

Perceived Effectiveness of NeuroAffective Relational Model Therapy in Treating Characteristics of Complex Trauma

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Abstract

Objective: The prevalence of early chronic interpersonal trauma in our society has created an urgent need for accurate diagnoses and effective treatments for complex trauma. Complex PTSD and Developmental Trauma Disorder (DTD) are two emerging diagnoses. This study introduces NARM Therapy as an emerging psychotherapeutic modality designed specifically to treat symptoms of complex trauma.

Method: A convenience sample of providers trained in NARM Therapy (N=76) completed an online survey asking about the perceived effectiveness of NARM Therapy in treating thirteen characteristics of complex trauma. Characteristics were chosen from across symptom clusters of Complex PTSD and DTD including Negative Self-Concept, Disturbance In Relationships & Affective Dysregulation.

Results: Between 66% and 99% of participants found NARM Therapy effective for 12 out of the 13 characteristics surveyed with particular effectiveness for characteristics related to Negative Self-Concept and Disturbance In Relationship. The only characteristic of complex trauma queried for which NARM Therapy was not widely reported as effective was the 13th, frequently engages in dangerous or reckless behavior, where 40% of respondents reported NARM Therapy to be effective and 54% had no experience treating this characteristic.

Conclusions: Results support the potential for NARM Therapy to effectively treat many characteristics of complex trauma. Future research should include testing the efficacy of NARM Therapy in both inpatient and outpatient settings, for both adults and adolescents, using validated measures for diagnosing complex trauma.

Keywords: NeuroAffective Relational Model, NARM, Complex Trauma, CPTSD, Developmental Trauma Disorder

Clinical Impact Statement

The prevalence of adverse childhood experiences (ACEs) in our society has created an urgent need for accurate diagnoses and effective treatments for what is known as complex trauma. Our manuscript describes and evaluates the perceived effectiveness of an emerging psychotherapy modality, NeuroAffective Relational Model Therapy, a modality designed specifically to address the broad range of symptoms associated with complex trauma. This study's results support the potential for NARM Therapy to effectively treat many characteristics of complex trauma. Future research should include testing the efficacy of NARM Therapy for both adults and adolescents, using validated measures for diagnosing complex trauma.

Introduction

In the United States, in 2016 alone, Children's Protective Services (CPS) investigated reports of child maltreatment in over 3.2 million children, an increase of 10% over 2012 (U.S. Department of Health & Human Services, Administration for Children and Families, 2018). The Adverse Childhood Experiences (ACEs) study firmly established a relationship between child abuse and neglect and increased mental and physical health issues in adulthood (Felitti, et al., 1998). Studies have also shown the intergenerational impact of ACEs, particularly related to substance use, violence and mental illness (Hughes, et al., 2017). Additional research has demonstrated that such early difficulties also negatively impact economic and educational opportunities, undermining individuals, families and communities across generations, marking child abuse as an urgent public health crisis (Metzler, Merrick, Klevens, Ports, & Ford, 2017; Dube, 2018; Merrick, Ford, Ports, & Guinn, 2018).

In addition to the growing understanding of the prevalence of childhood trauma and its life-long impact, the psychobiological basis for these resulting difficulties has been examined. Specifically, studies have shown the importance of secure attachment between caregiver and child for healthy human development (Ainsworth & Bowlby, 1991). Chronic traumatic stress during an infant's early years has been shown to impair right brain development, resulting in compromised nervous system regulation and sense of self, leading to significant emotional and interpersonal deficits (Schore, 2001; Fonagy, Gergely, Target, & Jurist, 2002). Additionally, emerging research is exploring the epigenetics of traumatic stress, in order to further understand the intergenerational impact of trauma (Pfeiffer, Mutesa, & Uddin, 2018). The prevalence of traumatic stress in our society has created an urgent need for accurate diagnoses and effective treatments to help mitigate the effects of early trauma.

Post-Traumatic Stress Disorder (PTSD) was first included as a diagnosis in the third edition of the Diagnostic and Statistical Manual of Mental Disorders, in response to psychological difficulties displayed in Vietnam Veterans (American Psychiatric Association, 1980; Stein & Rothbaum, 2018). However, the PTSD diagnosis has proved insufficient to capture significant symptoms resulting from prolonged interpersonal trauma during childhood which Herman (1992) first referred to as complex trauma (Herman, 1992). Consequently, researchers have proposed new diagnostic categories for both children and adults including: Disorders of Extreme Stress Not Otherwise Specified (DESNOS), Complex Post-Traumatic Stress Disorder (CPTSD) and Developmental Trauma Disorder (DTD) (Herman, 1992; Cloitre, et al., 2009; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005; van der Kolk, et al., 2009). Symptoms associated with these diagnoses are grouped into the following categories: difficulty with affect regulation, relational difficulties, dissociation, somatization and negative self-concept. Although the attempt to include the DTD diagnosis in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders was unsuccessful, the 11th version of the International Classification of Diseases (ICD-11) will include CPTSD as a diagnosis distinct from PTSD (American Psychiatric Association, 2013). The new CPTSD diagnosis requires the presence of PTSD symptoms plus difficulties with affect regulation, interpersonal relationships and negative self-concept (Maercker, et al., 2013). Also, the International Trauma Questionnaire (ITQ) was validated as an assessment for CPTSD (Shevlin, et al., 2018).

Treatment guidelines for CPTSD have not advanced to a specific set of recommendations. In 2009, Courtois and Ford recommended individual and group treatment for complex trauma, including pharmacotherapy, cognitive-behavioral therapy (CBT), emotion-focused therapy (EFT), internal family systems therapy (IFS) and Sensorimotor psychotherapy (SP) (Courtois & Ford, 2009). In 2011, Given the absence of treatment guidelines for CPTSD, the International Society for Traumatic Stress Studies (ISTSS) surveyed expert clinicians regarding best practices for the treatment of CPTSD (Cloitre, et al., 2011). In addition to substantially agreeing on CPTSD symptoms, experts surveyed recommended a sequenced, multi-phased approach to treatment. Three approaches were most commonly preferred: cognitive restructuring, narration of trauma, and emotion regulation strategies. Additionally, psychoeducation about trauma was highly valued as a primary intervention among experts surveyed. No agreement regarding duration of treatment emerged in this study. Common themes among recommended treatments included: establishing a collaborative client/therapist relationship, helping the client develop an observing ego, and emphasizing client areas of strength. Additionally, recent research indicates that the development of self-compassion is important in resolving CPTSD (Karatzias, et al., 2018).

In this study, we introduce and evaluate NeuroAffective Relational Model (NARM) Therapy, a psychotherapy designed *specifically* to address the broad range of symptoms associated with complex trauma (Heller & LaPierre, 2012). NARM Therapy is based on the premise that the basic human drive toward connection with self and others is seen in the way young children orient to and internalize their caregivers in the attachment process (Bowlby, 1982). This strong, primal drive toward connection to self and others remains despite the presence of chronic early trauma.

NARM Therapy is predicated on the idea that children have five biologically-based core needs that are essential for healthy development: the need for connection with self and others, the need for caregivers' attunement to needs and emotions, the need for healthy trust and dependency, the need for autonomy, and the need to give and receive love through relationship. When one or more of these core needs is not adequately met, children feel that their well-being is threatened, and their focus shifts away from healthy development towards survival. Difficulties with self-regulation, self-esteem and the capacity for relationship emerge early in childhood and frequently persist into adulthood. Children manage their inadequately met needs and subsequent physiological dysregulation, emotional disconnection, and social isolation, by adopting one or more of five biobehavioral strategies that NARM Therapy calls "Adaptive Survival Styles" (see Table 1).

Table 1. NARM Therapy Adaptive Survival Styles

Adaptive Survival Style	Core Difficulties
Connection Survival Style	Disconnected from physical and emotional self Difficulty relating to others
Attunement Survival Style	Difficulty knowing what we need Feeling our needs do not deserve to be met
Trust Survival Style	Feeling we cannot depend on anyone but ourselves Feeling we have to always be in control
Autonomy Survival Style	Feeling burdened and pressured Difficulty setting limits and saying no directly
Love-Sexuality Survival Style	Difficulty integrating heart and sexuality Self-esteem based on looks and performance

When a child adopts one or more of these survival styles, the child forecloses their authentic self, which consists of their connection to their body, emotional and social needs, and autonomous thoughts, as a way of protecting against the threat of loss of their primary attachment relationship (Mahler, Pine, & Bergman, 1975). NARM Therapy does not view these adaptive survival styles as pathological, but rather sees them as the necessary adaptations that the child must make to ensure survival. To reflect this orientation to the child’s resiliency, each survival style is named for the core biological need and the compromised core capacity that results. These survival styles provide five basic organizing principles that offer a clear framework for NARM Therapy and for the client’s continuing development of the self that was disrupted and disorganized by early trauma.

This structure enables NARM Therapy to work with what drives a client’s distress and symptoms, generally a complex psychobiological process of physiological dysregulation, emotional disorganization, and limiting core beliefs developed early in childhood in response to attachment and relational trauma. These psychobiological dynamics come to define one’s identity and are at the core of an individual’s sense of self. NARM Therapy combines top-down inquiry into one’s identifications with bottom-up somatic mindfulness which helps the client cultivate the ability to be present in the here and now. As clients begin to shift out of unresolved, disorganized beliefs, feelings and sensations that originated from the past, they become more physiologically regulated, emotionally balanced, and aware of the survival strategies still operating as a result of early trauma. NARM Therapy supports a greater sense of agency in one’s life, as clients feel less controlled and victimized by their past, and less preoccupied with their sense of safety and well-being in the future. This movement between top-down and bottom-up processing is what is referred to as the “NARM Therapy Healing Cycle” (see Figure 1). As self-regulation increases, old identifications begin to dissolve which further increases the capacity for self-regulation and so on.

The top-down inquiry is driven by the understanding that children develop faulty beliefs as a way of making sense of a caregiver’s maltreatment (Fonagy, Gergely, Target, & Jurist, 2002).

This often leads to identity distortion that can manifest as self-rejection, self-judgment and pervasive sense of shame. For example, a child may take on the belief that “the family chaos is all my fault” or “I am fundamentally flawed.” Disidentification from such limiting, shame-based core beliefs is a key element of NARM Therapy. NARM Therapy focuses in the here and now with how a client may still be identified with these self-limiting beliefs, still viewing the world from an insecure, shame-based childhood perspective with a limited sense of agency in their lives. NARM Therapy uses mindfulness to support adult clients in becoming aware of how they still limit their connection to their core needs and capacities, thus staying identified with disorganized patterns of the self as expressed through the adaptive survival styles.

Additionally, during NARM Therapy, inadequately met core needs and unresolved emotions are acknowledged and integrated in such a way that symptoms related to difficulty with affect regulation and dissociation progressively recede and greater capacity for self-regulation and more balanced connection to self and others is strengthened. When a child forecloses on core connection to self and others, whether it is through dissociation or a shutting down of social engagement, that foreclosure includes connection to and expression of healthy emotion. NARM Therapy holds that during childhood all emotion is a communication to the environment. For example, fussy, agitated babies are often attempting to communicate to their caregivers about their needs, well before their language skills develop. When basic needs are inadequately met by early environments, the intention of the emotion gets thwarted, leading to a sequence of behaviors that Bowlby first recognized in babies that were separated from their mothers: protest, despair and detachment (Bowlby, 1982). Ainsworth furthered the understanding of the disorganization that young children experience upon separation, and around frightening, depressed and/or disconnected caregivers (Ainsworth & Bell, 1970). Children who experience inadequate attachment with their caregivers demonstrate both acting-out strategies, including tantrums, biting and punching, as well as acting-in strategies, including self-harm, freezing and giving up any attempts to connect. These behaviors reflect the unresolved emotions which are too painful and overwhelming for children to process during this stage of their development. Consequently, NARM Therapy works with unresolved affect by inquiring into the implicit intention of the emotion, that which underlies and motivates the behaviors, an inquiry essential for the client to experience emotional completion of inadequately met childhood needs. This focus on emotional completion provides a pathway for the development of affect regulation, which leads to increasing self-regulation, separation-individuation, and sense of personal agency (Fonagy, Gergely, Target, & Jurist, 2002).

NARM Therapy emphasizes the client-centered, yet directive role of the NARM therapist. NARM therapists follow the intention that the client sets for themselves in coming to therapy (“contract”), which is an expression of the client’s deep desire for change, whether they recognize this consciously or not. NARM therapists do not continue the treatment without clear consent on what will be explored between client and therapist. Children with complex trauma generally experience limited agency over their lives such that they adapt to environmental demands, so it is essential not to re-enact this in the adult therapeutic process (Fonagy, Gergely, Target, & Jurist, 2002). At the same time, the NARM therapist recognizes that most clients will rely on familiar behavior, based on their adaptive survival styles, even if the familiar behavior is maladaptive. They may actively, albeit unconsciously, try to limit the therapeutic process, in order not to actualize the change they say that they desire. This reflects an unconscious loyalty to

the threat of attachment loss, wherein therapeutic success supports separation-individuation, something that feels threatening the more a client is identified with their adaptive survival styles.

NARM Therapy follows the framework of the five Adaptive Survival Styles and the NARM Therapy clinical process referred to as the NARM 4 Pillars, in order to gently confront and challenge the self-limiting beliefs, identifications and behaviors that interfere with what it is that the client truly wants for themselves. The NARM 4 Pillars are: 1) establishing a therapeutic “contract,” 2) asking exploratory questions, 3) reinforcing the client’s agency, and 4) reflecting the client’s psychobiological shifts. These psychobiological shifts may include physical, emotional, cognitive, behavioral, and relational shifts that disrupt old patterns and identifications and create new opportunities for healing and growth. The four pillars of NARM Therapy emphasize similar themes as those described in the ISTSS CPTSD treatment guidelines, namely establishing a collaborative client/therapist relationship, helping the client develop an observing ego, and emphasizing client areas of strength (Cloitre, et al., 2011).

Thus, NARM Therapy is an evidence-informed, trauma-informed and trauma-responsive model that emphasizes the client’s strengths, capacities, resources and resilience, exploring trauma history only to the degree that the resulting adaptive survival patterns interfere with one’s capacity to experience connection to body, emotions, self and other in the here and now. NARM Therapy supports personal freedom from survival styles and identifications resulting in increasing capacity for more connection, intimacy, agency, resilience, health and well-being, hallmarks of the resolution of complex trauma.

Materials and Methods

Recruitment

A convenience sample of professional adults who attended the NARM Therapy clinical training was invited to participate in this study via e-mail. Training attendees were healthcare professionals including: psychotherapists, psychologists, social workers, and somatic therapists. No compensation was offered to participants.

Experimental Design

Participants were given a single survey consisting of two sections. In Section I data were collected on demographics, professional training and experience. Section II queried participants’ perceived effectiveness of NARM Therapy in treating thirteen characteristics of complex trauma, gathered from characteristics proposed for both the new diagnostic categories DTD and CPTSD (Maercker, et al., 2013; van der Kolk, et al., 2009). In order to broadly assess the perceived effectiveness of NARM Therapy, characteristics were chosen across symptom clusters (see Table 2).

Table 2. Thirteen Characteristics of Complex Trauma Assessed in the NARM Perceived Effectiveness Survey

Characteristic	Symptom Cluster	Source
Persistent Beliefs about Oneself as Diminished, Defeated or Worthless	Negative Self-Concept	Cloitre, 2018, van der Kolk, 2009
Pervasive Feelings of Shame & Guilt	Negative Self-Concept	Cloitre, 2018
Persistent Difficulties in Sustaining Relationships and in Feeling Close to Others	Disturbance In Relationships, Relational Impairment	Cloitre, 2018, van der Kolk, 2009
Inability to Modulate, Tolerate, or Recover from Extreme Affect States	Affective Dysregulation	Cloitre, 2018, van der Kolk, 2009
Diminished Awareness/Dissociation of Sensations, Emotions and Bodily States	Affective Dysregulation	van der Kolk, 2009
Inability to Initiate or Sustain Goal-Directed Behavior	Attentional/ Behavioral Dysregulation	van der Kolk, 2009
Chronic Feelings of Failure	Negative Self-Concept	Cloitre, 2018
Numb & Emotionally Shut Down	Affective Dysregulation	Cloitre, 2018
Loss of Bodily Regulation in Areas of Sleep, Food & Self-Care	Physiological Dysregulation	van der Kolk, 2009
Hypervigilance/ Preoccupation with Threat	Sense of Threat	Cloitre, 2018, van der Kolk, 2009
Multiple Somatic Problems (e.g. GI issues, migraines, pain etc.)	Functional Impairment	van der Kolk, 2009
Aggressive Behavior Against Self & Others	Self & Relational Dysregulation, Behavioral Dysregulation	van der Kolk, 2009
Frequently Engages in Dangerous or Reckless Behavior	Behavioral Dysregulation	van der Kolk, 2009

For each characteristic, participants were first asked if, in their experience, NARM Therapy is effective for treating that characteristic. Unless they indicated they have no experience treating a given characteristic, they were then asked whether or not they use NARM Therapy in conjunction with other modalities to treat that characteristic. If they indicated that they combine NARM Therapy with other modalities, they were then asked to indicate, via a check box which modalities they use in combination with NARM Therapy to treat that characteristic. Finally, participants were asked if, in their overall experience, NARM Therapy is effective in treating complex trauma.

Data Collection

Data were collected via an online software program called SurveyGizmo. Responses were anonymous. However, participants could only answer the survey once. The survey was offered in English, French and German.

Statistical Methods

Clinical and demographic characteristics of study respondents and their perceptions of the effectiveness of NARM Therapy were tabulated from results provided by SurveyGizmo.

Results

Participants

Responses were received N=76 out of the 1258 participants invited. The response rate was significantly higher among US practitioners with N=51 participants out of 171 invited. 86% of participants identified as female and 14% as male. This result differs from the 2016 APA report indicating that 65% of the US psychology workforce identifies as female and (American Psychological Association, 2018). Two respondents indicated that they do not use NARM Therapy. Table 3 describes the demographics of the participants.

Table 3. Demographics Characteristics of Survey Participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age	76	27	75	53.45	10.192
Years In Practice Overall	76	1	40	18.41	10.857
Years Using NARM Therapy	76	0	11	2.74	2.042
Valid N (listwise)	76				

Detailed Results

Table 4 lists the thirteen characteristics of CPTSD/DTD in the order in which participants reported that they found NARM Therapy most effective for a given characteristic. For convenience, the description for each characteristic is listed in the same order in Table 1. As can be seen in the table, between 66% and 99% of participants found NARM Therapy effective for 12 of the 13 characteristics surveyed, with particular effectiveness for characteristics of negative self-concept and relational difficulties. NARM Therapy was perceived to be least effective in addressing dangerous behavior. However, 54.1% of participants also reported no experience with using NARM Therapy to treat that characteristic.

Table 4. Participant Perceptions of NARM Effectiveness for the thirteen Characteristics of CPTSD/DTD

Complex Trauma Characteristic	Is NARM Therapy Effective?		
	Yes	No	No Experience
Persistent Beliefs about Oneself as Diminished, Defeated or Worthless	98.6%	0.0%	1.4%
Pervasive Feelings of Shame & Guilt	95.9%	0.0%	4.1%
Persistent Difficulties in Sustaining Relationships and in Feeling Close to Others	94.6%	1.4%	4.1%
Inability to Modulate, Tolerate, or Recover from Extreme Affect States	89.2%	2.7%	8.1%
Diminished Awareness/Dissociation of Sensations, Emotions and Bodily States	87.8%	4.1%	8.1%
Inability to Initiate or Sustain Goal-Directed Behavior	83.8%	1.4%	14.9%
Chronic Feelings of Failure	81.1%	0.0%	18.9%
Numb & Emotionally Shut Down	81.1%	5.4%	13.5%
Loss of Bodily Regulation in Areas of Sleep, Food & Self-Care	79.7%	4.1%	16.2%
Hypervigilance/ Preoccupation with Threat	79.7%	9.5%	10.8%
Multiple Somatic Problems (e.g. GI issues, migraines, pain etc.)	67.6%	10.8%	21.6%
Aggressive Behavior Against Self & Others	66.2%	4.1%	29.7%
Frequently Engages in Dangerous or Reckless Behavior	40.5%	5.4%	54.1%

Discussion

NARM Therapy, unlike earlier psychotherapy modalities, was specifically designed to treat characteristics of complex trauma. The role of early abuse, neglect and attachment disruptions has been increasingly appreciated as fundamental to adult difficulties (Felitti, et al., 1998) (Bowlby, 1982). The prevalence of complex trauma worldwide, and the introduction of the official CPTSD diagnosis, has generated an urgent need for therapies designed specifically to address the nervous system dysregulation, attachment disruptions and identity distortions that result. Anecdotally, many therapists are becoming aware of the current research on ACEs and complex trauma and recognizing the limitations of their training, even in prior trauma-focused models like Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Eye Movement Desensitization and Reprocessing (EMDR). Additionally, many including the World Health Organization, the United States Department of Veterans Affairs, and the United States Army have expressed concerns that psychopharmacotherapy, including the widespread use of benzodiazepines in the treatment of trauma, are ineffective and problematic (World Health Organization, 2013; United States Department of Veterans Affairs; United States Army, 2014).

As shown in this survey of NARM practitioners, NARM Therapy is perceived, by them, as effective in addressing many characteristics of complex trauma across symptom clusters of the DTD and CPTSD diagnoses.

Due to the interpersonal origin of all complex trauma, relational modalities are better suited to help people recover from the relational difficulties and identity distortion that result (Courtois & Ford, 2009). As shown in this survey, NARM Therapy, an inherently relational modality, is perceived as particularly effective for addressing negative self-concept and relational difficulties. NARM therapists are trained to use curious, receptive presence to understand the way the client organizes their internal experience and the implicit and explicit ways clients express this inner reality. This inner reality can drive behaviors which manifest in society as soaring rates of mental illness, abuse, suicide, addiction, violence and incarceration as well as culturally sanctioned adaptations like workaholism (FWD.US, 2018; Merrick, et al., 2017; Zatti, et al., 2017; Mate, 2008). NARM Therapy does not focus on pathologizing these manifestations of complex trauma, but rather highlights the survival adaptations that begin in childhood and drive such behaviors, offering clients a level of acceptance many have never experienced. Receiving this acceptance from a NARM therapist and learning to integrate it in the form of self-acceptance is key to help people overcome their childhood survival styles and distortions of identity.

Survey results also indicate that NARM Therapy is perceived as effective in addressing characteristics of affective dysregulation for clients who feel emotionally shut down as well as those who experience difficulty with extreme affect. NARM Therapy promotes affect regulation by helping clients contain, rather than abreact, emotional states, leading to emotional completion. Through this process, clients access inadequately met needs, reduce shame and self-hatred and increase self-compassion, a key target for CPTSD resolution (Karatzias, et al., 2018). Difficulties with affect regulation are implicated in a number of mental health issues, including anxiety and depression (Schore, 2001). Resolving difficulty with affect regulation is essential for clients to improve self-regulation and the capacity for satisfying relationships. Seen in this way, NARM Therapy reinforces a growing understanding of the potential for posttraumatic growth and strengthened resiliency through the resolution of trauma.

Limitations

Study participants were a small convenience sample (approximately 2%) of NARM trained practitioners worldwide. Since recruitment occurred via email, only NARM practitioners with email addresses could be recruited. Because the study was conducted via online survey, the results have an inherent response bias. Definitions of characteristics queried were not provided to participants. NARM practitioners offered sessions in a naturalistic setting with no controls or assessment for CPTSD or DTD.

Directions for Future Research

This study introduces NARM Therapy as effective for treating characteristics of complex trauma. In order to establish NARM Therapy as an evidence-based best practice for the treatment of complex trauma, research into the efficacy of NARM Therapy is required. Randomized controlled studies could be done, for example using the International Trauma Questionnaire (ITQ) as an assessment tool (Shevlin, et al., 2018). NARM Therapy could be tested for treating

specific symptom clusters within CPTSD and DTD (Shevlin, et al., 2018; van der Kolk, et al., 2009). NARM Therapy could be tested for populations struggling with specific behavioral challenges related to interpersonal trauma, such as substance use and suicidal ideation. NARM Therapy could also be tested for efficacy in specific settings such as with parents in the child welfare setting and incarcerated persons. Additionally, NARM Therapy, designed as an intervention for adults, could be tested with adolescents. This application of NARM Therapy is currently being tested among addicted youth in a residential facility (M. Giresi, personal communication, August 22, 2018).

Ethics Statement

This study was carried out in accordance with the recommendations of the Sonoma State University IRB committee under case number 2892 with written informed consent from all subjects. The research protocol was approved by the Sonoma State University IRB Committee.

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