care as well as other interviews for long-care management, case management, respite care nursing and research nursing," Dalzell said. "I applied for every possibility within the realm of nursing. When I would get a call back, I would follow through. Still, the opening in a hospital setting didn't come. I worked as a case management nurse for a year and barely hung on, but it allowed me to prove my work ethic." Dalzell knew case management was not the job she wanted long term. "I was adding experience to my license," she said. "I wasn't going to be a novice nurse forever. I was adding to my worth."

Dalzell has learned a great deal through her experiences but considers her education as a critical factor in her life's journey. When asked for advice or words of encouragement for other individuals with disabilities who are pursuing a career, Dalzell said, "Take advantage of every opportunity possible to further your education. Your education is always going to be with you, whether you get a certain job. People can discriminate, they can judge, and they can throw their perceptions, but no one can take away what you have worked to obtain or



Andrea Dalzell (front) with her mom, Sharon left and her sister, Angela

A GOAL OBTAINED IN THE TIME OF PANDEMIC (CONTINUED FROM PAGE 9)

your goals. You have to be strong in your conviction. I had my moments when I wanted to change fields or simply give up. However, I would remind myself how far I had come and how I had succeeded when others caused me to feel 'less than.' It is essential to believe in yourself, your goals, and your accomplishments. Don't allow anyone else to dictate what that means for you."

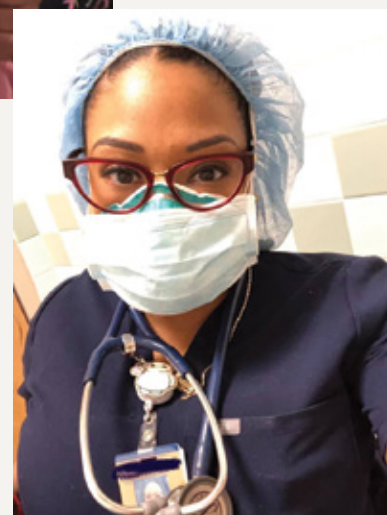
Regarding the pursuit of a job or career, Dalzell believes there are many avenues to get where you want, but you must wait for those avenues to come together for the result you desire. "A person with a disability has to be particularly diligent to meet their commitment to an employer," Dalzell said. "Don't jeopardize your health for your job but be mindful of dissuading the notion that an employee with a disability will be absent from work more often than other employees. Build your experience until you get the job you want and show that you are a stellar employee with value."

"Generally, we don't think of a nurse being in a wheelchair and, if you are the nurse in a wheelchair, you have to be aware it may be difficult for most people to understand that you are capable," Dalzell said. "I understand the hesitancy of a nurse manager to hire me to work in her unit. Hiring a registered nurse is an expensive investment for any facility, and hospital administration is considering the big picture of the dynamics of staff. My being in a wheelchair presented an additional consideration that many were not willing to risk." However, Dalzell didn't give up or allow others to determine her future.

"When the pandemic hit New York with a vengeance, nurse recruiters began sending emails and messages practically begging for nurses to apply, and I did," Dalzell said. "At each step in the hiring process, I held my breath, expecting the rejection I had experienced so many times. After I was hired and sitting in on my first unit report, a director questioned whether my wheelchair might be an infection risk. I respectfully stood my ground and continued with my orientation. During my first week at the hospital, I had many opportunities to exhibit my knowledge and confidence. Following a shift working together, one of my co-workers admitted that she was sorry that she had underestimated me in the beginning. That was a satisfying moment!



Andrea Dalzell, BSN, RN



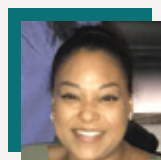
Andrea Dalzell on the job in NYC during the 2020 pandemic

Andrea Dalzell, Ms. Wheelchair New York 2015

"Now, I have a job as a hospital nurse and take care of people all night (or all day if I am on that shift). I love every minute of it!" Dalzell said. "It is ironic to me that I started this job, an opportunity I have wanted for so long, at the same time that everyone in New York was put under a 'stay-at-home' order." A mentor of Dalzell's recently remarked, "It took a pandemic for this 'seated' nurse to get hired."

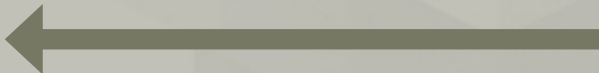
CONTACT

Andrea may be reached at ADALZELL@ME.COM



Andrea Dalzell, BSN, RN is a consumer advocate who lives in New York.

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ONE SIZE DOESN'T FIT ALL

RAZ CO-FOUNDER BUILT
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EQUIPMENT THAT FITS PEOPLE

Written by: **DANETTE BAKER**

David Harding's foray into manufacturing started in the late 1980s with Nick, a young man with spinal muscular atrophy. Because of his condition, Nick required an attendant throughout the day to assist with his pressure-relief regimen in his power chair, equipped with a power recline system. Nick controlled his chair with a midline-mounted joystick that had hand support pads mounted on either side of the joystick box. When the attendant reclined Nick to relieve pressure, his hands would slip off the support pads. The attendant would then have to reposition Nick's hands when returning him to an upright position so he could control the drive function of his chair.

What if, thought David Harding, instead of reclining, the chair had a tilt function for pressure relief? With enough tilt, he thought, there could be adequate pressure redistribution. Ultimately, Nick was prescribed a combined tilt and recline for his power chair, something that hadn't been done before. At the time, Harding was a founding partner of Motion Specialties, the complex rehab supply company that was taking the order for Nick's chair. The receipt of the order coincided with Richard Eakins joining the company as a partner and unofficial chief technical advisor. When they delivered the chair, it became apparent that Nick could independently manage his pressure relief with power tilt. With this success, Motion Specialties started building power tilt systems for others, including clients at the muscular dystrophy clinic at the Hospital for Sick Children in Toronto, Canada.

"That's what I like doing the most. Creating stuff and trying to make it the very best in the world," said Harding, now vice president, CEO and co-founder of Raz. He had just returned from ISS, where he introduced the first-generation prototype of Raz's latest accessory: the Whizard, a universal splash shield for commode chairs, conceived by Nelson Pang, co-founder of Raz and Harding's long-time business partner. The product was well-received at ISS, Harding said. Its design is unique in that the shield fits virtually every toilet or commode seat because it is held in place by virtue of the shape. The Whizard is an inexpensive accessory product, but it fits Harding's criterion for being best in class.

Raz, in fact, spawned from the lineage of Harding's ventures — Motion Specialties, Tarsys Engineering, Genus Medical, PDG and Motion Concepts — through which he often introduced products that brought new meaning to "custom fit."

Before Raz, for example, the shower/commode chair was more of an afterthought, Harding said. Typically, the shower/commode chair is the last piece of equipment ordered upon discharge, with little to no fitting or trialing, Harding said. However, people can spend up to four hours a day in these chairs for bowel routines and hygiene needs, so there has to be a concern for pressure injuries. Motion Specialties had been custom modifying shower chairs for years because none of the manufacturers took the category seriously, Harding said.

In 2004, Harding and Pang set about to exploit this gap in the market. Product research started at the local Home Depot Inc., trialing conventional toilet seats. Their goal was to compare comfort among the seats on display. Compared to wheelchair seating, pressures on a commode seat are higher because of the reduced support

area because of the aperture. The Home Depot trials reaffirmed what Harding and Pang knew: contouring was critical.

Designing the earliest Raz frames was relatively straight forward. Harding and Pang knew that the real advantage would be in the seats. One contoured shape was designed, and this translated into four SKUs, 16" or 19" deep with the fronts either open or bridged. The carefully shaped contours and the characteristics of the self-skinning urethane foam created seats are still in production. Today, Raz offers 17 molded seats — some with a visco-elastic foam layer on top — plus custom.

"The mobile shower commode chair is the second most important piece of mobility equipment someone can have," Harding said. "It deserves to be trialed and fitted every bit as much as a wheelchair and seating."

WHO IS DAVID HARDING?

Harding cut his teeth in DME at Doncaster Medical, a home medical supply company launched by his father shortly before Harding left for university. He had entered Western University in London, Canada, with intentions of becoming a lawyer but changed majors in his sophomore year.

"I didn't really know any happy lawyers," Harding quipped. "It sounded like a good idea to be a lawyer, but business had a huge range of opportunities, and I just thought I'd rather work for myself and make my own politics. I also couldn't see myself working long hours like lawyers in big firms."

Harding left Doncaster Medical in 1985, after his father sold the company, and launched Motion Specialties. Over



the next three decades, Harding's desire to have more control over the products he sold led to the founding of the previously mentioned ventures.

The original success with Nick led to the formation of Tarsys Engineering. Back in 1987, there were power tilts on the market, but they were designed for comfort and repositioning, not pressure relief. The conventional wisdom at the time was that clients who had pressure injuries, or were at risk for them, needed power recline. "We believed that with a 45-degree tilt, we could provide the necessary weight transfer without the shearing inherent in recline," Harding said. "We just knew a tilt would provide much more independence. And we were 100% right."

With other suppliers wanting to buy Motion's power tilt product, it was clear that a business opportunity existed, Harding said. So, in 1988, he along with other Motion partners and Pang, launched Tarsys Engineering, which was later merged with a Toronto scooter manufacturer Genus Medical. "Being a part of the development and commercialization of

power tilt is likely the most significant achievement in my business life," Harding said.

"Our early success with Tarsys got us really, really interested making this stuff that's important for people," he said. "It's funny to think when looking back that if someone else had built that tilt chair for us, I probably wouldn't have gone into the crazy manufacturing ventures that I did; I'd still have Motion Specialties and still be selling retail. But our desire to find solutions for our customers, and our ability to custom design and fabricate at Motion, led us to commercialize some of our better ideas."

Harding's quick, however, to give credit where credit is due. His success, he said, is a result of seeing opportunities and finding the folks who can do the job.

"My philosophy in life is to recognize my limitations and to find people who are smarter than I am in all the areas where I need support. So, I've surrounded myself with people who are good in a lot of different areas — it's always a team approach. People say that all the time, but it truly is with us. I've done nothing on my own and would not have been able to. I've just been lucky enough to have found like-minded friends and business acquaintances and investors that have supported the efforts."

Efforts like Raz, a niche company in the global DME industry. "We have a mantra at Raz, never fall in love with our designs; if there is a better way to do it, we immediately change directions for the better route."

Necessity, it's said, is the mother of invention; for Harding, it's been the incitation of a fortuitous career.

CONTACT

David may be reached at
DHARDING@RAZDESIGNINC.COM



David Harding has been serving the Complex Rehab Technology industry since the 1980s and is a Friend of NRRTS. He is vice president, CEO and co-founder of Raz Designs.



FAMILIES ARE KEY COLLABORATORS

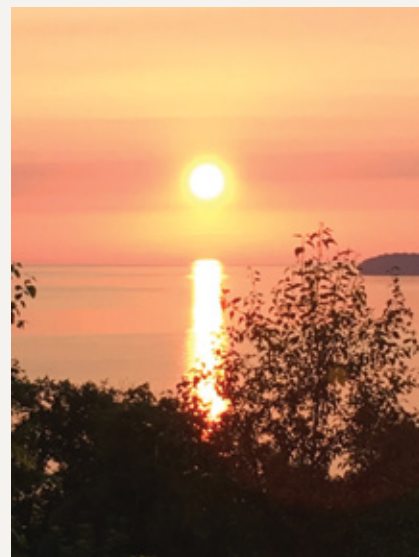
Written by: ROSA WALSTON LATIMER

As early as her teenage years, Lisa Kenyon, PT, DPT, PhD, knew she wanted her future to include working with children in some way. "When I was in high school, I did some volunteering with children with special needs and realized that this is what I wanted as a career," Kenyon said. "Later, I just stumbled into physical therapy. It was the greatest 'stumble' I've ever taken!"

A career that may have begun as a happenstance in Kenyon's future developed into 33 years in physical therapy devoted to pediatrics. "When I was a relatively new therapist, I worked with a lot of children who were very involved physically, and we didn't always know about their cognitive capabilities. It seemed to me that we needed to find better ways to try to help these children maximize their individual abilities," Kenyon said. "For a time, I did a lot of power mobility training with the children to try to help them learn and develop from the exploration of their environment. Some of those children went on to be able to have a power chair, but some did not. It was fulfilling to see some of the children learn skills such as 'cause and effect' and 'switch use' that were helpful to their development outside of their power wheelchair training. That's the work I've continued at Grand Valley State University."

Kenyon is an associate professor in the Department of Physical Therapy at Grand Valley State University in Grand Rapids, Michigan. She has been at the university for 10 years and leads the Grand Valley Power Mobility Project, an inter-professional research and service project. "My research focuses on power mobility provision and use for infants, children and young adults who have mobility impairments as well as possibly other developmental conditions that impact their mobility," Kenyon said. "In addition to research, teaching is very important to me. I like to think that I am planting seeds of interest with my students and their future experiences will water those seeds and, hopefully, develop an interest in a seating and wheeled mobility practice."

Kenyon is a valued presenter, both nationally and internationally, on topics related to pediatric physical therapy practice. She also develops and presents CEU courses for NRRTS. One of the most significant events in Kenyon's career occurred in 2015 when she traveled to China to help build a framework to provide educational advancement for Chinese-trained therapists. Following the leadership of training at Kunming Medical University in Yunnan Province, Kenyon led a workshop in Beijing for therapists, doctors and teachers addressing the use of manual handling techniques in facilitating a child's movement and function. The workshop was hosted by the Beijing School for the Blind. In Beijing, she also provided training at Beijing Children's Hospital through Olivia's Place, an organization in China that provides multidisciplinary pediatric therapy services to children. In an interview following the trip, Kenyon said, "I have developed a heart for China and see hope for a future that includes the availability of high-quality therapy services for children in China."



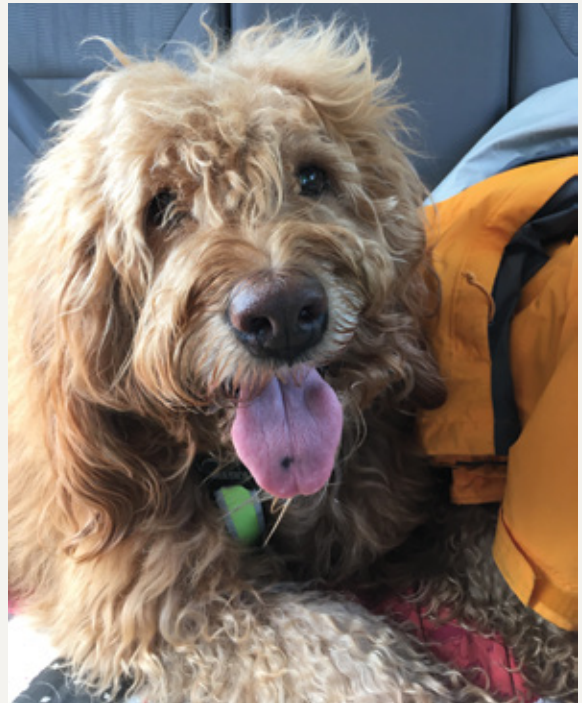
Sunrise over Lake Superior as seen from Bay Cliff Health Camp in Big Bay, Michigan

Closer to home, Kenyon is closely involved with the Bay Cliff Health Camp on Lake Superior in northern Michigan (<https://baycliff.org/>). The camp is a therapy and wellness center for children and adults with physical disabilities. Bay Cliff holds summer therapy camps for children with orthopedic, speech, hearing and vision disabilities. "Bay Cliff is a great place! I spend a week there each year along with some of my students," Kenyon said. "It is a wonderful learning opportunity for the students, plus it is good for them to be associated with this outstanding organization devoted to helping children. We also have the bonus of spending time in the beautiful natural setting of the camp."

Kenyon shared two fundamental principles that she believes are important for students and experienced therapists alike. "I believe we should always take advantage of as many



Lisa Kenyon's grandson, Ivar



Lisa Kenyon's 8-year-old Labradoodle, Maska

opportunities to learn, observe or interact as possible. Sometimes an experience only comes around once, and if you miss it, it is gone forever," Kenyon said. Addressing the work of a physical therapist, Kenyon considers patients and their families collaborating partners in the search for solutions. "We need always to be mindful to listen to the children and their families. This allows us to better match assistive technology devices to true needs. It takes everyone involved in that patient's care – not just one person or one therapist – to determine what is best for the patient. I believe the family is the key collaborator. My role as a therapist is to present them with options and then have them decide what is best."

Kenyon and her husband, Tom Kenyon, enjoy being outside as much as possible. "We enjoy all that Michigan has to offer. There are many parks and trails, and that's where we spend much of our free time with our dog, Maska," Kenyon said. "Tom is an excellent cook, so we also enjoy eating good food." The couple has two daughters: Shanna, 28, and Alena, 25. "Shanna lives in Germany with her husband and our 6-month-

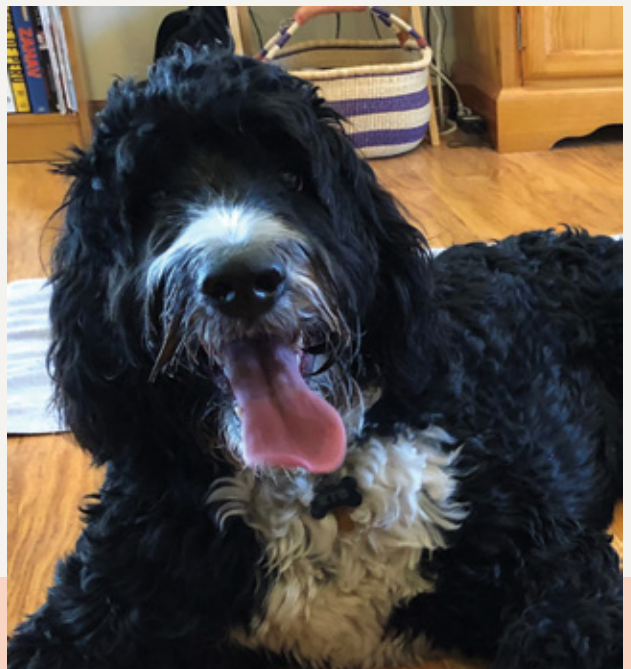
**"SOMETIMES AN EXPERIENCE
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GONE FOREVER."**



One of the many moose Lisa and Tom Kenyon, saw during a trip to Isle Royale National Park in far northern Michigan.



Ivar, Lisa's 6-month-old grandson



Kyo, a Bernedoodle – Bernese Mountain Dog Poodle mix, is Lisa's "grand dog"

CONTINUED ON PAGE 16

FAMILIES ARE KEY COLLABORATORS
(CONTINUED FROM PAGE 15)

old grandson. We get to Facetime with them every morning! Alena and our 'grand dog' live near us."

An accomplished therapist and educator, Kenyon continues to be energized by her life's work. "Physical therapy has enlarged my world, and through my work, I have experienced a great deal of joy in helping children and families. I continue to be in this work to see the smile on a child's face, and on the faces of their family, when that child realizes independence for the first time. It is remarkable to be a part of that transformation," Kenyon said. "I also find great joy in helping prepare future generations of students to be able to provide the therapy and help the people that have come to mean so much to me – those children and their families."

CONTACT

Lisa may be reached at
KENYONLI@GVSU.EDU

Lisa Kenyon, PT, DPT, PhD, is an associate professor in the Department of Physical Therapy at Grand Valley State University in Grand Rapids, Michigan. Kenyon heads the Grand Valley Power Mobility Project, an interprofessional research and service project that provides power mobility training for children and young adults who are not typically considered to be candidates for power mobility use. Kenyon presents nationally and internationally on topics related to pediatric physical therapy practice and has published multiple journal articles and book chapters pertaining to topics in pediatrics. Kenyon currently serves

on the Committee of Content Experts for the Pediatric Specialty Council of the American Board of Physical Therapy Specialties.



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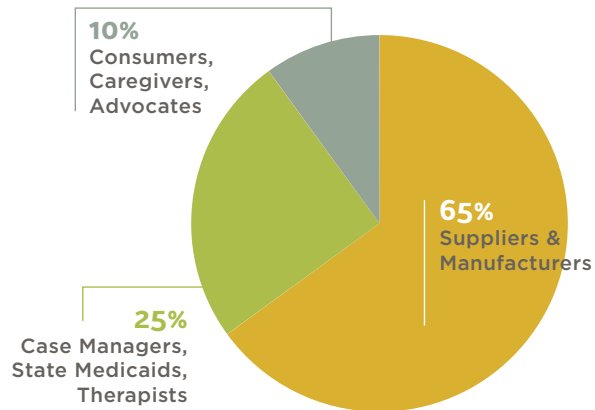
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VIBRATION IMPACT ON MANUAL WHEELCHAIR USERS

Written by: **MICHELLE L. LANGE, OTR/L, ABDA, ATP/SMS**

Whole-body vibration (WBV) is the vibration transmitted by a support surface to the body¹. In wheelchair mobility, WBV occurs as the frame rolls over a surface. A portion of the vibration is absorbed by the wheelchair frame and seating system. Suspension is sometimes used to further dampen vibration, however, is not available on many frames, particularly ultralightweight manual wheelchairs. Vibration can lead to user pain, spasms, loss of positioning, increased muscle tone, fatigue and reduced sitting tolerance. WBV increases with higher speeds and over uneven surfaces.

WHAT DOES THE RESEARCH SAY?

Garcia-Mendez, et al., (2013) found that WBV levels exceeded international standards in all of the 37 manual wheelchair participants. The researchers state that previous studies indicate cushions are not effective in reducing vibration transmitted to the user. In this 2013 study, of the participants using wheelchairs with suspension, none experienced a reduction in vibration. The researchers concluded that suspension systems needed to be improved.

Chénier and Aissaoui (2014)² found that wheelchair frames made of carbon transmitted less vibration than frames made of aluminum or titanium without increasing mechanical work.

Wolf, et al., (2007)³ found that “Wheelchair users experience pain over the course of the day for multiple reasons. Sitting for long periods of time and exposure to WBV can cause discomfort. Maeda et al., (2003)⁴ used a questionnaire that showed that WBV did cause discomfort, specifically at the neck, lower back and buttocks. This and other studies that measured WBV levels during wheelchair use show that WBV exposure may cause discomfort and eventually pain in wheelchair users.

CURRENT DESIGN

Since these studies, manual wheelchair design continues to improve and address vibration dampening using various strategies. For example, one frame separates the seat and base frames, adding in polymers to absorb vibrations (Ki Mobility Ethos). More current research is required.

CONTACT THE AUTHOR

Michelle may be reached at MICHELLELANGE1@OUTLOOK.COM

VIBRATION CAN LEAD TO USER PAIN, SPASMS, LOSS OF POSITIONING, INCREASED MUSCLE TONE, FATIGUE, AND REDUCED SITTING TOLERANCE. WBV INCREASES WITH HIGHER SPEEDS AND OVER UNEVEN SURFACES.

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Michelle Lange is an occupational therapist with over 30 years of experience and has been in private practice, Access to Independence, for over 10 years. She is a well-respected lecturer, both nationally and internationally, and has authored numerous texts, chapters and articles. She is the co-editor of Seating and Wheeled Mobility: a clinical resource guide, editor of Fundamentals in Assistive Technology, Fourth Edition, NRRTS Continuing Education Curriculum Coordinator and Clinical Editor of NRRTS DIRECTIONS magazine. Lange is a RESNA Fellow and member of the Clinician Task Force. She is a certified ATP, certified SMS and is a Senior Disability Analyst of the ABDA.





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A TRUSTWORTHY SOURCE

Written by: ROSA WALSTON LATIMER

More than three decades ago, Rick Graver teamed up with Mike Naus to establish Medtech Services, to provide quality wheelchair repairs in the Reno, Nevada, area. Graver had recently earned a degree in business administration from the University of Nevada, Reno, and Graver was an experienced wheelchair repairman. Medtech Services has experienced some changes through the years; however, a commitment to product quality and outstanding customer service has remained constant.

MR. GRAVER, LET'S START AT THE BEGINNING. TELL US WHAT DREW YOU TO THIS CAREER.

In the beginning, what drew me to this career was the potential to build my own business. I was working at a downtown hotel casino and met Mike Naus, who was the younger brother of my boss. Naus had about eight years' experience as a wheelchair repairman and was not happy in his job. I had gotten my degree and was wanting to start my own business. I have always been an entrepreneur, and, as Naus and I talked, I recognized what I thought was a promising opportunity. Naus had experience and some solid connections. I knew nothing about wheelchair repair, but because of my long-time employment at the casino, I was able to borrow enough money to start the business, and I knew how to market.

We rented a 500 square-foot shop, and on May 1, 1988, we opened Medtech Services, doing mostly simple repairs - flat tires and upholstery. I still worked at the casino at night and worked with Naus during the day, learning all I could about the business. This was the time in our industry when we were sewing Naugahyde upholstery and making parts for seats before seating developed into what it is now. Naus would cut the wood, measure, laminate the foam to the wood and cover the seat. One of the first tools we bought when we started the business was a \$500 sewing machine. From the beginning, the Veterans Administration has been our number one customer, and that continues today. Veterans will always be our most valued customers.

After a couple of years, we moved into a larger space in Sparks, Nevada, a town adjacent to Reno. I continued to work at the casino for about six years before I went full-time at Medtech. We were at that location for five years and then had the opportunity to

purchase a larger building in Reno. We are still at that location with 10,000 square feet of space.

DURING YOUR 32 YEARS IN THE BUSINESS, WHAT ARE SOME OF THE SIGNIFICANT CHANGES YOU HAVE EXPERIENCED?

The change that had the most impact on Medtech Services, and on me personally, was the death of my partner in 2001, 13 years after founding the company. Naus had done an outstanding job training the staff that worked with him in the shop, and we were able to continue.

A few years back, I could see the writing on the wall with reimbursement and the changes that were coming. Many items once considered for purchase were now being considered for rental. The regulatory part of the business was becoming very tedious.

Five years ago, I had the opportunity to sell the rehab part of Medtech to NuMotion. I have been an ATP for about 20 years, and our company did a lot of work for Medicare and Medicaid for many years. When I sold to NuMotion, I gave up all my provider numbers, and all the rehab business went to them. I kept the Medtech Services name, the location, telephone number, and all the retail business. Now we primarily focus on retail sales of mobility equipment and the sale of wheelchair vans, lifters, and scooter carriers. Service is still the heart of our business, and along with wheelchair repairs, we also do van repairs, installations and offer rental wheelchair vans and scooters. We are a supplier for both Braun and VMI.

This change from billing and reimbursement to private pay has not been easy, but I believe it was a good move. Documentation was a constant burden, and it was challenging to be the bad guy who had to tell a customer that the equipment they needed was not considered medically necessary. I grew Medtech based on billing and reimbursement, and, obviously, I gave up a significant portion of that business with this transaction with NuMotion; however, I believe it is better served by a larger company. Now, if a customer wants some equipment, we work within their means to meet their goals. We do not have to justify the transaction to a third party. In many ways, my job is easier and less stressful.

TELL US HOW YOU HAVE BEEN ABLE TO NAVIGATE AND LEAD YOUR STAFF THROUGH THESE CHANGES SUCCESSFULLY.

Training and education are essential to my employees and me. We need to keep up with the changes in the industry and products so we can better serve our customers. We take advantage of any opportunity we have for in-services, manufacturers' training and online training. Two of my staff are ATPs in training now. Neal just got his RRTS®, and Carlos is finishing his requirements to get his RRTS®. I will soon be starting them down the road to get more



Rick Graver, owner of Medtech Services



Rick Graver (center) with his son, Nicolas, and Shannon Sweeney, former Medtech general manager, at an MS walk

training to prepare them to become ATPs. All this training is available through NRRTS and the industry experts associated with the organization. Things are constantly changing, and I know I can trust NRRTS to keep my staff and me up to speed. The organization has been especially timely and reliable with information during the COVID-19 pandemic.

As a business owner, even after all these years, education remains important. NRRTS staff is always very responsive and helpful. I know I can depend on them to give me a 'heads up' when something new is coming up. My association with NRRTS underscores the fact that I am not in this alone. Other professionals are facing some of the same problems, and we can learn from and help each other.

MR. GRAVER, TELL US ABOUT YOUR FAMILY AND WHAT YOU DO FOR FUN.

My wife, Dawn, and I have been married for 26 years. She takes care of the month- and year-end accounting at Medtech. My youngest son, James, is a senior in high school. He will go to the University of Nevada, Reno, so I will have to work at least another four years! My older sons, Nicolas, and Anthony are twins, and both just graduated from the University of Nevada, Reno. Anthony has a mechanical engineering degree and has started work with GE. Nicolas had a dual major in economics and sociology. He is currently working for a company that does RV and van conversions to Mercedes Benz Sprinters.

As a family, we enjoy traveling and getting together with extended family. We spend a week together at Lake Tahoe every summer.

My 'fun' activity and what you might consider a hobby are my Shriner activities. I am heavily involved in Masonry, Scottish Rite and Shrine. These fraternal and charitable activities keep me busy in my spare time. The Shriners own 22 hospitals in the United States that provide treatment for children with orthopedic conditions and in need of burn care, regardless of their ability to pay. Specifically, my Shrine supports the Shriner's Hospital for Children – Northern California in Sacramento, and I serve on the Board of Governors for the hospital. I attend a board meeting in Sacramento each month and find this association very rewarding.

I GAVE UP A SIGNIFICANT PORTION OF THAT BUSINESS WITH THIS TRANSACTION WITH NUMOTION; HOWEVER, I BELIEVE IT IS BETTER SERVED BY A LARGER COMPANY.

FINALLY, WHAT KEEPS YOU MOTIVATED IN BOTH YOUR BUSINESS AND PERSONAL LIFE?

My passion for helping people solve problems keeps me motivated. Each situation brings its issues, and I enjoy the challenge of finding solutions. We work in a great industry, but to stay in it for the long haul, you must have a passion for helping people. That is probably universal for everyone in this industry. We like to help people and to be a part of a community. It is a bonus that you can make a living at it.

I experienced this to some extent when I worked in food service at the casino. I



A TRUSTWORTHY SOURCE (CONTINUED FROM PAGE 21)

always enjoyed the service part of the job. People would come out for a good time, and I enjoyed helping make that happen. Of course, my work with Medtech Services' customers is much more personal.

I have a very clear memory of when I first realized that I was in the right business. Naus and I received a call to go to a veteran's house to do a wheelchair repair. The man was in a hospital bed in the front room of the house. He was so glad to see Naus. He said, 'My wheelchair broke down, and I've been stuck in my bed.' Naus did the repairs on the veteran's power wheelchair, and the guy was genuinely grateful. I knew then I was hooked, and I was thankful that we could help this person. This feeling was like a bonus for me. I had gone into the business thinking about money, and now, in addition to that, I realized the positive effect I could have on others.

Naus taught me so much more than how to repair a wheelchair. After helping another customer, the situation left me feeling sad. Naus could see it on my face and reminded me that it isn't always easy to do this work. He told me to remember that we were in business and could not give our services away even though there would be situations when I would want to. I had to learn what Mike knew, and I learned from one of the best. I have remembered his advice although there are times when we do things to help our customers, and we do not get paid for it. I must trust that, if I remain committed to be a trustworthy, honest resource for those I serve, in the end, everything will be OK.

CONTACT THE AUTHOR

Rick may be reached at
RGRAVER@MEDTECHMAIL.COM



Rick Graver, ATP, CRTS® is a NRRTS Registrant in Reno, Nevada. Graver has been a Registrant since 1999.



(l to r) Dawn, Nicolas, James and Anthony Graver on family vacation in Hawaii



Derron Inskip, Medtech service manager, with his wife in the Medtech sponsored balloon at the Great Reno Balloon Race



Rick Graver and Medtech office manager Victoria Rosales at the Medtech 30th anniversary employee party, Reno Aces baseball game



Rick Graver at the Nevada Day Parade with the Shriners



Medtech Services in Reno, Nevada - celebrating 32 years of service

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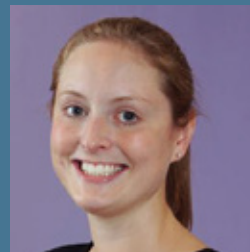
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COVID-19 TESTS THE COUNTRY AND OUR INDUSTRY

Written by: **DON CLAYBACK**, EXECUTIVE DIRECTOR OF NCART

We have all made and heard comments regarding the COVID-19 pandemic. "What a surreal time, what a fearful time, what a dangerous time." While it has been all that and more, thankfully our country and the Complex Rehab Technology (CRT) industry have been working hard to navigate through this most challenging period.

To start, we want to thank all who are enabling our nation to meet these challenges. Top of the list are the health care professionals: the dedicated physicians, nurses, therapists, researchers and supporting staff serving their local communities. Thanks also to the federal and state agencies working hard to develop and issue needed policy changes and guidance. Finally, thanks to all involved in recommending, prescribing, manufacturing, providing and servicing CRT to help people with disabilities stay independent, safe and healthy.

PROTECTING ACCESS TO CRT

As difficult a time as this is, we will all get through it. We will do that BY WORKING TOGETHER. To underscore that message there has been great collaboration within the CRT industry with many CRT stakeholder organizations joining forces. These include NCART, NRRTS, U.S. Rehab, Clinician Task Force, American Association for Homecare, State Associations, RESNA, APTA, AOTA, consumer groups, and others.

It has been very encouraging to see people stepping up to help protect CRT access. While things continue to develop at the time of writing this column, here

is a recap of significant information and actions to date:

Policymaker Intentions and Actions - The positive news is that federal and state policymakers have been working diligently to provide appropriate and timely policy changes and guidance. Common themes include opening new pathways for care, minimizing/eliminating direct physical contact, reducing burdens on health care professionals and facilities, and relaxing documentation requirements. The biggest challenge in this area is that agencies have been overwhelmed with the breadth and depth of developing massive changes and issuing the related guidance to the wide variety of healthcare entities and providers. Patience has been required.

The CARES Act - On March 27, the CARES Act (COVID-19 Aid, Relief, and Economic



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“TO START, WE WANT TO THANK ALL WHO ARE ENABLING OUR NATION TO MEET THESE CHALLENGES. TOP OF THE LIST ARE THE HEALTH CARE PROFESSIONALS: THE DEDICATED PHYSICIANS, NURSES, THERAPISTS, RESEARCHERS AND SUPPORTING STAFF SERVING THEIR LOCAL COMMUNITIES.

Security) was signed to provide the initial round of direction and relief. As to health care, this supplied the authority to expand telehealth, offered business-focused financial assistance, suspended the current 2% Medicare sequester payment cut for eight months, extended the 50/50 blended Medicare payment rates for rural Competitive Bid areas, and established a new 75/25 blended payment rates for all other Non Competitive Bid areas.

CMS Interim Final Rule - On March 30, Centers for Medicare and Medicaid Services (CMS) issued Interim Final Rule with Comment CMS-1744-IFC, an emergency rule focused on COVID-19 issues. Its provisions included details on the expansion of telehealth “services” (note it did not classify physical therapists or occupational therapists as eligible telehealth practitioners), allowed the PMD Face-to-Face requirement to be met by telehealth, indicated that Medicare National Coverage Determination and Local Coverage Determination requirements for in-person encounters do not apply during COVID-19, paused the PMD Prior Authorization program making it optional for PMD suppliers, waived the signature on delivery requirement and offered alternatives, provided accelerated/advance payments for Medicare providers, and relaxed timelines associated with appeals. Many of these provisions require detailed implementation instructions to be issued by the DME Medicare Administrator Contractors (MACs) in order to fully evaluate and implement. We are anxiously awaiting these instructions.

CRT Industry Webinars - As of this writing we are preparing the fourth in a weekly series of CRT Industry COVID-19 webinars which are being hosted by NCART, NRRTS, U.S. Rehab and the Clinician Task Force. These are being presented to communicate the work being done to secure policy changes, identify outstanding issues and solutions, publicize new policies and guidance and provide a timely forum for CRT related comments and discussions. Recordings and handouts are available at www.ncart.us.

Medicare Policies - The Interim Final Rule provided certain relief and guidance relating to CRT as described above. As mentioned, we are awaiting DME MAC instruction to provide further details on a variety of areas, including the waiver of in-person encounters and what documentation is required to be obtained for the billing of CRT during the COVID-19 pandemic.

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COVID-19 TESTS THE COUNTRY AND OUR INDUSTRY
(CONTINUED FROM PAGE 25)

State Medicaid Programs and Commercial Payers - Each state and commercial payer has been issuing individual policies and guidance. We have been advocating for specific CRT relief requests that are needed to allow the timely and safe provision of CRT. These include a waiver of any face-to-face requirements, allowance of remote technology for clinician and ATP involvement, relaxation of provisions when there is an urgent need for new/replacement equipment, and a waiver or limitation of the Prior Authorization requirement for repairs.

Expansion of Telehealth - Telehealth has significant benefits in the provision of CRT but policies vary by payer. When reviewing a payer's telehealth policy, it is important to look at two components: (a) which clinicians can provide services under telehealth and (b) what CPT codes are billable under telehealth. While many state Medicaid programs and commercial payers are allowing telehealth for CRT, the Interim Final Rule had major shortcomings related to using telehealth in the provision of CRT within the Medicare program. To remedy this, we are working with CMS to issue new guidance to: (a) add physical therapists and occupational therapists to the list of clinicians who can provide telehealth within Medicare and (b) add CPT Code 97542 "Wheelchair Management" to the list of approved telehealth billing codes. We are hoping for a positive response to these requests shortly.

Medicare Competitive Bidding Program (CBP) - There is good news as CMS announced it would be removing noninvasive ventilators from inclusion in the upcoming 3-year CBP. This was a major win for people who depend on these life-sustaining devices. Thanks to all the disability and consumer organizations who led this campaign. On a related note, industry organizations

are also requesting that CMS delay the CBP scheduled to start on Jan. 1, 2020 by at least one year. This would enable the already strained DME industry to recover and maintain the current level of access and services to Medicare beneficiaries through the post COVID-19 period.

Provider Relief Fund - The CARES Act provided \$100 billion for a provider relief fund to supply needed financial support. This is a grant of sorts and does not require repayment if the entity meets certain criteria. As of this writing \$30 billion has been distributed to Medicare providers, including hospitals, medical practices and DME/CRT companies. Additional details are available at the dedicated website. The basis and plans for distribution of the remaining \$70 billion are being finalized.

Other Financial Assistance - There is a variety of other assistance being made available that includes the Paycheck Protection Program, Medicare Accelerated/Advance Payments, and SBA Guidance and Loans. These are subject to certain limitations and funding but should be explored as potential financial resources.

CRT AND TELEHEALTH

During COVID-19 we have been advocating strongly for all payers to permit the use of telehealth and other remote options when appropriate for CRT. To assist in this, we published a "COVID-19 Advisory- Use of Remote Technology Required During Pandemic to Protect People with Disabilities Access to Needed Complex Rehab Technology." This outlines the basis and application of telehealth in relation to the provision of CRT products and supporting services. It also includes a decision tree developed by the Clinician Task Force to provide clinical guidance on the triaging of CRT clients when using remote technology. You can obtain a copy of the advisory at the COVID-19 area at www.ncart.us.

The appropriate and effective use of telehealth and other remote applications can play an important role in maintaining needed access to CRT in certain situations. Depending on the individual and the technology required, these options can be used for needed evaluations and consultations and reduce the need for in-person encounters. Once we get through this crisis, we will be discussing with policymakers the benefits of making remote technology permanently available when it increases the positive outcomes for someone requiring CRT.

AS WE MOVE AHEAD

At the time of this writing we continue to seek further policy changes and guidance at the federal and state levels. Congress also continues to work on supplying additional relief to the healthcare system and entities. If you have not yet signed up for CRT Alerts at www.access2crt.org please do so to ensure you receive timely updates.

We will be dealing with the impact of COVID-19 for many months and into 2021. This pandemic will have a major impact on federal and state budgets that government officials will need to address. The suspensions and closures of schools and wheelchair clinics will present significant challenges to maintaining needed evaluations, deliveries, and repairs of CRT. The new protocols and challenges will necessitate renewed advocacy, creativity and collaboration.

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NCART and the other dedicated organizations are here for you and will continue to work hard to ensure people with disabilities have timely access to CRT and the needed supporting services. Let us know if you are having difficulties that we can help with. As I said at the start, we will all get through this and we will do that BY WORKING TOGETHER.

SUPPORT NEEDED ADVOCACY

During these times it is critical to have an effective national CRT industry association. If your organization provides or manufactures CRT and is not yet an NCART member, please join to support our important work. We are exclusively focused on CRT advocacy at the federal and state levels and have a proven record of leading and collaborating with others to protect access and secure needed policy changes. More NCART members are needed to keep up the good fight. Check out the membership area at www.ncart.us for details or email me to set up a conversation.

CONTACT THE AUTHOR

Don may be reached at
DCLAYBACK@NCART.US

Don Clayback is executive director of NCART. NCART is national organization of Complex Rehab Technology (CRT) providers and manufacturers focused on ensuring individuals with disabilities have appropriate access to these products and services. In this role, he has responsibility for monitoring, analyzing, reporting and influencing legislative and regulatory activities. Clayback has more than 30 years of experience in the CRT and Home Medical

Equipment industries as a provider, consultant and advocate. He is actively involved in industry issues and a frequent speaker at state and national conferences.





RESNA: OUR COMMITMENT

Written by: **JULIE PIRIANO, PT, ATP/SMS**
CHAIR, RESNA PROFESSIONAL STANDARDS BOARD

It was just a few months ago, but it seems like years. COVID-19 has affected everything. As we slowly return to work, and society opens back up (albeit with restrictions), I find myself reflecting on the world before the virus and wondering what the “new normal” will be.

One decision that RESNA had to make is to cancel the annual conference scheduled for July 2020 in Arlington, Virginia. The Board of Directors felt we could not guarantee a safe experience. In addition, the board felt with all the social disruption, people would need to focus on their jobs and their families and attending a conference would be – and should be – the last thing on their minds.

However, we know that the RESNA conference is a major source of continuing education for ATPs. By the time this issue of *DIRECTIONS* is published, RESNA will have announced additional virtual continuing education. Please check the website at www.resna.org for more information.

Prior to the pandemic, RESNA already offered a variety of continuing education (CE) opportunities online. Over the past year, quizzes from Assistive Technology Journal moved online. You can now read the article, take the quiz, and download your CE certificate through your computer, tablet or smartphone. RESNA also has a webinar archive with on-demand webinars. In addition, on the RESNA website is a list of other CEU providers that offer RESNA CEUs.

For ATP certification renewal, certificants must demonstrate continued education by completing 20 hours of AT-related training, that may involve in-person and/or online courses, seminars and workshops. The 20 hours must comprise at least 1.0 Continuing Education Units (CEUs) and can include no more than 10 Continuing Education Credits (CECs / contact hours) over the course of the two-year recertification cycle. The 1.0 CEUs (10 hours) must be from IACET accredited continuing education providers or accredited university programs. IACET (International Association of Continuing Education and Training) accredits providers who meet the ANSI/IACET rigorous standard for high quality instruction. RESNA, NRRTS, ATIA and many manufacturers are IACET accredited continuing education providers. The University of Pittsburgh, which provides ISS CEUs, also counts towards this requirement, being an accredited university program. The other 10 hours can be from RESNA CEU providers and other organizations or can be contact hours. For example, a manufacturer demonstration at your workplace can qualify as a CEC. A certificate of attendance for a training session must include the attendee's name, the date(s) and length of the course (in hours), and the speaker/sponsor signature. As a reminder, a maximum of three hours of in-service product training per year (6 total) will be accepted.

For ATP/SMS renewal no additional continuing education is required. The SMS certification is focused specifically on seating, positioning, and mobility; therefore, the 20 hours of continuing education must be focused on this area of practice.

NRRTS requires all registrants to earn 1.0 CEU of IACET continuing education every year. Renewal of the RESNA ATP and ATP/SMS certification is every two

years. This means those who successfully renew NRRTS Registration meet the requirements to renew their ATP or their ATP/SMS. You can submit the same continuing education documentation for the ATP or ATP/SMS recertification as you do for your NRRTS Registration.

Do not let the COVID-19 pandemic and the difficulties associated with it set you back in your professional development. If anything, my hope is that this time has shown all of us how important we are in helping our clients live their fullest and healthiest lives. Keep learning, keep moving forward, and keep serving people with disabilities. Lean on organizations like RESNA, NRRTS, NCART, and the Clinician Task Force, who are all here to help you. We are all in this together.

CONTACT THE AUTHOR

Julie may be reached at
JPIRIANO@PRIDEMOBILITY.COM

Julie Piriano has worked in the seating and wheeled mobility industry for the past 35 years. She is vice president of Clinical Education, Rehab Industry Affairs and serves as Pride's Compliance Officer. She presents nationally and internationally on seating and wheeled mobility with a focus on evaluation, documentation and clinical applications of available technologies. Piriano served on the RESNA Board of Directors, currently serves as the Chair of the Professional Standards Board and is an active participant in the Wheeled Mobility and Seating SIG and the PT PSG. She is a Friend of NRRTS, member of the AAHomecare Complex Rehab and Mobility Council, the APTA and the Clinician Task Force. She serves on the NCART Medicaid Committee, the DMEMAC Advisory Councils, the board of several State Associations and the Mobility Management



Editorial Board. Piriano is a highly proactive industry resource on legislative and regulatory issues that impact the complex rehab industry.

NRRTS Live Webinars 2020 continued



August 4, 2020 at 7pm EST

Smart Power Wheelchairs – Increasing Efficiency and Safety in Driving

.1 CEU

Michelle L. Lange, OTR/L, ABDA, ATP/SMS

September 8, 2020 at 7 pm EST

Seat Cushion Shape for Control of Neuromotor Issues

.1 CEU

Jean Anne Zollars, PT, DPT, MA



September 9, 2020 at 11 am EST

Power Wheelchair Configuration Considerations for Evaluation and Skill Training

.1 CEU

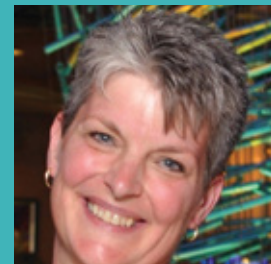
Jennith Bernstein, PT, DPT, ATP/SMS

September 10, 2020 at 7 pm EST

Good, Better, Best – Seating in the Bathroom

.1 CEU

Stefanie Sukstorf Laurence, B.Sc.OT, OT Reg.(Ont.)



October 7, 2020 at 11 am EST

Challenges to Seating and Positioning in Long-Term Care Settings: Common Seating Misconceptions that Get in the Way

.1 CEU

Ana Endsjo, MOTR/L, CLT

October 20, 2020 at 11 am EST

Come Roll with Me - A disability Awareness Program for School-Age Kids

.1 CEU

Cathy Carver, PT, ATP/SMS



For More Information, visit <https://nrrts.org/education/>

THE THREE MUSKETEERS - 2020

Written by: PENNY J. POWERS, PT, MS, ATP

"Energy and persistence conquer all things." – Benjamin Franklin

These are challenging times, and I wanted to connect with some of my heroes and share their insights and experiences. I affectionately refer to them as the "Three Musketeers" ... and I am not talking about candy bars! Meet three good men who are manual wheelchair users and who personify Benjamin Franklin's famous quotation.

INTRODUCTIONS AND BACKGROUND INFORMATION:

WILL CLARK: I was injured on March 22, 1974, at 21 years old as a result of a motor vehicle accident (MVA). My injury is from level T10 - L1, but functionally I am T12. I have used a manual wheelchair for 46 years except for a short time I used a power wheelchair after shoulder surgery.

MATT FLYNN: I was injured on Sept. 11, 1987, at level T12 as a result of a fall off a roof. I have used a manual wheelchair for 33 years.

RICK SLAUGHTER: I was injured at T12 / L1 as a result of an MVA. I have used a manual wheelchair for 41 years.

THINK BACK TO YOUR FIRST CHAIR – DID YOU HAVE A TEAM TO HELP YOU MAKE YOUR SELECTION?

WILL: One therapist – no TEAM – no explanation – I was at that stage that I thought I was going to walk out of there. The therapists tried to do their best; they added hill huggers and crutch holders and the chair weighed 60 pounds. It was HEAVY – bulky – tough to maneuver. I did not get into the chair for two months. It was transported via ambulance to rehab. The MD said, "Son – you are going to be married to that chair for the rest of your life." There was one choice – an E & J Premier – that was all there was.

MATT: I knew nothing about wheelchairs, and it was a salesman who showed me an E & J "steel" folding wheelchair. It was so heavy and nothing like the chairs of today. I was in rehab at University of Wisconsin Hospital. The physical and occupational therapists were great but had no knowledge of wheelchairs. There was no choice. It did not work out very well, but things are better now.

RICK: I do not recall having a team to help with my first chair, which was an Everest and Jennings 58-pound tank with 60 degree swing away footrests, adjustable height arms, wheel locks, and a very high sling back. Today's ultralight manual chairs are so much different than 20 and 30 years ago. The chairs today are much lighter, have smaller caster wheels, under mount wheel locks (if at all), and low back heights. Today's choices are endless.

WHAT ADVICE WOULD YOU GIVE YOUR YOUNGER SELF ABOUT SELECTION AND CONFIGURATION OF WHEELCHAIRS?

WILL: I would tell me, "We don't know what ability you will have in the future – you need as much adjustability as possible. A disability doesn't change your personality but if you were a couch potato before the injury – you will be a bigger couch potato



Will Clark



Matt Flynn



Rick Slaughter

with the injury." I advise people with a new injury to GO OUT and watch people in wheelchair sports and see how they do things ... to see "active, active, active" and how to manage their life. If they are ready for it – talk and engage with a veteran wheelchair user and support groups."

MATT: Shop around, talk with end-users about chairs – do your homework.

RICK: It is OK to be angry; it is OK to be sad, and no matter how bad it seems, circumstances can and will change for the better. Get and STAY active. Be a source of light for those you meet. Help others.

WE DESCRIBE THE ULTRA-LIGHT MANUAL WHEELCHAIRS THAT EACH OF YOU USE AS COMPLEX REHAB TECHNOLOGY. WHAT CHANGES IN THE ART AND SCIENCE OF OBTAINING A WHEELCHAIR DO YOU SEE AS POSITIVE?

WILL: Quadra is the brainchild of Jeff Minnebraker, who was a recreation therapist at Rancho Los Amigos rehab in Downey, California. Jeff started experimenting with materials in his garage and invented the “Quadra wheelchair.” This was considered a very big INNOVATION at the time. Marilyn Hamilton also built upon innovation and marketing and forged the path to better outcomes in the world of wheelchairs. I think this has helped us move forward: innovation, experimentation, and a “let’s do this” kind of spirit.

MATT: The best part of the evolution of wheelchairs is the improved understanding of seating mechanics by the therapists and suppliers; how each person sits. We have so many choices, such as titanium and aluminum frames. Go online. Look at the various makes and models. Speak to other chair users, if possible, to see what has worked for them. Find a seating clinic that can show you different makes, models, and configurations. Ask questions.

RICK: The most positive change I have seen in the art of obtaining custom wheelchairs has been the implementation of the Assistive Technology Professional. ATP’s have the training and knowledge to assist users in making the most appropriate decision regarding their mobility needs.

HAVE YOU CONSIDERED OR USED POWER ASSIST?

WILL: Yes – I like it best when outdoors. I have every confidence that it will benefit me if I can ever get out in the world again. COVID-19 has really limited my world.

MATT: The power assist has been the biggest change for me. It is indispensable for my life. I can do my road work to keep in shape, do my shoulder exercise/physical therapy, and then do anything I need to do in the community. It saves me!

RICK: I use power assist frequently. It has changed my life. As I have become older and acquired more ailments in hands, wrists, elbows, and shoulders, I decided to give the Smart Drive a try. I was sold the first time I used it. The Smart Drive is truly the best of both worlds, manual and power.

IF YOU COULD CHANGE ONE RULE IN THE AREA OF FUNDING – WHAT RULE WOULD YOU CHANGE AND WHY?

WILL: I wish the funding sources would go back to giving me a new cushion every year. My first cushion got so hard when it got cold – I grew up in the Midwest. I remember the BYE BYE Decubiti – it was awful for a man. My next cushion was a ROHO. The funding categories do not consider the individual’s needs, instead they lump everybody into one category. The HOME SETTING is not LIVING. IT IS NOT LIFE.

MATT: I would change individuals being “lumped together because they have the same code (diagnosis)” so that individuals could be considered as unique. Each person has individual needs.

RICK: Transit tiedowns are considered not medically necessary as they are used to transport a client (outside the home). This makes absolutely no sense to me.

IN YOUR LIFE – WHO HAS BEEN A HERO TO YOU AND WHY?

WILL: Uncle Maurice Northrup. He one of the two best men I have ever known. My stepfather, Henry Sampson, was so good to my mother, my sister, and me. His parents were both educators – his mother taught Lyndon Johnson. I have so much respect for how he treated people and what a difference he made in our lives. Their values and how they treated people helped shape the kind of person that I want to be.

MATT: My friend Bucky. He helped me with the hopelessness of never being able to walk again. He read the Gospels to me every night. That friendship and his gift made the biggest difference in my life. He didn’t know what to say, so he just kept reading the Gospels.

RICK: John E. Mayfield. He was my best friend, spiritual advisor, and 12-step sponsor. I also hold up as HEROS all those people who were placed in my path to help me in my endeavor to help others.

LAST BUT NOT LEAST, PLEASE ADD ANYTHING THAT YOU THINK SHOULD BE SHARED WITH READERS – SOMETHING THAT THEY SHOULD KNOW ABOUT YOUR EXPERIENCES, YOUR KNOWLEDGE OR YOUR WISDOM.

MATT: My advice is to end users. Don’t turn down something unless you try “re-engineering.” For example, I mow my own lawn. I figured out how to make hand controls for the lawn mower. It was

THE THREE MUSKETEERS - 2020
(CONTINUED FROM PAGE 31)

important to figure out different ways to transfer so that I can do the same activity as other people, but I get it done "

RICK: Regarding COVID-19, remember that those who propel their own wheelchair must touch wheels that contact so many surfaces that "walkers" only touch with their shoes! It is scary what might be hiding out there. I worry about the economic "health" of the industry – not just how the virus has hit the U.S. but other countries too.

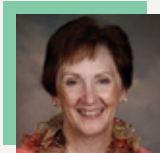
From all Three Musketeers – remember, "We are all in this together."

I know that there are more than just three heroes in my world and in your's as well. I am delighted to share their perspectives and "positivity" in these times of doubts. Remember "Energy and persistence conquer all things." – Benjamin Franklin

CONTACT THE AUTHOR

Penny may be reached at
PENNY.POWERS@VUMC.ORG

Penny J. Powers, MS, PT, ATP, is a Level IV Physical Therapist at Pi Beta Rehabilitation Institute at Vanderbilt University Medical Center. Powers is the lead physical therapist for the Adult Seating and Mobility Clinic. Her practices involve specialty seating for a diverse adult population. She has had presentations accepted at national conferences including RESNA and APTA Combined Sections meetings as well as the International Seating Symposium. She serves as adjunct faculty at Belmont University, DPT program. She has had IRB approved research projects in collaboration with Belmont University for the past seven years. Powers sustains membership in APTA including the Neuro



Section and RESNA. She currently serves on the Executive Board of the Clinician Task Force.

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NRRTS Live Webinars 2020 continued

October 21, 2020 at 11 am EST

Buttocks Shape Across Wheelchair Cushion

.1 CEU

Sharon Eve Sonenblum, PhD



November 3, 2020 at 7 pm EST

Considerations of Mobility for Oncology Patients

.1 CEU

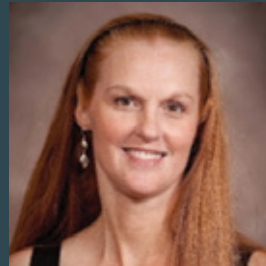
Stephanie Cooley, OTR/LATP

November 12, 2020 at 7 pm EST

One Size Doesn't Fit All: Meeting the Needs of Pediatric Power Mobility Learners

.1 CEU

Lisa K. Kenyon, PT, DPT, PhD, PCS



December 8, 2020 at 7 pm EST

How to do More with Your Power Wheelchair – Interfacing with The Outside World

.1 CEU

Antoinette Verdone, ATP



NRRTS recognizes quality education is critical for the professional rehab technology supplier.

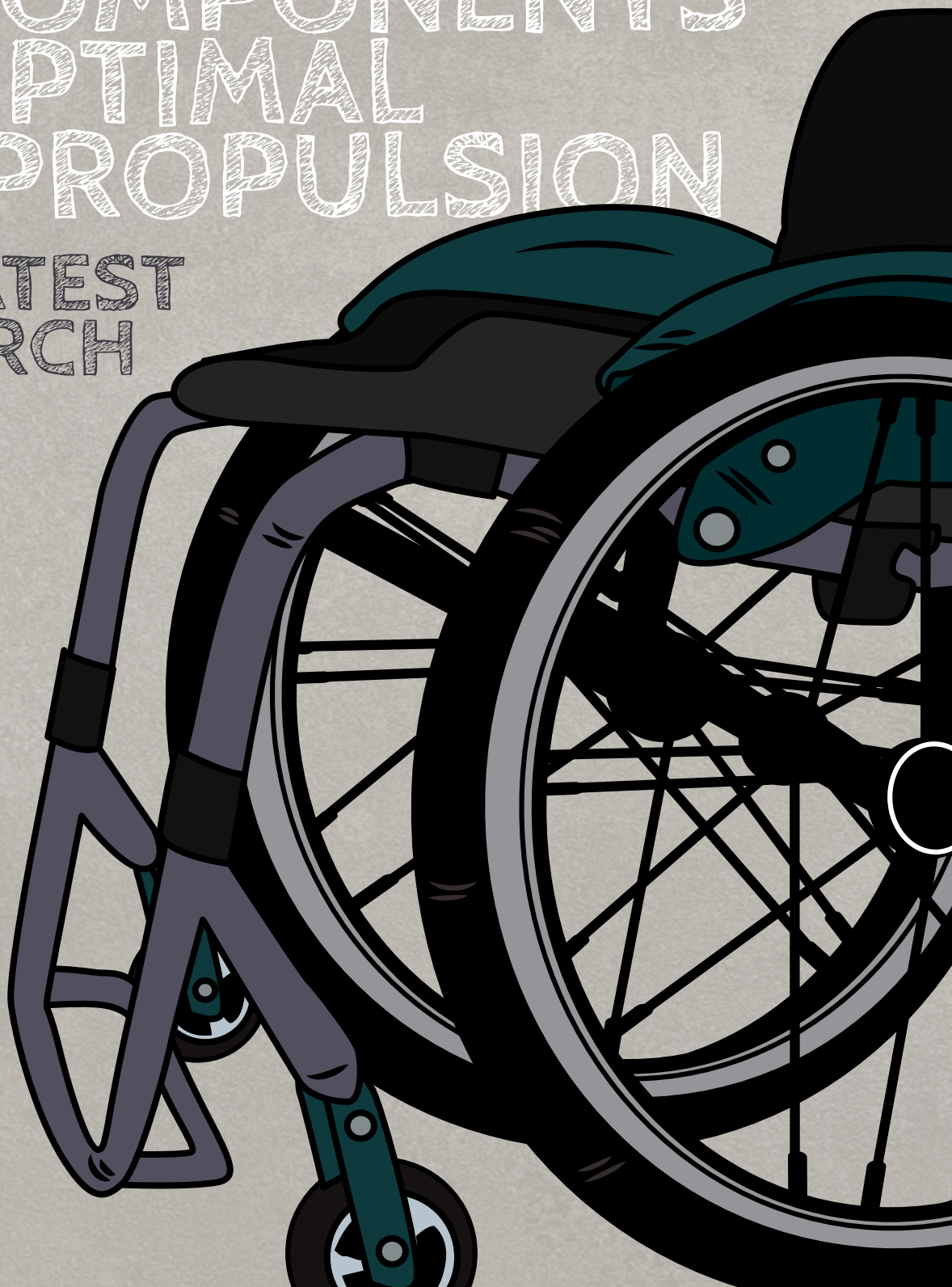
We are committed to offering this benefit to NRRTS Registrants, Friends of NRRTS and other CRT Professionals through our NRRTS Continuing Education Program. Our goal is to become a primary source of relevant, cost-effective educational programming and information in the industry and profession

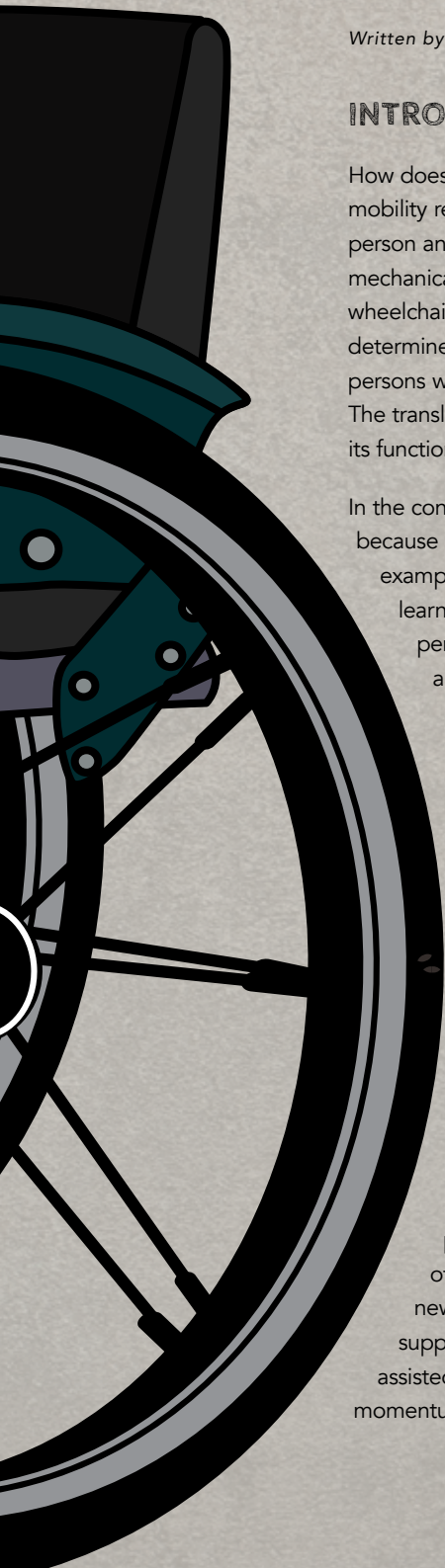
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MANUAL WHEELCHAIR CONFIGURATION AND COMPONENTS FOR OPTIMAL SELF-PROPULSION

THE LATEST
RESEARCH



A stylized illustration of a wheelchair's rear wheel and frame, showing the spokes, tire, and part of the seat and backrest in dark teal and black colors.

Written by: **IAN RICE, PHD, MS OT**

INTRODUCTION

How does the fit of a manual wheelchair effect the end user? The short answer is nearly all mobility related activities and more can be traced back to the state of the interface between person and wheelchair. Coupled with the fact that manual mobility is straining and far less mechanically efficient than ambulation,¹ the impact of a non-optimally configured manual wheelchair can be pronounced. For example, a multisite examination of wheelchair users determined that the wheelchair was simultaneously the most important mobility device used by persons with spinal cord injury (SCI) as well as the one that users most associate with barriers.² The translation was that a wheelchair must be calibrated to meet the needs of the individual or its functionality is quickly neutralized.

In the context of seating and mobility, the line between optimal and catastrophe is often narrow because subtle changes to configuration impact countless elements including safety. For example, configuration has the potential to effect mobility efficiency, propulsion technique, learning stroke techniques, upper limb injury potential, predisposition to tips and falls, performance of activities of daily living (ADLs) such as transfers, reaching and dressing, and of course, independence, sense of participation and quality of life. All these factors are well substantiated by over 20 years of literature. Moreover, since many aspects of configuration are interdependent, where changing one feature impacts another, finding an optimal setup inevitably requires a delicate balance and often compromise from the end user. Moreover, what works for an individual presently, may not meet their needs in another environment or over time.

Given the nuances of fit, it should come as no surprise that persons with disabilities fall far behind the general population in participation and activity metrics.^{3,4} For example, metrics like speed and daily distance traveled between wheelchair users and the general population differ considerably.⁵⁻⁹ Even more striking, those with SCI are among the most physically inactive in society, even compared to other populations of persons with disabilities.

As the importance of manual wheelchair (MWC) configuration is well documented, researchers have dedicated considerable effort to understand how components and adjustability features impact mobility performance, comfort, safety, injury potential, participation and quality of life (QOL). The following sections will summarize the body of evidence examining impactful MWC configuration and component features. Later, newer technologies will be discussed for their potential to enhance mobility through supplementation and/or replacement of the MWC. For example, pushrim activated power assisted wheelchairs (PAPAWs) and other power add-on systems have gained enormous momentum in recent years.

CONTINUED ON PAGE 36

MANUAL WHEELCHAIR CONFIGURATION AND COMPONENTS ... (CONTINUED FROM PAGE 35)

WHEELCHAIR PROPULSION TECHNIQUE, EQUIPMENT SELECTION, AND CONFIGURATION BASICS:

To fully appreciate the influence of configuration on mobility parameters, it is essential to first briefly highlight what the evidence suggests represents optimal propulsion technique, equipment selection and training. Published in 2005, recommendations specific to manual wheelchairs highlighted in the clinical practice guidelines for health care professionals,¹⁰ although aging, still hold up and have been confirmed recently by theoretical modeling approaches.¹¹ Current literature also demonstrates persons trained with evidence-based structured education programs utilizing the same guidelines, improved their wheelchair propulsion biomechanics.¹²

In terms of propulsion mechanics, the guidelines posit that wheelchair users should minimize stroke frequency, propulsive forces and extreme joint positions during propulsion. Users should also take long, smooth strokes that limit high impacts on the pushrim, while allowing the hand to drift down naturally, keeping the hands below the pushrim during the stroke recovery phase (see Figure 1). It is also recommended that individuals who rely on a MWC for independent manual mobility should be provided a high strength, fully customizable manual wheelchair made of the lightest possible materials, which are also durable for long term continuous use. Additionally, the rear wheel axle should be positioned as far forward possible (relative to the shoulder) without compromising the stability of the user. It has been established that when the hand is placed at the top dead-center position on the pushrim, the angle between the upper arm and forearm should form an angle between 100 and 120 degrees (see Figure 2).

MANUAL WHEELCHAIR CONFIGURATION

1. BACK SUPPORT HEIGHT:

A MWC back supports the trunk of the user, however variations in both height and angle can significantly impact the user's experience. The height of the back support can influence mobility, postural support, and propulsion biomechanics. For example, while a higher back support can be more supportive, it can simultaneously limit scapular motion and gleno-humeral range thereby limiting the rearward reach of the user during initiation of a propulsive stroke. In contrast, lower back supports tend to facilitate greater shoulder range of motion, which lends to a larger contact angle and push time promoting reduced stroke frequency.¹³ Interestingly, back support height was not found to effect the application of forces to the handrim in one

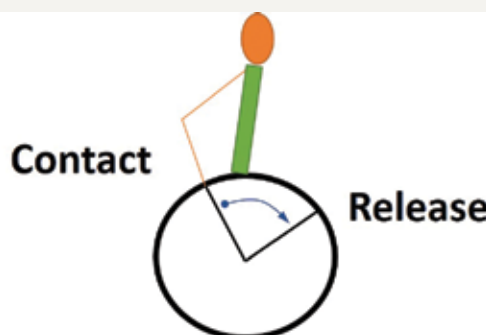


FIGURE 1 Contact angle (CA) - CA is the angle along the arc of the handrim from grasp to release. Ideal stroke technique is one in which CA is maximized, which promotes fewer and longer strokes to maintain speed

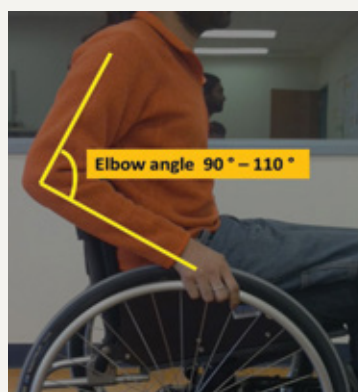


FIGURE 2 Seating height - The following method can be used to quantify how high or low an individual sits in their wheelchair, where a range of 90-110 degrees of elbow flexion is achieved when gripping top dead center of wheel (12 o'clock)

study.¹⁴ The general consensus is that those with impaired trunk control are recommended to use higher back supports positioned 20mm below the scapulae inferior angle, while those with intact trunk innervation should consider a lower back support, utilizing the top of the lumbar spine as a reference.¹⁵ Use of a back support that is too low may result in user trunk instability, which complicates manual propulsion. Finally, a low back support may force some to slide forward in their seat as a compensatory mechanism to gain stability, which causes several complications including forward chair instability, increased rolling resistance due to weighting the casters, and even development or worsening of destructive postures due to inadequate trunk support.

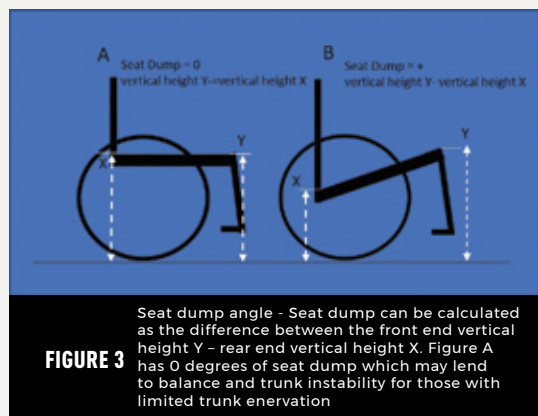
2. SEAT TO BACK SUPPORT ANGLE:

Seat to back support angle is important to assure proper positioning in the wheelchair for propulsion. An angle of less than 90 degrees has a tendency to fix the pelvis into a neutral or anterior pelvic tilt, creating a stable postural base. However, when confronted with a seat to back angle that is too closed, an individual with insufficient hip flexion range of motion may not fit properly into their chair, which causes forward sliding to relieve pressure from the hips and/or back. Unfortunately, to date, researchers have not been able to clarify an ideal back support angle for optimized propulsion biomechanics.

Moreover, much of the already limited literature on this topic has been completed in elderly populations of wheelchair users, which may limit generalizability. For example, it was determined that a 10-degree seat posterior tilt improved tangential force application in one study¹⁶ while Desroches, et al.¹⁷ found that altering the seat angle (0°, 5° and 10°) and back support angle (95°, 100° and 105°) did not influence shoulder loads during propulsion. However evidence was found in a separate study that an overly upright trunk posture can lead to the development of shoulder pain in persons with SCI.¹⁸ From a practical or clinical standpoint, backrest recline can improve comfort and trunk balance, however, may lend to rearward instability, particularly if the rear wheel axle is positioned forward as well. In essence, health care professionals should be aware of the potential additive effects of manipulating multiple features that alter the system's center of mass.

3. SEAT DUMP ANGLE (SEAT BUCKET):

Seat dump angle, defined as the inclination of the seat relative to horizontal, with the rear of the seat lower than the front (see Figure 3) has been examined for its effects on posture, reaching, functional activities and upper limb injury potential.¹⁹⁻²¹ Seat



dump has a role in properly supporting the thighs and minimizing the seat surface friction necessary to maintain an individual's stability within the frame. Increased seat

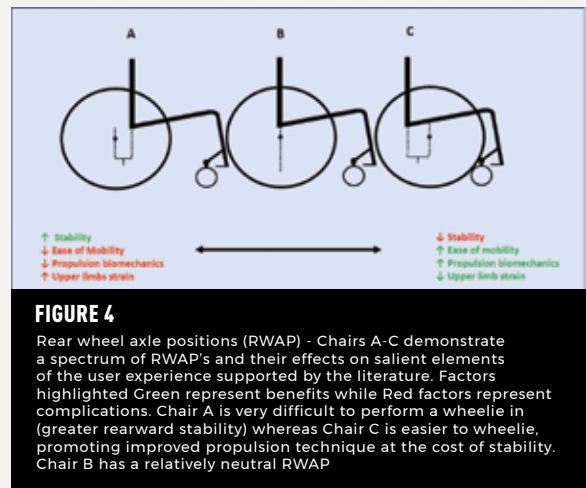
plane angle can reduce the individual's tendency to slide out of the wheelchair provided enough hip and knee flexion range of motion is available. Wheelchair athletes have been taking advantage seat dump for years to improve

performance (stability, balance, lower center of mass, etc.); however, its role in the context of everyday life, although gaining momentum, is still not well studied.

The primary benefits of seat dump have been tied to seated posture, reaching, and skin pressures. To date, less is known regarding how seat dump effects propulsion biomechanics. However, Cloud, et al.,^[20] found individuals using considerable seat dump (14 degrees) did not differ from those without dump in terms of subacromial impingement risk during propulsion. Deroches, et al.,¹⁷ also found changing the seat angle while keeping the wheel-axle position constant maintained similar shoulder loads. These findings can be interpreted to suggest if persons are deriving benefits from seat dump (propulsion, posture, reaching, or relieving skin pressures), they can do so without elevated risk of shoulder injury. Importantly, the influence of level of SCI on seat dump angles has not been well integrated into these findings, as persons may react differently as a function of level of injury. Therefore, an individual's characteristics should be considered, and pain status monitored after significant alterations are made. Like other aspects of configuration, seat dump can significantly affect several configuration parameters simultaneously. Many users also find transferring to be more difficult with increased seat dump, particularly when sliding forward out of a wheelchair.

4. REAR WHEEL AXLE POSITION HORIZONTAL AND VERTICAL:

The horizontal and vertical positions of the seat with respect to the rear wheel axle effect propulsion biomechanics as well as center of mass location and wheelchair stability. Much of the literature indicates that lower and backward seat positions relative to the rear wheel axle (see Figure 4) provide



advantages and may reduce risk of upper-limb injuries.²²⁻²⁵ For example, lower (100° to 120° elbow extension gripping top dead center of wheel) and backward seat positions with respect to the wheel axle have been associated with lower electromyograph activity,²⁴ lower push frequency,²² larger contact angle,²² lower rate of rise of propulsive force,²² reduced elbow and shoulder motions,²⁶ lower oxygen cost, and higher mechanical efficiency.²⁵ Mulroy, et al., demonstrated that a wheel axle placed 8 cm anterior to the shoulder decreased upward force around the shoulder.²⁷ The authors concluded that reducing upward force may diminish impingement on subacromial structures; thus, a nonoptimal wheelchair configuration could increase the risk of shoulder injuries.²⁷ A more optimal horizontal rear wheel axle position has also been associated with reduced rolling resistance as well as reducing the overall wheelchair length, which eases chair maneuverability due to reductions in the rotational inertia of the system.²⁸

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The key to selecting rear axle position is striking a balance as determined by the end user's preferences, perceptions of stability, wheelchair handling skills and overall needs. While positioning the wheels rearward (behind the shoulder) improves stability, it constrains reach and negatively effects propulsion biomechanics while a forward wheel position (in front of shoulders) improves propulsion biomechanics but reduces stability.¹⁵ A more stable chair also makes it more laborious for users to lift their front casters off the ground to perform wheelies, which is necessary to traverse obstacles. When considering vertical body positioning relative to the rear wheel axle or seat (how high or low an individual sits within the frame), balance must also be achieved. Lower positions appear to benefit biomechanics like contact angle, however at the expense of increased upper limb range of motion, which can be injurious.²⁵ Conversely, sitting²⁹ too high affects reach, therefore reducing contact angle which forces individuals to use a higher stroke frequency to maintain speed, which can lead to muscular fatigue.¹⁰

5. WHEELCHAIR WEIGHT:

Manual wheelchairs are typically categorized into standard (≥ 35 lb.), semi-adjustable standard lightweight (30-35 lb.), and adjustable ultralight (<30 lb.) frame groups. Not surprisingly, wheelchairs with reduced mass offer a range of advantages. For example, researchers have found the energy cost of propelling an ultralight wheelchair was 17% less than that of a lightweight wheelchair.^{30, 31} In addition, less mass requires reduced propulsive forces during propulsion which may protect the upper limbs.¹⁰ Those who use heavier wheelchairs (wheelchair, seating and user) also have been found to propel at slower self-selected velocities.³¹ Beekman, et al.³⁰ examined energy cost differences in persons with SCI [paraplegia ($n = 44$); tetraplegia ($n = 33$)] during a 20-minute bout of propulsion on an outdoor track in lightweight and ultralight wheelchairs. Those who used ultralight wheelchairs in both groups propelled faster and traveled farther compared to those using the heavier chairs. Finally, researchers have demonstrated a financial cost savings associated with lighter more adjustable wheelchairs. For example, highly adjustable, rigid, lightweight chairs although challenging to fund in the current health care environment, actually cost less to operate³² because they last longer²⁹ and are more durable.³³

6. WHEEL CHARACTERISTICS (SIZE AND WEIGHT):

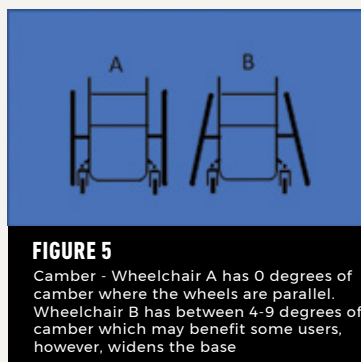
Wheel size (diameter) has an important role in several factors effecting ease of propulsion. For example, heavier wheels make it harder to initiate movement from a still position where lighter wheels allow for quicker acceleration.³⁴ Furthermore, because the rear wheels are located on the outer side of the

chair, the mass influences the rotational inertia of the system.²⁸ A larger diameter wheel also produces less rolling resistance; however, if too large for the individual, it may negatively affect access to the handrims. Interestingly, although users have reported improved comfort in manual propulsion with lighter wheels, there is no evidence to support energy expenditure benefits as a function of wheel weight when the wheels compared differed by 0.6 kg.³⁴

7. TIRE PRESSURE:

Typically, MWC users have the option of selecting from pneumatic, solid or hybrid categories of tires. Pneumatic tires provide impact and vibration absorption, which translates to improved user comfort,³⁵ while solid tires are typically selected for their convenience (no maintenance, deflation or flats).³⁶ The importance of maintaining tire pressure cannot be overstated, however. For example, Sawatzky, et al.,³⁷ compared the rolling resistance of five commonly used wheelchair tires (three pneumatic and two solid) at four different tire pressures (100, 75, 50, and 25 pounds of inflation) and determined that solid tires had greater rolling resistance than all three pneumatic tires even when tires were underinflated to 25% of tire pressure. Furthermore, energy expenditure measured during wheelchair propulsion showed that tire deflation significantly increased energy consumption at 50% of tire inflation.

8. REAR WHEEL CAMBER:



Defined as the inclination of the rear wheels (see Figure 5), rear-wheel camber impacts numerous aspects of the end user's experience including chair stability, safety, maneuverability, propulsion patterns, joint range of motion, mechanical efficiency, and physiological

performance. Wheelchair athletes typically utilize more extreme camber angles, sometimes in excess of 20 degrees, while more modest angles are favored in the context of everyday propulsion because camber adds width to the wheelchair base. However, only subtle degrees of camber are needed to protect the hands from pinches because the tires, in contact with the ground, extend wider than the top of the wheels where the hands contact during propulsion.

While the literature examining optimized camber is mixed, Perdios, et al.,³⁸ found 6 degrees to be optimal for lateral stability on an incline, propulsion comfort, and maneuverability, while angles ranging from 0 to 9 degrees did not affect associated cardiopulmonary parameters.³⁸ Rolling resistance was also found to be reduced by cambers up to 9 degrees, compared to wheels with no camber.³⁹

Larger camber angles, more than 15 degrees, have been found to change propulsion biomechanics as individuals tend to use more trunk flexion resulting in more contact with the front of the handrim. As a result, researchers observed increased elbow range of motion and wrist ulnar deviation with decreased wrist radial deviation.⁴⁰ Significantly more reports on the impact of camber exist, however will not be discussed here because a majority pertain to adapted sports where the angles examined far exceed those practical for use in everyday propulsion. Like a majority of the aforementioned configuration parameters, camber selection involves finding balance based on the user's preferences, needs and living environment. Given the current evidence, practitioners and end users should target a level of camber necessary to achieve lateral stability and chair responsiveness without sacrificing propulsion biomechanics and the ability to fit into one's living environments.

9. CASTER WHEELS:

Caster wheels are impactful to user comfort, stability, maneuverability, and rolling resistance. Solid casters are most commonly used; however, some users prefer pneumatic tires, which reduce rolling resistance if properly maintained. In regard to caster wheel diameter, smaller wheels are lighter and pivot more quickly, however, possess less shock and vibration absorption capabilities while increasing rolling resistance, which requires the user to expend more effort to maintain velocity. Typically, those who favor smaller caster wheels must be adept at performing frequent wheelies to traverse over rough terrain and bumps. If not, the smaller wheels tend to get stuck in grooves, which can increase forward tips. More recently, end-users who favor smaller casters may select front caster suspension⁴¹ which reduces vibration and is more forgiving over cracks and rough surfaces.

The location of the caster assembly in relation to the rear wheels is another configuration option that can have enormous impact on the user. For example, the shorter the distance between the rear wheel and caster, the lower the rolling resistance due to the increased weight upon the rear wheels.⁴² Furthermore, more mass is located near the center of the system and, therefore, rotational inertia is reduced, making turning maneuvers easier. However, the overall wheelchair length is reduced to support this type of configuration, which may impact the system's stability.¹⁵

10. HANDRIM SELECTION:

High forces and torques experienced repetitively through the upper limbs from the handrims contribute to the high levels of pain and injury in MWC users.^{10, 43} Because handrims serve as the interface between person and wheelchair, these have a critical role in guiding effective and safe propulsion. Standard handrims, which have been used for over 50 years, are hoop shaped and made from hard anodized aluminum with a tube diameter of just 19-20 mm. Despite their popularity, traditional handrims often present challenges to users in the form of slips, elevated hand pressures, and reduced mechanical efficiency. The low mechanical efficiency, in part stems from larger muscle groups activating to help stabilize the hand in contact with the rim because solid coupling, which should be achieved by the hands alone, is often complicated by slips and timing errors.⁴⁴ For example, van der Woude, et al.,⁴⁵ has explained that coupling of the hand to the rim is crucial to both propulsion and navigation, where the hand must accurately meet the speed of the rim at the instant of coupling. The coupling must be stable to accommodate the transfer of the rapidly increasing forces from the muscles of the arm and shoulder onto the rim.

Propulsion can be challenging enough without coupling errors which is why handrims have adopted ergonomic designs along with improved customization options for improved friction. An early study by Van der Linden, et al.,^[44] found that handrims with a greater tube diameter showed improved efficiency and lower physiological costs. The more recently developed Natural-Fit Handrim and the FlexRim have also been found to reduce impact loading, pain and fatigue with extended use.^{46, 47} Richter, et al.,⁴⁸ also found reduced finger and wrist flexor activity during manual propulsion with the use of FlexRims. The FlexRim utilizes an ergonomically shaped metallic handrim that connects to the wheel with a high friction urethane surface which conforms to the fit of an individual's hand in the form of a flexible handrim. The Natural-Fit handrim is constructed with a contoured thumb piece and an oval component which provides a superior gripping surface, a place to rest the thumb, and dual surfaces for propulsion and braking. The company claims it offers 80% more surface area for gripping than a standard handrim and weighs 9 ounces more.

Persons with impaired hand function may experience the most pronounced handrim coupling challenges, however several adaptations exist. For example, coated handrims have been produced for years with a variety of materials designed to increase friction between the hands and rim. Coating materials have evolved from vinyl, foams and rubbers to neoprene, which offers superior friction and more durability than earlier materials. The research indicates that adding a high-friction coating to the handrim improves grip and reduces forces necessary to stabilize the hand on the rim.⁴⁹ Handrim projections serve as another option for individuals with adequate arm and shoulder strength who may lack the hand and wrist strength to achieve solid coupling with a standard coated or coated ergo style handrim. While projections allow



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some to “catch” the handrim solidly, they do limit one’s capacity to coast, brake and perform more advanced wheelchair skills.



FIGURE 6 Ergonomic Handrims - The FlexRim conforms to the hand providing more support than a conventional handrim. FlexRim Richter et al., 2006 Arch Phys Med Rehabil Vol 87, December 2006

11. PUSHRIM-ACTIVATED POWER-ASSIST WHEELS (PAPAW):

Manual wheelchairs offer distinct advantages over power mobility because these frames are smaller, lighter, more maneuverable, collapsible and more easily transported – just to name a few. For those who desire these features, however experience fatigue, pain, weakness or limited upper limb capacity, a power add-on system may offer a unique solution. In the past, end-users confronted with these limitations were forced to choose between power or manual mobility. While full power options (power chairs and scooters) reduce physical demands, high costs, size, weight, and space requirements for operation and transportation exclude their use.

Pushrim activated power assisted wheelchairs (PAPAWs) and other power add-on systems have been around for over 20 years; however technological advancements have allowed for more seamless integration into the lives of many MWC users. Over time, PAPAWs and power add-ons have become lighter, more powerful and easier to control and operate. Moreover, end users describe the integration of these technologies as an extension of the body rather than a device to ride in.⁵⁰ For example, most PAPAW systems offer mechanical assistance but still require the user to engage with the handrims to activate motors. Compared with full manual propulsion, PAPAWs require less user strength and endurance to propel, which is ideal for more challenging situations like uneven terrain, carpet or ramps.⁵¹ Additionally, PAPAWs also require less energy demands, resulting in decreased shoulder pain, increased daily travel distances, as well as potential for participation and occupation.⁵³⁻⁵⁵ Although PAPAW systems have improved considerably over time, disassembly can pose challenges for some along with battery replacement.^{50, 54} Furthermore, and not surprisingly, the most significant barrier to obtaining many of these technologies is related to cost and reimbursement.

CONCLUSION:

Ideally, if one relies on a manual wheelchair as their primary mode of mobility it should serve as an extension of the body and meet their unique needs in the present and future. To achieve that end, focus should be directed toward customization, adjustability, durability, proper component selection and lightweight materials. In addition, these factors should be considered in relation to the characteristics of the person, their living environments and goals. Because those who rely on their upper limbs for mobility are already uniquely vulnerable to debilitating injuries, less than optimally configured wheelchairs can exacerbate a host of secondary health complications and diminish quality of life.

With an abundance of interdependent configuration options, the process of optimization may appear daunting, however ample resources exist (please see list of resources below). As stated previously, finding balance is key, and stakeholders should be educated to the maximum extent possible on the effects of a configuration or component choice. Often, end-users are confronted with sacrificing one parameter to achieve another. For example, a new parent may favor a stable wheelchair configuration over one which offers ease of mobility which may then shift back towards mobility as their children become increasingly mobile. Ultimately, as healthcare providers, making informed decisions based on user preferences and evidence-based resources can help us ensure the best outcomes in seating and mobility.

CONTACT THE AUTHOR

Ian can be reached at IANRICE@ILLINOIS.EDU

Ian Rice is an associate teaching professor in the Department of Kinesiology and Community Health Sciences at the University of Illinois, Urbana Champaign. Rice earned his PhD from the University of Pittsburgh in 2010 in rehabilitation science



and technology with a focus on biomechanics. His research interests include the study of interventional and adaptive technologies to promote injury prevention, physical activity, and full life participation in persons with mobility limitations.

RESOURCES

The following are particularly helpful evidence-based resources on the topics of manual wheelchair configuration, component selection, propulsion biomechanics, and upper limb injury prevention:

- Boninger, M., R. L. Waters, T. Chase, M. P. J. M. Dijkers, H. Gellman, R. J. Gironda, B. Goldstein, S. Johnson-Taylor, A. Koontz and S. McDowell, Preservation of upper limb function following spinal cord injury: a clinical practice guideline for healthcare professionals. 2005, Consortium for Spinal Cord Medicine: Washington DC.
- Medola, F.O., et al., Aspects of manual wheelchair configuration affecting mobility: a review. J Phys Ther Sci, 2014. 26(2): p. 313-8.
- Cooper, R.A., et al., Performance of selected lightweight wheelchairs on ANSI/RESNA tests. American National Standards Institute-Rehabilitation Engineering and Assistive Technology Society of North America. Arch Phys Med Rehabil, 1997. 78(10): p. 1138-44.

RESOURCES CONTINUED

- Digiovine CP, K.A., Boninger ML, Advances in manual wheelchair technology. *Top Spinal Cord Inj Rehabil*, 2006. 11: p. 1-14.
- Sawatzky, B., et al., The need for updated clinical practice guidelines for preservation of upper extremities in manual wheelchair users: a position paper. *Am J Phys Med Rehabil*, 2015. 94(4): p. 313-24.

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EVERY DAY WITH EMMITT

Written by: WENDY ALTZER, PT, ATP, AND GINNY PALEG, PT, DSCPT

Have you heard about the “F-Words” in childhood disability?¹ The latest trend in interventions for children with physical impairments is to focus on family, fitness, fun, friends, future and function. Instead of focusing on numerous task repetitions to “perfect” quality of movement, we focus on participation in everyday activities that the child and/or their family wants to do. Let’s make therapy fun and functional; we’ll show you how Emmitt’s family does it!

The updated recommendations² for interventions for children with cerebral palsy (CP) aligns perfectly with this model. The take home message is that we now know the

best ways to improve the lives of children with CP, now and for their future. We know that the best way to decrease stress and increase happiness is to enable the child to be in their

home and the community, coached by an expert clinician, to be active in the things they care about most.³ This works best when therapists “handle” and “facilitate” as little as possible (hands off) and focus less on quality of movement and reflexes.

The International Classification of Function (ICF) provides specific information about what to focus on. Increasingly, we are learning that emphasis should be more on activity, participation, modification of the environment and personal factors. Research shows this shift in focus actually leads to progress in body structure (things like strong bones and muscles) and function (things like bowel function).

Assistive technology is considered a strategy to increase participation in the ICF. We know from Novak,² that we must offer child-active, child-initiated, and caregiver-delivered strategies that are part of natural routines and coached by expert therapists. We know that play-based interventions work best when they involve problem solving. We also know that assistive technology enhances the child’s participation by modifying the environment. This means using power mobility,⁴ a standing frame,⁵ and a gait trainer⁶ (or upright dynamic mobility

“ I WAS BORN WITH CYTOMEGALOVIRUS (CMV). THIS VIRUS CAUSED ME TO BE VERY STIFF AND TO HAVE A HARD TIME CONTROLLING MY MOVEMENTS. THE DOCTORS SAY MY CMV CAUSED MY CEREBRAL PALSY (CP). I ALSO HAVE SEIZURES (EPILEPSY), AND A HARD TIME USING MY EYES (CEREBRAL VISION IMPAIRMENT OR CVI). ”



FIGURE 1 Jamming on the guitar is a favorite activity



FIGURE 2 Biking with my brother is fun



FIGURE 3 Kindness is always the best option

“MY THERAPISTS PROBLEM SOLVE HOW TO DO THINGS IN LIFE WITH ME AND MY PARENTS. IT IS HARD SOMETIMES TO DO WHAT THEY ASK, BUT JUST LOOK WHAT I CAN DO! JUST LIKE MANY PEOPLE WITH MOTOR ISSUES - I AM SMART AND UNDERSTAND YOU. I JUST HAVE A HARDER TIME TO TALK BACK.

system), beginning from 9 to 12 months of age when indicated. This evidence-based pathway is well described in the American Academy of Cerebral Palsy (AACPD) Hypotonia document.⁷

What do the F-words look like in real practice? Let's look at it from 6-year-old Emmitt's perspective.

Emmitt - I was born with cytomegalovirus (CMV). This virus caused me to be very stiff and to have a hard time controlling my movements. The doctors say my CMV caused my cerebral palsy (CP). I also have seizures (epilepsy), and a hard time using my eyes (cerebral vision impairment or CVI). People say I am a Gross Motor Function Classification System (GMFCS) Level IV, because I can roll over and also a Manual Ability Classification System (MACS) IV. I have a team of special doctors at Cincinnati Children's Hospital and a therapy team at home called Milestones in Hurricane, West Virginia. The doctors help me with medicines like Botox and Baclofen (which made me nuts) and keeping my seizures under control and making sure my other body parts work to their best, like my lungs and bowels. My therapists problem solve how to do things in life with me and my parents. It is hard sometimes to do what they ask, but just look what I can do! Just like many people with motor issues - I am smart and understand you. I just have a harder time responding.



FIGURE 4 What boy doesn't like to get a little messy?



FIGURE 5 I can drive and talk at the same time



FIGURE 6 Rocking the drums for Halloween



EVERY DAY WITH EMMITT (CONTINUED FROM PAGE 43)



FIGURE 7 Enjoying my swim on vacation with dad



FIGURE 8 Just chilling after a long day



FIGURE 9 I love my evening walks

FUN

I love to play the guitar with my bonus dad (stepdad)! Preferably hard rock.

I love to go to Katimali's and eat pizza with my friends.

I love to go to school and be with my friends and play.

I love to go to see my friends at therapy and try new things.

I love to swim in warm water.

I love to play with my brother and cousins.

FUNCTION

I prefer to move myself through the world, but there are times when mom needs to do it for me. I have an adapted stroller for that at home and an activity chair on wheels at school. I like to use my power chair especially outside. For the playground and walks, I use my KidWalk (gait trainer) all the time, and I am trying to wear it out. I have an adapted trike for riding, a stander, a bath chair, and a P-Pod chair to relax in. I have orthotics of all sorts to help me; also, I like to swing and swim. I use my right hand the most - usually the middle finger because it works the best.

FAMILY

I live with my mom, stepdad and brother. I also spend lots of time with my dad, grandparents and cousins. They all think there is nothing I can't do - we just have to figure out how I can do it. My little brother tries to help me move when I'm not fast enough for him. I can do big things one day if I can let you know how much I understand; give me a chance!

“I PREFER TO MOVE MYSELF THROUGH THE WORLD, BUT THERE ARE TIMES WHEN MOM NEEDS TO DO IT FOR ME.”

FITNESS

I use all kinds of wheels to get around my world. Exercise wise, my Freedom Concepts trike is a great find. I ride it all the time - even in the store sometimes! I also have a KidWalk, which lets me walk with support for exercise. I go everywhere in it - the playground, the store, and school. My favorite fitness activity is swimming. I use a WaterWayBabies neck ring when I swim, and I can turn in circles and move across the pool. My therapists tell me I need to kick with my legs more, one at a time, when I am swimming, but I like the Aquaman look.

CONTINUED ON PAGE 46

CEU COURSE APPROVAL

NRRTS is pleased to announce that, as an accredited IACET provider, we are now approving Learning Events & Courses.

Please contact Annette Hodges at ahodges@nrrts.org for details or visit the link below.



FOR MORE INFORMATION VISIT:
[NRRTS.ORG/CEU-COURSE-APPROVAL/](https://nrrts.org/ceu-course-approval/)

EVERY DAY WITH EMMITT (CONTINUED FROM PAGE 44)

FRIENDS

I love to meet new friends at school and in my community. I go to school four days a week when I don't have doctor's appointments. Thursdays are therapy days. I can use my communication device to talk with friends, and I love to team up to complete tasks in class or therapy with a friend. I really like it when I can meet with friends for play dates at the accessible playground or my aunt's pizza place. One day we may get a band together ...

FUTURE

My family wants to find a way to help me control my muscle tone, so I am more comfortable in life. I just got pins put in my hips to help guide their growth and keep me stepping in my KidWalk. My family and therapists are always looking for me to be able to try new things and new technology. I love music so maybe one day I will be in some sort of music production. I know I will need surgeries in the future, but with the support of my teams I will get through it.

CONTACT THE AUTHORS

Wendy may be reached at WENDYALTIZER@AOL.COM
Ginny may be reached at GINNY@PALEG.COM

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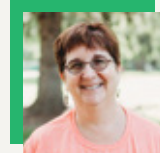
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Wendy Harris Altizer PT, ATP, resides in Hurricane, West Virginia. She practices in the field of pediatric physical therapy for ages birth to 21 in both outpatient and early intervention settings. Her passion is using assistive technology to promote participation. She also serves on the West Virginia Interagency Coordinating Council helping guide policy for early intervention in West Virginia.



Ginny Paleg is a pediatric physiotherapist from Silver Spring, Maryland. For the past 16 years, she has worked with children aged 0-3 years in homes and childcare. Paleg earned her master's degree in physical therapy at Emory University and her DScPT at the University of Maryland Baltimore. Paleg specializes in posture and mobility assessment and interventions for children at GMFCS Levels IV and V. She is certified in Precht General Movement Assessment and the Hammersmith Infant Neurological Exam (HINE). She has published more than 15 peer-reviewed journal articles on standing, gait trainers, and power mobility. Her most recent publications are the American Academy of Cerebral Palsy Hypotonia Care Pathway and a case study on standing with contractures.





Emmitt's F-words Profile



Facebook page: Every Day With Emmitt

Age: 6 years

GMFCS 4 MACS 4

FUNCTION (My strengths or how I do 'stuff'...):

I prefer to move myself but sometimes mom does it for me in my adapted stroller and activity chair. I like to use my power chair and KidWalk. I have an adapted trike for riding, a stander, a shower chair and a P-Pod chair to relax in. I have orthotics to help me. I like to swing and swim. I use my right hand the most to access devices and toys.

FAMILY (My family is...):

big. I live with my mom, stepdad and brother. I also spend lots of time with my dad and grandparents and cousins. They all think there is

FITNESS (I stay fit by...):

riding my Freedom Concepts trike- even in the store sometimes! Using my Kidwalk - I go everywhere in it walking- playground, store, school. My favorite is swimming. I use a WaterWay Babies neck ring when I swim and I can turn in circles and move across the pool like Aquaman.

FUN (I like...):

to play the guitar with my bonus dad - preferably hard rock! - I love to go to Katimali's and eat pizza with my friends - I love to go to school and be with my friends and play - I love to go to see my friends at therapy and try new things - I love to swim in warm water - I love to play

FRIENDS (My friends are...):

at school, therapy, my family and in my community. I go to school four days a week and Thursdays are therapy days. I use my communication device to talk with friends and to team up to complete tasks with a friend. I like it when I can have play dates at the playground or my aunts pizza place. One day we may get a band together.....

FUTURE (My goals are...):

finding a way to help control my tone so I am more comfortable in life. I just got pins put in my hips to help guide their growth and keep me stepping in my Kidwalk. I love music so maybe one day I will be in some sort of music production. I know I will need surgeries in the future but with the support of my teams I will make it!

CRT FUNDING IN THE TIME OF A PANDEMIC

Written by: **CLAUDIA AMORTEGUI**, PRESIDENT, THE ORION CONSULTING GROUP, INC.

What day is it today? Is it the weekend yet? Is my child still out of school? When is the next Zoom call? For many of us, these are daily and even hourly questions; whether you are in the Complex Rehab Technology (CRT) or durable medical equipment (DME) industry or even if you are in many other lines of work.

Who would have thought that after writing my last article just two months ago, life would change so very much? We all are trying to manage a new way of life, which includes trying to learn to safely function under the new parameters, especially for certain job functions. Some of the "rules" we can all recite in our sleep: wash your hands for at least 20 seconds, keep your distance, don't touch your face; however when it comes many in the CRT industry, things became much more difficult.

Obviously, the DME world interacts very closely to those people with compromised immune systems. When it comes to those in CRT, that statement still holds true, but as policies are being adapted to this new (and hopefully temporary) "normal," it is not at the top of the line like respiratory equipment. This is not to say that CRT is not critical, but as this pandemic exploded, respiratory was an obvious focus.

I have to say the Centers for Medicare and Medicaid Services (CMS) came out of the gate much more quickly than I would normally expect. There were some sweeping comments from CMS that portrayed the relaxing of certain medical and regulatory policies but not surprisingly, the rules were not very detailed. Many of us were inundated in multiple conference calls trying to dissect everything said and documented. This only led to even more questions. Not only did these questions affect CRT providers/suppliers, but also the clinicians who worked directly with the CRT clients.

On top of the policy questions, everyone from the clinicians to the suppliers/ATPs delivery personnel and technicians, had to learn and work around the distancing that was needed by everyone; this created a whole different kind of mess.

As for the clinicians, the first couple weeks were moving targets. If they were a part of a large facility or health care system, they were juggling the constant changes being made within their own organizations. Meanwhile, they were trying to determine the best way to provide for their patients. Not only did everyone have the same concerns for themselves and their clients, but there also were the bigger questions on what the funding sources would do and what they would require.

As mentioned earlier, CMS was announcing the easing of certain regulations, but the issue was the entire durable medical equipment, prosthetics, orthotics and supplies (DMEPOS) industry questioned what everything actually meant to them. To date, we have some



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I HAVE LEARNED THAT DURING THIS PERIOD, WE ARE ALL GOING TO HAVE TO BECOME EXPERTS IN PATIENCE – AT HOME AND AT WORK.

answers, but we also still have a lot of questions. What made everything harder is that although CMS would make certain announcements, the Medicare MACs (Noridian and CGS) had yet to receive their own instructions on how to implement the changes. The individual Medicaid and private insurance plans also had to understand how they would execute updated policies during this unknown time.

Medicare did announce that the face-to-face requirements were being lifted during this public health emergency for all products EXCEPT power mobility devices (PWCs and scooters). However, they did also announce the relaxing of the requirements for telehealth. During the public health emergency, practitioners (MD, DO, NP, PA, CNS) could perform a face-to-face visit via more common methods – such as FaceTime, Skype, Zoom, or their own internal portals.

The industry then understandably asked about the required specialty seating evaluation to be performed by an experienced seating and positioning therapist for CRT wheelchairs. Could those be done via telehealth? For me, this was not such a simple question. I am not a therapist, but I have been in this industry long enough to have learned that for most CRT seating/wheelchair evaluations, the therapist needs to get their hands on the client. But then, we have this need for social distancing and being extra careful with those whose health is compromised. I could see it for those end-users that needed some modifications with their current system or other similar issues. At the end of the day, it would be the clinicians who would determine when telehealth was appropriate for their patients. Another problem was CMS had not included the wheelchair management CPT code within the easing of the telehealth regulations. As of the writing of this article, we are still concerned the therapists will not be paid for their services if performed via telehealth.

Another obvious concern was the required end-user signatures on all the delivery documentation (i.e., delivery ticket, assignment of benefits, purchase option letter, etc. ...) Understandably, many end-users did not want to be in such close proximity to anyone. CMS had a statement in the interim final rule with comment period saying: For the duration of this public health emergency, for COVID-19 pandemic, it is in the best interest of patients, health care professionals and suppliers to limit face-to-face encounters and avoid exposure of vulnerable Medicare beneficiaries to COVID-19. Therefore, on an interim basis, we are finalizing that to the extent and NCD or LCD (including articles) would otherwise require a face-to-face or in-person encounter for evaluations, assessments, certifications or other implied face-to-face services, those requirements would not apply during the public health emergency for the COVID-19 pandemic. The industry has asked for confirmation this would apply to suppliers and all the delivery documents, including home assessments. In the meantime, this has been assumed by most, since everyone is trying to work around the situation. Companies just need to be certain things are documented as well as possible, since audits will likely follow when all of this is done.

One of my biggest concerns actually does not have to do with the documentation or policies. I am worried that through this pandemic the industry may tear apart what we have worked on for so long. The CRT industry has been trying to educate funding sources and Congress on the complexity of the products and the process. We have fought for their understanding of the importance, knowledge and training of ATPs and the needed involvement of specially trained therapists. If the industry pushes for the removal of certain requirements during this public health emergency, it could cause future questions. We need to find the happy medium. Yes, suppliers and clinicians need to be safe for both themselves and their clients. In many cases, this means that evaluations, and maybe even some deliveries, will be put on hold until a bit of time passes, unless it is truly an emergency situation for the client. I have learned, during this period, we are all going to have to become experts in patience – at home and at work. As everyone keeps saying, we will get through this together. Just do not forget about the clients or the audits.

CONTACT THE AUTHOR

Claudia may be reached at
INFO@ORIONREIMBURSEMENT.COM

Claudia Amortegui has a Master of Business Administration and more than 20 years of experience in the DMEPOS industry. Her experience comes from having worked on all sides of the industry, including the DMEPOS Medicare contractor, supplier, manufacturer and consultant. For many of these years Amortegui has focused on the rehabilitation side of the industry. Her work has allowed her to understand the different nuances of complex rehab versus standard DME. This rare combination of industry experiences enables Amortegui and her team at The



Orion Group to assist ATPs, referrals, reimbursement staff and funding sources in understanding the reimbursement process as it relates to complex rehab.



“WHAT WILL THE FUTURE BRING?”

Written by: WEESIE WALKER, ATP/SMS, EXECUTIVE DIRECTOR OF NRRTS

KEEP THE FAITH! WE WILL GET THROUGH THIS AND COME OUT STRONGER IN THE END.

As I sit here in my pajamas writing this article, many different ideas are going through my mind. What will the future bring?

Someday, we will look back on 2020 as the year of monumental disruption in every person's life. No one has ever been through anything like this situation. We will certainly reminisce about searching for toilet paper, rubbing alcohol, hand sanitizer and N95 masks. And, we will talk about the new terms we learned: “social distancing” and “zoom-bombing.”

My hope is we will also reflect on the powerful lessons we took away from this pandemic.

- Together, we can get through anything. Despite all the sadness and loss, we see people, groups and organizations coming together to find answers and resources. Sharing ideas, strategies and solutions makes everyone stronger.
- Complex Rehab Technology (CRT) Suppliers continued to provide necessary services to their customers. This is essential to their well-being. Everyone stepped up. Let us keep that momentum going forward.
- Telehealth has a place but will never replace the hands-on aspect of evaluation and fitting of CRT. We can get a firsthand look at how telehealth can make the process faster and smoother. This technology is a great opportunity to see how a person functions in their home environment.
- o Working from home can be wonderful ... especially the dress code!

Keep the faith! We will get through this and come out stronger in the end.

“The ultimate measure of a man is not where he stands in moments of comfort and convenience, but where he stands at times of challenge and controversy.” Martin Luther King, Jr.

CONTACT THE AUTHOR

Weesie may be reached at WWALKER@NRRTS.ORG

Weesie Walker, ATP/SMS, is the executive director of NRRTS. She has more than 25 years of experience as a Complex Rehab Technology supplier. She has served on the NRRTS and GAMES board of directors and the Professional Standards Board of RESNA. Throughout her career, Walker has worked to advocate for professional suppliers and the consumers they serve. She has presented at the Canadian Seating Symposium, RESNA Conference, AOTA Conference, Medtrade, ISS and the NSM Symposium. Walker is a NRRTS Fellow.



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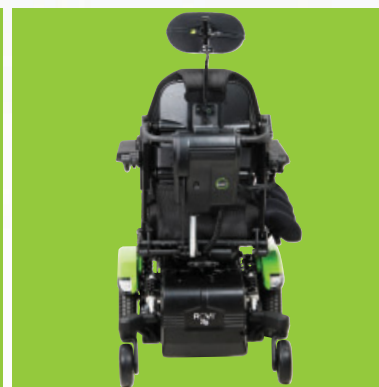
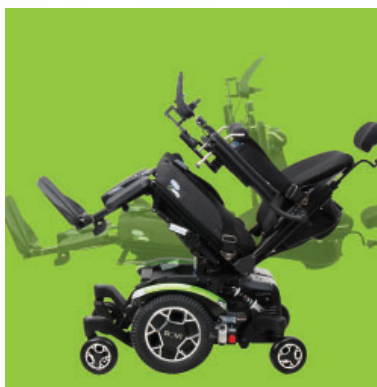
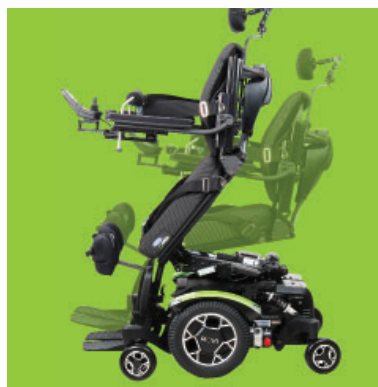
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NEW NRRTS REGISTRANTS

Congratulations to the newest NRRTS Registrants. NAMES INCLUDED ARE FROM FEB. 28 THROUGH APRIL 28, 2020.

Marc Bailey, RRTS®

Henley Medical
1090 McCallie Ave
Chattanooga, TN 37404
Telephone: 423-698-4200 x.6
Fax: 423-629-8810
Registration Date: 3/16/2020

Michael Bissonnette, RRTS®

National Seating & Mobility, Inc.
2747 Enterprise Ave Ste 4
Billings, MT 59102-7412
Telephone: 406-969-4733
Registration Date: 4/21/2020

James Drechsel, ATP, CRTS®

National Seating & Mobility, Inc.
65 Shiloh Rd
Asheville, NC 28803-2929
Telephone: 828-772-5398
Fax: 828-277-2581
Registration Date: 2/28/2020

Olga Fomina, ATP, CRTS®

National Seating & Mobility, Inc.
2462 Tripaldi Way
Hayward, CA 94545-5017
Telephone: 510-363-7502
Registration Date: 4/9/2020

Andrew Foster, OTR, ATP, CRTS®

Numotion
1101 Stones River Ct
LaVergne, TN 37086
Telephone: 615-895-5224
Fax: 615-895-4203
Registration Date: 4/22/2020

Xavier Gutierrez, RRTS®

National Seating & Mobility, Inc.
1125 E Stanford Ct
Anaheim, CA 92840
Telephone: 714-939-9322
Registration Date: 3/11/2020

Wayne Iba, ATP, CRTS®

National Seating & Mobility, Inc.
1125 E Stanford Ct
Anaheim, CA 92805
Telephone: 714-739-9322
Fax: 714-939-9323
Registration Date: 3/23/2020

Jenifer Johnson, PTA, ATP, RRTS®

National Seating & Mobility, Inc.
3347 Enterprise Rd
Norfolk, VA 23502
Telephone: 757-334-5070
Fax: 757-455-8536
Registration Date: 3/18/2020

Sochetra Kong, ATP, RRTS®

Rehab Medical
2700 NE Expy Bldg C Ste 800
Atlanta, GA 30345
Telephone: 470-528-0986
Registration Date: 3/27/2020

Shadrach Lee, RRTS®

National Seating & Mobility, Inc.
1775 Old Hwy 8 NW Ste 103
New Brighton, MI 55112-1891
Telephone: 651-756-7419
Registration Date: 4/15/2020

Carlos Rosas, RRTS®

Medtech Services, Inc.
555 Gentry Way
Reno, NV 89502-4612
Telephone: 775-826-2022
Fax: 775-826-6040
Registration Date: 4/28/2020

Jamin Sprague, ATP, CRTS®

Numotion
3433 S Buntin Ct
Kennewick, WA 99337-3174
Telephone: 509-221-9787
Registration Date: 3/31/2020

Katherine Warner, ATP, RRTS®

Numotion
1221 Profit Dr
Dallas, TX 75247
Telephone: 972-849-2533
Registration Date: 4/21/2020

Neal Webb, RRTS®

Medtech Services, Inc.
555 Gentry Way
Reno, NV 89502-4612
Telephone: 775-826-2022
Toll Free:
Fax: 775-826-6040
Registration Date: 4/1/2020

FORMER NRRTS REGISTRANTS

The NRRTS Board determined RRTS® and CRTS® should know who has maintained his/her registration in NRRTS, and who has not.

NAMES INCLUDED ARE FROM FEB. 28 THROUGH APRIL 28, 2020.

FOR AN UP-TO-DATE VERIFICATION ON REGISTRANTS, VISIT WWW.NRRTS.ORG, UPDATED DAILY.

Luis Amaro Doral, FL

Ralph M. Booker, ATP Pittsburgh, PA

James Dauber, OTR/L, ATP Springfield, MO

Michael A. Gartner, ATP Asheville, NC (Retired)

Scott Lucia Fort Walton Beach, FL

Paul Martin Gulf Breeze, FL

Michael Pisano, ATP Belleview, FL

Dennis Ponczek, ATP Countryside, IL

Kenmakara Sok, ATP Houston, TX

CRTS®

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James Drechsel, ATP, CRTS®

National Seating & Mobility, Inc.
Asheville, NC

Olga Fomina, ATP, CRTS®

National Seating & Mobility, Inc.
Hayward, CA

Andrew Foster, OTR, ATP, CRTS®

Numotion
LaVergne, TN

Wayne Iba, ATP, CRTS®

National Seating & Mobility, Inc.
Anaheim, CA

Brian Littlefield, ATP, CRTS®

National Seating & Mobility, Inc.
Bangor, ME

Christi McKim, MS, OTR/L, ATP, CRTS®

National Seating & Mobility, Inc.
Louisville, KY

Jamin Sprague, ATP, CRTS®

Numotion
Kennewick, WA

RENEWED NRRTS REGISTRANTS

The following individuals renewed their registry with NRRTS between Feb. 28 through April 28, 2020.

PLEASE NOTE IF YOU RENEWED AFTER APRIL 28, YOUR NAME WILL APPEAR IN A FUTURE ISSUE OF DIRECTIONS.

IF YOU RENEWED PRIOR TO FEB. 27, YOUR NAME IS IN A PREVIOUS ISSUE OF DIRECTIONS.

FOR AN UP-TO-DATE VERIFICATION ON REGISTRANTS, PLEASE VISIT WWW.NRRTS.ORG, WHICH IS UPDATED DAILY.

Jeremy Adkins, BS, ATP, CRTS®

Sarah Anderson, ATP, CRTS®

Amy Askelson, ATP, CRTS®

James Randall Blackwell, ATP, CRTS®

Reggio Blackwell, RRTS®

J. Gregg Blanchard, ATP, CRTS®

Christopher Boyd, ATP, CRTS®

Christopher E. Bridgeman, ATP, CRTS®

Orenthal Brown, RRTS®

Jorge Cabrera, RRTS®

William Cavender, ATP, CRTS®

Cyle Cook, ATP, CRTS®

Peter Eastman, RPTA, ATP/SMS, CRTS®

Michael A. Edney, ATP, CRTS®

Steven Edwards, ATP, CRTS®

Karl Thomas Eklund, ATP, CRTS®

Brent P Fadler, ATP, CRTS®

E. Scott Filion, ATP, CRTS®

Gregory M. Fleming, ATP/SMS, CRTS®

Stephen A. Frangione, ATP, CRTS®

David Glancy, ATP, CRTS®

Johnathan Grimes, ATP, CRTS®

Richard Gross, RRTS®

Michele A. Gunn, ATP, CRTS®

Raoul K. Harlan, ATP, CRTS®

Chad E. Hayes, COF, ATP, CRTS®

Corey Hileman, ATP, CRTS®

Michael Hohler, ATP, CRTS®

Edward B. Homan, ATP, CRTS®

Justin Horn, ATP, CRTS®

Darryl Hosmanek, ATP, CRTS®

Blaine Hunt, ATP/SMS, CRTS®

Ryan Jewell, ATP, CRTS®

Kevin Jones, MS, ATP, CRTS®

Joseph L. Kelley, ATP, CRTS®

Anne L. Kieschnik, ATP, CRTS®

John Lanier, ATP, CRTS®

Jeffrey M. LaRosa, ATP, CRTS®

Robert Lees, RRTS®

Thomas H. Linder, Jr., ATP, CRTS®

Shad Lofgreen, RRTS®

Scott Lopez, OTR/L, ATP, CRTS®

Robert Lyles, ATP, CRTS®

Nathan Lyon, ATP, CRTS®

Ryan A. Martin, ATP, CRTS®

Marc Martinez, RRTS®

Jason Ray Miller, ATP, CRTS®

Debbie Morgan, ATP, CRTS®

David T. Murray, ATP, CRTS®

Roxann Nasello, ATP, CRTS®

Dan Nederhood, ATP, CRTS®

Valerie A. Pagan, ATP, CRTS®

James Parnell, ATP, CRTS®

Michael F. Peterlin, ATP, CRTS®

John Petter, ATP, CRTS®

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Kurtis L. Schmidt, ATP, CRTS®

Randy Schmitt, ATP, CRTS®

Timothy A. Schrag, ATP, CRTS®

Brian McKenzie Shoemaker, ATP, CRTS®

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