Using Technology To Treat Panic Attacks: An Interview With Robert Cuyler, Ph.D. (https://www.openminds.com/market-intelligence/editorials/addressing-unnecessary-spend-app-discussion-palo-alto-health-science-chief-clinical-officer-robert-cuyler-ph-d/)

Feature Article | *by* Robert N. Cuyler, Ph.D. (https://www.openminds.com/team-members/robert-n-cuyler-ph-d/) | October 28, 2016

When it comes to clinical treatment technologies, there are what seems to be a never-ending supply of options. To get a better understanding of tech innovations in practice *OPEN MINDS* recently spoke with Robert Cuyler, Ph.D., chief clinical officer for Palo Alto Health Science (http://pahealthsciences.com/) (PAHS), about how his organization's new technology facilitates treatment of panic disorder. The treatment, Freespira (http://freespira.com/), is a a novel, FDA-cleared intervention for the treatment of panic disorder and the symptoms of attacks in adults age 18 and older. *OPEN MINDS* has categorized the many clinical treatment tech options into seven functions – with Freespira falling into the relapse prevention group (see The Health & Human Service Executive's Blueprint For Tech Strategy Development (https://www.openminds.com/?p=748284) for detail).

Freespira is an at-home therapy that trains individuals diagnosed with panic how to adjust their breathing to control and normalize their respiratory patterns, including the key variable: exhaled carbon dioxide (EtCO2) levels. The technology samples, measures, and transmits the user's EtCO2 levels and respiratory rate (RR) to an app where the two biomarkers, EtCO2 and RR are displayed as part of a structured treatment protocol.

The system can also be rented on a self-pay basis (and can be eligible for HSA/flexible-spending account coverage). Current self-pay rate is $499 for a month of treatment. Most clients return the system after that, but have the option to extend at the rate of $149 per month. PAHS is currently engaged in Quality Improvement (QI) programs with payers and health systems to cover Freespira for plan members.

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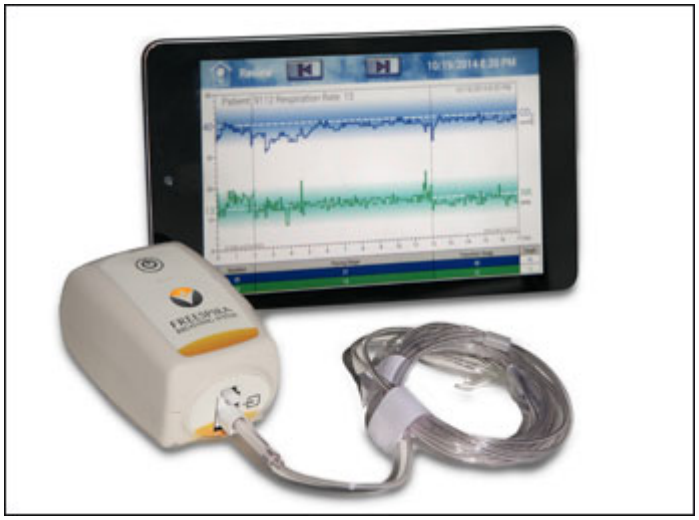
***OPEN MINDS*: How does Freespira work?**

Dr. Cuyler: Panic disorder (PD) is associated with very high utilization of medical resources and dollars. It affects roughly 2.7% of the population, part of the 27 million Americans a year who will have a panic attack. We recently commissioned work from a data analytics group with access to insurance claims data for a half million lives. They looked at a group of individuals with one or two claims for panic disorder compared to a matched group of healthy controls and found $5,000 per year in excess spending per person for the PD group. That's $15,000 extra over three-year

period. Panic sufferers primarily present in emergency department and to primary care and specialist physicians. Only a quarter initially seek behavioral health care. In medical settings, where their panic may not be initially diagnosed, they often undergo understandable but unnecessary tests, such as cardiac work-ups.



Freespira is a non-drug intervention for the treatment of panic. It can be used as a stand-alone intervention if patients have panic attacks but the rest of their life is good, or as an adjunct for the individual who also needs other forms of behavioral health care. Panic is a complex condition with frequent comorbidity, including substance abuse, depression, migraine, and other anxiety disorders such as agoraphobia and PTSD.

Panic patients typically exhibit dysfunctional breathing patterns, notably hyperventilation, leading to chronically low EtCO2 levels. The resulting chronic respiratory imbalance then affects blood chemistry and sets the stage for the vulnerability to acute panic episodes. Freespira trains the patient to normalize EtCO2 levels by stabilizing their respiratory rate and reducing respiratory volume, normalizing oxygen/carbon dioxide balance over the four-week treatment period.

The EtCO2 sensor is linked via Bluetooth to a tablet computer running custom software that coaches clients to pace their breathing and normalize EtCO2 levels. The intervention is clinician-directed and used at-home for four weeks, twice daily for 17 minutes each session. The physiological feedback of respiratory rate and exhaled CO2 allows the client to learn a breathing style that normalizes their respiratory physiology. Data from each treatment session is uploaded to the PAHS secure server, which enables treating clinicians to monitor their clients' compliance and progress remotely. Client training for Freespira can also be delivered by secure video, enabling access to the treatment for individuals who are distant from a trained provider, or who suffer from agoraphobia, a frequent comorbid condition, which may make that individual reluctant to seek care requiring even brief travel.

What are the organizational competencies necessary for the successful adoption and use of this technology?

The recommended protocol consists of an initial clinician training (in office or via secure video) followed by brief weekly reviews over the next month for monitoring progress and compliance.

It is really notable that this is a use-at-home therapeutic. It's authorized by a professional and the consumer is trained by a professional, but the treatment is delivered at home with session by session guidance from the App with remote review. In this way, we know clients are getting the therapy they need. We think the relationship with the clinician, and assurance that app will deliver the intervention the way it needs to be delivered every time, optimizes clinician/client engagement and consumer compliance.

The uploaded session dataset provides the potential for research on aggregate data as well as for individualized care at the practice level. In my own use with clients, I get on my secure portal and see that my client is using the treatment and see that they are successful at it. For example, I saw a client who was one week into the program, and on a graph of her EtCO2 level and respiratory rate I saw these spikes and

dips on just one day. She told me that night she was attempting the treatment and talking to her husband at the same time. Because of the data, I could tell her that she needed some private time — and I could not have spotted her compliance challenge without the availability of data-on-demand.

A *health care professional can be trained to competence in approximately one hour. Training and technical support are provided by PAHS to practitioners and health systems. The economic impact of panic is often unrecognized or underestimated, and health systems and payers benefit from data analytics that establish baseline and post-treatment spending. Increased recognition of the disorder and awareness of this additional intervention can promote access to this emerging evidence-based treatment.*

What outcomes and efficacy has your tech provided for consumers, and how do consumers feel about using the technology as part of treatment?

Freespira uses a treatment protocol originally researched at Stanford for teaching individuals with panic disorder how to normalize their EtCO2 and RR. In their published RCT, use of this protocol resulted in significant reductions in panic attacks and panic symptoms immediately post treatment lasting to at least 12 months. In fact, 68% of subjects were panic-attack-free one year following completion of this one-month intervention, and 96% of subjects had clinically-significant reductions in panic symptoms. The majority of subjects were in remission immediately post treatment to 12 months post treatment, defined as a PDSS score< 5.

A subsequent Freespira multi-center clinical trial, led by key clinicians in the anxiety and depression field, has been completed with results that are comparable or better than the academic trials; more than 65% were panic attack free with PDSS <5 at 12 months post treatment. No adverse events have been reported in clinical or commercial use.

Evidence points to very positive consumer acceptance. Multiple patient satisfaction surveys have established that approximately 90% of users would recommend the intervention to friends or family. Users in commercial and clinical trial settings completed at least 85% of the recommended 56 sessions in the course of the intervention, demonstrating very high treatment adherence, particularly for a consumer-directed, at-home intervention.

Plus, many clients express a desire to use a drug-free treatment for panic. Freespira has been adopted by many individual- and group-practice mental health professionals.

(See Just Breathe: A New Treatment Offers Promise For Reducing Panic Attacks (http://pittsburghquarterly.com/pq-health-science/pq-health/item/1226-just-breathe.html)).

What are your future plans for expanding this or other tech use?

Dr. Cuyler explained that health plans and health systems have expressed keen interest in offering a safe, effective, and affordable intervention to this population, broadening the possible future for this treatment and additional tech developments.

The scientific literature and industry claims data demonstrate that panic sufferers are very high utilizers of health care resources, with most of that spending in the medical sector (rather than behavioral health sector) related to emergency department visits, pharma costs, diagnostics, and medical visits. When symptoms become chronic, as they often do, recurrent spending, diminished quality of life, and functional impairment follow.

Currently, we are partnering with Allegheny Health Network and Highmark Health, and we are in various stages of implementation with five other major payers and health systems.