Henry Stifel Reflects on the Mission; Hope Has Never Been More Tangible

Henry G. Stifel III was 17, a junior in high school, when he was paralyzed in a 1982 auto accident in Short Hills, NJ. He is categorized a C4/5 tetraplegic; he has some arm function but none in his hands or fingers. The long-time board member of the Christopher & Dana Reeve Foundation lives in New York City; he is a Senior Vice President at Morgan Stanley. On the occasion of Henry’s recent 50th birthday, we caught up with him to see how he’s doing and to assess his view of progress in spinal cord injury research.

So, how’s Manhattan in a wheelchair? New York has come a long way toward being wheelchair-friendly in the 25-plus years I’ve lived here; it’s much better. If I’m going to work in the city I have to live here. Commuting would add two hours a day to my schedule; I don’t have two hours to spare.

You manage a busy lifestyle pretty much on your own, yes? I do. I have four people who help manage my care, including transfers from bed to chair, meals, transportation and all the other aspects of spinal cord injury health care. I know how to navigate the handful of subway stations that are accessible. Basically, everything I need is within five blocks of my home.

You’ve been holding up OK? I try to find a balance between my health care, relationships, work environment and everything else that drives you. Aging slows things down, for everybody. In the case of SCI, there are a lot of autonomic functions that are particularly a challenge, including bowel and bladder care. You learn to adapt. Tweak your regimen. You figure it out on your own and then you have to make sure those who care for you are trained, and on board. The medical community, when it comes to SCI, they do a phenomenal job.
job with the newly injured, and maybe up to five years or so post-injury. For people 30 or 40 years post, this is new territory. If something comes up a visit to the internist may not be enough. You have to be your own advocate. And I always find myself relying on the community; I share notes with friends with similar situations. We are the experts, and have learned to never give up.

**Were you destined to be an investment banker type?**

When I came out of my mother’s womb I don't recall saying, gosh, I want to work on Wall Street. When I was 17 I was planning on going to college. I had done a lot of drawing, and I found architecture very interesting, and also engineering. In 1983, I didn't pursue those interests – I was driving a sip 'n puff wheelchair, and I really couldn’t move anything the first few years. Computers were still at a nascent stage and not there for me – that’s quite different today, with all the things one can do with drafting and other artistic type things on a computer.

Tell us about those college days.

I saw a segment on *60 Minutes* about the work of Jerold Petrofsky, one of the early pioneers in FES [functional electrical stimulation – application of current directly to paralyzed leg muscle]. It was very exciting and so I said, I want to go there – Wright State in Dayton, Ohio. The campus was very well set up for students with disabilities; they had a very progressive disabilities services center. They paired me with students to help me with my care, and provided help with note-taking and so on.

**You went to Wright to help with the FES experiments?**

I was in the Petrofsky lab on a regular basis and was a regular user of the first FES bike developed there, the Regys. In fact, I was one of the first purchasers of a home unit.

**You transferred schools ....**

Once my participation in the research program at Wright State ended, I decided to move on to a college closer to one I might have gone to if I hadn't been injured. I brought the FES bike to William and Mary and kept it in the gym. I’d ride it every other day or so as the football team worked out in the weight room. I loved it at William and Mary. And they had a strong business school. I graduated with a finance degree.

**Then right into the work force?**

I was lucky to get a position as an analyst in the public finance department of Morgan Stanley. It was a great job, a very intense environment. We'd eat dinner in the office, work until 12 at night and every weekend. I thought I came in knowing something but you really don't learn anything until you're on the job. I moved over to private wealth management in 1999.

**The roots of the Reeve Foundation are indeed your own roots. How did the Stifel family react to your injury?**

The family was devastated, we all were. I was in the hospital for nine months, at Kessler then at Craig, in Denver. My family basically said, ‘Henry, we love you, we want you to be as active and independent as possible. You need to figure this out.’ There was a little tough love there. So I’m just trying to figure out how to get from point A to point B. And I began to realize that as long as you get to point B, that’s what matters. So I went back to my high school in December of my senior year, graduated with my class and went off by myself to Wright State the following September – completely dependent.

**Dependent but not helpless, right?**

I learned to understand everything I could about my injury, and I knew how to vocalize my needs. I learned early on that knowledge creates independence.

**Now your father, Hank, he reacted in a different way.**

My father was driven by the general negativity of the medical community toward paralysis. You can't blame the doctors; in 1982 SCI research was considered the graveyard of neuroscience. My father wanted to change that. So while I was still in rehab at Kessler, still trying to figure out how I’m going to get out of bed, he started a foundation. He said to me, ‘We’re going to raise money for paralysis research and you’re going to be the chairman.’

Thus began the Stifel Paralysis Re-
I was fortunate to have come from an affluent community. The foundation was born out of a community response to a crisis, and the desire of a family to create hope and support where it never existed before. People rallied around my family in an unbelievable way. There was so much love, so much support.

And the name soon changed too ... There are two things a foundation does. Raise money, and give it away. Those are two different jobs, both difficult to do well. We did the fundraising part very well. About this time we were approached by the American Paralysis Association. They said, ‘We have a viable review process, a national base. Why not become part of us.’ We agreed, they made my father the CEO, he moved the headquarters from Dallas to Short Hills.

Our goal was to stay focused on spinal cord injury research – and on the best ways to support the top-notch scientists.

And that advisory infrastructure continues today, and indeed was partly why Christopher Reeve was attracted to the APA. First, though, when was the first time you met Reeve?

At this time Reeve became a Board member at APA. After a couple years, it became clear that operating the two organizations in parallel made no sense. CRF came to APA in New Jersey to consider a merger. It made perfect sense. They were attracted to our open ar...
Salk Hosts Gathering of the SCI Research Field

The Reeve Foundation International Consortium on Spinal Cord Injury meets twice a year. The principal investigators from the seven Consortium centers, plus the Associates from each lab, spend two days drilling into the details of each others’ work, sharing data, ideas, and insight. Typically, the group invites a presentation from an outside lab. “Over the years we’ve made an effort to bring in scientists with specialization in some aspect of spinal cord research,” said Reeve Foundation Executive Vice President Susan Howley. “An infusion of ideas from non-Consortium labs brings value-added to the collaborative thinking that is the hallmark of Consortium meetings. Over the years, fascinating scientific dialogue has arisen from external presentations and from time to time, collaborations emerge as well. Such cross-pollination is essential to our efforts to move the science forward.”

At their most recent gathering, members of the Consortium participated in a special one-day symposium, “Spinal Cord Injury: Mechanisms to Restore Function.” The program, held at the Salk Institute in La Jolla, CA, included presentations from ten outside scientists. The program was organized by Sam Pfaff, Ph.D., a Salk scientist and Consortium member.

“Spinal Cord Injury: Mechanisms to Restore Function”

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This is a remarkable time in spinal cord injury research,” said Pfaff in his introductory remarks. “We are closer now to developing treatments for SCI because we now understand the mechanism of a number of therapies. This symposium will explore some of these mechanisms today.”

The presentations included a wide range of potential therapies, including stem cells, repurposed cancer drugs, hypoxia, microelectrical stimulation and even probiotics.

The first presenter was neuroscientist Zhigang He, Ph.D., from Harvard; his work explores regeneration of important spinal cord nerves by using genetic cues to power up nerve cell response to injury. In experiments, He has shown how to manipulate the genes associated with cortical spinal tract (CST) neurons; these nerves are important for arm and hand function, and locomotion. Deleting a gene called PTEN spurs the CST neurons to regenerate, quite robustly. He presented new, unpublished data on another way to boost nerve growth, using a cell-signaling protein called osteopontin, in combination with growth proteins such as insulin-like growth factor (IGF).

Phil Horner, Ph.D., a former Associate in the Consortium who has a full-scale lab of his own at the University of Washington, studies the role of myelin in spinal cord injury. Typically, this white, fatty nerve lining, a sort of insulation on nerve axons, is disrupted by trauma, thus leading to poor conduction of nerve messages. Horner asks, is it possible for myelin to be restored, and can myelin function be improved? Yes, he says. His animal experiments show that there are molecules, such as the cell-signaling protein neuregulin 1, that can be introduced to the lesion area after spinal cord injury to boost production of myelin and improve nerve conduction.

Mark Tuszynski, Ph.D., from the University of California, San Diego, says he first resisted the idea of using stem cells in an animal model of SCI. “It was done against my advice,” he admits, but it turned out that his colleague, Paul Lu, Ph.D., has revealed some “striking biology” using neural stem cells in support of axon growth. Implanted stem cells, nourished by a “cocktail” of a dozen growth molecules, grew great distances – as far as 50 mm – above and below the spinal cord lesion. Some formed what appeared to be functional connections and anatomical relays. Animals did not gain meaningful functional recovery but Tuszynski thinks that is a matter of timing and technique. The stem cell approach is not ready for clinical therapies, he said, “but it would not be crazy to think they will be useful for humans.”

Valeria Cavalli, Ph.D., a scientist at Washington University,
works to understand how the central nervous system (CNS), which does not regenerate after injury, can be coaxed into being more like the peripheral system, which does regenerate and restore full function after injury. She looks at molecular signaling – what are the messages sent from the cell body to the end of a damaged axon to initiate regrowth? Also, what are the steps, or programs, that might be rebooted to elicit a regenerative response? Cavalli continues to learn more about the basic biochemical basis of nerve growth in both the central and peripheral systems; in recent work she has been exploring the role of intermittent hypoxia (oxygen deprivation) as an activator of genes that form the blueprint for nerve growth in the injured spinal cord.

Frank Bradke, Ph.D., from the German Center for Neurodegenerative Diseases, in Bonn, described how low doses of drugs already in use to treat cancer can also reinvigorate injured axons. One such drug, epothilone B (epoB) encourages weak axons to grow. Moreover, epoB disrupts the cells that form a scar barrier at the injury site, allowing the axons to move out and away from the toxic injury area. This work dovetails with previous work from the Bradke lab showing similar regenerative potential from the drug Taxol; the cancer fighting compounds, in low doses, help stabilize the growing tip of an axon.

Neuroscientist/neurosurgeon Rob Brownstone, M.D., Ph.D., from Dalhousie University in Nova Scotia, studies the specific neural circuits that control movement. He described

**Symposium Highlights: Plying the Art and Craft of Research**

Valeria Cavalli studies the chemical signals the nervous system needs to repair itself. On the side, she’s an accomplished jeweler. Valeria doesn’t sell her work but she has for many years donated a piece to the Reeve Foundation’s annual fundraising gala, *A Magical Evening*. “I do them for the pleasure of doing them,” she says.

Phil Popovich has shown the remarkable co-dependence of the nervous system, the immune system and the microbiome — the gut. Spinal cord trauma upsets everything. Remedy? Probiotics (kefir, yogurt, etc) seem to improve gut health, thus boosting immune function. In the lab, mice taking a probiotic improved function, too.

Frank Bradke has found a way to help injured nerve axons to mount a comeback. He uses cancer-fighting drugs in low dosage to stabilize disruption at the axon tip, or growth cone. A drug, epoB, which is already approved for cancer therapy, promotes axon regeneration; what’s more, it also reduces scar formation at the injury site.

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The Big Idea will begin enrolling participants in early 2016 in a clinical study to test the application of spinal cord stimulation in a group of 36 subjects. This follows up on earlier research showing that epidural stimulation of persons with chronic, complete paralysis seems to reawaken spinal circuits; the first four young men fitted with the stimulator recovered voluntary movement in their legs, hips, ankles and toes. They also regained significant bladder, bowel and sexual function. Moreover, each of the participants improved in overall health, including increase of muscle mass, regulation of blood pressure and temperature, reduced fatigue and an overall boost to their sense of well-being.

The Big Idea will explore and measure the effect of epidural stimulation in several key areas. Research and medical experts have been teamed to gather details in the following areas:

**Cardiovascular:** Andrei Krassioukov, M.D., Ph.D., ICORD, University of British Columbia, with Gail Forrest, Ph.D., Human Performance & Movement Analysis Laboratory, Kessler Foundation Research Center, Glenn A. Hirsch, M.D., University of Louisville, Aaron Phillips, Ph.D., ICORD, Vancouver, Christopher West, Ph.D., ICORD, and Alexander Ovechkin, M.D., Ph.D., Assistant Professor Department of Neurological Surgery, University of Kentucky. (Note: Susan Harkema, Ph.D., professor, Department of Neurological Surgery, Rehabilitation Research Director of the Kentucky Spinal Cord Injury Research Center at the University of Louisville and Director of Research at Frazier Rehab Institute, is Principal Investigator for The Big Idea; she is a member of all study groups.)

Spinal cord injury affects heart and blood pressure function in major ways. “We know that people with SCI are dying of cardiovascular-related issues,” said Krassioukov, who leads the cardio group. “What can we do to help them? We have already seen some benefit from locomotor training – now we want to assess whether epidural stimulation has an effect too.” SCI has a “profound effect” on autonomic function, including management of blood pressure, Krassioukov said. In particular, orthostatic hypotension – the sudden dizziness or lightheadedness of sitting up or standing – is “devastating for many people, some who are unable to even participate in rehab.” Earlier work with epidural stimulation has shown promise in maintaining even blood pressure. Krassioukov and his group plan to test blood pressure parameters before, during and after spinal cord stimulation. “The benefit we’ve seen so far has been amazing,” he said. The study will also evaluate heart health. “People with spinal cord injury often have significant cardio deterioration,” Krassioukov said. “If spinal cord stimulation is beneficial, we want to quantify that.”

**Bowel, Bladder & Sexual Function:** Charles H. Hubschner, Ph.D., Department of Anatomical Sciences & Neurobiology, University of Louisville, with Graham Creasy, M.D., Professor of Spinal Cord Medicine, Stanford University School of Medicine, Todd Linshenmeyer, M.D., Division of Urology, Kessler Institute for Rehabilitation, Steve Williams, M.D., Director of Translation Research, University of Louisville.

Trial participants will be carefully monitored for any changes to bladder, bowel or sexual function. Each individual will keep a voiding diary – noting liquid intake and output, and timing of bowel movements. Said group leader Hubschner, bladder function will be more fully measured with periodic visits to the urology clinic for cystograms. “This will record bladder contractions as the bladder is slowly filled; we measure changes in bladder capacity and therefore assess the efficiency of voiding. We are looking for changes compared to a baseline set before implantation of the spinal cord stimulator.” Hubschner said his team will also be looking at certain bladder-related proteins. “Higher levels of these biomarkers, in animal studies, was related to increased bladder dysfunction and spasticity. We will see if the intervention brings the levels back down.”

Bowel function will be assessed in terms of time for defecation. The early studies indicate this is an area that epidural
stimulation benefits.

Hubschner said sexual function in male participants will assess erection function and hardness using survey tools used in the nondisabled population during trials for such medications as Viagra. The men will be asked to report on such things as desire, orgasm and overall satisfaction with intercourse. Dose and frequency of erectile medications will also be tallied.

Female participants will be questioned regarding desire, arousal, lubrication, pain and orgasm.

**Voluntary movement:** Claudia Angeli, Ph.D., Senior Researcher, Human Locomotion Research Center at Frazier Rehab Institute in Louisville, KY, Maxwell Boayke, M.D., University of Louisville, and James Guest, M.D., Ph.D., Miami Project.

The restoration of voluntary movement has been the most surprising result of the first few experiments with epidural stimulation. This recovery of movement is significant, of course; it turns upside down the dogma that a person with a so-called “complete” spinal cord injury cannot establish a connection between the brain and lower extremities. Voluntary movement, however, is not a primary end-point of The Big Idea study.

Here’s what may be happening, said Angeli, who heads this study group: “Let’s say you have an intent to move. That signal originates in the brain and gets through to the spinal cord but the cord is not aware enough or excited enough to do anything with that intent. When we add the stimulation, the spinal cord networks are made a little more aware, so when the intent comes through, the cord is able to interpret it and movement becomes voluntary.”

The Big Idea will measure each participant’s ability to willfully move his or her lower extremities when the stimulation is turned on. The research team will record specific muscle kinetics and look for correlates to the parameters of the stimulation.

**Pulmonary:** Alexander Ovechkin, M.D., Ph.D., with Gordon Mitchell, Ph.D., Professor of Physical Therapy, McKnight Brain Institute. Rodney Folz, M.D., Ph.D., Chief of the Division of Pulmonary/Critical Care & Sleep Medicine, University Hospitals, Case Western Reserve University School of Medicine, and Anthony DiMarco, M.D., Functional Electrical Stimulation Center, Case Western Reserve University.

Breathing complications associated with compromised respiratory muscle are a leading cause of death and a major health concern for people with chronic spinal cord injury. Said group leader Ovechkin, “The risk is high but currently there is no established standard of care or rehabilitative strategy to fight respiratory abnormalities. Results of our previous studies indicate that locomotor step training leads to increased spinal motor output to respiratory muscles, but does not improve voluntary control of these muscles. Here, we want to test the hypothesis that a combination of epidural stimulation and task specific motor training will lead to re-activation of voluntary respiratory motor control. We will evaluate respiratory motor control and function before and after the therapeutic interventions in the trial participants.”

**Quality of Life:** Alan Jette, Ph.D. and Mary Slavin, PT, Ph.D., Boston University School of Public Health, with Susie Charlifue, Ph.D., FACRM, Craig Hospital, Sarah Everhart Skeels, MPH, Boston University.

This study considers quality of life in several components: mobility function, daily activities and depression/anxiety levels. Each trial participant will be contacted periodically by a trained interviewer, said Jette, who co-heads this group with Slavin. Patients will be asked such things as, how satisfied are you with your life as a whole in the past four weeks? They will use a scale from 0 (completely dissatisfied), to 10 (completely satisfied). How satisfied are you with your physical health in the past four weeks? How satisfied are you with your psychological health, your emotions and mood in the past four weeks?

The interview will ask about basic mobility, self-care, bowel

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The ongoing Phase II/III clinical trial called RISCIS, for Riluzole in Spinal Cord Injury Study, enters its next phase with the collaboration of clinical centers from the Reeve Foundation’s North American Clinical Trials Network® (NACTN).

Riluzole is already approved by the U.S. Food and Drug Administration for the treatment of amyotrophic lateral sclerosis (ALS). In earlier tests in animals, and in a Reeve-sponsored Phase I safety trial in humans, the drug has shown protective benefit in acute spinal cord injury. The Phase II/III trial includes an innovative study of dosage of the drug.

RISCIS is a multi-center, randomized, placebo-controlled, double-blinded trial that will include 351 patients with acute cervical injuries, the group that appeared to benefit from the drug in the safety trial. The Phase II/III trial is being funded collaboratively by the Reeve Foundation, the Department of Defense (DOD) (in support of the ten NACTN sites) and by AOSpine North America, an international education and research society of 6,000 physicians whose mission is to advance spine care worldwide.

RISCIS is being co-directed by Robert Grossman, M.D., a neurosurgeon at Houston Methodist Hospital in Texas, and by Michael Fehlings, M.D., Ph.D., neurosurgeon and medical director of the Krembil Neuroscience Center at the University of Toronto. Said Grossman, “Riluzole appears to be safe in traumatic acute spinal cord injury; we are eager to better measure the drug’s effect in a larger number of patients. The potential for neurological recovery is promising.”

RISCIS is international, with clinical centers in the U.S., Canada, Europe and Australia. “Currently, there are 12 centers enrolled in the trial,” said Fehlings. “Our ultimate vision is to go to 36 centers worldwide. The trial is now active in Australia, with Sydney and Adelaide engaged. We are also in discussions with sites in Cambridge in the UK and Berlin, Germany.”

Fehlings said the trial has also formed a partnership with the Rick Hansen Institute in Canada to facilitate a MRI biomarker sub-study. “This study will use advanced imaging tools to examine the potential neuroprotective effects of Riluzole on the injured cord.”

At press time 23 patients have been randomized in the Phase II/III trial. Enrollment is complicated, said Fehlings, because of the changing demographics of spinal cord injury. The trial includes patients up to age 75 but not all meet the necessary criteria for participation. “We are seeing increasing numbers of older individuals with SCI who have significant medical co-morbidities,” Fehlings said.

The funding role of the Department of Defense in the project will allow enrollment of patients at the Brooke Army Medical Center in San Antonio. DOD funding will also support an important aspect of the trial, the pharmacology of Riluzole, to determine optimal dosage, which will be studied at the NACTN centers.

“Pharmacology is a very important part of the trial,” said Grossman. “We need to establish the most effective dosage. In the Phase I trial we measured blood levels of Riluzole. We found that with the same oral dosage of Riluzole in all patients some patients had high blood levels, others low. There was a suggestion of a correlation between higher blood levels of Riluzole and better outcomes. We will continue to study this correlation with the goal of establishing the blood level for effective treatment. If the effective blood level can be established the oral dosage of Riluzole can be adjusted to reach that level. It is a common clinical practice in the drug treatment of various conditions to measure the blood levels of the drug and adjust the dosage to reach the effective level for treatment.”

DOD financial support also requires an additional level of regulatory review. This complex and detailed aspect of

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RILUZOLE: SAFE, EASY, CHEAP. NEUROPROTECTIVE?

Researchers have identified a number of injury mechanisms that occur in the hours and days following spinal cord trauma. This cascade of secondary cellular events includes impairment of energy metabolism of neurons and glial cells of the spinal cord, excessive release from injured neurons of the neurotransmitter glutamate and excessive entry into cells of sodium and calcium producing swelling and death of cells.

Riluzole has several mechanisms of protecting neurons from secondary damage including blocking glutamate release and blocking excessive entry of sodium and calcium into cells.

Riluzole has been FDA-approved and widely used in treating ALS; it is regarded as safe. Importantly for enrolling patients who have very recently experienced major trauma, Riluzole is administered by pill, not surgery. Besides being safe and easy to give, Riluzole is off-patent and therefore inexpensive. Hopes are high that the drug is also neuroprotective.
animal experiments, using special florescent dyes, that located the exact spinal interneurons that control hand grasp. Once identified, the therapeutic strategy would be to manipulate these cells toward functional recovery.

Ohio State scientist Phil Popovich, Ph.D., presented data on the interrelationship between the nervous system, the immune system and the biome of the intestinal tract. He showed a rather striking amount of immune system compromise directly related to SCI trauma. This “dysbiosis” of the neuro-immune system actually shrinks the spleen (therefore reducing antibody protection in body) and degrades the microbiome of the gut, which is essential for optimal immune function. The “maladaptive plasticity” of the nervous system, in response to injury, can lead to autonomic dysreflexia, increased risk of infection and even to pain. But injured animals fed an over-the-counter probiotic (VSL 3) not only improved their gut health but also had better recovery following spinal cord injury.

Martin Goulding, Ph.D., from Salk, considered the importance of the dorsal spinal cord as a gate for sensory information coming to the central pattern generators of the spinal cord – the “spinal brain” that carries out motor tasks without direct brain input. Axel Nimmerjahn, Ph.D., also from Salk, discussed new ways of imaging spinal cord nerve cells, including the use of miniature microscopes that can observe nerve cell activity in a living animal.

Chet Moritz, Ph.D., at the University of Washington is focused on neuroprosthetics – using a device to bypass an injured area and move nerve messaging past the damage. In recent work, he has used intraspinal stimulation of the cervical spinal cord to reanimate paralyzed limbs. Recovery might occur directly from the effect of the electricity, or it might need extra help. In collaboration with UW colleague Phil Horner, they will combine stimulation with stem cell therapies. Moritz suggested that an underappreciated application of spinal cord stimulation may be to guide plasticity by providing the necessary electrical activity for orphaned spinal circuits.

— Sam Maddox
architecture approach to research and we were attracted to the marquee name. In 1999, we became the Christopher Reeve Paralysis Foundation.

And the Foundation branched out from research-only?
We went from a pure research-focused organization to a multifaceted foundation with a focus on cure, care and advocacy. We attracted a number of large supporters, and many new board members. Dana represented the “care” side of the equation. In 2002 we partnered with the Centers for Disease Control and Prevention to launch the Paralysis Resource Center; we increased our monetary support to nonprofits and charities that focused on quality of life issues related to disability.

Describe the impact Reeve had on the field?
Tremendous. He put a face on the cause. He brought awareness to the masses, he made people care. And of course he drove people to want to support our mission. When he passed it became clear that the cause was bigger than Christopher Reeve. That was his legacy. Of course at the Reeve Foundation, we had to hit the reset button. We were in crisis mode. Donations slowed to a trickle – the public didn’t think we were going to survive. We had been selling the brand more than the product so we needed to expand our messaging. We knew it would take more than one person to fill his shoes. It would take the whole community. And that has happened; for the most part we are united as a single voice.

The message is rather encouraging today, do you agree?
To see how this work has evolved in our 30-plus years is amazing. It is a monumental time in the history of spinal cord research. There are several human SCI clinical trials going on now in the United States. The field of neuromodulation, which the Reeve Foundation has led from the beginning, decades ago, has made tremendous progress – enough so that the Foundation has been able to spearhead The Big Idea, a clinical initiative to test the effects of epidural stimulation in 36-motor complete individuals living with spinal cord injuries. Findings in a small number of subjects have led to their ability to fully bear their own weight and experience a range of recoveries in autonomic function. This has never happened before. Seeing this is fantastic, and really inspiring.

For me personally, I truly believe The Big Idea and the promise of spinal cord stimulation will lead to meaningful incremental recoveries. The research suggests it might improve bowel or bladder function – this would be huge for my health, and my quality of life. There may also be ways to restore some upper extremity function. I’ve never been more hopeful.

Not hard to imagine that spinal cord stimulation could be great for you.
Absolutely. I don’t want to get overly clinical here but sometimes my morning routines can take three hours and I can go for days with severe G.I. issues due to having a neurogenic bowel that I’ve dealt with for over 30 years. We all do our best to minimize our personal challenges, but mine seem to be becoming more and more challenging as the years go on. The health outcomes for those individuals who have been implanted with the epidural stimulator are life-changing, and life-extending. If I ever have the opportunity to become a candidate and experience the same type of benefits, it would have a freeing effect on my life. To recapture a balance that at times seems to be lost, that would be amazing.

Well happy birthday, Henry.
Thanks. It’s so satisfying to be a part of this cause, to feel we’ve really made a difference. There’s a lot of excitement in the work we are doing, and so much more ahead. — Sam Maddox