San Mateo County Health System
Behavioral Health & Recovery Services (BHRS)

Mental Health Services Act (MHSA) – Innovation Project Brief #3

Project: Neurosequential Model of Therapeutics (NMT) within an Adult Service System

Background – A comprehensive Community Program Planning (CPP) process identified and supported the **need to provide alternative treatment options to broaden and deepen the focus on trauma informed care and provide better outcomes in recovery for BHRS consumers**. The proposed NMT project was identified as priority to address the need. The San Mateo County Mental Health and Substance Abuse Recovery Commission (MHSARC) held a public hearing on April 6, 2016, following a 30-day public comment period, and recommended the approval of the NMT project to the San Mateo County Board of Supervisors, which approved the project plan on May 24, 2016.

The Challenge –Trauma is frequently undiagnosed or misdiagnosed leading to inappropriate interventions in mental health care settings.[1] In an effort to become a trauma-informed system of care, BHRS provided an intensive training to 30 staff and 10 providers on the NMT evidence-based practice, see attached overview. Ten BHRS staff have become trainers to sustain the work and support neighboring counties. NMT locates the neurobiological reason for an individual's behavioral problems and, if appropriate, provides a holistic approach integrated with multiple forms of targeted therapies that may include music, dance, yoga, drumming, therapeutic massage, etc. These can help regulate brain functioning allowing consumers to self-regulate, for example, an indicator known to be predictive of positive outcomes for those affected by trauma.[2] From a sample of 10 repeated BHRS youth assessments, 100% improved self-regulation and 63% sensory integration, relational, and cognitive domain measures. There is little evidence, despite strong theoretical basis, on the possible application of a neurodevelopmental and sensory-focused treatment with adults[3]; this offers a prime opportunity to pilot the NMT approach with adult consumers.

The Proposed Project – The NMT project is intended to adapt, pilot and evaluate the application of the NMT approach to an adult population, within the BHRS Adult System of Care. It is a three year pilot project with an expected start date of September 1, 2016 and a total estimated cost of $108,000 for the first year, $78,000 each subsequent year. Key activities include the following:

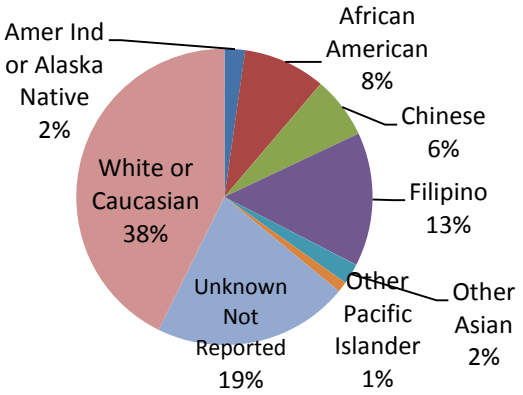
1) Adaptation of and formal training on the NMT approach, core concepts and metrics.
   - CTA will train 12-18 staff selected from up to 6 different BHRS adult system of care programs to bring the NMT model into their clinical work. It is estimated that approximately 75-100 consumers will receive an assessment and relevant interventions annually.
2) Implementation and follow through on the NMT-derived key recommendations.
3) Tracking improvement of the NMT metric domains for adult consumers to inform whether the NMT approach can improve outcomes and recovery for adult consumers.
4) Ensure fidelity to the NMT model, as required by the CTA for continued certification.

[1] Center for Substance Abuse Treatment (US). Trauma-Informed Care in Behavioral Health Services. Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 2014. (Treatment Improvement Protocol (TIP) Series, No. 57.) Chapter 3, Understanding the Impact of Trauma.
[2] Perry, B.D. & Dobson, C. (2013) The Neurosequential Model (NMT) in maltreated children. In (J. Ford & C. Courtois, Eds) Treating Complex Traumatic Stress Disorders in Children and Adolescents, pp 249-260. Guilford Press, New York
[3] Gardner, J. (2016). Sensory Modulation Treatment on a Psychiatric Inpatient Unit. Journal of Psychosocial Nursing and Mental Health Services,54(4), 44-51.

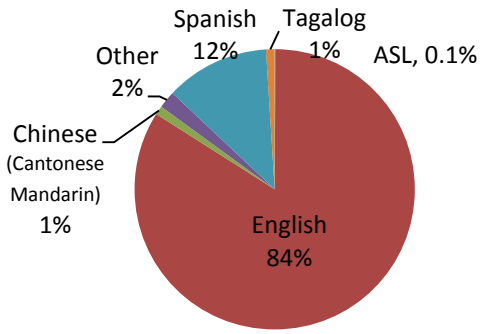
Target Population – Adult consumers receiving longer-term or residentially-based services will be selected to bring the NMT model into their current clinical treatment. Potential BHRS adult consumers present the following demographics:

Ethnicity:
19% Hispanic/Latinc

Race:



Languages spoken:



The Innovation – **MHSA Innovative Project Category:** Makes a change to an existing mental health practice that has not yet been demonstrated to be effective. **MHSA Primary Purpose:** Increase quality of mental health services, including measurable outcomes.

NMT has been integrated into a variety of settings serving infants through young adults. Yet, there is no outcome research for NMT conducted in an adult setting or population and it has not been implemented anywhere in a formal and intentional manner for an Adult System of Care. Expansion and evaluation to the adult system of care would be the first of its kind. The Child Trauma Academy (CTA) and its creator, Dr. Perry, are very supportive and will collaborate on the adaptation, implementation and evaluation.

Evaluation –

Learning Goal #1: Can NMT, a neurobiology and trauma-informed approach, be adapted in a way that leads to better outcomes in recovery for BHRS adult consumers?

- A decrease in psychiatric hospitalizations.[4]
- A minimum of 80% of consumers will agree that the NMT model was helpful in their recovery goals.

Learning Goal #2: Are alternative therapeutic and treatment options, focused on changing the brain organization and functioning, effective in adult consumers' recovery?

- At least 60% of adult NMT consumers will show improvement in each of four NMT functional domains: Sensory Integration, Self-Regulation, Relational, and Cognitive.

1. All providers and consumers receiving NMT approach will participate in the evaluation plan.
2. Data will be aggregated from individual metric assessments, pre/post health questionnaires and encounter data are all possible methods to be included.
3. The NMT "mapping process" provides scores in four functional domains (Sensory Integration, Self-regulation, Relational, and Cognitive) and rescored as a follow up or post assessment.

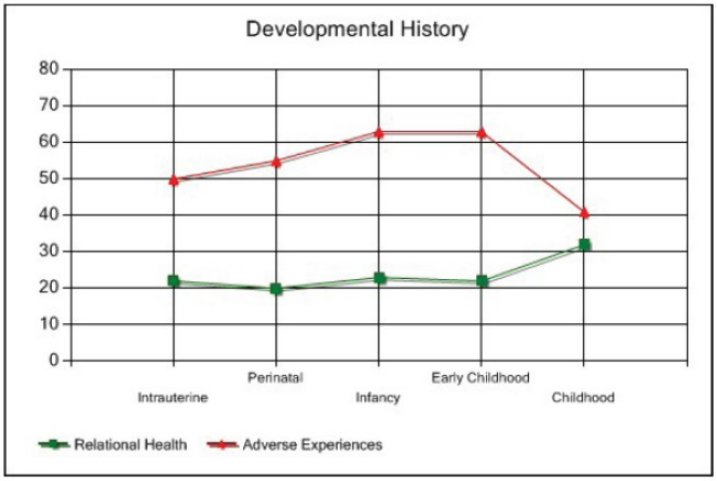
BHRS will manage the project, coordinate with CTA to adapt and administer the training, and ensure proper data collection. A Request for Proposal process will be conducted to select a qualified evaluator. Data cleaning, analysis and reporting will be conducted by a contract evaluator. The evaluation plan will include meaningful and diverse stakeholder participation through the MHSA Steering Committee, which is made up of diverse stakeholders and cultural groups and is open to the public. The MHSA Steering Committee will also be the primary venue for vetting next steps and decisions related to continuation of the project.

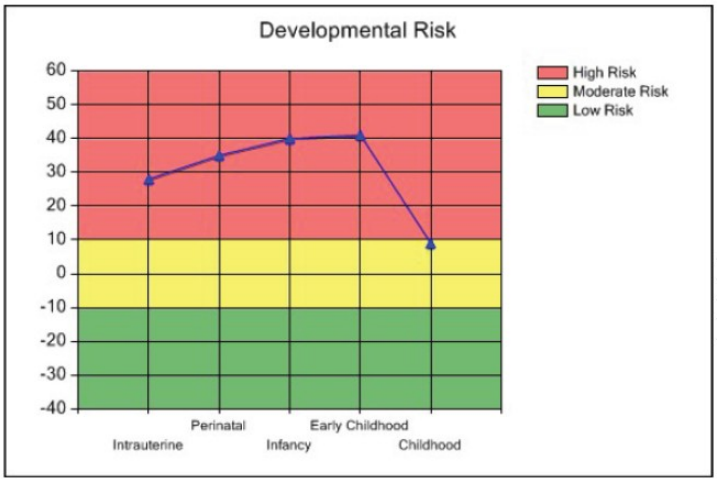
[4] Substance Abuse and Mental Health Services Administration. The Business Case for Preventing and Reducing Restraint and Seclusion Use. HHS Publication No. (SMA) 11-4632. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2011.

Overview of the Neurosequential Model of Therapeutics ©

The Neurosequential Model of Therapeutics (NMT) is a developmentally sensitive, neurobiology---informed approach to clinical problem solving. NMT is not a specific therapeutic technique or intervention. It is an approach that integrates core principles of neurodevelopment and traumatology to inform work with children, families and the communities in which they live. The Neurosequential Approach has three key components – training/capacity building, assessment and then, the specific recommendations for the selection and sequencing of therapeutic, educational and enrichment activities that match the needs and strengths of the individual.

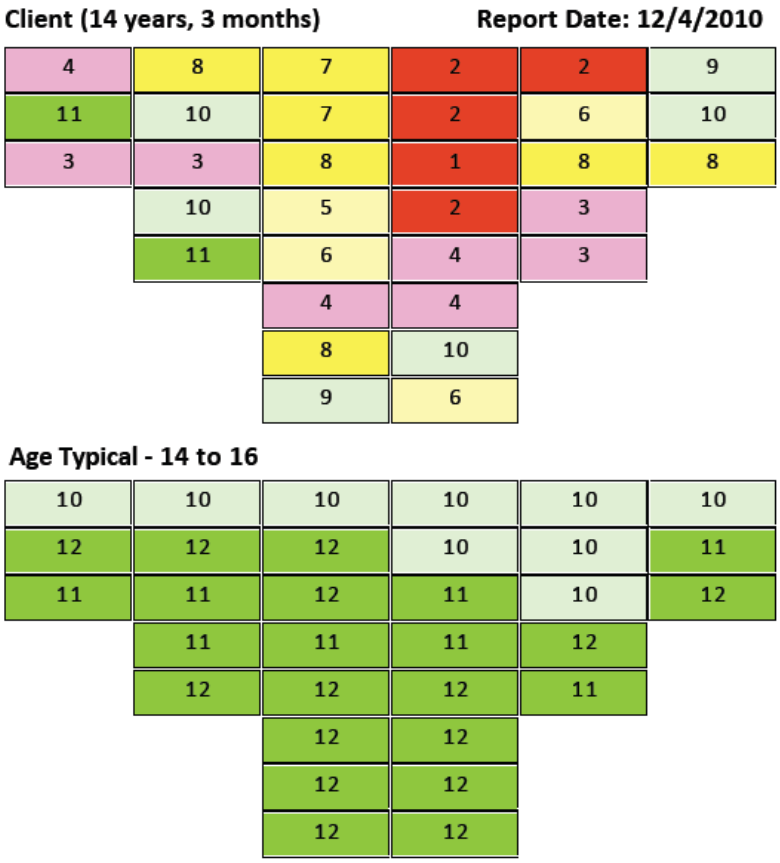
The NMT assessment process examines both past and current experience and functioning. A review of the history of adverse experiences and relational health factors helps create an estimate of the timing and severity of developmental risk that may have influenced brain development (see graph). In the sample graph, both the timing and severity of risk and resilience factors are plotted (top graph) to generate an overall developmental risk estimate (bottom graph). In this case this individual was at high risk for developmental disruptions – with potential significant functional consequences – during the entire first five years of life.





A review of current functioning identifies problems and strengths in current functioning and helps generate a visual representation of the child's estimated current functioning organized into a neurobiological fashion; this generates a Functional Brain Map (see below). The NMT "mapping" process helps identify various areas in the brain that appear to have functional or developmental problems; in turn, this helps guide the selection and sequencing of developmentally sensitive interventions. These interventions are designed to replicate the normal sequence of development beginning with the lowest, most abnormally functioning parts of the brain (e.g., brainstem) and moving sequentially up the brain as improvement is seen. The NMT is grounded in an awareness of the sequential development of the brain; cortical organization and functioning depend upon previous healthy organization and functioning of lower

neural networks originating in the brainstem and diencephalon. Therefore a dysregulated individual (child, youth or adult) will have a difficult time benefiting from educational, caregiving and therapeutic efforts targeted at, or requiring, "higher" cortical networks. This sequential approach is respectful of the normal developmental sequence of both brain development and functional development. Healthy development depends upon a sequential mastery of functions; and a dysregulated individual will be inefficient in mastering any task that requires relational abilities (limbic) and will have a difficult time engaging in more verbal/insight oriented (cortical) therapeutic and educational efforts.



The NMT Web---based Clinical Practice Tools (aka, NMT Metrics) help provide a structured assessment of developmental history of adverse experiences, relational health and current brain---mediated functioning. These NMT Metrics are designed to complement, not replace, existing assessment tools (e.g., CANS, CAFAS) and psychometrics (e.g., CBCL, IES, WISC, WRAT). They are designed to allow use across multiple systems using multiple assessment packages. The primary goal of the NMT Metrics and assessment is to ensure that the clinical team is organizing the client and family's data (and planning) in a developmentally sensitive and neurobiology---informed manner.

Above is an example of a functional brain "map" produced by the web---based NMT Clinical Practice Application. The top image (with the red squares) corresponds to a client (each box corresponds to brain functions mediated by a region/system in the brain. The map is color coded with red indicating significant problems; yellow indicates moderate compromise and green, fully organized and functionally capable). The bottom map is a comparative map for a "typical" same---aged child. The graphic representations allow a clinician, teacher, or parent to quickly visualize important aspects of a

child's history and current status. The information is key in designing developmentally appropriate educational, enrichment and therapeutic experiences to help the child.

This clinical approach helps professionals determine the strengths and vulnerabilities of the child and create an individualized intervention, enrichment and educational plan matched to his/her unique needs. The goal is to find a set of therapeutic activities that meet the child's current needs in various domains of functioning (i.e., social, emotional, cognitive and physical). An individual demonstrating significant problems in brainstem and diencephalic functions may end up with recommended activities that include music, dance, yoga, drumming, various sports, therapeutic massage to more traditional play therapy, sand tray or other art therapies. Later in the treatment process, after improved brainstem and diencephalic functioning, the treatment recommendations would shift to more insight oriented--- and cognitive---mental interventions such as PCIT or TF---CBT.

The NMT training and capacity building component incorporates didactic teaching with web--- based sessions using on clinical cases presented by participating clinicians. It also incorporates multimedia and reading materials that focus on child development, neurobiology, traumatology, attachment theory and a host of related areas relevant to understanding the impact of maltreatment and other developmental insults on the developing child. The CTA has developed an NMT training certification process for individual clinicians and organizations. This training process provides the necessary exposure to the core concepts, practical application and use of the web--- based NMT Metrics to establish and maintain fidelity required for examining clinical outcomes and conducting research using the NMT Metrics as part of the evaluation package. Certified clinicians from across the world demonstrate high fidelity and inter---rater reliability when "evaluating" and scoring the same client data.

The NMT is widely applicable to a variety of clinical and educational environments and has been integrated into a variety of settings across the full life cycle – infants through adults --- including therapeutic preschools, early head start programs, infant mental health, ECI programs, residential treatment centers, and in numerous private and outpatient clinical practices working with young children, youth and adults. Several large public child protective services and child mental health settings have become certified and routinely use the NMT.

Selected references

Perry, B.D. *The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children* In: Working with Traumatized Youth in Child Welfare (Nancy Boyd Webb, Ed.), The Guilford Press, New York, NY, pp. 27---52, 2006

Perry, B.D. *Child maltreatment: the role of abuse and neglect in developmental psychopathology* in Textbook of Child and Adolescent Psychopathology in (Theodore P. Beauchaine & Stephen P. Hinshaw, Eds) pp. 93---128 Wiley, New York 2008

Perry, B.D. *Examining child maltreatment through a neurodevelopmental lens: clinical application of the Neurosequential Model of Therapeutics.* Journal of Loss and Trauma 14: 240---255, 2009

Ludy---Dobson, C. & Perry, B.D. *The role of healthy relational interactions in buffering the impact of childhood trauma* in Working with Children to Heal Interpersonal Trauma in (Eliana Gil, Ed.) pp 26---44 The Guilford Press, New York, 2010

Barfield, S., Gaskill, R., Dobson, C. & Perry, B.D. *Neurosequential Model of Therapeutics© in a Therapeutic Preschool: Implications for Work with Children with Complex Neuropsychiatric Problems*. International Journal of Play Therapy Online First Publication, October 31, 2011. Doi:10.1037/a0025955

For more information visit The ChildTrauma Academy website:
www.ChildTrauma.org