San Mateo County Adult NMT Pilot Fiscal Year 2017-18 Evaluation Report

A Mental Health Services Act Innovation Project

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Introduction

Project Overview and Learning Goals

San Mateo Behavioral Health and Recovery Services (BHRS) implemented the Neurosequential Model of Therapeutics© (NMT) within the Adult System of Care as part of the three-year Mental Health Services Act (MHSA) Innovation (INN) plan. The MHSA INN project category and primary purpose of the NMT pilot project are as follows:

- **MHSA INN 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.
- **Project Innovation:** While NMT has been integrated into a variety of settings serving infants through young adults, there is no literature or research of NMT in a strictly adult setting or population. BHRS intends to adapt, pilot, and evaluate the application of the NMT approach to an adult population with a history of trauma. This expansion to and evaluation of NMT in an adult system of care is the first of its kind.

The Mental Health Services Oversight and Accountability Commission (MHSOAC) approved the project on July 28, 2016 and BHRS began implementation in September 2016. In 2017, BHRS contracted Resource Development Associates (RDA) to evaluate the adult NMT pilot project. This report provides findings from the second year of NMT implementation—July 1, 2017 to June 30, 2018—in the BHRS Adult System of Care.

BHRS developed two learning goals to guide the NMT pilot and assess the extent to which the program is meeting its intended MHSA objectives—to increase the quality of services and consumer outcomes. The learning goals are outlined in Figure 1 below. The first learning goal pertains to the adaptation and implementation of the NMT approach in the adult consumer population, while the second learning goal pertains to the effectiveness and impact of the NMT approach in improving recovery outcomes.

Figure 1. NMT Pilot Project Learning Goals

Learning Goal 1	Learning Goal 2
•Can NMT, a neurobiology and trauma-informed approach, be adapted in a way that leads to better outcomes in recovery for BHRS adult consumers?	•Are alternative therapeutic and treatment options, focused on changing the brain organization and function, effective in adult consumers' recovery?

Project Need

Through the MHSA Community Planning Process in San Mateo, BHRS and community stakeholders identified the need to provide alternative treatment options to broaden and deepen the focus on trauma informed care and provide better outcomes in recovery for adult BHRS consumers. To address this need, BHRS proposed implementing the NMT approach within the BHRS Adult System of Care. NMT is an innovative approach to treating trauma that is grounded in neurodevelopment and neurobiology. Subsequent sections provide a more in-depth description of NMT and its application to adults.

Project Description and Timeline

NMT Background

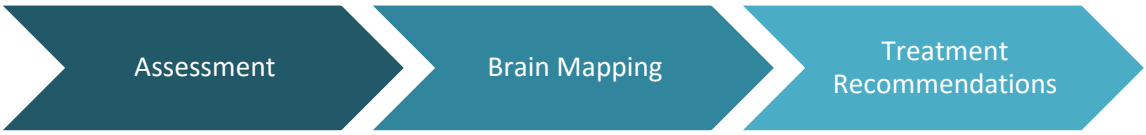
The Child Trauma Academy (CTA) developed NMT as an alternative approach to addressing trauma, typically used with children, that is grounded in neurodevelopment and neurobiology. NMT is not a single therapeutic technique or intervention. Rather, NMT uses assessments to guide the selection and sequence of a set of highly individualized therapeutic interventions (e.g., therapeutic massage, drumming, yoga, expressive arts, etc.) that best match each NMT consumer's unique strengths and neurodevelopmental needs.[1]

NMT is guided by the principle that trauma during brain development can lead to dysfunctional organization of neural networks and impaired neurodevelopment. The selected set of therapeutic interventions intends to help change and reorganize the neural systems to replicate the normal sequence of brain and functional development. Selected interventions first target the lowest, most abnormally functioning parts of the brain. Then, as consumers experience functional improvements, interventions are selected that target the next, higher brain region. The sequence of interventions aims to help consumers better cope, self-regulate, and progress in their recovery.

NMT Processes and Activities

As depicted in Figure 2, the NMT process consists of three main phases: 1) assessment, 2) brain mapping, and 3) the development of individualized treatment recommendations. These phases are briefly described below.

Figure 2. Key phases of the NMT Process



[1]Perry, B.D. & Hambrick, E. (2008) The Neurosequential Model of Therapeutics. *Reclaiming Children and Youth*, *17*(3), 38-43.

Assessment. NMT-trained providers collect information pertaining to the consumer's history of adverse experiences—including their timing, nature, and severity—as well as any protective factors. This information is used to estimate the risk and timing of potential developmental impairment. The assessment also includes an examination of current functioning and relationship quality (e.g., with parents, family, peers, community, etc.).

Brain Mapping. NMT-trained providers enter assessment data into a web-based tool designed by the CTA, which uses assessment data to generate a brain map illustrating the brain regions most affected by developmental impairment. Through this "mapping" process, scores are calculated in four functional domains: 1) Sensory integration, 2) Self-regulation, 3) Relational, and 4) Cognitive. The functional domain values are compared with age typical domain values to assess the degree of developmental impairment and identify the consumer's functional strengths and challenges.

Treatment Recommendations. Therapeutic interventions are identified that address the consumer's needs in the four functional domains, first targeting the lowest brain regions with most severe impairment. Throughout treatment, assessments and brain mapping are performed at regular intervals to evaluate any changes in functional domains, and treatment recommendations are adapted as appropriate.

Application of NMT to Adults

Since its development, NMT has been most widely used with children who experienced maltreatment and/or trauma, and BHRS has been using the NMT approach with children since 2012. However, the use of NMT with adults is limited. Given the high prevalence of trauma among adult behavioral health consumers and the relationship between childhood trauma and behavioral health issues in adulthood, there is a strong theoretical basis to predict that adult mental health consumers could benefit from the NMT approach.[2,3]

Nevertheless, NMT's effectiveness in the adult population is unknown. As mentioned, NMT has not been formally implemented into an adult system of care, and no outcome studies have been conducted to evaluate NMT in an adult population. BHRS is adapting, piloting, and evaluating the application of the NMT approach to an adult population with hopes of increasing the quality of mental health services and improving recovery outcomes for adult mental health consumers with a history of trauma.

[2]It is estimated that 40-80% of adults with mental illness and/or substance use issues also have experiences of trauma.
Source: Missouri Institute of Mental Health. (2004). Trauma among people with mental illness, substance use disorders and/or developmental disabilities. *MIMH Fact Sheet, January 2004.* Retrieved from: https://dmh.mo.gov/docs/mentalillness/traumafactsheet2004.pdf

[3]Anda, R.F., Felitti, V.J., Bremner, J.D., Walker, J.D., Whitfield, C., Perry, B.D., … Giles, W.H. (2006). The enduring effects of abuse and related adverse experiences in childhood: a convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience, 256*(3), 174-186.

BHRS NMT Pilot Project

NMT Providers

As mentioned, BHRS has been using the NMT approach with youth since 2012. In that time, 30 clinical staff in the BHRS Child and Youth System of Care and 10 clinical staff from community-based partner agencies received training through CTA.[4] In addition, 10 BHRS providers have become certified NMT trainers, and certify other providers in NMT through the CTA training. These trainers serve as mentors to NMT trainees and teach NMT principles and provide consultation to other providers. To expand NMT to the adult population, 12 providers within the BHRS Adult System of Care began NMT training with CTA in January 2017. The providers work in a variety of settings, including BHRS specialty mental health or regional clinics and programs serving consumers re-entering the community following incarceration.

Target Population

BHRS estimates that the adult NMT pilot project will serve approximately 75 to 100 adult consumers annually once the BHRS providers in the Adult System of Care are fully trained. Providers refer existing BHRS consumers from their caseloads to NMT, targeting three adult mental health populations:

- General adult consumers (ages 26+) receiving specialty mental health services;
- Transition age youth (TAY) consumers (ages 18-25); and
- Criminal justice-involved consumers re-entering the community following incarceration.

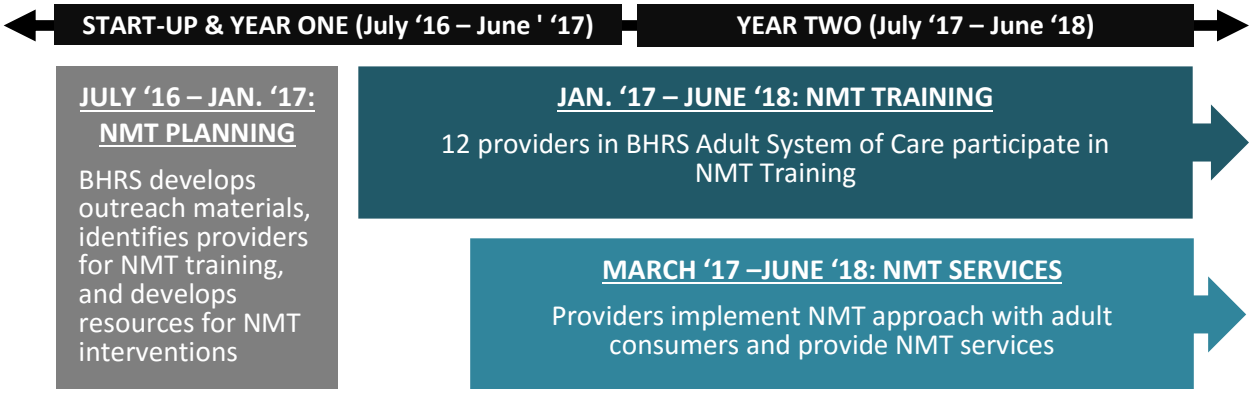
The three target populations likely have different experiences, needs, and coping skills and, as a result, could respond to NMT differently. For example, TAY are still undergoing brain development and therefore may be more responsive to neurodevelopmental treatment approaches such as NMT. In addition, the re-entry population might have different coping mechanisms than the general adult and TAY consumer populations, such as engaging in high-risk behaviors that might lead to incarceration. For the re-entry population, the experience of incarceration could also further contribute to trauma.

Implementation Timeline

Figure 3 illustrates the key activities that have taken place since NMT implementation began in July 2016.

[4]CTA operates the formal training certification program. The training takes place over approximately one year, with trainees learning through a combination of readings, videos, webinars, and case-based trainings.

Figure 3. NMT Implementation Timeline



Evaluation Overview

As mentioned, BHRS contracted RDA to evaluate the pilot and support project learning. In order to maximize RDA's role as research partners, RDA collaborated with BHRS and CTA when planning the evaluation—including identifying evaluation goals, validating the theory of change for NMT specific to the adult population, identifying the types of variables that may support or complicate outcomes in adults, and developing data collection tools to measure program implementation and consumer outcomes.

To guide the NMT evaluation, RDA developed evaluation sub-questions associated with each learning goal. The evaluation questions (EQ) are listed below. To the extent possible, the evaluation will examine implementation and outcome differences across the three target populations to identify how BHRS can adapt the NMT approach to best meet each population's unique needs. More in-depth information about the evaluation is available in the evaluation plan included in the Appendix.

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?

> **EQ 1.1.** How is the NMT approach being adapted to serve an adult population?
>
> **EQ 1.2.** Who is being served by the adult NMT project, what types of NMT-based services are consumers receiving, and with what duration and frequency?

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

> **EQ 2.1.** To what extent is the NMT approach supporting improvement in adult consumers' functional outcomes and overall recovery and wellbeing?
>
> **EQ 2.2.** To what extent is the experience of care with the NMT approach different from consumers' previous care experiences?

The first year of the evaluation focused largely on Learning Goal 1 to identify how BHRS is implementing and adapting the NMT approach with the adult population. During this second year, the evaluation examines both Learning Goals to: 1) identify how NMT implementation has progressed as the program has matured and providers are further along in or have completed NMT training, and 2) examine preliminary changes in consumers' functional and recovery outcomes as consumers participate in NMT.

Evaluation Methods

Data Collection

RDA employed a mixed-methods evaluation approach (i.e., using both qualitative and quantitative data) to identify who is participating in NMT, how BHRS is adapting the NMT approach for the adult population, and preliminary consumer outcomes. This report includes information about NMT implementation as well as preliminary consumer outcomes for adults who participated in NMT services during the evaluation period—July 1, 2017 to June 30, 2018, fiscal year 2017-2018 (FY17-18).

RDA worked closely with BHRS to identify and obtain appropriate outcome measures and data sources to address the evaluation questions. RDA collected quantitative information about NMT consumers from two main data sources: 1) BHRS's Electronic Health Record (EHR) system, Avatar, and 2) the NMT Database operated by CTA, which includes brain map and functional domain scores as well as recommended NMT interventions.

RDA also collected qualitative data through a focus group conducted with BHRS NMT providers (6 participants) on August 7, 2018 and a focus group with NMT consumers (7 participants) on September 27, 2018. The focus group with NMT providers centered on providers' experience of NMT training, how they are adapting the NMT approach with the adult population, and implementation successes and challenges. The focus group with the NMT consumers centered largely on their experience with NMT services, how NMT services differ from other mental health services received, and the perceived impacts of NMT on their wellness and recovery. Table 1 outlines the outcome data available for this report as well as the respective data sources.[5]

Table 1. Measurable Outcomes and Data Sources

Outcome Type	Outcome Measures	Data Sources
Process Outcomes	Number of consumers participating in NMT services	Electronic Health Records
	Characteristics of NMT consumers	Electronic Health Records
	Provider experience of NMT training and NMT implementation with the adult population	NMT Provider Focus Group
	Types of recommended NMT interventions	Consumer and Provider Focus Groups and NMT Database

[5]The Data Collection and Analysis section of the Appendix includes the types of additional outcome data expected to be available in later reports.

Outcome Type	Outcome Measures	Data Sources
Consumer Outcomes	Changes in functional domain scores	NMT Database
	Perceived impact of NMT services on consumer functional and recovery outcomes	NMT Consumer and Provider Focus Groups
	Consumer experience of NMT services	Consumer Focus Group

Data Analysis

To analyze the quantitative data (e.g., consumer characteristics and service utilization), RDA used descriptive statistics to examine frequencies and ranges. To analyze qualitative data, RDA transcribed focus group participants' responses to appropriately capture the responses and reactions of participants. RDA then thematically analyzed responses from participants to identify commonalities and differences in participant experiences.

Implementation Update

Changes to Innovation Project during Reporting Period

There were no changes to the NMT pilot project during the 2017-2018 fiscal year.

Key Accomplishments

Six providers within the BHRS Adult System of Care completed NMT training and are continuing training to become certified NMT trainers. In January 2017, 12 providers in the BHRS Adult System of Care began the scheduled CTA NMT training. As of the end of the reporting period, six providers completed the NMT training and are certified in NMT. Of these providers, five are continuing on to NMT "Train-the-Trainer" training, which began in July 2018, to become certified NMT trainers. Four providers are still continuing the NMT training, while two providers stopped the training due to workload and/or other demands but are intending to restart the training at a later date.

In year 2 of the NMT pilot, the number of consumers receiving NMT services doubled from year 1. During the second year of the NMT pilot project, 40 adult consumers received NMT-based services compared to 20 consumers during year 1. During year 2, providers completed baseline assessments with 37 consumers and completed follow-up assessments with 11 consumers. As providers are progressing through the training and have become more confident with the NMT assessment, providers are beginning to implement NMT assessments and interventions with more clinical cases. As more providers become fully trained, BHRS anticipates approximately 75 to 100 adult consumers will receive NMT services annually.

BHRS expanded the NMT resources and interventions available to consumers in the Adult System of Care. During the first year of the pilot project, the NMT interventions for adults were somewhat limited as BHRS worked to expand available resources. However, during the second year of the evaluation, BHRS established relationships with other services and programs, including yoga, drumming, therapeutic massage, and animal-assisted therapy. Additionally, providers within the adult system of care have been

able to use NMT pilot funding to better equip their offices and clinics with resources and tools for NMT interventions—including therapeutic lighting, art supplies, adult coloring books, weighted blankets, fidget spinners, bubbles and silly putty, sensory brushes, and other sensory integration tools. This broader array of NMT interventions will allow greater opportunity for both providers and consumers to try different therapies and identify the interventions that best meet consumers' needs.

NMT Consumer Profile

The following section describes the consumer population that participated in NMT services during FY17-18, including demographic information, behavioral health diagnoses, behavioral health service utilization, and baseline NMT assessment information.

Demographic Information

As mentioned previously, BHRS aims to serve three adult populations through the NMT pilot project: adult consumers (ages 26+) receiving specialty mental health services, TAY (ages 18-25) receiving mental health services, and criminal justice-involved consumers re-entering the community following incarceration.

During FY17-18, 40 adult consumers received NMT services, all of whom reflect the intended target population. Most consumers (n=31, 78%) were adults ages 26-59, while nine consumers (23%) were TAY. No consumers were under the age 18. In addition, at least 15 consumers (38%), including both adults and TAY, were also part of the re-entry population.[6]

Figure 4. NMT Consumer Population, FY17-18, N=40

Table 2 describes the demographic characteristics of the NMT consumers.[7] For some characteristics, information was unknown or not reported for all consumers. As a result, the total number of consumers may be less than 40. The number of consumers for whom information is available is reported in the table.

[6]Consumers were identified as part of the criminal justice/re-entry population if they received behavioral health services in custody, services through the BHRS mental health court, or services through a provider aimed at serving the re-entry population (e.g., Service Connect).

[7]In accordance with HIPAA, demographic categories comprised of fewer than five consumers were aggregated to protect consumer privacy.

Two-thirds of consumers reported they were female (n=26, 65%) and one-third reported they were male (n=14, 35%); no consumers reported a different sex.[8] The largest racial group was White (n=15, 42%), while 33% reported another race including Asian, Black or African American, and Other. Nine consumers (25%) reported they were two or more races. One-third of consumers reported they were Hispanic or Latino (n=12, 33%).

Nearly all consumers (n=37, 93%) spoke English as their primary language, while some consumers primarily spoke another language or more than one language. Most consumers reported they were heterosexual (n=14, 78%), while 17% (n=6) reported they were another sexual orientation, and 6% (n=2) declined to state their sexual orientation. Over half of consumers (n=24, 60%) had a known disability, including a chronic health condition, an intellectual disability, or another type of disability. No consumers reported that they were a veteran.

Table 2. Demographic Characteristics of Consumers, FY17-18

Characteristic	Consumers	% of Total
Gender (N=40)		
Female	26	65%
Male	14	35%
Race (N=36)		
White	15	42%
Other Race	12	33%
Two or More Races	9	25%
Ethnicity (N=36)		
Hispanic/Latino	12	33%
Not Hispanic/Latino	24	67%
Primary Language (N=40)		
English	37	93%
Other	3	7%
Sexual Orientation (N=36)		
Heterosexual	28	78%
LGBTQ+[9]	6	17%
Decline to State	2	6%
Disability (N=40)		
Any Disability	24	60%
No Known Disability	16	40%

Behavioral Health Diagnoses

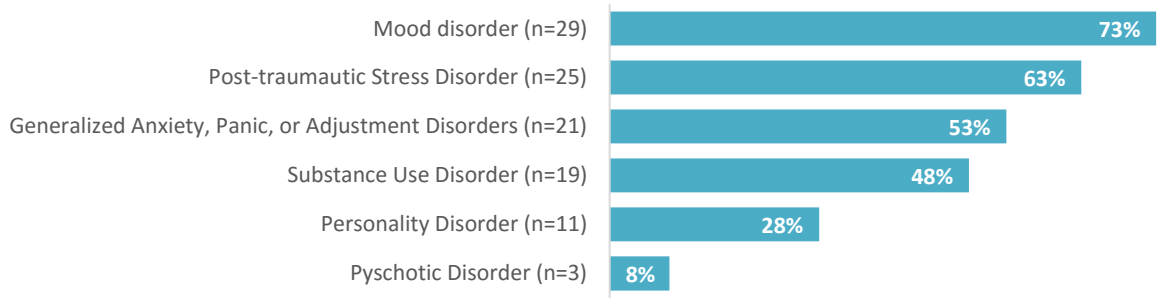
Consumers who participated in NMT had a variety of mental health diagnoses. Typically, the majority of adult consumers receiving specialty mental health services within adult systems of care have been diagnosed with a psychotic disorder (e.g., schizophrenia or schizoaffective disorder) or a mood disorder

[8]Information regarding gender identity was not available for this report. However, BHRS is actively working to incorporate gender orientation questions into their EHR.
[9]LGBTQ+ refers to lesbian, gay, bisexual, transgender, questioning or gender queer, intersex, asexual, or other sexual orientations.

(e.g., bipolar or major depressive disorders). However, as shown in Figure 5, the NMT population served during FY17-18 had a wider variety of behavioral health diagnoses. Consumers may have more than one behavioral health diagnosis; as a result, percentages add to greater than 100%.

While the most common diagnosis was a mood disorder wherein 73% (n=29) of consumers were diagnosed with a depressive or bipolar disorder, only 8% of consumers (n=3) were diagnosed with a psychotic disorder. Nearly two-thirds of consumers (63%, n=25) were diagnosed with a posttraumatic stress disorder (PTSD), and half (53%, n=21) were diagnosed with a generalized anxiety, panic, or adjustment disorder. In addition to these mental health diagnoses, 28% (n=11) also had a diagnosed personality disorder. Substance use is also prevalent among the population served, wherein half of consumers (n=19, 48%) have a documented co-occurring substance use disorder. Of these consumers, most reported using several substances, while some were diagnosed with specific cannabis, alcohol, amphetamine, or opioid use disorders. Most consumers with documented substance use disorders were also part of the criminal justice re-entry population.

Figure 5. Behavioral Health Diagnoses of NMT Consumers, N=40, FY17-18

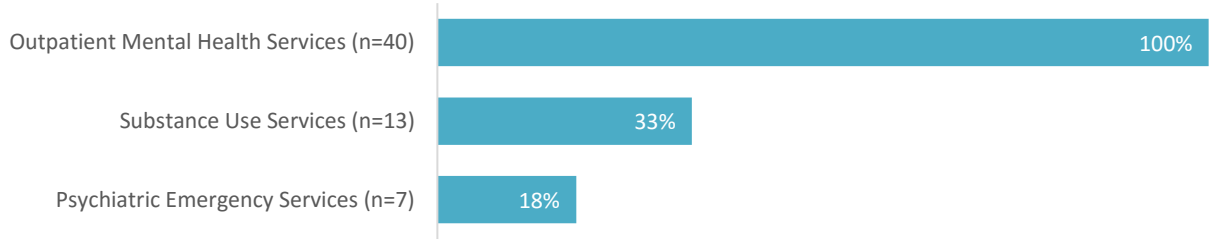


The breadth of diagnoses aligns with some of the diagnostic challenges that arise when working with individuals who have experienced significant trauma. Adults who have experienced trauma often have a more complex clinical presentation, frequently characterized by symptoms of anxiety, depression, and other mood fluctuations as well as substance misuse. Symptoms reflective of trauma may not clearly align to any one diagnosis within the existing diagnostic classification systems (e.g., DSM-IV TR or DSM-V). The relatively high prevalence of documented personality disorders may also be indicative of pervasive childhood trauma. As more consumers participate in NMT, it will be possible to explore consumers' clinical profile in greater depth.

Behavioral Health Service Utilization

All consumers who received NMT services were enrolled in and receiving outpatient mental health services. This aligns with the model of integrating NMT within existing mental health services rather than creating a stand-alone program. In addition to outpatient mental health services, one-third of consumers (n=13, 33%) also participated in outpatient and/or residential substance use services in the year prior to NMT enrollment. Additionally, in the year prior to NMT enrollment, 18% of consumers (n=7) experienced a mental health crisis that required psychiatric emergency services.

Figure 6. Behavioral Health Service Utilization, N=40, FY17-18



Baseline NMT Assessments

Brain Map and Functional Domain Scores

As mentioned previously, NMT-trained providers enter assessment data into a web-based tool designed by the CTA that uses the assessment data to generate a brain map illustrating the brain regions most likely to be affected by developmental impairment. Through this "mapping" process, scores are calculated in four functional domains: 1) Sensory integration, 2) Self-regulation, 3) Relational, and 4) Cognitive. The brain map and functional domain values can then be compared with age typical values to assess the degree of developmental impairment and identify the consumer's functional strengths and challenges.

These functional domains are defined as follows:

- **Sensory Integration** refers to a set of functions that integrate, process, store, and act on sensory input from outside (e.g., visual, auditory) and inside (e.g., metabolic) the body.
- **Self-Regulation** refers to a broad set of functions that modulate and regulate the activity of other key systems in other parts of the body and brain, such somatosensory and emotional regulation.
- **Relational** refers to the complex set of relationship-related functions such as bonding, attachment, attunement, reward, empathy, and related emotional functions.
- **Cognitive** refers to the myriad functions involved in complex sensory processing, speech, language, abstract cognition, reading, future planning, perspective-taking, moral reasoning, and similar cognitive capabilities.

As of the end of the reporting period, baseline assessments were completed for 37 consumers.[10] Of these 37 consumers, 29 were adults (78%) and 8 were TAY (22%). For each consumer, functional domain values were compared with age typical values to calculate the percent of age typical (i.e., the functional domain score). A score of 100% indicates normal functioning with respect to a person's age. A score lower than 100% indicates some degree of impairment, wherein lower scores correspond to greater impairment. For example, a functional domain score of 70% indicates greater impairment than a value of 80%.

The average baseline scores for the total brain map and each of the functional domains are illustrated in Figure 7. Consumers' average baseline brain map score was 81%. However, the values ranged widely from 53% (indicating a high degree of impairment) to 100% (indicating normal functioning). Consumers

[10] Baseline assessments were still ongoing and not yet completed for the remaining three consumers.

appeared to have relatively high functioning in the sensory integration and cognitive domains at baseline. The average sensory integration score was 85% (range: 51% to 100%), while the average cognitive domain score was 87% (range: 62% to 100%). In comparison, consumers appeared to have somewhat lower functioning in the self-regulation and relational domains. The average self-regulation score was 77% (range: 42% to 100%), while the average relational score was 76% (range: 49% to 100%).

Figure 7. Average Baseline Brain Map and Functional Domain Scores, N=37, FY17-18

Level of NMT Recommended Interventions

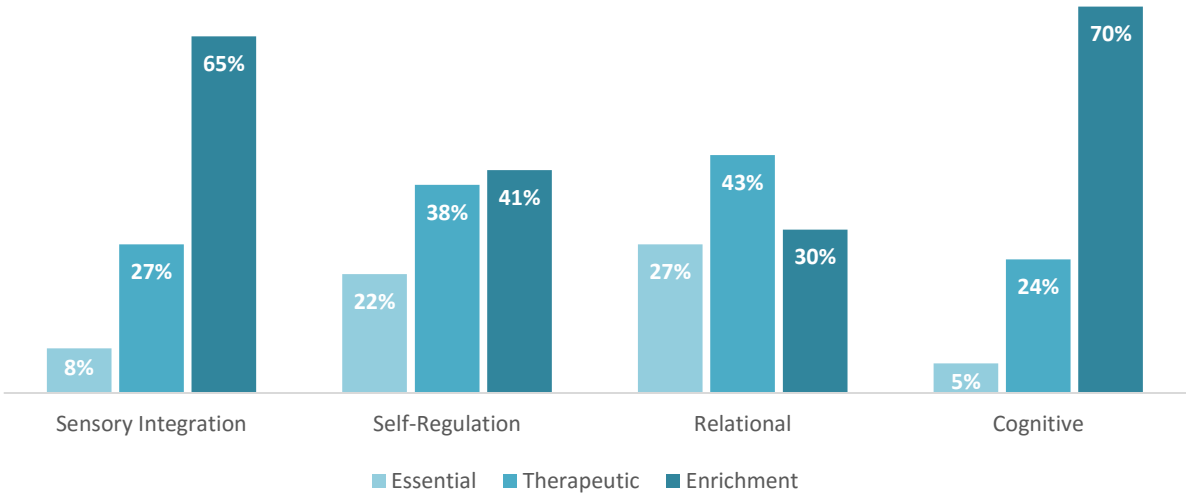
As discussed, brain map and functional domain scores are used to highlight the consumers' functional strengths and needs. This information can then be used to develop broad recommendations for the types and intensity of NMT interventions that consumers should receive to promote growth and recovery. To guide treatment planning, CTA developed cut-off scores to indicate whether interventions targeting each of the functional domain areas are recommended as essential, therapeutic, or enrichment. These recommendation categories, or levels, are described in greater detail below:

- **Essential:** Functional domain score is **<65%** of age typical. At the essential level, activities are considered crucial for future growth in the given domain. If functioning in the essential area is not increased, the individual will lack the foundation for future growth and development in this and other areas.
- **Therapeutic:** Functional domain score is **65-85%** of age typical. At the therapeutic level, activities are aimed at building strength and growth in the particular area. Therapeutic activities are viewed as important for continued growth and development.
- **Enrichment:** Functional domain score is **>85%** of age typical. At the enrichment level, activities provide positive, valuable experiences that continue to build capacity in the given area.

Figure 8 illustrates consumers' recommended level of intervention across each functional domain based upon their baseline assessment. In both the sensory integration and cognitive domains, interventions for most consumers (65-70%) were recommended as enrichment. Interventions in the cognitive and sensory integration domains were recommended as therapeutic for approximately one-quarter of consumers and recommended as essential for less than 10%. This reflects the relatively high functioning of consumers in these areas.

In comparison, for the self-regulation and relational domains, most consumers had interventions recommended as essential or therapeutic. Approximately one-quarter of consumers had interventions recommended as essential in these domains, while approximately 40% of consumers had interventions recommended as therapeutic. Interventions in the relational domain were recommended as enrichment for 30% of consumers and 41% in the self-regulation domain.

Figure 8. NMT Recommendation Categories across Functional Domains, N=37, FY17-18



Progress Toward Learning Goals

This section discusses the progress that the BHRS NMT Pilot has made toward achieving its two learning goals:

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

A summary of key findings is presented below, followed by a detailed discussion of each learning goal.

Summary of Key Findings

Learning Goal 1: NMT Implementation and Adaptation

- **Provider Experience** - Providers enjoy the NMT training and believe it is helping them better serve their clients. However, greater mentorship throughout the training process could help providers better understand NMT priniciples and apply NMT to the adult population.
- **Provider Skill Development** - Providers are becoming more confident with the NMT assessment process and are expanding NMT selection to include consumers who are lower functioning and/or have greater mental health needs.
- **Adaptations to Adults -** Assessments can still be more time consuming and more difficult to complete with adults than children and adults are sometimes less receptive to trying different types of activities. To address these challenges, providers are implementing strategies to make the assessment process smoother with adults and are tailoring activities to meet each consumers' specific needs and interests.

Learning Goal 2: NMT Outcomes

- **Improved Consumer Outcomes -** Consumers appear to be benefitting from NMT services, as indicated by increases in functional domain scores and progress in their recovery. The NMT approach may also make it easier for some consumers to engage in therapy.
- **Trauma-Informed Approach to Care** - NMT implementation may be helping clinics and programs within the BHRS adult system of care be more trauma-informed.

Learning Goal 1: NMT Implementation and Adaptation

The following section describes key successes and challenges implementing and adapting NMT to the adult population. The section includes discussion of the selection of providers in the adult system, NMT training, the NMT assessment process, and NMT interventions.

NMT Provider Selection

Providers opted in to NMT training voluntarily in order to strengthen their ability to serve consumers with a history of trauma. As mentioned, 12 providers began the NMT training in January 2017, all of whom are master's level clinicians. NMT training was voluntary, and all clinical staff opted in. Providers received information about NMT and the NMT training opportunity from supervisors, team members, and a training announcement circulated by BHRS. Providers shared that they chose to participate in the training because they were already working with consumers with a history of trauma and adverse experiences. Providers felt the NMT approach sounded promising to better serve these consumers and expressed interest in strengthening their abilities to respond to and treat the impact of trauma. Some providers had a background in occupational therapy and noted that they were already using more "hands on" interventions aiming to improve consumers' functioning. These providers hoped the NMT training would help them gain a more in-depth understanding of the principles of neurodevelopment and how NMT-based interventions can be used to improve consumers' recovery.

NMT Training

The NMT training model relies on a case conference or group supervision approach with intensive self-study. In this approach, the providers attend an initial in-person training and then begin implementing NMT while conducting their self-study and participating in NMT study groups and learning communities. To conduct their self-study, providers receive a detailed training syllabus with a variety of web-based training materials and resources—including videos, lectures, recordings, readings, and case studies—allowing providers to work through the content at their own pace. Providers must also participate in a monthly meeting, or case conference, wherein providers discuss real-life cases. These group discussions are the foundation for supervision of NMT implementation, provide opportunities for clinicians to refine their knowledge and skills, and allow for fidelity monitoring. Throughout the training, providers must also complete at least 10 NMT assessments. Certified NMT providers must then complete fidelity assessments annually, wherein providers evaluate the same client data and inter-rater reliability scores are calculated. NMT training is designed to be completed over the course of approximately one year, although the self-directed nature of the training allows the training to be extended as needed.

The NMT training is increasing providers' knowledge and ability to respond to consumers with a history of trauma. Overall, providers found the NMT training useful and interesting, and enjoyed learning about the neurobiology and impact of trauma. For many of the providers, the NMT training is providing an opportunity for more advanced training in brain development and neuropsychology related to trauma. The providers described how their increased knowledge and understanding about the impact of trauma is helping them better understand the behaviors and presentation of consumers. NMT trainers and supervisors also observed these changes among providers, and noted that the training appears to be improving providers' clinical skills. Given these benefits, several providers shared that all clinicians should receive some training in the NMT principles and the impact of trauma on neurodevelopment in order to improve service delivery.

> *The information is so valuable…The trauma lens from a neuro perspective, it has changed my outlook on the world and how I view things.*
>
> – NMT Provider

The NMT training is intensive and takes significant time and dedication. Providers also acknowledged that training takes dedication and requires a lot of time in addition to their existing caseloads and other responsibilities. Additionally, challenges in completing assessments with adult consumers as well as translating NMT tools from the child to adult population can make the training particularly intensive. For providers in the adult system, the training is requiring more than a year to complete. Among providers who completed the training, the process took approximately 18 months. However, some providers are working through the training at a slower pace, while two providers chose to suspend the training until they had more time to devote to it. Some providers shared that it was helpful when their supervisors were flexible in allowing them to take extra time to participate in the trainings and conduct NMT assessments. Providers also noted that it would be helpful if they could receive continuing education credits for the NMT training.

> *You have to be willing to go the extra mile to get this specific training. I was really close to dropping out because it's like taking another master's course and I already had so much on my plate. My supervisor was really accommodating in providing more time, but it's hard to follow-up when you're not getting clients consistently. It's a lot of work.*
>
> – NMT Provider

Greater mentorship throughout the training could help providers better understand and apply NMT principles and adapt NMT for an adult population. While the training is extensive, some providers shared that it would have been useful to devote more time and practice to treatment planning during the training. In some cases, providers felt they needed more explanation of how the underlying NMT principles related to the selection of specific interventions. Some providers also found it challenging to translate the underlying theory to practice as many of the learning materials focused on children rather than adults. In particular, some providers felt they needed more guidance in selecting practical interventions for adults. Some of the recommended interventions are geared more toward children, or adults may be more hesitant than children to try new activities if they are unfamiliar (e.g., yoga, knitting, clay therapy).

Providers noted that having greater access to NMT mentors (i.e., certified NMT trainers with more senior experience implementing NMT) could have helped trainees navigate some of the challenges related to learning the assessment tools and treatment planning as well as modifying interventions for adults. Some providers mentioned that it would also be helpful if they were paired with a NMT-certified provider who worked in the same clinic or program to promote more regular mentorship and familiarity with the target population.

> *There's a lot of reason and theory involved in the training, but then we had to do the treatment planning portion. I felt like I was thrown into the treatment planning a little bit. I needed more of a bridge.*
>
> – NMT Provider

It is important to note that the cohort of NMT trainees is larger than in previous years, primarily because of this INN project. Although trainees were paired with mentors in the latter half of the training, there were more trainees per trainer and new trainees may not have gotten as much support as in previous cohorts. However, as previously mentioned, five providers in the Adult System of Care are participating in the NMT Trainer certification training and can provide mentorship to future trainees in the Adult System of Care.

NMT Assessment Process

Providers are becoming more confident and adept with the NMT tools and the assessment process. The NMT assessment process is fairly intensive and includes a number of detailed questions to understand a consumer's developmental history and past experiences of trauma. For all new NMT trainees—in both adult and youth systems of care—it takes time for providers to learn and gain comfort with the assessment tool. Providers in adult systems may also have a steeper learning curve as they do not regularly conduct developmental histories with adult consumers with the level of detail required for the NMT assessment.

As all NMT trainees first learn the assessment questions and process, they often administer the assessment in a direct way, going question by question. This approach takes longer and there was concern that this approach may trigger or risk re-traumatizing consumers who are not accustomed to these types of questions. In particular, adults may be less accustomed to discussing early experiences—including trauma—and providers were concerned that the developmental history questions may bring up emotions that the consumer is not prepared to manage.

As providers have progressed through the training, they have become more confident with the assessment tool and appear to be more consistently implementing strategies to make the assessment process smoother and minimize the risk of re-traumatization. These strategies include:

1) Explaining the process to consumers to help them understand why the providers are asking about their childhood and adolescence;
2) Asking broader questions or combining questions to make the assessment more conversational, less burdensome, and less-time consuming for the consumer and to reduce the risk of re-traumatization;

3) Breaking up the assessment over multiple visits if the consumer had reactions to the questions or struggled to focus long enough to complete the assessment; and
4) Reaching out to additional respondents who may have information about the consumer, such as another provider who is familiar with the consumer's history.

Some consumers who participated in the focus group also acknowledged that the assessment process can feel long and that it can be difficult to discuss past experiences of trauma, particularly if it is their first time meeting with a provider. However, consumers who participated in the focus group shared that providers were patient and made them feel safe. Some providers mentioned it could also be useful to have a standardized set of materials or an orientation to NMT that could be used by all providers to help introduce consumers to NMT prior to beginning services. The orientation or materials could be used to help explain the NMT principles and process to consumers so consumers know what to expect and feel more comfortable with assessment.

As providers gain comfort with the NMT assessment process, providers are expanding NMT selection criteria to include consumers with greater mental health needs. In the earlier stages of NMT training, providers were often conservative in determining which consumers to refer to NMT. Providers were mindful of the risk of the assessment process and effectiveness of interventions based upon consumers' level of functioning, coping skills, and ability to self-regulate as well as providers' experience with the assessment tool. Several providers mentioned that they typically only referred higher functioning consumers—including consumers they knew well and with whom they developed trust and rapport; consumers who were willing and comfortable discussing their trauma; consumers who had the coping skills to manage reactions that may arise as a result of the assessment; and consumers who are stable and compliant with medication, are not actively abusing substances, and are not actively psychotic.

> *In the beginning, I would have thought I needed the good therapy client who has good insight…Now, I'm thinking, why couldn't we implement [NMT] with someone more impaired?*
>
> – NMT Provider

As providers gain more experience and confidence with NMT and the assessment process, providers' perception of the adult population that may benefit from NMT is evolving, and providers' selection criteria is expanding. Providers still consider the risks of engaging in the assessment with the potential benefits of NMT and strive to build rapport with consumers before beginning the assessment process. However, providers feel that the most important selection criteria for NMT are:

- Consumer has a history of trauma;
- Consumer is willing to participate in NMT and regularly shows up for appointments; and
- Consumer is stable enough to recall information and provide realistic responses.

Providers mentioned that it can still be challenging to conduct assessments with individuals who are actively abusing substances or are experiencing psychosis, as this may influence consumers' ability or willingness to respond to assessment questions and/or regularly participate in NMT services.

Nevertheless, it is apparent that providers are implementing NMT with adult consumers across a greater spectrum of mental health severity.

Assessments are more time consuming and can be challenging to complete with adults. Providers noted that one challenge in implementing NMT with the adult population is that the assessments can be more time consuming and more difficult to complete than with children. One provider noted that while they can sometimes complete an NMT assessment for a child in 1-2 meetings, for adults it can often take 3-4 meetings over the course of a month or longer. Some reasons the assessment process is often longer for adults are:

- With adults, the NMT assessment collects information for a consumers' entire developmental history—fetal stages through adulthood. In contrast, the assessment is shorter for children as it only collects information through the child's current developmental stage.
- The assessments can be more time consuming for adults if consumers cannot recall information, and/or if consumers need to take breaks or stop the assessment if it brings up difficult experiences.
- Compared to children, adult consumers may have fewer collateral contacts that the providers or consumers can work with in order to fill in information gaps of the assessment.
- Adult consumers may be less likely to regularly participate in NMT services due to the severity of mental illness, substance use, homelessness, incarceration, etc.

Given these challenges, providers are experiencing difficulty completing assessments if consumers stop regularly attending mental health service appointments or become incarcerated, hospitalized, or otherwise unavailable to continue.

NMT Interventions

Providers are implementing a breadth of NMT interventions, tailoring activities to each consumers' specific interests and needs. The recommendations serve to guide the types of interventions that consumers may need and that providers should focus on. However, the specific interventions selected are tailored to what each individual is interested in and willing to do. As mentioned, adults may be less willing to try new and different types of activities compared to children, so providers often try to introduce interventions that may be more familiar. For example, some consumers shared that they first tried exercises such as deep breathing, counting, going for walks, and mindfulness exercises. While these activities may help some consumers become more comfortable with the different approach to therapy, consumers also appreciated that they could practice these techniques on their own.

> *Every time I meet with [my provider], we work on a different project. At that time, I'm at peace. I'm in a secure place. I could have a bad day, but talking with [my provider], playing with clay or listening to music, it takes me away.*
>
> – NMT Consumer

Providers also try to learn about consumers' hobbies and interests and will suggest or encourage activities that align with the recommended interventions. As providers build rapport with consumers and learn

more about their specific goals and needs, they may suggest new or additional activities that consumers may enjoy or benefit from such as yoga, drumming, or spinning clay. In some cases, consumers also suggest new activities they would like to try. Consumers appreciated having a variety of activities to choose from and tools to use to best meet their needs in different situations. This flexible and individualized approach helps consumers feel supported and engaged as well as increases the likelihood that they will implement the interventions independently.

Learning Goal 2: NMT Outcomes

The following section describes individual-level outcomes of adult consumers who participated in NMT services—including changes in assessment scores and recovery outcomes—as well as larger systems-level changes in the providers' approach to care as a result of NMT implementation in the adult system.

NMT Consumer Outcomes

Providers conduct follow-up NMT assessments with consumers to evaluate consumers' progress as well as update consumers' treatment plans if necessary. At the time of this report, follow-up assessment data were available for 11 consumers. Among these consumers, five were adults and six were TAY. On average, there were 12 months between the baseline and follow-up assessments, although the time interval ranged from 4 to 20 months.

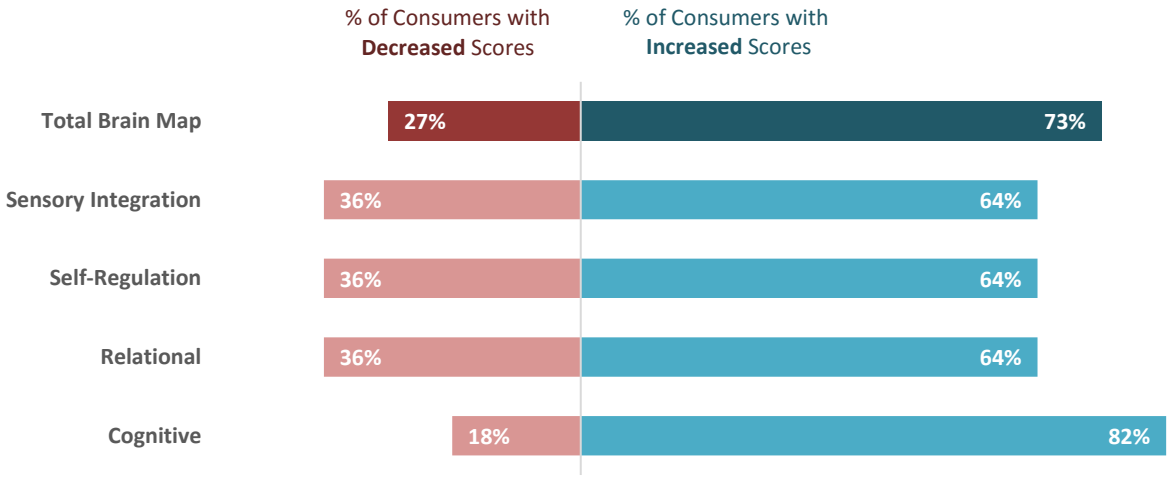
The relatively small number of individuals with follow-up assessments and the varying length of time between assessments may partially reflect the challenges in completing assessments and inconsistent participation in services among the adult population. Additionally, providers who did not progress as far in the training may not have had the opportunity to complete follow-up assessments as they were likely serving fewer consumers or serving consumers for a shorter period of time. As the program continues to mature and greater numbers of consumers are served for longer periods, we expect more consumers will receive follow-up assessments.

For the report, changes in assessment data were examined; however, given the small number of individuals with follow-up data available, assessment findings should be considered preliminary and exploratory. Focus groups with providers and consumers were also used to collect additional qualitative information about how NMT has impacted consumers' wellness and recovery.

Although the magnitude of change varies, most consumers are showing increases in their assessment scores, suggesting functional improvements. For the 11 consumers with follow-up data available for this report, baseline and follow-up assessment data were examined to identify changes in consumers' brain map and functional domain scores as consumers participated in NMT services. An increase was defined as any positive change in a score from baseline to follow-up (follow-up score – baseline score > 0), while a decrease was defined as any negative change in scores from baseline to follow-up (follow-up score – baseline score <0).

Of the 11 consumers, most consumers showed increases in their total brain map scores and across all functional domains from baseline to the follow-up assessment. As shown in Figure 9, 73% of consumers (n=8) showed increases in their total brain map scores, while 27% (n=3) showed a decrease. Across the sensory integration, self-regulation, and relational domains, 64% of consumers (n=7) showed increases in domain scores, while 36% (n=4) showed decreases. The greatest number of consumers (n=9, 82%) showed increases in the cognitive domain, with only 18% (n=2) showing decreases in domain scores.

Figure 9. Percentage of Consumers with Increased and Decreased Assessment Scores from Baseline to Follow-up, N=11, FY17-18



In general, increases in brain map values suggest improvement (progress toward age typical functioning), while decreases in brain map values suggest further impairment (movement away from age typical functioning). However, given that NMT has not yet been widely implemented with adults, it is unclear what magnitude of change in assessment scores may be expected and how changes translate to functional and recovery outcomes in adults.

Overall, the average change in consumers' brain map and functional domain values was +3% to +5%, depending on the specific domain (Table 3). However, the magnitude of change varied widely across consumers. Scores in the self-regulation and relational domains appeared to be particularly variable, where the change in scores ranged from a decrease of approximately -30% to an increase of nearly 30% from baseline to follow-up. Providers noted that consumers who had particularly large increases in assessment scores responded particularly well to the selected NMT interventions. These consumers regularly engaged in the recommended activities and/or practiced various self-soothing or calming techniques on a day-to-day basis. However, in other cases, providers noted that some consumers showed great progress in their recovery, but the change in assessment scores was minor.

Table 3. Average Change in Assessment Scores from Baseline to Follow-Up, N=11, FY17-18

	Average Change in Scores	Range of Change in Scores
Total Brain Map	+4%	-18% to +23%
Sensory Integration	+3%	-7% to +25%
Self-Regulation	+3%	-32% to +28%
Relational	+4%	-33% to +26%
Cognitive	+5%	-3% to +20%

It is important to note that providers' increasing experience and confidence with the NMT assessment may also partially contribute to differences in domain scores from baseline to follow-up. Providers generally completed baseline assessments earlier in their NMT training, whereas follow-up assessments were completed later when providers had more practice and training. As providers gain more experience with the assessments, they may score criteria slightly differently, which may contribute to a change in assessment scores. As more consumers participate in NMT services and more assessments are completed, it may be possible to better understand how changes in assessment scores relate to changes in consumers' functioning and recovery.

NMT services appear to be helping consumers progress in their recovery. Aside from changes in assessment scores, all focus group participants could point to benefits consumers experienced as a result of participating in NMT interventions. Consumers most frequently discussed how the NMT interventions helped them feel less anxious and more relaxed. Concentrating on an activity—such as an art project or spinning clay—helped consumers "get out of their head," while techniques such as deep breathing or the use of sensory tools—such as fidget spinners, stress balls, brushes, and massagers—helped consumers stay centered and calm. In some cases, consumers and providers reported that the NMT-based techniques and activities are helping to decrease substance use as well as reduce or avoid medication to cope with depression and anxiety. Other changes noted by consumers and providers included more consistent sleep schedules, increased attention to hygiene and self-care, and improved ability to communicate. For some consumers, the assessment process and NMT interventions appear to be helping consumers process their experiences to develop better insight and understand the impact that trauma has had on their current behaviors.

> *The moment you start, you get the anger out by massaging the clay. All the stress and tension I had in my hands and my mind, I didn't have it anymore. I didn't even remember the reason why I was so upset or hurt.*
>
> – NMT Consumer

The NMT approach may make it easier for some consumers to engage in therapy. Consumers shared that NMT felt different from other mental health services consumers had received. In many cases, consumers were accustomed to more traditional talk therapy, which often left consumers feeling emotional and fatigued after sessions. As one consumer noted, "just talking to the therapist makes me relive things I don't want to." In contrast, NMT-based activities made consumers feel "refreshed" and "light." While consumers enjoy the variety of interventions and activities, several consumers also observed that it was easier for them to discuss their feelings and trauma when engaging in the activities and that it helped them feel safe. Consumers also talked about how providers will engage in activities—such as drawing, coloring, and building models—with the consumers, which helps build rapport and trust. Several consumers mentioned that no other providers have worked with consumers in this way before, and that with NMT, they look forward to their next sessions.

> *[NMT] doesn't feel like the normal going to the counselor and you just tell them your feelings and it's depressing and it's serious. [NMT] doesn't feel like that. It feels light.*
>
> – NMT Consumer

Provider Approach to Care

NMT implementation may be helping clinics and programs be more trauma-informed. As mentioned, providers reported that being trained in NMT and the neurodevelopmental impacts of trauma is changing the way they approach care, regardless of whether they are implementing NMT with a consumer. Moreover, providers observed that the presence of NMT is beginning to influence other providers who are not trained in NMT but work with NMT-trained providers. Both NMT-trained providers and non-NMT providers are making changes to their office set-up and have added objects in therapy rooms to increase consumer comfort. NMT trained providers are also increasingly receiving requests from non-NMT providers to conduct assessments with consumers on the non-NMT providers' caseloads, including both adults and the parents of children on their caseloads. With the increasing demand for NMT services, one provider suggested that it would be useful to have a more explicit NMT program wherein people who screen for severe trauma are then sent to a dedicated team of NMT providers. These findings suggest that training providers in the adult system of care in NMT principles may support adult clinics and programs in being more trauma-informed and trauma-capable organizations overall.

Conclusion

The 2017-2018 fiscal year marked the first full year of NMT implementation in the BHRS Adult System of Care. During this time, providers in the adult system progressed in their training and served 40 consumers from diverse populations. Additionally, BHRS made great strides to better equip clinics and programs with NMT resources to expand the NMT interventions available to adult consumers.

> *If [NMT] can be done throughout all of San Mateo County and the whole mental health system, it could have so much of an impact.*
>
> – NMT Consumer

Throughout the year, providers gained more experience with the NMT assessment process, and are beginning to expand NMT selection to include consumers who are lower functioning and/or have greater mental health needs. However, implementing NMT assessments and interventions can still be more challenging and time consuming with adults compared to children. Adults sometimes have difficulty recalling information, may not be able or willing to participate in outpatient services consistently, and can be more hesitant to try different types of activities. To address these issues, providers are implementing strategies to limit the burden of the assessment process on consumers and are tailoring NMT services and interventions to each consumers' specific interests and needs.

Consumers appear to be benefitting from NMT implementation, and for some, the NMT approach may make it easier for consumers to engage in therapy. Although follow-up assessment data were limited, preliminary data suggest that consumers are improving across all functional domains. Consumers and providers also cited improvements in consumers' mood, coping mechanisms, and self-care as well as decreases in substance use.

Additionally, NMT implementation is strengthening trained providers ability to serve consumers with a history of trauma, and shows promise in supporting the adoption of trauma-informed practices and treatment options in the BHRS Adult System of Care overall. Over the next year, BHRS and RDA will continue to evaluate implementation progress to identify facilitators, challenges, and possible recommendations for adapting NMT in an adult system of care and will continue to collect consumer-level data to examine changes in consumer outcomes.

Appendix. Adult Neurosequential Model of Therapeutics Evaluation Plan

Introduction

The Neurosequential Model of Therapeutics© (NMT) within the Adult System of Care was developed as part of the San Mateo Behavioral Health and Recovery Services (BHRS) three-year Mental Health Services Act (MHSA) Innovation plan. At their core, MHSA programs are intended to provide counties with funding to create fundamental changes to the access and delivery of mental health services. The goal of MHSA Innovation (INN) programs are to test novel approaches and interventions created by local communities through an inclusive Community Program Planning (CPP) process. INN programs seek to do the following:

- Increase access to mental health programs for underserved groups,
- Increase quality of services and outcomes, and
- Promote interagency collaboration.

Through the CPP process, BHRS identified 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. To address this need, BHRS proposed implementing the NMT approach within the BHRS Adult System of Care. NMT is an innovative approach to treating trauma, typically used with children, that is grounded in neurodevelopment and neurobiology.

BHRS intends to adapt, pilot, and evaluate the application of the NMT approach to an adult population in order to increase the quality of mental health services and recovery outcomes for adult mental health consumers with a history of trauma. The NMT pilot meets INN requirements as it represents a change to an existing practice which has not yet been demonstrated to be effective. This expansion and evaluation of NMT within an adult system of care will be the first of its kind.

The San Mateo County Board of Supervisors approved the Adult NMT project on May 24, 2016, and BHRS began implementation of the three-year pilot in September 2016. BHRS selected Resource Development Associates (RDA) to conduct a two-year evaluation of the adult NMT pilot project beginning in January 2017. The NMT evaluation is intended to help BHRS achieve the following objectives:

1. Meaningfully engage stakeholders throughout the evaluation process;
2. Measure the impact of the program;
3. Support data-driven decisions about program implementation and continuation;
4. Increase knowledge about what works in mental health and with the adult consumers; and
5. Comply with INN regulatory and reporting requirements.

NMT Literature Review: Support for NMT

NMT Background

Adverse childhood experiences (ACEs) (e.g., chronic stress, neglect, abuse, trauma, etc.) can profoundly impair neurodevelopment and brain functioning. Disordered brain functioning can in turn contribute to a myriad of physical, cognitive, emotional, and behavioral problems that may persist throughout the lifespan (Perry, Pollard, Blakly, Baker, & Vigilante, 1995; Felitti et al., 1998; Anda et al., 2006). The impact of adverse experiences on brain development and the resulting functional and behavioral issues also vary with the timing, severity, pattern, and nature of the trauma, as well as by the unique experiences and genetic characteristics of each individual. However, many treatment approaches designed to help individuals cope and progress in their recovery do not consider or adequately address the complexity and variability of neurodevelopmental impairment caused by childhood trauma.

The Child Trauma Academy (CTA) developed NMT as an alternative approach to trauma-informed treatment that is grounded in neurodevelopment and neurobiology (Perry, 2008). NMT is not a single therapeutic technique or intervention. Rather, NMT aims to guide the selection and sequence of a set of highly individualized educational, enrichment, and therapeutic interventions (e.g., therapeutic massage, drumming, yoga, expressive arts, etc.) that best match each NMT consumers' unique strengths and neurodevelopmental needs to help consumers better cope, self-regulate, and progress in their recovery. (Perry & Hambrick, 2008).

As trauma during brain development can lead to dysfunctional organization of neural networks and impaired neurodevelopment, the selected set of interventions are intended to help change and reorganize the neural systems to replicate the normal sequence of both brain and functional development (Perry & Hambrick, 2008). Interventions are selected to first target the lowest, most abnormally functioning parts of the brain. Then, as functional improvements are made, therapies are selected that target the next, higher brain region (Perry & Hambrick, 2008). The sequence of interventions aim to help consumers better cope, self-regulate, and progress in their recovery.

Since its development, NMT has been implemented in various behavioral health settings (Perry & Dobson, 2013), including BHRS which has been using the NMT approach with youth since 2012. To date, the number of studies evaluating the effectiveness of NMT are limited. However, some studies have found evidence of increased social-emotional development and improvements in problematic behavior in children receiving NMT (Barfield, Gaskill, Dobson, & Perry, 2012). In BHRS, among a sample of 10 youth receiving NMT assessments and interventions, all showed improved self-regulation, and two-thirds showed improvements in sensory integration, relational, and cognitive domain measures.

Application of NMT for Adults

Currently, NMT is most widely used with maltreated and traumatized children, and the use of NMT with adults is limited. However, there is a strong theoretical basis to predict that adult mental health consumers may also benefit from the NMT approach. As mentioned, NMT is built upon the premise that trauma can cause neurological damage and that sequential, neurodevelopmentally appropriate interventions can help improve coping skills and recovery outcomes.

A study of over 17,000 adults revealed a strong positive relationship between ACEs and the increased likelihood of behavioral health issues, suggesting disordered brain functioning in response to child trauma (Anda et al., 2006). In particular, adults who experienced four or more ACEs were 3.6 times more likely to be depressed, 2.4 times more likely to experience anxiety, 7.2 times more likely to suffer alcoholism, and 4.5 times more likely to use illicit drugs than adults with no ACEs (Anda et al., 2006). The relationship between trauma and mental health is further strengthened by the high prevalence of adult consumers with mental illness and/or substance use issues who also have experiences of trauma, approximately 40 to 80% (Missouri Institute of Mental Health, 2004). These findings suggest that interventions, such as NMT, that address the neurological impacts of trauma may be effective in helping consumers improve coping skills and achieve better recovery outcomes.

Despite the potential of using NMT with adults, there are also important differences between the adult and youth consumer populations that should be considered. In comparison to children, the extent of neurological damage is likely greater among adult mental health consumers who may suffer continued brain impairment beyond the effects of childhood trauma. For instance, many adult mental health consumers also have a history of long-term psychiatric medication usage as well as long-term substance abuse, both of which can further impair brain functioning.

In addition, initial studies of NMT have found the approach is most effective for children in safe, stable, and nurturing environments (Perry & Hambrick, 2008). However, many adult consumers may still be experiencing patterns of instability and trauma. One study found that nearly a third of mental health consumers had been victimized within the previous six months (Desmarais et al., 2014), while other studies found that consumers with serious mental illness are more than 10 times more likely to be homeless than the general population (Treatment Advocacy Center, 2016).

Nevertheless, the effectiveness of NMT in improving recovery outcomes in the adult population is unknown. As of yet, no outcome studies have been conducted to evaluate NMT in an adult population and NMT has not yet been formally implemented into an Adult System of Care. Given this opportunity and the preliminary success of NMT with youth, San Mateo BHRS has undertaken a project to adapt, pilot, and evaluate the application of the NMT approach to an adult population within the BHRS Adult System of Care.

San Mateo BHRS Adult NMT Pilot Project

NMT Providers

As mentioned previously, BHRS has been using the NMT approach with youth for the past five years. In that time, 10 BHRS providers have become certified NMT trainers. These NMT trainers cannot certify other providers in NMT; however, the trainers can provide consultation and teaching of NMT principles. In January 2017, 14 mental health clinicians began NMT training.[11] The clinicians work in a variety of settings within the BHRS Adult System of Care, including BHRS specialty mental health or regional clinics as well as programs targeted toward consumers re-entering the community following incarceration.

Target Population

The NMT providers will incorporate the NMT process into their clinical work, targeting three main populations of adult mental health consumers, including:

- General adult consumers receiving specialty mental health services,
- Transition age youth (TAY) consumers (ages 18-25), and
- Criminal justice-involved consumers re-entering the community following incarceration.

It is important to note that the three target populations likely have different experiences, needs, and coping skills and as a result, could respond to NMT differently. For example, TAY are still undergoing brain development and therefore may be more responsive to neurodevelopmental treatment approaches, such as NMT. The re-entry population may have different coping mechanisms than the general adult and TAY consumer populations, such as engaging in high risk behaviors that are more likely to lead to incarceration. In addition, for the re-entry population, the experience of incarceration could contribute to trauma.

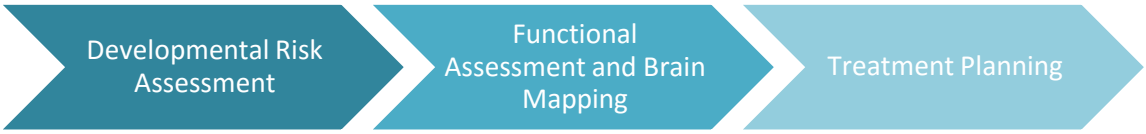
BHRS estimates that through the adult NMT pilot project, approximately 75 to 100 adult consumers will receive NMT-based services annually. Providers will refer existing BHRS consumers from their caseloads to NMT. Due to the novel nature of this pilot, clear selection criteria for adults referred to NMT have not yet been established. Although, adult consumers who will most benefit will likely have a history of crisis or trauma. Additionally, NMT is not intended for consumers diagnosed with serious psychotic disorders or who are currently cycling in and out of psychiatric hospitalization. As implementation progresses, BHRS will establish guidance in case selection with the support of NMT trainers and mentors.

[11]The formal training certification program takes place over one year, with trainees learning through a combination of readings, videos, webinars, and case-based trainings. Trainees begin implementing the NMT model with consumers shortly after the training commences and must conduct a minimum of 10 NMT assessments annually. In order to ensure fidelity to the NMT model, CTA requires that all certified NMT providers complete fidelity assessments twice annually, wherein the providers evaluate the same client data and inter-rater reliability scores are calculated.

NMT Process and Activities

The NMT approach helps clinicians identify the developmental strengths and challenges of each individual to help create an individualized treatment plan matching their unique developmental needs. As depicted in Figure 2, the NMT process consists of three main phases: 1) developmental risk assessment, 2) functional assessment and brain mapping, and 3) the development of individualized treatment recommendations. These phases are described in greater detail below. However, the elements of the NMT process and specific NMT-based services will likely be modified as the approach is adapted to the adult population.

Figure 10. Key phases of the NMT Process



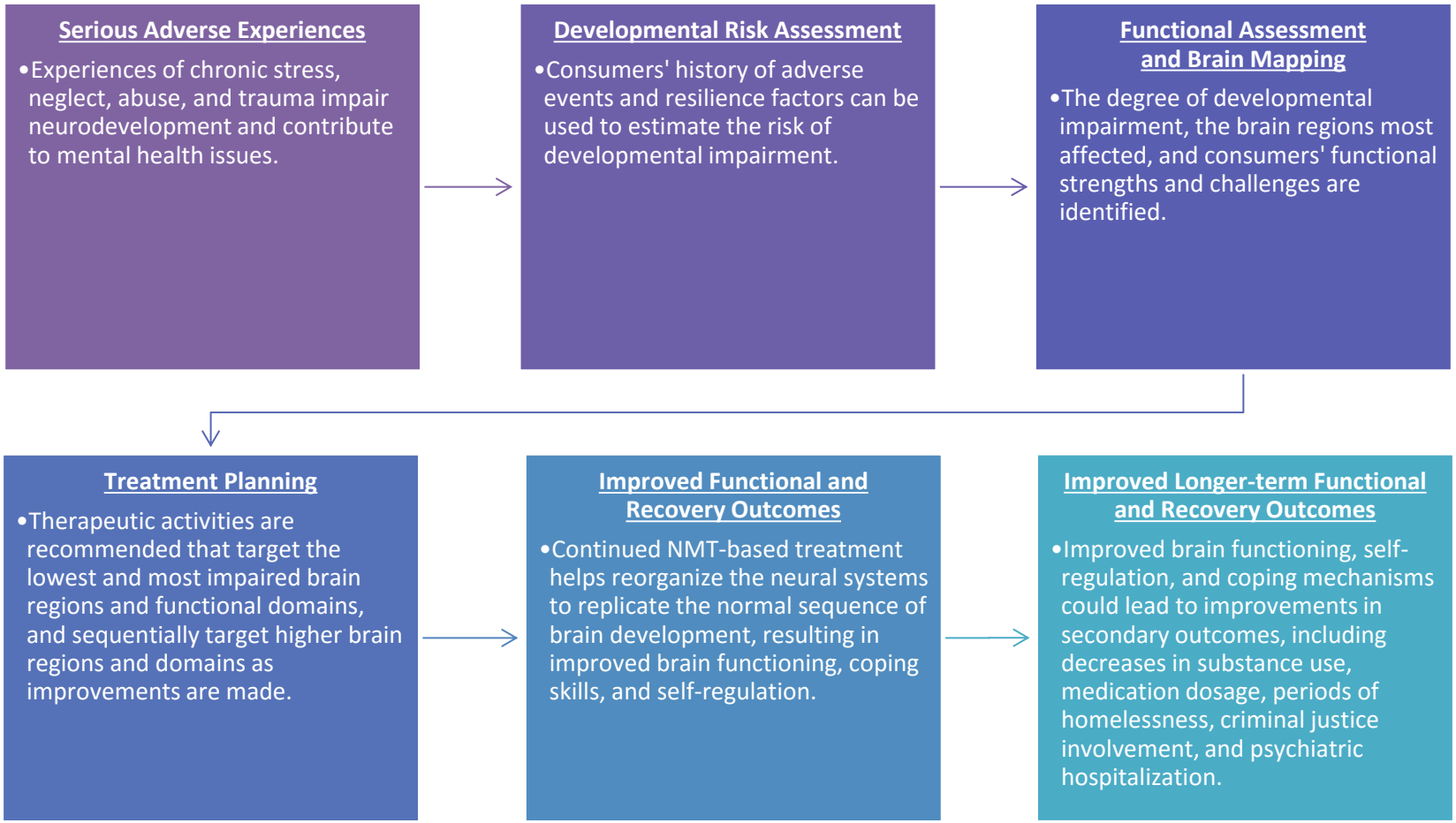
Developmental Risk Assessment. NMT-trained clinicians collect information pertaining to consumers' history of adverse experiences – including their timing, nature, and severity – as well as any protective factors to estimate the risk and timing of potential developmental impairment.

Functional Assessment and Brain Mapping. NMT-trained clinicians conduct an assessment various brain-mediated functions (e.g., heart rate, motor skills, short-term memory, speech and language, etc.) to develop a brain map identifying the brain regions most affected by developmental impairment. Through this "mapping" process, scores are calculated in four functional domains: 1) Sensory integration, 2) Self-regulation, 3) Relational, and 4) Cognitive. The functional domain values are then compared with age typical domain values to assess the degree of developmental impairment, identify the consumers' functional strengths and challenges, and track progress over time.

Treatment Planning. In the third phase of the NMT process, therapeutic activities are identified that address the consumers' needs in the four functional domains, first targeting the lowest brain regions with most severe impairment. For example, consumers with severely impaired self-regulation scores often have hyper-reactive response systems and may benefit from deep-breathing techniques and the use of weighted vests or blankets. Consumers impaired in the sensory integration domain may benefit from patterned, repetitive somatosensory activities such as drumming and yoga. Treatment may include a mix of activities that are tailored to each consumers' unique developmental needs and activity preferences.

Throughout treatment, functional assessment and brain mapping are performed at regular intervals to evaluate any changes in functional domains. As functional improvements are made, treatment recommendations are adapted, with therapeutic activities becoming more advanced and/or targeting higher brain regions. Ultimately, as NMT treatment progresses, it is expected that consumers will experience improved functional and recovery outcomes. The NMT process and outcomes pathway is summarized in Figure 11.

Figure 11. NMT Process and Outcomes Pathway



Evaluation Overview

Learning Goals and Evaluation Questions

BHRS developed two main learning goals for the NMT evaluation. The first learning goal pertains to the adaptation and implementation of the NMT approach in the adult consumer population, while the second learning goal pertains to the effectiveness and impact of the NMT approach in improving recovery outcomes. To further guide the NMT evaluation, RDA developed evaluation sub-questions associated with each learning goal. The learning goals and evaluation questions (EQ) are listed below.

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?

> **EQ 1.1.** How is the NMT approach being adapted to serve an adult population?
>
> **EQ 1.2.** Who is being served by the adult NMT project, what types of NMT-based services are consumers receiving, and with what duration and frequency?

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

> **EQ 2.1.** To what extent is the NMT approach supporting improvement in adult consumers' functional outcomes and overall recovery and wellbeing?
>
> **EQ 2.2.** To what extent is the experience of care with the NMT approach different from consumers' previous care experiences?

Evaluation Strategy

RDA will implement a mixed methods evaluation that is collaborative and emphasizes continuous quality improvement.

Mixed Methods. A mixed methods approach utilizes both qualitative and quantitative data to address the research questions. Utilizing mixed methods allows the evaluator to identify the correlation between program participation and outcomes and also identify the program strengths and challenges from the participants' perspective. This allows program staff to make adjustments to the program in real-time.

Collaborative. RDA conceptualizes its role as research partners rather than outside evaluators. In this approach, BHRS staff, service recipients, and other invested parties work collaboratively with evaluators to articulate program goals, develop outcome measures, and interpret and respond to evaluation findings.

Continuous Program Improvement. RDA will work with BHRS and its stakeholders to build capacity for evaluation and engage in ongoing continuous program improvement. Continuous program improvement

is a framework by which evaluation is not a one-time event, but an ongoing way of providing data for the program to use to strengthen program design and implementation.

Data Collection and Analysis

In order to develop a comprehensive understanding of program implementation and impact, BHRS and RDA identified a number of expected measurable outcomes including process outcomes, clinical outcomes, functional and recovery outcomes, and consumers' experience of care. Process outcomes will largely be descriptive, and will include documentation of any training and NMT implementation activities, the number of consumers served, and the types of services provided. Consumer-level outcomes, including clinical, functional, and recovery outcomes, will be evaluated before and during NMT treatment to assess the impact of NMT services.

During the first year, the evaluation will focus on collecting and analyzing process outcomes to assess NMT implementation, as well as collecting individual-level clinical, functional, and recovery baseline data. The second year will focus on measuring progress in NMT implementation and changes in clinical, functional, and recovery outcomes from baseline. Throughout both years, RDA will provide technical assistance to BHRS staff implementing the NMT intervention to support their ability to collect client data.

BHRS and RDA identified a number of data sources to collect outcome measures, including NMT metrics, the NMT treatment plan, Avatar electronic health records, the NMT consumer form, and focus groups with NMT providers and with NMT consumers. Table 4 lists the expected measurable outcomes as well as the data sources that will be used to collect each outcome measure. The data sources are described in greater detail below. In addition, Table 6 in Appendix I summarizes the data sources and information that will be used to address each learning goal and evaluation question, and Table 7 in Appendix II outlines the specific data requested.

Table 4. Expected Measurable Outcomes and Data Sources

Outcome Type	Outcome Measures	Data Sources
Process Outcomes	Clinician experience of NMT training and implementation	Provider Focus Group
	Number and demographics of consumers participating in NMT services	Avatar Electronic Health Records (EHR)
	Number and type of NMT services provided	NMT Treatment Plan
Clinical Outcomes	Changes in brain map values	NMT Database
	Changes in functional domain values	NMT Database
Shorter-term Functional and Recovery Outcomes	Changes in coping skills and self-regulation	Consumer & Provider Focus Groups
	Continued participation in NMT services	NMT Database
	Continued participation in BHRS outpatient services	Avatar EHR
Longer-term Functional and Recovery Outcomes	Changes in substance use	Avatar EHR
	Changes in medication dosage	NMT Consumer Form
	Changes in homelessness	NMT Consumer Form
	Changes in criminal justice involvement	NMT Consumer Form
	Changes in psychiatric hospitalization	Avatar EHR

Outcome Type	Outcome Measures	Data Sources
Experience of Care	Consumer experience of NMT services and perceived impact	Consumer Focus Group

Data Sources

NMT Metrics. RDA will work with CTA and BHRS to obtain NMT Metrics with which to measure clients' functional domain values. NMT metrics will be obtained from consumers' initial NMT brain mapping and at agreed upon intervals thereafter (e.g., every six months). The NMT functional domain values will be used to establish consumers' baseline functioning at service start and documenting any change that occurs over the course of service delivery. To the extent that adult age typical functional domain values are available, RDA will also compare BHRS consumers' functional domain scores to age typical values to assess the degree of impairment and progress toward age typical functioning.

NMT Treatment Plan. RDA will work with BHRS to obtain information from consumers' treatment plans at agreed upon intervals. The NMT Treatment Plans include information about the types of treatment or activities that are recommended, treatment received, and any progress notes. This information will be used to assess NMT treatment participation and adherence to the service plan.

Avatar Electronic Health Record Data. RDA will work with BHRS to obtain relevant consumer-level information from BHRS' electronic health record (EHR) system, Avatar. Information obtained from the EHR may include client demographic information, clinical diagnoses, BHRS mental health service utilization, and psychiatric hospitalization. EHR Data will be requested for the year prior to NMT enrollment as well as during NMT participation to assess any changes in mental health service utilization during NMT treatment.

NMT Consumer Form. RDA developed a NMT consumer form to capture additional consumer-level information that is not currently captured or not readily extractable from existing data sources. The NMT consumer form includes information regarding consumers' current psychiatric medication, substance use, housing and homelessness, and criminal justice system involvement (e.g., arrests and incarcerations). NMT providers will administer the consumer form during NMT assessments at agreed upon intervals (e.g., once a month). This information will be used to assess changes in longer-term functional and recovery-oriented outcomes throughout NMT participation (e.g., changes in the frequency or duration of incarcerations or arrests, frequency of substance use, and medication dosage). The NMT consumer form is available in Appendix III.

Focus Groups with Providers Trained in NMT. RDA will facilitate focus groups with BHRS Adult System of Care staff who were trained in the NMT model. During the first year of the evaluation, these focus groups will explore providers' experiences with the NMT training and initial application of the NMT model, including the quality and applicability of their training in NMT, successes and challenges in adapting the model for adult consumers, and the integration of the brain mapping and other elements of the NMT approach into their existing service delivery processes. During the second year of the evaluation, the focus groups with providers will assess how their experiences using the NMT approach have changed over time, any new successes or challenges that have emerged, and their perceptions of the impact of the NMT

approach on client wellbeing, including improvements in functional and recovery outcomes. The focus group protocol is available in Appendix IV.

Focus Groups with Clients Participating in NMT. During the second year of the evaluation, RDA will facilitate focus groups with adult BHRS clients who have received the NMT-based services. During the first year of the evaluation, the focus groups will ascertain clients' experiences with the NMT approach, how NMT services differ from other mental health services received, and consumers' perception of the impact of NMT on their own wellness and recovery. Before beginning the focus groups, the intention of the focus groups will be explained and informed consent will be obtained from all consumers. The focus group protocol is available in Appendix IV and the consent form is available in Appendix V.

Data Analysis

RDA will begin our analysis by organizing and cleaning the NMT and client-level data as well as information from the focus groups. To analyze the quantitative data we will conduct both descriptive and inferential statistics, as appropriate, to describe the outcomes as well as to identify changes over time. To assess process outcomes, descriptive statistics will primarily be used, while pre-post analyses will be used assess changes in clinical, functional, and recovery outcomes before and during NMT services.

Qualitative data will inform both the process and consumer outcomes. To evaluate qualitative data, focus group participants' responses will be transcribed so that participants' responses and reactions are appropriately captured. RDA will then thematically analyze responses from participants to identify any recurring themes and key takeaways from the focus groups. RDA will triangulate qualitative findings with quantitative findings to develop a complete picture of the extent to which the NMT goals have been achieved.

Reporting

On an annual basis, RDA will draft a report that provides a comprehensive understanding of the implementation and impact of the NMT project to date as well as comply with new MHSA INN regulations. The report will address the learning goals and evaluation questions, including an information about the progress of NMT implementation and related process outcomes, preliminary outcome measures, and recommendations for actionable program improvements.

Findings will be shared with relevant BHRS staff through a findings work session prior to drafting the report. This work session will give BHRS staff an opportunity to interpret and respond to findings as well as provide feedback. Following the work session, RDA will draft the annual report and send it to BHRS for review. RDA will then address and incorporate BHRS feedback, finalize the report, and send it to BHRS for submission to the Mental Health Services Oversight and Accountability Commission (MHSOAC). The final report will then be available for presentation to the MHSA Steering Committee and the Stakeholder Advisory Committee.

Timeline

The NMT evaluation is a two-year evaluation, beginning in January 2017 and running through December 2018. Table 5 below provides an outline of evaluation activities over the two year evaluation period, including the organization responsible for conducting each activity (i.e., RDA and/or BHRS). RDA understands that program needs develop and evolve, so RDA will be flexible in adapting the evaluation timeline to align with BHRS needs. RDA will confer with BHRS when creating any modifications to the evaluation timeline.

Table 5. NMT Evaluation Activities Timeline

Phase	Major Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1 (2017)	Project Kickoff Meeting (RDA & BHRS)												
	Evaluation Planning (RDA & BHRS)												
	Compile and Send NMT Consumer Data (BHRS)												
	Focus Groups: Service Providers and Consumers (RDA)												
	NMT Data Analysis (RDA)												
	Findings Work Session (RDA & BHRS)												
	Draft Annual Report (RDA)												
	Review Report and Provide Feedback (BHRS)												
	Finalize Annual Report (RDA)												
	Submit Annual Report to MHSOAC (BHRS)												X
Year 2 (2018)	Compile and Send NMT Consumer Data (BHRS)												
	Focus Groups: Service Providers and Consumers (RDA)												
	NMT Data Analysis (RDA)												
	Findings Work Session (RDA & BHRS)												
	Draft Annual Report (RDA)												
	Review Report and Provide Feedback (BHRS)												
	Finalize Annual Report (RDA)												
	Submit Annual Report to MHSOAC (BHRS)												X
Ongoing	Regular Meetings and Communication (RDA and BHRS)												
	Technical Assistance (RDA)												

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Information Collected for Evaluation Questions

Table 6. Data Sources and the Evaluation Questions Addressed

Data Source	Information Collected	Learning Goal 1		Learning Goal 2	
		EQ 1.1	EQ 1.2	EQ 2.1	EQ 2.2
NMT Metrics	• Brain Map Values • Functional Domain Values			✓	
NMT Treatment Plan	• Recommended Treatment • Treatment Participation		✓	✓	
Avatar Electronic Health Records	• Demographic Information • Clinical Diagnosis • BHRS Mental Health Service Utilization • Psychiatric Hospitalization • Substance Use		✓	✓	
NMT Consumer Form	• Current Psychiatric Medication • Housing and Homelessness • Criminal Justice System Involvement (Arrests and Incarcerations)		✓	✓	
Focus Groups with NMT Providers	• Providers' experience with NMT training and implementation • Successes and challenges in adapting NMT to adults • Providers' perceived impact of NMT on consumers' recovery and wellbeing	✓	✓	✓	
Focus Groups with NMT Consumers	• Consumers' experience of NMT services and activities • Consumers' perceived impact of NMT on their recovery and wellbeing			✓	✓

NMT Data Request

Description: The table below lists the data requested for every adult consumer who was or is currently enrolled in BHRS NMT services as of the end of the given fiscal year (i.e., June 30th). Data for the previous fiscal year(s) will be requested once annually, in September. The asterisks (*) denote specific consumer data that is requested by the MHSOAC for the Annual Innovative Project Report.

Table 7. Data Requested for Adult NMT Consumers

Domain	Categories	Variables	Data Source	Time Period
Consumer Information	Identifying Information	Medical Record/Mental Health Number	Avatar Electronic Health Records	Most Recent Information
		Client Name		
	Demographic Information*	Date of Birth*		
		Gender*		
		Race*		
		Ethnicity*		
		Primary Language*		
		Sexual Orientation*		
		Veteran Status*		
	Physical or Mental Impairment*	Difficulty hearing, speaking, communicating*		
		Limited physical mobility*		
		Learning disability*		
		Chronic health conditions*		
		Other disabilities/health conditions*		
	Clinical Diagnoses	Primary diagnosis code		
		Primary diagnosis description		
		Secondary diagnosis code		
		Secondary diagnosis description		
		Substance use disorder diagnosis		
Psychiatric Medication Prescriptions	Identifying Information	Medical Record/Mental Health Number	Avatar Electronic Health Records – Order Connect	All Data during NMT Enrollment
		Client Name		
	Medication	Medication Name		
		Medication Dosage		
		Instructions for Use		
Substance Use, Housing, and Criminal Justice	Substance Use	Substances used	Avatar Electronic Health Records – NMT Consumer Form (to be added)	All Data during NMT Enrollment (Not yet collected)
		Substance use frequency		
		Substance use route of administration		
	Housing Status	Residence last night		
		Nights homeless in last month		
	Criminal Justice Involvement	Arrests in last month		
		Incarcerations in last month		
BHRS Mental Health and Substance Use Service Utilization	Identifying Information	Medical Record/Mental Health Number	Avatar Electronic Health Records	All Data during NMT Enrollment and Previous Year
		Client Name		
	Service Episode Information	Episode Number		
		Provider Organization/Level of Care (e.g., Outpatient, Adult Residential, etc.)		
		Program Name		
		Episode Opening Date		

Domain	Categories	Variables	Data Source	Time Period
		Episode Closing Date		
	Service Encounter Information	Service Code		
		Service Description		
		Date of Service		
		Service Length (minutes)		
Psychiatric Inpatient and Emergency Service Utilization – Service Episodes	Identifying Information	Medical Record/Mental Health Number	Billing/Claims Data	All Data during NMT Enrollment and Previous Year
		Client Name		
	Episode Information	Episode Number		
		Provider Organization/Level of Care (e.g., Psychiatric Emergency Services, Psychiatric Inpatient, etc.)		
		Program Name		
		Episode Admission Date		
		Episode Discharge Date		
		Service Length (days)		
NMT Assessments and Metrics	Identifying Information	Medical Record/Mental Health Number	CTA NMT Database	All Data during NMT Enrollment
		Client Name		
	Assessment Information	Assessment Date		
		Assessment Type (e.g., Initial assessment, Follow-up assessment)		
	NMT Metrics	Developmental History Values		
		Functional Brain Map Values		
		Functional Domain Values		
	NMT Treatment Plan	NMT Treatment Recommendations		

Adult NMT Consumer Form

Instructions: These questions are intended to provide information about adult NMT consumers' substance use, housing status, and criminal justice involvement. Please administer the questionnaire to consumers every six months during the NMT assessment. Please inform the consumers that this information will only be used to identify any changes throughout NMT participation, and there will be no repercussions for any illicit activity. Additionally, consumers can choose not to respond to any questions they feel uncomfortable answering.

1. a. In the past 30 days, did you use the following substances (if any)?

   b. If yes, how frequently did you use the substance and what was the primary route of administration?

Substance Type	Y/N	Frequency (check one)	Route (check one)
a. Alcohol	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
b. Cocaine/Crack	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
c. Hallucinogens (PCP, LSD, Mushrooms, Mescaline/Peyote)	☐ Yes	☐ Daily	☐ Oral

Substance Type	Y/N	Frequency (check one)	Route (check one)
	☐ No ☐ Don't Know ☐ Refused to Answer	☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
d. MDMA (Ecstasy, Molly)	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
e. Methamphetamine or other Amphetamines	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
f. Synthetics (Spice, Flakka, Bath Salts)	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection

Substance Type	Y/N	Frequency (check one)	Route (check one)
		☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Don't Know ☐ Refused to Answer
g. Inhalants	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
h. Other Downers (Ketamine, GHB)	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer
i. Other Prescription Drugs (Benzodiazepines, Barbiturates)	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer

Substance Type	Y/N	Frequency (check one)	Route (check one)
j. Other: _____	☐ Yes ☐ No ☐ Don't Know ☐ Refused to Answer	☐ Daily ☐ Several times a week ☐ Every weekend ☐ A few times a month ☐ Once ☐ Don't Know ☐ Refused to Answer	☐ Oral ☐ Nasal ☐ Smoking ☐ Injection ☐ Don't Know ☐ Refused to Answer

2. Where did you sleep last night?

☐ Own house or apartment
☐ Family home
☐ Couch or someone else's home
☐ Transitional housing
☐ Emergency shelter
☐ Streets
☐ Other: _____
☐ Don't Know
☐ Refused to Answer

3. In the past 30 days, how many nights did you spend homeless, if any (e.g., on the streets, in a car, an emergency shelter, someone's couch or home without paying rent, etc.)?

# of Homeless Nights: _____ ☐ Don't Know ☐ Refused to Answer

4. In the past 30 days, how many times were you arrested, if at all?

# of Arrests: _____ ☐ Don't Know ☐ Refused to Answer

5. In the past 30 days, how many nights did you spend in jail/prison, if any?

# of Nights in Jail: _____ ☐ Don't Know ☐ Refused to Answer

NMT Provider Focus Group Protocol

Thank you for making time to join our focus group today. My name is _____ and this is _____. We are with a consulting firm from Oakland, California called Resource Development Associates (RDA) and we were hired by San Mateo Behavioral Health and Recovery Services (BHRS) to evaluate BHRS' implementation of the Neurosequential Model of Therapeutics (NMT) program within the Adult System of Care. As part of this evaluation, we will be conducting focus groups with staff members, as well as consumers, to better understand program processes and outcomes as well as the strengths and challenges of implementing NMT in the Adult System of Care. We're here to talk to you today about your experiences as NMT providers.

I will be facilitating this focus group and _____ is here to take notes. Please note that what you say in this focus group will remain anonymous, but we will be taking notes of the discussion. My role as the facilitator means that it is my job to ensure everyone has a chance to say what is on his or her mind in a respectful way. We have a few guidelines to help us do that. Please:

- Silence your cell phones
- There are no "wrong" or "right" opinions, please share your opinions honestly
- Engage in the conversation
- Listen to understand
- Be curious about others' opinions
- Limit "side conversations" or "cross talk" so that everyone can hear what is being said
- Your names will not be linked to any comments unless we specifically ask if we can use your comment as a quote

Does anyone have any questions before we begin?

Introductions

Before we get started I would like everyone to answer these two questions:

- What is your name?
- What is your position/role?

NMT Training

1. Please describe the NMT training you received.
    a. Where are you in your NMT training?
    b. What has been challenging about the training? Working well?
    c. What types of ongoing training and/or support do you receive?

NMT Referral/Recruitment

2. Could you describe the recruitment or referral process for the NMT?
    a. What is the consumer population that you are serving?
    b. How do you identify consumers that may benefit for NMT?
    c. What information do you provide to consumers about the NMT program?
    d. What about the referral and recruitment process is working well? What is not working well?

NMT Services

3. Could you describe the NMT assessment process?
    a. What is working well about the assessment process? What has been challenging?
    b. How do consumers respond to the NMT assessments?
    c. What information, if any, do you share with consumers?

4. Could describe the NMT services and activities?
    a. How often do you meet with consumers?
    b. How do you decide the treatment plan? What types of activities are included?
    c. How do you involve the consumer in the treatment planning?
    d. How do you involve family members or their social network in the treatment planning?
    e. How do NMT services differ from other mental health services you have provided?

5. Thinking about consumers who are doing well, what has been helpful in getting them to participate in NMT treatment or what has helped them in their recovery?
    a. What makes it difficult to get consumers to engage in treatment?
    b. What strategies do you use in those situations where the consumer is difficult to engage?

Overall Experience and Perspective

6. From your perspective, what has been working well about implementing NMT with the adult population? What has been challenging?
    a. What could be done to improve the NMT approach among the adult population?

7. From your perspective, how would you describe the impact of the NMT approach on consumers?
    a. Changes in coping mechanisms and self-regulation?
    b. Changes in other wellness and recovery outcomes?

8. Think about your team, what is something you are most proud of?

9. Is there anything else you would like to add?

Thank you for your time! We value your input and appreciate you sharing your experiences with us.

NMT Consumer Focus Group Protocol

Thank you for making the time to join our focus group today. My name is _____ and this is _____. We are with a consulting firm from Oakland, California called Resource Development Associates (RDA) and we were hired by San Mateo Behavioral Health and Recovery Services (BHRS) to evaluate BHRS' implementation of the Neurosequential Model of Therapeutics (NMT) program within the Adult System of Care. As part of this evaluation, we will are conducting focus groups with people who have participated in the NMT program to understand how the program is working and what people like you are experiencing.

I will be facilitating this focus group and _____ is here to take notes. Please note that what you say in this focus group will remain anonymous, but we will be taking notes of the discussion. My role as the facilitator means that it is my job to ensure everyone has a chance to say what is on his or her mind in a respectful way. We have a few guidelines to help us do that. Please:

- Silence your cell phones
- There are no "wrong" or "right" opinions, please share your opinions honestly
- Engage in the conversation
- Listen to understand
- Be curious about others' opinions
- Limit "side conversations" or "cross talk" so that everyone can hear what is being said
- Your names will not be linked to any comments unless we specifically ask if we can use your comment as a quote

Does anyone have any questions before we begin?

Introductions

Before we get started let's go around the room and have everyone share:

- Your name
- Where you're from

Referral Process

1. How did you learn about NMT?
    a. Who referred you?
    b. What type of information did you receive about NMT?
    c. Why did you decide to participate in NMT?

NMT Experience

2. How would you describe the NMT assessment (e.g., risk assessment, brain mapping, etc.)
    a. What kinds of questions do they ask you?
    b. Is there anything about the assessment that feels stressful?
    c. Is there anything the provider does to make it less stressful? Anything you do?
    d. What kinds of information about the assessment did the provider share with you?

3. How would you describe the NMT treatment you have received (e.g., yoga, drumming, art, etc)?
    a. What kinds of activities did the provider recommend? What kinds of activities are you doing?
    b. How did the provider decide the activities?
    c. How are you involved in planning NMT activities?
    d. How is your family involved in the NMT activities?
    e. How often do you participate in NMT activities?
    f. Have the activities been like what you thought they would be?
    g. How have NMT services differed from other mental health services you have received in the past?

4. How has NMT helped you?
    a. What do you like about the NMT program?
    b. What has been challenging?
    c. What has helped you continue to participate in the different activities?

Consumer Perceptions and Recommendations

5. What is the best part about NMT?

6. What is something you would do or change to make NMT better?

7. What is something you would add or include in the program, that isn't already happening?

8. What have been some of your accomplishments since starting NMT services?
    a. What has helped you achieve this?

9. Is there anything else you'd like to add that we haven't already talked about?

Thank you for your time! We really value your input and appreciate you sharing your experiences with us.