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- Alan Ludovici | Designer, Rider, Ethos Creator

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THE RETURN OF THE IBOT

Twenty years after Dean Kamen revealed his stair-climbing wonder chair on national TV, the iBOT is poised to take center stage again with a new and improved model. The original iBOT built a loyal following but never found a wide user base because of a number of issues, including its high cost. BOB VOGEL tested the new model and talked with the team members behind it to see what they learned from the original’s struggles and how they are working to make iBOT 2.0 a success.

Cover and Contents Photos by Matthew Lomanno Photography
THE PRICE OF PROGRESS

The reveal of the iBOT in 1999 was the first time I can remember getting excited about adaptive equipment. I’d been injured just over a year and still hadn’t sold myself on the idea of using a power chair full time. In my 18-year-old mind it was pretty simple: Cool kids used manual chairs and everybody else used power chairs.

Watching the iBOT cruise over sand and snow and then, miraculously climb up and down stairs, it seemed like it could change things — improve access and perceptions of what a wheelchair could do. In this issue we cover two new products that have the same potential, the second-generation iBOT and the Bowhead Reach. Both offer slick designs and unique, empowering features that could change users’ lives. They also share the original iBOT’s ultimate downfall: a hefty price tag with limited prospects of insurance coverage.

The new iBOT will set you back almost $30,000. The Bowhead Reach starts at $15,000.

In their respective features, Bob Vogel and Seth McBride do a good job explaining some of the intricacies behind why these devices cost so much and why insurance doesn’t touch them, but I can sympathize with anyone who reads about the new chairs and feels left out. On top of the never-ending list of medical and adaptive expenses so many of us must endure, how the hell are we supposed to afford these things?

The harsh reality is that unless you become god’s gift to crowdfunding or win the lottery, there’s no how-to guide or resource list we can publish that will make it easier for you to get an iBOT or Bowhead Reach.

But before you slam down the magazine or rage-quit your browser, think back to 1999 and how far adaptive tech has come. Seat elevators, power assist devices and improved drive systems are but a few of the many advances we enjoy today thanks to the innovations of the last 20 years.

In an ideal world, all of these life-changing devices would be affordable for everyone from day one. But it’s just as easy to imagine a much darker reality in which the innovation that actually improves our mobility equipment has been replaced by corporate restyling — where new names, model numbers and letters are the only real changes from year to year.

Innovators like Dean Kamen, inventor of the iBOT, and Christian Bagg, inventor of the Bowhead Reach, are a big part of why the technology keeps improving — even if it seems to do so too slowly or at too high a cost. The stories behind them and their inventions are as interesting as the devices themselves, and they reflect the underlying dynamics that drive the technology so many of us rely on.

As Vogel reports in this issue’s cover story, there are already people lining up to buy a new iBOT, and surely there are many outdoor enthusiasts who will find a way to pony up for the Bowhead Reach. Hopefully both companies will find ways to lower their price, allowing more of us to enjoy them and benefit from their advances. In the meantime, by sharing their stories and reporting on their inventions, we hope to inspire the next generation of inventors and keep progress rolling.

“Before you slam down the magazine or rage-quit your browser, think back to 1999 and how far adaptive tech has come.”
It’s been a whopping 32 months since Bob Vogel wrote “The iBOT Returns: Lighter, Leaner and Covered by Insurance?” for our November 2016 issue, but as he reports now, the new iBOT is finally almost here. Vogel has been on the beat the whole time and got a firsthand look and test-drive this winter. You’ll have to read the article for his verdict on the product, but one of his takeaways after using the iBOT’s standing and stair climbing features was an even deeper appreciation of the need to reform Centers for Medicare & Medicaid Services’ “In Home Rule.” The rule restricts Medicare coverage of mobility assistive equipment (wheelchairs, walkers, scooters, and other mobility devices) to only those needed for assistance with mobility-related activities of daily living in the home. “Using the iBOT drives home how silly the In Home Rule is and shows how out of touch CMS is with what accessibility really means,” says Vogel.

Based on the number of letters and comments we receive, Reveca Torres’ Reframed column has quickly become one of our readers’ favorites. Torres blends the eye of an artist, the perspective of an SCI advocate and a deep intellect to create bimonthly contributions that speak volumes about life with a spinal cord injury, using a few carefully selected words and images. For her part, Torres says she appreciates the opportunity the space has given her “to delve into the details of everyday life.”

Every group or organization needs a go-to person who either has the answers or knows where to get them. United Spinal Association, which includes New Mobility, is incredibly fortunate to have Bill Fertig in that role as the head of the organization’s Resource Center. Fertig started managing the Resource Center when it was still under the National Spinal Cord Injury Association and has helped build it into the invaluable reserve of knowledge and assistance it is today.

Please send queries, manuscripts or feedback to Ian Ruder: iruder@unitedspinal.org
A Force of Nature

Srin is truly the real deal ("Srin Madipalli, Airbnb and the Quest to ‘Belong Anywhere,’" May 2019). When he had Accomable, he not only arranged accommodations for me and a group of American students on a study abroad trip but helped me beyond all expectations when British Airways severely damaged my power wheelchair and it would not work when I arrived in England. He really is a force of nature. I miss Accomable greatly, but I am glad he is at Airbnb and sincerely hope he makes the impact on that company that he is trying to make.

Leslie Donovan
Newmobility.com

Sleep Vacation

I am C4-5 quadriplegic, paralyzed from the shoulders down, since May 2007 ("Dreamwalkers," May 2019). I dream every time I sleep and pretty much in all of my dreams, except for maybe five, I am not paralyzed. I may mention it in my dream and/or legs and arms don’t work exactly right but they still work. Mostly though, nothing is wrong with me. It’s my way to escape the paralysis!

Dereck Lockwood
Newmobility.com

Falling, Asleep

I am not solely a wheelchair user yet, but I do not dare walk without my walker. My left side is paralyzed, causing me to lose my grip on the walker and nearly fall several times a day. I have started to have dreams about walking without my walker and I’m always falling ("Dreamwalkers," May 2019). I never hit the floor or the ground as I wake up first in fear.

It seems to occur more if I fall asleep in my recliner without my CPAP machine on. I believe my brain creates the dreams when it is starving for oxygen. I wake up and the oxygen returns to my brain. I feel it is my subconscious mind waking me up before I suffocate.

Leland Olson
Newmobility.com

A Common Bond

I never see myself in my dreams, but the chair is always there with me and it is always causing me stress in some way ("Dreamwalkers," May 2019). Like, it gets a flat tire while I am pushing it up an endless hill or I worry someone is going to steal it when I have to go into a minute market for something. Who knew we all have this common thread?!

Holli Kaiser
Newmobility.com

Only in Dreams

I once dreamt that I was walking to my wheelchair accessible van after going to a movie, and upon seeing my van, I realized we left my wheelchair in the theater and had to go back and get it! I never hit the floor or the ground as I wake up first in fear.

William A. Miller
Newmobility.com

Teaching Touch

Not everyone likes to be hugged, so I have started asking "may I hug you?" when I feel like hugging someone I don’t know well ("U Can’t Touch This," May 2019). Everything seems to go in cycles. Children were taught "don’t touch" for a long time. Then touching became acceptable. Then it went too far with unwelcome or inappropriate touching. Now is definitely the time to start conversations about appropriate and inappropriate touching. We want to stop the inappropriate kind and increase the wanted, needed, appropriate kind. We definitely don’t want to lose the beneficial effects of touching.

Joann Block
Newmobility.com

Access Laments

I am just turning 58 and have been running into these types of issues also after 35 years as a para ("Do I Throw in the Towel on a Close Friend Who Still Doesn’t Get My Access Needs?" May 2019). I will not go to a person’s home to have to be dragged up steps and then not be able to get to the only bathroom. I find myself staying home more and sometimes I don’t mind, but other times I do. I lived in southwest Florida for 20 years and wish I’d never left due to the fact it was a very accessible area. It is good to know I am not the only person who is going through these changes as I get older.

Alan Duboyce
Newmobility.com

“I miss Accomable greatly, but I am glad Srin is at Airbnb.”
The WORLD renowned WAKEBOARD professional BEN LECLAIR with his signature HAND PLANT FLIP move.

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For his story www.bensquad.org

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Ali Stroker Wins Tony

Actress Ali Stroker made history again this June when she became the first wheelchair user to win a Tony Award. “This award is for every kid who is watching tonight who has a disability, who has a limitation or a challenge, who has been waiting to see themselves represented in this arena — you are,” she said while accepting her Tony for playing Ado Annie in "Oklahoma!" Stroker was also the first wheeler to star in a Broadway play. For more, see newmobility.com/2019/06/ali-stroker-tony

Anti-Grabs Keep Away Pesky ‘Helpers’

“Tired of people grabbing your wheelchair without asking? Frustrated by not having your autonomy respected? Worried when people walk behind your wheelchair because what if this is another one who thinks you exist for their emotional gratification?”

That’s the opening of the sales pitch for Anti-Grabs, the brilliant, if slightly macabre, solution for anyone who is tired of being pushed around. With 23 metal spikes on each Anti-Grab, tell the general public to keep their hands to themselves while accessorizing your chair in style.

Etsy seller HeckinWheels is open to making custom Anti-Grabs in different colors or for different parts of wheelchairs, and encourages interested parties to get in touch via the Etsy shop. If the website can be believed, people are grabbing up Anti-Grabs as fast as HeckinWheels can make them, but unfortunately, Anti-Grabs can’t be shipped from the U.K. to the United States as of yet. Let HeckinWheels know there is demand stateside, or send some to your European friends: etsy.me/2wKDsdi.

‘Wine on Wheels’ Rolls into Portland

To celebrate 30 years of New Mobility, the NM staff is busy planning a wine tasting event in partnership with the authoritative voice on wine from our community, New York City sommelier and para Yannick Benjamin. His Wine on Wheels organization has raised awareness and more than $750K for various nonprofits in different cities, and now he’s bringing his franchise to Portland, Oregon, on August 1.

Wine on Wheels Portland will tap into the Pacific Northwest’s growing reputation as one of the premier regions for wine, offering ticket-holders a chance to sample a wide variety of wines from a handpicked selection of some of the area’s best wineries. Attendees will also enjoy delicious appetizers, a silent auction and other festivities.

The funds raised will help bring NM’s brand of disability journalism into the 21st century by supporting a redesign of newmobility.com that allows us to share impactful articles with contemporary web-based storytelling. The redesign will also focus on making our site more attractive to digital advertisers, so we can ensure we have the revenue to keep hiring the writers from our community who make New Mobility what it is.

To find out more about Wine on Wheels Portland, or to purchase tickets, visit bit.ly/2KqGCMr.

DON’T MISS TWO SPECIAL EPISODES OF UNITED ON WHEELS RECORDED FOR MENTAL HEALTH AWARENESS MONTH. DOWNLOAD BOTH, OR ANY PREVIOUS EPISODES OF UNITED SPINAL’S WHEELCHAIR LIFESTYLE PODCAST AT UNITEDONWHEELS.BLUBRRY.NET.

POSTS

NEWS

ALI STROKER WINS TONY

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POSTS
Restaurant Reviewer Adds Access Info

Washington Post food critic Todd Sietsma struck a blow for all food-lovers May 22 when he dedicated a column to explaining his decision to start regularly including accessibility as a factor in his reviews. Sietsma explained that an outpouring of reader mail, combined with the reality that more than 70,000 Washingtonians live with a disability, convinced him that sacrificing some of his anonymity to investigate access made sense. “Ultimately, the facts outweigh the cons,” he wrote, hopefully sparking a trend in food journalism. Read his column here: wapo.st/2QXUT3w

Magnetic Buttons to the Rescue

Buttons don’t have be a bother anymore, thanks to Buttons 2 Button, a new, easy-to-use product that allows you to turn almost any button into a simple magnetic clasp. Gina Adams was inspired to invent Buttons 2 Button by watching her father’s struggles with dexterity as he lived with Parkinson’s. Adams, a mom and entrepreneur, developed the idea while finishing her MBA and is launching it as the first product of her new company, Wareologie. The adapters are available in sets of 10 for $30. Adams ran a crowdfunding campaign to fund the venture in May and June, and the sets are now available for preorder at buttons2button.com. James Murtha, a C4 quad serving as the company’s chief innovation officer, can’t wait for people to try them. “I want this product to be on shelves so badly,” he says. “Honestly, I want it for myself!”

WAGS of SCI

With over 5,000 Instagram followers, a thriving website and a bustling forum on Reeve Connect, Brooke Pagé and Elena Pauly have built WAGS of SCI — Wives and Girlfriends of SCI, for those not hip to the lingo — into one of the fastest growing SCI-related online communities on the net. Pagé, the wife of a C4 quad, and Pauly, the girlfriend of a C5 quad, launched WAGS of SCI on Instagram in November 2017, months after the social media app helped connect them. Pagé and Pauly live in Vancouver, British Columbia, mere blocks apart, but didn’t meet until Pagé’s mom tagged her in one of Pauly’s Instagram pictures. When they finally met, they immediately realized the value in connecting and discussing their experiences and emotions. “Just being able to relate to somebody in your shoes is really hard to find,” Pagé said. “We never wanted a woman whose partner has a spinal cord injury to ever feel alone again.”

Their Instagram page quickly found a devoted audience, and they have continued expanding the resources they offer, including regional ambassadors, a forum they moderate for the Christopher Reeve Foundation and, as of earlier this year, a new website. “It has really blown up,” said Pagé. “We didn’t realize there was this number of women all around the world who had such a big need for this.”

The passion project has grown into a full-time — though still volunteer — job. They are currently considering launching a foundation. “We really love it,” says Pauly. “We’re always looking for new content and new ways to interact with our audience.”

To connect with the WAGS, or simply to see what they’re up to next, visit wagsofsci.com or follow them on Instagram @wagsofsci.
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- Ongoing Educational Webinars

Membership in United Spinal Association is free and open to all individuals who are living with SCI/D, their family members, friends and healthcare providers. Visit unitedspinal.org or call 800/962-9629.

United Spinal has over 70 years of experience educating and empowering individuals with SCI/D to achieve and maintain the highest levels of independence, health and personal fulfillment. We have 50-plus local chapters and 190-plus support groups nationwide, connecting our members to their peers and fostering an expansive grassroots network that enriches lives.

Summer Fun in the Sun
Shelly asks:
I am trying to purchase a beach wheelchair for my daughter. Our family is planning a trip to the shore this summer, and she doesn’t want to go with us because she can’t move around easily on the sand.

Executive Editor Josie Byzek answers:
Before purchasing an expensive beach chair, try reaching out to the beaches your family is interested in visiting and see if they have chairs available. Many lease them, and others may even provide them for free upon request.

You can find information on the different types of beach wheelchairs and where to purchase them in our March 2016 article, “Beach Chairs: More Available Than Ever” (newmobility.com/2016/03/beach-wheelchairs/). Contact info for the companies that sell them is included in the resource list at the end of the article. Also you’ll find helpful information from our readers in the comments section, including additional vendors, foundations that offer assistance in securing beach chairs and useful tips from wheelchair users.

Time to Mow the Lawn
Larry asks:
Several years ago you printed an article about a man who invented a Hoyer lift to get him on his riding lawn mower. There was also a link to a video showing him being lifted from his wheelchair onto the riding lawn mower and mowing his grass. I have spastic paraparesis and use a scooter for mobility. I need to have someone construct this lift so I can get on my lawn mower. Thanks for your help!

Executive Editor Josie Byzek and Spinal Cord Injury Resource Center Director Bill Fertig respond:
Despite exhaustive searches of our archives and website, we could not find the exact story and video you remember. But we did find these articles that we hope inspire a system that works for you:
- “Yardwork Adaptations:” Seth McBride interviews wheelchair users about their lawn work techniques; newmobility.com/2018/09/yardwork-adaptations
- “The Tao of Mowing:” Bob Vogel, a para, writes about his favorite chore; newmobility.com/2015/03/the-tao-of-mowing
- “Growing With Mowing:” Kary Wright, a quad, talks about how he uses a lift that he calls “the meat hook” to seat him in his riding mower; newmobility.com/2015/12/growing-with-mowing

Got Questions?
If you have a question for United Spinal staff, please submit it at unitedspinal.org/ask-us or call 800/962-9629 (choose Option 1). For nonemergency medical questions, try the Craig Hospital Nurse Advice line, 800/247-0257.
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DIETARY DETECTIVE

Dietary fads used to come and go every decade or so. The ’60s were all about Weight Watchers and the Macrobiotic Diet, until the Grapefruit and Scarsdale diets took over in the ’70s. These were replaced by the Cabbage Soup and Liquid diets in the ’80s until the Low Fat and Zone trends ruled over the ’90s. Today, diet crazes turn over so frequently it’s hard to keep track of their fashionable names, never mind what you’re actually supposed to be putting in your mouth. The plethora of popular diets that people swear by right now include Keto, Paleo, FODMAP, Intermittent Fasting, Anti-Inflammatory and Carb Cycling just to name a few. All make similar claims of weight loss, decreased inflammation, increased physical energy and mental clarity, enticing you to try one or a few to see which your body responds to best. While I highly encourage everyone to eat well, try new recipes and thoroughly enjoy their food, I have a growing concern.

In my nutrition practice, I’m seeing more clients with disabilities and chronic health conditions jumping onto these trendy food bandwagons without doing any homework about how an excess or deficit of specific nutrients may affect them and, in some cases, potentially make their condition worse. Here are a couple of cases to demonstrate:

Detoxifying diets are currently very in vogue. An individual with a spinal cord injury who was dealing with a pressure sore put himself on a long term “detox” eating plan that he’d read about on the internet. This diet involved only eating fruits, vegetables and a small selection and quantity of nuts and seeds. It is recommended that individuals with spinal cord injuries who have pressure wounds increase their calorie and protein consumption in order to support the healing process. To the contrary, this particular “detox” diet was severely limiting the critical macronutrients he needed to help heal his pressure sore.

The ketogenic diet, which is also all the rage right now, was actually developed in the 1920s to help reduce seizures in children who had resistance to epileptic medications. The keto diet, which involves a high intake of healthy fats with moderate protein and limited carbohydrate consumption, causes the body to burn fat instead of glucose. This process, known as ketosis, is what inhibits seizure activity.

Studies have shown that the ketogenic diet can decrease seizure activity by as much as 50% in some individuals, though the diet has most recently gained popularity for its ability to help people lose weight quickly. While this diet has proven to be safe and effective in treating a serious medical condition, it can be risky depending on the situation.

For example, an individual living with Type 2 diabetes who uses insulin to control her blood sugar levels was eager to lose weight and put herself on a ketogenic diet. While this low carbohydrate diet may seem like an ideal plan to lose weight and also manage blood sugar levels, for this person, when followed alongside her insulin regime, it led to low blood sugar, which contributed to severe headaches.

Another individual living with both epilepsy and a serous kidney condition also tried the ketogenic diet in hopes of minimizing her seizures. For this woman, the diet, in combination with her kidney dysfunction, triggered a dangerous condition called ketoacidosis — when burning fat causes blood to become too acidic. Ketoacidosis can damage the liver, kidneys and brain.

I too tried keto, as I like to try all diets before recommending them to my clients, and I experienced what is known as “keto flu.” This is a collection of flu-like symptoms that occur as the body adapts to burning fat as its fuel source. While I was aware of this potential side effect, I must admit I was surprised at the intensity of the muscle cramps and lethargy. Luckily, because I was aware of what was causing my symptoms, I was able to take steps to alleviate them.

I write this as a caution that not all diets are for everyone, particularly if you are living with a chronic health condition. I strongly urge you to be your own dietary detective and research your own condition, specific nutritional needs and always consult with your physician or health care provider before starting any hot new diet plan.

EAT WELL

By Joanne Smith
THE LUXURY OF ROLLING OUT OF BED

You would think that “rolling out of bed” is a term that applies to us wheelers, but the fact is I haven’t had the luxury of making a quick departure from my bed in two decades.

In the morning the alarm goes off, my eyes open and my dream vanishes into a feeling. I take a breath, groan, yawn and stretch a little. The cat stretches too, displeased that I’ve disturbed his slumber. Those morning moments are identical, and I live this over and over. It’s a necessary routine to get my day started and sometimes I check out.

Then comes stretching and range of motion. If I want to do it right, I need help. I am taken to the throne and then into the shower — lavish scents in soaps and shampoos and the privilege of hot water — it’s royal treatment. I’m naked and cold and my mind checks back in because the moment the water touches my skin it hurts. Nerve pain. I breathe through it until the burning stops hurting and transforms into relief from the warm liquid soothing it. I endure this part because, well, hygiene, and in the end my hair will be silky and I’ll smell good.

Back into the bed — I haven’t officially broken free. Just rolling in the bed is a struggle. Putting on pants … oof … this takes time. The bra and shirt … yeah, I’ve got this! Socks. Shoes. Somebody help me. Transfer into the chair. Shift this way. Pull the pants that way. There! I rolled out of bed … two hours after my alarm went off. I didn’t hit snooze three times, my hair isn’t tangled or oily, and pajamas are not part of my outfit. Thankfully, my monotonous mornings result in me rolling out of bed put together, with enough time to have breakfast.

REFRAMED

by Reveca Torres

Some of the fun in doing this kind of detective work is finding delicious new recipes — this is a fantastic summer dish I recently found and wanted to share!

NO-TUNA SALAD SANDWICH

1 large can chickpeas, rinsed and drained
1 tsp. Dijon mustard
1 tbsp. pure maple syrup
¼ cup red onion, diced
¼ cup pickle, diced
3 tbsp. fresh dill, chopped
2 tbsp. mayonnaise
1 tsp. capers, drained
1 pinch sea salt and pepper

1. Mash chick peas in bowl with fork. Mix in all other ingredients.
2. Serve on a bed of greens or mashed up on whole grain bread.

Joanne Smith is a nutritionist and co-author of Eat Well Live Well with SCI and Other Neurological Conditions. For more information on nutrition for neurological injuries, go to eatwelllivewellwithsci.com.
Amy Burnett will try anything at least once. Because of this open-minded attitude, the 44-year-old is now a member of the U.S. Para-Badminton team, spokesmodel for Permobil and a runway model with Fashion is for Every Body.

Burnett found herself stuck in a nursing home two years after her spinal cord injury when surgery to remove a cyst resulted in complications and a second surgery. This was 1999 and she didn’t even have a phone or TV to pass the time.

“It was extremely lonely,” she says. She told herself if she could get through this hardship then she’d know she can get through anything. And when she did get through it, she made a vow to never limit herself in anything she did. Since then, her “I’ll try anything once” mantra has made for some incredible opportunities.

“I want to try everything, see everything and do everything,” she says. “I’m not going to let my disability limit me and I don’t want the rest of the world to see us as limited because we use wheelchairs.”

While watching badminton during the Rio Olympics in 2016, she remembered how much fun she had playing the sport in gym class before her injury. So she simply called the World Badminton Federation to ask if there was a para version. This led to her attending an open-training camp in Arizona where, after demonstrating that she could hit a birdie, she was invited to become a member of the U.S. Para-Badminton team, joining a roster that included amputees and players with short stature.

“I’m the only person in the United States who plays badminton from a wheelchair currently, and I’m the very first person who uses a wheelchair ever on the team,” she says.

To be fair, it’s not like she never played a sport before. She did taekwondo before her injury, played wheelchair basketball in rehab and still coaches wheelchair tennis. And her ability to put herself forward isn’t just limited to sports — it’s also how she became a spokesmodel for Permobil.

She says Permobil recognized how valuable her interpersonal skills are for the community and how she wouldn’t mind going over to somebody and saying, “There’s...
This will be our third year hosting Camp United. It’s an all-types-of-sports-day for people with any spinal cord disorder. We want people to bring their friends, family and anyone who has anything to do with them. We get them all participating. Instead of just saying, ‘Hey, you, with the disability! You get to try this sport and have a great time, but your family has to watch,’ we say, ‘We want your family to come and have fun with you, whether you’re trying out a kayak or a sailboat, or a sports chair to play badminton or whatever.’ I’ve enjoyed being involved with the event and think the family focus really sets it apart. It’s a nice way of saying, ‘We know you have a family, let them all come.’

Her work with Permobil got her noticed by Fashion is for Every Body — a nonprofit dedicated to showcasing models of all shapes, sizes, skin tones and abilities as a way of promoting self-esteem, inclusion and body-positivity within the fashion industry. “I thought, well, I’ll represent my group as well as I can,” she says. “I just love the all-inclusivity of it and how it’s actually called Fashion is for Every Body, which is every body type, I guess.”

Today she receives offers to model clothes for designers, while still travelling the world with Team USA. “Life has taken many twists and many turns, but through my faith, I just believed there were better things for me than wasting away in a nursing home bed,” she says.

UNEXPECTEDLY INACCESSIBLE: When you’re in Lima, Peru, there are no toilet lids and ROHO makes a seat that attaches to the lids, so my first request was a shiny, beautiful toilet lid.

WHY I JOINED UNITED SPINAL: I broke both my legs in 2017, and I have both state and federal insurance. But if you leave the state you reside in, they won’t cover you, so without extra insurance I thought, wow, I live in the United States of America, but sometimes it doesn’t feel so united.
Don’t go to Mexico, they said. It’s full of banditos and drug smuggling cartels, they said. You won’t be able to get around on your own, they said. I’m not sure who “they” are, but they couldn’t have been more wrong.

As a C6 quadriplegic, I know travel can be difficult, especially in developing countries. There are always uncertainties that make you question if it is worth all the effort. From non-ADA lodging to the ever growing list of “what ifs,” it can be a daunting endeavor to say the least.

What I’ve found, though, is that without continuing to push yourself out of your comfort zone and willingness to adapt and overcome, life can be as boring as driving through western Kansas. I’ve chosen a different path on purpose. I’ll take the risk.

On Feb. 1, I crossed the border into Mexico. It was my first international road trip in my new van I named Spock. I have been designing, building and planning a trip to South America for years but wanted to give Spock a proper shakedown. Hence I named this journey the Baja Shakedown.

I knew Baja was supposed to be beautiful and relatively safe, so it seemed like a perfect first test. My plan was to see how the van performs both on- and off-road, test the equipment for durability, make sure there weren’t any critical changes needed before heading to South America, assess my body, and further my Spanish language study in a school in La Paz.

I don’t want to spoil it for you but Baja was absolutely incredible and I’ll definitely be back.

I spent the first half of my Baja Shakedown with this motley crew. I wanted someone to share the experience with as well as was unsure if I’d be able to navigate Mexico completely solo as a quadriplegic. Diana and Oleg were absolutely wonderful to have along on the journey! From margaritas around campfires to helping me get out of the sand when stuck, I wouldn’t have done it any other way.
Some of the best moments on the road are those times you can relax and soak it all in. Oftentimes in the United States, we’re expected to be efficient and productive; not waste time and make more money. When I was on the beaches of Baja with no cell signal and no obligations, I felt my anxiety level decrease and a general wholesomeness overwhelm me.

Bahia de Conception was one of the most suggested places to visit in Baja and I now know why. Between the turquoise blue water, multiple islands and boat community, it’s definitely a “must see.” The best part is the beaches are hard and flat — perfect for wheelchairs!

A PHOTO ESSAY
BY KIRK WILLIAMS

Some of the best moments on the road are those times you can relax and soak it all in. Oftentimes in the United States, we’re expected to be efficient and productive; not waste time and make more money. When I was on the beaches of Baja with no cell signal and no obligations, I felt my anxiety level decrease and a general wholesomeness overwhelm me.
Nelson Mandela once said, “If you talk to a man in a language he understands, that goes to his head. If you talk to him in his language, that goes to his heart.” After traveling internationally, I’ve learned this couldn’t be more true. I therefore wanted to challenge my mind in La Paz and learn a bit of Spanish before going to South America. I took a two week course that consisted of three hours of class a day. I’m still nowhere near fluent but definitely have a better foundation to build upon.

When designing the van, I knew the wheelchair lift was one of the most critical modifications. In previous vehicles, I’ve used platform lifts but have run into various issues in extreme conditions. Knowing that I’ll be spending much of my time off-road, I wanted the simplest, most reliable system I could find. I decided on the SuperArm lift from Handicaps, Inc. for a few key reasons: First, it doesn’t block the door when not in use. Second, it takes up less space in the van, requires much less room to park and works regardless of how level the terrain is. Third, it’s simple design means less electronics to potentially go wrong. And fourth, it’s also a great swing where I can sit back, relax and enjoy the sunset!
One of my favorite things about Baja was all the different roads through vast desert wilderness. We’d pick certain key areas on the map then play a game of ‘connect the dots’ for the best way to get there.

This is Esteban, who I met in Ensenada. He was the only quadriplegic I interacted with the entire trip, and he shared how tough it is to afford supplies, wheelchairs and caregivers without any sort of medical insurance in Mexico. He’s a music teacher and jazz drummer. An amazing guy. Follow him @quaddrumer on Instagram.

There’s no real way to describe the fantastically tall and hardened cacti along the Baja peninsula. From horizon to horizon as far as the eye can see, these green spires point toward the sky above and proudly display their battle wounds from such harsh living conditions. I took this pic with a drone hoping to capture the unique landscape. For scale, my van is close to 9 feet tall!
“FIFTY FEET ABOVE SEA LEVEL. SITUATED ON WEST FACING CLIFF, THE WINDS FINALLY BEGAN TO DIE DOWN FOR THE EVENING. THE WAVES CRASHING BELOW, COMPLEMENTED BY A CRACKLING FIRE, WERE THE TELL-TALE SIGHTS AND SOUNDS OF A GREAT DAY COMING TO A CLOSE.”

Navigation is all part of the journey and similar to pushing a wheelchair, line choice is critical. Despite using hand controls and a tri-pin because of my lack of dexterity, I love technical off-road routes that challenge my mind and abilities. The best part is not knowing what’s around the next bend and trying to pick the smoothest line to get there.

Below: Testing your limits is always part of the adventure, but so is being properly prepared. Never do one without the other! Seen here is what happened when I thought it was a good idea to take Spock over the sand dunes. Fortunately, I had prepared for this type of scenario in advance and with the help of friends shovelling and Maxtrax recovery boards, we managed to get out and back to firmer ground.

Right: Oleg (who conveniently was a bike mechanic) helped to fix the chain for my power sliding door that snapped on the washboard roads. We had to be creative with the repair. We used Gorilla Tape, dental floss and zip ties! It took us three days but we eventually figured it out.
Above: I envisioned this image long before I took it. It is a square portrait of both Spock and myself in Baja. A keepsake. Using a tripod and 50mm 1.8 lens, I wanted to keep the depth of field fairly shallow while still portraying the beautiful landscapes. My iPad in my lap is actually a remote trigger for the GH4 camera I used. This photo took me well over 30 minutes to setup and capture but I’m pleased with how it turned out and it’ll always take me back to this moment in time.

Right: As a photographer, I sometimes suffer a curse of FOMAS (fear of missing a shot). It’s very tough when the light starts to pop to just sit back and enjoy the moment. This moment however, with a GoPro in my hand and fresh drink on the bumper, I decided it was OK. I wanted to just be there, smell the air and reflect. I’m so glad I did.

Follow kirk on Instagram @impact.overland or visit impactoverland.com
Many users of the iBOT say that “standing” in balance mode is more important to them than the ability to climb stairs.
The original iBOT holds the rare distinction of being both a huge failure and a revolutionary industry changer. When inventor Dean Kamen pulled back the curtain on his groundbreaking wheelchair design on national television in 1999, viewers marveled at the chair’s ability to “stand” and balance on two wheels, tackle snow, sand and other tricky terrain — and most notably, to climb and descend stairs. Kamen had set out to create a personal mobility device that would make the world more accessible for wheelchair users, and technology-wise he succeeded. The iBOT was decades ahead of its time and introduced ideas that shifted the paradigm of what a power wheelchair could do, ultimately resulting in cooler products for wheelchair users.

At the same time, even with all the buzz, from a business standpoint the iBOT bombed. Despite a reported investment north of $100 million by Johnson & Johnson, only 500 iBOTs were purchased over seven years. Compare that to the approximately 20,000 power chairs sold annually by industry leader Permobil.

Johnson & Johnson’s decision to discontinue the iBOT in 2009 was far from surprising but left behind a passionate base of users and industry watchers to ponder what could have been if the iBOT had found more robust sales.

Those ponderings came back to the fore in May 2016 when a Toyota press release announced that Kamen was working on a second generation iBOT. The buzz from the release and a subsequent story in New Mobility simmered down over the last three years, as few updates beyond a quick glimpse in some TV spots have emerged. But that’s about to change. The new iBOTs are poised to roll off manufacturing lines by this fall, bringing with them the promise of another leap forward in technology and questions about what was learned from the original run.
Looking back, you might say the first iBOT was 20 years ahead of its time — a futuristic chair that unlocked a whole new world of possibilities for its many users.

“The iBOT transformed power wheelchairs,” says Rory Cooper, founder and director of the Human Engineering Research Laboratories at the University of Pittsburgh. “Because of its capabilities, other manufacturers had to advance their products, which led to power chairs with seat raising capabilities like the Permobil F5 and Quantum 'Eye Level' and so on. And it had a cool factor.” The iBOT paved the way for other personal mobility devices, including seated Segways like the Omeo (OGO) as well as four-wheel-drive personal mobility devices like the WHILL. Furthermore, it is still the only power chair that can do all of that and climb stairs.

It is unlikely the iBOT would have made it to the consumer market as an FDA approved medical device without the dedication and financial resources of a huge company that believed in Kamen’s mission. Enter Johnson & Johnson, which in 1994 signed with Kamen’s DEKA Research & Development to develop, manufacture and sell the iBOT. Johnson & Johnson spent $50 million and nine years on research and development, including clinical trials, to bring the iBOT to market. A big part of this initial success was the iBOT gaining FDA approval as a medical device, albeit labeled Class III — the strictest classification. This classification meant no modifications could be made, including to seating and controllers. J&J reportedly spent another $50 million during the iBOT’s commercial run.

But the combination of a steep price tag — $28,000, eventually lowered to $25,000 — and minimal insurance coverage, thanks in part to the Class III label, stunted the chair’s sales. In the end, Johnson & Johnson could no longer justify continuing the project because of the growing financial commitment and support needed. It discontinued the iBOT in 2009 but continued servicing it through 2013.

Despite only 500 units being sold, the original fleet of iBOTs proved its durability and viability, delivering over 10 million hours of operation time. Luke Merrow, the CEO of Mobius Mobility, the company that will be manufacturing, marketing and selling the new iBOT, says there are around 100 iBOTs still out there functioning 10 years after the last one was delivered. “The original iBOT gave us validation that a multi-modal mobility device — two-wheel-drive, four-wheel-drive, dynamic-
standing, stair-climbing — really makes a difference in people's independence, and it's clear the device hit the sweet spot of functionality, independence and access,” he says.

**LEARNING FROM THE PAST**

When Kamen declared his intention to bring back an updated version of the iBOT, Johnson & Johnson was supportive, telling him it wanted the chair to succeed for wheelchair users, and handing him the “keys to the kingdom” to make it happen. When I interviewed Kamen in 2016, he was excited and optimistic about the timeline for the iBOT to receive FDA clearance as a Class II device. Nearly three years later, it looks like he was a bit too optimistic. However, Merrow puts the delay in context. “The sophistication of this product is massive, and getting clearance was a huge undertaking,” he says. “It took us until mid-2017 to prepare the documentation for the FDA, which consisted of 2,619 pages, in the form of 82 documents, submitted in nine binders. And we received FDA clearance in March 2018.”

Getting the FDA to lower the new iBOT to a Class II device was a critical win, and Merrow and Kamen hope the new classification will make it easier for the chair to catch on. As a Class III device, nothing could be changed on the design of the original iBOT, so it could not accommodate complex seating or alternative controls like switches or sip-and-puff. As a Class II device, the new iBOT can be used as a power base, meaning it can accept different seating systems and different controllers. Mobius plans on adding these options as soon as possible, says Merrow. How long this will take has a lot to do with sales volume — more sales mean more money is available to spend on R&D for seating and specialty controls.

For consumers concerned whether Mobius will stay in business long enough to keep producing and supporting the new iBOTs, Merrow responded that the company’s business model is to do the exact opposite of what Johnson & Johnson did. Instead of an expensive, nationwide sales organization, Mobius is starting out lean and responsive so that even without reimbursement coverage, the company will be self-sustaining on very low sales volume, yet scalable to be able to handle larger volumes as sales increase. The business plan is designed to produce iBOTs for the long haul, whether sales are robust or tepid.

Unfortunately for would-be-users, the new iBOT still carries an initial MSRP of $30,000, a price Kamen had hoped would be considerably less. “We are keeping our costs extremely low,” says Merrow, “but this is the price we need to charge at this point in order for the company to be sustainable. Our goal is to bring the costs down, but how long this will take is an unknown.” He adds, “Dean wants this machine to be as affordable as possible. He remains personally involved and deeply committed to advancing the iBOT technology and making it available to those who can benefit from it.”

Cooper says that because much of the new iBOT is robotic and many of the new and advanced parts are in high demand, its manufacturing has proved to be significantly more expensive than anticipated. He believes $30,000 is a reasonable price for the iBOT, with a caveat. “This is on the high end for wheelchairs, which is going to be a challenge. Typically, $30,000 is only covered [by insurance] for complex seating needs, alternative controls and possibly a ventilator.”

Although the FDA’s changing the iBOT to a Class II device is helpful for reimbursement purposes, getting Centers for Medicare and Medicaid Services coverage is a slow process, takes a lot of work and can be frustrating, especially with Medicare’s “for indoor use only” rule on mobility devices. “Unfortunately, Medicare doesn’t have a category for a chair that makes a user’s house more accessible by enabling them to reach high cabinets and use stairs, and lasts twice as long as conventional power chairs,” says Merrow. To that end Mobius is also working to help pass federal legislation — H.R. 2408: Create a Separate Benefit Category for CRT and H.R. 2293: Protecting Access to Wheelchairs Act.

Mobius and Kamen have been meeting with the powers-that-be at CMS, as well as private insurance companies, to educate them about the chair’s potential and to secure coverage for it.

“Although we are diligently working on getting the iBOT covered under insurance, we aren’t waiting around for it,” says Merrow. “As we’ve seen from other products like the [recently discontinued] WHILL Model M, there is no guarantee your product will get a reimbursement code that will work for people who need it. Our goal is to get the iBOT to as many people as possible.” In addition to continually working to get
funding for the iBOT, Mobius is looking for ways to bring the price down, while keeping the company sustainable.

**THE ROLLOUT**

At first, iBOTs will only be available at the Mobius facility in Manchester, New Hampshire, and restricted to five new customers per week. Mobius has a training manual and fitting “template” and wants to ensure that every iBOT user gets the same high level of training.

“This isn’t a simple ‘fit the chair, here is the joystick, let’s go’ training. It is two days of learning and practice to make sure you are completely dialed in on all aspects of your iBOT. Like any other device, say a car, it is extremely safe when used properly, but it can get you into a lot of trouble if it isn’t used properly,” says Merrow.

When first-time iBOT users arrive at Mobius, they’ll spend two days for fitting and training. First, they will tackle the Mobius indoor test track. In four-wheel-drive mode, they’ll take on the demo track’s sand, gravel and rocky areas, as well as curbs and 12-degree grades. Then while navigating in two-wheel “standing mode,” they’ll reach high shelves in a practice kitchen. In stair mode, they’ll practice ascending and descending stairs.

The facility is located next to perfect outdoor practice areas that can be used if the weather is nice. These include curbs, grassy areas, a path next to the river and a local café where they can grab a bite.

Current iBOT users will move through the orientation much more quickly, with a focus on seating adjustment and learning the easier, more intuitive controls.

Over time, Mobius plans to ratchet up its capacity by establishing satellite hubs for distribution and training.

“At this point we are open to doing this in-house or with partners — a dealer, rehab center or VA — but it has to be a win for the end user in terms of delivery, training and price. The point of this is to make sure end users receive consistent training and service,” says Merrow. The timeline for how long it will take to ramp up iBOT satellite hubs remains to be seen.

**HUNGRY AND HOPEFUL**

A big part of lowering the price of the iBOT involves economies of scale, where reaching a certain sales number can help bring down the overall costs thanks to the ability to buy and build in bulk.

The iBOT may have received a huge boon in this regard in February. That’s when FedEx announced a collaboration with Kamen and DEKA to produce an autonomous delivery machine called SameDay Bot that uses an iBOT power base equipped with sensing technology for its deliveries (see photos below). According to an article in Techcrunch.com, FedEx will be working with AutoZone, Lowe’s, Pizza Hut, Target and Walgreens for SameDay Bot delivery to nearby customers [see resources]. Initial testing is expected to start this summer. The article states that the SameDay Bot will complement FedEx SameDay service, which operates in 1,900 cities.

If this takes off, FedEx will be ordering a substantial number of iBOT bases. Kamen is quoted in the article saying, “By leveraging this base in an additional application, we hope that the iBOT will become even more accessible to those who need it for their own mobility.” Translation: The key to significantly lowering the price of the iBOT may come from delivery of auto parts, medications and pizza.
Gary Linfoot tested the iBOT’s stair mode on all 700 steps at Colorado’s Red Rocks Amphitheatre.

TEST DRIVING THE NEW iBOT

I’ve been looking forward to the roll-out of the new iBOT since I wrote about it for New Mobility in November 2016. When I received an invite for a test drive earlier this year, I promptly booked a trip and traveled to Manchester, New Hampshire, to spend a day at Mobius Mobility’s newly acquired and remodeled headquarters — where the new iBOT will be manufactured and customers will go for fitting and training.

Upon arrival, I was greeted by Mobius Mobility CEO Luke Merrow who led me to the demo track where two new iBOTs were waiting. My first impression was that it looked similar to the original iBOT, but with slimmer, cleaner lines.

I was informed that for the time being the name for the new iBOT is … iBOT. The official product description is iBOT Personal Mobility Device.

A FAN FAVORITE

The new specs are eagerly anticipated by many of the original iBOT users. While the chair never achieved the widespread usage Kamen and others envisioned, it inspired deep loyalty in the people fortunate enough to obtain one.

I spoke with three people who are still using their original iBOT and have spent significant time demoing the new machine. Derek O’Brien, 36, in his 14th year as a C6-7 quad, got his iBOT in 2006 with cash from a community fundraiser. Alan Brown, 52, in his 31st year as a C5-6 incomplete quad, has two iBOTs. He got them through Blue Cross Blue Shield insurance, albeit after filing many appeals. Brown helped Kamen get the FDA to classify the new iBOT as a Class II medical device by testifying before the Orthopedic and Rehabilitation Devices Panel of the Medical Devices Advisory committee of the FDA. Gary Linfoot, 50, a former Army helicopter pilot in his 10th year as a T10 para, got his iBOT paid for by a veteran’s organization. He is a consultant for Infinite Hero Foundation, which already has funding to purchase eight new iBOTs for veterans.

The new iBOT base is more streamlined and now accepts different seating systems — at press time customers have seating options from Motion Concepts and TiLite in widths from 16 to 20 inches. The seats are sleeker than the original iBOT’s high-back one-size-fits-all seat. All three iBOT users commented on the cleaner look and improved seating options.

“The new model looks like the iBOT was put on a diet. It’s
smaller and cleaner looking, and it feels cool, not like you are in a power chair,” says O’Brien. Merrow informed me that the new iBOT is 50 pounds lighter than the original, meaning the power base is now 168 pounds with batteries. Additionally, all of the electronics have been redesigned and updated. An example of this is the gyroscope systems. They used to be half the size of a shoebox and are now the size of a sugar cube.

The new iBOT retains the same four modes of operation as the original:
1. **Standard**: Rear drive with front casters.
2. **4-Wheel**: Dynamically-stabilized four-wheel-drive, where the seat moves fore and aft, and the drive wheels articulate for ascending/descending grades, curbs and varied terrain.
3. **Balance**: Allows standing and moving at eye-level on two wheels.
4. **Stair**: Enables the chair to climb up and down stairs.

The controller has been redesigned to make it intuitive to use. “It’s easy and seamless to go from one function to the other,” says O’Brien.

**TESTING IT OUT**

I transferred to the iBOT and went through a setup mode that determines the six calibrations needed to maintain proper center of gravity. You must do this before using balance mode but it only takes a few minutes. I was then given a brief tutorial on the different driving modes. I checked out my power-chair driving skills and — under Merrow’s guidance — started my three-hour test drive.

I immediately went to balance mode. It was everything I thought it would be and more. The first thing I noticed as my head rose to 5 feet 10 inches is, “Wow, I’m up really high!” Because the iBOT dynamically balances on two wheels, the resulting sensation is different than being in a standing frame, chair, or elevated seat. It is much closer to how I remember standing, a feeling I hadn’t experienced in the 34 years since my injury.

As an athlete, in my pre-SCI days, I was aware of the amazing, subtle, instant mind/spinal-cord/muscle coordination it takes to stand and balance on size 8 feet. Thinking that all of this is being done by coordination of gyroscopes, microprocessors and motors is really cool. Like standing on feet, if you lean forward or backward in the iBOT, it stays upright by adjusting with proportional movements.

If somebody pushes you it adjusts the same way a standing person would — by taking a step forward or back. Although driving the iBOT quickly became intuitive, the wow factor remained during the entire test drive.

While in balance mode I conversed with several people at Mobius and noticed how much more conversation I catch at standing height. Thoughts of once again being eye-level with people at crowded parties rather than staring at their butts quickly came to mind, as did thoughts of being able to see at a concert when everybody in front of me is standing. As the conversation continued, everybody sat down except me. Balance mode felt so good I stayed there. I was the person standing, looking down on people sitting.

Still in balance mode, I wheeled into the employee kitchen. Cabinets that would ordinarily have been hard to reach or out of reach were easily accessible, and reaching them didn’t cause any shoulder strain. I found myself daydreaming of accessing the upper shelves in my house and at grocery stores.

O’Brien, Brown and Linfoot agreed that balance mode is their favorite feature. They backed up my feelings about being at eye level and how talking face-to-face gives a feeling of more respect. “Standing mode has a cool factor, it has changed my life,” says Brown, who doesn’t have the hand function to be able to climb stairs independently in the iBOT. He also found standing mode was helpful when he was working with clients as a sports agent and as a father. “I’m the cool dad,” he says, “especially when I’m playing basketball in standing mode.”

For O’Brien, who also doesn’t have the hand function to do stairs, balance mode highlights have been “walking” down a crowded main street at Disneyland, being best man at his brother’s wedding, standing next to him during the ceremony, rising to give the best man speech, and dancing the night away at the reception.

The author reaches high cabinets in balance mode, referred to by some as “standing mode.”
BEYOND THE EASILY ACCESSED

After an impressive run through an indoor demo track that included going up and down a 12-degree grade and curbs, I was ready for the stairs. In order to signal the chair to climb, I set it on stair mode, then leaned back and pulled on the stair railing. If there is no railing, or if a person doesn’t have enough function, an assistant can provide the needed support. Descending stairs requires pulling forward. My first descent, as I faced forward at the top of a flight of stairs in a power chair and pulled forward, took some of getting used to, but was smooth and controlled.

For Linfoot, the ability to go up and down stairs is huge. “At home if I want to go up or down the stairs, the iBOT takes me,” he says. When he was demoing the iBOT in Denver he put it to the test by climbing and then descending all 700 stairs at the famous Red Rocks outdoor stadium. “It was easy, no problem.”

For the next part of the tour, I joined Merrow on a quarter-mile walk from Mobius’s office to the manufacturing building. It felt cool “walking” in balance mode and conversing with Merrow as we strolled down the hall. Once outside, I went into 4-wheel mode to traverse the bumpy pavement, snow and ice. When we came to a high curb and a 40-foot wide, snow-covered, hilly median, Merrow continued across and I instinctively turned to wheel 30-yards around it. Merrow casually said, “Where are you going?” It took me a second before realizing, “I’m in an iBOT!” Sure enough it smoothly climbed the curb, powered though the snow, and gracefully descended the curb on the other side.

All three iBOT users raved about the game-changing impact 4-wheel mode had for them. “4-wheel mode is especially useful during snowy winter months,” says O’Brien. “Also, I live in an older city, and it’s great being able to cross streets with no curb cuts and enter businesses and buildings with a big step or thresholds without having to think about it.” Brown finds the same benefits in terms of curbs, and adds wheeling over torn up concrete to the list, but his favorite part of 4-wheel mode is effortlessly cruising across sandy beaches. For Linfoot, the mode means being able to let his dogs off leash and run with them off-road in the hills around his house.

Brown and Linfoot credit long-term use of the iBOT with keeping their shoulders healthy. “With my iBOT, I’ve been able to get out of my manual chair and give my shoulders a chance to rest and heal,” says Brown. Linfoot tore a biceps tendon because of overuse and was able to use the iBOT to rest it and let it fully heal, which took almost a year. Like many iBOT owners, Brown, Linfoot and O’Brien say they are grateful that the chair has been brought back to life and are anxiously waiting to place an order for one.

Our final stop of the day was lunch at a local restaurant. The only tables available were tall ones set up for bar stools. Another chance to use balance mode got me excited. I pulled up to the table and found myself looking down at diners sitting at conventional-height tables while I enjoyed my meal. By the time my demo was over, I was hooked. I started pondering ways to come up with the purchase price. Four months later, I am still pondering.
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How the Bowhead Reach Is Opening The Outdoors Like Never Before
BY SETH MCBRIDE
I drive north to see a guy about an adaptive bike. 850 miles, one international border, five cups of coffee and a night sleeping in the back of my car on the edge of a quiet lake in Central British Columbia. It’s a long journey, especially because I don’t even know if I have the function to ride the thing. But I’d been waiting a long time for a piece of equipment like this. Seventeen years, to be precise. Ever since I broke my neck while on a summer ski trip not far from here.

Now after many hours of analyzing Instagram videos and one phone call to get details the internet didn’t provide, I think that maybe, just maybe, a machinist in Calgary has done it — designed a product that could allow me, with weak hands and little core function, to access the wilderness in a way that’s been unavailable since my accident.

Ten hours from home, I wind along a river colored milky turquoise with glacial runoff and flanked by forest and high mountains. This landscape stirs a fire that’s been in me since I was a kid exploring my Southeast Alaska home. For the first time in a long time, I don’t immediately tamp it down.

The frustrations of that experience made one thing clear: “I need to figure out this fucking leaning problem, because the world I want to play in isn’t flat.”

Up until now, the biggest issue in adaptive off-road design has been how to deal with side slopes. A fixed base — like on a typical handcycle, a wheelchair or a cross-country sit-ski — provides stability, but when you’re traversing a slope, the entire frame has to angle to meet it. As the rider, you have to lean up the fall line to stop yourself from tipping over, which puts you in an awkward position to steer or crank.

Putting his machinist training to work, Bagg came up with an idea for a pivoting frame that would attach to his seat and give the skis a limited approximation of the articulation that human knees typically supply — if the slope dropped away on one side, a single ski could drop with it while his seat bucket stayed vertical. Bagg manufactured a prototype, and to his surprise, it worked. Not that Bagg was stabbing in the darkness. He was already in the adaptive design business, having cofounded the manual wheelchair company Icon alongside Canadian Paralympian Jeff Adams. Still: “As a designer and builder of things, very often things don’t work,” he says. “And my expectation isn’t ever that they do [right away], just that it’s the start of the process. … But this one worked.”

Now Bagg had a ski that he could take off-trail. After a winter of testing, he started to build an improved version. He was in the process of cutting the parts when he spied an off-road handcycle that he’d been slowly designing and evolving but so far remained unimpressed with. “What if I just turn this thing upside down, and bolt it to the front of the bike?” Bagg thought in a flash of inspiration. He did, and again it worked. “Now all of a sudden I can lean into corners. I can accommodate side slopes. It’s doing everything I want it to do,” he says.

**let’s just go biking.**

The bike that I see sitting on Bagg’s deck is the result of seven years of development, redevelopment and refinements — this is a high-performance machine, with the components to match. But really, he says, “It’s all about the leaning. If McLaren designed our suspension system and took away the leaning, it would be garbage. Whereas if we had the leaning and low-end shocks from Sears, it would still be better than a Sport-On [a competitor] with a Fox shock. [The leaning] is what allows it to be narrow, which allows you to not have to go on accessible trails. It’s what lets you not dive into the outside of a corner when you’re turning. Performance-wise, it’s key, but it’s also key safety-
wise. It just doesn’t tip like the other bikes.”

I put on a helmet and transfer into the seat. Bagg is nervous. This bike is his baby since before he had real babies, and he’s proud of it. But he really wants me to like it too. He helps me remove the pin that locks out the front end. The bike wiggles but I stay upright. I tentatively move the cranks side to side, leaning myself a few degrees to the left, then the right. I smile. I might be able to control it.

I take it for a slow spin around the neighborhood. After 17 years of riding handcycles, I feel like a 4 year old who has just taken off the training wheels. I ride it for 20 minutes, taking it up, down and across some grassy hills at a local park. Bagg tails me on his road handcycle, hoping I don’t fall over. I’m wobbly and unsure of my movements, but I can tell that’s an issue with skill, not function.

With power available at the flick of my thumb, it’s a little strange how easily the Reach ascends steep hills and powers over soft dirt. Originally Bagg designed the Reach to be powered by an arm crank. He’s an athlete, the kind of super para who has ceiling-mounted climbing holds that he sometimes uses to ascend and descend the stairs to his basement workshop. At first he was militantly anti-motor. Then he had a potential customer who was adamant that he needed a motor on the bike, so Bagg put a motor on it. “That’s when I realized I was never going to go back to a hand crank, at least not for this,” he says. “There are a thousand different ways I can get exercise, but I cannot have the kind of fun, or keep up with people or have the kind of access with a hand crank as I can with a motor.”

Before, when he’d go riding or exploring with friends, it was all about him. Which trails, what pace, he was always the limiting factor. His friends were happy to assist, but they were always assisting. Adventure was never on equal ground. Once he’d put the motor on the Reach, the speed it offered, along with the ability to cope with narrow trails and off-camber slopes, meant that all of a sudden, he could ride with friends on their terms.

The first time Bagg realized this was when he went to meet a friend for a ride. The friend was a professional triathlete, the kind of guy who is great to have around in case something goes wrong. When Bagg got to the trailhead, there were 15-20 people milling around, getting their mountain bikes ready. “What’s going on?” Bagg asked.

“It’s the Wednesday ride,” his friend replied nonchalantly. “Oh, are we … we’re not … I’m not going on this,” said Bagg, trying to beg off. “I’m not ready for this.”

“Dude, it’s ready,” his friend assured. “It’s a bike. You go bike speed on bike trails, so let’s just go biking.”

**issues with innovation.**

I love the Reach, but we’ve had our rough spots. My first mountain bike trail ride, I sheared through one of the steering linkages, and a friend had to splint it with athletic tape so I could limp back to the road. My first ride this spring, the controller had somehow fried the battery, and I lost power after a quarter of a mile. In both instances, I was pissed, and so was my wife. “If you’re going to pay that kind of money for a bike, it should work,” she fumed. I had no counter argument.

What kept my faith in the company, and the bike, was Bagg’s response. In the case of the steering linkage, he fabricated a new version, machined from aluminum instead of 3D printed material, and sent it express mail. Same with replacing the battery and controller. The problem with being an early adopter of a technology is that problems invariably arise. Bagg owned and resolved the issues, and the fixes are incorporated into the new versions of the bike. Sure, I wish I didn’t have to deal with them, but they’ve been taken care of as well as I could’ve expected.

**real versatility.**

Ryan St. Lawrence was a mountain bike racer who was injured while riding some training laps on a local trail. After his T4 spinal cord injury, he tried everything from kneelers to a bucket bike (essentially a typical, two-wheeled mountain bike with a bucket seat and an electric motor bolted on). He didn’t love the other three-wheel bikes — the kneeling, headfirst position was uncomfortable and he hated the chest plate that you use to steer while pedaling. The bucket bike was a lot of fun, but he couldn’t get on and off it independently, and it wasn’t good for anything but riding flowy mountain bike trails.

After getting in touch with Bagg, St. Lawrence got his hands on a Reach. He was immediately impressed, not only with its capability but with its versatility. “I can take the
Bowhead on a downhill mountain bike track … but I can also take my dog for a walk or just use it as a wheelchair on a grassy surface that would be hard for me to push on regularly,” he says. “I see the Bowhead as having so many more uses than just an aggressive downhill bike.”

One use Bagg likely never anticipated when he designed the Reach was as a cross-country touring machine. Janne Kouri, a C6 quad and the founder of NextStep, a network of functional rehab centers, recently used the Reach on a 3,000 mile ride from California to Washington, D.C., dubbed the “Ride for Paralysis.” The Reach didn’t have a quad-friendly braking option until I asked for one, but Bagg has since developed a system that allows anyone with wrist-extension to control both front and rear brakes. The upright seating position and supportive chest harness make the bike a lot more quad-friendly than you’d imagine. Kouri, a power chair user, kept the front end locked out because he didn’t need the articulation on road.

He logged 60-plus miles a day on the bike, often at full throttle, for two months. Kouri is a big guy, and he put the bike through constant, long-haul work that it was never intended for. But through the extreme conditions, the Reach held up with only minor issues. “In very hot weather, going over the Rockies, there were a few days the motor overheated and I had to pull over for 15 or 20 minutes and let it cool down,” Kouri told me from the road. “Overall it’s been amazing. It’s got me all the way to Memphis and ultimately to D.C. It’s a remarkable piece of equipment.”

reintegration.

After begging and borrowing enough money to buy my own [see sidebar], I’ve taken it to the beach with my family, where I was able to navigate soft sand independently for the first time since my SCI. I’ve taken it down forest paths with my 2-year-old son on my lap, keeping up with my wife as she runs trails. I’ve spent evenings pinning the throttle across open fields, grinning like a loon as I lock up the rear brake and practice drift turns through the dirt. I went riding along a gravel road and after spotting a trail wandering up a hillside and into the forest, I explored it with no regard to width, slope or supposed accessibility. I returned with a few scrapes and needed to dismount and wrestle the bike free from a tree, but I was otherwise pleased with the experience. I’ve sat at the top of a steep ridge, surveying the trail that passed over roots and around trees, and felt my breath shorten and a shiver rise up my shoulders as I decided whether I had the skill to safely descend.

This is what I was looking for when I drove to Calgary — a reintegration with the terrain and experiences that helped form me. In the words of former New Mobility editor Barry Corbet, I wanted “to transport myself instead of being transported. To go where I dared.”

Somehow the bike has delivered.

the elephant in the room: cost.

The Bowhead Reach retails for $15,000. If you’re choking on your sandwich, I’ll give you a moment to compose yourself. Continuing: There’s no question that 15K is a lot of money, especially for members of the disability community who have to pay every time they take a pee. But there are reasons for the price tag that have nothing to do with padded margins.

Bagg says that the Reach has about 100 unique parts that outside companies fabricate, in addition to the 30-40 the company makes on its own. Add in welding, machining, assembly, hydraulics, wiring, battery cells and everything else that goes into an electric vehicle, and the sticker price climbs quickly. “You could say, ‘If you’re putting electric vehicles on the table, look at Smart Cars — they’re 15 grand and have a hell of a lot more parts,’” Bagg acknowledges. “There are also millions of Smart Cars, and if I could make millions of bikes, they’d be $2,500 or less.”

Small adaptive equipment manufacturers aren’t able to benefit from the economy of scale. When you can only order in small batches, everything is more expensive. “This is a barely functional business model, as far as profit goes,” Bagg says. “The amount of work and money it takes to make a bike, the sales price just covers that.”

So what about everyone who can’t afford 15K? “We’re getting in contact with as many funding organizations as we can, as many provincial and federal parks as we can, to try and get the equipment out to people who don’t have the money. Because I do believe in that, and I do want everyone to be able to experience what I’ve experienced.”

For more, visit: bowheadcorp.com

Above: Inventor Christian Bagg. 
Below: Ryan St. Lawrence prepares to transfer into the Reach.
The Wit and Wisdom of Wheelchair Junkie Mark Smith

When Mark Smith, our contributing editor and longtime expert on innovative products, died in November, he left a vacuum that is yet to be filled in either the broader SCI/D community or New Mobility. As the self-described Wheelchair Junkie, Smith was the go-to expert on everything to do with wheelchairs, from the lightest manuals to the fastest powered. Yet he had another side to him that those who visited his Powerchair Diaries came to know and treasure. A prolific blogger, he chronicled all aspects of his life as it happened, from his deep love for his children to humorous “slice of life” observations to heartachingly vulnerable accounts of growing up with cerebral palsy and parents who struggled with addictions. Here we present a few selections from the Powerchair Diaries. To read them all, visit Powerchairdiaries.com.

Mark Smith is shown with his wife, Holly, his daughter Emily and his stepdaughter Annabelle.
Annabelle was 5 when she came into my life. It was among my truest blessings, not just because of my own yearning to continue being a round-the-clock parent since my oldest daughter was finishing high school and going off to college, but because of the beautiful child Annabelle was. She exuded a joy and carefree zest for life that simply isn’t found in most people, even children.

Any time that we marry someone with children, it’s often said to be a “package deal,” but this union was far beyond such simple words. This was the universe bestowing me among the most precious gifts in my life — a wife and a second daughter.

We often hear of “special needs children.” In raising my oldest daughter, Emily, I always took issue with that term because every child has “special needs,” where our role as parents is to identify and meet each of our children’s needs, unique to that child. In raising Emily from birth through graduate school, I’ve been aware of the many “special needs” she’s had along the way.

Annabelle, likewise, has special needs. But again, like all children, hers are unique. Annabelle has spina bifida and autism. She’s wicked smart and has a sense of humor that has those of us around her laughing most of the time, but she doesn’t have “typical” interpersonal interactions. There’s no I-love-you, which makes her hugging her mother or occasionally holding my hand so powerful within our hearts.

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As parents, my wife and I ensure that Annabelle has everything she needs, from skilled nursing care, to a special bed, to her own play room. I didn’t realize how much Annabelle recognized me and my dedication to meeting her needs until one night in our van. She was watching YouTube videos on her tablet while my wife took our groceries into the house. Suddenly Annabelle dropped her tablet in a spot on the van floor where neither of us could easily get it. She became upset, panicking, and I realized that if I reclined my seat back, I might be able to grab the tablet. As I did so, it put me in proximity to Annabelle, and she began patting my shoulder, repeating, “Mark! Mark! Mark!”

This moment was profound because she doesn’t address anyone by name. Her addressing me directly in her moment of desperation was both heartbreaking, as she was so upset, and breathtaking because she was reaching out to me for help.

Fortunately, I scooped up the tablet and handed it to her, crisis ended.

Annabelle’s father will rightfully always be such. However, being acknowledged as her “Mark” in her time of need was among the most heartfelt moments of my life.
Counting Fish  Posted Nov. 17, 2017

When I first met Chris at the medical center, I wasn’t sure what was up with him.

Chris sat next to me awaiting blood work. He was in his early 30s, with dreadlocks and crazy-colored basketball shoes. A sweatshirt and sagging pants rounded out his urban look.

His first words to me were, “Do you go up and down in your chair for fun?” observing my power wheelchair’s elevating seat that takes me from sitting to standing height.

I gave him my standard answer, that it’s really about increased independence and social inclusion.

“I get that,” he said with enthusiasm. “But if it were me, I’d be going up and down all day long for fun.”

I wasn’t sure what to make of him. His comment seemed a bit odd but totally sincere. At that moment a nurse came out and smiling. I couldn’t stop watching him.

Chris began counting the fish one by one until they scattered and he could no longer count them.

“You try,” he said, and she did, the fish scattering again. “See, it’s impossible,” he said and the little girl laughed.

Chris’ girlfriend was with him, and as we waited, he’d jump on the other side of a glass partition and make funny faces. I couldn’t stop watching him and smiling.

Soon, both our names were called for our respective appointments. The center has four private suites for those with more complex needs or privacy concerns. Based on my situation, cerebral palsy and all, I get a private suite for something as simple as a shot.

As my wife and I entered our private suite, Chris and his girlfriend entered the one next to us. Several nurses followed him in with a cart full of medical supplies like I’d never seen. He told me earlier that he had both multiple sclerosis and cancer — and the suite and the nurses and the cart hit it home to me, with heart-sinking gravity.

One could easily wonder about Chris, how it is that someone facing such profound health conditions and a seemingly unknown future can move through the world with such carefree joy.

When We’re De-Elevated  Posted Jan. 30, 2015

My family and I went to see the famed Rockefeller Christmas tree, and it was more crowded than anywhere I’ve ever been. However, because my power wheelchair has an elevating seat that places me at 5 foot 7 inches tall, I worked my way through the crowd slowly but surely, eye to eye with those moving about, and people smiled at me, gingerly moving aside as needed for my 24-inch-wide power wheelchair to pass.

As we got closer to the tree, the crowed became so dense that I couldn’t see the ground, merely following the heads in front of me. Suddenly my power wheelchair dropped down a medium-height curb leading to the tree. Although the unexpected curb startled me, all was fine and we continued, shoulder-to-shoulder in the crowd, finishing with a classic family photo of the tree behind us.

We worked our way back through the crowd, and I watched carefully for the curb, knowing that while I couldn’t climb it while elevated, I could lower my seat to standard wheelchair height and safely drive up it.

As I reached the curb, the crowd continued flowing around me — that is, until I lowered my seat. Suddenly, at typical wheelchair height, my world changed. It was literally darker, more confined and, most shocking to me, I became invisible. While moments earlier I was at standing height, level with the crowd, now people were slamming into me, falling on me, oblivious to the fact that I was “down there.” I’d gone from a person in the crowd to suddenly invisible and of no stature simply by lowering my seat.

I yelled to my fiancée and, in a panic, I charged the curb, clipping people along the way. It felt like it was life or death — I was both fighting and fleeing.

Once up the curb, I quickly elevated my seat and as people immediately began safely flowing back around me, I took a deep breath, composed myself, and realized a universal truth: Being invisible to society is terrifying.

For me, that was an experience I’ve culturally known in other ways as a man with a disability. Beyond the change in physical stature I described with my elevating seat, I’ve been de-elevated in social stature at times.

I was fortunate amidst the crowd at Rockefeller Center that eve because at the touch of a button I elevated back to being seen. However, for many, the experience of being de-elevated often isn’t so easily resolved. When we’re dismissed by others and made to feel invisible, there is no button to push. Rather, the experience of being made invisible based not on our character, but on the ignorance, stereotyping and discrimination of others … well … just hurts.
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GEAR HACKS

By Seth McBride

HACKING A HOME

Gear Hacks is starting a project — a 1,728 square foot, “is it a garage, is it a house, does it really matter as long as it keeps you protected from the elements?” kind of project. Over the next year, my wife, Kelly, and I will be building a home on family property about 60 miles east of our current home in Oregon.

In the spirit of Gear Hacks, we’re trying to piece together the build — using skilled (and costly) labor for the times it would be stupid not to hire professionals, but otherwise doing as much as we, our friends and family can on our own. That means no general contractor and no project manager. It’s going to be messy, complicated, exhausting and, let’s hope, totally worth it.

Budget

$120,000. That’s the number we have to work with. It comes from cash from the sale of our previous home combined with a personal loan. Personal loans generally have higher interest rates and are smaller in total amount than construction loans, but construction loans (and the mortgages they roll into) have stricter requirements. Banks often want a general contractor handling the entire project, and they want the house to be comparable to other houses in the area. A personal loan offers less money at a higher interest rate, but few restrictions on how you use the money. We can’t afford a general contractor and traditional construction costs, so personal loan it is.

The Garagedominium?

The goal is to have a comfortable, accessible space to live as a family and to do so without breaking the bank. For those who have done any research on custom home construction, this is easier said than done. After a ton of research on everything from traditional framing, to prefab and modular homes, to post and beam construction, we settled on … a pole building garage. Seriously.

Pole buildings get their name from the 6-by-6-inch wooden poles that, along with the roof joists, form the building’s load-bearing structure. You see them everywhere — commercial buildings, workshops, agricultural buildings — because they’re simple, quick and inexpensive to build. They might not be the prettiest, but they can be insulated and weatherproofed just as well as a traditional, stick-built house. From an accessibility standpoint, the simple construction offers a few benefits, first being that they have no internal, load bearing walls, which means that the interior layout can be wide open, perfect for wheeling. Second, they’re traditionally built on a slab-on-grade foundation, which can allow you to roll right up to your front door without ramps or expensive lifts.

Another benefit is that both slab foundations and pole buildings are quick to construct, making it easy to hire locals who need small side jobs. And perhaps most crucially, they’re cheap. A quote from a recommended local company

Matt clears the site (left) for a pole building similar to the example shown above.
for a 36-by-48-foot structure with metal siding and roofing, plywood sheathing on the roof and walls, along with roof felt and house wrap, 10 large windows, two garage style doors and one exterior door, and all the components necessary to assemble it — everything you need for a weather-tight shell — came in at just under $28,000. With a slab foundation, including extra concrete for a carport and a large "deck," quoted at $12,000, the total including labor to help put up the building is about $50,000. That's less than half of what a traditional house shell and foundation would likely cost.

**Beyond the Shell**

Our plan is to hire local help to get the shell of our home constructed, and then do the majority of the interior through DIY, friends and family. And this is where we want to hear from you, fine readers. Do you have any interior accessibility tips — anything from kitchen layout, to floor plans that work well for a wheelchair user, to bathroom hacks, to ... well ... anything? We want to hear about it. Wheelchair users: Have you framed a wall, hung cabinets, installed a vanity or put up drywall? We want to hear about it. Have any questions about costs, methods or our sanity? Email me at smcbride@unitedspinal.org. We’ll be checking in on this project for the next 10 months. Let’s have a conversation about home building. Hopefully we teach each other a few things in the process.
What if it were possible to replace lost neurons by combining superfast, individual-specific 3D printing with cellular therapy designed to promote axon growth? Turns out that it is possible.

This is another story about the holy grail of spinal cord injury repair: regeneration — the process by which cells of the spinal cord grow back again across the damaged section, or gap. During my own adult life, the prospect of regeneration has gone from “impossible, don’t even bother” to “oh wait, I see how this might work.” Since the 1970s, scientists struggling to repair damaged cords have faced a long and frustrating set of harsh surprises, with each small success revealing yet more obstacles to overcome. Regeneration is not a project for the faint of heart or for those in a hurry — but it is marked with milestones like the one I’m about to describe.

In the February edition of the journal *Nature Medicine*, a team of researchers led by Dr. Mark Tuszynski reported that they’d found a new way to fill a spinal cord gap. Their paper is called “Biomimetic 3D printed scaffolds for spinal cord injury repair.”

Details will follow, but first a little history: It used to be thought that once broken, the delicate thread-like axons that carry messages from brain to body and body to brain simply could not regrow. Ever. Then scientists learned that axons could in fact grow under the right conditions, but they kept running up against “glial scarring” — the physical and chemical barrier that walls off damaged cells in the cord and protects the healthy parts above and below an injury site. Axons that grew fine in petri dishes were stopped cold in living creatures when they bumped up against the glial scar. Researchers thus began a long string of attempts to fashion a way to go around or through it.

One idea was to use bits of borrowed peripheral nerves to form living bridges that would give axons a path to avoid the scar, but it turned out that axons needed more guidance and more incentive to grow. Experiments with all sorts of bridges and tunnels, some of them with promising results, proved to be unrepeatable. Paths through or around the injury site were very hard to create and often required one-in-a-million surgical skills. The axons stubbornly refused to grow, at least in meaningful numbers.

Setting bridges aside, perhaps the trick would be to simply replace all the damaged cells with new ones. Over the last few decades, many variants on this idea have been tried, with a variety of candidate cells being implanted into the damaged cords of rodents — and a not insignificant number of human volunteers and customers. So far, and in spite of much hype, it’s only recently that cells from any source have been shown to reliably lead to regeneration in large mammals. We looked at two instances of recent regeneration successes in New Mobility’s October 2018 and January 2019 issues. One involved a bridge, and the other involved neuroprogenitor cells (NPCs).

Tuszynski’s team used both NPCs and a bridge that relies on new technology. For the first time, 3D printing is now producing a very promising version of the long-awaited bridge. Even more intriguing, when seeded with NPCs, this bridge consistently gets closer to the goal than anything tried so far. Axons are crossing the injury and coming out the other side to form strong new connections. What makes NPCs special is that they’re exactly like the cells in a developing embryo that can only differentiate into the cells of the central nervous system.

Can 3D Technology Simplify the Complexity of the Spinal Cord?

If you could slice through the human spinal cord like a sushi roll and look down at the round surface you created, you’d see a sort of gray butterfly shape...
surrounded by a lighter-colored field. The butterfly shape is the central part of the cord. The outer field is where the axons are. These axons — and this is important — are arranged according to what kinds of information they pass along and which direction it goes. The critical point is that the arrangement of groups of axons inside the cord is parallel. The tracts are a bit like bundles of extremely fine hairs, all placed neatly alongside one another and symmetrically on either side of the gray matter.

I have to pause here in sheer amazement that all of this can be known in such detail. When surgeons operate to expose the spinal cord, these structures aren’t even visible. What they see there is just a soft, semi-liquid mesh.

At the site of an injury, all of this meticulous biology, consisting of millions and millions of individual cells, each with a particular set of connections, is destroyed.

Tuszynski’s team worked with rats, trying to establish proof of the concept that a tiny scaffold printed to match the precise dimensions of an injury and then loaded with NPCs could serve as both bridge and living relay switch. The paper lays out the process by which they were able to prove their point. There were four sets of rats, all with spinal cords completely severed at the thoracic level.

• One of the groups was a control — no further intervention was done.
• One was given just the cells, with no scaffold of any kind.
• One was given a different scaffold model without the cells.
• One was given the scaffold built by a 3D printer and loaded with cells.

The 3D scaffold, which can be printed in 1.6 seconds, is both flexible and sturdy and made from a material that does not appear in nature. Think of a tiny, very firm Jell-O made from a mold and you’ll be close.

Designed to mimic the shape and structure of a cord cross section, the scaffold has microscopic channels built in to guide the complex arrangement of axons along their original paths and link up with their counterparts on the other side of the injury site.

And that’s exactly what the axons did. The host axons entered the bridge and formed synapses with some of the NPCs that had been implanted there. Some of the NPCs then differentiated and grew their own axons out of the bridge and into the healthy cord below, where more synapses were formed. And all of that translated into measurable improvement in movement for the rats — and another step toward the once-thought-impossible goal of regeneration.

What’s exciting about this technology is that it’s both scalable and adaptable to different injury geometries. It’s likely that every person reading this has been told at some point that “every injury is different.” The complexity of the cord makes it impossible to predict with any specificity what patient will get what kind of outcome after damage to the cord. With 3D technology, that could change. An MRI of the injury can produce a precise set of dimensions of the lesion. That set of dimensions can then be fed into digital design software, which can in turn be used to create a soft gel scaffold that’s exactly like the injury, no matter how misshapen it is. Even better, the fact that this is a digitized process means it’s very fast and requires none of the extraordinary surgical transplant skills that made earlier attempts at bridging techniques so difficult to reproduce. The scaffold is placed into the lesion, where technology has ensured that it fits perfectly.

Someone from Tuszynski’s lab at this fall’s Working 2 Walk lab in Cleveland, Ohio, will be prepared to explain how this technology works and describe the path forward. I intend to be there.

**Resources**

- Working 2 Walk conference, u2fp.org/working-2-walk/this-years-symposium.html
With a ton of ways to increase your independence at Abilities Expo, your glass really is half full!

- Cutting-edge products and services
- Get answers from the experts
- Adaptive sports for better health
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- Service animals open doors
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EMPLOYMENT OPPORTUNITY

Job Title: Americans with Disabilities Act (ADA) Coordinator (Part-Time)

Description: The Americans with Disabilities Act (ADA) Coordinator will build upon and administer the ADA accommodation program from start to finish. The position will also be involved in the Light Duty/Return-to-Work program. Other duties include but are not limited to the following: Identifies and performs outreach to employees possibly requiring accommodations; educates management and employees on the rights and duties under the ADA; coordinates with management and employees to develop and provide employees effective and reasonable accommodations; develops written materials and other informational pieces regarding the ADA program; develops and maintains internal measures to track ADA status and compliance and maintains and documents records of all disability and accommodation issues ensures compliance with applicable laws, regulations, and policies; assures that workers with disabilities are provided effective and reasonable accommodations allowing them to work productively and safely; assure Township-Sponsored activities, Township Facilities and events address accessibility and accommodation concerns.

Requirements: Bachelor's degree in social sciences, human resource management, business administration or related field and two years of personnel administration experience are required (or a combination of education and/or training and/or experience which provides an equivalent background required to perform the work of the class); a minimum of eighteen (18) months of experience in a position that involved evaluating and administering reasonable accommodation issues subject to the ADA or §504 and completion of a course on barrier-free design or ADA accessibility guidelines which was sponsored or approved by the New Jersey Department of Community Affairs or a department which oversees the Uniform Construction Code in any other State, the American Institute of Architects, the Paralyzed Veterans Association, or the United Spinal Association, within twelve (12) months of hire.

Salary: DOQ

Hours: Part-Time, three days weekly (not to exceed twenty one hours per week).

Apply: Send resume or application to: Ms. Braedon Gregory, HRIS Coordinator, Human Resources Department, Township of Montclair, 205 Claremont Avenue, Montclair, New Jersey 07042 or email: bgregory@montclairnjusa.org

Closing Date: Job posting will remain open until position is filled.

For more information, call 305-243-7108.

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**Meet New Member Brittany Sanchez**

**From:** Freeport, Texas

**Age:** 33

**T7-T9 SCI in 2017**

**Why I joined United Spinal:**

I was curious about people like me. I want to keep getting stronger and learn new things that you need to know.

**Can’t live without:** My Dalton air mattress. I had two pressure sores in the first year of my injury but haven’t gotten a new one since I got the mattress.

**On making life easier:** I drink lots of water and watch things that you need to know.

**Meet other members or join United Spinal at unitedspinal.org**
LEAVING A MARK

When I first got my dog, he had a lot of energy. I mean A LOT of energy. He required frequent trips to the dog park if I didn’t want him catapulting himself around the living room furniture. That dog would run for hours.

After a bit, we started to be welcomed into the “regulars” crowd at the park and people would come over to make small talk. While my dog basically ignored me until I made him come home, other people’s dogs stuck to them like Velcro. One afternoon, mid-conversation, one of the group’s mutts walked straight up to me, angled himself, lifted his leg and peed on my rear wheel. Mortified internally, I played it off as no big deal. The owners, melting with embarrassment, still made an overly apologetic exit.

Trying to appear unfazed, I let my dog run around some more. The joke was on me, though. In minutes, another dog ran up and peed on the other dog’s pee. Yep, time to go home, buddy.

Dee Hydrant

THE VETTING PROCESS

For 25 years, I worked at my family’s Corvette and specialty car dealership in sales support and internet marketing. Frequently, customers called to inquire about what makes and models we currently had for sale. I always made a point to invite them to come check out our inventory in person, but never bothered to mention that I am a wheelchair user paralyzed from the waist down since birth due to spina bifida.

When they arrived for their showroom visit, their expressions often changed as I rolled up to greet them. After introducing myself, customers commonly would tilt their heads and say something to the effect of, “You sounded different on the phone.” To which I would reply, “Well, I’m a little shorter than most!” It always got a laugh.

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