



DYSTONIA
MEDICAL
RESEARCH
FOUNDATION

Dystonia Dialogue

NEWSLETTER OF THE DYSTONIA MEDICAL RESEARCH FOUNDATION

Spring 2018 | Volume 41 • No. 1

MOVING TOWARD A CURE

4

Runners
Compete to
Honor Dystonia
Community

6-7

Musician's
Dystonia &
Research
Fellowship Award
Announcements

14

Dystonia is
More than a
Movement
Disorder



Inside this Issue

4 Runners Compete to Honor Dystonia Community Team DMRF at TCS New York City Marathon Raises Awareness

6 DMRF Announces Investigations into Novel Therapies for Musicians

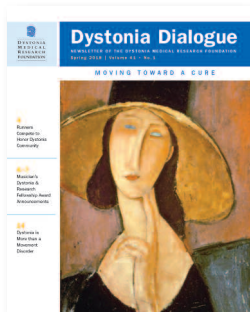
James C. Kilik Research Awards Fund Groundbreaking Studies

7 Research Fellowship Announcements Postdoctoral Awards Support Outstanding Young Investigators

14 "It Stacks on Our Shoulders like Bricks" Burden of Dystonia is More than a Movement Disorder

18 Personal Profile Meet Lydia Guerrero

On the Cover:



Depictions resembling dystonia are found throughout early and modern art, including this portrait by Amedeo Modigliani (1884–1920) which immediately brings to mind the head position and hand-to-chin sensory trick characteristic of cervical dystonia. A portrait from 1893 by Stanisław Wyspiański (left) appears to capture a dystonic arm posture in a young girl. Figures with dystonic postures can be found in ancient and indigenous art across cultures.



The Dystonia Medical Research Foundation (DMRF) is committed to making dystonia a thing of the past, while attending to the needs of individuals and families today.

Images reprinted from Journal of the Neurological Sciences, Volume 356, Issue 1, 49–54, Garcia-Ruiz, Pedro J. et al. Art and dystonia, 2015, with permission from Elsevier.

The *Dystonia Dialogue* is the magazine of the Dystonia Medical Research Foundation (DMRF). It is published three times a year to provide information to individuals affected by dystonia, family members, and supporters of the DMRF.

The Dystonia Medical Research Foundation (DMRF) is a non-profit, 501c(3) organization founded in 1976. The mission is to advance research for more effective treatments and a cure, to promote awareness and education, and to support the well being of affected individuals and families.

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The *Dystonia Dialogue* reports on developments in dystonia research and treatments but does not endorse or recommend any of the therapies discussed. Individuals are urged to consult a physician with questions and concerns about their symptoms and care.

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Foundation Update



Art Kessler
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Janet L. Hieshetter
Executive Director

We are passionate about dystonia research because we know it will lead us toward better treatments and a cure. Expanding the dystonia research field will accelerate progress, and this requires a sophisticated mix of approaches. The DMRF research strategy is not only to invest in research studies but to invest in the people doing the work. The results have been outstanding. The impact of a single research project is never limited only to the hypotheses tested or conclusions reached. DMRF investigators provide more than just data at the end of a project. They work tirelessly to build upon each new discovery and create opportunities to advance the field.

Many of the world's dystonia experts cite support from the DMRF early in their careers as the reason they chose to pursue dystonia research. DMRF-funded scientists have tested therapies, discovered dystonia-causing genes, clarified the origins of dystonia in the brain, created tools to help dystonia investigators design new experiments, and even defined what dystonia is (and is not). As senior investigators, DMRF grant recipients have passed the torch of dystonia research to the young scientists they train. Many join the DMRF's Medical & Scientific Advisory Council to volunteer their time and expertise toward helping DMRF achieve our science goals. DMRF-funded scientists are often clinicians who diagnose and treat countless dystonia patients—typically after years of misdiagnosis. Our investigators promote public awareness and advocate for federal funding side-by-side with patients on Capitol Hill. Some have literally run marathons and climbed mountains to bring greater public awareness to dystonia and highlight how dystonia affects the lives of their patients.

The DMRF is honored to work with these tireless researchers and support them in their quest to better understand and cure dystonia. We are proud to share with our readers the progress they are making. See pages 6–7 to learn about new research projects focused on musician's dystonia as well as newly funded research fellowships for young investigators. Learn more about the expansive impact of DMRF research funding on pages 10–11.

The reason DMRF is able to continue our important work is because of members like you. The value of your support far exceeds any dollar amount. By joining DMRF you are fueling a worldwide effort to find a cure. Thank you for renewing your DMRF membership today and helping to create a better life for all people with dystonia and their loved ones.

Sincerely,

A blue ink cursive signature of Art Kessler.

Art Kessler
President

A blue ink cursive signature of Janet L. Hieshetter.

Janet L. Hieshetter
Executive Director

Runners Compete to Honor Dystonia Community

Team DMRF at TCS New York City Marathon Raises Awareness & Research Funds

In honor of those struggling with dystonia, Team DMRF has competed in the world famous TCS New York City Marathon since 2013—literally running for those who can't.

This past November, Team DMRF included Pat Brogan and Dr. Rita Aidoo. Carrie Siu-Butt and Larry Dubill were forced to withdraw from the race due to injury but have their sights on making it to the starting line on November 4, 2018.

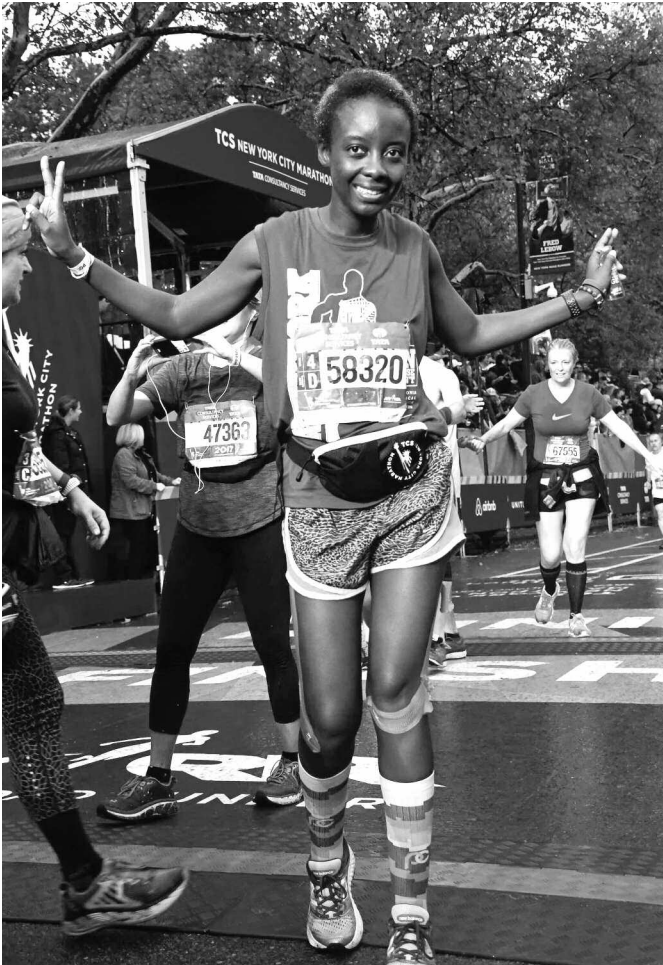
"This is probably going to sound really weird," says Pat Brogan, for whom the TCS New York City Marathon was one of four

races he completed last fall. "Running with dystonia is extremely painful to start with—for like the first couple miles. It's horrible. But then something happens. I think the rhythm and being tired and moving your body, it just takes your brain in a different direction so the symptoms aren't as bad. And that's pretty cool. The down side is that afterwards you suffer a little bit, and you have to put yourself back together. But anybody who deals with chronic pain and dystonia knows that little reprieve from the symptoms is paradise."

Pat was training for a triathlon on his bike in 2001 when he was struck by a vehicle. The hit-and-run collision ultimately triggered the onset of cervical dystonia, causing excruciating muscle spasms in his neck. He has since endured multiple brain surgeries, survived dangerous infections, and has dedicated his life to advocating on behalf of the dystonia community. His experience was documented in the 2006 independent film, *Twisted*. Over the years, Pat and his supporters have raised over \$180,000 to support the DMRF mission.

Pat was easy to spot on race day in his "Run For Those Who Can't" singlet and bouncing a tennis ball, a sensory trick that helps control his running gait and balance.

"I had never done a marathon before. It felt good to show people that you can accomplish a lot, not just with dystonia but that even at 50 you can start your marathon career," he says with a laugh. "I've lost so much, and then you get it back, and then you lose it again. I have been on this rollercoaster with brain infections, dystonia, setbacks, and having to re-invent yourself, learning how to run again, so many different things. I want to do the things that make me happy and feel good, and being an athlete is really high on that list."



"I wanted to run for DMRF because it would give me the opportunity to educate people about dystonia." – Rita Aidoo, DO, MPH

Rita Aidoo, DO, MPH is a physician specializing in family medicine and obstetrics. She was introduced to dystonia as part of her neurology training. "The patient population was very different," she observed. "They had these great attitudes, amazing spirits, and that really stuck with me because prior to that most of the people I have encountered with debilitating diseases were mostly depressed." Last year, one of her patients was diagnosed with dystonia after 20 years of believing he had Parkinson's disease. "This drove home the need for research and funding," she says. That week Dr. Aidoo contacted the DMRF about running the New York City Marathon to help advance awareness.

Slots remain available for Team DMRF at the 2018 TCS New York City Marathon. For more information, contact the DMRF at dystonia@dystonia-foundation.org or 312-755-0198.



"I don't want to sit back and let dystonia take over. If I feel good, I'm going to go as hard as I can. And if I don't feel good, then I won't." – Pat Brogan

Get Social

Check Out DMRF Online Forums

Connect with others in the dystonia community via the internet:

Cervical Dystonia Support Forum

facebook.com/groups/dmrf.cervical/

Moderators: Denise Gaskell & Tom Seaman

Oromandibular, Blepharospasm & Cranial Dystonia Support Forum

facebook.com/groups/OMDBleph/

Generalized Dystonia Support Forum

facebook.com/groups/dmrf.gen/

Moderator: Paula Schneider

20/30 Dystonia Group - A Forum for People in Their 20s and 30s

facebook.com/groups/2030dmrf/

Moderators: Ginny Bryan, Chelsi Christman & Marcie Povitsky

Support4Parents of Children with Dystonia

facebook.com/groups/support4parents.dmrf/

Moderators: Carol-Ann Peralta & Dena Sherry

Parenting with Dystonia Support Forum

facebook.com/groups/dmrf.parenting/

Moderator: Jenelle Dörner

Dystonia Spouses & Loved Ones

facebook.com/groups/dmrf.lovedones/

DBSforDystonia Yahoo Group

health.groups.yahoo.com/group/DBSforDystonia/

DBSforDystonia/

Moderator: Dee Linde

Online Dystonia Bulletin Boards

dystonia-bb.org/

Moderators: Bob Campbell, Jeff Harris & Linda Walking Woman

For a complete list of DMRF's online social forums, visit: dystonia-foundation.org/online

Your Voice Matters, Your Story Matters

Dystonia Advocacy Day is March 19–20, 2018



Anneliese (far left) and Jason Ornelis pictured at Advocacy Day with fellow Douglas Kramer Young Advocate Award recipient Chelsi Christman (2nd from left) and Hannah Stanley.

“You’re surrounded by understanding, loving, caring people who are on this dystonia journey with you and want to make change,” explains Anneliese Ornelis. She and husband Jason Ornelis, who has cervical dystonia, participate annually in Dystonia Advocacy Day in Washington, DC. “I advocate and spread awareness for dystonia in my everyday life, but walking around the Capitol alongside others from the dystonia community feels powerful and meaningful. It’s like a reunion with family, and then going on an advocacy mission together.”

Dystonia advocates from across the country are convening on Capitol Hill for **Dystonia Advocacy Day, March 19–20**, to participate in legislative training and meetings in Congressional offices to educate legislators about dystonia



**Dystonia
Advocacy Network**

**DMRF is proud to provide
staff support for the DAN.
Member organizations include:**

**Benign Essential Blepharospasm
Research Foundation (BEBRF)**

**Dystonia Medical Research
Foundation (DMRF)**

**National Spasmodic
Dysphonia Association (NSDA)**

**National Spasmodic
Torticollis Association (NSTA)**

and issues that affect the dystonia community. “I look forward to Advocacy Day all year,” says Jason. “The DMRF is very supportive and prepares you really well. Because we live with dystonia we’re the best ones to be there, in person, sharing our stories. After the first meeting you are exhilarated and excited to do it again.”

The Dystonia Advocacy Network (DAN) is a grassroots organization that brings people together to speak out with a unified, powerful voice on legislative and public policy issues relevant to dystonia. The DAN continuously works to develop and advance a legislative agenda that raises awareness, educates policymakers, addresses patient care issues, and moves research forward.

Dystonia advocates work year round to develop relationships with legislative leaders and help them understand the challenges of those living with dystonia. “Whether it be an email, phone call, or participating in Advocacy Day, it adds up and can affect policy decisions that affect us all,” says Jason.

Individuals with all types of dystonia as well as family and friends are encouraged to get involved. “I had not expected that people wanted to hear from me, too, even though I myself don’t have dystonia,” says Anneliese. “People genuinely want to hear my story from the spouse point of view. Before, I solely concentrated on sharing how dystonia affected my husband.”

Jason and Anneliese are each Douglas Kramer Young Advocate Award recipients. The couple has organized dystonia awareness races and promote awareness on social media.

Taking Action

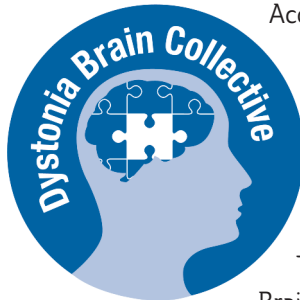
Traveling to Washington, DC for Dystonia Advocacy Day is just one way to make a difference. By becoming a legislative advocate, you can have a powerful effect on the laws and policies that affect the dystonia community even by acting from home.

To get started:

- Visit dystonia-advocacy.org/agenda to read a summary of the dystonia community's legislative agenda.
- Sign up to receive DAN legislative alerts via email at: dystonia-advocacy.org/contact
- When you receive a DAN legislative alert, respond promptly by calling or sending an email to your legislators. The DAN makes it easy. Every legislative alert includes simple instructions to take action.

For more information on the DAN and becoming a dystonia advocate, contact the DMRF at dystonia@dystonia-foundation.org or 312-755-0198.

Contribute to Research by Registering as a Brain Donor



Access to brain tissue samples is a valuable resource that dystonia investigators value deeply in the pursuit of a cure. Registering in advance as a brain donor is a way to contribute to the field of dystonia that assists researchers working today and in the future.

The DMRF works in partnership with the Harvard Brain Tissue Resource Center (HBTRC) at McLean

Hospital in Belmont, Massachusetts to assist people interested in registering as brain donors. The HBTRC maintains a private collection of brain tissue from individuals with all forms of dystonia. The DMRF also serves as the administrative center for the Dystonia Brain Collective, a partnership among several dystonia patient groups to encourage and facilitate brain donation. Donated tissue is available to researchers for dystonia-related studies.

For more information on brain donation or to begin the registration process, visit dystonia-foundation.org/brain or contact the DMRF at 800-377-3978 or brainbank@dystonia-foundation.org.

About Brain Donation

- Brain donation does not alter the appearance of the donor or interfere with memorial services or remembrance practices.
- There is no cost to the donor or family.
- Brain donation does not violate the tenets of most religious or spiritual organizations.
- Donor information remains confidential. However donors must inform next of kin that they are registered to donate their brain.
- Donated brain tissue must be received at the HBTRC within 24 hours of the donor's death. HBTRC staff are on call 24 hours a day.
- Individuals have the right to withdraw from the program at any time.
- By combining brain donation with monetary support, you immeasurably multiply your assistance to the progress of dystonia research.

Find Your Nearest DMRF Support Group

Visit dystonia-foundation.org/supportgroups or call 312-755-0198

New Studies Explore Novel Therapies for Musicians

James C. Kilik Memorial Research Awards Fund Groundbreaking Science

The DMRF is funding two James C. Kilik Memorial Research Awards to investigate innovative treatment strategies for dystonia, the disorder that devastated the careers of high profile musicians such as legendary pianists Leon Fleisher and Gary Graffman, oboist Alex Klein, hip hop icon Darryl “DMC” McDaniels, and numerous others.

“It’s a new day dawning for anyone like me thanks to the late, wonderful clarinetist Jim Kilik,” says critically-acclaimed guitarist and DMRF Awareness Ambassador Billy McLaughlin. “Even for those who aren’t musicians, research looking at any of the dystonias—whether hand or embouchure or laryngeal dystonia—the research is going to play out over time, as we know it always does, and help find a cure for all types of dystonia.”

James Kilik played clarinet with the Delaware Symphony and was a faculty member at Settlement Music School and Widener University. He became active in the DMRF’s Musicians With Dystonia program after developing hand dystonia in 1995, including appearing in *Changing Keys*, an independent film about Billy McLaughlin’s battle to reclaim his career after developing dystonia. Kilik left the DMRF a generous bequest upon his death in 2015.

The following investigators earned James C. Kilik Memorial Research Awards:

Robert Chen, MA, MSc, MB BCH, MB BChir, University of Toronto

“Modulating the Functional Connectivity of the Cerebellum in Musician’s Dystonia”

Dr. Chen is using functional MRI to identify impaired connections between the cerebellum and parts of the brain that mediate movements



Jim Kilik’s generous bequest is funding important new research.



Video of DMRF Awareness Ambassador Billy McLaughlin speaking about musician’s dystonia research funding is available at youtube.com/FacesofDystonia

and cognition, and testing whether these connections can be normalized by non-invasive brain stimulation. This is the first study to look at functional brain connections in musicians with hand dystonia and the first to test the effects of cerebellar stimulation in musicians with dystonia.

Christine Kim, MD, Columbia University

“A Study to Identify Kinematic and Force Measures Capturing Impairment in Musician’s Dystonia among String Players and Improvement with Retraining Therapy”

Treatment for musician’s dystonia is challenging and typically includes physical therapy to ‘re-learn’ the movements required to perform. Retraining therapies have had some success among keyboard players, but not yet among string players. Dr. Kim seeks to better understand how the timing, motion, and force of finger movements is affected by dystonia in string players in order to design more effective retraining therapy.

For more information about DMRF’s science activities, visit dystonia-foundation.org/research. Interviews with dystonia investigators are available for viewing at youtube.com/FacesOfDystonia

About Musician's Dystonia

- Musician's dystonia is a task-specific, focal dystonia.
- Musician's dystonia is characterized by excessive, involuntary muscle movements and postures triggered by playing an instrument.
- Symptoms begin as a gradual, painless loss of dexterity and muscle control, often mistaken for faulty technique or lack of preparation.
- String and piano players develop involuntary movements in the fingers and hands; brass and woodwind musicians develop symptoms in the hands or embouchure.
- Over time, symptoms may spread to involve other movement tasks or previously unaffected parts of the body.
- Estimates suggest 1% of professional musicians are affected by dystonia, but rates vary by instrument.
- 20% of musicians with dystonia have a family member who is affected.
- Treatment may include oral medications, botulinum neurotoxin injections, and/or physical therapy.
- Sensorimotor re-training and non-invasive brain stimulation techniques are being explored as novel treatment options.

For more information, visit dystonia-foundation.org/musicians

Research Fellowship Announcements

The DMRF is committed to attracting bright, young investigators to dystonia research. Over the years, DMRF has created funding awards to support investigators at different stages in their scientific training. Postdoctoral fellowship awards recognize and support outstanding young scientists who have earned a doctoral degree and have embarked on a period of mentored research.

Postdoctoral research is a critical part of acquiring the professional skills needed to pursue a science career in dystonia, and these awards are part of DMRF's strategy to encourage new perspectives and a steady stream of fresh ideas to the field.

In 2018, DMRF is supporting post-doctoral fellows who are working to fundamentally improve our understanding of brain dysfunction and molecular mechanisms underlying dystonia.

Lilian Cruz, PhD
Massachusetts General Hospital
"CRISPR/Cas9 System Targeting Specific DYT1 Allele Mutation in Patient Induced Pluripotent Stem Cells (iPSCs): A Strategy for Phenotype Reversion in iPSCs-Derived Neurons"
Mentors: Xandra Breakefield, PhD & Cris Bragg, PhD

CRISPR-Cas9 is a unique technology that has attracted a great deal of attention in recent months. It enables researchers to edit DNA. Dr. Cruz is applying this technology in an attempt to repair neurons that are abnormal due to a dystonia-causing mutation in the

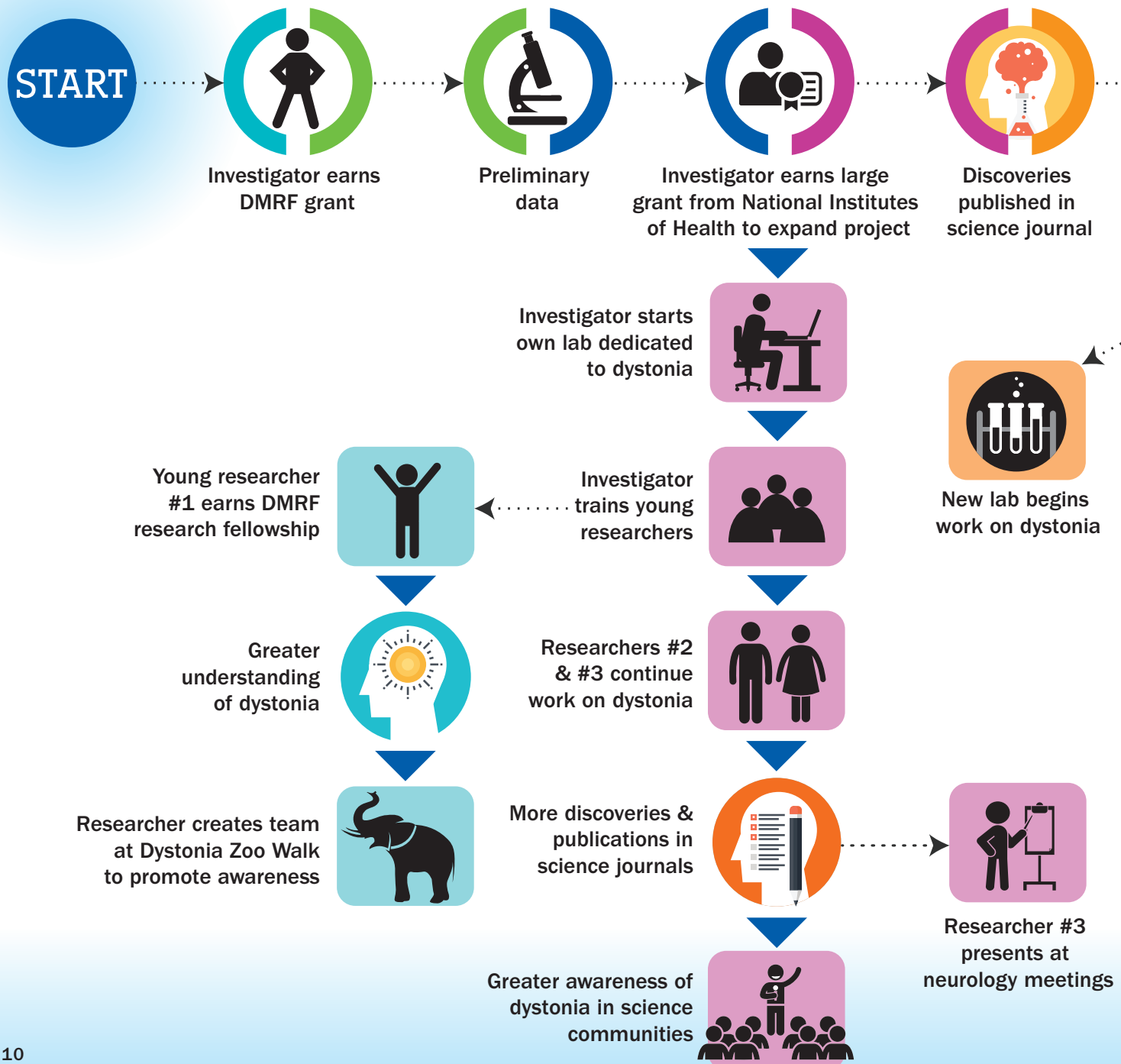
DYT1 gene. Her work will also study how the mutated torsinA protein encoded by the gene interferes with the functions of neurons; this may lead to uncovering new strategies to treat the disorder.

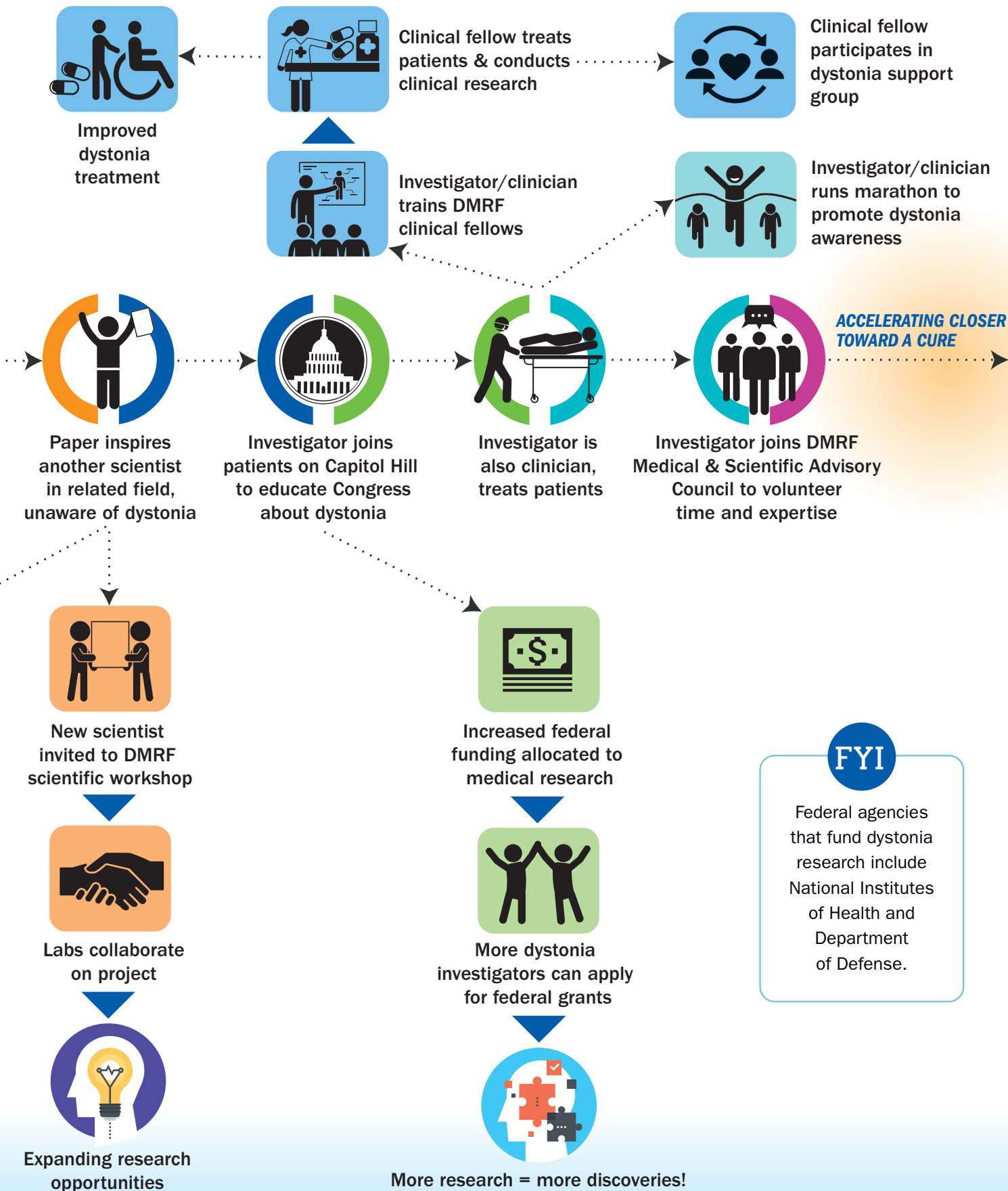
Maria Daniela Cîrnaru, PhD
Mount Sinai Beth Israel
"Role of the X-linked Dystonia Parkinsonism (XDP) Causative Gene TAF1 in the Striatal Development and Maintenance"
Mentor: Michelle Ehrlich, MD

X-linked dystonia parkinsonism (XDP) is an inherited and degenerative form of dystonia that affects men from Panay Island in the Philippines. Unlike other dystonias, XDP is characterized by extensive neuron loss in a brain region involved in movement control and reward. Dr. Cîrnaru hypothesizes that two genes, TAF1 and N-TAF1, control the expression of important factors that influence the health of these neurons. This project may enhance understanding of the role of TAF1 in the pathogenesis of XDP and accelerate the development of novel therapeutic strategies for XDP and other dystonias.

Impact of DMRF Funding

When you support DMRF science, a single grant award can lead to more than you might expect. The impact of a research grant is never limited only to the hypotheses tested or conclusions reached. That's why DMRF puts such a high priority on offering dystonia investigators the grant funding they need. DMRF investigators deliver more than their data; they often dedicate their careers to helping dystonia patients and expanding the dystonia research field.





Cervical Dystonia

Cervical dystonia is a focal dystonia that affects the head and neck. Cervical dystonia produces excessive muscle contractions in the neck. These muscle contractions cause involuntary, repetitive movements and awkward positions of the head, neck, and sometimes shoulders.

Cervical dystonia is sometimes referred to as spasmodic torticollis.

Cervical dystonia may cause:

- Neck to twist or tilt to the side
- Head to tip forward or back
- Shoulder to elevate toward the ear
- Neck to shift away from the midline of the body
- Tremor-like movements of the head
- Spasmodic jerking of the head

Additional features of cervical dystonia may include a hand tremor, depression, and anxiety.

Cervical dystonia is among the most common forms of dystonia seen in movement disorder clinics.

Cervical dystonia may occur sporadically or be caused by physical trauma, brain injury, certain medications, and additional secondary factors.

Movement symptoms are often partially relieved by a sensory trick such as gently touching the chin, face, or back of the head.

Up to 20% of individuals with cervical dystonia may experience a temporary remission, lasting from days to years. In fewer than 6% of cases, the dystonia spreads to other body areas.

Up to 25% of people with cervical dystonia have a family member with dystonia or tremor.



Treatment may include oral medications, botulinum neurotoxin injections, peripheral denervation surgery, deep brain stimulation, and physical therapy. Complementary therapies, for example occupational therapy and stress reduction practices, may be helpful for overall wellness.

Four brands of botulinum neurotoxin are approved by the Food & Drug Administration for use in cervical dystonia: Botox®, Dysport®, Xeomin®, Myobloc®.

Research is exploring numerous novel therapeutic targets for cervical dystonia.

A presentation about cervical dystonia by movement disorder specialist Cynthia Comella, MD of Rush University Medical Center is available for viewing at dystonia-foundation.org/CD

COPING TIPS

Members of the DMRF's Cervical Dystonia Support Forum on Facebook were asked to name their top coping tips. Below is a sampling of the responses. Join the group at facebook.com/groups/dmrf.cervical

- Connect with others who have cervical dystonia
- Meditation
- Physical therapy
- Positive attitude
- Reduce stress
- Heat packs
- Warm baths
- Laughter
- Educate yourself and stay informed
- Caring doctor
- Botulinum neurotoxin injections
- Oral medications
- Acceptance
- Learn your triggers and avoid them

People on the Move

The DMRF is extremely grateful for the grassroots volunteers across the country working to improve dystonia awareness and raise funds for medical research. Every volunteer makes a difference!

Students at Nutley High School in New Jersey dedicated the annual Powderpuff Football Game to dystonia awareness in memory of **Melissa Centrella**, the late daughter of past DMRF President **Claire Centrella**. Special thanks to English and special education teacher **Melissa Brady** for coordinating this effort.

Rochester Dystonia Support Group Leader **Carina Welch** partnered with **Pastor Devin Lyles** of The Pillar to host Game Night for Dystonia in November to raise awareness and funds to support DMRF.



Special thanks to **Pumped Up SUP** (Stand Up Paddleboard) for their campaign to raise dystonia awareness and research funds. Stand Up for a Dystonia Cure raised \$1,600 in less than a month by

holding a random drawing for an Earth River SUP Inflatable Paddleboard Package. Congratulations to winner **Linda Gromen**. Pumped Up SUP is owned by **Sandra Aresta** and **Michael Katz** whose child is affected by dystonia. Pumped Up SUP is also donating a portion of proceeds from sales of Earth River paddle boards for online

customers who use code DMRF200 at check out. Customers using this code will receive a \$100 discount on an Earth River SUP inflatable paddle board while supporting DMRF with a \$100 donation from the proceeds of the sale. Visit pumpedupsup.com/collections/earth-river-sup



The final meeting of 2017 for the **Dystonia Support & Advocacy Group of San Diego County** led by **Martha Murphy** celebrated the group's 30th anniversary!



The Fairfield, Connecticut Dystonia Support Group led by **Carol Smith** hosted a meeting featuring movement disorder neurologist **Dr. Sarah Buckingham** of Stamford Hospital.

Behind the Scenes Support

The DMRF wishes to acknowledge some of the dedicated sponsors and vendors that work behind the scenes to support the success of our events and campaigns.



X-Treme Apparel, headed by President Mark Daus, supplies thousands of t-shirts for a hectic schedule of DMRF Zoo Walks and community events.



Selffee edible photo booths print images directly onto food and beverages. They supported the Dystonia Bronx Zoo Walk by printing selfies on cookies at the event! Founded by Farsh Kanji and David Weiss.

"We got involved with DMRF because dystonia deserves more awareness, and much research is still being done on its etiology and treatment. It was a blast to bring smiles to guests at the Bronx Zoo Walk."

- Farsh Kanji, Co-Founder, Selffee



Kohl's Cares Associates in Action provide Zoo Walk volunteers.

“It Stacks on Our Shoulders like Bricks”

Burden of Dystonia is More than a Movement Disorder

Dystonia is a neurological disorder that affects the physical body, but the impact goes far deeper. The hallmark signs of dystonia are excessive, involuntary muscle contractions that cause abnormal postures and/or repetitive movements. Individuals diagnosed with dystonia also commonly experience symptoms that affect more than how the body moves.

“Besides the physical motor symptoms of dystonia, many patients suffer from psychological complaints, such as anxiety and depression, but also problems with cognition, pain, and sleep have been reported. It appears that the type of dystonia predicts which non-motor symptoms are most common. However, there is a lot of overlap,” Professor Marina AJ de Koning-Tijssen is a movement disorders specialist in the Department of Neurology, University Medical Centre Groningen (Netherlands) and DMRF research grant recipient. Much of her work is devoted to better understanding non-motor features associated with dystonia. She explains: “Research showed that non-motor symptoms are an important burden for many patients with dystonia. Some studies showed that the non-motor symptoms even had a bigger influence on quality of life than the dystonic symptoms.”

Movement disorder neurologists are increasingly recommending that addressing these non-motor aspects of dystonia is essential for helping patients feel and function as well as possible. A team of specialists may be needed to implement a complete treatment plan.

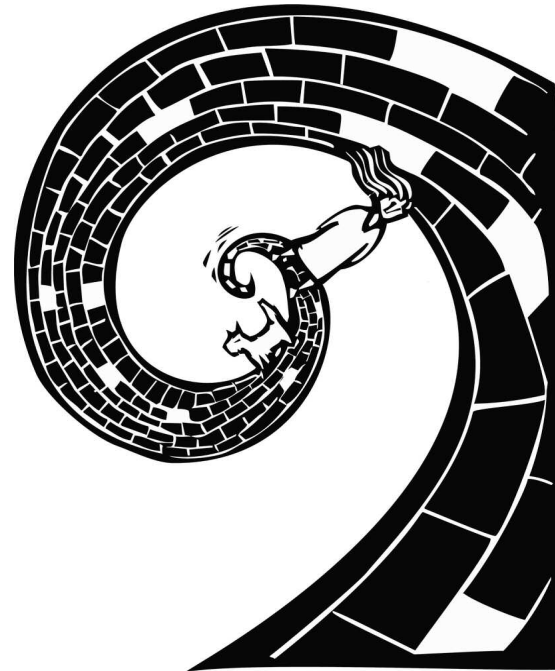
MENTAL HEALTH

The human brain is staggeringly complex: structures and pathways associated with movement are also involved in cognition, emotion, memory, and other mental functions. Research has demonstrated that individuals with dystonia are prone to certain mental health disorders.

“Whether these symptoms are part of the dystonia syndrome or are a consequence of living with dystonia is not totally clarified yet,” elaborates Dr. de Koning-Tijssen. “Nevertheless, researchers have found some clues that it is more likely that the non-motor symptoms are part of the dystonia syndrome.”

○ Depression & Anxiety

Individuals with dystonia are more likely to experience anxiety and depression than the general population, and at higher rates than individuals with other chronic disorders. Studies have shown that as many as 70% of focal and generalized dystonia patients will experience depression and/or anxiety over their lifetime. For individuals with cervical dystonia, this number may be as high as 90%. By comparison, 35% of people



in the general population will experience depressive and/or anxiety disorders at some point in their lives.

Patterns of psychiatric manifestations may vary depending on the type of dystonia. Individuals with cervical dystonia or dopa-responsive dystonia appear prone to both major depressive disorder and anxiety disorders. Anxiety disorders are especially prevalent in dystonia-affected musicians. Rates of depression are high among individuals with blepharospasm. By contrast, there may be little or no increased risk for depression and anxiety associated with spasmodic dysphonia/laryngeal dystonia compared to the general population.

It would seem intuitive that individuals with the most severe dystonia symptoms are more susceptible to depression

“Having dystonia, or any disability or chronic condition, isn’t just about the symptoms. People tend to forget they are a whole person with anger and frustrations, guilt, depression, and it builds up. We aren’t just a product of a sudden condition.

“Therapy helped me learn to process what I was feeling both mentally and physically—it made me pay attention to what I was hanging on to, what was good around me, what to not waste my energy on, what to finally let go. I had to sort out the person I was before dystonia, and now with it. And it’s helped.

“Our emotional state can affect our symptoms. We clench our necks, tighten our scalps when we cry, we curl our bodies inward. It stacks on our shoulders like bricks. We carry everything with us.”

*~Michaela Whitney,
DMRF Member*

and anxiety. In a study of mental health disorders among individuals with spasmodic dysphonia, severe voice impairment did seem to predict higher rates of depression and anxiety. Similarly, pain is highly correlated with depression in dystonia. But ironically, multiple studies have shown that the severity of dystonia is not a dominant influence on mental health. “In some types of dystonia the psychological complaints have no association with the severity of the dystonic motor symptoms,” says Dr. de Koning-Tijssen. “Therefore, it is unlikely that the psychological symptoms are a consequence of living with the difficulties of dystonia.”

Regardless of the severity of dystonia symptoms, the presence of depression and/or anxiety is among the most significant predictors of diminished quality of life. Because untreated mental health disorders can have serious and lasting health consequences, several research groups have recommended more routine evaluation of individuals diagnosed with dystonia for co-existing mood and anxiety disorders.

○ **Social Anxiety**

Social anxiety is the most common anxiety disorder among individuals with dystonia. One study showed that 50% of patients with cervical dystonia experience social anxiety, seemingly rooted in low self-esteem due to negative body image and not necessarily correlated to severity of dystonia symptoms.

○ **Alcoholism**

Myoclonus-dystonia is a risk factor for alcoholism, and individuals with cervical dystonia and isolated (primary) generalized dystonias may also be prone. Alcohol abuse in myoclonus-dystonia may be linked to obsessive-compulsive

disorder, a non-motor feature that appears uniquely common among individuals with this particular diagnosis but not dystonia more generally.

○ **Cognition**

“Problems with cognition are usually mild and have been reported in patients with inherited young onset dystonia and myoclonus-dystonia,” says Dr. de Koning-Tijssen. The source of cognitive changes can be challenging to assess, and research continues to explore this. Medications used to treat dystonia can cause cognition problems, especially affecting memory. Mood disorders can cause changes in executive functioning and ability to self-regulate. Disabling dystonia symptoms may make it difficult to concentrate, leading to attention deficits.

Several lines of evidence suggest mental health disorders are part of the underlying neurology of dystonia, not secondary to the dystonia or simply a coincidence. For example:

- Depression and anxiety often occur prior to the onset of dystonia.
- There may be no correlation between the severity of a person’s dystonia and psychiatric symptoms.
- Increased depression is seen in both asymptomatic DYT1 gene carriers and those with dystonia symptoms.
- Reduction in dystonia severity often does not alleviate depression or anxiety.

Furthermore, neurotransmitters associated with dystonia also have roles in psychological processes:

Continued on page 16

“Mention all symptoms connected to the dystonia to your neurologist, but especially depressive symptoms and anxiety are common—and important to address. Also sleep problems, fatigue, problems with alcohol consumption, and obsessions can be related to the dystonia.”

~ Professor Marina AJ de Koning-Tijssen, Department of Neurology, University Medical Centre Groningen

“Some researchers suggest that the non-motor symptoms result from an altered metabolism of signaling substances in specific regions in the brain. Two of those substances are dopamine and serotonin. Especially serotonin is known to play a role in psychological complaints but also in sleep.” Dr. de Koning-Tijssen recently earned a research contract through the DMRF’s Myoclonus-Dystonia Research Program to examine the role of serotonin in dystonia. Elze Timmers, PhD is integrally involved in the project.

Researchers acknowledge the complex interplay between a person’s movements, behaviors, and emotions. Dystonia is a formative experience; the impact can be life-changing. People naturally have an individual emotional and mental reaction to their circumstances. In some cases, it does appear that controlling dystonia motor symptoms has a positive effect on mental health. For example, a study in volunteers with cervical dystonia revealed decreased severity of depression with successful botulinum neurotoxin therapy.

“The main role for the neurologist is to recognize the non-motor symptoms. Then, adequate treatment can be started,” explains Dr. de Koning-Tijssen. “Treatment may be initiated by a neurologist, but most often this will be done by mental healthcare professionals with specific expertise in these areas.”

SLEEP

Problems with sleep are among the most common and problematic non-motor symptoms associated with dystonia. Although there is little evidence that dystonia causes daytime drowsiness, several studies do suggest dystonia interferes with the ability to sleep well. Fatigue is common and can be debilitating. Sleep disturbances occur even in cases when the dystonia symptoms are reduced or absent during sleep, and in cases where the dystonia is well-controlled with treatment.

In a study of blepharospasm and oromandibular dystonia patients, the more severe the dystonia, the greater the sleep disturbance. Interestingly, in a study of focal and generalized dystonia patients, trouble sleeping did not appear to correlate to severity of motor symptoms.

Abnormal brain plasticity during sleep may be implicated in the development of movement disorders, particularly dystonia and Parkinson’s disease. Plasticity is the brain’s ability to adapt and change over time, and sleep may have a role in reshaping brain processes involved in memory and learning. Dystonia has been linked to abnormal plasticity: learned movements that were once second nature—blinking, writing, walking—become abnormal. Researchers are beginning to explore the role of sleep in the brain’s learning processes, and how this may relate to the development of movement disorders.

PAIN

Not everyone with dystonia experiences pain, but depending on the type of dystonia, pain can be a pervasive and disabling symptom. Up to 76% of cervical dystonia patients have pain in the head, neck, and sometimes arm.

Pain can often be attributed to the repeated dystonic movements and abnormal postures. However, not all patients with similar symptoms experience the same degree of pain. This suggests the relationship between dystonia and pain may be more nuanced.

In many cases, alleviating the dystonia symptoms will reduce pain. For example, the sustained intense neck muscle contractions of cervical dystonia often cause muscle pain in the neck and shoulders as well as headache. The headache develops or worsens in relation to the cervical dystonia, and the location of the headache corresponds to the location of dystonic muscles. Alleviating the dystonic spasms can reduce both the muscle pain and secondary headache. However, people may experience pain that is more difficult to directly attribute to dystonia symptoms. Individuals with dystonic head tremor—a “no-no” or “yes-yes” shaking of the head—appear especially prone to headache, even if the tremor is mild, and the location of the headache is not clearly related to the muscle movement.

Researchers continue to explore the relationship between dystonia and pain. There may be neurological changes in how the body perceives and processes pain. Some research suggests that individuals with dystonia may have an altered threshold for pain, which has been measured even in body parts not affected by dystonia. Depression and sleep disturbance—which are common among dystonia patients—may worsen pain. Dystonia can also cause or worsen painful orthopedic conditions such as arthritis.

SENSORY FEATURES

The sensory nervous system is responsible for processing stimuli from the senses: sight, hearing, touch, taste, smell, and body awareness. “Research showed that the sensory function in the brain is altered in dystonia patients. However, the precise mechanism is not fully understood,” explains Dr. de Koning-Tijssen. Some of these sensory differences can be measured in the brain but not necessarily recognized by patients at a conscious level. For example, brain studies using neurophysiological techniques have shown that dystonia patients have trouble distinguishing certain types of visual and touch stimuli. However, some people do report sensory symptoms. For example, individuals with blepharospasm may experience light sensitivity. Sensory tricks, which are intentional movements or gestures that can temporarily reduce dystonia symptoms, are common and validate theories that dystonia is a disorder of how the nervous system integrates motor and sensory processes.

TREATING NON-MOTOR SYMPTOMS

Living well with dystonia requires more than addressing the physical movement symptoms. A team of healthcare professionals from multiple disciplines may be necessary, including a movement disorder neurologist, psychiatrist, clinical psychologist, and others depending on the needs of the individual. Appropriate complementary therapies may provide valuable underlying support to the treatment process.

In addition to the importance of individuals and families being mindful of non-motor symptoms associated with dystonia, “it is important that neurologists are aware of the existence of these non-motor symptoms,” says Dr. de Koning-Tijssen. “By doing additional research in order to understand more about the non-motor symptoms we hope to gain more attention for this important subject.”

Professor Marina AJ de Koning-Tijssen is head of the Movement Disorders section in the Department of Neurology, University Medical Centre Groningen, in the Netherlands. As a neurologist, she is an expert in hyperkinetic movement disorders including dystonia, myoclonus, hyperkplexia, tremor, tics, and functional jerks. After her Neurology training at Leiden University, with periods at the Johns Hopkins University in Baltimore and the Institute of Neurology and Neurosurgery, Queens Square, London, she started an internationally renowned movement disorders group, first in Amsterdam, and since 2012 at the University of Groningen. In 2016 the Groningen Expertise Centre for Rare Movements was established, officially part of the European Reference Network for Rare Neurological Diseases.

Anxiety

An anxiety disorder differs from simple worry in the following ways:

- It is more intense
- It is long-lasting
- It interferes with work, activities, or relationships

Social anxiety disorder is the fear of any situation where public scrutiny may occur, usually with the fear of embarrassment or humiliation.

Depression

Clinical depression includes at least one of these two symptoms, nearly every day, for more than two weeks:

- An unusually sad mood
- Loss of enjoyment and interest in activities that were once enjoyable

Additional symptoms of clinical depression can include:

- Lack of energy and tiredness
- Feeling worthless or feeling guilty
- Thinking about death or wishing to be dead
- Difficulty concentrating or making decisions
- Moving more slowly, or becoming agitated and unable to settle
- Sleeping difficulties, or sleeping too much
- Loss of interest in food, or eating too much; weight loss or weight gain

If you believe you may be experiencing symptoms of a mental health disorder, talk to your doctor about evaluation and treatment options.

PERSONAL PROFILE

Lydia Guerrero

Lydia is a communications and design professional who donated services to create a dystonia awareness video in support of the \$5Cure4Dystonia campaign (5dollarcure.com).

How did your symptoms start, and how were you diagnosed?

In my late teens I recognized a change in my voice. Sometimes I could talk clearly, but mostly my words would skip and I sounded like I was sick. When I was about 20 years old, I went to see a general doctor. He concluded that I should rest my vocal cords for two weeks and come back for a follow-up. I had to prepare everyone in my circle—family, work, school—that I would not be able to talk for the duration of the next two weeks. That in itself was an interesting experiment. At the follow up appointment, the doctor had about seven or eight interns and residents stand around to listen to me speak for the first time after two weeks. He said to count to 20. I did with a clear voice. He said to count again. This time my words skipped. He recommended speech therapy. So I came back a third time to see a speech therapist. With a few sessions, I was taught to relax my voice by taking a deep breath before speaking and was given relaxing tapes to listen to.

I don't remember a diagnosis from the doctors at that time—mind you, it was over 25 years ago. Though I do remember feeling like I was still in the dark. I concluded it was all in my head. I wasn't told that, but it seemed the only explanation. If the doctors don't know, I must be doing this to myself somehow. I didn't talk about it with anyone—no family members, friends, no one—I was sure I could work through it on my own.

Life got busy with having a family, raising kids, and working my own small businesses. Four years ago, while doing research on a different subject, I somehow came across a video of a group discussing their speech issues.



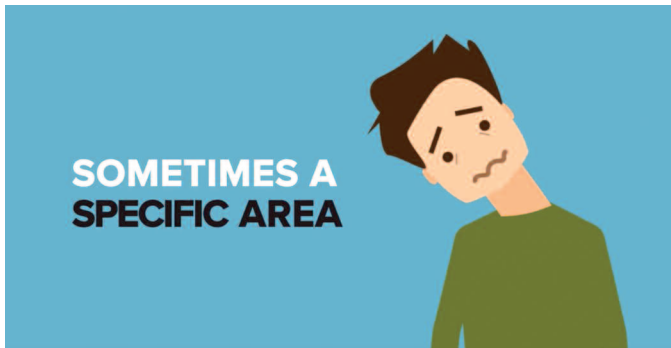
It took 25 years for Lydia's voice symptoms to be correctly diagnosed.

I remember sitting in front of my computer screen, crying, thinking that there are others out there like me. Thinking that I finally might have a chance at naming or “labeling” what I have been challenged with all these years.

I saw a specialist in early 2017. An otolaryngologist diagnosed me with spasmodic dysphonia. When he said what it was, I actually chuckled because I already had plenty of research on the matter and was just thankful to have a professional call it what it is.

How does spasmodic dysphonia affect you?

It affects me in so many ways. On a daily basis: Imagine typing up a letter to someone that you want to share your thoughts and experiences with. Or typing up an email for work. Now imagine the keyboard you're using is not working correctly. Sometimes it skips whole words, doesn't finish words, or all the words show up but letters are distorted. You want to get your thoughts across, but you don't have access to another keyboard and need to figure out how to do it. What are your choices? You either send the message as is—broken—in hopes that the receiver will be patient and fill in the blanks, or you don't send it at all because it doesn't represent you entirely. Now imagine this happening every single day and every single time you need to type something. With spasmodic dysphonia, every single time I want to say something, it's not certain how it will come out. Every day, I need to communicate with others and every day—in every conversation—I have challenges. The daily challenges are, one, not knowing if I can get the words out. Two, if I can get the words out, not knowing how they will sound. And three,



The animation Lydia created to promote \$5Cure4Dystonia can be viewed and shared at dystonia-foundation.org/5dollaracure

deciding in that moment if I should speak or just say nothing at all. It's frustrating and exhausting. There are times I am in a social situation and want to share my thoughts, I want to share in the conversation, and if I say a few words and it feels too strained, I may choose not to say anything. This happens many times.. I'll either spurt out a few things here and there to try to get part of my point across, or I will say nothing.

Work. What can I say here? Imagine trying to represent a client and needing to choose whether to send a broken message or none at all. Imagine trying to talk on the phone—a regular daily task—and struggling through every sentence. I can work, but the communication challenge is exhausting.

As a matter of fact, I decided to put myself behind a computer to do the bulk of my work, rather than in front of clients—at least for a larger portion of my time. I'm working on building my own business so I can focus on what I *can* do.

What is so frustrating is not only the continual effort to get a point across, but also the idea that someone may see me as nervous or incompetent because of my voice. The funny thing is—and maybe because it comes and goes—people who know me don't view me that way at all. It's just this perpetual emotional cycle I go through, mostly when meeting someone new, being on the phone, or trying to converse in a loud environment.

What treatments help?

Since I lived most my life not knowing what I was dealing with and having to manage it myself, I haven't had any medical treatments and choose not to at this point. However, through the years I realized a few things that have helped me. One, changing my voice with a higher pitch or whisper can give a smooth sound for a brief moment. Two, talking in short phrases or sentences is easier for me to get a point across. I sometimes leave it up to the other person to finish my sentence. Three, speaking over a microphone and hearing the echo of my voice in the building somehow allows my voice to sound better. Four, first impressions should be face-to-face and not over the phone. Five, in person, I can distract people from my voice if I am more animated—at least I think it works.

Why is it important for you to promote dystonia awareness?

I tried for a large portion of my adult life to overcome something that I knew nothing about. I found work-a-rounds, but in reality it's not any better. Once I learned the "label," and realized it was under a larger umbrella of dystonia, I researched further. The things we all have in common are the challenges of work, social time, and emotions. These have not been my only challenges in life, but they have been the longest running. If I can help add quality to someone else's life, I feel compelled to do my part.

Spasmodic dysphonia is a focal dystonia of the vocal cord muscles, sometimes referred to as laryngeal dystonia. Treatment options are available.

Find more information at dystonia-foundation.org

Dystonia Dialogue

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