It’s easy to picture Matt Courson in front of a crowd, his voice strong, his smile bright, spreading a message of determination and hope. But what’s not apparent at first are the many obstacles he’s already overcome at such a young age.

Matt is his message, in every sense.

One April evening four years ago, Matt climbed on his four-wheeler for a short trip to visit a friend. He never made it. He can’t remember much about the ride, but he knows he went over a 20-foot embankment. When he came to after the crash, he couldn’t move.

Matt Courson: Never Giving In, Never Giving Up

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you can join us for this year’s event, which, once again, will be held at Boordy’s Vineyard on **Saturday, September 25.**

**Save the date!**

We continue to seek new and innovative ways to promote ABRT, including our recently acquired sailing simulator, a welcome enhancement to our treatment program that will be fully integrated this year. This program will ultimately provide more individuals with disabilities with an effective transition to real aquatic sailing in conjunction with Baltimore’s downtown adaptive sailing club.

I have initiated a series of discussions and action items at the federal congressional level and with Centers for Medicare and Medicaid Services (CMS) on the benefits of functional electrical stimulation (FES) and the need to provide reimbursement for critical FES equipment necessary for efficient home-based ABRT programs. FES is key to functional recovery, and our data prove this. The practical benefits of FES (i.e., decreased spasticity, increased muscle mass, etc.) are well documented. Our recently published article in *Experimental Neurology* pushes beyond traditional boundaries to provide the first evidence that FES can promote central nervous system repair following injury.

These are very exciting times, and I am so grateful to everyone for their hard work, commitment, and support. Let’s continue to make great strides in 2010 and beyond!

John McDonald
Director
International Center for Spinal Cord Injury
Kennedy Krieger Institute

"One of the most important things about the spinal cord program at Kennedy is its philosophy." — Mother of a patient

**Stem Cell Initiatives Aim to Advance Spinal Cord Therapies**

The Hugo W. Moser Research Institute at Kennedy Krieger has developed the Neural Transplantation Team (NTT) project to focus on creating a stem cell-based therapy for spinal cord injury. The NTT project takes cell therapy for spinal cord injury to the next level. Instead of embryonic stem cells, we use a new technique, called induced pluripotency, to create cells that are virtually identical to embryonic stem cells from a safe and routine skin biopsy. These stem cells, called iPS cells, are an immunological match to the biopsy donor, avoiding the chronic use of immunosuppressive drugs and other risks of using tissues from other individuals. Instead of a human clinical trial, the NTT project plans to evaluate the effectiveness and safety of Oligodendrocyte Precursor Cells (OPCs) created from iPS cells in nonhuman subjects with mild chronic spinal cord injury. We have performed many biopsies and obtained skin cell lines from individual subjects. Currently, we are creating iPS cells...
“I laid out there all night calling for help,” Matt says. It was only the next morning that a fireman found him and took him to the hospital. His jaw was broken in two places, his back bone was shattered. He underwent an eight-hour surgery to repair the damage to his spine.

In a matter of moments, Matt’s life had turned upside down. Doctors gave his injury a classification of ASIA A complete, meaning he would essentially never recover any activity below his spinal cord injury. Walking was out of the question.

“I would be sitting in my chair, watching other people as they got up and walked and wonder how you would do it,” he says.

But Matt was determined not to let his injury get the best of him. Even when he lay immobile in a hospital bed, the first thing he told his dad was, “I am not going to let this injury beat me. I am going to make a difference.”

In 2007, more than a year after his injury, Matt arrived at the International Center for Spinal Cord Injury (ICSCI) at Kennedy Krieger Institute to work with specialists whom he calls “some of the most knowledgeable spinal cord injury doctors in the world.”

What makes the center different is its commitment to its philosophy that, with the right combination of therapies, recovery is possible months or years after an injury. The center’s activity based restorative therapy (ABRT) uses techniques that show great promise in helping individuals with chronic spinal cord injuries recover sensation, movement, and independence.

While he was at Kennedy Krieger, Matt’s therapy included gait training and daily sessions on a bike that employs functional electronic stimulation (FES). With FES, a computer sends electrical messages telling a person’s legs to contract and relax, just as the brain normally would.

When Matt left the Institute, he was reevaluated as an ASIA C incomplete injury, giving him greater hope of recovery—he was even able to walk 300 feet using leg braces and a walker. His therapists taught him how to continue his therapies at home, and now he can stand up by himself for a short time.

Looking back, Matt says he knew right away that Kennedy Krieger was different.

“The first day I knew there was hope. There are a lot of heroes here,” says Matt. “The therapists went the extra mile to do everything they could to help me get back on my feet.” — Matt Courson

“My goal now is to help others,” he says. “My injury just happens to be a spinal cord injury, but everyone goes through something like this in life.”

For more information on Matt Courson and other success stories, visit www.spinalcordrecovery.org.
“In three months here, she improved more than she did in an entire year at her previous rehabilitation center.” — Mother ICSCI patient Lily Wilkinson

Department of Defense Contract

The International Center for Spinal Cord Injury (ICSCI) completed the first year of a contract awarded by the Department of Defense to perform research and training on the role of neural activity in recovery from spinal cord injury. The contract, *Advanced Restoration Therapies in Spinal Cord Injury*, is led by principle investigator Dr. John McDonald, and addresses the problem of spinal cord injury (SCI) from both clinical and basic science perspectives. The awarding of this contract reflects the comprehensive nature of our mission as a department and shows the commitment by the defense department to provide the most up-to-date care for injured soldiers and veterans.

Under the contract, Dr. Cristina Sadowsky leads a project aimed at measuring the effectiveness of activity based restorative therapy (ABRT), including functional electrical stimulation (FES), applied to arms and shoulders of patients recovering from SCI. Dr. Visar Belegu is using advanced MRI techniques to investigate how the structure of the injured cord correlates with function in the injured individual.

Drs. Devin Gary and Andres Hurtado lead the basic science research efforts focused on understanding how ABRT and FES work at a cellular and tissue level, and how neural activity influences regeneration of the injured nervous system. This basic science research is crucial for developing future clinical treatments and interventions aimed at improving recovery from paralysis.

Ms. Karen Good, Drs. Larry Schramm, and Albert Recio developed a two-day training program outlining the principles and practices of ABRT for rehabilitation professionals at military and Veterans Administration medical centers across the country. The goal is to allow our successful therapeutic approach to be implemented widely in military hospitals to help injured soldiers and veterans. The first workshop was held in September 2009 at Kennedy Krieger and included participants from Walter Reed Army Medical Center, Bethesda National Naval Hospital, and the VA Hospital Center in Pittsburgh, Pa.
ICSCI Faculty Publications

“Poststroke subgranular and rostral subventricular zone proliferation in a mouse model of neonatal stroke.” Kadam SD, Mulholland JD, McDonald JW, Comi AM. J Neurosci Res. 2009 Sep;87(12):2653-66. PMID: 19396874


Nearly 200 friends of the International Center for Spinal Cord Injury sipped wine and socialized at our second year “Stompin’ for the Cord” at Boordy Vineyards. Guests enjoyed entertainment from the Lonesome River Band, and many took home some extraordinary auction items. Bidding was intense at times, but at the end of the evening everyone was a winner, including Dr. McDonald, who took home a vintage 1929 slot machine.

In addition to Scott Donohoo, who served as our local celebrity auctioneer, a featured highlight of the evening was the ICSCI first-edition cookbook. The book is filled with favorite recipes from Kennedy Krieger staff, patients, friends, and supporters. The cover features photographs of our therapists and doctors, all of whom make a difference every day in the lives of the patients who come to our facility.

More than $70,000 was raised for spinal cord research, thanks to the generous support of our patients, friends, and community. The money raised allows us to help the many people living with paralysis by advancing research and providing access to the best care and a world-class rehabilitative therapy program.

**Save the Date**

**3rd Annual - Stompin’ For The Cord**

*When:* Saturday, September 25, 2010

*Where:* Boordy Vineyards

For ticket information contact Vickie Rosellini at 443-592-6142 or vickierose@hughes.net.
from these nonhuman subjects. We are also working to perfect and improve methods to generate OPCs from iPS cells.

The project advanced further in 2009, when the FDA approved a clinical safety trial of an embryonic stem cell-based therapy for spinal cord injury. This trial, funded by Geron Corporation, plans to use the human embryonic stem cell line H1 to create OPCs and to transplant these cells near and within the injury site. Only patients with acute injury are included in this first trial. Recently, this trial was placed on clinical hold by the FDA, pending the agency's review of new nonclinical animal study data submitted by Geron.

We are optimistic that this clinical trial will restart, and we look forward to news of the first results. The NTT project has always been a patient-funded enterprise. This ensures that techniques and results can be shared openly and that we can focus on science that directly relates to developing treatments. With your continued support we will strive to continue this tradition.

Stem Cell Initiatives Aim to Advance Spinal Cord Therapies

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Working 2 Walk (W2W)

In August 2009, spinal cord injury scientists, practitioners, and consumers from across the country came together in Chicago for an impressive W2W meeting hosted by Unite 2 Fight Paralysis. The meeting included a variety of programs that allowed for the exchange of powerful ideas and dissemination of a broad array of information around research, rehabilitation, and advocacy.

Baltimore was well represented by our own Dr. John McDonald and Dr. Douglas Kerr from The Johns Hopkins Hospital. They both contributed to discussions on the latest updates on paralysis research and state-of-the-art treatments for functional restoration. Dr. McDonald’s remarks focused on activity based restorative therapy (ABRT) and the goal of increasing neurological activity with physiological work.

Dr. Kerr used a portion of his presentation to discuss a neurobiological change that occurred in a group of secondary progressive multiple sclerosis patients who incorporated the functional electronic stimulation (FES) bike into their therapy. He commented that the positive outcomes of the FES were some of the best he’s seen to date.

Dr. Wise Young of Rutgers University gave an impressive overview of the stem cell research underway in China. He mentioned the financial concerns burdening all SCI clinical trials and researchers. Financial support and scientific collaboration are imperative to increasing momentum, said Dr. Young.

Susan Maus, Marilyn Smith, and Donna Sullivan facilitated the “Day at the Races,” sponsored by the Sam Schmidt Paralysis Foundation at the Chicagoland Speedway. Attendees and speakers enjoyed a special vantage point and access to drivers at the race track.

Unite 2 Fight Paralysis is a volunteer, community-based advocacy organization dedicated to curative therapies.
Transitioning today’s science to near-term therapeutic applications, we focus on developing and applying advanced restoration strategies for optimizing spontaneous recovery in those living with paralysis.

“My continued recovery is a miracle in and of itself. More important than my own improvement is the knowledge that my recovery may help someone else.” — Santa Wallace, ICSCI patient

**INTERNATIONAL CENTER FOR SPINAL CORD INJURY PARTICIPATES IN 2009 WORLD STEM CELL SUMMIT**

Representatives from the International Center for Spinal Cord Injury (ICSCI) took part in the 2009 World Stem Cell Summit held in Baltimore, Maryland. ICSCI joined more than 1,200 of the world’s most influential stem cell stakeholders. Dr. John McDonald, director of ICSCI, and Josh Basile, a spinal cord injury patient at Kennedy Krieger, spoke on recent stem cell progress surrounding spinal cord injury (SCI). Dr. McDonald focused on embryonic stem cell transplantation in the injured spinal cord and also discussed spontaneous spinal cord repair and recovery, as well as using endogenous stem cells for repair through activity based restoration therapy (ABRT) strategies and based on principles of brain activity.

Mr. Basile spoke from the patient perspective, addressing the importance of advocacy and the role patients play in motivating scientists and policymakers toward future cures. He hoped to inspire attendees to influence the direction of this potentially life-changing research. Other panelists included Peter Kiernan from the Christopher & Dana Reeve Foundation, Dr. Wise Young from Rutgers University, and Jane Lebkowski from Geron biopharmaceutical company. The panel was moderated by Thomas Scalea from the University of Maryland School of Medicine.