

# Spikes & Spasms

The TremorAction.org Newsletter

MAY 2011

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## WELCOME TO THE AAN ISSUE!

Unlike past AAN Annual Meetings, Tremor Action Network was one of only a handful of advocacy organizations in attendance. We asked nonprofits why they didn't exhibit. The general consensus was the location...Hawaii. Too far to travel the distance from nonprofit headquarters, too expensive to ship exhibit materials, neurologists more apt to frequent the outdoor scenery rather than the exhibit hall. **Our take: Their loss, our gain!!!**

According to Franziska Schwarz, AAN Exhibits Program Manager, more than 1400 consumers attended the inaugural Brain Health Fair, visiting the Hilton Hawaiian Village exhibit hall to learn more about neurological disorders. Ms. Schwarz commented, "The exhibit hall was exciting and lively and was one of the main reasons for the tremendous success of the event."

The May newsletter introduces readers to TAN's participation at the AAN Brain Health Fair, and "inside" the AAN Annual Meeting Exhibit Hall.

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## Tremor Action Network and Allsup Surf "Brain" Waves in Hawai'i

*The two organizations team to raise awareness of essential tremor and related movement disorders; provide information on Social Security Disability insurance and Medicare*

By Tan Venuti, MPH

Approximately 12,000 healthcare providers, researchers and consumers hit the shores of Honolulu this April at the 63rd annual American Academy of Neurology (AAN) meeting and Brain Health Fair. [Tremor Action Network](#) (TAN), a nonprofit organization providing support to essential tremor and tremor-related movement disorder patients, family members and caregivers collaborated with Allsup, a nationwide Social Security Disability Insurance (SSDI) representation firm, to bring educational materials to Hawai'i consumers and medical professionals from around the world.

"As a patient advocacy organization we believe it is our responsibility to partner with the AAN to promote patient awareness," said TAN president Kathleen Welker.

TAN-the first volunteer nonprofit public benefit organization founded by people diagnosed with essential tremor, cervical dystonia (spasmodic torticollis), and tremor related neurological movement disorders-was one of few national nonprofit organizations able to make it across the Pacific to participate in the annual gathering of neurologists.

Thousands of patients, physicians, nurses, and academic researchers visited the TAN booth to learn about essential tremor and tremor-related neurological

**"Allsup information makes the SSDI medical requirements process easier for both the patient and their treating physician."**

movement disorders and the services TAN provides, which include advocacy for research, patient resources, an online forum and [quarterly online newsletter](#).

"Our second reason for participating at the AAN meeting, and equally important as the first, was to share information about [Allsup SSDI](#) and [Medicare](#) services with Hawaiian consumers who can immediately benefit from both services," said Welker.

That information was shared at the AAN Foundation's first ever Brain Health Fair, which welcomed more than 1,400 patients, caregivers and educators interested in learning more about the brain and their neurologic well-being.

"We enjoy communicating one-on-one with consumers, and the Brain Fair was an excellent opportunity to discuss

SSDI and Medicare services with those consumers that attended the event," said Welker.

"It was shocking to see how many people were starved for information, support, and guidance," said TAN volunteer Salli James.

James added that many patients with severe tremor, dystonia or Parkinsonism were interested in getting information to their doctors for help. Movement disorders patients often turn to their neurologist for medical records assistance when applying for SSDI.

"The information in the [Allsup provider packet](#) makes the SSDI medical requirements process easier for both the patient and their treating physician; in this case, the neurologist," Welker explained.

For more information on TAN visit [www.tremoraction.org](http://www.tremoraction.org). For more information on Allsup, visit [www.Allsup.com](http://www.Allsup.com) (for consumers) or [www.AllsupAlliances.com](http://www.AllsupAlliances.com) (for nonprofit organizations).

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## About the Author

Tai Venuti is Allsup's manager of strategic alliances, responsible for developing and growing relationships with organizations that share the company's commitment to empowering people with disabilities. She previously managed national public health campaigns for the U.S.

Department of Health and Human Services, and is an experienced presenter and panelist. She holds a master's degree in public health from St. Louis University, a bachelor's degree in journalism from Michigan State University, and is accredited by the Public Relations Society of America.

Read her blog entries at <http://allsup.wordpress.com/> or visit [AllsupAlliances.com](http://AllsupAlliances.com) for more information.

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## TAN In Action: Poster Sessions AAN Exhibit Hall April 11-14, 2011

Tremor Action Network believes it is essential to support and promote clinical research for the advancement of essential tremor and related movement disorders. TAN learned much from our attendance and review of movement disorders poster sessions.

Each poster is displayed on a poster board, 7 ft 10  $\frac{1}{2}$  in wide and 3 ft 10 in high. A poster is an illustration of the scientific work - the abstract. The poster schedule is divided into morning and afternoon sessions. Each poster is numbered to identify the session and location. The abstract authors must be available to discuss the work displayed. An abstract is brief, but it conveys much of the work in the multi-page paper that accompanies or follows it.

We have highlighted selected abstracts, including history of neurology abstracts and 3 posters with illustrations, to share with Spikes & Spasms readers.

We thank the American Academy of Neurology, in particular Exhibits Program Manager Franziska Schwarz, for helping to make TAN's participation a success. 10 thousand registrants representing 59% AAN member and 41% non-members, from the USA, Canada and International countries, attended the 63rd AAN Annual Meeting. Neurologists from Australia, China, Hong Kong, Japan, Korea, New Zealand and Thailand served as the Meeting's Ambassadors.

### **The California Parkinson's Disease Registry Pilot Project in Santa Clara County, CA**

*C. Tanner, S. Jewell, P. English, M. Siegel, D. Roucoux, G. Wasson, A. Wasson, S.V. Den Eeden, C. Meng, K. Comyns, K. Albers, S. Goldman, L. Nelson, B. Topol, J. Bronstein, J.W. Langston, B. Ritz (Northern | Southern California and Washington, DC)*

Population-based characteristics of Parkinson's Disease are not reported well. CA legislation has made it possible to

report PD and Parkinsonism conditions. The data collected is for 4,211 cases in Santa Clara County. 72.8% of the cases were diagnosed with PD, a mean age of 76.5 years, more likely to be male, and of Caucasian race. Medical facilities reported 86.2% of the cases. The findings highlight the need for the passage of Senate Bill S. 425, the National Neurological Diseases Surveillance System Act that TAN actively supported when it was introduced in the House of Representatives as Bill H.R. 1362. The House unanimously passed the Act. TAN featured the Act in the OCT 2010 issue of Spikes & Spasms (p.17).

#### **Demographics and Distribution of Parkinson's Disease/Parkinsonism by Military Period of Service among Veterans Seen within the Veterans Affairs Healthcare System, FY 2002-2008**

*E.C. Lai, S. Moore (Houston, Texas)*

This abstract is the continuation of the "Demographic and Geographic Distribution of Veterans with Parkinson's Disease," presented in the OCT 2010 issue of Spikes & Spasms (p.16). The findings include the fiscal year (FY) 2008. Veterans Affairs has added Parkinson's Disease in connection for service in Vietnam. The population of PD patients that served in Vietnam is increasing in proportion to WWII and Korean Conflict patients. The change in distribution indicates the need for more attention to PD occurrence in the Vietnam group of Veterans.

#### **Changes in Clinical Management Following DaTscan™ (ioflupane) Imaging in Patients with a Clinically Uncertain Parkinsonian Syndrome: Interim Report**

*A. Kupsch, N. Bajaj, F. Weiland, A. Tartaglione, S. Klutmann, R. Copp, P. Sherwin, A. Tate (Berlin and Hamburg Germany, Nottingham, U.K., La Spezia, Italy, Roseville, CA, Ann Arbor, MI, and Princeton, NJ)*

The first randomized study of the DaTscan impact on diagnosis, patient management, and quality of life in patients with uncertain Parkinsonian syndrome

(degenerative forms). DaTscan assists in differentiating from non-degenerative disorders (essential tremor or dystonic tremor). There was a reported change in diagnosis (107 patients), and also management changes. The conclusion is DaTscan is useful and safe for movement disorders assessments.

#### **Long-Term Analysis of Deep Brain Stimulation in Parkinson's Disease: Beyond 5 Years**

*A. Knight-Greenfield, T. Cheung, L. Raciti, R.L. Alterman, M. Tagliati (New York, New York, Catania, Italy, and Los Angeles, California)*

Parallels the findings in "Functional Outcome after Ten Years in Parkinsonian Patients Having Undergone STN DBS," presented in the OCT 2010 issue of Spikes & Spasms (p. 16). STN DBS improves motor function of Parkinson's Disease patients, but it does not improve the natural course of the disease. Speech, cognition, and in some cases gait appear to deteriorate.

**"There is a debate whether the arm tremor in CD+ is a classification of ET."**

#### **Cervical Dystonia and Hand Tremor (CD+) - A Distinct Phenotype from**

##### **Cervical Dystonia (CD) and Essential Tremor (ET)?**

*A.D. Acosta Madiedo, V. Shanker, R. Saunders-Pullman, W. Severt, S. Bressman (New York, New York and Englewood, New Jersey)*

Charts and available videos of patients diagnosed with cervical dystonia (63 cases of CD), CD+ (10 cases) and essential tremor (36 cases of ET), from 2007-2010 were reviewed. The objective was to compare clinical features and family histories. Data collected suggests CD+ shares clinical features with CD and ET, but may be a distinct clinical entity. Onset is much later than in CD (mean age = 55 CD+ v 43 CD). There is more prevalence of neck pain than in ET (30% CD+ v 5.6% ET), and more likely to have a family history of ET than patients with CD or ET (90% CD+ v 15.2% CD and 44.4% ET). Family history of dystonia seems to be greater in CD+ than in ET, but similar to CD (60% CD+ v 2.7% ET and 31% CD). There is a debate whether the arm tremor in CD+ is a classification of ET or



dystonic tremor. The mean age of hand tremor is similar to ET (= 47 CD+ v 43 ET), but not CD.

### **Differentiating Neck Symptoms in Idiopathic Cervical Dystonia (CD) from Essential Tremor with Neck Involvement (ETN)**

*A.D. Acosta Madiedo, V. Shanker, R. Saunders-Pullman, W. Severt, S. Bressman (New York, New York and Englewood, New Jersey)*

Early diagnosis of an isolated neck tremor is challenging. Patients with this symptom are frequently misdiagnosed, because of the challenge in recognizing the tremor as a manifestation of CD v ETN. Clinical features for each may help differentiate between the two movement disorders. 63 cases of CD and 13 cases of ETN were identified for this study. Patients' charts from 2007-2010 were reviewed. The ETN patients were more apt to report anxiety symptoms (38.5% v 12.7%, and complain of hearing loss (38.5% v 5%). Unlike the CD patients, no ETN patient reported neck pain (50.8% v 0%). ETN patients were more likely to have a family history of ET than CD (76.9% v 13.8%). Onset of the disease was earlier in CD patients (mean age = 43 v 55). Findings suggest that clinical features may be useful to distinguish CD from ETN in ambiguous cases.

### **Estimating Annual Rate of Decline: Prospective, Longitudinal Data on Arm Tremor Severity in Two Groups of Essential Tremor Cases**

*E.D. Louis (New York, New York)*

Does a patients tremor worsen over time? Collected baseline and follow-up data for a mean = 5.7 and 4.3 years on two tremor severity studies (combined n = 83 cases), exhibited a progressive worsening in tremor. The annual average increase in tremor severity (from baseline) was between 3.1% and 5.3%.

### **DAT-SPECT in Patients with Long-Standing Essential and Associated Rest Tremor**

*M. De Verdal, G. Castelnovo, L. Collombier, D. Renard, P.O. Kotzki, P. Labauge (Nimes, France)*

Rest tremor (RT) is seen in about 19% of essential tremor

(ET) patients. A high incidence of Parkinson's disease (PD) (up to four times) has been reported in patients with ET. The objective was to analyze by I123-FP-CIT single photon emission tomography (DAT-SPECT), patients with mixed tremor (ET associated with RT) without PD traits. DAT-SPECT is typically normal in ET, and abnormal in PD. 25 patients with mixed tremor participated in the study. DAT-SPECT was abnormal in 19 patients (80%). The presynaptic dopaminergic dysfunction finding is a future debate for a phenotypic variation of ET.

### **Metabolic Tremor Masquerading as Essential Tremor**

*X. Lu, S. Iyadurai (Saint Louis, Missouri)*

An isolated case of an individual in their late 20's presenting with an onset of essential tremor (ET), predominantly in the arms. ET was non-responsive to alcohol. Neurological exam revealed high frequency medium amplitude postural tremor. Brief and occasional resting tremor was noted. Laboratory testing showed very elevated rennin activity. A re-diagnosis of metabolic tremor was made. Tremor symptom improved with prescription of propranolol. The findings present a case of ET in association with hyper-retinemia (increased retin activity).

### **Essential Tremor Is Not Associated with Ethanol Abuse**

*E. Ruzicka, O. Ulmanova, M. Vinopalova, M. Miovsky, T. Zima (Prague, Czech Republic)*

Alcoholism has been suggested in essential tremor (ET), as ethanol is known to improve tremor in ET patients. 30 days of data on alcohol intake was reported in 35 healthy participants and 95 ET patients. Alcohol metabolism and liver function related blood markers were evaluated, along with self-reporting alcoholic intake. 23% of patients confessed to intentional use to suppress ET. Laboratory markers and self-reporting did not provide data that confirmed a higher incidence of alcoholism in ET patients. What's not known is if only patients with controlled intake of alcohol agreed to participate.

### **Radiosurgery for Intractable Tremors: Clinical Outcome for 45 Patients**

*T. Witjas, J.P. Azulay, A. Eusebio, M. Leveque, J.C. Peragut, J. Regis (Marseille, France)*

Some patients are poor candidates for Deep Brain Stimulation. 45 patients with severe refractory tremor (35 essential tremor and 10 Parkinsonian) were treated with unilateral Gamma-knife thalamotomy. One year after radiosurgery, functional impairment of activities of daily living was decreased by 60% and tremor reduction was 40% of the left hand and 56% reduction of the right hand. Only side effect was a transient hemiparesis. The results conclude Gamma-knife thalamotomy is an effective and safe procedure for treating severe tremor.

### **Charlatan Exploitation of Neurological Symptoms: The Case of the Reinhardt Brothers**

*M.B. Jensen, E.L. Janik (Madison, Wisconsin)*

No medical regulations in the early 20th century made individuals with neurological symptoms vulnerable to exploitation by charlatans. Documents on the Reinhardt brothers in Wisconsin reveal the Reinhardts targeted pharmacies and the public with a health manual that listed neurological symptoms (dizziness, weakness, memory problems, nervousness, etc.). The Reinhardts' written advice was to contact them. Those that did usually received a "sexual weakness" diagnosis, building on the period-theme that sexuality was the cause of mental and physical deterioration. "Electric belts and medicine" were prescribed to alleviate the neurological symptoms. The abstract suggests that practice of charlatan exploitation was widespread until the implementation of medical regulations, and that fraudulent exploitation activities may still continue today.

### **Neurologists' Contributions to the Development of Performing Arts Medicine**

*R.J. Lederman (Cleveland, Ohio)*

Interest in performing arts medicine date back to the mid-19th century, especially among musicians. The 1840 textbook by Romberg references a pianist with an involuntary thumb condition. London neurologist Poore

reported in 1887 "21 pianists with hand failure." Textbooks written by Gowers and Oppenheim describe instrumentalists with "occupation neuroses." Other contributions in the early 20th century were made by Kurt Singer and Alajouanine. Modern era 1977 contributions are cited in Critchley and Henson's publication of "Music and the Brain." Hochberg and Lockwood reported in the 1980's their experiences with musicians. Written contributions have been made beyond the 1980's. Neurologists worldwide have given numerous oral presentations. For over 150 years music performance medical problems have attracted neurologists' attention. Most notable is the Performing Arts Medicine Association, [PAMA](#).

### **Neurology in the Shadow of Nazi Germany**

*B.D. Schanker (Brookline, Massachusetts)*

Historical evidence indicates neurologists, psychiatrists and neuroscientists conducted substantial neuroscience research in Nazi Germany. Psychiatrists and neurologists used opiates, barbiturates and carbon monoxide to euthanize mentally-ill patients. Prisoners were used for studies in neurophysiology and neuropsychopharmacology. Neural transplantation and regeneration surgeries were performed. Some of the deadliest neurochemical agents, Tabun, Sarin and Soman, were developed by neuroscientists. Over 2000 brains of murder victims were handed over to various academic institutions and research facilities for neuropathological studies. Lack of medical standards led numerous neurologists and neuroscientists to jeopardize their ethical duty of care for personal and professional gains. The Nazi Germany events highlight the importance of neurologists and neuroscientists' role in society to protect and defend patients and scientific integrity.

### **Mercury Exposure in Ancient Peru: Lessons for a Changing Industrial World**

*D.J. Correa, J. Newmark (Washington, DC and Falls Church, Virginia)*

Heavy exposure to mercury and other metals in ancient and colonial Peru parallels with modern society observations of

long and lasting neurological effects (tremors, the inability to perform rapid alternating movements, cerebellar decline) from exposure to poisonous metals. During the colonial period colonizers exploited the Peruvian miners who suffered consequences - loss of life, because of mercury intoxication. Large quantities of mercury continue to be released. Emissions in China equal the level found in colonial Peru. Increase in emissions from combustion, smelters and incinerators in countries with little regulation get transported from the atmosphere to ecosystems, exposing people to what plagued Peru. The mining history of Peru is a warning of modern society's consequences to mercury exposure.

**Source:** 2011 Abstracts

63rd AAN Annual Meeting April 9 - April 16, 2011



# Essential Tremor Quantification During Activities of Daily Living



Dustin A. Heldman<sup>1</sup>, Danielle Filipkowski<sup>1</sup>, Joseph Jankovic<sup>2</sup>, David Vaillancourt<sup>3</sup>, Jane Prodoehl<sup>3</sup>, Rodger Elble<sup>4</sup>, Joseph P. Giuffrida<sup>1</sup>



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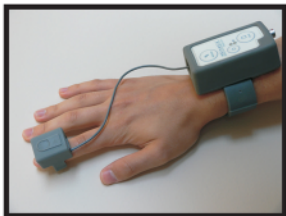


## Introduction

Essential tremor (ET), characterized primarily by postural and/or kinetic tremor, is typically measured in the clinic with subjective tremor rating scales. These ratings are often used to adjust medications and assess efficacy in clinical trials but require the presence of a clinician and do not necessarily capture tremor fluctuations throughout the day during activities of daily living (ADL). Therefore, the objective of this study was to evaluate the ability of motion sensors to discriminate tremor from voluntary posture and motion, classify tremor as postural or kinetic, and rate tremor severity during standardized tasks and non-standardized activities of daily living.

## Methods

Ten subjects with ET (Table 1) wore motion sensors (Kinesia, Great Lakes NeuroTech) on the index finger (Figure 1) and performed standardized motor tasks from the Washington Heights-Inwood Genetic Study of Essential Tremor (WHIGET) tremor rating scale (wTRS) and non-standardized ADL task (Table 2). Four movement disorder specialists independently rated video segments of the standardized tasks but not the ADL tasks. Quantitative features were extracted from the motion sensors and used to develop mathematical models for predicting rating scores from kinematic data.



**Figure 1.** Motion sensors placed on the index finger recorded kinematic data while subjects performed the tasks.

**Table 1. Subject Demographics**

Age (yr)	56 - 83
Gender	7 men, 3 women
Disease Duration (yr)	10 - 40
Tremor Frequency (Hz)	
Range	4.2 - 9.6
Mean ± SD	6.1 ± 0.9

**Table 2. Study Task List**

Standardized Tasks	Activities of Daily Living
*Hands in lap (rest)	*Typing
*Arms extended horizontally (postural)	*Computer mouse
*Repeated nose touching	*Folding laundry
*Pouring water	*TV remote
*Drinking water	
*Spoonng water	
*Spiral drawing	





# Essential Tremor Quantification During Activities of Daily Living



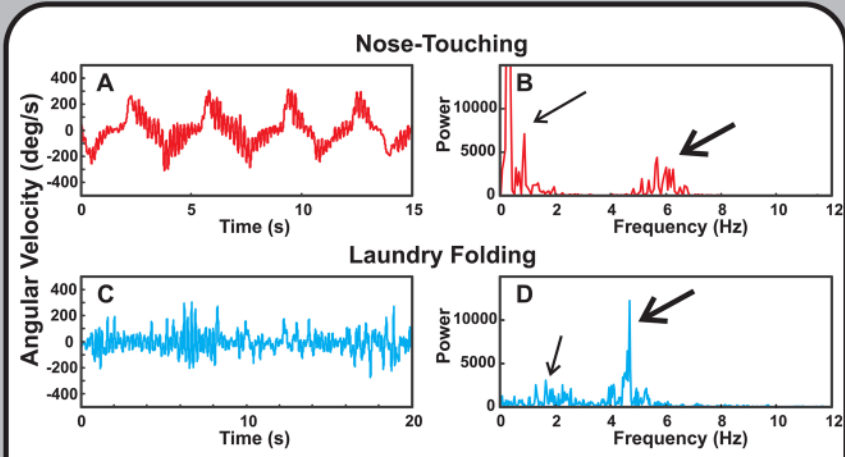
Dustin A. Heldman<sup>1</sup>, Danielle Filipkowski<sup>1</sup>, Joseph Jankovic<sup>2</sup>, David Vaillancourt<sup>3</sup>, Jane Prodoehl<sup>5</sup>, Rodger Elble<sup>4</sup>, Joseph P. Giuffrida<sup>1</sup>

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## Standardized Correlations

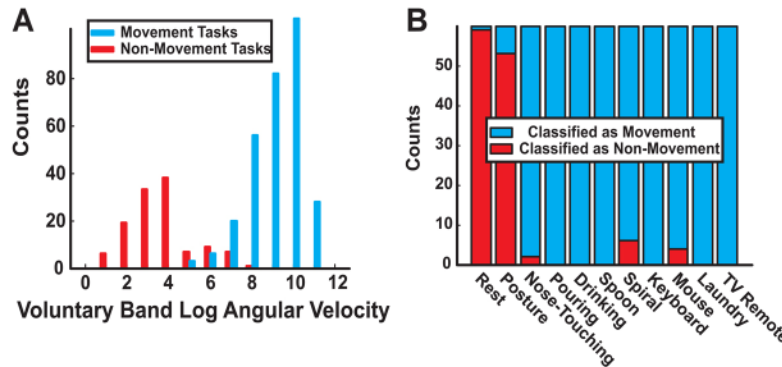


**Figure 2.** **A)** Raw data recorded from the z-gyroscope during nose-touching task. The four slow waves are due to voluntary motion, while the fast oscillations are due to tremor. **B)** Power spectrum of the signal in **A**. The signal due to the voluntary motion is marked with a thin arrow, tremor is marked with a thick arrow. **C)** Raw data recorded from the x-gyroscope during the laundry folding task. **D)** Power spectrum of the signal in **C**. The signal due to the voluntary motion is marked with a thin arrow, while tremor is marked by a thick arrow.

**Table 3. Clinical Correlation**

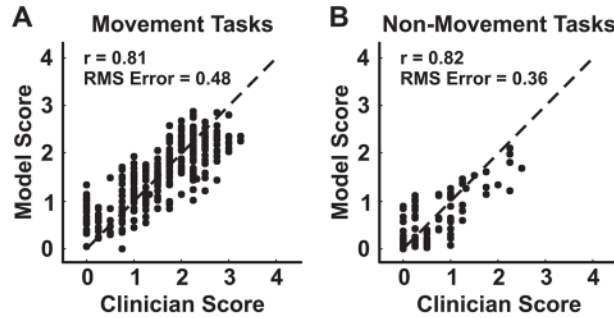
Task	Acc.	Gyr.
Rest	0.57	0.60
Arms Outstretched	0.88	0.91
Nose-touching	0.78	0.69
Pouring	0.77	0.78
Drinking	0.87	0.90
Spoon	0.79	0.76
Spiral	0.83	0.87
<b>Kinetic Mean</b>	<b>0.81</b>	<b>0.80</b>

**Table 3.** Correlations between clinician scores and kinematic data extracted from the frequency band corresponding to tremor (4 - 12 Hz) on the accelerometers (Acc.) and gyroscopes (Gyr.) for the standardized tasks. The "Kinetic Mean" is the average correlation for the tasks that require voluntary movement.

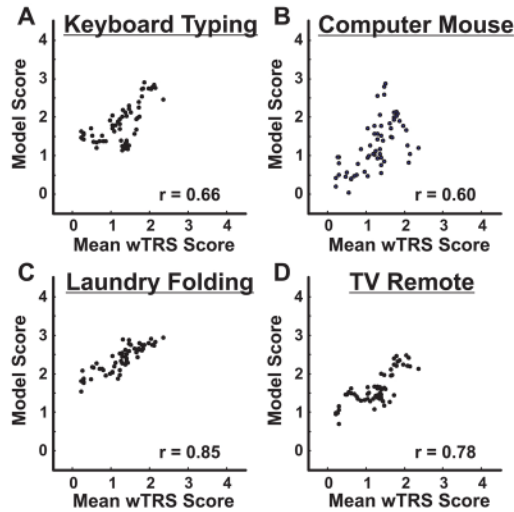


**Figure 3.** **A.** The magnitude of the logarithm of the peak power of the gyroscope signals in the frequency band corresponding to voluntary movement (0.1 - 3.0 Hz) is shown for the tasks that required voluntary motion (blue) and those that did not (red). The midpoint was used as a threshold for classifying tremor as "postural" or "kinetic" so the appropriate tremor quantification algorithm could later be applied. **B.** The threshold-based classifications of whether the subject was moving voluntarily (blue) or not (red) are shown for each of the 11 tasks.

## ADL Extrapolation



**Figure 4.** The scores output by the kinematic models are compared to the actual scores for tasks when voluntary movement was present (A) and tasks where there was no discernible voluntary movement (B). Each dot represents one of the 420 single standardized task performances. Correlation coefficients and RMS errors are given for each tremor type. The dashed line corresponds to a perfect fit.



**Figure 5.** The model output is compared to the mean of the clinician wTRS scores given by the clinicians in the same block for the keyboard typing (A), computer mouse (B), laundry folding (C), and TV remote (D) tasks. Each dot represents one of the 60 task performances for each of the four ADL tasks. The correlation coefficient comparing the scores is shown for each task.

## Conclusions

Tremor detection, discrimination, and quantification with motion sensors generalizes to unconstrained activities, and in turn may provide clinicians with a more sensitive, quantitative assessment in the context of daily life. Continuous classification and rating throughout the day may aid clinicians and researchers in therapy development and optimizing symptom management for patients with both ET and other movement disorders.

This work was supported by 1R43AG0347081 and R01NS058487

- - <http://hscweb3.hsc.usf.edu/health/now> -

## **USF study: Most patients stop drugs for essential tremor after deep brain stimulation surgery**

Posted By [abaier](#) On April 5, 2011 @ 5:04 pm In [Alzheimer's and Neurosciences, Press Releases, Research Really Matters, USF Health News](#) | [Comments Disabled](#)

### ***Medications lose effectiveness for many with longstanding tremors***

**Tampa, FL** – Deep brain stimulation, a surgical procedure to suppress faulty nerve signals, allowed 77 percent of patients to stop the medications used to treat their essential tremors within one year following the surgery, University of South Florida researchers report.

“It’s a significant finding demonstrating that patients see a lot of symptom improvement with this treatment option,” said Andrew Resnick, a research assistant in the USF Health Department of Neurology. Resnick will present results of the limited retrospective study April 12, 2011, at the annual meeting of the American Academy of Neurology in Honolulu, Hawaii.



**USF Health neurologist Dr. Theresa Zesiewicz with research assistant Andrew Resnick**

Essential tremor, which affects the hands, head and voice, is three times more prevalent than Parkinson’s disease. The largely hereditary neurological condition can cause uncontrollable shaking that interferes with normal daily activities such as eating, drinking and getting dressed. Tremors can begin in early adulthood and become more severe as a person grows older.

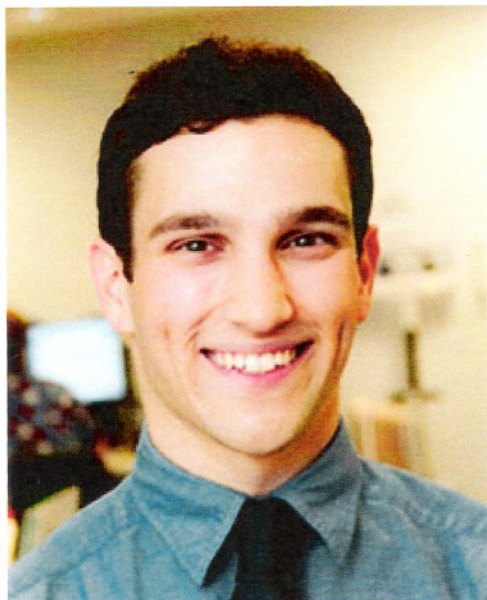
While medications (primidone, propranolol and/or topiramate) help alleviate essential tremors in some patients, over time many patients discontinue the drugs because their effectiveness wanes or the side effects become intolerable, said USF Health neurologist Theresa Zesiewicz, MD, who was the lead author in developing the AAN’s first guidelines for treatment of essential tremor. “Essentially, they just give up trying to treat essential tremor.”

The USF study reviewed the charts of 31 patients who underwent unilateral deep brain



stimulation (DBS) surgery for essential tremor from 2000 to 2010. The therapy uses an implanted device similar to a pacemaker to stimulate a targeted region of the brain with electrical impulses, blocking or correcting abnormal nerve signals that cause the tremors.

At the time of surgery, 20 of the 31 patients had been diagnosed with essential tremor for 10 or more years and 11 had been diagnosed for less than 10 years.



**Resnick will present the findings April 12 at the American Academy of Neurology's 2011 Annual Meeting and again at the Movement Disorders Society's 15th International Congress of Parkinson's Disease and Movement Disorders in June.**

The researchers found that all 13 patients still taking anti-tremor medications at the time of DBS surgery gained effective control of their tremors following the procedure. In fact, symptom improvement was so good that 10 patients in this group (77 percent) stopped the anti-tremor medications within one year of surgery. The remaining three (23 percent) continued to take propranolol, an antihypertensive as well as an anti-tremor drug, only because they still needed it to control blood pressure.

Eighteen of the 31 patients (54 percent) had discontinued anti-tremor medications a year or more before the DBS surgery – 10 because the medications stopped working and eight because of adverse side effects such as nausea, headaches and other flu-like symptoms, drops in blood pressure, cognitive impairment or depression. Most patients in this group had long-standing essential tremor (10 or more years). All these patients also benefitted from the DBS surgery, though some experienced longer symptom improvement than others.

USF Health neurosurgeon Dr. Donald Smith implanted the first DBS device for essential tremor during a North American clinical trial in 1993 and has performed over 200 procedures since the FDA approved the anti-tremor surgery in 1997.



**USF Health neurosurgeon Dr. Donald Smith is a pioneer in deep brain stimulation surgery for essential tremor.**

By the time patients reach the point of contemplating surgery, the tremors are usually very debilitating, said Dr. Smith, surgical co-director of the Movement Disorders Clinic in the USF Department of Neurosurgery.

"People may not be able to write, or comb their hair; they can't use tools, can't sew or knit. They have difficult feeding themselves and drinking, so they're often embarrassed to go out to eat." Dr. Smith said. "It's a rewarding procedure to perform, because most patients come in with high levels of disability and can be turned around quickly. It's a home-run surgery."

A limitation of the USF study was that only unilateral DBS, which treats one side of the brain affecting tremors in the dominant hand, was examined. Bilateral DBS for tremor in both hands is associated with more side effects, Dr. Zesiewicz said, but patients are often satisfied when they regain control in the dominant hand.

Future research should include larger, long-term studies investigating how long the tremor control effects of DBS last, the researchers conclude. For instance, will patients who have undergone the procedure need medication again 10 to 20 years after the surgery, or can physicians alter the intensity of electrical impulses delivered by the DBS device so that the procedure's benefits are sustained?

In addition to Resnick, Dr. Smith and Dr. Zesiewicz, USF Health's Teresita Malapira, Dr. Fernando Vale, Kelly Sullivan (neuroepidemiologist) and Amber Miller, and the University of Florida's Dr. Michael Okun conducted the study.

**- USF Health -**

*USF Health is dedicated to creating a model of health care based on understanding the full spectrum of health. It includes the University of South Florida's colleges of Medicine, Nursing, Public Health and Pharmacy, the School of Biomedical Sciences and the School of Physical Therapy and Rehabilitation Sciences; and the USF Physician's Group. With more than \$394.1 million in research grants and contracts in FY2009/2010, the University of South Florida is a high impact global research university.*

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## Autonomic Function is Normal in Essential Tremor but not Parkinson's Disease

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### INTRODUCTION

- It has been reported that patients with Parkinson's Disease (PD) have autonomic dysfunction (1,2,3,4,5,6)
- The Scale for Outcomes in Parkinson's Disease for Autonomic Symptoms (SCOPA-AUT) has been developed (7) and validated (8) as a comprehensive questionnaire designed to assess for the presence of symptoms of autonomic dysfunction.
- Data collected using the SCOPA-AUT has indicated the presence of symptoms of autonomic dysfunction in PD patients in gastrointestinal, urinary, cardiovascular, thermoregulatory, pupillomotor, and sexual domains (9)
- To date, no literature has documented symptoms of autonomic dysfunction in patients with ET.
- The objective of this study was to compare the occurrence and symptoms of autonomic dysfunction in PD and essential tremor using the SCOPA-AUT.

### SUBJECTS & METHODS

- All subjects were enrolled in an ongoing longitudinal clinicopathological study, the Banner Sun Health Research Institute Brain and Body Donation Program. (10)
- All subjects received a standardized movement disorders examination. (11) Following each evaluation subjects received a movement disorder diagnosis including 1) Clinically probable PD, 2) ET 3) Control (excluded subjects with PSP, DLB, other forms of parkinsonism, dementia).

### SUBJECTS & METHODS

#### (Continued)

- Subjects who had both PD and ET were excluded as were subjects with dementia.
- Medications (by category) were recorded for each subject at each visit.
- Autonomic function was measured using the SCOPA-Aut questionnaire; this is a 23 item questionnaire divided into six domains of autonomic function. (7)
- Subjects with PD and ET were compared to the Control group. Comparisons were made by using the two-sample *t* test. Adjusted means were compared by using a general linear model. The proportion of subjects with a score greater than zero was compared by using the Pearson chi-square test.

### RESULTS

- The mean SCOPA-Aut Total score was higher in PD patients (mean=25, SD=12) than Controls (mean=16, SD=9.1),  $p < 0.001$ .
- There was no difference in mean SCOPA-AUT total scores between ET patients and Controls.
- The only medication difference between groups was for dopaminergic agents in the PD patients.

### CONCLUSIONS

- This study confirms prior research (9) documenting the presence of autonomic dysfunction in PD. The total SCOPA-AUT score for PD patients in our study was significant ( $p < 0.001$ )
- Domains of autonomic dysfunction found to be significant in PD include: Gastrointestinal, Urinary, Cardiovascular, and Thermoregulatory.
- This study is the first to establish that there is no evidence of autonomic dysfunction in ET, with the exception of sialorrhea.
- The total SCOPA-AUT score as well as all individual domains were not significant in ET patients.
- The comparison of the non-motor complications of ET and PD may provide additional insight into whether these two disorders have a shared etiology- this study finds that ET only shared sialorrhea with the autonomic dysfunction found in PD.

### Subject Demographic and Overall Domain Scores:

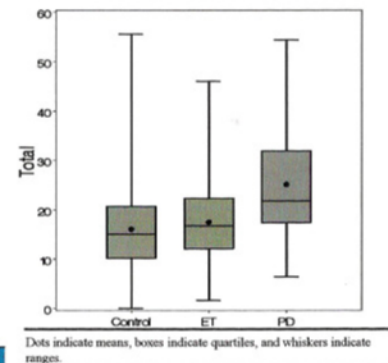
	PD	ET	Control
N	62	84	291
Female	44%*	44%*	69%
Age (y): mean	73*	83 <sup>b</sup>	81
SCOPA-Aut (0-100): mean			
Total	25*	17	16
Gastrointestinal	24*	12	10
Urinary	34 <sup>b</sup>	30	28
Cardiovascular	9 <sup>b</sup>	4	5
Thermoregulatory	16 <sup>b</sup>	13	12
Pupillomotor	21	17	21
Sexual - Men	61	57	49
Sexual - Women	32	21	25

\* $P < .001$  vs Control. <sup>b</sup> $P < .05$  vs Control.

### SCOPA-AUT Score Greater than Zero:

	Control	PD	P	ET	P
Swallowing/Choking	22%	53%	<.001	25%	.53
Sialorrhea	25%	81%	<.001	43%	.002
Dysphagia	19%	41%	<.001	15%	.42
Early Abdominal Fullness	22%	41%	.002	22%	.94
Constipation	31%	63%	<.001	33%	.85
Straining for Defecation	53%	74%	.003	51%	.68
Fecal Incontinence	15%	13%	.68	23%	.12
Urinary Urgency	52%	66%	.04	52%	.96
Urinary Incontinence	50%	60%	.15	48%	.81
Incomplete Emptying	42%	54%	.08	44%	.70
Weak Stream of Urine	47%	54%	.34	57%	.12
Frequency	76%	82%	.35	80%	.56
Nocturia	93%	98%	.13	95%	.56
Lightheaded Standing Up	20%	39%	.001	17%	.56
Lightheaded Standing for some time	14%	27%	.01	10%	.24
Syncope	2%	5%	.14	1%	.73
Hyperhidrosis During the Day	22%	34%	.05	18%	.38
Hyperhidrosis During the Night	23%	34%	.05	30%	.18
Cold Intolerance	33%	37%	.56	31%	.76
Heat Intolerance	33%	46%	.07	30%	.53
Oversensitive to Bright Light	46%	51%	.46	37%	.15
Erection Problem	80%	94%	.08	84%	.60
Ejaculation Problem	72%	84%	.22	80%	.44
Vaginal Lubrication	53%	82%	.08	25%	.28
Problem with Orgasm	45%	64%	.27	NA	

### SCOPA-AUT Total Score



Dots indicate means, boxes indicate quartiles, and whiskers indicate ranges.

### Medication use in PD and ET Patients:

	PD (n=51)	ET (n=65)	Control (n=186)
Cholinesterase Inhibitor	12%	2%	4%
SSRI	8%	9%	8%
Other Antidepressant	14%	11%	9%
Atypical Antipsychotic	2%	0%	1%
Typical Antipsychotic	0%	0%	0%
Anxiolytic	18%	14%	8%
Sedative Hypnotic	6%	17%	7%
Dopaminergic Agent	98%	2%	2%
Statin	25%	37%	36%
Vitamin E	16%	11%	13%
NSAID	18%	17%	19%
Estrogen	4%	6%	11%

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# Spokes Otter Goes Hawaii Five-0

The Essential Otter Advocate <http://romert.blogspot.com>

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