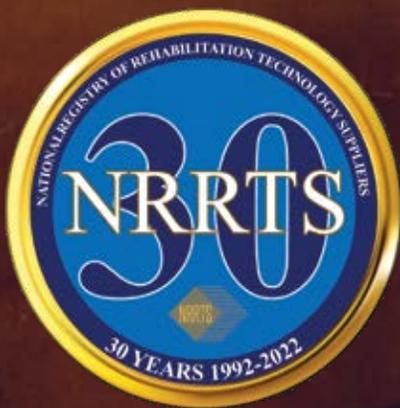


DIRECTIONS



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Page 32



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IN THIS ISSUE

6 FROM THE NRRTS OFFICE
Thank you, Gerry!

8 INDUSTRY LEADER
Advocacy: A Marathon Not a Sprint

12 SALUTE TO DON CLAYBACK
Thank you, Don!

14 LIFE ON WHEELS
Balancing Hope and Reality

16 CLINICALLY SPEAKING
There is Much to Be Done

20 THE FIGHT FOR FUNDING
The Fight for Funding: Power Seat Options and the Electronics to Operate Them

24 CLINICIAN TASK FORCE
The Clinician Task Force, a 2022 Industry Update

26 CRT UPDATE
CRT Virtual Congressional Fly-In

32 CLINICAL PERSPECTIVE 
CEU ARTICLE
Seminal Innovations in Complex Rehab Technology Seating and Positioning

44 CLINICAL EDITORIAL
Seating and Wheeled Mobility Recommendations: Be Specific!

46 REHAB CASE STUDY
Positioning and Pulmonary Function

50 WEESIE'S WORLD
Travelers in the Wilderness

52 RESNA
RESNA Certification News

54 DIRECTIONS CANADA
Clinician's Overview of Health Canada Licensing Requirements

IN EVERY ISSUE

56 | New NRRTS Registrants

57 | New CRTS® and Former Registrants

58 | Renewed NRRTS Registrants

Back Cover | Charter Corporate Friends of NRRTS,
Corporate Friends of NRRTS, Association Friends of NRRTS

FROM THE EDITOR-IN-CHIEF

Change, Change, Change

NRRTS has a new president – Carey Britton, ATP/SMS, CRTS®, took the helm in mid-August. Welcome, Carey. We are excited to have you. NRRTS would also like to thank Gerry Dickerson, ATP, CRTS®, for his service as president. Gerry is an excellent RTS and an even better friend. Finally, NRRTS would like to thank Don Clayback for his service at NCART. We wish Don the best in his future endeavors.

Amy Odom, BS

ADVERTISERS

ALTIMATE INSIDE FRONT COVER

ATLAS..... PAGE 51

CLARKE HEALTHCARE..... PAGE 56

CLINICIAN TASK FORCE PAGE 25

ETAC..... PAGE 03

MK BATTERY PAGE 07

PRIME ENGINEERING..... PAGE 55

RIDE DESIGNS PAGE 28

STEALTH..... INSIDE BACK COVER

SYMMETRIC DESIGNS..... PAGE 05

US REHAB PAGE 17

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THANK YOU, GERRY!

Written by: CAREY BRITTON, ATP/SMS, CRTS®

Please help me extend a huge thank you and show great appreciation for Gerry Dickerson for his dedication, sweat and tears for NRRTS and our Industry. Dickerson has become a living legend within our industry, and hopefully will continue to be outspoken with his views as the historian of our industry. Dickerson made a comment in DIRECTIONS, Vol. 5 of 2019, stating to take a moment and ask yourself, "Am I doing even half of what Elaine Stewart does?" Dickerson's lead-by-example approach has impacted many of us, challenging us to elevate the profession, challenge the status quo, and increase registration and standards — helping to leave the industry better. I will restate his question: When we become frustrated with our industry, are you doing what you can do to make it better? Let one of Dickerson's legacies be to make our actions speak louder than our words. Let's stop waiting for others to change the industry, NRRTS needs you to get involved.

For those of you who have not met me, I originated from upstate New York and moved to Florida in 1988. My dad and I partnered in a mobility business in 1992 and then my dad passed away a year later. With the help of my mother, we had a successful business for many years. In 2015, the business was acquired by NSM, and due to my passion for helping people, I have continued to fine-tune my profession. I joined NRRTS after I was called out by Michele Gunn for complaining about the state of the industry.

It is bittersweet for me to be elected president by the elite in seating and mobility; in the 30th year of NRRTS, as I also celebrate my 30th year in the seating/mobility industry. I am so fortunate in my 30 years, I have never sat in bed dreading to get up for work. I was at a conference outside our industry this past year, and I was asked what I do for a living. When I explained, I meet with people, listen to their seating/mobility challenges and then create and implement a solution to enable people to regain their mobility and freedom. The people I was speaking with, train marine mammals (a dream job?), and they were jealous of what I do. There are no other professions, I am aware of, that can give you this level of satisfaction, humility and appreciation.

I am very optimistic in 2022, with all our progress from the efforts of our amazing volunteer board of directors, our hardworking and committed NRRTS staff, our supportive Friends of NRRTS and our partners within the industry. Although we have not been able to get a carve out for Complex Rehab Technology (CRT) yet, we are recognized as specialized durable medical equipment, and are slowly making progress in states on the value of the CRTS®. Our DIRECTIONS magazine continues to improve; despite being the best product in the industry. Our CEU programs offer the most up-to-date tools/trends and education from the foremost leaders in our industry. I am thankful for our continued advocacy efforts with more Registrants stepping up to get involved with issues negatively affecting our industry. Finally, our certificate program will be a game changer in helping guide people along a path to becoming a CRTS®. This program has been a focus of NRRTS, as many of us are nearing the end of our career, to perpetuate and escalate the industry.

Although our 30th year is a time to celebrate, it is not a time to rest on our past. There are always challenges to affect our ability to provide the critical services we offer. CRT is such a small part within the health care system, and without our LOUD voice and commitment to showing the world what we do makes a difference. When we have a chance to tell our story, people understand the value. Although NRRTS is an amazing organization, it is only as good as those who get involved and act. NRRTS is not a Union but an organization to guide and support its Registrants to move the industry in a direction that will be there for generations.

Please help me during my term as your president to grow NRRTS Registration and to increase engagement to make CRT thrive.

CONTACT THE AUTHOR

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CAREY.BRITTON@NSM-SEATING.COM



Carey Britton, ATP/SMS, CRTS®, is president of NRRTS. Britton works for National Seating & Mobility in Pompano Beach, Florida.



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ADVOCACY: A MARATHON NOT A SPRINT

Written by: ROSA WALSTON LATIMER



Don Clayback speaking at panel discussion regarding CRT federal legislation.

Don Clayback has been a prominent advocate for Complex Rehab Technology (CRT) for 37 years, serving as executive director of the National Coalition for Assistive and Rehab Technology (NCART) for the past 13. Although he left that position at the end of September, Clayback is not retiring. "The past two months, I have been working with our incoming executive director, Wayne Grau, as he transitions into his responsibilities, Clayback said. "I don't yet have anything definite in place for my next step, but I will be exploring opportunities and hope to stay involved in this arena in some manner." Whatever that next step is, Clayback will continue to use his focus and commitment to promote and protect access to CRT.

WOULD YOU GIVE US A BRIEF OVERVIEW OF YOUR CAREER AND HOW NCART WAS ORGANIZED?

In 1985, I was enjoying a successful career as a Certified Public Accountant (CPA) when my father-in-law invited me to join his medical equipment business, Dowd Medical, in Buffalo, New York. At that time, CRT wasn't as popular a term as now, but we provided custom seating and mobility and various adaptive equipment, along with basic durable medical equipment (DME). I was involved in both management of the company

and worked in the field doing evaluations, fittings and training. After about 10 years, we sold the company to a large respiratory business in Buffalo. I stayed on for a year and then began consulting in the industry on the operations and financial side. During my provider years, I got very involved with The MED Group as a member company and served on the board of directors. After eight years of consulting, I joined The MED Group as vice president of networks, managing the rehab, respiratory and repair networks for six years.

Through my rehab network responsibilities with The MED Group, I became a member of the small group that founded NCART in 2004. Eleven of us from within the industry formed this new organization to address the specific needs and future of the CRT industry. I joined as a founding board member and took on the offices of secretary and treasurer. I helped with the early development of NCART and eventually became the second NCART executive director in 2009.

WHAT WAS THE NEED THAT PRECIPITATED THE ORGANIZATION OF NCART?

The companies and individuals deeply involved in CRT saw a need to establish a distinct CRT message and identity. At that time, third-party payers focused on the DME category, and while CRT is a small part of that category, the provision process and end users are very different from standard DME. We realized we needed an organization whose sole mission was to promote and protect access to CRT for people with disabilities. That continues to be the organization's one-sentence mission statement. It is simple but underscores the critical need for promoting a distinct CRT identity by educating policymakers and legislators about what this specialized equipment is, who uses it, the benefits it provides, and what needs to be done to ensure that access is protected. Because it is a small segment of the bigger DME industry, CRT and the people who depend on it can easily get lost in policy discussions and decisions. We need to prevent that from happening.

WHAT IS THE SPECIFIC FOCUS OF NCART?

NCART's emphasis is to establish the coverage and funding policies that need to be in place to give people with disabilities the access to CRT they need. To do that, we focus on three areas. First, educating on what CRT is all about. Before discussing issues that compromise access, people need to know what CRT is and why access is important. Second, we assemble needed workgroups and develop and execute advocacy plans to resolve whatever issue is



Weesie Walker, NRRTS executive director, and Don Clayback, then NCART executive director, at NCART/NRRTS Annual CRT Conference.



Don Clayback and fellow CRT advocates meeting with Rep. Jim Langevin, chair of Congress' Bipartisan Disability Caucus.

in play or to establish needed policy improvements. And third, we collaborate with other impacted groups and organizations to bring the right voices to the table. Those voices include providers, manufacturers, consumers, clinicians and other stakeholders. The involvement of the combined CRT community has been and will continue to be the foundation for change.

Although we focus advocacy efforts at the federal level on Medicare, NCART has also made progress on the state level as state Medicaid programs play a significant role in access to CRT. Medicaid is more difficult to work with because every state has different policies, whereas with Medicare, you are working with one entity. Sometimes when people hear the word 'Medicare,' they think it relates to older people and doesn't impact someone who is younger and using CRT. However, Medicare policies are important because Medicare is a significant reference for other payers. Medicaid organizations look at what Medicare covers, as do commercial payers. If we can influence positive change at the Medicare level, those improvements will flow to Medicaid programs and commercial payers.

WHAT ARE SOME OF THE SUCCESSES THE ORGANIZATION HAS ACHIEVED?

NCART has held a leadership role in many initiatives, but certainly, it has been the entire CRT community that has come together to make things happen. The first big success was in 2008 when we worked with Congress and obtained an exemption that kept CRT wheelchairs from being included in Medicare's competitive bidding program. That literally took an act of Congress! While NCART led this initiative, the credit needs to be spread across a broad spectrum, including CRT providers and manufacturers, consumer organizations, other

CONTINUED ON PAGE 10

THE INVOLVEMENT OF THE COMBINED CRT COMMUNITY HAS BEEN AND WILL CONTINUE TO BE THE FOUNDATION FOR CHANGE.



Don Clayback (center) at United Spinal Association Roll on Capitol Hill with fellow advocates.



CRT ADVOCACY AND POLICY CHANGE IS A MARATHON, NOT A SPRINT. YOU MUST BE PREPARED TO PUT IN THE TIME AND STAY ON TASK.



Don Clayback enjoys his annual Buffalo Bills away-game trip with his college buddies and is looking for "super" things this season.

ADVOCACY: A MARATHON ... (CONTINUED FROM PAGE 9)

industry organizations, caregivers, occupational and physical therapists, and physicians who came together under the CRT community umbrella.

Similar advocacy efforts focused on creating a separate benefit category for CRT, segregating it from DME. The outcome would be similar to how orthotics and prosthetics were given their benefit category. We communicated the need for policymakers to understand that CRT has many unique aspects when considering the complexity of the equipment, the people with disabilities who use it, and the significant evaluation and configuration process based on the person's specific medical and functional needs. We were successful in getting federal legislation to create a CRT separate benefit category introduced in Congress. Unfortunately, other pressing issues have taken priority. We have been successful with some pieces of this initiative and are reevaluating the best strategy moving forward, given the current environment.

Another significant success was, over approximately a five-year period, getting multiple bills passed in Congress and eventually getting Centers for Medicare and Medicaid Services (CMS) to make Medicare policy changes so that payment cuts didn't hit essential components of CRT wheelchairs. Until this was accomplished, Medicare attempted to inappropriately apply competitive bid payment rates to accessories used with CRT manual and power wheelchairs. The term "accessories" is misleading because that

tends to suggest cup holders or floor mats that you can add to a car. Medicare classifies almost anything aside from the frame of the wheelchair as an accessory. They were looking at cutting payments for important components that someone needs to make a wheelchair individualized to them. The impact of this would have extended beyond Medicare to many other payers and hurt people with disabilities across the country.

When I talk to folks about advocacy results, I always try to find a balance. It is important to recognize the tangible achievements that have resulted from everyone's investment and hard work. That doesn't mean we don't have more work to do. But hopefully, it shows advocates the fact you sent an email to your member of Congress, made a phone call or came to Washington, D.C., for our annual conference can ultimately make a difference. When you are involved in CRT advocacy, it can be a challenge because it isn't as simple as spending 30 days getting a petition signed, and suddenly, we have a fix. CRT advocacy and policy change is a marathon, not a sprint. You must be prepared to put in the time and stay on task. You can get to that finish line, but you need to remain focused and persistent throughout the process.

WHAT OTHER ORGANIZATIONS HAVE SUPPORTED NCART'S MISSION?

I often refer to NRRTS and NCART as sister organizations. The relationship and collaboration of the two organizations have been a big part of the CRT successes that we have achieved. NRRTS has been involved in some level of collaboration in our accomplishments. Both personally and organizationally, I value what NRRTS brings to the table and appreciate the support that NRRTS gives to NCART and the industry.

In addition, our collaboration with RESNA, the Clinician Task Force, U.S. Rehab and leading manufacturers and providers have been crucial in the work of NCART. On the consumer side, many organizations have been key collaborators through the years, such as the United Spinal Association, ITEM Coalition, Christopher and Dana Reeve Foundation, ALS Association, Spina Bifida Association, Paralyzed Veterans of America and National Multiple Sclerosis Society. Access to CRT is vital to the members of these groups. Still, they have many other issues they need to advocate for, so NCART sincerely appreciates their commitment and support of our work.



Don Clayback and his kids enjoying the Buffalo summer on Lake Erie (left to right: son-in-law Ian, daughters Cara and Kelsey, son Andrew)



Don Clayback and New York State CRT Delegation about to visit Sen. Chuck Schumer's office as part of National CRT Conference.

GOING FORWARD, WHAT IS A CHALLENGE YOU SEE FOR THE CRT COMMUNITY?

Of course we face many challenges, and they are constantly changing. The main challenge is to increase advocacy time and resources to educate federal and state legislators and policymakers on the needed coverage and funding improvements to support the provision of CRT. This includes creating the right environment so CRT manufacturers can design and produce innovative products. We also need to provide the right environment so CRT providers can serve the people in their local communities, supplying the right individually configured equipment and critical supporting services.

The proper standards and safeguards must be established to ensure people with disabilities receive the dependable products and professional supporting services they require.

Another challenge is increasing the CRT workforce by encouraging the development of rehab technology professionals and rehab/repair technicians. A positive move helping bring younger generations into our industry is being made at several universities offering educational tracks to address this. You also see many CRT companies looking to develop individuals internally, which is great.

I don't think you can have a better profession or career, whatever role you may have in our industry. We can make a dramatic, positive difference in someone's quality of life. What could be more fulfilling than that? Those who have personal experience in the work of CRT need to share this important message.

CONTACT

Don may be reached at DCLAYBACK@GMAIL.COM



Don Clayback is the former executive director of the National Coalition for Assistive and Rehab Technology (NCART), a national association of Complex Rehab Technology providers and manufacturers that promotes and protects access to CRT. Don has 37 years of experience as a provider, consultant and advocate in the Complex Rehab Technology and Home Medical Equipment industries. He has been recognized nationally for his industry and advocacy work and is a frequent speaker at state and national conferences.

THANK YOU, DON!

Don,

It's hard to believe we are saying goodbye to you as executive director at NCART!

I'll miss all our conversations about advocacy, politics and CRT.

Thanks for all the hard work, passion and commitment to advance the promise of CRT.

But I believe we can all rest assured in the fact that you will not drift too far away from your CRT family.

All the best in what the next chapter brings.

Gerry Dickerson, ATP, CRTS®

Don, you've been a champion for the Complex Rehab Industry. Your unwavering message to Congress has assisted our ability to provide needed equipment to those that do not always have a voice of their own. Thank you is not enough! Know your efforts are very much appreciated, and you will be missed.

Thank you; you will be missed.

Elaine Stewart, ATP, CRTS®

Don,

It's hard to believe that we are staring down your NCART exit — the time has passed so swiftly! So much has happened during your tenure! I am thankful to you for your years of service and dedication to the CRT industry.

Wishing you the very best for you.

Denise Harmon, ATP, CRTS®

Thanks, Don, for the many years of dedication to our like cause of protecting access to CRT for consumers. I wish you well in the future and will miss watching one of the best cat herders in action.

Michele Gunn, ATP, CRTS®

Don,

We appreciate all your dedication toward the improvement of our industry and access to the consumer. It has been a pleasure working with you and know that you will be missed.

Carey Britton, ATP/SMS, CRTS®

Don, Thanks for all you have done over the years to make a difference in the CRT industry. Through your leadership, we have accomplished some great things. NCART and the CRT industry are in a better place thanks to your efforts. I've truly appreciated your collaboration and friendship as we fought to improve access to CRT for those we serve. All the best in your future endeavors!

Gary Gilberti

Don, I am so thankful to have gotten to know you this past year and for your guidance to the Clinician Task Force. Your understanding and patience while tackling tough issues is unparalleled. We would not be the organization we are without your support. We wish only the very best for you in your future endeavors!

Cara Masselink, executive director, Clinician Task Force

Don,

Congratulations! Thank you for the many years of leadership and service to NCART. The industry and NCART are in a much better position today as a result. Hope your future plans provide an opportunity to remain active in CRT advocacy.

All the best,

Seth Johnson, Quantum Rehab

NCART Board and Executive Committee member

Working closely with you for the last 10 years has been a privilege. You have steadily demonstrated an unmatched commitment to the work of protecting access to Complex Rehab Technology and invested countless hours in laying foundations that equip our industry for past, present and future challenges. You are a true leader, mentor, advocate and friend. I am forever grateful for the opportunity I've had to learn from you and even more thankful you plan to continue working in the CRT space in some capacity. Don, thank you for your dedication, your persistence and your direction. Very best wishes to you in the next chapter!

Mickae E. Lee, Associate Director, NCART

Don,

Thank you for your tireless work ethic and attention to detail during your tenure as executive director of NCART.

Greg Packer

You have served as a strong leader with a clear vision in your role as executive director of NCART. My hope, and expectation, is this ending will make room for a new beginning. You still have so much more to offer, and there are too many issues to solve for you to merely become a new page in the storybook of CRT leaders.

I have had the pleasure and honor of working alongside you for several decades. I have learned from you, I admire you, respect you and consider you a friend. You are driven, passionate, organized, ethical and have (ridiculously) high expectations of yourself.

The side of you that you hide tells a slightly different story ... you are funny too. I laugh when I think about the "ice breakers" you used to pass time at NCART board dinners while waiting for meals to be served. Your repertoire consists of things like, "Tell us your favorite movie," or my favorite, "Tell us a secret about yourself that no one knows" ... you know, those things you always wanted to share in public, but no one asked.

Compassion is another part of your nature. You pick up the phone to call people when tough life experiences hit them. It doesn't matter how busy you are or how hard the phone call will be! You sincerely listen and genuinely care; not just once, as often as needed. You are an amazing father, son and friend. As hard as you work, you find time for the people in your life who matter the most.

Please don't let me leave you with the impression that you are perfect ... no way ... you are better than that ... you are authentic. I can only hope our paths continue to cross.

Rita Stanley

I would like to thank you not only for your incredible service to our industry but also for inspiring me to personally get involved politically on issues that directly affect our industry.

I never imagined I would one day sit in a senator or representative's office in Washington, D.C., to discuss CRT issues and concerns affecting the patients and families that we all serve.

I'm also so grateful for the opportunity to serve on the NCART Board of Directors.

Don, know you have made a tremendous difference for our industry

that has made it better and allows for us to serve the patients and families that need CRT.

We still have a long way to go, but you have set a strong foundation for the next chapter to begin.

Best wishes!!!

Michael K. Barner, ATP, CRTS®

I would like to take this opportunity to thank you, Don, for your commitment, your hard work and your leadership at NCART. I have known you for over 20 years, and I worked with you when you were at The MED Group and when you joined NCART to help protect Complex Rehab Technology companies from egregious legislation and regulation. The industry owes you a great deal of appreciation and admiration for the value you have brought to manufacturers, suppliers, and clinicians, but most importantly the people we serve. Thank you, Don, for all you have done. We appreciate it.

Wayne Grau

Don,

I'm still in denial that you are leaving NCART. We've known one another for ALMOST 30 years, and I have always appreciated your honesty, integrity and work ethic. Thank you for your advocacy efforts, and I look forward to working with you in the future. This verse from Thessalonians captures your spirit and service.

1 Thessalonians 5:11 — Therefore encourage one another and build each other up, just as in fact you are doing.

God bless,

Amy Odom, Director of Operations, NRRTS

To my friend and colleague, Don Clayback, I want to wish you all the best in your future endeavors. I will never forget the first NCART Board Meeting for me as the new executive director of NRRTS. After the meeting ended, you called me and asked if I had any questions. Boy! Did I have a lot of questions? You took time to bring me up to date on the current topics of discussion and answered my questions. This gesture gave me assurance that no one is in this alone and that sharing information is a priority to achieving the best outcomes through the partnership of NRRTS and NCART.

Weesie Walker, ATP/SMS

BALANCING HOPE AND REALITY

Written by: ROSA WALSTON LATIMER

"My faith doesn't make it easy, but it makes it possible," Brooklyn Boyer said, describing her life following an accident two years ago that left her paralyzed from her chest down.

In the summer before her senior year at Lubbock Christian High School in Lubbock, Texas, Boyer was swimming at a friend's house and went headfirst down the pool slide. "She hit her head on the bottom of the pool and suffered a C-5 vertebrae injury," Brooklyn's mother, Tonia Boyer, said. After two weeks in the surgical intensive care unit at Covenant Hospital in Lubbock, the Boyer family flew to Englewood, Colorado, so Brooklyn could begin intense rehab at the Craig Rehabilitation Hospital.

"This was in the height of COVID, and during the first week they were only allowing one caregiver to stay with the patient," Tonia said. Brooklyn's father, David, and her older brother, Tyler, stayed in family housing, and Tonia was the full-time family caregiver for Brooklyn. During this time, the family was only allowed to see each other twice a week for an hour outside. "We would meet on the hospital grounds, but Brooklyn and I had to stay six feet away from David and Tyler. We couldn't hug or touch each other." Fortunately, the restrictions were soon relaxed a bit. "David and I were allowed to trade off with Brooklyn every 24 hours. Even then, we would only see each other for about 10 minutes each morning. We were trying to navigate the life-

altering injury our daughter had experienced and had little time in the same room with each other. We are a very close family, and this situation added a layer of anxiety to an already stressful time. But we survived, and none of us got COVID. That is truly a blessing."

During the three-month stay at the Craig Rehabilitation Hospital, friends and family provided invaluable help. "My boyfriend and his family were in Colorado part of the time. Even though I could only see them once a week during family visit time, their presence provided much needed support for our family," Brooklyn said. "Part of my treatment was to work out in the gym at Craig. The gym had

huge windows and my out-of-town visitors would sit on the other side of those windows and encourage me. That was very special."

Brooklyn noted the enthusiastic support has continued during the two years after her accident. "My support system has remained steadfast," Brooklyn said. "My friends, my family, my church, my school community and the hospital staff all encourage me. It uplifts me knowing they are always with me no matter what I am experiencing. I cherish any time I can spend with loved ones and friends."



Brooklyn Boyer working out at the Lubbock Christian University REC Center.



The Boyer Family: Tyler, Brooklyn, Tonia and David.

Brooklyn's hometown community support became a reality when a group organized and completed necessary modifications to the Boyer home while the family was in Colorado. "When we came home from our time at Craig, our house had been converted into a completely accessible place to live. They did a wonderful job. Everything was ready for us," Tonia said. "It was such a relief David and I had people helping make the decisions about what needed to change and how to accommodate those changes." The home modifications were a priceless gift, but Tonia faced conflicted feelings. "We were so excited to come home, but it was very sobering to return to our home where we would lead a completely different life. We came back to a new normal that was daunting."

In an interview soon after Brooklyn's accident, her brother described her as a "bubbly little firecracker" with a drive to do her absolute best at whatever came her way. He also recognized the foundation for this instinct is Brooklyn's unshakable faith in God and her circumstances haven't changed her. "She's still the enthusiastic, energetic Brooklyn."

The Boyer family doesn't believe in coincidences and shares the belief God is working amid their circumstances. "When I was lying at the bottom of the pool, unable to move, I could feel God was there with me, and I was going to be OK," Brooklyn said.

Remember the boyfriend who visited Brooklyn while she was at Craig for treatment? His name is Alan Mann, and he was at the pool when Brooklyn hit bottom. Alan had just completed lifeguard training, and as she realized she was seriously injured, Brooklyn believed he would know how to help her. And he did. When

Brooklyn floated to the surface, Alan put a pine board under her, made sure she could breathe, and kept her stabilized until the paramedics arrived.

"I believe God put together the medical team for us before the accident occurred," Tonia said. "The staff at Covenant Hospital, Craig Rehabilitation and Moody Neurorehabilitation Institute in Lubbock, where she was in rehab after we returned home, are exceptional and personally invested in Brooklyn's care. Many are like family. They send her encouraging videos and pray for us. God knew the people we would need long before we needed them."

"Craig was a wonderful place full of wonderful people," Brooklyn added. "You wish you didn't have to go through these situations, but when you do, Craig is certainly where you want to be."

"We are also grateful for the adaptive equipment that is available to Brooklyn to help her live as independently as possible. Until you've traveled this path, you have no idea what is available or how to navigate funding," Tonia said. "We are so proud of Brooklyn and her determination to go to college and live life to the fullest. We're extremely grateful for the providers of the complex rehab equipment, the technicians, the therapists — everyone involved in Brooklyn's care."

If we look at Brooklyn's accomplishments during the past two years, omitting references to her accident and treatment, the list looks very similar to many other young women currently in their lives. After returning home from three months at Craig Rehabilitation Hospital, she completed her last year of high school, graduating along with her classmates. Brooklyn attended summer youth camp and began her college experience in person at Lubbock Christian University, majoring in biology. "The Disability Services office has been huge in helping me be successful. They help me take tests and teach me about available technology." Brooklyn is undecided about what degree she will pursue. "I have some interest in psychology and counseling, or maybe communications," Brooklyn said. "I took a self-paced college algebra class in the summer. That occupied a lot of my time!" Later this year, Brooklyn and her family are traveling to Austin to enjoy a Harry Styles concert.

"As a mother, the most gut-wrenching part of this experience has been watching Brooklyn suffer and



Brooklyn and friends, (l to r) Clara, Ellie, Bella, Chyler.



Brooklyn and her boyfriend, Alan Mann.

letting go of what I thought her life would look like," Tonia said. "Trying to balance between having hope and facing the reality of the 'now' is very difficult. I think I will always, on some level, grieve for the life Brooklyn had before. When Brooklyn was on the cusp of gaining her independence, it was ripped away in a heartbeat."

This journey is not without tears and frustrations, but the Boyer family is in it together and fortified by their love. "There are days when Brooklyn weeps, because she wants her previous life back," Tonia said. "David and I have times of frustration and profound sadness." At these difficult times, Brooklyn's parents can draw strength from their daughter's words of encouragement, "Be ready for the challenge because the challenge is a blessing." Our daughter is brave and confident the Lord is working in her. How could you doubt that kind of faith?" Tonia said. "Brooklyn teaches us all the time with her positive outlook. We share the joy of her accomplishments and the progress she is making. We have learned our faith doesn't remove the difficulty of a situation but makes it possible for us to keep going one day at a time. It is overwhelming if we try to think too far ahead. When we face challenges, David always says, "Can we do it today? Yes, we can do it today with God's help."

"I know we have hard things, but I try to focus on the positives, because we have a really beautiful life," Brooklyn said.

CONTACT

The Boyer family may be reached at BROOKLYNSWALK@GMAIL.COM



Brooklyn Boyer is 19 and in her second year at Lubbock Christian University in Lubbock, Texas. Her father, David Boyer, is a dean in the School of Education at the university and her mother, Tonia, is a professor in the School of Education. Brooklyn's brother, Tyler, is working full time and continues to help the family with Brooklyn's care. To honor the Boyer family, an anonymous donor established the Boyer Family Endowed Scholarship at Lubbock Christian University to fund scholarships for students seeking an education degree through the University's School of Education.

THERE IS MUCH TO BE DONE

Written by: ROSA WALSTON LATIMER



Rosalie Wang, Ph.D.

Rosalie Wang is a professor in the Department of Occupational Science and Occupational Therapy at the University of Toronto. She received tenure this year and primarily spends her time on research but also teaches a professional entry-level course in the Master of Science in Occupational Therapy program.

Her primary focus for the past few years has been advancing Canadian policies for technology access. “This is important to me because there remain significant issues for Canadians to access the assistive technology they need in a fair way,” Wang said. “We have engaged with several charity groups, users of assistive technology, policymakers, and other stakeholders in this project. Ultimately, our goal is to create a national strategy for enhancing equitable access to assistive technology.”

WOULD YOU TELL US MORE ABOUT YOUR RESEARCH AND THE COURSE YOU TEACH?

My research program covers several topic areas: a methodology for technology-based intervention development and evaluation; technology development, evaluation, implementation and implications in senior care and post-stroke care; and understanding and advancing Canadian policies for technology access.

I teach the Applied Skills and Technology course in our Master of Science in Occupational Therapy program. The students learn and practice skills such as transfers and seating and mobility assessments. They also study different assistive technologies and how those technologies can benefit their clients. In the course, students engage in a design project to address an occupational goal of a client or group of clients. Those projects focus on in-depth analysis of the goals and issues from all dimensions, defining design criteria, creating prototypes and evaluating them.

WHAT LED YOU TO A CAREER IN OCCUPATIONAL THERAPY?

I’m in my second career now! I graduated with a Bachelor of Science in Occupational Therapy from the University of British Columbia, Vancouver, Canada, in 1998. My first job was as an occupational therapist in long-term residential care for seniors. I love working with seniors because I learn so much from our conversations. I heard about their lives, their experiences, places they’ve been and things they’ve accomplished. I cherish the conversations I had with my clients. I believe occupational therapy can significantly contribute to residents’ quality of life in long-term care. I enjoyed my work, whether training someone to use a new powered wheelchair; getting them fitted for a more comfortable seating system; putting a new falls prevention plan

in place to support safety; or helping with strategies to help them make their needs known. Over my six years of practice, I shifted to a few other job roles but primarily worked with seniors.

While I found my role as an occupational therapist very rewarding, I constantly needed new challenges. I also found we didn’t have all the tools to best assist our clients, so I went back to school to pursue research. I enrolled in a master’s program in rehabilitation sciences. And, because I was so interested in technology applications and their potential to assist clients (I prescribed a lot of wheelchairs in my practice!), I did my program in conjunction with biomedical engineering at the University of Toronto (Canada). I wanted to design and evaluate new interventions that could be transferred to practice and could benefit people in their daily lives.

However, I didn’t finish my master’s degree. I loved my project, which was developing and evaluating anti-collision technology for powered wheelchairs for long-term care residents with physical and cognitive impairments (not a surprising topic for me!), and I wanted to continue doing that. So, with the support of my supervisor and advisory committee, I transferred to the Ph.D. program. I had no idea what I would do once I earned my Ph.D., because I never had any strong wish to be a professor. I was driven by what I felt was an extremely important problem to resolve.

In my work as an occupational therapist in long-term care, one of the most challenging things I had to do



Rosalie Wang with her husband, Ulrich Fekl, and their dog, Emmy, enjoying a hike near Toronto.

THERE IS SO MUCH TO DO! THERE ARE MANY UNSOLVED PROBLEMS TO TACKLE, MANY MORE WAYS IN WHICH WE CAN HELP PEOPLE TO ACHIEVE THEIR OCCUPATIONAL GOALS IN LIFE AND MANY INEQUITIES THAT NEED MITIGATING.



Rosalie Wang and colleagues observe a demonstration of an upper limb rehabilitation robot developed at the Intelligent Assistive Technology and Systems Lab, University of Toronto.

was discuss with a resident they were having too many driving accidents or near misses, putting other residents at risk for injury. They might lose their “license” to drive in the residence. Telling someone they would lose their mobility independence was awful, because it would impact everything in their lives, but we had other residents to protect. I was convinced solutions could be found or created to enhance their safety, especially with so much new technology being developed or applied in other areas. I believed the focus of these developments needed to be on older people living in long-term care!

I was fortunate to have been in Toronto during grad school, where there’s a great interest in technology for rehabilitation and assistive technology. I was also fortunate to have the support of many mentors who encouraged me to pursue a faculty position. I was open to all sorts of career opportunities because I didn’t begin with the aim of being in academia. I just wanted to help solve problems.

WHAT KEEPS YOU ENGAGED IN YOUR WORK?

There is so much to do! There are many unsolved problems to tackle, many more ways in which we can help people to achieve their occupational goals in life and many inequities that need mitigating. I always have many ideas floating around in my head about research questions, possible solutions and how we can

CONTINUED ON PAGE 18

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THERE IS MUCH TO BE DONE
(CONTINUED FROM PAGE 17)

best disseminate and integrate research into practice. One of the projects I'm very excited about is researching how we can enhance the generation of meaningful and timely evidence in rehabilitation science and technology. Much research evidence is not translated into practice, and many technology products and services are not made available on the market for people to use. I believe a paradigm shift is needed to refocus our efforts away from current clinical trials approaches and evidence hierarchies.

WHAT ADVICE WOULD YOU GIVE TO SOMEONE JUST BEGINNING IN YOUR FIELD?

Talk to as many people as possible who are engaged in this field. Through these interactions, you will learn what others have tried and accomplished, how they have succeeded or failed and learned as a result, and what opportunities might be available. Ask questions. Get feedback. Most people are willing to chat about their career trajectories or offer guidance. And, you never know what opportunities might come up with some networking. Seek out new experiences, especially those that enable you to immerse yourself in contexts very different from what you are accustomed to or comfortable with.

It sounds cliché but taking some risks is critical. When we are trying to come up with a solution to a problem, understanding the situation may mean being immersed in it and experiencing it in some way. If we have a breadth of experiences from which to draw, or knowledge transmitted to us from others with lived expertise, we can often make novel and unexpected connections and develop better solutions.

YOU ARE A FIRST-GENERATION IMMIGRANT TO CANADA. TELL US ABOUT YOUR FAMILY AND YOUR EARLY EXPERIENCES.

I moved from Zhong Shan, China, to Vancouver with my parents and older brother when I was 1 1/2 years old. Like many immigrants in the



Rosalie Wang as a witness at the Standing Senate Committee on Social Affairs Science and Technology on Bill C-81, an act to ensure a barrier-free Canada.

1970s, my parents didn't have a lot of resources when we arrived. They had to work extremely hard and save all their money to purchase a house and to support my brother and I to go to university. We never went on vacation as children. My first trip outside my home was a high school graduation trip to Palm Springs on a bus with my classmates! My parents always made sure that we were well taken care of. And Canada has been wonderful to my family and me. I am a proud Canadian! We had all the opportunities for a good education, to be supported by a health care system that, while not perfect, provided security and to be included in a multicultural society. Again, not perfect, but we felt we were part of the community of Canadians. My husband, Ulrich Fekl, is an associate professor in the Department of Chemical and Physical Sciences at the University of Toronto. He emigrated from Germany and we, along with our little Havanese pup, Emmy, live in a culturally diverse area in Toronto that we absolutely love.

CONTACT

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Rosalie Wang at the WHO Headquarters in Geneva during the Global Report on Assistive Technology Consultation in 2019.



Rosalie Wang with Emmy in her Toronto backyard.



Rosalie Wang, PhD, OT Reg.(Ont.), is an associate professor in the Department of Occupational Science and Occupational Therapy, University of Toronto, and affiliate scientist at the KITE-Toronto Rehabilitation Institute. As an occupational therapist, she worked in Canada and the U.K. in long-term residential care, acute care, subacute stroke rehabilitation, homecare and a specialist mobility seating and positioning clinic. Her current research focuses on developing and implementing technology to enable daily activity participation and social inclusion of seniors. As an AGE-WELL investigator, she co-led a national project on enhancing equitable access to assistive technologies in Canada.



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THE FIGHT FOR FUNDING: POWER SEAT OPTIONS AND THE ELECTRONICS TO OPERATE THEM

Written by: JULIE PIRIANO, PT, ATP/SMS

According to the Medicare part B utilization data from 2020¹, Group 3 multiple power option (MPO) power wheelchairs were approved, provided and funded five times more often than Group 3 single power option (SPO) bases and 10 times more often than Group 3 no power option (NPO) bases. This is an important statistic to note as the Medicare coverage criteria for power tilt, power recline, the combination of power tilt/recline and power leg elevation has remained unchanged since it was first added to the Wheelchair Options and Accessories Local Coverage Determination² on 1/1/2004.

However, peer-reviewed research published over the past 17-plus years confirms the medical benefits derived from these power seat functions goes well beyond a strict implementation of the Medicare policy and has allowed the needs of the beneficiary to be considered on a case-by-case basis in prior authorization. In fact, the RESNA position papers on the Application of Tilt, Recline and Elevating Legrests for Wheelchairs^{3,4} state, “these features are often medically necessary, as they enable certain individuals to:

- Realign posture and enhance function;
- Enhance visual orientation, speech, alertness and arousal;
- Improve physiological processes such as orthostatic hypotension, respiration and bowel and bladder function;
- Improve transfer biomechanics;
- Regulate spasticity;
- Accommodate and prevent contractures and orthopedic deformities;
- Manage edema;
- Redistribute and relieve pressure;
- Increase seating tolerance and comfort; and
- Independently change position to allow dynamic movement.”

That is why it is so important to document any benefits deemed medically necessary for your client, even if they do not specifically address Medicare’s policy.

While “tilt and recline” seem to go together like salt and pepper, the reality is sometimes you only need salt, and sometimes you need pepper, but oftentimes you need both. The point is, during the evaluation and recommendation process there should be an indication why power tilt, power recline or a combination of tilt and recline are medically necessary for the beneficiary, and why anything other than what is being recommended will not meet the beneficiary’s needs. Ask yourself – does the documentation being submitted for review detail what power seat function(s):

1. Were considered and ruled out – and WHY? For example (not all inclusive):
 - a. Power tilt alone was considered and ruled out as the client:
 - i. Has fair/poor sitting balance and tilt alone does not allow them to perform/participate in gravity assisted repositioning in the chair.
 - ii. Has respiratory compromise and tilt alone does not allow for changes in the seat to back angle to promote respiratory health.
 - iii. Has an indwelling catheter/uses a urinal/wears a protective undergarment and tilt alone does not provide an open seat to back angle for effective bladder (or bowel) management in the chair requiring unnecessary transfers.
 - iv. Uses a mechanical lift to transfer and tilt alone does not provide adequate postural support to safely remove/replace the sling in the chair.
 - v. Has lower extremity extensor spasticity/tone/reflex activity and tilt alone does not provide an outlet for the elicited movement.
 - vi. Sits in the power wheelchair for 15 hours each day and a fixed seat-to-back angle does not provide the mechanical movement required to maintain muscle length and joint range of motion at the hips and knees, which can result in preventable contractures and orthopedic deformity.
 - vii. Has lower extremity edema and tilt alone does not provide adequate circulatory return due to the static, flexed angle at the hip.
 - viii. Is unable to perform an effective pressure relief technique/has a pressure injury/has a history of pressure injury and tilt alone creates increased pressure at the posterior pelvis/sacrum/coccyx increasing the risk for a preventable adverse medical outcome.
 - ix. Has neck/back pain and tilt alone does not allow for changes in intervertebral pressure to support sitting in the chair for more than X hours at a time.

- x. Has fair/poor upper extremity strength and tilt alone does not provide an adequate position for movement/function in a gravity eliminated position.
- b. Power recline alone was considered and ruled out as the client:
 - i. Has swallowing issues and requires a fixed seat-to-back angle to minimize the risk for aspiration.
 - ii. Has strong extensor tone/spasticity/reflex activity and movement of the seat-to-back angle elicits undesirable muscle activity.
 - iii. Has postural asymmetries and requires a precise seat to back angle to maintain contact with the seating and positioning components.
 - iv. Has a pressure injury at the scapula/spinous processes and cannot tolerate any residual shear created by a reclining back.
- 2. Were tried and failed to meet the client's needs – and WHY?
- 3. Were tried, found to meet the client's needs, are reasonable and necessary – and WHY?

Unless the use of power tilt or power recline is contra-indicated, the combination of the two may provide a much better clinical outcome for persons with disabilities and may also explain why the combination of power tilt and recline (E1007/E1008) has continually out-paced the provision of power tilt (E1002) or power recline (E1003 – E1005), all with or without power leg elevation, since the codes were implemented in 2004. Assuming the client requires the mechanical means to change their position throughout the day, and the documentation supports that need, the next question is – How will they operate their power seat function(s)?

The Wheelchair Options and Accessories Policy Article⁵ states that a power tilt seating system, a power recline seating system, a combination power tilt and recline seating system, and a power leg elevation feature all include “a switch control, which is independent of the power wheelchair drive control interface,” to activate the actuator motor and move the seat, back and/or leg position(s).

However, for safe, timely, and independent operation of the actuator motor(s) the real question is – How many times do(es) the switch(es) need to be activated each day, and can the client do it consistently? Ask yourself – does the documentation being submitted for review detail that:

1. Switches were considered and ruled out – and WHY? For example (not all inclusive):
 - a. The client uses an alternative drive input device (i.e., head array, sip-n-puff, chin control, etc.) and needs to operate the power seat functions through the same device.
 - b. The client uses an alternative joystick handle (i.e., goal post, mushroom, U/T shaped handle, or flexible shaft, etc.), does

not have the ability to use a traditional joystick, and does not have the fine motor control to operate switches.

- c. The client requires individualized joystick programming (i.e., short throw, center dead band, three direction, or re-assigned directions, etc.) to operate their chair and must operate the power seat function(s) with the same parameters.
 - d. The activation of an incorrect switch (i.e., leg elevation/descent) could result in an adverse change in the client's seated position and contact with the seating and positioning components, or the switches box increasing their risk for injury.
 - e. The client's inability to return from a tilted, reclined or combination position to the upright seated position could cause an adverse physiological response (i.e., heart rate, blood pressure, respiration rate, oxygen saturation, etc.), affect the digestive process (i.e., chewing, swallowing, digestion, bowel and/or bladder function, etc.), or produce pressure points and an increased risk of medical complications.
2. Switches were tried, and failed to meet the client's needs – and WHY? For example (not all inclusive):
 - a. The client has a progressive neurological condition and there were inconsistencies noted/observed with the operation of power seat functions over the course of the day or between days.
 - b. The client takes medications/has a medical condition (describe) that results in the inconsistent operation of switches within or between days.
 - c. The client's upper extremity function (i.e., strength, range of motion, dexterity, coordination, control, etc.) changes in a fully tilted, reclined or combination position such that they cannot activate the switch(es) accurately to return to an upright position.
 - d. The client's line of sight changes in the tilted, reclined or combination position such that they cannot see to operate the correct switch(es) and return to a full upright, and seated position.
 3. Switches were tried, they worked and are deemed reasonable and necessary.

CONTINUED ON PAGE 22



THE FIGHT FOR FUNDING ...
(CONTINUED FROM PAGE 21)

The client can activate the right switch, in the right direction from an upright seated position as well as a fully tilted, reclined or combination tilted and reclined position safely, timely, independently, and consistently within and between days. As a result, the least costly alternative, the switch(es) included with the power seat function, were verified as the recommended manner in which the client will operate their power seat functions.

If the use of switches is ruled out, the Wheelchair Options and Accessories Policy Article⁵ describes the electronic components that allow the beneficiary to control one actuator motor (E2310) or two or more actuator motors (E2311) “from a single interface (e.g., proportional joystick, touchpad or non-proportional interface)” when used with power tilt, power recline, power shear reduction, power leg elevation, power seat elevation and/or power standing system. Through drive control operation of the power seat function(s) should be justified so that E2310 or E2311 is deemed reasonable and necessary for coverage and reimbursement, depending on the number of actuator motors there are on the chair.

The number of actuator motors is also important when we look at whether the chair can safely operate with a nonexpandable controller included in the basic equipment package or requires upgrade to an expandable controller (E2377) and the high-powered wire harness (E2313) used with it. Of note, all Group 3 power wheelchairs are capable of upgrade to an expandable controller if:

- There is a proportional drive input device other than a standard (basic) proportional joystick;
- There is a nonproportional drive input device;
- There is a separate display (used with an alternative control device);
- There are other electronic devices (e.g., control of an augmentative speech device or computer through the chair’s drive control);
- There is an attendant control (in place of a beneficiary-operated control device); or
- There are three or more power seating actuator motors

While the Medicare Wheelchair Options and Accessories Policy Article⁵ gives us an example of the three (or more) actuator motors being operated “through the drive input device,” it clarifies this statement by reminding providers that this would “require the use of an additional component, E2310 or E2311. Any power wheelchair that has three or more actuator motors on the system **REQUIRES** an expandable controller and a high-powered wire harness regardless of

how the actuator motors are operated by the client – with switches or through the drive input device.

This is because power wheelchairs are FDA Class II Medical Devices subject to recognized consensus standards, which offers the required level of control necessary to assure the safety and effectiveness of the device. This includes but is not limited to a mandate to reduce risks via risk management as outlined in ISO 14971:2019 Medical Devices – Application of Risk Management to Medical Devices⁶. This also comprises electrical safety, fatigue, flammability, and a host of other standards as mandated by the ANSI/RESNA⁷ testing specifications and confirmed by an independent testing facility before the chair can be code verified. Due to these extensive requirements, power wheelchairs with three or more actuator motors must be upgraded for use with an expandable controller and the associated specialized wire harnessing to assure safe operation for the following reasons:

1. The weight of the chair combined with the weight of the power seating components creates an increased load on the electrical system that must be managed with components designed to handle the actuator loads and the electrical currents associated with them.
2. The controller area network (CAN) of communication and complex safety and inhibit system are required to execute the commands of power wheelchair users.
3. The complex “memory” capabilities of the expandable controller have the capacity to handle the complex seating configurations available in the system with three or more actuators.

A nonexpandable controller, included in the basic equipment package, cannot handle the current, the communication or the complexity of the system once a third actuator motor is added, regardless of what component that actuator motor moves, or how the wheelchair user moves it.

Here is where it gets “fun,” The need for an expandable controller (E2377), the high-powered wire harness (E2313) and the operation of the power seat actuators through the drive input device (E2310 or

BASE DESIGNATION	NPO BASE		SPO BASE			MPO BASE		
POWER SEATING			Tilt or Recline	Tilt or Recline	Tilt or Recline	Tilt and Recline	Tilt and Recline	Tilt and Recline
POWER LEG ELEVATION	PAFP	PELRs		PAFP	PELRs		PAFP	PELRs
ACTUATOR #	1	2	1	2	3	2	3	4
CONTROLLER	NE	NE	NE	NE	EX E2377 E2313	NE	EX E2377 E2313	EX E2377 E2313
THROUGH DRIVE CONTROL	E2310	E2311	E2310	E2311	E2311	E2311	E2311	E2311

FIGURE 1

E2311) has nothing to do with the chair’s designation as an SPO or MPO base. This is why actuator motor count becomes so important when the client has a medical need for power seat functions, is driving their chair with a joystick and needs to operate their power seat functions through the drive input device. The chart in Figure 1 can be used as a guide to understand when each component is typically used.

As with any separately billable component on a power wheelchair, the devil is in the details of the documentation. Step one is to ensure there is solid justification for the power positioning functions deemed medically necessary for the client. Step two is to determine if there is a medical need for the client to operate their power seat functions through the drive input device. Finally, step three is to count the actuator motors and ensure the system is set up to safely handle the current, communication and complex seating needs of the client. While it’s important to understand coverage criteria set forth in Medicare policy, it is far more important to understand the needs of your client, document it thoroughly and be prepared to fight for funding with your client if the power seat functions and the electronics to operate it, that were tried and deemed medically necessary, are denied for coverage and reimbursement.

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Resources

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- ISO 14971:2019 MEDICAL DEVICES – APPLICATION OF RISK MANAGEMENT TO MEDICAL DEVICES AVAILABLE AT [HTTPS://WWW.ISO.ORG/STANDARD/72704.HTML](https://www.iso.org/standard/72704.html)
- RESNA WC-2 WHEELCHAIRS – VOLUME 2: ADDITIONAL REQUIREMENTS FOR WHEELCHAIRS (INCLUDING SCOOTERS) WITH ELECTRICAL SYSTEMS (2019) AVAILABLE AT WWW.RESNA.ORG



Julie Piriano, PT, ATP/SMS, is the vice president of Clinical Education, Rehab Industry Affairs and Compliance for Pride Mobility Products Corporation.

THE CLINICIAN TASK FORCE, A 2022 INDUSTRY UPDATE

Written by: **TABATHA JAMES, OTR/L, ATP/SMS**

The Clinician Task Force (CTF) is a specialized group primarily of occupational and physical therapists dedicated to supporting the disability community by enhancing the quality of care and clinical education for the practice of seating and wheeled mobility (SWM). Since 2004, the CTF has enriched SWM practice through its contributions to research, policy and industry collaboration, upholding the mission to provide clinically based expertise that informs and promotes public policy, best practices and positive outcomes.

The CTF continues to grow and currently sits at 82 members who are focused on prioritizing access to and awareness of Complex Rehabilitation Technology (CRT) and distinguishing it from Durable Medical Equipment (DME). The mix of members is maintained at 80% clinicians not associated with a manufacturer or supplier and 20% members employed by manufacturers or suppliers. All members are actively involved in work groups that support the political, economic and social causes that align with their personal ethos and client population. Our members have and continue to effect change at the federal, state and local levels with Medicare and Medicaid, and work diligently as education consultants for clinicians and students new to Complex Rehab Technology (CRT) and the specialized practice of seating and wheeled mobility. The Clinician Task Force invites novice and experienced clinicians to join and contribute their expertise and enthusiasm.

The four work groups currently maintained are:

1. Federal legislation and coverage issues.
2. Medicare issues.
3. Medicaid issues.
4. SWM clinician/education Issues - advancing access and education for the public, our industry, clinicians and university level student clinicians.

This CTF feature will begin a rotation highlighting the efforts of the individual CTF workgroups as well as our united efforts. We hope these updates will help to inform the industry and DIRECTIONS readership of CTF activities and progress. This aligns with our mission to provide clinical based expertise to inform and promote

THE CTF BELIEVES FOR CHANGE TO OCCUR WITHIN THE INDUSTRY OR ORGANIZATIONS, STRATEGIC INVOLVEMENT MUST TRANSLATE INTO ACTION. THE KEY TO EFFECTING CHANGE IS CONNECTION AND BALANCE, BUILDING ON ACHIEVEMENTS FROM DAYS PAST AND INCORPORATING ON-GOING EFFORTS TOWARD A UNITED VISION.

public policy, best practices and positive outcomes regarding people with disabilities who require CRT products and related services.

FEDERAL LEGISLATION AND COVERAGE:

Our Clinical Coverage work group (CCG) continues to work closely with the Centers for Medicare and Medicaid Services (CMS), advocating for improved funding access for clients demonstrating medical necessity for power standing and power seat elevation. These members identified a need for accessible knowledge about comprehensive wheelchair seating services to guide the match between the person and the most appropriate equipment for all practice settings — a supporting document can be found at cliniciantaskforce.us to guide the provision of services. The CCG has published their policy analyses for these components in the Archives of Physical Medicine and Rehabilitation and ScienceDirect. The group members are conducting a scoping review for Supported Standing Devices, anticipating publication later in 2022.

SWM CLINICIAN ISSUES AND EDUCATION:

The Clinical Issues and Education work group divides its focus into current practice challenges and expanding curriculum development at the university level. This group has been working to provide comprehensive resources for novice and experienced clinicians as well as students. They have organized lists of continuing education options and quality SWM education resources for beginner, intermediate and advanced practitioners of seating and wheeled mobility.

Resources currently found on www.cliniciantaskforce.us include:

- Publications by CTF members.
- Online course listing.
- SWM textbook/guide list.
- Evidence and flowcharts.
- Denial roadmap.
- SWM curriculum.

UPCOMING CALLS TO ACTION:

- A National Coverage Decision for wheelchair seat elevation and power standing systems opened for public comment in August 2022. This is an opportunity to discuss the impact and medical necessity of these features, and we will be asking Congress to support the request for Medicare to cover these items.
- On Sept. 14, 2022, the CTF collaborated with NCART and NRRTS to participate in a Virtual Congressional Fly-in Day. On this day, members of Congress and their staffers engage with industry stakeholders and SWM users to champion for policies to reflect medical necessity, support sufficient funding and continue to reduce barriers to accessible care. This is a free all-day event where the Clinician Task Force, NCART and NRRTS members represent and facilitate conversations with Congresspersons in all states and encourage the voices and contributions of all participants and end-users.

Topics of interest for the 2022 Virtual Congressional Fly-In Day included but were not limited to:

- Promote clinical evidence in support of seat elevators and standing systems.
- Passing Legislation to support the permanence of occupational and physical therapists as telehealth providers.
- State and payer specific conversations.
- Shared experiences of end users and their providers.

The CTF believes for change to occur within the industry or organizations, strategic involvement must translate into action. The key to effecting change is connection and balance, building on achievements from days past and incorporating on-going efforts toward a united vision. Individual- and system-wide advocates are required to sustain and influence specific initiatives. Change requires a remarkable show of resilience, commitment and force – particularly when influencing policymakers.

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Tabatha James is a licensed occupational therapist and RESNA Certified ATP/SMS in North Carolina. She received her Master of Science in Occupational Therapy from the University of Illinois at Chicago in 2016. Her additional clinical interests include neurological specialties, aging-in-place, hippotherapy, adaptive sports and accessible camps. She is a member of the Clinician Task Force and NCOTA.

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CRT VIRTUAL CONGRESSIONAL FLY-IN

Written by: DON CLAYBACK, EXECUTIVE DIRECTOR OF NCART

As of this writing, we are less than 48 hours away from the Sept. 14 CRT Virtual Congressional Fly-In. This joint NCART/NRRTS annual event gives Complex Rehab Technology (CRT) stakeholders the opportunity to take our CRT access message to Members of Congress and their staff. We are doing it virtually this year and are focused on three “Congressional Asks:”

ASK 1: Contact Centers for Medicare and Medicaid Services (CMS) Administrator Chiquita Brooks-LaSure asking CMS to move forward with establishing Medicare coverage for power seat elevation and power standing systems on CRT power wheelchairs needed by people with mobility impairments.

ASK 2: Provide federal financial assistance to address unsustainable cost increases CRT manufacturers and suppliers have incurred over the past two years to allow them to maintain critical access to CRT and the supporting services for people with disabilities.

ASK 3: Make permanent the unique CRT telehealth flexibilities that are in place during the Public Health Emergency to protect access for people with disabilities.

We have a record number of Congressional appointments and are looking forward to many productive discussions. Thanks to all the industry sponsors who provided the needed financial support and to all the advocates who will be spending Sept. 14 sharing the CRT access message with Congress.

COVERAGE OF POWER SEAT ELEVATION AND STANDING SYSTEMS

In addition to the inclusion of this issue in our CRT Virtual Congressional Fly-In, we finally have positive news to acknowledge regarding the national initiative to establish Medicare coverage for power seat elevation and power standing systems used with CRT power wheelchairs.

As reported on Aug. 15, CMS finally announced the opening of a 30-day period seeking public comment on Medicare coverage of power seat elevation. While this is good news, unfortunately CMS also announced it is “delaying” a review of Medicare coverage for power standing systems to a later date. We are extremely disappointed with this delay since power standing systems were included as a connected benefit in the initial September 2020 request for coverage.

Accordingly, the ITEM Coalition, NCART and other workgroup members have been working on two tracks. The immediate track is to promote and facilitate the submission of as many public comments as

WE HAVE A RECORD NUMBER OF CONGRESSIONAL APPOINTMENTS AND ARE LOOKING FORWARD TO MANY PRODUCTIVE DISCUSSIONS.

possible by Sept. 14 in support of power seat elevation coverage. The second track is to actively work with our Congressional supporters and CMS to open the public comment period for power standing quickly so that review can continue.

The ITEM Coalition opened a dedicated website at www.rise4access.org that has proven to be a great resource for advocates. There you will find a variety of educational information along with a national petition you can sign in support of coverage. With two days left in the public comment period on power seat elevation we are already at over 2,800 submitted comments. You can find the link to the CMS public comment page at the ITEM website above.

The full text of comments submitted by NCART can be found in the NCART blog at www.ncart.us.

Our primary message is we strongly support Medicare coverage of power seat elevation to establish critical access for Medicare beneficiaries with disabilities as detailed in the formal September 2020 coverage request. The need for and benefits of power seat elevation systems are recognized by national disability and medical professional organizations. In addition, Medicaid agencies, commercial payers and the Veterans Affairs already provide coverage under their programs.

We also commented that while we are grateful that CMS is moving forward with its review of the power seat elevation portion of the coverage request, we are very disappointed that CMS is delaying to a later date the opening of comments for power standing systems. The September 2020 request intentionally related to both technologies, as they each provide important

medical benefits to Medicare beneficiaries. We request that CMS open the additional public comment period for power standing systems as soon as possible to avoid further delay.

Another important event will be taking place. NCART is joining with the ITEM Coalition to present a Congressional Briefing at the Capitol on Sept. 14 entitled “Medicare Coverage of Power Seat Elevation and Standing Systems for People with Mobility Disabilities.” The event will feature Members of Congress, wheelchair users, clinicians and others speaking on the need for Medicare coverage. It will be a great opportunity to get Congressional offices and other federal agencies updated on the need for CMS action.

Much more to come on this initiative, but we now are moving in the right direction and thanks for everyone’s continued engagement.

EXPIRATION OF PUBLIC HEALTH EMERGENCY

The COVID-19 Public Health Emergency (PHE) is currently in effect through Oct. 13, 2022. This is subject to further extension by Health and Human Services Secretary Xavier Becerra, who has stated he will give stakeholders at least 60 days advance notice of the end of the PHE.

From a CRT perspective, this means that physical and occupational therapists will continue to be permitted to provide CRT telehealth services to their Medicare clients until at least into early 2023. This is based on legislation passed by Congress earlier in the year that extended current COVID-19 telehealth flexibilities for an additional 151 days after the end of the PHE.

There are varying predictions on when the PHE may end, and that expiration will depend on a variety of factors in the months ahead. The most popular sentiment is that the PHE will extend until at least early 2023. Once the PHE expires there will be major implications at the state level due to the end of certain temporary Medicaid waivers and related funding.

CMS issued guidance on Aug. 18 entitled “Creating a Roadmap for the End of the COVID-19 Public Health Emergency.” CMS is encouraging health care providers

to prepare for the end of these flexibilities as soon as possible and to begin moving forward to reestablishing previous health and safety standards and billing practices.

CMS AND MEDICARE ADVANTAGE PLANS

CMS recently issued a “Request for Information” regarding various aspects of the Medicare Advantage (MA) program. The request asked questions including how to advance health equity through policy, how plans can align on data for utilization management to reduce provider burden, what information gaps are currently present, and how CMS can promote collaborations between MA plans and various stakeholder groups.

NCART comments were submitted on Aug. 31 with CRT-specific recommendations related to improving access to CRT under these programs. These recommendations include stronger oversight of MA plans, increasing prior authorization and claims processing efficiency, and establishing reporting requirements to measure and report network adequacy and performance. The full comments are posted in the NCART blog at www.ncart.us.

Significant improvements are needed given its far-reaching and growing impact on the health outcomes and lives of Medicare beneficiaries. We will be monitoring the next steps in this process and how CMS will use the collective public comments to improve the Medicare Advantage program.

SUCCESSFUL NATIONAL CRT AWARENESS WEEK

Thanks once again to everyone who took the time to promote a better understanding of CRT and to celebrate the CRT community during our National CRT Awareness Week in August. The stories, videos, podcasts, panel discussions and photos shared emphasized why access to this unique equipment is so important.

The combined voices of the CRT community calling out for change will continue to be the driving force behind getting the legislative and regulatory actions needed to establish and protect access to CRT. We are grateful for the thousands of individuals across the country who are dedicated to educating and advocating. With everyone working together we can continue to make progress.

BECOME AN NCART MEMBER

NCART is the national advocacy association of leading CRT providers and manufacturers dedicated to protecting CRT access. To continue our work, we depend on membership support to take on important

CONTINUED ON PAGE 28



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CRT VIRTUAL CONGRESSIONAL ... (CONTINUED FROM PAGE 27)

federal and state initiatives. If you are a CRT provider or manufacturer and not yet an NCART member, please consider joining. Add your support to that of other industry leaders. For information visit the membership area at www.ncart.us or email wgrau@ncart.us to set up a conversation.

PERSONAL THANK YOU

Finally, this is my last column for DIRECTIONS. As was announced in February, I will be leaving my position as NCART executive director on Sept. 30, after 13 years on the job. It has been a great experience leading NCART's advocacy initiatives on behalf of the CRT industry and promoting access to CRT for people with disabilities.

I want to sincerely thank everyone who has supported the activities of NCART and all the other organizations in our collective work. We have made progress in our mission over the years and that work must continue as there is plenty to do. The CRT access advocacy movement needs to grow and that requires more voices, support and engagement.

I wish our incoming executive director Wayne Grau the best of success as he takes over. He can be contacted at wgrau@ncart.us. While I will be exploring options for my next chapter, if there is something I can assist with you can reach me at dclayback@gmail.com. Thanks again for all your support and keep up the good fight.

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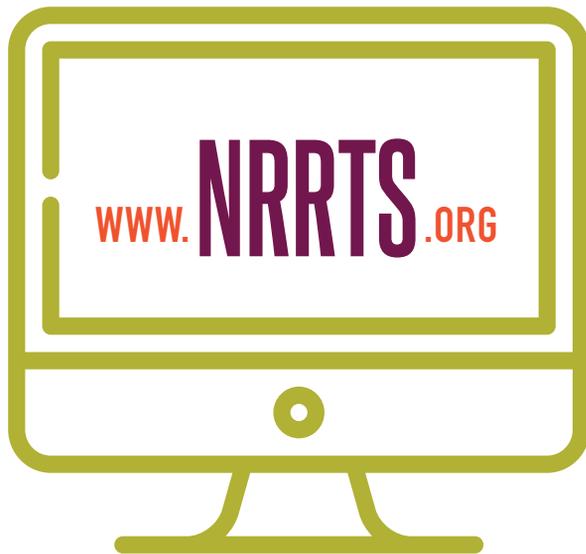


Don Clayback is the former executive director of the National Coalition for Assistive and Rehab Technology (NCART), a national association of Complex Rehab Technology (CRT) providers and manufacturers that promotes and protects access to

CRT. Don Clayback has 37 years of experience as a provider, consultant and advocate in the CRT and Home Medical Equipment industries. He has been recognized nationally for his industry and advocacy work and is a frequent speaker at state and national conferences.

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OCTOBER 25, 2022, AT 3 PM ET

The Pelvic-Spine Connection: The Key to Positioning and Function

Speaker: Tina Roesler, PT, MS, ABDA

Beginner/Intermediate Level, Seating and Positioning/Medical Terminology, ATP/SMS Prep Content

The wheelchair and seating evaluation has become a very specialized process that focuses on matching the most appropriate equipment with the client's postural and functional requirements. But often it has a strong focus on the equipment itself. A properly fitting wheelchair can increase a user's function within the environment physically and socially and can improve overall quality of life. On the contrary, a poor fitting wheelchair and sitting posture can negatively affect the user's health. An important aspect to proper fitting is to understand the biomechanics of the pelvis and spine and how they integrate to promote stability and function in the seated client. Back to basics.

For more information, visit the website www.nrrts.org



NOVEMBER 16, 2022 AT 7 PM ET

MAKING POWER WHEELCHAIRS SMARTER

Speakers: Michelle L. Lange, OTR/L, ABDA, ATP/SMS and Jean L. Minkel, PT, ATP

Intermediate Level, Seating and Positioning, ATP/SMS Prep Content

A Smart Wheelchair provides features beyond what current power wheelchairs offer. Smart technologies may include Sensors that warn the driver of potential hazards, such as obstacles or tipping risk on a steep incline. Some Sensors are integrated into the PWC electronics to prevent collisions by assisting with steering and speed as well as prevent a PWC from going off a curb outside. Smart wheelchairs can connect with the external environment, such as sending notifications to a caregiver's smartphone. This technology may also monitor, record, and report data such as weight shifts and health information. It's a whole new world!



DECEMBER 6, 2022, AT 7 PM ET

The Mat Exam

Speaker: Kelly Waugh, PT, MAPT, ATP

Intermediate Level, Seating and Positioning, ATP/SMS Prep Content

The mat exam is one of the most important components of a Wheelchair Seating and Mobility Assessment. This webinar will provide the basics on this critical hands-on part of the physical assessment: What is it, who does it, when is it done and why? After an introduction covering these key questions, we will review basic mat exam methodologies highlighting the significance of joint range of motion findings for wheelchair prescription. A

summary will review how to translate supine range of motion values into the three primary body and seating system angles useful for seating prescription.



DECEMBER 7, 2022, AT 11 AM ET

Ready to Play: Positioning to Facilitate Active Participation for Young Children with Physical Disabilities

Speaker: Angie Kiger, M.Ed., CTRS, ATP/SMS

Intermediate Level, Seating and Positioning, ATP/SMS Prep Content

A day in the life of a young child typically includes preschool, playdates with friends, mealtime with family, bath time, etc. Having the opportunity experience the quintessential aspects of childhood is vital for every child's overall growth and development. However, making those everyday experiences happen for a child with physical disabilities can be difficult.

During this one-hour session, common obstacles young children with physical disabilities may experience when it comes to being able to participate, the potential negative impacts of not participating and strategies to facilitate activity participation will be discussed. Are you ready to help children play?



DECEMBER 8, 2022, AT 3 PM ET

Support Surfaces

Speaker: Linda Norton, B.Sc.OT, MSc.CH, PhD, OT Reg(ONT)

Intermediate Level, Seating and Positioning, ATP/SMS Prep Content

Therapeutic support surfaces are a critical component of pressure injury prevention and management. Knowledgeable Complex Rehab Technology suppliers who can apply the latest research and standard terminology to the client's circumstances are in a unique position to have a positive impact on the client's health. Following a brief review of the applicable terminology, principles and best practices, participants will learn how to compare support surfaces from different manufacturers to choose the features that would benefit a specific client. Using a case-based approach, participants will explore applying research and best practices to the client's situation to determine the best options.



In a time of drastic change, it is the learners who inherit the future. We appreciate our learners' willingness to adapt to the ever-changing sphere of Complex Rehab Technology, even before COVID hit our world.

We have over 100 on-demand webinars and CEU articles in our library that cover a variety of topics on seating and positioning, medical terminology, ethics, funding and best business practices.

The education program awarded over 1,356 CEUs from August 2019 to August 2020 — that equals 13,560 hours of education!

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IACET CEUs are accepted by NRRTS for the RRTS® and CRTS® credentials and by RESNA for the ATP and SMS certification renewal. The National Board for Certification in Occupational Therapy Inc. (NBCOT) accepts the IACET CEUs as PDU for the American Occupational Therapy Association (AOTA). State occupational and physical therapy associations also accept IACET CEUs for license renewal.



SEMINAL INNOVATIONS IN COMPLEX REHAB TECHNOLOGY SEATING AND POSITIONING

Written by: TOM BORCHERDING AND TOM WHELAN



NRRTS is pleased to offer another CEU article. This article is approved by NRRTS, as an accredited provider, for .2 CEU. After reading the article, please visit <http://bit.ly/CEUARTICLE> to order the article. Upon passing the exam, you will be sent a CEU certificate.

NRRTS thanks LUCI for sponsoring this article

The history of Complex Rehab Technology (CRT) has almost exclusively occurred within the past 60 years. A young industry by most standards, CRT history is rich with legendary innovators, influential leaders, passionate clinicians, brilliant engineers, dedicated manufacturers and powerful brands.

This article is part two in a series covering the history of CRT in North America. Whereas part one addressed manual and power wheelchairs (visit <https://b.link/V6TB> to read), part two focuses on seminal events and trailblazers whose work from the 1960s into the mid-1990s served to shape the CRT seating and positioning industry of today. While the field of wheelchair seating and positioning is broad, professional and sophisticated today, that was not the case just 60 years ago, when the first seating solutions were crafted in local shops, schools and hospitals. Think about that for a moment — a mere 60 years ago there was no biomechanics of seating, no ISS, no ROHO, no Freedom Designs, no Bodypoint, no Jay Medical. We have come a long way in a very short time!

The purpose of this article is twofold. First, to provide recognition for the seminal events, inventions, innovators and leaders from CRT seating and positioning history. Second, to build historical documentation to remember this great generation of industry leaders while also serving to educate future generations of CRT professionals. As we have found in our research, some written documentation covering CRT history does exist, but most of our history lives in the memories of CRT veterans. While we strived in our research to be both accurate and inclusive, we want to acknowledge there are pertinent contributors to the field we haven't recognized due to oversight or article length limitations, and we apologize.

THE 1960S AND 1970S – A FLEDGLING INDUSTRY

Triggered by veterans returning from a series of wars with debilitating injuries, wheelchairs started to become less institutional and more prominently seen in society. With greater acceptance and more

varieties of wheelchairs, came a newly recognized need – that of postural support to maintain a functional seated position and protection against pressure injuries.

Local suppliers and even some institutions responded to this need, crafting seating solutions in their shops utilizing plywood, cardboard, foams and other materials. One example was an Ohio enclave of MED Group members. It began in 1977 with Miller's Rental and Sales (Akron) and grew to include Columbus Medical (Columbus), Hamilton's Health Aids of Ohio (Cincinnati), and Sugarman's Surgical Supply (Toledo). John J. Miller, Jody Whitmyer, and the team at Miller's was custom bending metal to make drop hooks, cobbling parts from other manufacturers and creating custom foam and plywood supports to make finished systems, with the others following suit. In addition, the four MED Group members were open to collaborating and learning from each other to expand custom seating throughout the markets they served. Fast forward to today, Miller's Rental and Sales is still a favored source for all types of bracketry and other seating solutions.

A brilliant innovation that would ultimately change the commercial market landscape of wheelchair seating tracks to the late 1960s, when Robert H. Graebe of Belleville, Illinois, invented the ROHO® Cushion. Filed in 1968 and issued in 1971, Graebe owned one of the most significant patents in CRT history for the original ROHO cushion, U.S. patent 3605145-A, which states "A body support including a plurality of pliant outwardly extending air cells which are in communication with one another through a base. When loaded the air cells support the load with substantially the same force per unit area irrespective of the amount they are deflected." Graebe was issued more than 30 U.S. patents throughout his career working on engineering and designs at ROHO¹ (see Figures 1 and 2).

"Mr. G." as he was known to friends and colleagues was an electrical engineer with the aerospace giant McDonnell Douglas Corporation. He constructed the first adjustable cellular air cushions to solve the problem of 'bedsores' (now referred to as pressure

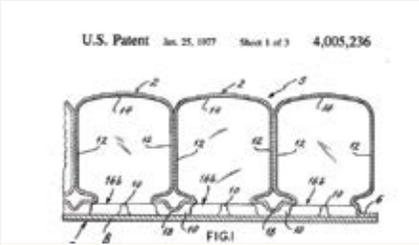


FIGURE 1

One of numerous U.S. Patents issued to Robert H. Graebe, for ROHO design and technology development (1977)

injuries) being reported by doctors at Jewish Hospital in St. Louis, Missouri. With the early clinical success of these cushions and recognition of the widespread need for such a pressure reducing solution for individuals using wheelchairs, Graebe committed to building pneumatic support surfaces full time, formally incorporating ROHO in 1973. What started with building ROHO cushions one at a time in his garage, initially using balloons and rubber bands, became one of the most powerful brands in CRT, with the ROHO brand synonymous with wheelchair seating across the globe.

ROHO was also an advocate of education throughout the decades of the 1980s and 1990s, hiring seating specialist Jan Clarke to lead a training and education department and contracting with prominent clinicians such as Jessica Presperin, Kathy Riley, Sue Wagner, Susan Johnson Taylor, and Barbara (Levy) Crume to present principles of seating seminars to national and international audiences.



FIGURE 2

Robert H. Graebe (pictured with Tom B.) receiving the Max Starkloff Lifetime Achievement Award in 2018

SOCIETAL AWAKENING AND EARLY CLINICIAN TRAILBLAZERS

Seating and positioning as we know it today was strongly influenced by societal demand in the 1970s that individuals with intellectual or developmental disabilities be treated with care and respect and provided opportunities for independence outside of institutional living.

NEW YORK:

In 1972, Geraldo Rivera filmed an expose "The Last Great Disgrace" that garnered national attention to the issues of abuse and deplorable living conditions in the Willowbrook State School, a residential facility in Staten Island that housed up to 6,000 individuals with physical and intellectual disabilities (see Figure 3). This expose and the resulting outrage from the public ultimately led to the passage of the Civil Rights of Institutionalized Persons Act of 1980, which set standards of care and expectations of independence for many individuals who previously were institutionalized without hope of being productive, independent contributors to society.²

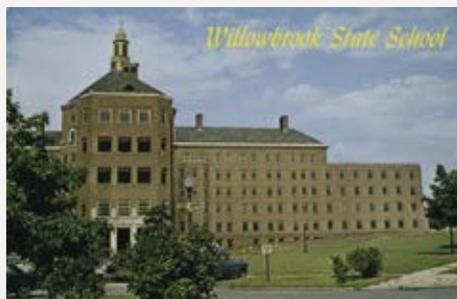


FIGURE 3

Willowbrook State School, subject of Geraldo Rivera's expose "The Last Great Disgrace"

ALABAMA:

An unrelated federal court case that started in Alabama in 1972, "Wyatt v. Stickney," further fed the narrative of disgraceful conditions in institutional residential facilities. In this case, terminated employees from Bryce Hospital, a mental institution in Tuscaloosa, initiated a class action suit on behalf of Ricky Wyatt, an involuntary resident of the institution diagnosed with a mental illness who reportedly suffered from inhumane treatment and horrific conditions. The outcome of this case led to what is referred to as the "Wyatt Standards" – standards of care for individuals with mental illness or developmental disabilities. According to the Alabama Disabilities Advocacy Program (ADAP), "Federal Court in Alabama held for the 1st time people who are involuntarily committed to state institutions ... have a constitutional right to treatment that will afford them a realistic opportunity to return to society."³ This landmark legislation set the principles for humane treatment of individuals with disabilities that now makes up the fabric of the health care laws in the U.S. and around the world.⁴

MASSACHUSETTS:

In 1978 Massachusetts Governor Michael Dukakis signed the Northampton Consent Decree resolving the lawsuit "Brewster v. the Commonwealth of Massachusetts." The decree included the following statement: "WHEREAS, it is the solemn duty of the Commonwealth to maximize the opportunities for all citizens to live as full and fulfilling lives as possible."⁵

An immediate challenge was supplying positioning and mobility to the physically impaired residents of state institutions. Many residents had such extreme

CONTINUED ON PAGE 34

SEMINAL INNOVATIONS ...
(CONTINUED FROM PAGE 33)

complex needs they could only be supported in bed. The state was not concerned no technology program or commercially available equipment yet existed!

Enter the Wrentham State School in Wrentham, Massachusetts, where Industrial Designer Charles Radville and technicians had access to a production facility equipped for craftsmanship. His team also had physical therapy occupational therapy, and surgical support on contract from Boston's Children's Hospital to provide guidance in meeting the clinical needs of individuals with disabilities residing in state institutions. As Mitch Komisar, later working in this program as an industrial designer from the Rhode Island School of Design, reports "at this time, on a state scale, the field of adaptive equipment was established."

EARLY TRAILBLAZERS:

Coinciding with this growing national narrative placed the spotlight on care for individuals with disabilities, two clinicians, Adrienne Falk Bergen and Joan Bergman, blazed the path as innovators for creating independence through mobility and seating and positioning solutions. Their pioneering work, in many ways, trace us back to the beginning of a fledgling new industry – wheelchair seating and positioning.



FIGURE 4 Team Rehab Report Cover with Adrienne Falk Bergen (August 1998)

Adrienne Bergen graduated with a physical therapy degree from Columbia University College of Physicians and Surgeons in 1969 and went to work at Blythedale Children's Hospital in Valhalla, New York, a pediatric residential rehab facility (see Figure 4). Recognizing children needed to be supported in their mobility devices to gain functional independence, Bergen created numerous drawings for supports. With help from engineers and handymen (including her father-in-law who produced systems in his garage), and utilizing tri-wall cardboard, towels, foam and other materials available at the facility, she crafted some of the earliest seating systems for children.

Not satisfied with helping just the local children at Blythedale, Bergen shared her case studies, theories and product solutions with other clinicians around the country. Before the advent of RESNA or the International Seating Symposium, Bergen traveled to teach seating principles and, as Denise Harmon states, "answered all letters suppliers and clinicians sent to her, asking her advice on seating for complex clients." To help spread the message about principles of wheelchair seating, Bergen wrote multiple books on the subject

— "Selected Equipment for Pediatric Rehabilitation" (1974), "Positioning and Adaptive Equipment in Physical Therapy in the Developmental Disabilities" (1977, Second Edition 1982, co-authored with Cheryl Colangelo and Linda Gottlieb), and "The Wheelchair and Other Adapted Equipment" (1982, co-authored with Cheryl Colangelo).



FIGURE 5 Modern Day photo of Joan Bergman

Joan Bergman graduated with a physical therapy degree from Boston University in 1954 and received her PhD in behavioral studies from the University of Alabama in 1974 (see Figure 5). Polio was running rampant in 1954 and, upon graduation, Bergman went to work for the National Foundation

for Infantile Paralysis and was placed at Crippled Children's Clinic and Hospital in Birmingham, Alabama. In 1955, she was recruited to Jefferson Hillman Hospital (now Jefferson Tower of the University of Alabama at Birmingham (UAB)) to develop the first physical therapy service delivery program in the area.

Influenced by the case of Wyatt v. Stickney, the state of Alabama established a demonstration project, *Demonstration of Service Modalities for the Noncommunicative Developmentally Disabled* (DESEMO) and named Bergman as director of the project. DESEMO was housed in the Sparks Center for Developmental and Learning Disorders at UAB. Sparks Center was a federally funded facility with the mandate to train multiple discipline professionals to be specialists in developmental disabilities.

Working in the late 1970s and using a case-group of 20 individuals with severe orthopedic asymmetries who exhibited contractures, breathing difficulties and could not maintain a seated position due to seemingly non-reducible postures, this multidisciplinary team learned how to handle/position these individuals by mimicking the hand placements caregivers were using as postural supports. With this knowledge and recognizing the basic seating materials in use at the time could not address these severe asymmetries, Bergman and her team pioneered the first molded seating system to inhibit reflex behavior and facilitate function. Using weather balloons filled with polystyrene

pellets, epoxy and a vacuum motor to evacuate air and fix a molded shape, the resulting “DESEMO” system became both the project name and the brand name of molding kits that, by 1982, had become the first commercial use custom molded seating systems - used not only in Birmingham but also by renowned rehab facilities such as University of Tennessee - Memphis and Rancho Los Amigos.

UNIVERSITY OF TENNESSEE (MEMPHIS), RESNA AND THE BIRTH OF REHAB ENGINEERING

Industry pioneers Doug Hobson and Elaine Trefler were major contributors across numerous clinical, research, training and product platforms to advance the field of seating and positioning across North America. Their story starts in the 1960s and early 1970s in Canada, with Trefler first working in the child amputee clinic at the Crippled Children’s Center in Toronto and later joining Hobson at Shriners Hospital in Winnipeg. Their work at Shriners created perhaps the first multidisciplinary rehab engineering center focused on both the service delivery and the research for children with severe intellectual and physical disabilities, which was a forerunner to the modern practice of rehabilitation.

Hobson and Trefler moved to Memphis in 1975, when Hobson was hired as associate professor and technical director to build a rehabilitation engineering program at the University of Tennessee – Memphis (UT-Memphis). Hobson’s charter was to develop a new program at the local children’s hospital, which was a research and clinical component of UT - Memphis. Under his leadership, this program advanced to become one of the first and best-known rehabilitation engineering programs to provide multidisciplinary service delivery programs for children (see Figure 6). This team of Assistive Technology industry legends included Susan Johnson Taylor, Greg Shaw, Mike Heinrich and Nigel Shapcott. Recognition of their work quickly followed, with the UT-Memphis Rehab Engineering program receiving research grants from the National Institute on Disability and Rehabilitation Research and thereby becoming the first Rehabilitation Engineering Research Center for wheeled mobility and seating.

Hobson and Trefler were trailblazers who shaped the industry we know today, advocating for “cohesiveness” across multidiscipline research and clinical areas. Hobson was one of the five founders of RESNA (1979), which formalized research, education and industry standards for product testing to ensure quality of mobility devices. RESNA’s annual meeting became the industry “must attend” event, bringing researchers, engineers, clinicians, suppliers and



FIGURE 6 University of Tennessee - Memphis Assistive Technology team and guests, circa mid-1980s (left to right Geoff Bardsley (with bagpipes), Doug Hobson, Elaine Trefler, Kathy Riley, Bengt Engstrom, Susan Johnson Taylor, Jessica Presperin Pedersen, Faith Saftler-Savage, Max Rogmans)

manufacturers together under one roof to advance the practice of mobility and seating and other technologies for persons with disabilities.

Trefler was a pioneer in industry education, advancing early workshops in Memphis focused on seating and positioning. Trefler went on to organize numerous rehab conferences at venues across the U.S. Ken Kozole shares the following about Trefler’s impact: “Elaine was instrumental in providing educational workshops, publishing and presenting concepts of seating. She set the basics of seating and positioning for me as a novice clinician.”



FIGURE 7 Beadseat® developed by the rehab engineering team at the University of Tennessee - Memphis

Hobson and Trefler’s contributions also extended to technology and seating products. MPI (vacuum molded plastic inserts) was among the first prefabricated modular seating components, using plastic shapes to provide postural support in wheelchairs. Hobson and the rehab engineering team at UT-Memphis was instrumental

in the development and early use of Foam-In-Place technology, developing the Bead Seat® system, which utilized vacuum and glue to mold and capture a shape around an individual (see Figure 7).

CONTINUED ON PAGE 36



SEMINAL INNOVATIONS ...
(CONTINUED FROM PAGE 35)

OTHER INFLUENTIAL REHABILITATION ENGINEERING RESEARCH CENTERS

Along with the program at UT-Memphis, other prominent rehabilitation engineering research centers shaped the landscape of Assistive Technology and the field of seating and positioning.

The Rehab Engineering Research Center at the University of Virginia (UVA), Charlottesville, has a very impressive “Who’s Who” of industry legends that worked or trained here. Founded in 1976 by Colin A. McLaurin, one of the founding fathers of rehab engineering and one of North America’s first rehab engineers, Virginia’s Rehab Engineering Research Center developed the first formal university-based education program in rehab engineering.⁶ Notable industry leaders who passed through their doors include Cliff Brubaker, Glenn Hedman, KC Chung, Stephen Sprigle, and David Brienza.

The University of Pittsburgh is one of the preeminent rehab engineering/rehab science programs in the country, with a powerhouse “Who’s Who” list of industry leaders both past and present involved in their various rehab and engineering programs. Pitt’s rehab sciences program started gaining traction in 1991 when Cliff Brubaker became dean of the School of Health and Rehabilitation Sciences and founded the Department of Rehab Science and Technology. In 1992, Brubaker welcomed Doug Hobson as associate professor and director of the Rehabilitation Engineering Research Center. Other legends in the fields of mobility and seating track to Pittsburgh’s rehab science program, including Elaine Trefler, David Brienza, Mark Schmeler, Kate Seelman, Rory Cooper, Michael Boninger, Carmen DiGiovine and Jon Pearlman.

THE INTERNATIONAL SEATING SYMPOSIUM – RECOGNITION OF AN INDUSTRY

The Sunny Hill Health Centre for Children in Vancouver, British Columbia, plays a very important role in the development of the seating and positioning industry, organizing the first International Seating Symposium (ISS) hosted in Vancouver in February 1983. The initial organizers of that inaugural symposium, Lori Roxborough, Daphne Neen, Maureen Story, Bob Gobert, Elaine Liau and Dr. Stephen Tredwell, had the goal of “bringing clinicians, researchers and exhibitors together to develop resources, create a forum that fostered an exchange of ideas and create a network focused on seating and mobility.”⁷ Fun fact – this first ISS had 98 participants and 11 exhibitors.⁸

ISS made its debut in the United States in 1987, with Trefler and Hobson as the driving force to collaborate with the Sunny Hill team in bringing ISS to Memphis. This started the pattern of hosting ISS in alternate years in Canada and the U.S., further

reinforcing the international nature of the seating and positioning industry. In the mid-1990s, the University of Pittsburgh became the host for ISS exhibitions scheduled in the U.S.

ISS continues to be the spotlight event of the industry, now with international partner Seating Symposiums in Ireland, Latin America, Australia and New Zealand.

ADVANCEMENT OF CUSTOM MOLDED SEATING

Both the Bead Seat and the DESEMO System were catalysts for the advancement of commercial development of molded seating. Michael Silverman was an orthotist from Chicago, Illinois, who visited UAB to learn about the DESEMO System and met with the team at UT-Memphis to become educated on the Bead Seat. Silverman saw an opportunity to advance the science of molded seating by using computer-aided design and the innovation of a seating simulator (which used plaster strips to capture the shape from the simulator bag) to create a better fit and more polished finished product. With funding from his father Oscar Silverman, an orthotist who ran a muscular dystrophy orthopedic clinic in Chicago, Silverman founded PinDot Products Inc. in 1982 to advance the commercialization of molded seating with the popular product brands CoutourU and Silhouette.

PinDot was also a manufacturer who pursued patents to protect their innovations. Respected Assistive Technology leaders Peter Axelson and Mike Heinrich were both awarded multiple patents for technology developed to support PinDot advancements.

PinDot was also an early embracer of education, contracting with the powerhouse team of Kerry Jones and Cathy Bazata to offer in-house trainings and travel the country presenting PinDot seminars. PinDot joined other seating and positioning manufacturers, notably ROHO, Jay Medical and Freedom Designs, as early advocates for industry education, extending education on principles of seating and product solutions to a national and even international audience of clinicians and rehab technology suppliers.

Jones and Bazata merit additional recognition beyond their work with PinDot, teaching “hands-on” illustration of the human body and mechanical principles to support the body in all planes. They were also an early

producer of custom seating systems from their South Bend, Indiana, facility. Jean Minkel writes, “Kerry and Cathy introduced a whole generation of designers and therapists to the fun of being creative in your work and finding great positioning solutions for a wide variety of clients.”

INFLUENCE OF ORTHOTICS AND PROSTHETICS

Perhaps no one individual made a bigger impact on the establishment of the CRT profession than Simon Margolis. Before entering the Assistive Technology field in 1973 as a staff orthotist at the VA Medical Center in New York City, Margolis was a taxi driver in the city that never sleeps.⁹ Margolis moved to Wisconsin where he worked as an Assistive Technology Professional in the University of Wisconsin mobile outreach seating clinic. Margolis was also director of the National Rehab Network for The MED Group, director of seating and wheeled mobility for Ottobock USA, and vice president of clinical and professional development for National Seating & Mobility. Margolis was a legendary educator, mentor, industry leader, advocate and designer. Founder of the seating manufacturer Metalcraft Inc. (1984), Margolis designed, crafted and fitted custom seating systems. Margolis pioneered such notable products as the BiAngular Back and the Subasis Bar, and through his advocacy and leadership at RESNA, NCART and NRRTS, gave voice to the CRT community and pushed to raise the bar on ethics and professionalism in the CRT industry.

Martin Carlson was an orthotist hailing from the upper Midwest. Hired in the mid-1970s, Carlson was director of the Habilitation Technology Lab at Gillette Children’s Hospital in St. Paul, Minnesota. Carlson and his team developed the Gillette Sitting Support orthosis which utilized orthotic techniques to fabricate a custom molded seating system to improve seated support for children with cerebral palsy or Duchenne muscular dystrophy.¹⁰ Carlson and his wife, Peg, founded Tamarack® Habilitation Technologies in 1990.

In the mid-1980s, Joe Bieganek joined the Gillette orthotic seating team. He, along with RESNA Fellow David Wilkie, worked with Carlson and others on the Gillette team, advancing the technology. Bieganek moved to Denver in 1990 to head up the custom seating department for Denver Children’s Hospital. In 1998 he founded the Aspen Seating Clinic, taking on a partnership with Tom Hetzel shortly thereafter. Their story will need to be captured in a follow-up to this article, covering the impact from contemporary clinicians and manufacturers!

MARGOLIS PIONEERED SUCH NOTABLE PRODUCTS AS THE BIANGULAR BACK AND THE SUBASIS BAR, AND THROUGH HIS ADVOCACY AND LEADERSHIP AT RESNA, NCART AND NRRTS, GAVE VOICE TO THE CRT COMMUNITY AND PUSHED TO RAISE THE BAR ON ETHICS AND PROFESSIONALISM IN THE CRT INDUSTRY.

REHAB ENGINEERING CENTERS AND THE EVOLUTION OF SEATING CLINICS

Concurrent to the leadership provided from storied university-based rehab engineering programs such as UT-Memphis and UVA, dedicated hospitals for rehabilitation services were born, with help from funding through the U.S. Department of Health, Education and Welfare.

The first two rehab engineering centers were established in 1971 - Rancho Los Amigos Medical Center in Los Angeles (Downey), California, and Moss Rehabilitation Hospital in Philadelphia, Pennsylvania. Three more were added the following year: Texas Institute for Rehabilitation and Research (TIRR) in Houston, Rehabilitation Institute of Chicago (RIC), and Children’s Hospital Center in Boston. These five rehab facilities were amongst the first to establish “seating clinics” where clients could be seen by a multidisciplinary team for formal seating and mobility evaluations, serving as models for the modern-day practice of rehabilitation.

The Veterans Affairs (VA) also expanded its commitment to rehabilitation by funding rehabilitation engineering centers at VA Medical Centers in Palo Alto (California), Decatur (Georgia), and Hines (Illinois). In the same manner as Rancho, Moss and RIC, these VA centers

CONTINUED ON PAGE 38



SEMINAL INNOVATIONS ... (CONTINUED FROM PAGE 37)

were established to support a multidisciplinary team of engineers and clinicians to address the seating and mobility needs of veterans with disabilities.

Many industry veterans interviewed for this article point to the Seating Center at Rancho Los Amigos as the most influential of these early seating clinics. Preceding the establishment of Rancho's "pressure clinic," John Rogers, a rehab engineer from Rancho's Tissue Trauma Group, and Dr. Vernon Nickel evaluated acceptable sitting pressures to prevent pressure injuries and implemented a foam cushion cutting and fitting technique that created an early generation "off-loading" cushion utilizing an ischial cut-out for the purpose of pressure injury reduction, a technique exported to other institutions around the country and still utilized at Rancho to this day.

Rehab Engineers John Rogers and Jim Reswich are credited with establishing the first wheelchair cushion fitting clinic at Rancho in the early 1970s,¹¹ which soon after became the famed "Rancho Seating Center." Physical therapist and supervisor of the spinal injury treatment area, Elwin Edberg, supported by John Rogers and Jim Reswich, conducted regular seating assessments carving foam cushions with an electric bread knife (initially using an Exacto knife), which became the trademark of the Rancho clinic. Antje Hunt followed in Edberg's footsteps, leading Rancho's Seating Center for several decades and training numerous clinicians, manufacturers and rehab technology suppliers in the skills of client assessment and custom seating.

ERIC JAY AND THE RISE OF JAY® MEDICAL

The Jay brand, founded in 1982 by Eric Jay, is often most associated with the first Jay Cushion and its patented JAY Flow™ fluid technology, which revolutionized wheelchair seating. While Jay deserves much credit for all its innovations in seating, it is worth noting that several patents covering flowable liquids preceded Eric Jay's original Jay Flow patent.

While Jay Medical may not be solely responsible for the underlying viscous fluid technology, no one can understate the impact started with Eric Jay's 1982 patent (Seat Cushion US4588229A filed 1982-03-16), which states "... a seat cushion for the human body which comprises a pad comprising a flexible envelope containing a fluid filling material, which pad

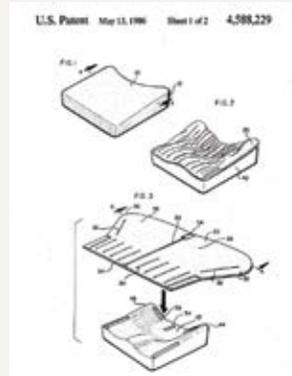


FIGURE 8
Imagery for U.S. Patent issued to Jay Medical, Ltd. for the original Jay Cushion design (1983)

is adapted to be used in combination with a shaped tray, the envelope of the pad is an extensible elastomeric material and the pad is partitioned or segmented to limit the flow of the fluid filling material in selected areas of the pad." (See Figure 8)

The first Jay Cushion was a new approach to pressure distributing cushions, and the team at Jay Medical was just getting started, filing 21 patents from 1982 through 1996. These include what might be the first off-the-shelf back, the Jay Back, in

1988. The Jay solid adjustable drop seat was developed in 1989, and in 1992 a patent was filed for the Jay GS seating system for growth. Another essential aspect of Jay's success was the commitment to education, deploying Joan Padgett and Tom Hetzel into the market as clinical educators on the "Jay way." It is probably not a stretch to say Jay was the first to drive the modern concept of off-the-shelf packaged seating.

THE ADVENT OF PRESSURE MAPPING

In 1989, Verg Inc. created five working pressure mapping systems for use by Ottobock in Canada and the U.S., which marked the advent of thin, whole-seat pressure maps. This exciting new technology ultimately promoted under the brand name Force Sensor Array (FSA) was exhibited by Ottobock at Medtrade in Atlanta that same year.

Andrew Frank, vice president of sales for Ottobock Canada, commented Vern Taylor "created these first systems following conversations about the value of understanding seat interface pressures," and "asking if a method could be developed which could measure and visualize seating pressures." Taylor, with a degree in physical therapy, was teaching biomechanics of seating. He took the discussion with Ottobock to his brother Geoff Taylor, who was an engineer working in the aerospace industry

The Taylor brothers,, leveraging a Canadian company Interlink FSR, which made custom sensors, and working with local Winnipeg Electrical Engineer Robin Kjaldgaard and software engineer Grant Derksen, produced the first FSA systems.

Early adopters of the FSA technology were the James A. Haley VA Hospital in Tampa, Florida, and Barbara Crume at Care Partners Rehab Hospital in Asheville, North Carolina. FSA would often install and train the customer on a turnkey system — computer, monitor, printer and FSA. It was frequently the first computer in the physical therapy department!

EVOLUTION OF MOBILITY + SEATING SYSTEMS

In Burley, Idaho, in the early 1970s, Larry Mulholland and his wife, Nancy Mulholland, a physical therapist working in local school systems, set out to develop a better positioning system for kids, starting Mulholland Positioning Systems Inc. Larry Mulholland filed his first patent in 1972, which led to the groundbreaking Mulholland Positioning System (see Figure 9). This unique seating system featured lace and fabric construction with postural supports integrated into a mobility base (see Figure 10). Mulholland filed multiple patents as he continued to innovate, including what may be the first rigid, anterior shoulder support.

During the same time period, two different companies were developing pediatric systems of their own, Ortho-Kinetics from Milwaukee, Illinois, and Safety Travel Chair from Cleveland, Ohio. In 1972, Ortho-Kinetics filed a patent application for an “orthopedic chair with scoliosis pads,” which was one of the first documented adjustable lateral pads on a positioning chair. Two years later, they filed a patent application for a stroller that could also be used as a car seat. Safety Travel was developing similar systems, leading to a legal showdown around patent claims and intellectual property. Following extensive litigation that lasted many years, both companies were allowed to market their products. Together they brought to market many new hardware and pad options that were then adapted by suppliers to fit many other wheelchairs.

In the late 1970s, a small company in Vassar, Michigan, offered different solutions to the problem of positioning individuals with severe disabilities. Gunnell Inc. started manufacturing complete custom wheelchairs with integrated seating systems. (See Figure 11) These chairs featured tilt-in-space and recline, both active and as an adjustment. But what really set Gunnell apart was the menu of available seating modifications, including firm seats and backs that could be custom ordered to accommodate asymmetrical postures, unusual trunk shapes and windswept tendencies. Eventually, they would integrate a foam-in-place option.

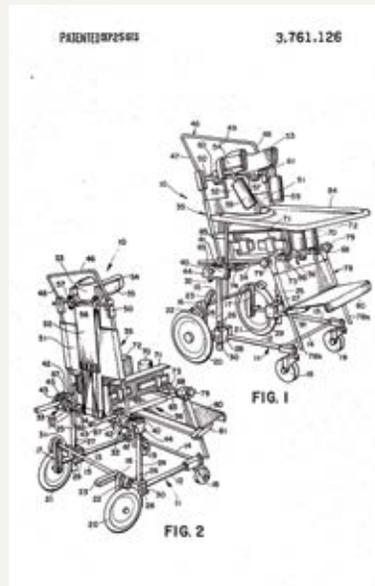


FIGURE 9

Imagery for U.S. Patent issued to Larry Mulholland for an adjustable mobility base with seating platform (1973)



FIGURE 10

Mulholland Positioning Travel Chair



FIGURE 11

Gunnell mobility base and seating system

Mulholland, along with Ortho Kinetics, Safety Travel and Gunnell, were among the first companies to offer integrated mobility and positioning systems, heralding the change from local custom fabrication to central fabrication and integrated systems.

OTHER NOTABLE SEATING AND POSITIONING MANUFACTURERS (CIRCA 1960S, 1970S, 1980S, EARLY-TO-MID 1990S)

Dynamic Systems Inc. was incorporated in 1967 by its founder Charles A. Yost, who in the mid-1960s was co-inventor of a high-energy dissipation foam technology used in a NASA research project to improve crash safety in airline passenger seats. Yost called the foam “Temper Foam,” which Dynamic Systems continued to develop post-NASA for medical applications. These foams are still being sold under recognized brand names SunMate®, Pudgee® and Liquid SunMate® Foam-in-Place Seating. Fun fact – Yost and Dynamic Systems were inducted into the U.S. Space Technology Hall of Fame in 1998 for the successful development and commercialization of seating technology.¹²

CONTINUED ON PAGE 40



SEMINAL INNOVATIONS ...
(CONTINUED FROM PAGE 39)

Thera/fin Corporation was founded by Gilbert "Gibb" Fink in 1968, starting in a garage with seed money from a neighbor. (See Figure 12) Thera/fin came from the idea that a gentleman named Fink would make "Therapeutic Adaptives." Thera/fink sounded hokey, so he dropped the "k." As an occupational therapist, Therafin became the perfect way to meld his creative ideas and passion for helping people. Fink would stop and talk to people with disabilities, even inviting them into his home to discuss their issues and brainstorm ideas for

new products to solve them. Therafin started with six products, including a suppository inserter, transfer board, and hand exercising device. The product line quickly expanded, and Therafin became a go-to supplier for activities of daily living (ADLs), seating hardware, strap systems and especially trays.

Freedom Designs® was founded by Ginny Maloco in 1981, advancing the use of plywood and foams to become one of the first

commercial manufacturers of planar seating. Maloco, after attending weekly seating clinics run by Antje Hunt at Rancho Los Amigos, recognized a need for building a customized system where the child and not the equipment would be the central focal point. This recognition inspired her to start Freedom Designs.

Freedom was among the first CRT manufacturers to offer technical seminars for therapists which included continuing education units and dedicated supplier training programs. These programs were led for over 21 years by legendary Education Specialist Karen "Missy" Ball. On the sales end of the business, Freedom was led by Maloco's husband, Mike Maloco, and represented in the field by the late Foster Davis, a truly great ambassador of the Freedom brand. As Hymie Pogir states, "Freedom Designs was one of the first central fabrication manufacturers (of planar seating), which opened access to seating solutions for many more consumers."

Special Health Systems LTD (SHS) was founded by Canadian Kinesiologist Patrick Harrison in 1982 and included among its employees seating specialist Corrinne Carriere (see Figure 14). SHS manufactured one of the first off-the-shelf product lines in seating featuring high-quality, contoured foam cushions and pre-contoured back supports.

Whitmyer® Biomechanix was founded by Jody Whitmyer in 1989. Originally contributing to the DESEMO System by fabricating an adjustable headrest solution, Whitmyer started crafting custom seating systems while working at Miller's Rental and Sales. Whitmyer was a pioneer in the creation of adjustable postural components,



FIGURE 13 Early generation seating system circa 1980s

best known for innovative, modular head positioning solutions utilizing adjustable positioning hardware compatible with other seating components and mobility bases. Maureen Story states "Jody ... was the first to think outside the box and develop headrests that actually supported the head rather than just being a back stop."

OTHER NOTABLE INDIVIDUALS INFLUENCING THE FORMATION OF AN INDUSTRY (CIRCA 1970S, 1980S, EARLY-TO-MID 1990S)

Sheila Buck - Occupational therapist and president at Therapy NOW at the University of Western Ontario, Buck provides assessment and prescription for Assistive Technology in the community, long-term care, and group home settings. Buck is a frequent lecturer on seating and mobility across Canada, the U.S. and Europe and has authored two editions of a practical guide to seating and mobility/Assistive Technology titled "More Than Four Wheels." Maureen Story writes that Buck reminds us to "not abandon our seniors."

David Cooper - Rehab technologist at Sunny Hill Health Centre for Children, Vancouver, British Columbia, is a pioneer in the design of dynamic seating, providing solutions to address children with high tone and movement disorders. Cooper, who shared his ideas openly while speaking at numerous conferences and symposiums, inspired clinicians to explore applications for dynamic seating and inspired numerous manufacturers to develop commercially available dynamic systems.

Barbara (Levy) Crume - Physical therapist and Clinician Task Force member, Crume started the Wheelchair Clinic at Care Partners Rehab Hospital, Asheville, North Carolina, in 1993. Now a seating and wheeled

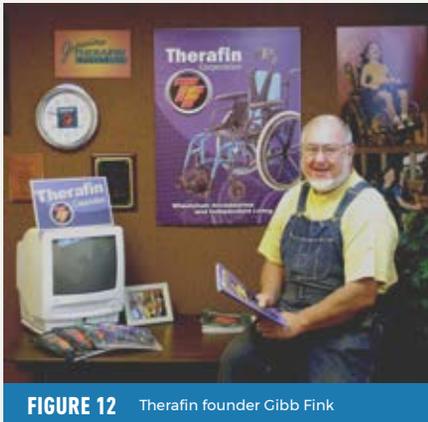


FIGURE 12 Therafin founder Gibb Fink

mobility specialist at Mountain Care, Crume consults with manufacturers on product design and is a frequent lecturer at top industry events such as RESNA, ISS and ATPA's annual conference.

Bengt Engstrom - Swedish physiotherapist and independent business owner, Engstrom is one of the most influential and prolific lecturers on wheelchair seating worldwide. Jean Minkel states, "Bengt's demonstrations of different postural presentations using his own body are still vivid in my mind."

Tamara Kittelson - Occupational therapist, Clinician Task Force member, and executive director of Posture 24/7, a nonprofit organization that promotes awareness of 24-hour postural care to support the health and quality of life for persons with impaired movement. Kittelson specializes in positioning and mobility for children and adults with complex needs and is noted for her work in the field of 24-hour posture care.

Ken Kozole - Occupational therapist, mechanical engineer, lecturer, author and product designer, Kozole worked for Dudley Childress in the famed Northwestern University Rehab Engineering Program at the Rehab Institute of Chicago in the early 1980s, moving on to Sharp Memorial Hospital in San Diego, California, before finding his long-term home at Shriners Hospital in Salt Lake City, Utah. Starting Shriners' wheelchair seating and mobility program in 1998 from a closet across from the therapy department, Kozole built the program into a premier seating and positioning service for children for all over America and Northern Mexico.¹³

Michelle Lange - Occupational therapist, RESNA Fellow, Clinical Task Force member and president of Access to Independence in Arvada, Colorado, whose experience tracks back to California Children's Services in Southern California. Lange was clinical director of the Assistive Technology Clinic at the Children's Hospital in Denver, Colorado, before moving to private practice. Lange is a clinician, lecturer and author.

Jean Minkel - Physical therapist, RESNA Fellow, senior vice president at the nonprofit Independence Care System and leader of "On a Roll," an occupational and physical therapist practice specializing in seating and mobility assessments. Minkel was inspired early

in her career by the children of the Massachusetts Hospital School in Canton, Massachusetts, a residential facility for children with multiple disabilities. Minkel, along with Martin Ferguson-Pell formed the Center for Rehab Technology at Helen Hayes Hospital in West Haverstraw, New York, where she was director of the seating and mobility program. Minkel is an author and teaching legend in the field of Assistive Technology.

Martin Ferguson-Pell - Ph.D. in biomedical engineering, and RESNA Fellow, whose 1974 doctorate research was on interface pressure measurement. Pell was instrumental in the establishment of the Center for Rehabilitation Technology at Helen Hayes Hospital, where he built the CUSHFIT system, the first expert system designed for clinical practice supporting wheelchair cushion assessment.¹⁴

Jessica Presperin Pederson - Occupational therapist, RESNA Fellow, renown lecturer and pioneer in the establishment of the seating and positioning industry, Pederson was part of a clinical team that

established the first wheelchair clinic in Chicago (1984) at the Rehab Institute of Chicago (now Shirley Ryan Ability Lab) and was one of the first professionals to be certified as an ATP¹⁵ (see Figure 14). Pederson is a frequent presenter at industry conferences and has presented clinical education programs for multiple manufacturers including ROHO, PinDot, Raz Design and Sunrise Medical, for whom she now works as director of clinical education, North America.

Allen Siekman - Designer, educator and owner of Allen Siekman Consulting with over 30 years of clinical experience



specializing in the design and provision of seating equipment for children and adults with moderate to severe physical challenges. Siekman was head of the Seating and Mobility department at the Rehab Engineering Center at Stanford Children's Hospital and worked for both Invacare Corporation and Beneficial Designs Inc. in leadership positions responsible for wheelchair seating. Siekman pioneered the Anti-Thrust seat, did early research and development in dynamic seating, and is perhaps best known for his advocacy and leadership in developing international wheelchair seating standards and testing methods.

CONTINUED ON PAGE 42



TIMELINE

1965	Gunnell Inc. founded
1967	Dynamic Systems founded by Charles A. Yost
1968	Robert H. Graebe issued patent for the original ROHO cushion
1968	Thera/fin Corporation founded by Gilbert Fink
1971	First 2 RERCs established – Rancho Los Amigos Medical Center (Los Angeles, Calif.) and Moss Rehabilitation Center (Philadelphia, Pa.)
1971	Mulholland Positioning Systems founded by Larry Mulholland
1972	Rancho Los Amigos develops an “off-loading” cushion as part of treatment protocol in their new “Pressure Clinic”
1972	Geraldo Rivera releases expose “The Last Great Disgrace”
1972	Landmark federal court case initiated in Alabama, Wyatt v. Stickney
1973 (est)	First VA Rehabilitation Engineering Centers established at VA facilities in Palo Alto, Calif., Decatur, Ga., and Hines, Ill.
1973	Ortho-Kinetics introduces the Travel Chair
1974	“Selected Equipment for Pediatric Rehabilitation” published, authored by Adrienne Bergen
1974	The Gillette Sitting Support Orthosis developed by Martin Carlson and team at Gillette Children’s Hospital
1975	Doug Hobson and Elaine Treffer move to Memphis, establishing what would become the RERC National Center for wheeled mobility and seating at the University of Tenn., Memphis.
1976	Rehab Engineering Research Center at University of Virginia founded by Colin A. McLaurin
1977	Miller’s Rental and Sales begins crafting custom seating systems
1977	“Positioning and Adaptive Equipment in Physical Therapy in the Developmental Disabilities” published, authored by Adrienne Bergen, Cheryl Colangelo, and Linda Gottlieb
1978	Northampton Consent Decree signed in response to Brewster v. the Commonwealth of Massachusetts
1978 (est)	DESEMO Project led by Joan Bergman at the University of Alabama Birmingham
1979	RESNA founded
1980	Passage of the Civil Rights of Institutionalized Persons Act of 1980
1981	Freedom Designs founded by Ginny Maloco

1982	Special Health Systems founded by Patrick Harrison
1982	Jay Medical founded by Eric Jay, introducing the original Jay cushion
1982	“The Wheelchair and Other Adapted Equipment” published, authored by Adrienne Bergen and Cheryl Colangelo
1982	PinDot Products founded by Michael Silverman
1983	First International Seating Symposium, Vancouver
1984	Metalcraft founded by Simon Margolis
1987	First International Seating Symposium in the United States (Memphis)
1989	Verg Inc. creates a working pressure mapping system
1989	Whitmyer Biomechanix founded by Jody Whitmyer
1989	New Mobility magazine debuts
1990	Team Rehab Report debuts
1991	University of Pittsburgh Rehab Sciences program brings in Cliff Brubaker as Dean and starts Department of Rehab Science and Technology
1992	NRRTS founded

SEMINAL INNOVATIONS ... (CONTINUED FROM PAGE 41)

Stephen Sprigle - Biomedical engineer with a license in physical therapy, RESNA Fellow and professor at the School of Industrial Design, Georgia Institute of Technology where he leads the Rehabilitation Engineering and Applied Research Lab (REARLab), which focuses on the biomechanics of wheelchair seating and posture, pressure injury prevention and manual wheelchair propulsion. ‘Sprigle’ as he is known to many in the field is a brilliant engineer with the unique ability to explain difficult concepts about applied engineering to a clinical audience while never losing focus on the seated client.

Susan Johnson Taylor - Occupational therapist, RESNA Fellow, educator and author who was an instrumental part of the legendary clinical and research team in the mid-1980s at the Rehab Engineering Center, University of Tennessee-Memphis. Taylor went on to work in the Seating and Mobility Clinic at Shepherd Center and the Wheelchair and Seating Clinic at the Rehab Institute of Chicago before joining Numotion as director of training and education.

Kelly Waugh - Physical therapist, Clinician Task Force member, and senior research instructor at the Center for Inclusive Design and Engineering in Denver, Colorado. Waugh and Faith Savage were involved in early seating and positioning of residents in institutional settings in Florida as the result of a lawsuit. Together, they developed early assessment processes and strategies and worked closely with Michael Bullard on the first linear seating simulator, the Flamingo.

Waugh is a frequent lecturer on complex wheelchair seating and has been very involved with standards and seating measures.

POSITIVE ROLE OF INDUSTRY ASSOCIATIONS AND THE PRESS

One visible sign of the arrival of an industry is the advent of trade publications and industry organizations to help spread the word about products, professionals and standards, and the field of seating and positioning is no exception. New Mobility Magazine was first published in 1989 by founder Sam Maddox and was led through the 1990s by editor Barry Corbet, focusing on the community of wheelchair users.¹⁶ Team Rehab Report, published by CRT advocate Jody Rich and edited by industry friend Andrea Segedy, provided extensive coverage of the growing field of seating and positioning throughout the 1990s, and certainly played a role in marketing promotion and extending education on products and principles of seating. NCART and RESNA have been great friends to the industry, providing both events and platforms for marketing and education. And last, but certainly not least, NRRTS and their bi-monthly publication "DIRECTIONS," the premier publication of the CRT industry that reaches readers in all 50 states, Canada and Puerto Rico, provides great exposure to manufacturers and industry professionals looking for a platform to share information on the industry that is wheelchair seating and mobility.

SUMMARY

We hope you have enjoyed this walk down memory lane, reflecting on groundbreaking events, innovations, trailblazers and leaders from the 1960s into the mid-1990s who have shaped the field of wheelchair seating and positioning in the modern day. While we have tried to be inclusive with this article, we know every reader will likely identify other people, products or events that made contributions to this great industry that so many of us call home. Please share that feedback by sending an email to nrrtsarticlefeedback@gmail.com, so along with NRRTS we can use this article as a steppingstone to a truly comprehensive body of work reflecting the history of this exciting field.

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16. [HTTPS://NEWMOBILITY.COM/ABOUT/](https://newmobility.com/about/)

This article contains wording that is no longer considered appropriate today. This wording is limited to proper names and references as used at that time.



Tom Borcharding has spent his entire career in the Complex Rehab Technology (CRT) industry, working in customer service and sales for Everest and Jennings, sales management and executive leadership for ROHO, global leadership for Permobil and now serving as senior vice president of business development for LUCI. Borcharding earned his bachelor's degree from Miami University (Ohio) and is proud to be an original friend of NRRTS. Borcharding lives in Chesterfield, Missouri, with his wife, Jan, and teenagers, Kaelin (18) and Kyle (17). Outside of work, you will likely find Borcharding attending one of his kids' games, working in his yard or enjoying a round of golf.



Tom Whelan has worked in the Rehab Technology area since 1981. He began as a tech and RTS and did so until moving into sales and then product management with Meyra in 1986. Three years later, he started Functional Rehab Equipment and became an owner-operator. Whelan returned to product management at Sunrise, advancing over time to global product responsibility. Whelan joined Ki in 2012 and is currently the vice president of product development, where he also has responsibility for education. Whelan is a named inventor on more than two dozen patents for Complex Rehab Technology.



SEATING AND WHEELED MOBILITY RECOMMENDATIONS: BE SPECIFIC!

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

Complex Rehab Technology Suppliers are typically familiar with equipment features and product options. However, I am a strong believer the clinician needs to be familiar with product, as well. Many clinicians do not recommend products in detail. For example, the clinician may recommend a “headrest,” but not specify which one. It is critical during the evaluation for the team to discuss the features required on a specific product and choose the optimal one for an individual client. Otherwise, we are not acting as a team and client outcomes will suffer.

Another example are secondary supports. It is easy to just say (and document) the client needs a pelvic belt, however the specific angle of attachment and other product features may be critical to the product being successful. Let’s look at Taylor who is an 8-year-old boy with the diagnosis of cerebral palsy. He sits in a chronic posterior pelvic tilt. He has a “pelvic belt,” but it is only keeping him from extending out of his seat and onto the floor. The current pelvic belt is mounted at 45 degrees, and he can rotate his pelvis right under it. The current pelvic belt has no padding, and he has deep red marks from the edges of the webbing. The current pelvic belt also has a very large buckle, which also digs into his soft tissue during extension. Finally, the belt itself lengthens quite readily in response to his extension. During a recent evaluation, the team discussed strategies to reduce this posterior pelvic tilt and a critical piece of the solution was the pelvic belt. This item was changed to a more durable brand, which did not lengthen under force, was padded, had a smaller buckle and was mounted at a 60-degree angle. The justifications in the Letter of Medical necessity were like the those for the original pelvic belt. However, the specific pelvic belt features and mounting angle, along with the rest of the seating system, ensured a more neutral pelvic position.

So, we can agree that the team must work together to make the most appropriate and specific product recommendations. What are the barriers?

1. THE CLINICIAN MAY NOT BE FAMILIAR WITH THE PRODUCT OPTIONS AND FEATURES.

So, the clinician involved with the evaluation is not familiar with the relevant products. I speak to many suppliers who tell me they would absolutely love to work with a more experienced clinician. However, there simply may not be someone experienced in a certain geographical area.

TIME UPFRONT CAN RESULT IN BETTER CLIENT OUTCOMES AND LESS BACK-END PROBLEMS. IF THE ENTIRE TEAM IS NOT ON BOARD UPFRONT, IT IS UNLIKELY THAT EVERYONE WILL BE ON BOARD AFTER DELIVERY.

CLINICIAN SOLUTION:

Just like any other practice area, seating and mobility takes education to build and maintain competence. It may seem daunting, but this exciting practice area can unlock client function and independence!

SUPPLIER SOLUTION:

If you can’t find an experienced clinician, try and forge one. Find a clinician who is interested in learning more. Set up some in-services to build competence, and you will end up with a stronger team – and stronger client outcomes.

2. THE SUPPLIER MAY NOT SHARE SPECIFIC PRODUCT OPTIONS AND FEATURES WITH THE CLINICIAN.

Ok, this is an editorial, so I’m going to lay down my opinion. Time is money; I get it. Discussing every potential solution takes time. Some solutions are not as profitable or streamlined. The clinician may not appear interested and may even be offended. Where’s the motivation there?

CLINICIAN SOLUTION:

See above, be teachable and be a team player.

SUPPLIER SOLUTION:

Time upfront can result in better client outcomes and less back-end problems. If the entire team is not on board upfront, it is unlikely that everyone will be on board after delivery. And who gets the blame? Well, you know ...

3. THE SUPPLIER MAY BE HESITANT TO 'EDUCATE' THE CLINICIAN

Maybe I've convinced the suppliers reading this editorial it is worth their time to build competence in a clinician team member (in the absence of a more experienced person). Yet I also understand the hesitation. Will the clinician be offended with a training offer from the supplier? If that clinician has a "chip on their shoulder," probably yes.

CLINICIAN SOLUTION:

Oh my gosh, take the chip off your shoulder and be a team player. We all have room to learn and grow. The goal is the best client outcome.

SUPPLIER SOLUTION:

A great way to broach this subject is to discuss how your area needs a solid seating and wheeled mobility team and ask the clinician if they are interested in taking this up a notch. Emphasize the goal of better client outcomes. Bring chocolate.

4. THE TEAM DOES NOT HAVE ADEQUATE TIME TO DISCUSS EACH ITEM IN DETAIL.

Everyone is short on time and under pressure to stay solvent, both the supplier and clinician alike. And the reality is if every potential option was discussed in detail, it could take all day.

JOINT SOLUTION:

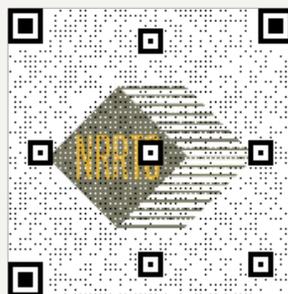
The Seating and Wheeled Mobility evaluation does not (and arguably should not) have to be done in a single appointment. The clinician can see the client

for an initial appointment to gather information, complete a mat assessment and identify needed product features. The clinician can share these results with the supplier to begin narrowing down options for the second appointment (which the supplier should attend). At this appointment, the focus is on matching client parameters with product features, allowing time to discuss specific needed angles, support surfaces and other product features. By sticking to these issues, rather than jumping to product, we can save a lot of time (Scan the QR code at the end of the article to read Volume 4 Clinical Editorial on "Jumping to Product"). Once all team members are on the same page, all this information can be used to identify specific products. Remember, the client and caregivers are our most important team members and need to be educated and provided choice in these decisions.

Didn't I start with clinicians needing to be specific in their recommendations? That's right! Being specific requires a strong familiarity with product features to recognize what needs to be specified. This also requires strong teamwork so that team members can continue to sharpen each other's skills.

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Scan the QR code to read Volume 4 Clinical Editorial on "Jumping to Product."



Michelle Lange is an occupational therapist with 35 years of experience and has been in private practice, Access to Independence, for over 15 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. Lange is a certified ATP, certified SMS and is a Senior Disability Analyst of the ABDA.

POSITIONING AND PULMONARY FUNCTION

Written by: KEITH MCWILLIAMS, OTD, OTR, DRS, AND LEE ANN HOFFMAN, OTD, MSC., ATP/SMS, CAPS

OVERVIEW

A significant relationship exists between posture and pulmonary function. For example, the expiratory flow is the greatest in standing, decreases in upright sitting and significantly decreases in the slumped seated posture (Barks & Davenport, 2012). Breathing occurs in three dimensions: anterior-posterior, superior-inferior and laterally. All daily tasks require a symbiotic relationship between breathing and the posture demands of the trunk such as breathing, coughing, sleeping, eating, talking and moving (Massery, 2012). Respiration function is impacted in several populations such as those with spinal cord injury (SCI).

SPINAL CORD INJURY AND RESPIRATION

Respiratory complications lead to increased morbidity and mortality rates in people with SCI. Compromised breathing is evident in the lying position for individuals with tetraplegia and presents as sleep-disordered breathing (sleep apnea and snoring) and occurs at a higher rate than in the able-bodied population (Hitzig et al., 2011). Furthermore, increased stress is placed on the respiratory system in the seated position for people with SCI, caused by the displacement of the ribcage as a result of a forward flexed posture (posteriorly tilted pelvis, kyphotic thoracic spine and hyperextended cervical spine). The forward flexed seated position negatively impacts the strength and efficiency of the respiratory muscles (Hitzig et al., 2011; Torres-Castro et al., 2016). In addition, many individuals with neurological health conditions may have reduced or lost the ability of intrinsic mobility of the chest wall muscles (Massery, 1994). Additional risk factors that further impact respiration include increased body weight, smoking and exposure to air pollutants.

For individuals with spinal cord injury, diminished trunk control and restrictive breathing are often secondary complications associated with poor positioning and/or inadequate support from the wheelchair seating system. Individuals who self-propel their manual wheelchairs are likely to experience frequent and recurrent periods where their upper limbs are in internal rotation and abduction, during wheelchair propulsion. Not only is this positioning pattern known to result in musculoskeletal injuries associated with overuse of the upper limbs, but this posture is also linked with reduced respiratory inspiration volume (Massery, 1994; Paralyzed Veterans of America, 2005).

Proper positioning may positively influence respiration, allowing for maximal chest wall expansion (Barks & Davenport, 2012; Massery, 2010; Pope, 2007). Chest wall expansion can be facilitated in lying, sitting and standing - as all postures are linked.

PROMOTING RESPIRATION THROUGH ALTERNATIVE POSITIONING

Massery (1994) outlined the postures to promote respiratory inspiration and expiration in lying, sitting and standing. Some of these postures are designed to be assumed short-term for respiratory improvement; however, they are not practical for longer-term pressure distribution or functional activities. These are summarized as follows in Table 1.

SEATED POSTURE AND POSITIONING FOR RESPIRATION

Massery (1994) described upright postures and activities and the challenges related to breathing and balance, with specific reference to the “unsupported spine” (p.12). Pelvic position and alignment dictate the position of the body segments above and below the pelvis. If the pelvic position is in neutral or anterior pelvic tilt, the upper body has the potential for improved upright positioning against gravity – thereby promoting respiration quality and quantity. Massery (1994) stated how the orientation of the neutral or anteriorly positioned pelvis in healthy adults will not only promote respiration but also improve upper extremity positioning and range of motion potential. Massery (1994) outlines the symbiotic relationship between seated posture, positioning and respiration:

- Reduce the kyphotic curve of the spine.
- Adduct the scapula (or encourage a more neutral position).
- Promote neutral or externally rotated upper extremity positioning.
- Promote head position and a neutral chin orientation (p12).

Massery (1994) stated often the mere correction of the pelvis can serve to improve both posture and respiration. Conversely, when the pelvic alignment is in posterior pelvic tilt, the upper body tends to migrate into a forward flex kyphotic posture and reduces the chest and abdomen space thereby impacting the ability for the diaphragm and lungs to contract and expand respectively. This forward flexed posture in upright

LYING	
<p>INSPIRATION:</p> <ul style="list-style-type: none"> • <u>Decrease the number of pillows under the head:</u> Respect the length-tension relationship of neck accessory muscles (sternocleidomastoid and scalene muscles). • <u>In the event of any functional limitations/restrictions to range of motion:</u> For example, someone with upper extremity paralysis but adequate shoulder mobility can maximize inspiration by placing their arms in a supported flexion/abduction/external rotation position to maximally stretch the neck, pectoralis and intercoastal upper chest wall muscles. Gravity will help to increase the end range of the upper extremity. • <u>Improvement:</u> The following can stretch the anterior muscles of the chest wall: <ul style="list-style-type: none"> • Neutral or retracted scapula with the humerus in an externally rotated position. • Hands behind the head. • Towels/pillows behind the elbows to support the upper extremity at the end range. • Forearm in supination (promoting external rotation of the upper limbs). • Towel behind the thoracic spine. 	<p>EXPIRATION:</p> <ul style="list-style-type: none"> • Trunk flexion • Shoulder extension • Shoulder adduction • Shoulder internal rotation
SITTING	
<p>INSPIRATION:</p> <ul style="list-style-type: none"> • <u>Pelvis position:</u> Leaning forward. Towel placement to create anterior pelvic tilt will promote upper body extension/ reduce kyphotic posture resulting in chest wall expansion. Gravity assisting the diaphragm – the inferior plane of respiration. • <u>Head position:</u> Neutral head and neck: important for swallowing and speech volume. • <u>Shoulder positioning:</u> Reaching with external rotation (rather than internal rotation) results in greater chest wall movements/ thoracic extension for increased inspiratory volumes. 	<p>EXPIRATION:</p> <ul style="list-style-type: none"> • Posterior pelvic tilt • Trunk kyphosis • Knee flexion
STANDING	
<p>INSPIRATION:</p> <ul style="list-style-type: none"> • Requires both trunk flexion/extension. • Initiate standing with inhalation and neck in extension. 	<p>EXPIRATION:</p> <ul style="list-style-type: none"> • Forward lean - exhalation • Stand to sit - exhalation - counting out loud to control decent and exhalation.

TABLE 1

Summary of Postures for Inspiration and Expiration

Note. Summarized from Massery (1994) What's positioning got to do with it? (see Figure 1).

sitting has been associated with individuals with diagnoses such as SCI, neurodegenerative health conditions and those presenting with low muscle tone in the trunk. Massery (1994) acknowledged that prolonged active sitting to promote a neutral or anteriorly positioned pelvis is challenging for individuals with health conditions and may require passive assistance.

IMPLICATIONS FOR PRACTICE

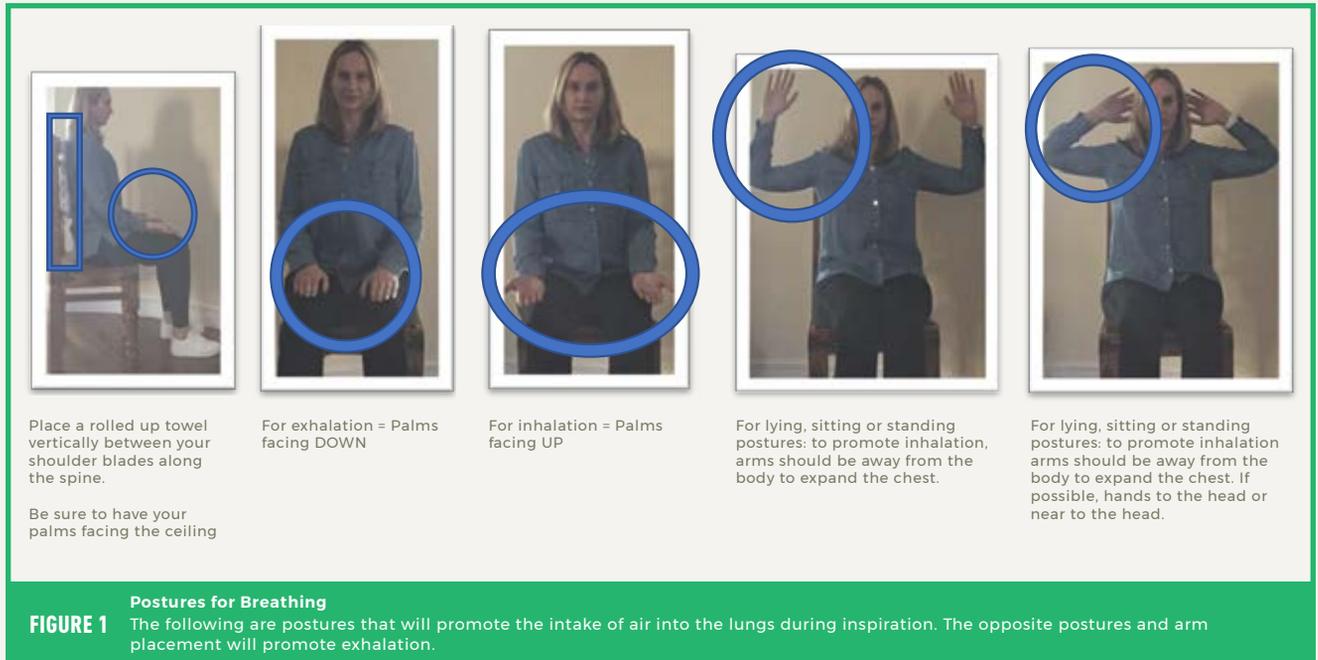
Positioning practices can be implemented to help mitigate respiratory complications and have a positive impact on the quality and quantity of respiratory function. Providing solutions in lying, sitting and

standing for the implementation of small daily changes to positioning may be a viable solution for people with SCI who are concerned with their respiratory function.

SEATED POSITIONING:

Provision of posterior support in the seated posture promotes the lumbar curve and decreases thoracic kyphosis for those individuals with reducible postural asymmetries. Greater expansion of the rib cage can be promoted leading to improved quality of inspiration

CONTINUED ON PAGE 48



POSITIONING AND ...
(CONTINUED FROM PAGE 47)

(Torres-Castro et al., 2016). Many off-the-shelf back supports can provide generic or customized support to the upper pelvis and lower spine to promote a neutral pelvic tilt and spinal extension, thereby the expanding the chest. Used in combination with anterior trunk supports, counterforce can be provided to ensure that the appropriate level of support is in place to promote respiration. Introducing posterior supports should only be implemented after a comprehensive mat eval of the person and their posture to prevent hyperlumbar lordosis or micro stress and shear on the lumbar region.

SCI clients with non-reducible asymmetries and established postural habits and patterns may require a more custom approach as “off-the-shelf” solutions will not align with body contours (Pope, 2007).

Providing support to the lower abdomen in the seated posture can also be a beneficial intervention. Decreased abdominal muscle strength is noted in people with SCI as a result of their level of injury. In the seated position, abdominal structures are less supported due to decreased abdominal wall muscle tone, resulting in lowering of the diaphragm. Supporting the abdomen can support respiration and provide a measure of postural support to the trunk. Wadsworth et al. (2009) reviewed studies relating to the use of abdominal binders for breathing, speech and cardiovascular function for individuals with an SCI. The review concluded that abdominal binders improve the vital capacity of individuals with SCI. Variables relating to the use, materials, size (girth and height) and positional orientation of the abdominal binder need to be investigated to ensure the desired outcome. Wadsworth et al. (2012) reported that an individually fitted

abdominal binder improved forced vital capacity, forced expiratory volume and resulted in maximum sustained vowel time in people with newly acquired tetraplegia.

SUPINE POSITIONING:

To promote expiration, the adoption of a supine lying position results in the weight of the abdominal contents providing support and elevation to the diaphragm in a cephalad direction and results in the ability to achieve greater excursion of the diaphragm. In a study of 10 healthy adults, it was concluded diaphragmatic movement in the supine position is greater than in the sitting position, especially in the posterior part of the diaphragm (Takazakura et al., 2004). To further aid individuals with tetraplegia, the head of the bed can be lowered from supine (tipped downwards) by 15 degrees to achieve a 6% increase in vital capacity (Berlowitz, 2016). While this position is associated with gains in respiration, the likelihood of being implemented is reduced. This position limits functional engagement and requires the individual to have access to a bed with this function.

CONCLUSION

Careful attention is needed during the assessment and provision of Complex Rehab Technology (CRT), specifically regarding equipment, positioning and

the location of positioning supports. The provision of external supportive surfaces must respect the three dimensions in which respiration occurs. Furthermore, the team must take into consideration the level of client injury and how this impacts the inspiratory muscles (T11) and the expiratory muscles (L3) (Torres-Castro et al., 2016). Fortunately, even introducing small postural changes in the positioning of the upper limbs can serve to assist and promote both inspiration and expiration in lying, sitting, and standing postures.

Addressing postures in lying, sitting and standing, in addition to providing positioning supports, can lead to improved pulmonary function. We know that standing postures yield the greatest respiratory potential and that slumped seated postures provide the least. For individuals with spinal cord injury with diminished trunk control, restrictive breathing is a secondary complication associated with poor positioning/inadequate support from the wheelchair/seating system. This must be addressed in the provision of equipment and positioning recommendations. Challenges exist regarding creating awareness and educating those who may be at a greater risk of decreased respiratory function as they continue to age with an SCI, as they may no longer be actively seeking or engaged in therapy services or interventions.

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TRAVELERS IN THE WILDERNESS

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

“We are all travelers in the wilderness of this world, and the best we can find in our travels is an honest friend.”

-Robert Louis Stevenson

Since March 2020, our lives have changed due to the pandemic. Complex Rehab Technology (CRT) Suppliers learned how to continue providing services as lock downs were instituted and learned how to use remote technology. It was not an option to stop meeting the ongoing needs of people who rely on CRT.

One thing the pandemic stopped was in-person conferences. Some conferences converted to a virtual event. Some were canceled or postponed. Seeing people in Zoom meetings are okay, but nothing compares to hanging out with your friends, sharing ideas, sharing concerns and solving all the world’s problems. We did it just to keep the connection. More than once during our screen time together, we lamented that we could not be together.

Some of my fondest memories come from interactions with my colleagues at these events. Did you wonder why the Washington, D.C., hotel now has a sign that says, “No Noise after 10 PM?” Did you know one year our event planner had to go dumpster diving to retrieve conference materials that had been mistakenly discarded? Each of us has tales about different happenings at our in-person conferences. Besides the courses offered, being with this amazing group of people was the biggest draw.

In August, Numotion held an in-person conference. This was the first in-person event for me since ISS Vancouver in 2020. It was both exciting and scary at the same time. Finally, an opportunity to be together again! But it meant going to the airport and getting on an airplane. Do you wear a mask in the airport? Do you wear a mask on the plane? Will my flight get delayed? Will my flight be canceled? All these new travel issues created anxiety. After arriving at the hotel and seeing that first familiar face, all travel anxiety was immediately gone.

It was just like I remembered it. We were back together again. We walked the exhibit hall and touched equipment. We shook hands. We laughed. We told stories. And just like that, it was almost back to normal.

Traveling through the wilderness in the world was worth catching up with my honest friends.



Susan Taylor, Weesie Walker and Andrea Madsen



Mike Collins and Weesie Walker



Tom Simon, Weesie Walker, Anne Kieschnik and Mike Seidel



Weesie Walker and Allan Boyd

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RESNA CERTIFICATION NEWS

Written by: **ANDREA VAN HOOK, EXECUTIVE DIRECTOR, RESNA**

Did you know that RESNA's Assistive Technology Professional (ATP) certification program is accredited by the National Commission for Certifying Agencies (NCCA)? This accreditation means that RESNA's ATP program meets rigorous standards for professional certification programs. By passing the ATP exam and maintaining your certification, you are recognized as having demonstrated competence in analyzing the needs of consumers with disabilities, assisting in the selection of appropriate assistive technology for the consumers' needs, and providing training in the use of the selected devices.

RESNA's ATP program has been accredited by NCCA since 2010. RESNA's ongoing obligation and commitment is to actively maintain and update the exam through a fair, rigorous, transparent and legally defensible process, the details of which are available on the RESNA website. For the past two years, RESNA staff and volunteers have been working on an update of the ATP exam.

Recently RESNA released a new ATP Exam Outline for an updated ATP exam to launch Jan. 1, 2023. ATP exam applicants who plan to test in 2023 should review the new outline, an updated Assistive Technology (AT) Job Knowledge List and the Recognized Acronyms List, now available on the website at www.resna.org/atp. Candidates who sit for the new exam will have to wait to receive their official scores until late April/early May, as RESNA will be conducting a study to establish a new passing score. For this inconvenience, candidates will receive a substantial discount on their exam fee.

Setting a new passing score involves a panel of subject matter experts who rate the difficulty level of each test item in respect to basic competency, and then the panelists' aggregated ratings data is analyzed to identify the range of statistically acceptable cut-off scores. After reviewing pilot testers' exam scores in relation to the identified cut-score range, RESNA's Professional Standards Board will then approve a passing score.

RESNA is not only committed to maintaining the ATP program, but also the Seating and Mobility Specialist (SMS) certification program. The SMS certification is an advanced certification that recognizes those who specialize in seating and mobility products. RESNA has convened a panel of subject matter experts to begin the process of updating this exam. We expect to announce a new, updated exam outline in 2023 to start in 2024.

RESNA also offers the Rehabilitation Engineering Technologist (RET) certification. Those that hold the RET certification apply engineering

FOLLOWING A YEAR-LONG PROCESS OF STAKEHOLDER INPUT AND DISCUSSION, RESNA'S PROFESSIONAL STANDARDS BOARD (PSB) EXPECTS TO PUBLISH AN UPDATED STANDARDS OF PRACTICE AND CODE OF CONDUCT THIS FALL

principles to the design, modification, customization, fabrication and/or integration of AT for persons with disabilities. To qualify for this certification, applicants must already be ATP-certified in good standing and have graduated with an engineering degree from an accredited, four-year institution.

UPDATED CODE OF CONDUCT AND STANDARDS OF PRACTICE FOR CERTIFIED PROFESSIONALS

Following a year-long process of stakeholder input and discussion, RESNA's Professional Standards Board (PSB) expects to publish an updated Standards of Practice and Code of Conduct this fall, which will apply to all certified professionals starting Jan. 1, 2023.

The content of the Standards of Practice and Code of Conduct has not changed dramatically. Instead, the update reorganizes the material into four clear and easy-to-understand "duties" of the certified professional:

- Duties owed to consumers and the public.
- Practice standards for working in AT.
- Duties owed to companies and affiliated entities.
- Duties owed to RESNA.

The PSB thanks the many subject matter experts, RESNA members and certified professionals that have participated and submitted hundreds of comments and suggestions. The PSB has spent the past few months improving the document based on these suggestions and is expected to submit a final version to the RESNA Board of Directors before the end of 2022 for final approval.

The PSB will hold informational sessions in 2023 to provide more information about the updated Code of Conduct and Standards of Practice.

RESNA'S COMMITMENT TO CERTIFICATION AND PROTECTING THE PUBLIC

Each year, RESNA invests hundreds of volunteer hours and thousands of dollars into maintaining the certification programs. RESNA's certification staff are credentialing professionals, with deep expertise in governance, program operations and assessment development and validation of certification programs. By promoting the professionalism of AT service providers, RESNA's certifications ultimately serve to protect consumers of AT solutions. We are proud of our commitment to AT professionals and to the field of assistive technology.

Interested in getting involved as a volunteer? Email info@resna.org for more information.

CONTACT THE AUTHOR

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Andrea Van Hook is executive director of RESNA. She has over 20 years of experience in nonprofit association management. She lives and works in the Washington, D.C., area.

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CLINICIAN'S OVERVIEW OF HEALTH CANADA LICENSING REQUIREMENTS

Written by: **STEVE CRANNA**

The foundation of NRRTS is a commitment to consumer protection concerning Complex Rehab Technology (CRT). Within NRRTS Canada, provider compliance with regulatory requirements has been raised in several conversations across the provinces in recent months.

This article will provide a high-level overview of the primary requirements for our industry from Health Canada, which is similar to the Food and Drug Administration (FDA) in the United States. The overarching mandate of these independent agencies is to protect citizens and ensure and enforce product-specific safety standards. Safety recalls are also overseen by Health Canada when products are deemed unsafe due to potential or actual serious injury to the user or the caregiver.

Two types of Health Canada licenses pertain to our industry sector: one is for the device itself, and the other is for the company distributing the products.

1. Medical Device License (MDL): Health Canada requires all drugs and devices available in Canada to be manufactured and distributed under a license. There are four license classifications. Class I represents the lowest risk (includes wheelchairs, walkers, etc.), and Class IV represents the highest risk products. For example, flotation mattresses – which include any air mattresses – are Class II, and blood pressure monitors are Class III. Class II, III, and IV medical devices must be licensed before they may be imported or sold in Canada.
2. Medical Device Establishment License (MDEL): This license pertains to providers in our industry and will be our focus. It is the most pertinent in that it deals with recalls and provider responsibilities.

Most products such as wheelchairs, walkers and cushions supplied by providers (retailers, under the Act) are Class I and do not require the provider to have an MDEL if they are supplying directly to the

THIS ARTICLE WILL PROVIDE A HIGH-LEVEL OVERVIEW OF THE PRIMARY REQUIREMENTS FOR OUR INDUSTRY FROM HEALTH CANADA

end user. However, an MDEL is required by these same retailers of Class I equipment if they sell or rent to entities that are not an end user. For example, sales to hospitals and long-term care facilities, in which multiple patients will use the equipment, require an MDEL as the retailer has now become a distributor under the Act. Most providers in Canada are selling to end users and institutions, which necessitates an MDEL.

The primary requirements of MDEL licensing are to have established Standard Operating Procedures (SOPs), which enable product tracking in case of recalls. Furthermore, long-term care facilities and hospitals fall under MDEL standards for the products in use in their locations. The SOPs require the provider to identify all the customers to whom they have provided a specific product, often accomplished through serial number tracking. SOPs are reviewed and approved by Health Canada before granting a license.

The Act reads as follows: Any person who imports a medical device for his/her own personal use retailers, including:

- Companies that sell medical devices to the end user (ultimate consumer or end user) for their own personal use; and
- Canadian manufacturers of Class I medical devices who sell their devices solely to ultimate consumers or end users.

NRRTS expects all NRRTS Registrants to work within their government's policies. This expectation includes ensuring that their companies have the required insurance and licensing in Canada. In addition, the expectation is that providers are vigilant in ensuring the manufacturers and suppliers they work with also have the required Health Canada licensing.

These expectations demonstrate the industry's commitment to the safety of our clients and the standards and principles NRRTS expects of its registrants and their respective organizations.

As an NRRTS Registrant or a clinician, you can verify the status of your provider by accessing the easy-to-use lookup to search for license holders at: <https://b.link/CAMedDev>

Another suggested approach is simply asking your employer/provider for their MDEL license status or license number. Reputable companies requiring the license will readily provide you with their MDEL number. As professionals, this ensures your patients have the protection provided to them by our Canadian government. It also mitigates any legal exposure in case of a recall.

For details on requirements and processes, you may refer to the Guidance Documents provided by Health Canada at: <https://b.link/MedDevApp>

CONTACT THE AUTHOR

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STEVE.CRANNA@VGM.COM



Steve Cranna is the director of new business development and government relations at VGM Group Services.

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NEW NRRTS REGISTRANTS

Congratulations to the newest NRRTS Registrants. NAMES INCLUDED ARE FROM JULY 2, 2022, THROUGH SEPT. 15, 2022.

Arturo Bonilla, RRTS®
Access Medica
3266 Grey Hawk Ct
Carlsbad, CA 92010
Telephone: 760-929-2828
Registration Date: 07/14/2022

John West, ATP, RRTS®
Universal Med Supply
1329 W Walnut Hill Ln Ste 100
Irving, TX 75038-3027
Telephone: 972-228-1820
Registration Date: 09/14/2022

Miguel Nunez, RRTS®
National Seating & Mobility Inc.
1406 SW 13 Ct
Pompano Beach, FL 33069
Telephone: 321-746-4482
Registration Date: 08/15/2022

Douglas Hess, ATP, CRTS®
Freedom Mobility Center
110 Talbert Pointe Dr.
 Mooresville, NC 28117
Telephone: 704-658-0817
Registration Date: 08/09/2022

Keith Miller, RRTS®
Motion
1346 39 St N
Lethbridge, Alberta T1H5L8
Telephone: 403-849-7619
Registration Date: 08/09/2022

Ryan Strap, RRTS®
Motion
9503 49 St NW
Edmonton, Alberta T6B2L8
Telephone: 780-468-4002
Registration Date: 09/01/2022

Gavin Arnold, RRTS®
Access Medical
3266 Grey Hawk Ct
Carlsbad, CA 92010
Telephone: 760-407-6543
Registration Date: 08/02/2022

Mark Hebert, ATP, CRTS®
Rehab Medical Inc.
3359 Copter Rd, Unit 8
Pensacola, FL 32514
Telephone: 850-227-5300
Registration Date: 07/28/2022

Spencer Doerrig, RRTS®
Access Medical
3266 Grey Hawk Ct
Carlsbad, CA 92010
Telephone: 760-677-5556
Registration Date: 08/16/2022

Glenn Hales, ATP, CRTS®
Custom Mobility
7199 Bryan Dairy Rd
Largo, FL 33777
Telephone: 727-539-8199
Registration Date: 09/07/2022

Matthew MacQueen, RRTS®
Browning's Pharmacy & Health Care
141 E Hibiscus Blvd
Melbourne, FL 32901
Telephone: 321-725-6320
Registration Date: 08/03/2022

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CRTS®

Congratulations to NRRTS Registrants recently awarded the CRTS® credential. A CRTS® receives a lapel pin signifying CRTS® or Certified Rehabilitation Technology Supplier® status and guidelines about the correct use of the credential. NAMES LISTED ARE FROM JULY 2, 2022, THROUGH SEPT. 15, 2022.

Douglas Hess, ATP, CRTS®
Freedom Mobility Center
 Mooresville, NC

Jacob Hinkson, ATP, CRTS®
Numotion
Tampa, FL

Teresa “Gaye” Barger, ATP, CRTS®
Certified Seating & Mobility
Atlanta, GA

Glenn Hales, ATP, CRTS®
Custom Mobility
Largo, FL

Jordan Swan, ATP, CRTS®
Southern Pharmaceutical Corporation
Richardson, TX

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 JULY 2, 2022, THROUGH SEPT. 15, 2022. FOR AN UP-TO-DATE VERIFICATION ON REGISTRANTS, VISIT WWW.NRRTS.ORG, UPDATED DAILY.

Michelle McMahon, ATP
Cheyenne, WY

Robert Rex Johnson, ATP
Memphis, TN

David Manuel
Victoria, British Columbia

Stephanie Souilliere
Manitoba, Alberta

Jerry Newman – Retired
Valdosta, GA

Robert Lees
Roanoke, VA

Daniel Cohen
Ottawa, Ontario

Jill Arrowsmith
Oakville, Ontario

Phil Hochhausen
Calgary, Alberta

Jason Victoria
Richmond, British Columbia

Emmanuel Galang
Etobicoke, Ontario

Michael Lopezgamez, ATP
Peoria, AZ

Kevin Moser
Cedar Rapids, IA

Jeffrey Hansen
Kelowna, British Columbia

Greg Thompson
London, Ontario

Kate Spurr
Halifax, Nova Scotia

Chris Thompson, ATP
Savannah, GA

David Farr
London, Ontario

Christopher Kaplar
Burnaby, British Columbia

Jeff Richards
Kamloops, British Columbia

Heather Pringle
Marshall, MN

Jason Farr
London, Ontario

Kyle Cruickshank
Victoria, British Columbia

BE SURE TO FOLLOW NRRTS ON SOCIAL MEDIA!



RENEWED NRRTS REGISTRANTS

The following individuals renewed their registry with NRRTS between July 2, 2022, and Sept. 15, 2022.

PLEASE NOTE IF YOU RENEWED AFTER SEPT. 15, 2022, YOUR NAME WILL APPEAR IN A FUTURE ISSUE OF DIRECTIONS.
IF YOU RENEWED PRIOR TO JULY 2, 2022 YOUR NAME IS IN A PREVIOUS ISSUE OF DIRECTIONS.

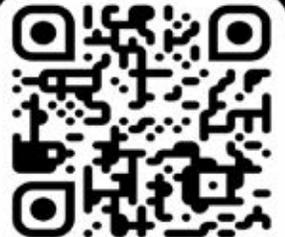
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Aaron Harvey, RRTS®	Jason P. Steiner, ATP, CRTS®	Phillip D. Swanson, ATP, CRTS®
Albert Alvarado, ATP, CRTS®	Jason S. Lovato, ATP, CRTS®	Rick Church, RRTS®
Albert Baxter, ATP, CRTS®	Jay Krusemark, ATP, CRTS®	Robert Garwood, ATP, CRTS®
Alex Biello, ATP, CRTS®	Jeff Cysewski, ATP, CRTS®	Robert Brent Hudson, ATP, CRTS®
Amanda Bult, RRTS®	Jeffrey C. Ray, ATP, CRTS®	Robin Grider, ATP, CRTS®
Andres V. Ferreira, ATP, CRTS®	Jillian Petrillo, RRTS®	Rose Ebner, ATP/SMS, CRTS®
Andrew Cantrell, ATP, CRTS®	Job Huckaby, ATP, RRTS®	Russell Pratt, RRTS®
Aundre Judge, RRTS®	Joe Wood, RRTS®	Ryan J. Romero, ATP, CRTS®
Barney Deichert, ATP, CRTS®	Joe Prieto, ATP, CRTS®	Sally Buxton, RRTS®
Benjamin Jones, RRTS®	Jonathan C Adams, ATP, CRTS®	Sean P. Reed, ATP, CRTS®
Blake Faulk, RRTS®	Jordan Joslin, ATP/SMS, CRTS®	Sharon Frant Brooks, MA, OTR/L, ATP/SMS, CRTS®
Bradley R. Gooch, MBA, ATP, CRTS®	Jordan Swan, ATP, CRTS®	Shean Wages, MHA, ATP, CRTS®
Brett A. Watson, ATP, CRTS®	Jose Escobedo, ATP, CRTS®	Stacy Denmark, ATP, CRTS®
Brian Coltman, ATP/SMS, CRTS®	Joseph Loza, ATP, CRTS®	Stephen Clark, ATP, CRTS®
Britt Sitzes, ATP/SMS, CRTS®	Joseph Vance Bryant, ATP, CRTS®	Tammy McDowell, RRTS®
Bryan Benton, ATP, CRTS®	Joshua Hamilton, RRTS®	Ted L. Hyde, BFA, CO, FAAOP, ATP, CRTS®
Carlos Lorenzo, RRTS®	Julian C. Fiske, ATP, CRTS®	Teresa "Gaye" Barger, ATP, CRTS®
Carlos M. Collazo, ATP, CRTS®	Julie McCallum, ATP, CRTS®	Thomas C. Powell, IV, ATP, CRTS®
Charles E. Pfeifer, ATP, CRTS®	K. Brandon Cowart, ATP, CRTS®	Tim Robinson, ATP/SMS, CRTS®
Christian Stephens, ATP, CRTS®	Karen Bussey, ATP, CRTS®	Trisha Swan, RRTS®
Coleman R Mansfield, ATP/SMS, CRTS®	Kathy Fowler, ATP, CRTS®	Tristan Yapunchik, ATP, CRTS®
Cyle Cook, ATP, CRTS®	Katie Allesia, RRTS®	William Leoutsacos, RRTS®
Derek W.M. Ng, ATP, CRTS®	Kenneth Gibbons, ATP, CRTS®	Xavier Garza, ATP, RRTS®
Donald W Callaway, ATP, CRTS®	Kevin Ross-Jenkinson, ATP, CRTS®	Yvonne Powell, RRTS®
Douglas Mitchell Livermore, ATP, CRTS®	Kevin Wallace, ATP, CRTS®	Zeb Dugan, ATP/SMS, CRTS®
Eric T. Smith, ATP, CRTS®	Kevin J. Mooney, ATP, CRTS®	
Faith Uzebu, RRTS®	Kristen Maak, OTR/L, ATP, CRTS®	
Francesca Whitaker, ATP, RRTS®	Latoria Cooke, ATP, RRTS®	
Frank A. Lane, ATP, CRTS®	Lisa Hammock, ATP, CRTS®	
Gerald Erkhart, ATP, CRTS®	Lyle Haynes, ATP, CRTS®	
Gregg M. Platis, ATP, CRTS®	Lynn Ferguson, ATP, CRTS®	
James Blair, ATP, CRTS®	Matthew Lippy, ATP, CRTS®	
James Rees, ATP, CRTS®	Michael Thayer, ATP, CRTS®	
James C. Bond, ATP, CRTS®	Michael T. Crown, ATP, CRTS®	
Jason Kelln, ATP, CRTS®	Myles Fillmore, RRTS®	
Jason Cook, ATP, CRTS®	Nancy Greco, ATP, CRTS®	
Jason Lang, ATP, CRTS®	Pat Molloy, RRTS®	

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