

**COUNTY OF LOS ANGELES – DEPARTMENT OF MENTAL HEALTH
MENTAL HEALTH SERVICES ACT ADMINISTRATION
INNOVATION (INN) PROPOSAL**

Project Name: Biofeedback Therapy for Children and Youth

Total amount INN requested: \$ 18,150,800

Proposed Duration of project: 5 years

General Requirement

An Innovative Project must be defined by one of the following general criteria. The proposed project:

- Introduces a new practice or approach to the overall mental health system, including, but not limited to, prevention and early intervention
- Makes a change to an existing practice in the field of mental health, including but not limited to, application to a different population
- Applies a promising community driven practice or approach that has been successful in a non-mental health context or setting to the mental health system
- Supports participation in a housing program designed to stabilize a person's living situation while also providing supportive services onsite

Primary Purpose

An Innovative Project must have a primary purpose that is developed and evaluated in relation to the chosen general requirement. The proposed project:

- Increases access to mental health services to underserved groups
- Increases the quality of mental health services, including measured outcomes
- Promotes interagency and community collaboration related to mental health services or supports or outcomes
- Increase access to mental health services, including but not limited to services provided through permanent supportive housing

Introduction

Biofeedback therapy is a type of complementary and alternative medicine (CAM) that uses electronic devices to help people with self-regulation and self-control. Biofeedback is often used to treat Attention Deficit Hyperactivity Disorder (ADHD), anxiety, depression, and pain. It can also help people with trauma recover from their experiences. The history of biofeedback can be traced back to the early 1900s when researchers began to study the relationship between the mind and the body. In the 1960s, researchers developed devices that could measure physiological responses, such as heart rate and blood pressure. These devices were used to help people learn to control their bodily functions. In the 1970s, biofeedback began to treat various conditions, including stress, anxiety, and pain.

In Los Angeles County, biofeedback is available in the private sector and at a high cost. Two types of biofeedback include Infra- Low Frequency (ILF) neurofeedback and sensory therapy; both use technology to offer immediate feedback to the user. Biofeedback therapy is typically a short-term treatment lasting 12-20 sessions. During each session, the client will work with a therapist using a biofeedback device to monitor the client's progress and provide feedback.

Trauma Treatments

Biofeedback therapy has been identified as an effective trauma treatment. In a study published in the *Journal of Traumatic Stress*, researchers found that biofeedback therapy was effective in reducing symptoms of Post-Traumatic Stress Disorder (PTSD) in veterans¹. The study found that biofeedback therapy was more effective than a control group that received traditional therapy.

Bessel Van Der Kolk (2014) studied the effects of neurofeedback in children and adults in his book *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. Van Der Kolk found that “20 sessions of neurofeedback resulted in a 40% decrease in PTSD symptoms in a group of participants with chronic histories of trauma who had not significantly responded to talking or drug therapy” (p. 330)².

In her book, *Neurofeedback in the Treatment of Developmental Trauma: Calming the Fear Driven Brain*, Sebern Fisher, Ph.D., provides a comprehensive overview of neurofeedback and its use in treating developmental trauma. Fisher discusses the underlying brain mechanisms of developmental trauma, the benefits of neurofeedback, and the different types of neurofeedback that can be used to treat developmental trauma. Fisher also provides case studies of patients who have benefited from neurofeedback treatment. These case studies illustrate the power of neurofeedback to help people with developmental trauma heal and recover.³

The sensory therapy proposed in this project uses positive psychology and technology to help people who have experienced trauma. The approach helps people to:

- Identify their strengths and resources. Trauma can make people feel like they have lost their sense of self. Positive psychology can help people to identify their strengths and resources, which can give them a sense of hope and resilience.
- Focus on positive experiences. Trauma can make it difficult for people to focus on positive experiences. Positive psychology can help people to focus on the good things in their lives, which can help them to feel more connected to others and the world around them.
- Develop healthy coping mechanisms. Trauma can cause people to develop unhealthy coping mechanisms, such as substance abuse or self-harm. Positive psychology can help people to develop healthier coping mechanisms, such as exercise, relaxation techniques, or journaling.

Sensory therapy uses various techniques, including:

- Guided imagery: This technique uses visualization to help people relax and focus on positive experiences.

¹ Panisch LS, Hai AH. The Effectiveness of Using Neurofeedback in the Treatment of Post-Traumatic Stress Disorder: A Systematic Review. *Trauma Violence Abuse*. 2020 Jul;21(3):541-550. doi: 10.1177/1524838018781103. Epub 2018 Jun 11. PMID: 29890906.

² Van der Kolk, B. A. (2015). *The body keeps the score: Brain, mind, and body in the healing of trauma*. New York, NY: Penguin Books.

³ Fisher, S. F. (2014). *Neurofeedback in the treatment of developmental trauma: Calming the fear-driven brain*. New York, NY: W. W. Norton & Company.

- **Biofeedback:** This technique uses sensors to measure physiological responses, such as heart rate and breathing, and provides feedback to help people learn to control these responses.
- **Mindfulness meditation:** This technique helps people to focus on the present moment and to become more aware of their thoughts and feelings.

Sensory therapy is designed to be a safe and supportive environment for people to explore their experiences and learn new coping mechanisms. The therapy is also intended to be flexible and can be adapted to meet the individual needs of each participant.

Primary Problem

The children, youth, and families served by the Los Angeles County Department of Mental Health (LACDMH) are exposed to chronic and prolonged trauma and stressors resulting in symptoms associated with several mental health disorders including, but not limited to, anxiety, depression, attention deficits, sleep and appetite disorders, behavior disorders, psychotic symptoms, and emotional disturbances impacting their brain's ability to self-regulate and function to its full capacity. This increased after the Covid 19 pandemic. In 2021, the United States Surgeon General released an advisory highlighting the urgent need to address the nation's youth mental health crisis. It is essential to support our children and youth in their pursuit of optimal self-regulation, increasing their capacity to appropriately adapt their thoughts, feelings, and behaviors in various situations to achieve optimal well-being and reduce or prevent the more harmful symptoms associated with chronic and severe mental illnesses⁴.

Biofeedback therapies can assist children and youth with improved self-regulation to address trauma and stressors. LACDMH proposes implementing biofeedback therapies, a new practice in the public mental health system which will increase access to underserved groups. To achieve optimal well-being and reduce or prevent the more harmful symptoms associated with chronic and severe mental illnesses.

Supporting children and youth's mental health requires a sustained workforce. The mental health workforce shortage is a serious problem in the United States. According to the Substance Abuse and Mental Health Services Administration (SAMHSA), by 2025, the U.S. will be short about 31,000 full-time equivalent mental health practitioners⁵. This shortage is due to several factors, including:

- **Increased demand for mental health services:** The number of people seeking mental health services has been increasing in recent years due largely to the rising rates of chronic mental illness, the increasing awareness of mental health issues, and the decreasing stigma associated with seeking help.
- **Decreasing supply of mental health professionals:** The number of professionals graduating from training programs has not kept pace with the increasing demand for

⁴ Office of the Surgeon General (OSG). Protecting Youth Mental Health: The U.S. Surgeon General's Advisory [Internet]. Washington (DC): US Department of Health and Human Services; 2021. PMID: 34982518.

⁵ Delphin-Rittmon, M. (2023, March 8). How SAMHSA Is Tackling the Mental Health Workforce Shortage. MedCity News. Retrieved June 16, 2023, from <https://medcitynews.com/2023/03/how-samhsa-is-tackling-the-mental-health-workforce-shortage/>

services. High rates of burnout have been identified as another contributor to the decrease in the supply of mental health professionals.

The proposal to use biofeedback with children and families in the LACDMH system is intended to support the mental health workforce by improving mental health outcomes for clients, which in turn can lead to increased job satisfaction for mental health professionals.

Infra-Low Frequency Neurofeedback

ILF Neurofeedback is a function-focused intervention that builds and strengthens brain functioning by giving the brain feedback to itself to promote self-regulation and self-control. The specific application involves placing sensors on the head to read brainwave activity, processing the signal by computer, and showing the activity back to the brain using visual, tactile, or sensory feedback. Staff will be trained to use ILF neurofeedback therapy.

Sensory Therapy

This proposed intervention is designed to provide clients with a simple and effective way to manage their mental health. This proposal outlines a web-based voice analysis program that measures emotional states and provides users with instant binaural beats and biofeedback. This program aims to improve mental health outcomes for youth by providing easy-to-use tools.

Implementation of the proposed intervention requires the following:

- **Software Subscription**

- **Voice analysis technology:** The program uses voice analysis technology to measure the energy and frequencies in a person's voice to determine their emotional state. The voice analysis will give the user a real-time understanding of their emotions and help them regulate their mood. Clinical staff will be trained to assist youth in using the web-based voice analysis technology to create positive goals and set positive intentions. The frequencies in the voice are analyzed in the web-based software to determine the vibration of that specific thought and recommend a sensory therapy that amplifies those frequencies. Next, a guided breathing exercise helps to regulate the nervous system. Finally, using the breath and mindset as the guide, the sensory process begins and can be followed independently.
- **Instant binaural beats:** Binaural beats are a form of auditory therapy that involves listening to different frequencies in each ear. The program provides users instant binaural beats tailored to their emotional state and the desired goal. These beats will help the user to achieve a relaxed state and reduce stress. Clients may use this outside session as a coping skill to reduce stress.
- **Self – administered mood evaluation:** The program includes a mood journal feature that will allow users to monitor and improve their mood over time. The mood journal will help users identify triggers and patterns affecting their mental health. Clients may also use these outside sessions as a daily coping skill to assist with self-control and self-regulation.

- **Hardware**

- **Wavetable:** This device synchronizes sound frequencies, light pulses, tactile vibrations, color, and music into a timed session to take the user's nervous system out of fight or flight mode and allow for the reduction of stress and anxiety. This biofeedback therapy would be available to parents while their children receive services at the directly operated clinics and available in a portable table for field-based services.

These biofeedback therapies were chosen because they can reduce symptoms in weeks or months, which is needed for an overwhelmed public mental health system. A project by the Pritzker Family Foundation, which offered training to Los Angeles County community mental health agency providers, found that providers trained in biofeedback reported improved outcomes for their clients and increased satisfaction with their work.

Target Population

The target population for this proposal includes children and Transition Age Youth (TAY) birth to 24 years of age and their families who are:

- Enrolled in services at a Los Angeles County Child Directly Operated Mental Health Clinic, or
- Receiving services through the Specialized Foster Care programs.

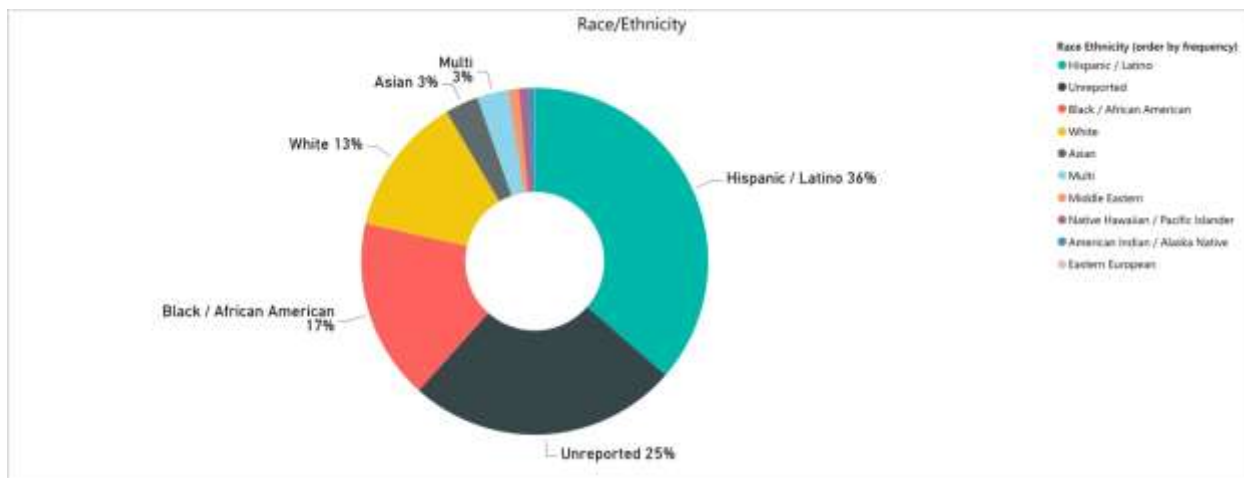
There are approximately 4,300 children and youth receiving services from the 14 the Directly Operated children's mental health clinics in Los Angeles County.

Specialized Foster Care (SFC) programs cover all 8 Service Planning Areas (SPAs). There are approximately 21,000, receiving services from SFC. Clients SFC are involved in the Department of Children and Family Services (DCFS) system and are delivered services in the field. Neurofeedback will be a field-based service for SFC clients. TAY aged 16 to 24 will be served via a mobile van.

Community Disparities

This project will reduce disparities in the underserved population in Los Angeles County, who are predominantly people of color, living below the poverty line, lack awareness of alternative mental health treatment modalities, and may be limited in the services they access due to transportation challenges.⁶

⁶ Rhee TG, Evans RL, McAlpine DD, Johnson PJ. Racial/Ethnic Differences in the Use of Complementary and Alternative Medicine in US Adults With Moderate Mental Distress. *J Prim Care Community Health*. 2017 Apr;8(2):43-54. doi: 10.1177/2150131916671229. Epub 2016 Sep 27. PMID: 27678243; PMCID: PMC5932659.



Current Client Demographics for LACDMH one-year data through March 2023, as of May 2023.

This project will provide access to biofeedback therapy, generally available to Los Angeles County residents who can afford to pay out of pocket.⁷ By making biofeedback therapy available in the field, we can reduce transportation issues and make it more accessible to people who need it. Additionally, training the public mental health workforce will help to educate more people about biofeedback therapy and its benefits.

Intended Outcomes

This innovative project will help LACDMH learn the following about the impact of biofeedback therapies on a large public mental health system:

- The best strategies for introducing interventions that rely heavily on technology to support healing interventions.
- The impact on complex trauma, chronic and severe mental illness, and other symptoms.
- The impact across ethnic, racial, and other diverse communities who have traditionally been under or un-served.
- The impact on mental health workforce retention of large-scale biofeedback training.
- The budgetary impact of reduced hospitalization, reduced treatment length, or improved functioning of communities.

Positive outcomes of this project will support the expansion of biofeedback therapies to all LACDMH programs and the expansion of a training program available to all clinicians.

Community Leadership Team

The CLT brings together leadership from important networks of stakeholders (e.g., Service Area Leadership Teams, Underserved Cultural Communities, Cultural Competency Committee) among others, to gather input about experiences with programs in the current mental health system; to gauge the overall impact and effectiveness of programs; to drive recommendations for improvement of programs and processes; and to acknowledge and provide feedback regarding

⁷Duke University. (2022, March 8). The color of wealth in Los Angeles. Samuel DuBois Cook Center on Social Equity. Retrieved June 1, 2023, from <https://socialequity.duke.edu/portfolio-item/the-color-of-wealth-in-los-angeles/>

future and/or unmet needs. The intention of the CLT is to Strengthen the collaborative relationship between the CLT Leaders and the DMH Director and key staff to achieve a shared vision

The proposal was presented and approved by the CLT on January 31, 2023.