San Mateo County Adult NMT Pilot Fiscal Year 2018-19 Evaluation Report

A Mental Health Services Act Innovation Project

Prepared by:

Resource Development Associates

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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 third year of NMT implementation—July 1, 2018 to June 30, 2019—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.

NMT Background

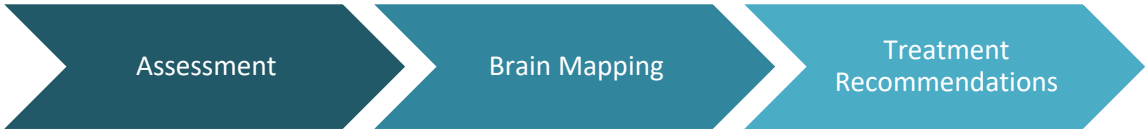
The Child Trauma Academy (CTA) developed NMT as an alternative approach to addressing trauma, typically used with children, that is grounded in neurodevelopment and neurobiology. NMT is not a single therapeutic technique or intervention. Rather, NMT uses assessments to guide the selection and sequence 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



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

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

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.

NMT Training

CTA offers two levels of training: the Phase I NMT Certification training, and the Phase II "Train-the-Trainer" training for providers already certified in NMT. The NMT training model, for both Phase I and Phase II trainings, relies on a case conference or group supervision approach with intensive self-study. 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 course of the training, trainees are also expected to conduct NMT assessments and interventions.

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 Phase I and Phase II training structure is briefly described below:

- **Phase I training**: The Phase I training providers attend an initial in-person training that teaches the core principles of NMT. After this initial training, providers begin conducting their self-study and implementing NMT, often with the support of an NMT mentor. Throughout the training, trainees also participate in NMT study groups and learning communities. To graduate the training, providers must complete at least 10 NMT assessments.
- **Phase II training:** The Phase II training to prepare NMT clinicians to become NMT trainers or mentors. The structure and format of the Phase II training is similar to Phase I, and includes a combination of self-study, monthly meetings, and conducting NMT assessments. However, the Phase II training examines NMT principles in greater depth. Like the Phase I training, Phase II clinicians must conduct at least 10 NMT assessments. By the end of the Phase II training, providers are expected to be able to lead the core principles training and mentor providers in the Phase I training.

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.

Project Description and Timeline

BHRS NMT Pilot Project

NMT Providers

As mentioned, BHRS has been using the NMT approach with youth since 2012. Prior to beginning the NMT adult pilot, 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. In addition, 10 BHRS providers became 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, BHRS began training providers within the Adult System of Care 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:

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[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.

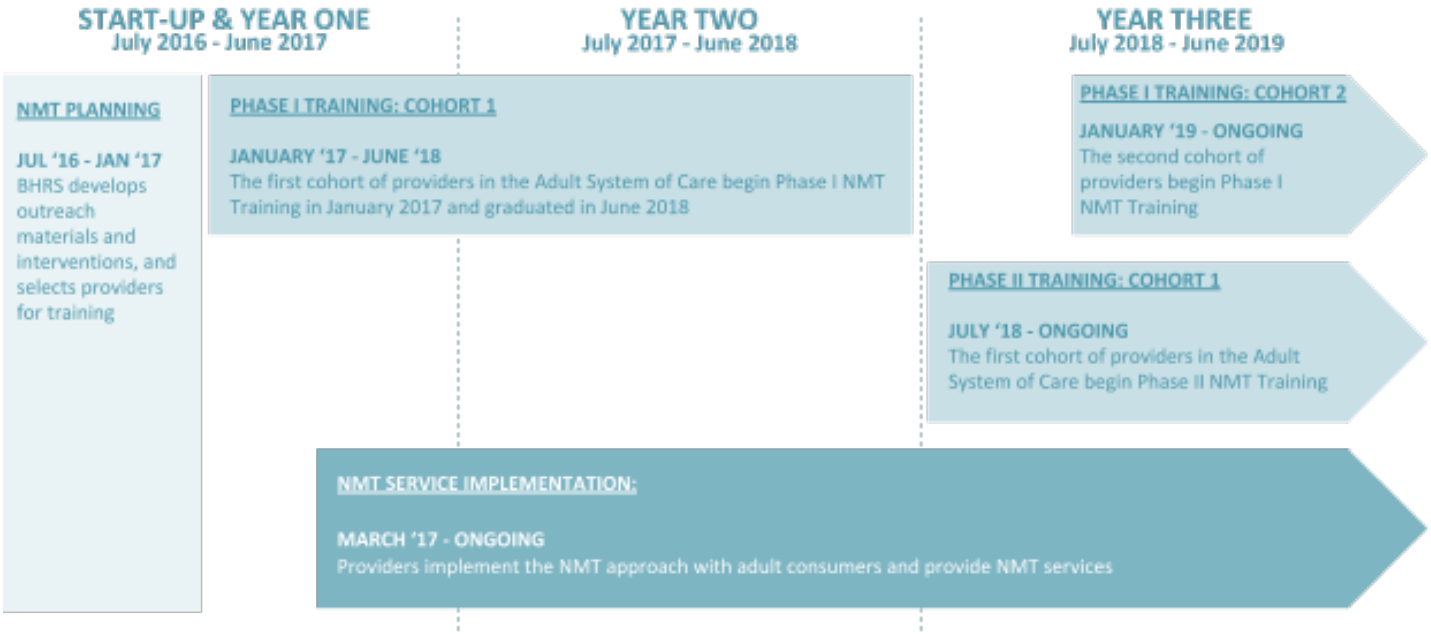
- General adult consumers (ages 26+) receiving specialty mental health services;
- Transition age youth (TAY) consumers (ages 16-25); and
- Criminal justice-involved consumers re-entering the community following incarceration.

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.

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.

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?

In this third year of the NMT implementation, the evaluation examines both Learning Goals to: 1) identify how NMT implementation has progressed as the program has matured 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 were open to NMT services during the evaluation period—July 1, 2018 to June 30, 2019, fiscal year 2018-2019 (FY18-19).

RDA worked closely with BHRS to identify and obtain appropriate outcome measures and data sources to address the evaluation questions. Table 1 outlines the outcome data available for this report as well as the respective data sources.[4]

Quantitative data: RDA collected quantitative data about NMT consumers from two main 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 and recommended NMT interventions.

Qualitative data: RDA also collected qualitative data through discussions with BHRS NMT providers and NMT consumers. RDA conducted two focus groups with NMT providers on August 6, 2019—including one group with a new cohort of BHRS providers participating in the Phase I training (7 participants) and one group with BHRS providers participating in the Phase II NMT "Train-the-Trainer" training. Additionally, on August 29, 2019 RDA conducted two separate discussions with NMT consumers (total of 3 participants).

Focus groups with BHRS providers centered on providers' experience of NMT training, how they are adapting the NMT approach with the adult population, and implementation successes and challenges. Discussions with consumers focused 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. 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	Provider Focus Groups
	Types of recommended NMT interventions	Consumer and Provider Focus Groups and NMT Database
Consumer Outcomes	Changes in brain map and functional domain scores	NMT Database
	Perceived impact of NMT services on consumer functional and recovery outcomes	Consumer and Provider Focus Groups
	Consumer experience of NMT services	Consumer Focus Group

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

Data Analysis

To analyze the quantitative data (e.g., consumer characteristics and service utilization), RDA used descriptive statistics to examine frequencies and ranges. When the sample size was large enough, RDA also explored differences in outcomes across different sub-populations (e.g., adults, TAY, criminal justice involved adults, etc.) 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 2018-2019 fiscal year.

Key Implementation Updates and Accomplishments

In FY18-19, BHRS began training two new cohorts of providers within the adult system of care, including NMT certification training (Phase I) and NMT Train-the-Trainer training (Phase II). Phase I training began in January 2019 with 16 total providers—including six providers from the Adult System of Care. This was the second cohort of providers in the Adult System of Care to participate in the Phase I training. Phase II training began in July 2018 and includes five providers from the Adult System of Care. Before participating in Phase II training, providers must first complete the Phase I training. As the first cohort of adult providers completed the Phase I training in FY17-18, this was the first cohort to participate in the Phase II training.

As more providers are certified or begin NMT training, the volume of adult consumers participating in NMT services continues to grow. During Year 3 of the pilot, 77 consumers were enrolled in NMT services, compared to 40 in year 2 and 20 in year 1. Additionally, as the pilot progresses, providers have been able to complete more follow-up assessments to assess changes in functional outcomes. As of the end of Year 3, follow-up assessments were available for 28 consumers, compared to 11 consumers during Year 2.

BHRS created and filled a Mental Health Program Specialist position to support NMT training and the NMT pilot. As NMT continues to expand within the BHRS systems of care, the Mental Health Program Specialist role has been instrumental in supporting the organization and coordination of the NMT program. The Mental Health Program Specialist is a certified NMT clinician and trainer within BHRS and has acted as a resource and mentor for NMT trainees.

BHRS continued to expand the NMT resources and interventions available to consumers in the Adult System of Care. During the third year of pilot, BHRS continued to implement new interventions—such as offering the "Art of Yoga" therapeutic yoga sessions for NMT consumers at the North County clinic. BHRS also equipped all NMT providers with a basket of sensory tools (e.g., fidget spinners, stress balls, play doh, sensory brushes, pipe cleaners, etc.). Providers can request specific resources or interventions to best meet their client's needs (e.g., rocking chair, weighted blankets, coloring books, sketch pads, etc.). In addition to providing resources directly for interventions, NMT providers also received training in implementing sensory profiles to better understand consumers' sensory preferences and behaviors. This information can then be used to further inform appropriate therapeutic strategies and interventions.

NMT Consumer Profile

The following section describes the consumer population that participated in NMT services during FY18-19, 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 16-25) receiving mental health services, and criminal justice-involved consumers re-entering the community following incarceration.

During FY18-19, 77 adult consumers received NMT services, all of whom reflect the intended target population. Overall, the average age of consumers was 34, with ages ranging from 17 to 70. Most consumers (n=56, 72%) were adults ages 26 and older, while 21 consumers (27%) were TAY. In addition, at least 28 consumers (36%) were also part of the re-entry population, almost all of whom were adults.[5]

Figure 4. NMT Consumer Population, N=77

Table 2 describes the demographic characteristics of the NMT consumers.[6] For some characteristics, information was unknown or not reported for all consumers. As a result, the total number of consumers may be less than 77. The number of consumers for whom information is available is reported in the table.

Two-thirds of consumers reported they were female (n=49, 64%) and one-third reported they were male (n=28, 36%); no consumers reported a different sex.[7] Although the largest racial group was White (n=24, 34%), approximately a quarter of consumers each reported they were two or more races (n=18, 25%) or reported their race as Other (n=19, 27%). A smaller proportion of consumers reported their race as Black or African American (n=5, 7%) or Asian/Pacific Islander (n=5, 7%). Nearly half of consumers also reported

[5]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).
[6]In accordance with HIPAA, demographic categories comprised of fewer than five consumers were aggregated to protect consumer privacy.
[7]Information regarding gender identity was not available for this report.

their ethnicity as Hispanic/Latino (n=31, 44%). Race was unknown or unreported for six consumers, and ethnicity was not reported for seven consumers.

The majority of consumers (n=67, 87%) reporting speaking English only, while 9% of consumers reported speaking Spanish (n=7), and 4% reported another language (n=3). Most consumers reported they were heterosexual (n=51, 81%), while 17% (n=11) reported they were another sexual orientation, and one consumer declined to state their sexual orientation. Sexual orientation was unknown or unreported for 14 consumers. Nearly half of consumers (n=37, 48%) had a known disability. Of these consumers, nearly all (95%, n=35) reported a chronic health condition, while 16% (n=6) had an intellectual or developmental disability. No consumers reported that they were a veteran.

Table 2. Demographic Characteristics of Consumers

Characteristic	Consumers	% of Total
Gender (N=77)		
Female	49	64%
Male	28	36%
Race (N=71)		
White	24	34%
Black or African American	5	7%
Asian/Pacific Islander	5	7%
Other Race	19	27%
Two or More Races	18	25%
Ethnicity (N=70)		
Hispanic/Latino	31	44%
Not Hispanic/Latino	39	56%
Primary Language (N=77)		
English	67	87%
Spanish	7	9%
Other	3	4%
Sexual Orientation (N=63)		
Heterosexual	51	81%
LGBTQ+[8]	11	17%
Declined to State	1	2%
Disability (N=77)		
Any Disability	37	48%
No Known Disability	40	52%

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 (e.g., bipolar or major depressive disorders). However, as shown in Figure 5, the NMT population served

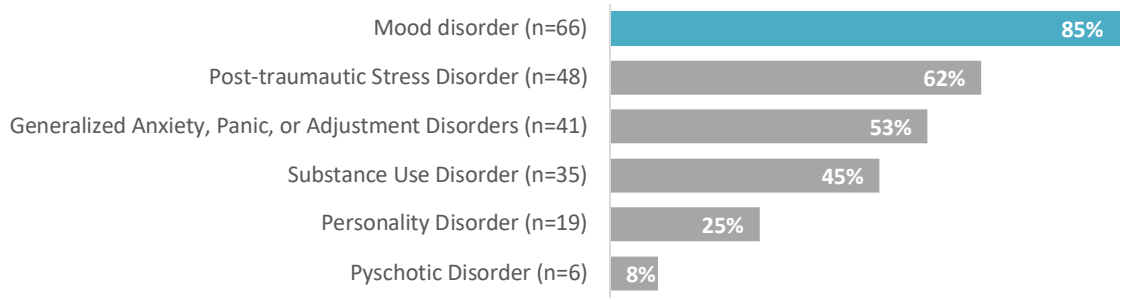
[8]LGBTQ+ refers to lesbian, gay, bisexual, transgender, questioning or gender queer, intersex, asexual, or other sexual orientations.

during FY18-19 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%.

The most common diagnosis was a mood disorder; 85% (n=66) of consumers were diagnosed with a depressive or bipolar disorder. Of those, most were diagnosed with a major depressive disorder while a smaller subset were diagnosed with bipolar disorder or an unspecified mood disorder. Nearly two-thirds of consumers (62%, n=48) were diagnosed with a posttraumatic stress disorder (PTSD), and half (53%, n=41) were diagnosed with a generalized anxiety, panic, or adjustment disorder. Only 8% of consumers (n=6) were diagnosed with a psychotic disorder. In addition to these mental health diagnoses, 25% (n=19) also had a diagnosed personality disorder.

Substance use is also prevalent among the population served, wherein nearly half of consumers (n=35, 45%) have a documented co-occurring substance use disorder. Of these consumers, most reported using several substances, while some were diagnosed with specific cannabis, alcohol, opioid, stimulant, or other substance 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=77



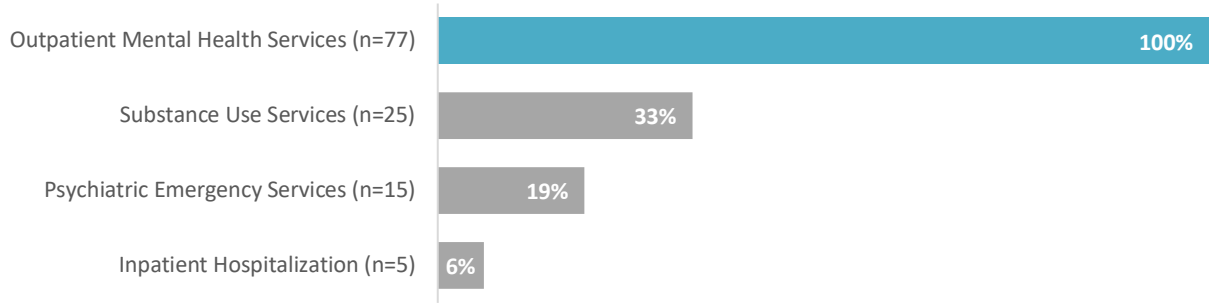
The breadth of diagnoses aligns with some of the diagnostic challenges that arise when working with individuals who have experienced significant trauma. Adults who have experienced trauma often have a more complex clinical presentation, frequently characterized by symptoms of anxiety, depression, and 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.

Behavioral Health Service Utilization

All consumers who received NMT services were enrolled in and receiving outpatient mental health services, which 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=25, 33%) also participated in outpatient and/or residential substance use services. Of these consumers, five also participated in detoxification services in the year prior to enrollment. Additionally,

19% of consumers (n=15) experienced a mental health crisis that required psychiatric emergency services, and 6% of consumers experienced inpatient hospitalizations in the year prior to enrollment.

Figure 6. Behavioral Health Service Utilization, N=77



Baseline NMT Assessments

Baseline Brain Map and Functional Domain Scores

As mentioned previously, NMT-trained providers enter assessment data into a web-based tool designed by 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 assessment data were completed and available for 72 consumers. Of these 72 consumers, 71% were adults (n=51) and 29% were TAY (n=21). Additionally, 39% (n=28) were part of the reentry population. For each consumer, functional domain values were compared with age typical values to calculate the percent of age typical 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 76%. However, the values ranged widely from 29% (indicating a high degree of impairment) to 100% (indicating normal functioning). Consumers appeared to have relatively high functioning in the sensory integration and cognitive domains at baseline, while baseline functioning in the self-regulation and relational domains tended to be slightly lower. For both the sensory integration score and cognitive domains, the average score was 81% (sensory integration range: 38% to 100%, cognitive range: 15% to 100%). In comparison, for both self-regulation and relational domains, the average score was 71% (self-regulation range: 35% to 100%, relational range: 27% to 100%). Overall, there were not significant differences in baseline scores and the level of recommended interventions between adults and TAY.

Figure 7. Average Baseline Brain Map and Functional Domain Scores, N=72

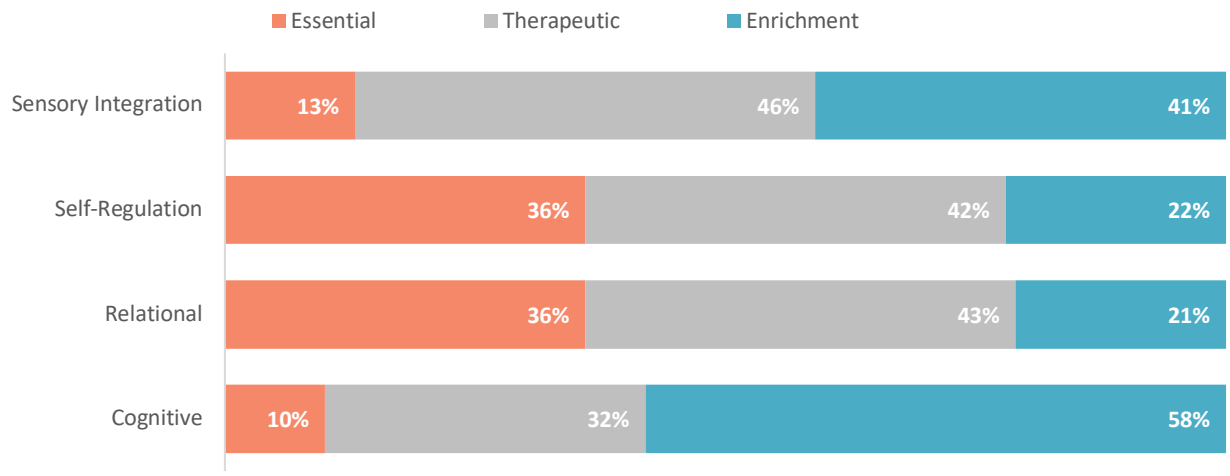
Level of NMT Recommended Interventions

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.

The recommended level of interventions reflect the relatively high functioning of consumers in the cognitive and sensory integration domains, compared to the self-regulation and relational domains (Figure 8)**.** In both the sensory integration and cognitive domains, interventions for approximately half of consumers were recommended as enrichment, whereas interventions were recommended as essential for only 10% of consumers. In comparison, for the self-regulation and relational domains, only 20% of consumers had interventions recommended as essential while over 30% had interventions recommended as essential.

Figure 8. NMT Recommendation Categories across Functional Domains, N=72



Differences Across Target Populations

Overall, there were no significant differences between adults and TAY in the baseline functional domain scores and the recommended level of NMT interventions. Although, adults appeared to have a slightly wider range in functional domain scores. Additionally, baseline values were similar among adults in the re-entry population and adults who were not criminal justice involved. Baseline functional domain scores and baseline recommended level of interventions information for each of the target populations is available in Appendix I.

Progress Toward Learning Goals

Summary of Key Findings

This section discusses the progress that the BHRS NMT Pilot has made toward achieving its two learning goals. A summary of key findings is presented below, followed by a detailed discussion of each learning goal.

Learning Goal 1: NMT Implementation and Adaptation

NMT Capacity in Adult System of Care. BHRS continues to expand NMT capacity throughout the Adult System of Care as more providers are being trained and more consumers are receiving NMT services. BHRS is selecting NMT trainees to fill gaps in adult outpatient clinics and programs. However, some providers are experiencing challenges in getting buy-in for NMT among providers in their clinic or program who are not NMT-certified.

NMT Training Support. BHRS is building upon lessons learned and has implemented a number of strategies to better prepare and support providers through the intensive NMT training. These improvements are helping providers stay motivated and continue with training. However, the training is still time intensive and providers continue to face challenges balancing NMT training with caseload and productivity demands.

Adaptations to Adults. Although NMT assessments continue to take longer and are more complex with adults than children, NMT providers are becoming increasingly adept at adapting the NMT approach to adults. As providers are becoming more confident in the NMT approach and assessment process, providers continue to implement NMT with a broader adult population.

Provider Skill Development. The NMT training is increasing providers' knowledge and ability to respond to consumers with a history of trauma. Learning the NMT approach also helps providers bring creativity to their work and appears to be sharpening providers' clinical skills. In some cases, the opportunity for skill development and creativity in their clinical work is encouraging providers to stay at BHRS.

Learning Goal 2: NMT Outcomes

Improved Consumer Functional Domain Scores. Consumers appear to be benefitting from NMT services, as indicated by increases in functional domain scores. However, the magnitude of change varies widely across consumers, and preliminary data demonstrate greater and more consistent improvement among transition age youth compared to adults.

Improved Consumer Recovery and Experience of Care. NMT appears to be enhancing the consumer experience of care and helping consumers progress in their recovery. Prior to NMT, most consumers had only engaged in more traditional approaches to treatment. Consumers appreciated the individualized approach of NMT, the alternative interventions, and working with providers in a new way. For some consumers, the NMT approach may make it easier to engage in therapy.

Trauma-Informed Approach to Care. NMT training and implementation continues to support NMT clinicians—and, in turn, other providers who work with NMT clinicians—to implement a more trauma-informed approach to care with their caseloads and in their clinics overall.

Learning Goal 1: NMT Implementation and Adaptation

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

NMT Provider Selection

BHRS is selecting providers to fill NMT gaps throughout the Adult System of Care. Both the NMT Phase I and Phase II trainings are voluntary and available to BHRS master's level clinicians, although staff must apply to participate in the training. As providers' interest in NMT has grown, BHRS received a greater volume of applications from providers in both the Adult and Children's Systems of Care. When selecting providers to participate, BHRS aimed to fill gaps in the system of care and prioritized clinics or programs that did not have any or had only one NMT-certified clinician.

Providers are participating in NMT training to strengthen their ability to serve consumers with a history of trauma. As mentioned, five providers in the Adult System of Care began the NMT Phase II "Train-the-Trainer" training in July 2018, while six providers began the Phase I training in January 2019. Providers received information about NMT and the NMT training opportunity from supervisors, team members, and a training announcement circulated by BHRS. Several providers shared that they chose to apply to the Phase I training after learning more about the impact of trauma on neurodevelopment and the NMT approach in the six core principles training. Other providers were already familiar with the NMT approach—either from attending other trainings or conferences where NMT was discussed or working with other NMT-trained clinicians—and were eager to participate in the training themselves.

> *There were three people going through training program [at my clinic], and they would come back and share what they were learning and the changes and progress they were making…I also heard NMT referenced through other trainings I was part of. When the opportunity came to do the training myself, I was on board.*
>
> – NMT Provider

Providers participating in the Phase II training wanted to deepen their understanding of NMT principles learned in the Phase I training. In some cases, providers completed the Phase I training several years earlier and wanted to refresh and strengthen their training. Others had just completed the Phase I training and wanted to continue to build upon the foundations and skills learned to strengthen their own abilities as well as educate others on NMT principles.

NMT Training

BHRS has implemented a number of strategies to support providers to stay on track with the intensive NMT training obligations. NMT trainings require significant time and dedication. Providers from the first cohort of trainees in the Adult System of Care shared that the training was more demanding and time consuming than expected. They added that translating NMT tools from the child to adult population intensified the time spent during training. Additionally, providers noted that the training website is difficult to navigate, posing impediments to accessing the self-study materials.

> *[My mentor] provides a lot of positive feedback, modeling a lot of what we are learning. She's attentive and doesn't seem to miss a thing which helps me feel more engaged. It's like going through school again, but when you're engaged and you see progress and you see changes in your clients, then it feels worth it.*
>
> – NMT Provider

To address some of these challenges, BHRS implemented several strategies to better support trainees, including:

1) **Setting clearer expectations about NMT training demands.** During the training outreach and selection process, BHRS was clear with potential trainees as well as supervisors about the NMT training requirements to help ensure providers and their supervisors better understood the demands prior to beginning the training.
2) **Compiling and organizing training materials for providers.** Each month the BHRS' Mental Health Program Specialist for the NMT program creates a zip file with all of the self-study materials along with a checklist or instructions for training activities and expectations for that month. Providers shared that these emails help keep providers organized, motivated, and engaged.
3) **Providing greater mentorship throughout the training.** Although providers in the first cohort were assigned mentors toward the end of the training period, BHRS ensured that every trainee in the current cohort was assigned a mentor at the beginning of the training. Mentors work with trainees on a biweekly or monthly basis (depending on the trainee's needs) to help trainees better understand and integrate NMT principles. This often includes reviewing and discussing self-study materials, reviewing cases, co-leading or supporting trainees during assessments and intervention planning. Several providers noted that the mentorship was the most helpful aspect of the training.
4) **Granting trainees compensatory time for NMT training and self-study.** To help ease the burden of participating in NMT training on top of existing work and caseloads, BHRS has granted all trainees four hours of compensatory time (i.e., comp time) each week. This time is intended to help trainees set aside time for self-study and other training requirements.

Sufficient time to complete training requirements remains a challenge for trainees. Overall, the strategies mentioned have been immensely helpful to better support and retain providers throughout the training, and BHRS noted far fewer providers have dropped out compared to previous years. However, having sufficient time to complete training requirements remains a challenge for providers.

> *Time is a challenge in general, and the productivity index is a pressure as well. Yeah, we can use comp time, but I still need to reach a level of productivity.*
>
> – NMT Provider

For both the Phase I and Phase II training, the allocated comp time may not be enough at the beginning of the training when providers are familiarizing themselves with the materials and/or may be learning NMT principles for the first time. Additionally, it appears that the approval of comp time is inconsistent across sites and supervisors, and providers are sometimes unsure of when to use or how to submit comp time. Phase II providers shared that they need time to practice teaching and presenting on NMT modules but are unclear if comp time can be used. Several trainees shared that even with comp time, they still feel pressure to meet productivity targets and end up needing to work additional hours to keep up with the training. As a result, some providers may fall behind on training requirements.

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. For Phase I trainees in particular, their increased knowledge and understanding about the impact of trauma is helping them better understand the behaviors and presentation of consumers. For Phase II trainees, the training is helping them understand NMT principles more deeply. Phase II providers are improving their ability to identify and integrate appropriate interventions (particularly the use of sensory tools) into therapy, as well as apply and explain NMT principles to consumers and other providers.

Learning the NMT approach helps some providers bring creativity to their clinical work, which may also support provider retention at BHRS. NMT enables providers to "think outside the box" when identifying interventions to best meet each consumer's unique needs. In some cases, providers shared that the ability to be creative in their clinical work as a result of NMT keeps them at BHRS. NMT trainers and supervisors also observed these changes among providers and noted that the training appears to be sharpening 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 to the entire adult consumer population.

NMT Assessment Process

Providers are implementing strategies to streamline 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 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 may trigger or risk re-traumatizing consumers—particularly adults—who are not accustomed to these types of questions. As providers progress through the training and become more confident with the assessment tool, they typically learn and implement strategies to make the assessment process smoother and minimize the risk of re-traumatization. These strategies include:

> *At first, I tried to run the NMT assessment like a regular BHRS assessment, and I realized some of the questions are really intense for adults that are going through a lot of trauma. Now, I give clients lots of space to talk, and I don't put a limit on the number of sessions to complete the assessment. My mentor has given me many tips on how to go through the assessment.*
>
> – NMT Provider

1) **Explaining the process and providing some psychoeducation 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 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;
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
5) **Examining existing health records** for clients who have been open to BHRS to learn more about the consumer's history; and
6) **Closing an assessment session with mindfulness exercises, meditation, or other interventions** to help soothe or stabilize consumers after discussing difficult topics.

For the second cohort of providers in the Phase I training, mentors are helping to shorten the assessment learning curve and are helping trainees learn and implement some of the strategies more quickly. In addition to discussing the assessment process with trainees, mentors also often conduct the first assessments with trainees. During these co-assessments, mentors model these strategies or give feedback to trainees about how to make the assessment process easier.

Consumers who participated in the focus group acknowledged that the assessment process can feel long but appreciated when providers broke it up over multiple sessions. Some consumers also enjoyed learning

about NMT and how it works but found the NMT language and materials to be complicated and difficult to understand. These consumers shared that it could be helpful to have more accessible materials to explain the NMT approach and process to a non-clinical audience.

Assessments continue to be more time consuming and challenging to complete with the adult population compared to children. Although providers are implementing different strategies to make the assessment process less burdensome, providers noted that implementing NMT assessments with adults continues to be more time consuming and challenging than with children. As noted in previous reports, some reasons the assessment process is often longer for adults are:

> *It is easier to complete an NMT metric with children than adults. It's geared toward kids and it's a much shorter history. They take a lot more time to do with adults and it's definitely an investment, 3-4 sessions for an assessment at least. For adult clinicians, 10 metrics might be too much.*
>
> – NMT Provider

- 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. With the complexity of adult cases and the time it takes to complete, some providers noted that the Phase I training requirement of 10 completed assessments may be too demanding in the adult population.

Although completing the assessments can still be a challenge, NMT providers often begin implementing the NMT approach with consumers before the assessment is completed. Providers have found that implementing NMT interventions can help consumers better understand the underlying principles and builds buy-in for continuing the assessment process. When engaging in NMT interventions, consumers may also feel more comfortable sharing information that then informs the assessment.

Providers are continuing to expand 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. At the beginning of the pilot, several providers mentioned that they typically only referred higher functioning consumers.

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:

> *Those that are actively psychotic are really difficult to do in person. It's not as linear or black and white, but you can often get answers just being with them and building rapport. You can also provide what you think the NMT intervention is first, rather than waiting for the assessment to be complete.*
>
> – NMT Provider

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

As NMT continues to expand throughout the BHRS System of Care, providers are also identifying other populations that may benefit from NMT—such as parents of children in the Youth System of Care, mothers experiencing post-partum depression, and individuals with more severe mental health needs who are receiving services at residential placements. Providers mentioned that it can still be challenging to conduct assessments with individuals who are actively abusing substances, are experiencing psychosis, or have developmental disabilities as this may influence consumers' ability or willingness to respond to assessment questions and/or regularly participate in NMT services. However, if it is apparent that the individual could benefit from NMT services, providers are still implementing the NMT approach and interventions with these clients even if a formal assessment cannot be completed.

NMT Interventions

> *[My provider] has a box of squishy things, as well as a sand tray. [The interventions] offer a different way to express yourself, rather than talking it out.*
>
> – NMT Consumer

Providers are continuing to implement a breadth of NMT interventions, tailoring activities to each consumer's specific interests and needs. The assessment recommendations serve to guide the types of interventions that consumers may need and that providers should prioritize. However, the specific interventions that providers select are tailored to what each individual is interested in and willing to do. Compared to the Youth System of Care, the Adult System of Care is more heavily focused on medication management and talk therapy. As a result, adults are typically unaccustomed to participating in the types of alternative interventions recommended by NMT. Providers found that compared to children, some adults may be less willing to try new and different types of activities.

With adults, providers often try to introduce interventions that may be more familiar—such as deep breathing, counting, going for walks, and mindfulness exercises. Every NMT provider also has a basket of

sensory tools in their office (e.g., fidget spinners, stress balls, play doh, sensory brushes, pipe cleaners, etc.) that are available for consumers to use. Providers noted that these tools can often serve as a conversation starter and are a good mechanism to communicate NMT principles.

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, massage therapy, animal assisted therapy, drumming, or spinning clay. In some cases, consumers also suggest new activities they would like to try. Consumers reported 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 and increases the likelihood that they will implement the interventions independently.

Support and resources from BHRS help providers implement the various NMT interventions. Some providers shared that they are used to purchasing materials or tools for their offices out-of-pocket. With the NMT pilot, providers are able to request tools and resources for the NMT interventions through County funds, which has helped providers expand the interventions available to better meet each consumer's unique interests and needs. Nevertheless, some providers noted that insufficient space or poor office configuration can still be a constraint for effectively implementing some NMT interventions. Additionally, some providers noted that it can be challenging to find instructors or providers to lead some NMT interventions if they are group (rather than individual) activities—such as yoga or gardening—due to providers' workload constraints.

> *We have funds to support NMT interventions, like getting a rocking chair for one of our clients. This is the first time I've gotten supplies with County support.*
>
> – NMT Provider

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 providers' approach to care as a result of NMT implementation in the adult system.

Changes in Brain Map and Functional Domain Scores

At the time of this report, follow-up assessment data were available for 28 consumers. Providers conduct follow-up NMT assessments with consumers to evaluate consumers' progress as well as update consumers' treatment plans if necessary. On average, there were 12 months between the baseline and most recent follow-up assessments, although the time interval ranged from 4 to nearly 2.5 years.

Among consumers with follow-up assessments, 16 were adults (57%) and 12 were TAY (43%). Additionally, seven consumers were part of the reentry population, all of whom are adults. The evaluation examined changes in assessment scores overall, as well as across sub-populations—including a comparison of adults to TAY, and a comparison of reentry and non-reentry adults. However, given the small number of individuals with follow-up data available, assessment findings should be considered exploratory.

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. In some cases, programs are designed to be short-term and consumers may graduate or move on to other services before a follow-up assessment is completed. As the program continues to mature and greater numbers of consumers are served for longer periods, more follow-up assessments will be available.

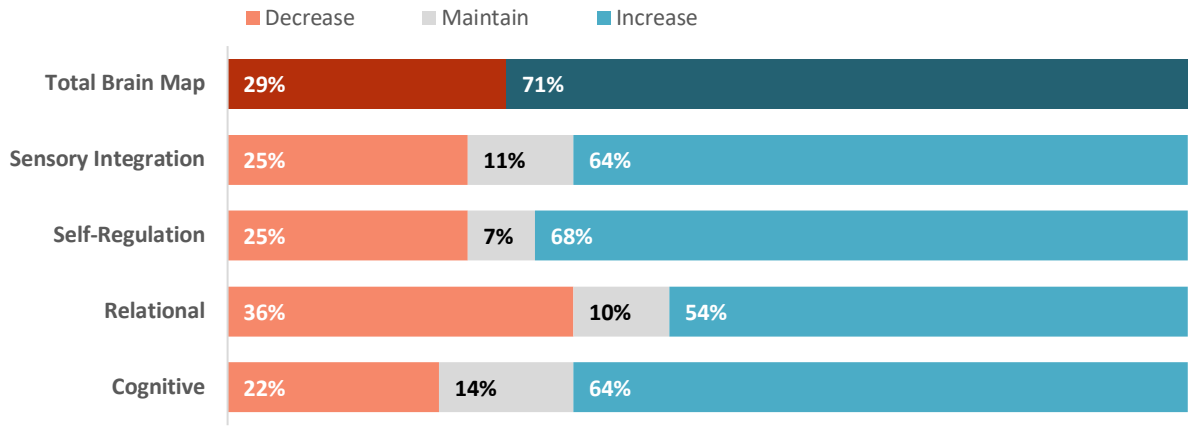
For the 28 consumers with follow-up data available for this report, baseline and follow-up assessment data were examined to identify changes in consumers' brain map and functional domain scores as consumers participated in NMT services. Brain map and functional domain changes are defined as follows:

- **Increase:** any positive change in a score from baseline to follow-up (follow-up – baseline > 0),
- **Decrease:** any negative change in scores from baseline to follow-up (follow-up – baseline < 0).
- **Maintain:** no change in the score from baseline to follow-up (follow-up – baseline = 0)

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).

Although the magnitude of change varies, most consumers are showing increases in their assessment scores, suggesting functional improvements. As shown in Figure 9, 71% of consumers (n=20) showed increases in their total brain map scores, while 29% (n=8) showed a decrease. Across the sensory integration, self-regulation, and cognitive domains, approximately two-thirds of consumers showed increases in domain scores, while a quarter showed decreases. Slightly fewer consumers (54%) showed increases in the relational domain, while one-third showed decreases. Across all functional domains, roughly 10% of consumers showed no change in scores.[9]

Figure 9. Percentage of Consumers with Increased and Decreased Assessment Scores from Baseline to Follow-up, N=28



[9]Although consumers may not have showed changes in one or more of the functional domain scores from baseline to follow-up (i.e., scores were maintained), all consumers showed some change (i.e., increase or decrease) in their overall brain map scores.

Overall, the average change in consumers' brain map and functional domain values was +3% to +5%, depending on the specific domain (Table 3). Trends in functional domain values are similar to those seen among consumers in the previous year.

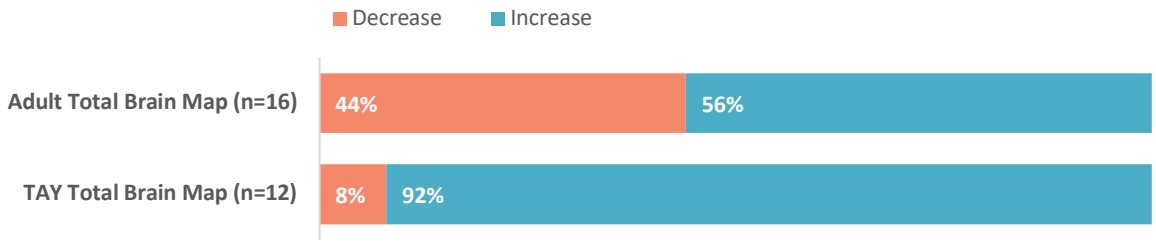
Table 3. Average Change in Assessment Scores from Baseline to Follow-Up, N=28

	Average Change in Scores	Range of Change in Scores
Total Brain Map	**+4%**	**-13% to +23%**
Sensory Integration	+4%	-7% to +25%
Self-Regulation	+5%	-11% to +29%
Relational	+4%	-13% to +28%
Cognitive	+3%	-26% to +24%

Providers noted that consumers who had particularly large increases in assessment scores responded particularly well to the selected NMT interventions and consistently engaged in NMT services. 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. In contrast, providers noted that individuals who showed decreases in assessment scores tended not to engage regularly in NMT services and may have had more active substance use and/or psychosis.

Compared to adults, TAY demonstrated greater and more consistent improvement in functional domain scores from baseline to follow-up. As mentioned, differences in the change in functional domain scores were examined across sub-populations. Overall, there were no significant differences between adults who were and were not part of the reentry population. However, significant differences emerged across the adult (n=16) and TAY population (n=12). Nearly all TAY showed improvements in their total brain map scores, compared to approximately half of adults (Figure 10). On average, the magnitude of change in assessment scores also tended to be larger among TAY. Among TAY, brain map scores increased by an average of 9% (range: -1% to +23%), while brain map scores increased by an average of 1% among adults (range -13% to +23). These trends continued across each of the functional domains, wherein more TAY had increased scores and the change in scores was larger compared to adults. Additional data regarding changes in functional domain scores across subpopulations is available in Appendix II.

Figure 10. Percentage of Adults and TAY with Increased and Decreased Brain Map Scores from Baseline to Follow-up, N=28



The larger and more consistent increases among TAY may reflect greater neuroplasticity among TAY compared to adults as they are still undergoing brain development. Additionally, TAY were also less likely

to have co-occurring substance use disorders and/or psychotic disorders, as may also have fewer years of heavy psychiatric medication. All of these factors may help TAY more consistently engage in and be more responsive to NMT interventions compared to adults. Differences in NMT effectiveness across sub-populations will continue to be explored as more consumers participate in NMT services and receive follow-up assessments.

Changes in functional scores may also be reflective of providers' as well as consumers' increasing experience and comfort with NMT and the assessment process. Providers observed that consumers may be more forthcoming about their history or experiences as they build rapport with providers and begin to see the benefits of NMT. As a result, more accurate information may be available for follow-up assessments, which could change assessment scores. Additionally, 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 also score criteria slightly differently.

NMT Consumer Recovery and Experience of Care

NMT services appear to be helping consumers progress in their recovery. Aside from changes in assessment scores, all focus group participants (including providers and consumers) could point to benefits consumers experienced as a result of participating in NMT interventions. As in previous years, consumers frequently discussed how the NMT interventions helped them feel less anxious, more relaxed, and more in control. Concentrating on an activity—such as coloring or origami—helped consumers "get out of their head," while techniques such as deep breathing, meditation, yoga, or the use of sensory tools helped consumers stay centered and calm. As one consumer shared, "If there's something on my mind and I do origami, my focus is on the origami. After I'm done with the origami, the stuff I was worried about isn't too much to worry about anymore."

> *Evaluating situations and making better choices has been a significant improvement. Now I think about options to handle a situation, rather than just reacting to a negative stimulus. Now, I also think about the association of things. I think I would have handled issues with my family differently before. Now I have empathy and think about how they got to be that way.*
>
> – NMT Consumer

In several cases, consumers felt NMT was helping improve their quality of life and shared that they had a renewed interest in hobbies, reaching their goals, and spending time with family or friends. Other changes noted by consumers and providers included better communication, improved ability to manage anger or stress, and being better equipped to recognize and manage triggers. In previous years, other consumers reported that the NMT-based techniques and activities were helping consumers decrease substance use as well as reduce or avoid medication to cope with depression and anxiety.

For some consumers, the assessment process and NMT interventions appear to be helping them process their experiences to develop better insight and understand the impact that trauma has had on their current behaviors as well as behaviors of others. Consumers talked about how the interventions create a

safe space for them to address and rewrite their history. Providers also shared that some consumers are beginning to use NMT and trauma-informed language when discussing their experiences and recovery.

> *[NMT interventions] like the sand tray, or sketching, or writing offer a different way to express yourself, rather than talking it out.*
>
> – NMT Consumer

NMT offers an alternative approach to treatment that many consumers had never experienced. For some consumers, the NMT approach makes it easier for consumers to engage in therapy. As in previous years, consumers shared that NMT felt different from other mental health services they had received. In many cases, consumers were accustomed to more traditional talk therapy, which often left them feeling emotional and fatigued after sessions. In other cases, consumers talked about how other services they had received felt "one size fits all" and that previous providers did not try to get to know or understand them as individuals. In contrast, NMT-based activities made consumers feel "refreshed" and "light".

Several consumers 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 shared that providers' willingness to engage consumers in individualized activities such as drawing, coloring, and meditating helps build rapport and trust. Several consumers mentioned that no other providers have worked with them in this way before and that with NMT they look forward to their next sessions. As mentioned previously, in several cases, NMT consumers also implement NMT interventions on their own in between sessions.

Provider Approach to Care

> *Since I've been in a leadership role [at my clinic], NMT has been a constant part of agenda. At least once a month, I'm presenting on something on NMT and trauma-informed care…We want to get to a point where [non-NMT trained] supervisors can tell when a person needs a metric.*
>
> – NMT Provider

NMT implementation may be helping clinics and programs be more trauma-informed. As mentioned above, providers reported that being trained in NMT and the neurodevelopmental impacts of trauma is changing the way they approach care with all consumers. Additionally, providing NMT services in the Adult System of Care appears to be supporting non-NMT providers to employ a more trauma-informed approach when working with both NMT and non-NMT clients.

The NMT assessment process typically provides more comprehensive information about consumers' history and helps identify types of interventions that the consumer responds well to. This information is then often used to inform the way other non-NMT providers work with the client. In one instance, NMT metrics and sensory interventions with consumers in residential placements have been integral in helping non-NMT providers better understand consumers' behaviors and triggers. Additionally, the NMT clinicians have been able to offer recommendations for therapeutic strategies or interventions that the non-NMT providers can implement that are likely to be effective with the clients.

NMT-trained providers are 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. Additionally, as the NMT adult pilot progresses, BHRS is receiving a greater volume of requests for the core principles training throughout the Adult System of Care. 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.

In some cases, NMT clinicians mentioned that other providers within their clinics or programs are not always as open or receptive to NMT. In particular, providers observed that non-NMT clinicians who have worked in the mental health system for a long time may see NMT as an intervention that will come and go, or may see NMT as too time intensive. In other cases, NMT providers work on interdisciplinary teams or with non-BHRS providers who do not have as much training in trauma-informed approaches and who may be more dismissive of NMT.

> *What we're learning is that adults are interfacing with a lot of different parts of our system. We still need more trauma-informed training across BHRS and those providers and agencies we work with.*
>
> – NMT Provider

Providers noted that having a supervisor who is trained in or supportive of NMT can make it easier to implement NMT more widely within a clinic or program. During case conferencing, supervisors can recommend that a consumer on a non-NMT provider's caseload receive an NMT assessment based upon the consumer's presentation and history of trauma. In contrast, NMT clinicians in non-supervisory roles and/or in larger teams sometimes feel they have less authority and can only suggest NMT to their fellow colleagues. NMT providers are hopeful that with the increasing exposure to NMT in the Adult System of Care, more providers will be receptive to and request NMT for their clients.

Recommendations

Based on the evaluation findings, below are recommendations to support NMT Adult Pilot implementation.

Continue to be intentional in trainee selection to fill NMT gaps in the BHRS Adult System of Care. To continue expanding NMT services and buy-in within the Adult System of Care, BHRS should continue prioritizing training providers at sites or programs where there are no or only one NMT trained clinician. Additionally, BHRS may wish to consider recruiting or selecting more trainees in supervisory or leadership roles to help facilitate wider adoption of NMT within the program.

Continue exploring and implementing strategies to help alleviate the time burden of NMT training. Several providers noted that finding time for NMT training activities can still be a challenge and compensatory time is used or granted inconsistently. BHRS may wish to consider providing a refresher to supervisors and trainees to clarify when, how, and for what training activities compensatory time can be applied. Additionally, BHRS may wish to consider allowing more comp time at the beginning of training when the learning curve may be steepest for trainees and NMT activities may take longer.

Consider developing more accessible, non-clinical NMT materials for consumers and their family members to help explain NMT principles and the approach. Some consumers shared that NMT materials explaining the NMT approach can be complicated and difficult to understand. Creating educational and outreach materials that use more accessible language could facilitate more interest and buy-in for NMT among consumers and family members.

Identify opportunities to disseminate findings from the NMT adult pilot. The NMT adult pilot is now in the third year of implementation, during which time BHRS has identified a number of strategies to successfully adapt the NMT to an adult population and expand NMT within an Adult System of Care. Additionally, preliminary findings are demonstrating positive outcomes among the adult population. The lessons learned by BHRS through the adult NMT pilot may be useful to other counties, systems of care, or partner agencies that are interested in NMT specifically or wish to implement or learn about alternative, trauma-informed approaches. To support this shared learning, BHRS may wish to identify opportunities to disseminate the evaluation findings—including lessons learned, success factors, and outcomes—more widely. This could include delivering findings presentations; drafting a white paper or brief document of key takeaways; and/or synthesizing lessons learned and successful implementation strategies to help guide and support others who may be interested in implementing NMT in an adult population.

Conclusion

The 2018-2019 fiscal year marked the third year of NMT implementation in the BHRS Adult System of Care. During this time, BHRS continued to expand NMT capacity throughout the Adult System. BHRS began the first "NMT Train-the-Trainer" training and the second NMT certification training with providers in the adult system of care. Providers were intentionally selected to fill gaps in NMT services across adult clinics and programs. As more providers are being trained in NMT across BHRS adult programs, the volume of adult consumers receiving NMT services continues to grow. In FY18-19, 77 consumers were enrolled in NMT services. Additionally, BHRS continues to better equip clinics and programs with NMT resources to expand the NMT interventions available to adult consumers.

BHRS built upon lessons learned during the first two years of the pilot and is becoming increasingly adept at adapting the NMT approach to adults. BHRS implemented a number of strategies to better support providers throughout the intensive NMT training. In particular, greater one-on-one mentorship throughout the training process has been instrumental in supporting providers to learn NMT principles and streamline the assessment process. Consumers also 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. TAY appear to be responding particularly well to NMT and showed greater and more consistent improvements in functional domain scores compared to adults. Consumers and providers also cited improvements in consumers' coping mechanisms and overall quality of life.

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. In particular, BHRS and RDA will focus on understanding how NMT can continue to be expanded and sustained within the BHRS Adult System of Care. RDA will also continue to collect consumer-level data to examine changes in consumer outcomes overall and across sub-populations.

Appendix I. Baseline NMT Assessments Across Target Populations

Adults compared to TAY

Table 4. Average Baseline Functional Domain Scores among Adults and TAY (N=72)

Functional Domain	Adult (N=51) Average Score (Range)	TAY (N=21) Average Score (Range)
Total Brain Map	**76% (28 to 96%)**	**76% (55 to 99%)**
Sensory Integration	82% (38 to 100%)	79% (51 to 100%)
Self-Regulation	71% (35 to 94%)	73% (45 to 100%)
Relational	70% (27 to 96%)	73% (49 to 100%)
Cognitive	82% (15 to 100%)	80% (61 to 99%)

No significant differences were found across groups using t-test.

Table 5. Baseline Recommended Intervention Level among Adults and TAY (N=72)

Functional Domain	Recommended Intervention Level	Adult (N=51) % of Consumers	TAY (N=21) % of Consumers
Sensory Integration	Essential	14%	10%
	Therapeutic	39%	62%
	Enrichment	47%	29%
Self-Regulation	Essential	37%	33%
	Therapeutic	39%	48%
	Enrichment	24%	19%
Relational	Essential	41%	24%
	Therapeutic	37%	57%
	Enrichment	22%	19%
Cognitive	Essential	8%	14%
	Therapeutic	31%	33%
	Enrichment	61%	52%

No significant differences were found across groups using chi-square.

Non-Reentry compared to Reentry Adults

Table 6. Average Baseline Functional Domain Scores among Non-Reentry and Reentry Adults (N=51)

Functional Domain	Adult: Non-Reentry (N=27) Average Score (Range)	Adult: Reentry (N=24) Average Score (Range)
Total Brain Map	**75% (40 to 85%)**	**78% (28 to 96%)**
Sensory Integration	79% (51 to 100%)	85% (38 to 100%)
Self-Regulation	68% (39 to 94%)	74% (35 to 94%)
Relational	70% (36 to 96%)	70% (27 to 93%)
Cognitive	82% (22 to 97%)	81% (15 to 100%)

No significant differences were found across groups using t-test.

Table 7. Baseline Recommended Intervention Level among Non-Reentry and Reentry Adults (N=51)

Functional Domain	Recommended Intervention Level	Adult: Non-Reentry (N=27) % of Consumers	Adult: Reentry (N=24) % of Consumers
Sensory Integration	Essential	14%	11%
	Therapeutic	50%	39%
	Enrichment	36%	50%
Self-Regulation	Essential	41%	29%
	Therapeutic	41%	43%
	Enrichment	18%	29%
Relational	Essential	34%	39%
	Therapeutic	48%	36%
	Enrichment	18%	25%
Cognitive	Essential	5%	18%
	Therapeutic	36%	25%
	Enrichment	59%	57%

No significant differences were found across groups using chi-square.

Appendix II. Changes in NMT Scores Across Target Populations

Adults compared to TAY

Table 8. Type of Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Change in Scores	Adult (N=16) % of Consumers	TAY (N=12) % of Consumers
Total Brain Map*	**Decrease**	**44%**	**8%**
	Maintain	**-**	**-**
	Increase	**56%**	**92%**
Sensory Integration*	Decrease	38%	8%
	Maintain	19%	-
	Increase	44%	92%
Self-Regulation*	Decrease	44%	-
	Maintain	13%	-
	Increase	44%	100%
Relational*	Decrease	50%	17%
	Maintain	19%	-
	Increase	31%	83%
Cognitive	Decrease	31%	8%
	Maintain	19%	8%
	Increase	50%	83%

*Indicates significant difference between populations using a chi-square test, p-value<0.05.

Table 9. Average Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Adult (N=16) Average Change (Range)	TAY (N=12) Average Change (Range)
Total Brain Map*	**1% (-13 to +23%)**	**9% (-1 to +23%)**
Sensory Integration	2% (-7 to +25%)	6% (-1 to +22%)
Self-Regulation*	1% (-11 to +28%)	11% (+1 to 30%)
Relational*	0% (-13 to +26%)	10% (-3 to 28%)
Cognitive*	0% (-26 to +11%)	7% (-2 to 24%)

*Indicates significant difference between populations using a t-test, p-value<0.05.

Non-Reentry compared to Reentry Adults

Table 10. Type of Change in Functional Domain Scores among Adults and TAY (N=28)

Functional Domain	Change in Scores	Adult: Non-Reentry (N=9) % of Consumers	Adult: Reentry (N=7) % of Consumers
Total Brain Map	**Decrease**	**44%**	**8%**
	Maintain	**-**	**-**
	Increase	**56%**	**92%**
Sensory Integration	Decrease	38%	8%
	Maintain	19%	-
	Increase	44%	92%
Self-Regulation	Decrease	44%	-
	Maintain	13%	-
	Increase	44%	100%
Relational	Decrease	50%	17%
	Maintain	19%	-
	Increase	31%	83%
Cognitive	Decrease	31%	8%
	Maintain	19%	8%
	Increase	50%	83%

No significant differences were found across groups using chi-square.

Table 11. Average Change in Functional Domain Scores among Non-Reentry and Reentry Adults (N=16)

Functional Domain	Adult: Not Reentry (N=9) Average Change (Range)	Adult: Reentry (N=7) Average Change (Range)
Total Brain Map	**1% (-13 to +23%)**	**1% (-2 to +7%)**
Sensory Integration	5% (-7 to +25%)	0% (-5 to +3%)
Self-Regulation	6% (-11 to +30%)	2% (-8 to +10%)
Relational	6% (-13 to +28%)	0% (-10 to +9%)
Cognitive	4% (-26 to +24%)	1% (-2 to +6%)

No significant differences were found across groups using t-test.