### ROGERS | Research Center

## 2024 ANNUAL REPORT

BREAKTHROUGHS AND BRIGHT FUTURES



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#### **Letter from the Executive Vice President of Research**

Here at the Rogers Research Center, we strive to be at the forefront of innovation in behavioral health and substance use treatment, leveraging novel technologies and treatment delivery strategies to enhance patient care and outcomes. In our fourth year of operations, our team has made great strides in exploring innovative evidence-based therapeutic interventions. We are investigating whether neurological patterns in obsessive-compulsive disorder (OCD) and anxiety can be quantified throughout treatment, potentially paving the way for more personalized and effective approaches to care.

We are grateful to over 850 patients who voluntarily participated in our genetics and biobank studies in 2024. Their commitment to building knowledge in behavioral health research is helping us explore the prevalence of rare diseases among patients treated for behavioral health symptoms, identify opportunities for earlier intervention, and deepen our understanding of genetic predispositions to behavioral health symptoms, and response and tolerance to specific medications.

There is so much to be done in our field, and we are excited and fortunate to have excellent partners, talented team members, generous donors, and a supportive board and leadership team. Thanks to their unwavering support, we have secured new resources to help sustain and grow our efforts. Together, we are driving meaningful progress in behavioral health and substance use research, and we remain committed to transforming the lives of those we serve through innovation and scientific excellence.



Sincerely,

**Kelly Piacsek, PhD**Executive Vice President of Research
Rogers Research Center

#### **Letter from our President and CEO**

As we reflect on this past year, I am proud of the way in which Rogers Behavioral Health has continued to advance innovation while delivering exceptional, evidence-based care to those we serve. In a rapidly changing healthcare landscape, our commitment to patient-centered care remains strong, and the work of the Rogers Research Center is central to driving our mission forward.

Research plays a vital role in Rogers' strategy, serving as a foundation for innovation and continuous improvement. The Research Center's ability to collaborate closely with clinical teams across our organization makes Rogers stand out as a translational research institution. By working directly with those providing care, we are uniquely positioned to answer critical questions about treatment effectiveness and bridge the gap between research and real-world application. This means we can bring innovative, effective treatments to our patients faster—breaking down barriers to implementation and improving outcomes in ways that set Rogers apart.

As a leader in specialty and subspecialty mental health care, Rogers has a long-standing reputation for excellence. The Research Center upholds that legacy by not only maintaining the highest standards but also charting new paths to improve care and expand access.

We are grateful to share the accomplishments of our research and clinical teams over the past year. Their dedication and collaboration continue to propel us forward, ensuring Rogers remains at the forefront of innovation and excellence in mental health care.



With gratitude,

Cindy Meyer, MSSW President and CEO

#### **Research Center 2024 Metrics**



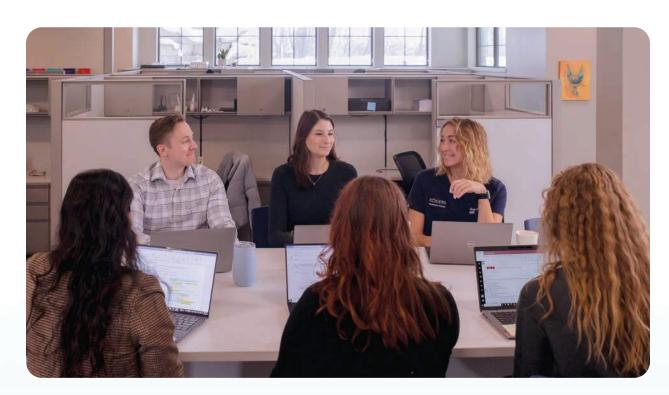
#### **Donor Acknowledgments**

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#### Eating disorder research and clinical partnership

Research shows that eating disorders have historically held the second highest mortality rate of any psychiatric illness, surpassed only by opiate addiction. To address the ongoing and increasing need for acute, individualized care, Rogers Behavioral Health established an Eating Disorder Center of Excellence. In healthcare, a Center of Excellence is an integrated team or entity that provides leadership, best practices, research, support, or training for a specific focus area. These centers are distinguished by their high standards in patient care, their novel research contributions, and their role in education within their field. At Rogers, a core attribute of our Eating Disorder Center of Excellence is synergizing research and clinical practice to foster innovation and improve treatment outcomes.

By working directly with clinicians, our researchers gain practical insights into patient needs, clinical workflows, data input, and treatment challenges. This collaboration allows them to design studies that address real-world issues, accelerating the translation of research findings into practice and ensuring any novel approaches are effectively implemented. For clinical staff, access to cutting-edge research not only supports evidence-based care but also enhances their ability to deliver personalized treatment. Together, researchers and clinicians bridge the gap between theory and practice. advancing the field and improving recovery rates for individuals navigating the complexities of eating disorders.



Another advantage of this partnership is access to large-scale datasets built from decades of systematically collected patient-reported outcomes. These retrospective data can provide new knowledge into the predictors (factors associated with treatment outcomes). mediators (factors influenced by treatment that affect outcomes), and moderators (factors determining for whom or under what conditions treatment is effective) of response to treatment among our patients. These findings will inform prospective research targeting critical indicators of treatment response, with many such efforts already underway.

Rogers provides treatment for the broad spectrum of eating disorders, and in collaboration with clinical teams, a few factors have been prioritized for further study. These include sleep as a predictor and moderator of response to treatment; other predictors like rapid weight gain or symptom reduction within the first four weeks of treatment; mediators like weight/ shape concerns, body image avoidance, and fear of food; and moderators like gender, diagnosis, baseline weight status, focusing on closer evaluation of patients with avoidant/restrictive food intake disorder (ARFID), a relatively newer diagnosis explored in greater depth on page 22 of this report. Analyses from these studies will provide a foundation for designing prospective studies to test novel treatment interventions and approaches. These studies will engage external collaborators in technology and academia to leverage the best innovations and expertise available.

Rogers' Eating Disorder Center of Excellence addresses a nationwide shortage of residential beds for the intensive treatment of eating disorders. It does this through expanding services as well as research and innovation efforts that reinforce our commitment to the highest quality, personalized care for long-term recovery.

"As the service line leader overseeing clinical care in our eating disorder programs, working with Dr. Zickgraf and the Research Center on eating disorder projects has been a dream. It is a top priority of



mine to ensure high quality, evidencebased treatment for our patients at Rogers, and partnering with Dr. Zickgraf helps us truly bridge the research-topractice gap that can so often occur in mental health. The questions we are able to address through her research have and will continue to inform improvements in our clinical care, for example, by being able to target predictors and moderators of outcomes with more precise and personalized interventions. In addition, this clinicalresearch partnership is allowing us to disseminate work in the field and re-establish Rogers as a thought leader in the area of eating disorder treatment."

— Nicole Stettler, PhD

#### The role of health economics in research

The research programs conducted by Rogers Research Center help provide the clinical and scientific evidence necessary to translate emerging treatments and technologies from experimental concepts to clinical care. However, adoption and implementation of new healthcare approaches also typically includes rigorous study of the cost effectiveness for patients, payers and healthcare systems when compared to the standard of care.

Health Economics and Outcomes Research (HEOR) is a field of research that evaluates the cost-effectiveness and real-world impact of clinical interventions. HEOR studies help provide essential data to inform evidencebased healthcare decisions and utilization. Recognizing the importance of this work, Rogers Research Center welcomed Dr. Kelly Parsons to the team at the beginning of 2024 to help grow its expertise and capacity in HEOR. Dr. Parsons brings extensive experience in clinical research, genetics, and molecular diagnostics, including experience generating and reporting on cost-effectiveness data in support of novel diagnostic testing.

Several current research initiatives have strong potential for HEOR analysis. One example is a study in development that will test whether a cranial electrotherapy stimulation (CES) device approved to treat anxiety and insomnia can help reduce acute mealtime anxiety for patients in Rogers' inpatient Eating Disorder Recovery Program. Patients receiving high intensity eating disorder treatment sometimes require interventions such as anti-anxiety medications, meal supplementation, or even feeding tube insertion, which requires a hospital transfer. If the study finds that using this CES device prior to meals reduces anxiety and improves patients' compliance withself-feeding, there may be evidence to also support



Dr. Kelly Parsons

the cost-benefit using CES compared to currently available interventions. For instance, the cost of the device could be offset by downstream savings, such as shorter lengths of stay, reduced readmissions, or fewer hospital transfers for feeding tube placement.

Pharmacogenomic testing for medication optimization is another high potential area for HEOR studies to inform clinical practice. Currently, this specialized genetic test that may be helpful in aiding a physician in medication selection is used sporadically and is often not covered by insurance. However, for patients experiencing frequent side effects requiring medical attention or taking multiple medications without significant symptom improvement, pharmacogenetic testing could provide insights that assist the physician in optimizing prescription medications, which may also provide cost-savings, or accelerate the path to recovery. By identifying safer medications or enabling physicians to reduce the number of prescriptions, this testing has the potential to deliver significant savings for both patients and insurers.

Projects like these illustrate Rogers Research Center's commitment to advancing cost effective clinical innovations. By integrating HEOR into our portfolio, the team is poised to address critical questions about the value and impact of emerging healthcare technologies with the goal of shaping a future where cutting-edge care is both accessible and affordable.

### Student engagement and research education at Rogers Research Center

While translational research is the Research Center's primary focus, mentoring and educating the next generation of research scientists is vital to inspire a future generation of curious learners and professionals. Several Research Center team members bring experience from academic medical centers and institutions where mentoring and training graduate students and postdoctoral fellows was integral to their roles. Although Rogers operates as a clinical institution rather than a training hospital, the Research Center engages in numerous student-facing educational opportunities.

#### **Summer internship program**

For the past two summers, the Research Center has welcomed undergraduate and early career interns. The internship program, open to current college students and recent college graduates, received over fifty applications in its first year. The team selected five exceptional candidates, three of whom returned for the summer of 2024.

"These outreach activities not only showcase the impactful work conducted at Rogers but also inspire the next generation of scientists and researchers."



#### Student engagement and research education at Rogers Research Center (continued)

The interns worked closely with principal investigators on a variety of projects, gaining hands-on experience in study design, data collection, and research analysis. For example, several interns collaborated with Dr. Rachel Schwartz on a clinician survey to assess treatment factors of Non-Fear-Based OCD and conducted preliminary coding for Dr. Schwartz's retrospective analysis examining perinatal OCD outcomes. Others contributed to Dr. Sheldon Garrison's work on pharmacogenomic testing, conducting data reviews to quantify test results to support ongoing studies.

#### **Community outreach and education**

Beyond Rogers Research Center's internal mentorship efforts, the team is committed to promoting careers in science and technology through community outreach. Dr. Kelly Parsons, whose expertise lies in genetics and genetic testing, engaged local middle school students during their genetics unit by delivering an interactive lecture. As part of the session, students conducted a hands-on experiment extracting DNA from strawberries using everyday household items, sparking curiosity and excitement

about the field of genetics. Dr. Kelly Piacsek - with a background in biomedical engineering - worked with High School students in a Health Careers class where she demonstrated how various medical devices work, and how multidisciplinary research teams come together through a variety of careers to conduct the research that helps demonstrate safety and efficacy of new medical technologies.

Similarly, Dr. Parsons and Dr. Piacsek have participated in high school career days. introducing students to diverse research career paths and detailing the educational steps required to pursue them. These outreach activities not only showcase the impactful work conducted at Rogers but also inspire the next generation of scientists and researchers. Dr. Piacsek was an invited speaker at the Medical College of Wisconsin's Advancement of Women in Science's Women's History Month grand rounds presentation and was a guest lecturer at Marquette University's Igniting Insights Leadership program. Dr. Piacsek also annually hosts undergraduate students who are enrolled in Marquette's eLEAD program for full-day leadership shadow experiences.

#### Biobank and genetics research

Completing its second full year of operations, the Rogers Research Center Biobank has shown significant growth, providing a solid foundation for both internal research and external studies with academic and industry partners. The Biobank expanded from a handful of collection sites in Wisconsin in 2023 to more than 40 collection locations nationwide, while also driving progress in two groundbreaking international genetics collaborations.

As the central hub for Rogers' genetics research, the Biobank dramatically increased the availability of high-quality genetic samples for research. This success will catalyze the launch of internal prospective genetics studies.

Externally, the Biobank team continues to excel in collaborative efforts. It leads the nation in participant recruitment for a landmark obsessive-compulsive disorder (OCD) genetics study led by the University of California San Francisco (UCSF), in partnership with institutions such as Yale, Harvard's McLean Hospital, and Massachusetts General Hospital. Additionally, the team is advancing its collaboration with a multinational group led by Baylor College of Medicine to uncover genetic risk factors for OCD unique to Latino, Brazilian, and Hispanic populations.

#### Key accomplishments in 2024

Locations

**Collection** Expanded the multi-site genetics biorepository serving multiple advanced behavioral health-related genetics studies. Forty different Rogers collection locations nationwide are recruiting including telehealth. Former patients are also recruited by mail.



#### Key accomplishments in 2024 Continued

#### Biobank Recruitment

The Biobank houses biological samples from 867 patients that are now available for genetics research studies and is quickly expanding collection via mail outreach.

### Recruitment

With 111 participants, Rogers is currently the leading study site in a large collaboration led by UCSF, which is aimed at identifying genetic risk factors of OCD and related behavioral health conditions.

#### Baylor Recruitment

Actively recruiting for a multi-national OCD genetics study in collaboration with Baylor College of Medicine, resulting in multiple manuscripts to date and 27 active participants.

### **Manuscripts**

Two manuscripts investigating treatable rare genetic diseases with behavioral presentations are currently under review in European Journal of Medical Genetics, a leading medical genetics journal, and the Orphanet Journal of Rare Diseases.

#### **Published Abstracts**

Two peer-reviewed abstracts investigating treatable rare genetic diseases with behavioral presentations were published in Genetics in Medicine.

#### **Collection Demographics**

#### **Levels of Care**

Intensive Outpatient	13%
Partial Hospitalization	
Residential	
Community	2%
Inpatient	

#### **Clinic Locations**

Brown Deer	16%
Community	2%
National Clinics	4%
Oconomowoc	
West Allis	17%
Telehealth	-

#### Sex

Female	58%
Male	41%

#### **Age Distribution**

Child/Adolescent	1%
Adult	99%

#### **Treatment Programs**

Depression	.17%
Eating Disorders	.7%
General MH	.4%
OCD and Anxiety	.21%
Substance Use	.30%
Trauma	.8%
All Others	.13%

#### **Race and Ethnicity**

Asian	2%
Black/African American	5%
Hispanic	7%
Native Populations	1%
Other/Undisclosed	9%
White	

#### **Journey of a Genetic Sample**



Participant donates a genetic sample



Collected sample shipped to the Rogers Research Center



Sample is de-identified



Sample is processed in a clean, specialized environment in the 1300 Series Class II, Type A2 Biological Safety Cabinet



The KingFisher™ Apex robot extracts purified genomic DNA that will be used for research



DNA quantity is measured as a quality control using the NanoDrop Eight Spectrophotometer



DNA quality is digitally measured using the E-Gel™ Power Snap Plus Electrophoresis System and then stored at -80°C



DNA is used for innovative clinical research

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#### Examining the clinical utility of pharmacogenomics testing



Medication management for individuals with behavioral health conditions can be complex, with frequent reports of side effects and limited therapeutic response. Underlying clinically significant genetic variations affecting an individual's biology further complicate the process of medication selection, resulting in highly variable symptoms that may require multiple medications, and potentially, several medication changes. Consequently, patients may exhibit reduced compliance and experience prolonged periods of adjustments to find the most effective medication and doses. One approach to streamline medication trialing and optimize dosing is pharmacogenomic (PGx) testing.

PGx testing evaluates small variations in an individual's genetic profile to provide

recommendations for medications that are less likely to result in side effects and more likely to be effective. PGx testing leverages patient-specific genetic insights that predict how the body breaks down (metabolizes) and uses (absorbs) a range of medications. Understanding these factors (called drug-gene relationships) may be key to medication management, ultimately improving medication compliance and patient outcomes, while reducing side effects and the need for medication changes.

This past year, Dr. Sheldon Garrison led a group of Research Center team members who conducted two large-scale retrospective analyses using electronic medical records to assess the clinical utility of pharmacogenomic testing. Their research aimed to compare clinical



outcomes between individuals whose medication choices were guided by PGx test results with those who did not undergo PGx testing. The first study examined 99 children and adolescents with autism spectrum disorder (ASD) receiving treatment for co-occurring anxiety and depression. Preliminary findings indicated that patients without gene-drug interactions, as indicated by PGx testing, were prescribed fewer medications. However, regardless of the number of medications prescribed, all 99 participants achieved comparable improvements in quality of life and symptom reduction. These findings were presented in an abstract at the American College of Medical Genetics annual meeting, which will be published in Genetics in Medicine Open. Additionally, a manuscript detailing this study is under review in a leading

journal. The second study focused on children, adolescents, and adults diagnosed with obsessive-compulsive disorder (OCD) who underwent PGx testing. Early results suggest that individuals without gene-drug interactions were generally prescribed fewer psychotropic medications than those with potential interactions. Future studies will include posttraumatic stress disorder and borderline personality disorder with co-occurring depression.

Study team: Sheldon Garrison, PhD (PI); Jeff Engelmann, PhD; Matthew Boyer, MD; Nicolette Weisensel, MD; Rachel Schwartz, PhD; Maharaj Singh, PhD; Martin Franklin, PhD; Amaya Ramos, MD; Sreya Vadapalli, MBS; Madeline Hartig, MS; Sophie Schweinert, BS; Zaira Chavez, BS

#### Rare genetic diseases in behavioral health: a comprehensive review of therapeutic strategies and diagnostic delay with paired economic impact analysis

This publication explores treatable rare genetic diseases (TRGDs) that cause neuropsychiatric symptoms and their significant challenges in diagnosis and treatment. It has been submitted to the Orphanet Journal for Rare Disorders for review.

#### **Key points include:**

#### **Treatment Challenges:**

Medications play a crucial role in the standard treatment of most psychiatric conditions. However, their effectiveness is limited if the underlying biological causes of the condition are not addressed by the medication.

#### TRGDs in Behavioral Health:

The review identified 108 TRGDs frequently misdiagnosed as primary mental health conditions, such as depression, anxiety, and obsessive-compulsive disorder. The presenting neuropsychiatric symptoms in these cases stem from the underlying TRGD.

#### **Diagnostic Challenges:**

Many TRGDs with neuropsychiatric symptoms face prolonged delays in diagnosis, averaging 7.7 years. During this time, individuals may be prescribed medications that do not improve the underlying TRGD and thus do not improve the neuropsychiatric symptoms.

#### **Economic Impact:**

The 108 TRGDs have a significant healthcare economic burden, with annual mental health-related costs exceeding \$4.2 billion for inpatient care in the US alone.

#### **Proposed Solutions:**

The study advocates for incorporating genetic testing, particularly exome sequencing, as a targeted tool for patients who exhibit treatment resistance or atypical symptom progression. Rather than a universal approach, genetic screening could be considered when clinical features suggest a potential underlying rare disease. This strategy can help distinguish between primary psychiatric conditions and genetic disorders, leading to more precise, condition-specific treatments.

This study underscores the importance of integrating genetic testing into behavioral health care to address diagnostic delays, improve patient care, and reduce economic burden.

Authors: Sheldon R. Garrison, PhD; Isaac J. Siegel, BS; Sarah L. Vaithilingam, MD; Madeline M. Hartig, MS; Ella C. Patty, Lily E. Mantsch

## Modulators of craving in women seeking intensive treatment for substance use disorders

Despite the abundance of research that has been conducted in the recent past, a significant gap in women's mental health and addiction care remains. According to the National Institute on Drug Abuse, men are more likely to use illicit drugs, but women are more susceptible to craving and relapse. Factors that might contribute to this disparity in the relapse rate have been understudied and are largely unknown. One possible explanation might be the influence of hormone levels on cue-induced craving and relapse. Studies of the effect of differing levels of various hormones impacted by the menstrual cycle can heighten the addictiveness of substances and reduce the efficacy of methadone maintenance therapy. Other studies found that hormonal changes can reduce the rewarding effects of certain drugs and decrease craving responses. Despite the sparsity of consistent findings within the literature, there is consensus that sex differences exist in brain activity in response to stress-induced cravings, cue-induced cravings, and relapse-related behaviors. Further research is necessary to better quantify the relationship between changes in hormone levels and substance use behavior and to understand mechanisms that might underlie these changes.

As a first step in this process, Drs. Jeff Engelmann and Michelle Maloney are conducting a retrospective study investigating the relationship between menstrual cycle data, medication use, and patient-reported outcomes in Rogers' Mental Health and Addiction Recovery program. Using these data, the study team will analyze whether a patient's menstrual cycle phase can predict scores on the Urge to Use Scale and on questions about craving and withdrawal symptoms on the Brief Addiction Monitor. Additional analyses

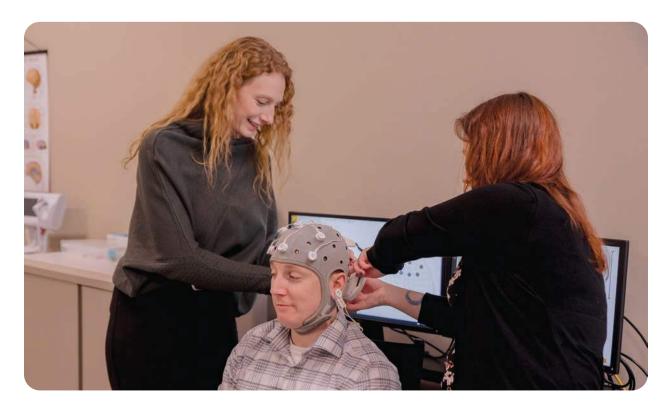


will impact whether the effectiveness of FDA-approved medications for substance use disorders is influenced by menstrual cycle phase.

If the study team finds evidence of a relationship between these factors. the long-term goal is to conduct prospective research that relates direct measurement of blood hormone levels to biomarkers of craving and relapse measured using electroencephalography (EEG), a reliable, valid, and non-invasive measure of brain activity. Direct measurement of hormone levels and EEG might allow for earlier and/ or more tailored interventions, such as identifying patients at an acute higher risk for relapse and providing them with additional support. With this work, the study team hopes to pursue funding opportunities to help close the gap in knowledge about women's mental health.

**Study team:** *Jeff Engelmann, PhD (PI); Michelle Maloney, PhD, NCSE, LPC, CAADC, CRPS* 

# Event-related potential predictors of outcomes in patients seeking intensive treatment for obsessive-compulsive disorder



Despite advances in medicine and therapeutic interventions, around 20% of individuals with obsessive-compulsive disorder (OCD) do not respond to conventional treatment methods. Understanding factors that may predict or contribute to an individual patient's limited response to standard of care can help treatment teams identify and mitigate potential barriers. Evidence is emerging that quantitative brain functional changes that accompany OCD symptom improvement during treatment may offer a direct measure of recovery. Not only will direct measures of mental health improvement aid in determining responses to novel interventions. but additionally, they will help establish meaningful baselines and models that may be predictive of treatment response for a variety of clinical presentations.

# "Around 20% of individuals with obsessive-compulsive disorder (OCD) do not respond to conventional treatment methods."

Electroencephalography (EEG) is a validated, non-invasive measure of the brain's electrical activity. EEG is portable, relatively inexpensive, and has few medical contraindications, making it a practical method to deploy in clinical settings to investigate the relationship between brain activity and treatment response. The data obtained from EEG recordings are measurements of waveforms elicited in response to events or stimuli. Extensive research indicates that the brain's response to making a mistake is amplified in individuals with OCD and/or anxiety

compared to individuals without those conditions. However, the magnitude of this brain response varies. While it is suggested that these variances may be explained by comorbidities, diverse symptom profiles, and medication use, clinical populations with such heterogeneous features are severely understudied.

Dr. Jeff Engelmann and his team have developed a study to measure the brain responses of patients with OCD/anxiety and comorbid depression while completing specific and well-studied cognitive tasks. The first task employed is a Flanker task, designed to induce errors and subsequently measure an individual's response to making errors. The research team will analyze a patient's brain activity in response to trials where they make a mistake compared to trials where they respond correctly. The second task, a Probabilistic Reward task, is designed to measure an individual's sensitivity to rewards. The EEG will measure brain reactivity of patients when presented with rewarding stimuli. Typically, individuals with depression demonstrate a weaker neural response to rewards, reflecting

a key characterization of major depressive disorder, known as anhedonia – a reduced ability to feel pleasure. A full study session takes approximately 60 minutes to complete, and participants are asked to complete up to three sessions over the course of their treatment program.

Altogether, the purpose of this study is threefold – 1) evaluate the impact of standard treatment on patients' error-response signal, 2) evaluate whether error-response at baseline (admission) predicts treatment trajectory and outcomes, and 3) explore the relationship between reward sensitivity and treatment outcomes in patients with OCD both with and without comorbid depression.

The study is enrolling patients ages 13+ with an OCD diagnosis and admitted to an OCD and anxiety residential program at Rogers.

The goal is to recruit 80 total participants – 40 with and 40 without comorbid depression.

**Study team:** Jeff Engelmann, PhD (PI); Katelyn Greenberg, MA; Holly Pelnar, BA; My Le Tran, BS

#### Written exposure therapy for moderate to severe PTSD

Among many effective interventions for posttraumatic stress disorder (PTSD), the most researched therapies include prolonged exposure and cognitive processing therapy. While these therapies are timetested and have well-established efficacy, they are also time- and effort-intensive for both providers and patients. Providers must complete rigorous training before they can administer either of these interventions, and for patients these treatments typically entail months of therapy and a considerable amount of homework. These factors can make the treatments difficult to complete

for some individuals, as demonstrated by dropout rates between 36-45%.

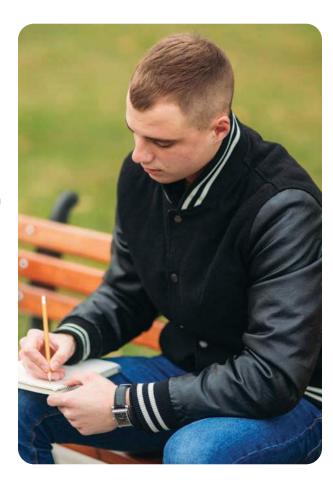
Fortunately, recent research suggests that another approach called written exposure therapy may be more tolerable and accessible, while being just as effective in treating PTSD. Written exposure therapy takes less time than standard PTSD treatments. In written exposure therapy, patients typically spend 30 minutes writing about their traumatic experience and its impact on their lives in just five weekly sessions. In addition to being more efficient

### Written exposure therapy for moderate to severe PTSD (continued)

and writing-based, written exposure therapy does not require between-session homework assignments. This may help to explain why, compared to other evidence-based therapies for PTSD, the dropout rates for written exposure therapy are lower, estimated to be between 6-24%. Increasing evidence also suggests that it is effective when delivered in a group format, via telehealth, and with adolescent populations. Taken together, this suggests that written exposure therapy may be a more acceptable, accessible, and cost-effective alternative to prolonged exposure or cognitive processing therapy.

In the summer of 2024, Rogers began written exposure therapy with some patient groups being treated for PTSD. To assess its effectiveness here at Rogers, the Research Center's Dr. Rachel Schwartz has proposed a retrospective analysis of treatment records for those who received this type of therapy. In this study, treatment outcomes of patients who received written exposure therapy will be compared to those who received prolonged exposure, which has been the standard therapy for PTSD at Rogers. The study team hopes to develop a better understanding of how effective written exposure therapy is compared to current standards of care at Rogers, as well as any predictors or moderators that may explain patterns of effectiveness among patients. Ultimately, the study team hopes that their findings can help inform ongoing program development efforts here at Rogers and to help inform the field on the effectiveness of this treatment approach in an intensive treatment environment.

"Compared to other evidence-based therapies for PTSD, the dropout rates for written exposure therapy are lower, estimated to be between 6-24%"



Study team: Rachel Schwartz, PhD (PI); Emily Golding, LCSW; Amanda Guiden, LCPC; Michael Smith, LCSW; Rae Anne Ho Fung, PhD, LP; Kelly Piacsek, PhD; Jeff Engelmann, PhD; Sreya Vadapalli, MBS; Maddie Hartig, MS

#### **Non-Fear-Based OCD presentations**

One of the most common interventions used at Rogers Behavioral Health to treat obsessive-compulsive disorder (OCD) is known as exposure and response prevention (ERP). While ERP is extremely effective, research has shown that about a third of patients with OCD do not entirely respond to ERP treatment. One explanation for this is that, while ERP is well suited for symptoms motivated by fear, not all patients with OCD necessarily have symptoms that are motivated by fear.

There are two prominent types of Non-Fear-Based OCD in which OCD symptoms are motivated by emotions other than fear. The first of these is "Not Just Right" (NJR) OCD. In this form, compulsions are performed to counteract an internal feeling of discomfort, "incompleteness," or things feeling "not just right." NJR is the primary OCD presentation in about 38% of cases and is associated with worse symptom severity, functioning, and quality of life compared to fear-based OCD. A second type of Non-Fear-Based OCD is disgust OCD, where feelings of disgust and revulsion are the drivers of rituals and avoidance. Disgust OCD is estimated to be the sole or primary presentation in about a quarter of OCD cases.

Since ERP was designed to target fear and anxiety specifically, in its standard form, ERP produces only limited relief for NJR and disgust symptoms. However, research suggests that when clinicians tailor ERP to be a better fit with Non-Fear-Based OCD, the treatment has good outcomes. While the implications of these findings can be life altering for those who experience Non-Fear-Based OCD, the best way to tailor this intervention to Non-Fear-Based OCD remains unclear. Many suggestions about how to tailor ERP have been made throughout the literature, but information is lacking on whether clinicians in the

community are knowledgeable of and regularly implementing these strategies, and whether there are any strategies being commonly utilized in practice that are not yet discussed in the scientific literature.

To address this gap, the Research Center's Dr. Rachel Schwartz is running a crosssectional survey study to identify common and helpful tailoring strategies that clinicians use when treating patients with NJR and disgust OCD symptoms. With this study, the research team aims to examine how clinicians' professional background and experience treating OCD is related to their perceptions on treating Non-Fear-Based OCD. The study entails a one-time online survey that asks mental health providers from diverse professional backgrounds questions related to demographic and professional background, experience treating OCD, and perspectives on tailoring ERP to NJR and disgust OCD. Findings from this study will be used to inform the development and testing of the first ever treatment protocol for Non-Fear-Based OCD.

**Study team:** Rachel Schwartz, PhD (PI); Martin Franklin, PhD; Jeff Engelmann, PhD; Hana Zickgraf, PhD; Sreya Vadapalli, MBS; Maddie Hartig, BS; Kelly Piacsek, PhD; Sophie Schweinert, BS; Rachel Lopez



### Advances in the management of pediatric OCD: Predictors, moderators, and new frontiers

Drs. Martin Franklin and Rachel Schwartz recently published an article titled, "Advances in the Management of Pediatric OCD: Predictors, Moderators, and New Frontiers." This article appeared in Springer's Current Developmental Disorders Reports in September 2024. It summarizes the literature on the effectiveness of exposure and response prevention (ERP) to treat pediatric OCD and evidence about predictors and moderators of patient outcomes, which is used to identify subgroups of patients who are not currently helped by available treatments.

In the review, Drs. Franklin and Schwartz describe robust literature finding ERP to be effective both alone and when combined with pharmacotherapy. Studies over many decades and from around the world have reported significant symptom reduction in 60-90% of patients and have recently begun

to include groups who receive telehealth in their analyses, including here at Rogers. Despite this extensive research base, the review highlights several important frontiers in the future of this work: more research is needed on using ERP in non-research settings, expanding access to treatment continues to be a pressing issue, and studies have failed to produce consistent findings about which factors predict and moderate the effects of ERP in pediatric OCD. Drs. Franklin and Schwartz argue that to advance this literature, more research is specifically needed on family accommodation (the ways in which family members modify their behavior to reduce a loved one's OCD-related distress, such as participating in compulsions, providing reassurance, or avoiding triggers) and Non-Fear-Based OCD, going into detail about how treatment might be tailored for clients with non-fearbased presentations.

# Toward a specific and descriptive definition of avoidant/restrictive food intake disorder: A proposal for updated diagnostic criteria

Avoidant/Restrictive Food Intake Disorder (ARFID) is a restrictive eating disorder characterized by an extreme avoidance of certain foods or overall restriction of food intake, driven by selective eating related to the sensory properties of food, fear of aversive consequences (such as choking or vomiting), or a general lack of interest in eating, rather than concerns about body weight or shape. ARFID was first introduced in the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 2013, marking

a significant step in recognizing restrictive eating patterns not driven by body image concerns. However, since its inclusion, ARFID has been a subject of ongoing debate. The current diagnostic criteria define ARFID solely based on its consequences – such as weight loss, nutritional deficiencies, or psychological distress – without clearly specifying the behaviors that cause it or requiring that specific behaviors, beliefs, or feelings be present for the diagnosis. Additionally, the most current version of the DSM (DSM-5-TR)



does not allow concurrent diagnosis of ARFID and other restrictive eating disorders like anorexia nervosa, even when symptoms overlap. The absence of a positive definition of ARFID in diagnostic criteria has made treatment development and clinical diagnosis more complex and may be limiting the generalizability and comparability of research, because different programs interpret and apply the diagnostic criteria differently.

To address these issues, a team of researchers, Drs. Zickgraf and Schwartz from Rogers Research Center and clinicians Drs. Cares and Stettler from the Rogers Eating Disorder Recovery program, collaborated to propose a revised framework that more precisely defines ARFID based on the emotions and behaviors underlying restrictive eating. Their work, published in the International Journal of Eating Disorders (IJED), presents a new approach aimed at improving diagnosis and treatment, ensuring patients receive care that reflects their full range of symptoms and lived experiences.

Building on Dr. Zickgraf's decade of research

on the specific eating behaviors that define ARFID and distinguish it from other eating disorders, and Drs. Cares' and Stettler's clinical experiences with complex eating disorder cases, the team propose a clearer definition of ARFID based on specific eatingrelated beliefs and emotions. This framework identifies three distinctive drivers of ARFID: disgust/distaste, lack of enjoyment/ uncomfortable fullness, and/or acute panic and fear. In the publication, the team explained how these features clearly differentiate ARFID from other eating disorders, and from OCD and anxiety disorders, which sometimes involve food avoidance and can be misdiagnosed as ARFID.

At Rogers, these refined criteria would allow clinicians to personalize treatment based on the emotions, beliefs, and behaviors driving a patient's restrictive eating. Also, individuals experiencing both ARFID and body image concerns would receive the diagnoses that accurately reflect their symptoms and lived experiences, ensuring all symptoms are recognized and treated.

# Toward a specific and descriptive definition of avoidant/restrictive food intake disorder: A proposal for updated diagnostic criteria (continued)

The next step in this research is to empirically evaluate the proposed criteria by applying them retrospectively to 405 patients treated for ARFID at Rogers since 2018 who gave us permission to use their data in research. This large-scale study will provide the most comprehensive evaluation to date of the three symptom profiles of ARFID in a clinical sample.

The article will appear in a special issue of IJED focused on advancements in ARFID research as a featured article. Invited

commentaries on the proposed criteria by other ARFID experts will appear alongside it. This work underscores the importance of collaboration between our research and clinically oriented psychologists in identifying and using cutting-edge, translational research methods to solve problems that directly affect patients.

Authors: Hana Zickgraf, PhD; Sam Cares, PhD, Rachel Schwartz, PhD, Courtney Breiner, PhD, Nicole Stettler, PhD

### Broadening the conceptualization of panic disorder: Insights for treating fear-ARFID

Accepted into Behaviour Research and Therapy journal, this publication explores the intersection between panic disorder and the fear-based presentation of avoidant/restrictive food intake disorder (fear-ARFID). Rogers Research Center's Drs. Hana Zickgraf and Rachel Schwartz propose a shared model of pathogenesis for these conditions, emphasizing interoceptive sensitivity—the heightened awareness and fear of bodily sensations—as a key maintenance mechanism for both conditions. This innovative perspective offers new insights into treating fear-ARFID, a relatively new diagnosis introduced in DSM-5, which currently lacks specific evidence-based treatments.

Drawing on the extensive research supporting panic control therapy (PCT) for panic disorder, the study outlines how core components of this treatment, such as interoceptive exposure, could be adapted to treat fear-ARFID. This approach could expand treatment accessibility by equipping anxiety-focused clinicians with familiar, evidence-based tools to address fear-ARFID effectively. The proposed model not only bridges the gap between eating disorder and anxiety research but also highlights the potential for tailored, mechanism-driven interventions to enhance patient care.

This work underscores the importance of collaborative, translational research in advancing our understanding of complex conditions and paves the way for further clinical studies to develop and validate targeted treatments for fear-ARFID.

**Authors:** Hana Zickgraf, PhD; Rachel Schwartz, PhD

## Leveraging technology in an adolescent dialectical behavior therapy program

The Nashotah Center at Rogers Behavioral Health in Oconomowoc, Wisconsin, is a residential treatment program for female adolescents up to age 18 who struggle with emotional dysregulation and related mental health conditions. This 16-bed facility provides a structured environment where residents typically stay between 60 to 90 days.

The program emphasizes dialectical behavior therapy (DBT), a type of cognitive behavioral therapy (CBT) designed to help individuals manage intense emotions, improve relationships, and develop coping strategies. In collaboration with Dr. Eric Ulland, MD, Medical Director for the Nashotah Center, and his team, the Research Center is evaluating clinical feasibility of several studies evaluating the use of consumer devices to enhance treatment and patient experience within the program.

#### **Virtual Reality**

Mindfulness exercises are a core component of DBT, with the goal of teaching individuals to be present in the moment, increase self-awareness, and reduce impulsive reactions and judgement. The Nashotah Center practices daily mindfulness exercises through a variety of facilitated and selfguided practices, reflection, and journaling. With the rapid advancement of commercial virtual reality (VR) technologies, the team has evaluated a VR headset-based system to use in addition to, or in place of, current self-quided mindfulness technologies, such as a portable audio player and computerbased audio tracks. Virtual reality (VR) imagery provides a computer-generated three-dimensional simulation that utilizes images, sounds, and other sensory input to create immersive, realistic user experiences. The virtual environment is presented through



a headset containing an integrated screen and sound system. The use of VR-based technology in clinical practice has rapidly evolved in recent years. Applications in the mental health space include exposure therapy, mindfulness, meditation, emotional regulation, and attention practice. Not only does evidence suggest VR may aid in improving clinical outcomes, but it also is highly appealing to patients, improving the quality of therapeutic activities, which has the potential to improve compliance and engagement. A study of the use of VR will begin early 2025 with two key aims: first, to evaluate patient preferences related to the feasibility and acceptability of the technology, and second, to evaluate the effect of the availability of VR on patient engagement with mindfulness practices and how that impacts patient treatment outcomes.

### Leveraging technology in an adolescent dialectical behavior therapy program (continued)

#### **Biometric Assessment**

Two other core areas of DBT treatment include an emphasis on improving distress tolerance - one's ability to cope with crisis situations without resorting to selfdestructive behaviors, and emotion regulation - their ability to understand, manage and change intense emotional responses. Throughout treatment, patients practice and perfect skills to help them improve in these areas. Patients must be both mentally and physically prepared to engage in treatment for it to be effective. In addition, as patients improve their tolerance in these areas, their bodies also respond differently to stress and uncertainty. Because of this insight, it is of great clinical and scientific interest to identify ways to measure physiological readiness for, and response to, treatment in this environment. Fortunately, significant technological progress has been made in consumer wearable devices, which are

becoming increasingly common to track activity and monitor health. As such, these wearable devices now incorporate advanced algorithms capable of measuring 20+ biometric variables related to activity, stress, sleep, and overall health in devices that can be worn on a wrist or finger. Accordingly, the research center is collaborating with Dr. Ulland and the Nashotah Center clinical team to advance a study using a wearable biometric ring to evaluate sleep and key cardiovascular functions including resting heart rate, heart rate variability, and respiratory rate. The team hypothesizes that these measurements will correlate with treatment experiences and milestones, and will aid clinicians in quantifying, and possibly even predicting, treatment readiness and response.

**Study Team:** Erik Ulland, MD (PI); Elizabeth Wall, APNP; Kelly Piacsek, PhD; Jeffrey Engelmann, PhD; Katelyn Greenberg, MA; My Le Tran, BS

## Alpha-Stim in managing mealtime anxiety for eating disorders

Eating disorders (ED) are a severe form of psychopathology affecting approximately 8% of women and 2% of men in the United States. Eating disorders, including anorexia nervosa (AN), bulimia nervosa (BN), and avoidant/restrictive food intake disorder (AFRID) are characterized by restrictive eating and/or inappropriate compensatory behaviors (i.e., purging or excessive exercise) that directly impact weight, nutritional status, hydration, and electrolyte balance.

As a result, these diagnoses are associated with one of the highest morbidity and mortality rates of any psychiatric diagnosis. Additionally, EDs are associated with elevated suicidal ideation and behavior. The rate of suicide greatly contributes to the high mortality rates of EDs, accounting for nearly 20% of deaths with anorexia nervosa.

One of the primary concerns addressed in ED treatment programs, including those

### Alpha-Stim in managing mealtime anxiety for eating disorders (continued)

at Rogers Behavioral Health, is food-related anxiety and food refusal. While anxiety is an expected part of treatment typically managed with cognitive behavioral therapy (CBT), approximately one third of patients require additional strategies for management of this acute anxiety. These may include a reduced meal plan, naso-gastric tubefeeding, one-to-one support from program staff, or fast-acting anxiolytics (i.e., benzodiazepines). Although necessary to combat the dangerousness of food refusal, these interventions sometimes interfere with patients' routine treatment and/or slow their progress toward meeting the program goals required for discharge to less intensive levels of care.

In response to this concern, Dr. Hana Zickgraf and her team have developed a study to investigate the effectiveness of an alternative to managing mealtime anxiety. Alpha-Stim is a non-invasive, cranial electrotherapy



stimulation device with FDA-clearance for anxiety, pain, and insomnia. This device delivers tiny, painless currents of electricity to the brain via electrodes worn as ear clips, serving to regulate brain activity and provide rapid, lasting symptom relief. Alpha-Stim may be preferable to other short-term interventions, helping patients meet the goals of their treatment program and discharge to lower levels of care more quickly, without hindrance to concurrent therapies or the side effects of medications. Finally, this well-tolerated and portable device can be either clinician- or selfadministered, making it adaptable across all levels of care.

The protocol for a pilot trial is currently undergoing Institutional Review Board review and will be submitted to the Wisconsin Department of Health and ClinicalTrials.gov. The pilot aims to recruit adult inpatients receiving treatment for EDs who are experiencing anxiety about eating that interferes with their treatment at Rogers and might require medication, tube feeding, or a longer inpatient stay. A pilot is intended to evaluate on a small-scale whether Alpha-Stim is altogether a practical, satisfactory (for both patients and clinicians), and effective method of managing anxiety symptoms. The device will be administered in addition to standard of care CBT at Rogers.

**Study Team:** Hana Zickgraf, PhD (PI); Peter DeVries, MD; Kelly Parsons, PhD; Jeffrey Engelmann, PhD; Maharaj Singh, MD; Katelyn Greenberg, MA; My Le Tran, BS

### Characterizing and predicting incidents of seclusion and restraint in child and adolescent inpatients

Seclusion and restraint are procedures utilized in psychiatric settings in response to patients who exhibit behavior that poses an immediate risk of harm to themselves or others. Restraint – referring to the physical restriction of a patient's ability to move, and seclusion – referring to the involuntary confinement of a patient to a room or enclosed area, are used as a last resort when less restrictive measures have been ineffective, and patient or staff safety is at risk. Prior studies have concluded that on average, 7% of individuals treated at the inpatient level are involved in an incident of seclusion and restraint, with this value ranging from 0-23%. These interventions are carefully regulated and only initiated by staff who receive significant training and demonstrate competency in the techniques. Despite this, seclusion and restraint can be controversial and have broad impact on patients, care providers, and organizations. While seclusion and restraint have been well-studied and carefully trained in mental health environments, the variation in incidents, including both staff and patient characteristics, makes analysis of trends difficult. For instance, not only do the incidents of seclusion and restraint vary significantly among institutions, but also between mental health services within the same institution.

At Rogers Behavioral Health, trends in the incidence of seclusion and restraint, particularly in the Child and Adolescent Mental Health Recovery inpatient program, have led physicians to inquire about potential methods of predicting the likelihood of incidents based on both patient and environmental factors. If predicted effectively, there is potential to reduce the frequency of such events, and therefore, improve the overall safety of the units



### Characterizing and predicting incidents of seclusion and restraint in child and adolescent inpatients (continued)

and the treatment benefits to all patients. In response, the inpatient units at Rogers have implemented the Brøset Violence Checklist, a short-term violence prediction instrument. This measure evaluates six key behaviors: confusion, irritability, boisterousness, verbal threats, physical threats, and attacks on objects. Implementation of the Brøset Violence Checklist as a risk assessment is hypothesized to help reduce seclusion and restraint incidents by early identification and intervention of contributing factors.

Rogers Research Center will retrospectively analyze the patient and environment-related characteristics surrounding incidents of seclusion and restraint within Rogers' Child and Adolescent Mental Health Recovery inpatient program. The models built from real world patient data will aid in revealing patterns that may account for site and seasonal trends in seclusion and restraint over the past several years. The team will utilize data from the Brøset Violence Checklist to identify risk factors and compare frequency of seclusion and restraint incidents before and after its implementation. The study proposal was approved by Rogers Institutional Review Board in late 2024.

**Study team:** Kelly Piacsek, PhD (PI); Hemalatha Rajanna, MD; Jeff Engelmann, PhD; Maharaj Singh, PhD; Sreya Vadapalli, MS; Katelyn Greenberg, MA

## Psychometric evaluation of eating disorder and OCD and anxiety assessments at Rogers

Measurement-based care is central to Rogers' mission of providing data-driven. personalized, and evidence-based treatment. All Rogers patients complete comprehensive self-report symptom assessments when they admit to a treatment program and provide updates on their progress every two weeks and at discharge. The set of assessments a patient completes at various time points is referred to clinically as a "battery." To ensure a balance between respecting our patients' time and effort and collecting the information clinicians need to evaluate progress, Dr. Hana Zickgraf, in collaboration with Drs. Nicole Stettler (Eating Disorder Recovery) and Martin Franklin (OCD and Anxiety) will evaluate the factorial and predictive validity of the measures in each service line's admission.

progress, and discharge batteries. This collaboration leverages Dr. Zickgraf's expertise in statistical evaluation of the properties of patient self-report outcome measures, including 1) factorial validity and measurement invariance, and 2) item uniqueness and predictive validity.

Factorial validity and measurement invariance analyses for every measure in each battery will help us make sure that they all measure the intended symptoms equally for patients with different symptom profiles or personal characteristics (e.g., age, gender) that might influence how they understand and respond to self-report questionnaire items. If any measures or items are found to work differently for different groups of people, we can account for these

## Psychometric evaluation of eating disorder and OCD and anxiety assessments at Rogers (continued)

differences in the scoring system, so that the data clinicians see is meaningful and informative for every patient.

Item uniqueness and predictive validity analyses will help us to identify questionnaires or individual items on assessments that may not be providing useful information about the treatment progress of our patients. By identifying pairs or groups of items that provide redundant information, and questionnaires that fail to predict symptom outcomes, we will streamline the assessment batteries so that patients are only asked to respond to items that provide unique and meaningful information about their symptoms and progress in treatment.

This work bridges rigorous data analysis with clinical practice to enhance patient outcomes. These analyses are made possible by the large archival datasets available at Rogers. By refining the measurement characteristics of Rogers' assessment batteries, we ensure that the data collected from patients is both clinically relevant and actionable. These improvements will allow clinicians to track patient progress more accurately, tailor interventions more effectively, and reduce unnecessary patient burden. Beyond Rogers, these findings contribute valuable insights to the broader eating disorder and OCD/ anxiety research communities, reinforcing the role of measurement-based care in driving evidence-based treatment advancements.

**Study team:** Hana Zickgraf, PhD; Nicole Stettler, PhD; Martin Franklin, PhD



### Advancing pediatric OCD treatment through expert collaboration

Expanding the reach of high-quality, evidence-based care for pediatric obsessive-compulsive disorder (OCD) necessitates continuous education and specialized training for clinicians. To address this, Dr. Martin E. Franklin, an internationally renowned expert in the cognitive-behavioral treatment of OCD and related conditions, has spearheaded initiatives to disseminate advanced treatment strategies to the broader clinical community.

Dr. Franklin serves as the Executive Clinical Director of OCD and Anxiety Services at Rogers Behavioral Health and is an Associate Professor Emeritus of Clinical Psychology in Psychi-



atry at the University of Pennsylvania School of Medicine. Authoring over 265 scholarly works and delivering lectures worldwide on OCD, trichotillomania, Tourette Syndrome, and related disorders, Dr. Franklin has dedicated more than three decades of his career to understanding and treating OCD across all ages. Notably, he co-authored the treatment manual "Treating OCD in Children and Adolescents: A Cognitive-Behavioral Approach," which offers a comprehensive framework for clinicians.

In collaboration with Dr. John Piacentini, a UCLA Professor of Psychiatry and leading authority on pediatric anxiety and OCD, Dr. Franklin developed specialized training programs aimed at enhancing clinician proficiency in managing complex pediatric OCD cases. In April 2024, they conducted a continuing education workshop in Los Angeles called "Navigating Treacherous Waters: Clinical Management of Partial and Non-Response in Pediatric OCD." The workshop received overwhelmingly positive feedback from clinician attendees, underscoring the demand for advanced, research-driven treatment approaches.

Drs. Franklin and Piacentini presented a condensed version of the workshop at a meeting of the Philadelphia Behavior Therapy Association and again at the annual meeting of the Association for Behavioral and Cognitive Therapies (ABCT) Master Clinician Workshop Series in Philadelphia in November 2024. Through collaborative educational initiatives, Dr. Franklin continues to contribute his expertise to the field of pediatric OCD treatment. Drs. Franklin and Amanda Heins, Clinical Supervisor for Rogers' Adolescent OCD and Anxiety Residential program in Wisconsin, presented a similar workshop at the annual meeting of the Anxiety and Depression Association of America in April 2025 in Nevada. Drs. Piacentini and Franklin have submitted workshop proposals to conduct this same training at the annual meetings of the American Academy of Child and Adolescent Psychiatry in Chicago in October 2025, and again at the annual ABCT meeting in November 2025 in New Orleans.

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