

# Our Research Team is Looking to Expand

The Tarnow Center for Self-Management  
Houston, TX

Erin MacInerney, Research Assistant & Marketing Coordinator

Under the direction of Dr. Jay Tarnow, The Tarnow Center for Self-Management has always been on the leading edge of psychiatry, using an integrative medicine approach with a multidisciplinary team of psychiatrists, psychologists, social workers, counselors, and marriage family therapists. This model provides unique opportunities for both treatment and clinical research.

Dr. Ron Swatzyna, the Director of Electro-Neuro Analysis Research at the Tarnow Center, started collecting data in 2005 and his first article was published in 2009. From 2014 to the present, he has co-authored seven articles in peer-reviewed journals. In addition to publishing this research, Dr. Swatzyna also presented these clinical studies at various scientific conferences. His first study, *The Basic Application of Pharmacology-EEG in a Clinical Setting*, was presented in 2008. Since then, he has presented 35 papers in the United States and four papers internationally including: Nijmegen, The Netherlands (2016); Nova Scotia, Canada (2014); Venice, Italy (2014); and Valencia, Spain (2014).

## A Large Team

Conducting clinical research requires a large and dedicated multidisciplinary team including psychiatrists, neurologists, etc. Below is a list of those who have contributed and received authorship:

Jay D. Tarnow, MD, Tarnow Center Medical Director  
Gerald P. Kozlowski, PhD, Associate Professor Saybrook University  
Robert Turner, MD, Neurologist/Epileptologist, Charleston, SC  
Meyer Proler, MD, Electroencephalographer, Baylor College of Medicine  
Vijayan Pillai, PhD, Professor University of Texas at Arlington  
Martijn Arns, PhD, Professor Utecht University, The Netherlands  
Sabastian Obruch, MD, Senior Physician and Researcher, University of Zurich  
Jay Gunkelman, Chief Scientist, Brain Science International

## Research Assistants

Alexandra Roark, Research Assistant, University of Texas at Austin  
Erin MacInerney, Research Assistant, accepted to Vanderbilt University  
Jonika, Tannous, Research Assistant, University of Texas Health Science Center  
Christine, Schieszler, Research Assistant, Roosevelt University  
Jacob Mardick, Research Assistant, Milsap College, MS  
Biance Gonzalez, Research Assistant, Baylor University

## **A Call for New Research**

In 2012 Dr. Thomas Insel, the director of the National Institute for Mental Health, stated that the Diagnostic and Statistical Manual (DSM) is not a valid instrument and funding for DSM based research was stopped. The Research Domain Criteria project (RDoC) was instituted with the goal of identifying neurobiomarkers underlying presenting symptoms in psychiatry. There is a big push to identify genetic, electrical, chemical and structural biomarkers underlying psychiatric symptoms. In 2014 Dr. Swatzyna and his team identified four neurobiomarkers that accounted for psychiatric medication failure using EEG/qEEG. With the support of Dr. Tarnow, Dr. Swatzyna is working to bring EEG and qEEG analysis into mainstream psychiatry to assist with medication and treatment selection. In this effort, Dr. Swatzyna was asked to participate in a symposium to be presented at the World Psychiatric Association XVII World Congress, in Berlin (October 2017). He is joining Oliver Poggerall, MD, PhD (Psychiatric Clinic of the Ludwig-Maximilians-University, Munich, Germany); Tomiki Sumiyoshi, MD, PhD, (Department of Clinical Epidemiology, National Center of Neurology and Psychiatry, Japan); and Nash Boutros, MD (University of Missouri-Kansas City, School of Medicine, Chair, Department of Psychiatry) to present their clinical findings.

## **New Research Assistants Needed**

Dr. Swatzyna is currently looking for new research assistants to join his multidisciplinary clinical research team to take part in every aspect of research and publishing and an opportunity to learn more about integrative medicine, including neurofeedback. In return, the assistant will receive authorship. Previous research assistants had completed or were finishing their bachelor's degree and were interested in gaining research experience prior to graduate school. Dr. Swatzyna's research assistants have been accepted into top graduate schools such as Roosevelt University in Chicago, the University of Texas in Austin, The University of Texas Health Sciences Center in Houston, and Vanderbilt University in Nashville. Additionally, experience on this research team meets the requirements for associate membership into Rice University/Texas Medical Center Chapter of Sigma Xi, The Scientific Research Honor Society. Each research assistant has been nominated and inducted into the Society.

Currently, Dr. Swatzyna's team has two research assistants. Ms. Roark started at The University of Texas at Austin Graduate School of Social Work in January 2017, and Ms. MacInerney will pursue her MEd in Human Development Counseling at Vanderbilt University's Peabody College, starting August 2017. Dr. Swatzyna and his team just completed a study "Electroencephalogram (EEG) for Children with Autism Spectrum Disorder: Evidential Considerations for Routine Screening" April 7, 2017 for publication in the journal *Neuropsychiatric Electrophysiology*.

The Tarnow Center uses cutting-edge science including Genome testing, ALCAT food sensitivity testing, Spectra Cell Micronutrient testing, EEG/qEEG analysis, and psychophysiological testing to assist in medication selection and treatment planning. Exposure to this group of 11 doctors and therapists will also include weekly clinical staffings, and opportunities to observe or co-facilitate individual, family, and group therapy sessions. Dr.

Swatzyna also presents his research nationally and internationally. His research assistants have the opportunity to present posters and co-present oral papers at these prestigious conferences.

Dr. Swatzyna, as a Neurofeedback and Biofeedback mentor, strongly supports his assistantstoward earning certification from the Biofeedback Certification International Alliance (BCIA). Research assistant's duties require about 30 hours a week with a flex schedule and Fridays, Saturdays, and Sundays off. There is no pay for research hours; however, the assistant will receive authorship credits on all papers where they were involved. There are also opportunities to become a contract employee of The Tarnow Center. This would include work as a neurofeedback technician, social media marketer, and technical writer. Details will be discussed with any appropriate candidates during phone interviews. Anyone interested in working as a research assistant for Dr. Swatzyna, please email: [drron@tarnowcenter.com](mailto:drron@tarnowcenter.com)

### **Peer-Reviewed Publications**

Below are summaries of the publications Dr. Swatzyna has been a part of since 2009:

#### Breakfast Choices Influence Brainwave Activity: Case Study of a 12-year-old Female.

*Erin K. MacInerney, Ronald J. Swatzyna, Alexandra J. Roark, Bianca C. Gonzalez, and Gerald P. Kozlowski*

Previous research into the benefits of children eating breakfast has focused on educational and cognitive performance, and behavior. This single case study used qEEG in order to assess how different breakfast choices affect a 12-year-old female's brainwave activity. The three breakfast conditions included no-breakfast, a high sugar/high carbohydrate breakfast, and a nutritionally balanced breakfast. The results show that skipping breakfast or eating a high sugar/high carbohydrate breakfast increased high beta activity in the brain, which is associated with anxiety and focus issues. These findings suggest that eating a nutritionally balanced breakfast may reduce anxiety and increased focus as compared to other breakfast options.

#### Retrospective Analysis of Nonepileptic Patients with Isolated Epileptiform Discharges Treated with Anticonvulsants.

*Ronald J. Swatzyna, Jay D. Tarnow, Meyer L. Proler, Alexandra J. Roark, Erin K. MacInerney, and Gerald P. Kozlowski*

Although antiepileptic drugs (AEDs) are prescribed to nonepileptic patients with a variety of diagnoses, the FDA has only approved their use for a small number of psychiatric conditions. Previous research recommends an empirical trial of AEDs when isolated epileptiform discharges (IEDs) are identified in the electroencephalogram (EEG). The purpose of this study was to evaluate the outcome of treating nonepileptic patients with AEDs when IEDs are present. The sample was comprised of 76 refractory cases from a multidisciplinary practice whose EEG readings contained IEDs. The psychiatrist's progress notes were assessed to determine the impact of adding anticonvulsants based on parent, teacher reports and clinical observation. The findings found that the majority of the patients improved (85.53%) when AEDs were prescribed.

These results suggest that IEDs may predict positive treatment outcome to anticonvulsant medication regardless of age, gender, or diagnosis.

### Integration of EEG into Psychiatric Practice: A Step Toward Precision Medicine for Autism Spectrum Disorder

*Ronald J. Swatzyna, Jay D. Tarnow, Robert P. Turner, Alexandra J. Roark, Erin K. MacInerney, and Gerald P. Kozlowski.*

Autism Spectrum Disorder (ASD) often presents a treatment challenge due to the variety of symptoms that make each case unique. Medication prescribed to manage ASD associated symptoms such as anxiety, depression, attention issues, and behavioral problems often fail to alleviate symptoms and can produce undesirable side effects. This medication failure could be related to the increased prevalence of isolated epileptiform discharges (IEDs) in psychiatric patients, that go undetected without the use of an electroencephalogram (EEG). The purpose of this study was to reveal the prevalence of IEDs in the ASD population, and to demonstrate the usefulness of the EEG for providing data to treating physicians. The study was comprised of 140 nonepileptic patients with ASD under the age of 25. Of the 140 patients, 36.4% were found to have IEDs after an EEG screening. The results show that compared to a healthy population, many patients with ASD have IEDs despite never having a seizure. These findings support the use of EEG in patients with ASD, to allow for more individualized and precise medication selection.

### The Utility of EEG in Attention Deficit Hyperactivity Disorder: A Replication Study

*Ronald J. Swatzyna, Jay D. Tarnow, Alexandra Roark, and Jacob Mardick.*

Over the last 30 years, the use of stimulants in pediatrics has increased, yet long-term consequences have yet to be fully explored. Past studies have identified isolated epileptiform discharges (IEDs), a brainwave abnormality, in children with attention deficit hyperactivity disorder (ADHD). An article published in 2011 suggested that EEG technology should be considered prior to prescribing stimulants to children with ADHD in order to screen for epileptiform discharges. The 2011 study found 26% prevalence of IEDs when using sleep-deprived EEGs. This study sought to replicate the 2011 results using conventional EEG and qEEG technologies. Our results showed 32% of patients with ADHD had IEDs, which further supports that an EEG screening should be considered before prescribing stimulant medications.

### Sleep maintenance, spindling excessive beta and impulse control: an RDoC arousal and regulatory systems approach?

*Martijn Arns, Ronald J. Swatzyna, Jay Gunkelman, and Sebastian Olbrich.*

In 2009 the National Institute of Mental Health (NIMH) introduced the Research Domain Criteria project (RDoC) which sought to analyze basic dimensions of functioning that underlie human behavior to find new ways of studying mental disorders. The purpose of this study was to investigate the relationship between arousal systems and behavioral dimensions. Specifically, this study analyzed spindling excessive beta (SEB) and its relation to insomnia,

impulsivity/hyperactivity and attention. The results found an SEB occurrence in patients between 0-10.8%. It was found that patients with frontal SEBs only had significantly higher impulsivity/hyperactivity and insomnia complaints. To conclude, this data reveals that frontal SEB may be an electroencephalographic marker caused by sleep maintenance problems with concurrent impulse control problems.

#### Pharmaco-EEG: A Study of Individualized Medicine in Clinical Practice

*Ronald J. Swatzyna, Gerald P. Kozlowski, and Jay D. Tarnow*

Pharmaco-electroencephalography research using neurological data from clinical EEG and qEEG technologies could improve medication selection and treatment planning in psychiatry. Over the past 5 years in a multidisciplinary practice, 386 refractory cases have been found to contain a small number of brainwave abnormalities related to the following diagnostic categories: mood, anxiety, Autism Spectrum Disorder, and Attention Deficit Hyperactivity Disorder. The brainwave abnormalities were the following: encephalopathy, focal slowing, beta spindles, and transient discharges. However, results found that although these abnormalities were noted in the majority of cases with medication failure they did not align directly with specific diagnoses. These findings suggest that data from the EEG and qEEG can help guide individualized medicine selection and treatment planning, especially when previous medications have failed.

#### EEG/QEEG Technology Identifies Neurobiomarkers Critical to Medication Selection and Treatment in Refractory Cases: A Preliminary Study

*Ronald J. Swatzyna, Jay D. Tarnow, Jonika D. Tannous, Vijayan Pillai, Christine Schieszler, and Gerald P. Kozlowski*

In psychiatry, diagnosis reliability is instrumental for proper management of medications and treatments. Going along with this, The National Institute of Mental Health (NIMH) is searching for neurobiological measures that account for observed and reported symptoms. The purpose of this study was to find neurobiomarkers that account for medication failure in 386 refractory clinical cases. The results found 4 such measures that could explain why medication failed in each of the refractory cases: encephalopathy, focal slowing, beta spindles, and transient discharges. The study found positive correlations between number of medications prescribed and the number of neurobiomarkers identified in children and adolescents. A positive correlation between number of medications prescribed and number of diagnosis was found in adults.

#### **References**

1. MacImerney, EK, Swatzyna, RJ, Roark, AJ, Gonzalez, BC, & Kozlowski (2017). Breakfast Choices Influence Brainwave Activity: Case Study of a 12-year-old Female. *NeuroRegulation*, Spring 2014: 66-71.
2. Swatzyna, RJ, Tarnow, JD, Proler, ML, Roark, AJ, MacImerney EK, & Kozlowski, GP. (2017). Retrospective Analysis of Nonepileptic Patients with Isolated Epileptiform Discharges Treated with Anticonvulsants. *Clinical EEG and Neuroscience*. [epub ahead of print].

3. Swatzyna, R.J., Tarnow, J.D., Turner, R.P., Roark, A.J., MacInerney, E.K., and Kozlowski, G.P. (2016). Integration of EEG into Psychiatric Practice: A Step Toward Precision Medicine. *Journal of Clinical Neurophysiology* (2016 Nov 22 Epub ahead of print).
4. Swatzyna, R.J., Tarnow, J.D., Roark, A., & Mardick, J. (2016). The Utility of EEG in Attention Deficit Hyperactivity Disorder: A Replication Study. *Clinical EEG and Neuroscience*. DOI 10.1177-1550059416640441.
5. Arns, M., Swatzyna, R.J., Gunkelman, J., & Olbrich, S. (2015). Sleep maintenance, spindling excessive beta and regulatory systems approach? *Neuropsychiatric Electrophysiology* electronically published June 2015.
6. Swatzyna, R.J., Kozlowski, G.P. & Tarnow, J.D. (2015). Pharmaco-EEG: A Study of Individualized Medicine in Clinical Practice. *Clinical EEG and Neuroscience*. Vol. 46(3) 192-196: DOI: 10.1177/1550059414556120
7. Swatzyna, R.J., Tarnow, J.D., Tannous, J., Schieszler, C., Pillai, V.J. & Kozlowski, G.P. (2014). EEG/QEEG Technology Identifies Neurobiomarkers Critical to Medication Selection and Treatment: A Preliminary Study. *Journal of Psychology and Clinical Psychiatry*.