

Expanding Access to Brain Stimulation Therapies for Serious Mental Illness



2026
*MENTAL HEALTH
INNOVATIONS
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Expanding Access to Brain Stimulation Therapies for Serious Mental Illness

Expanding Access to Brain Stimulation Therapies for Serious Mental Illness was prepared for the Substance Abuse and Mental Health Services Administration (SAMHSA) under Task 2.2 of NASMHPD's Technical Assistance Coalition contract/task order HHSS283201700024I/75S20321F42001. Asha Stanly served as contracting officer representative.

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Publication No. PEP26-01-001

Released 2026

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ABSTRACT

Public mental health systems provide services for a large number of individuals with serious mental illness (SMI) who do not respond to standard treatments. For many of these individuals, outpatient care with psychotherapy and medications does not produce sustained improvement, leading to reliance on partial hospital programs, emergency departments, and inpatient care. This pattern reflects structural barriers in current care models and systems, which do not reliably escalate to alternative therapeutics that could enhance symptom improvement. These alternatives can include procedural, circuit-targeted interventions that may offer greater clinical benefit for SMI. Advances in neuroscience have demonstrated that many psychiatric symptoms can be approached as brain circuit disorders. These insights have translated into a range of evidence-based interventions—including electroconvulsive therapy and transcranial magnetic stimulation—that directly modulate these circuits and can produce meaningful clinical improvement, even in individuals who have not benefited from conventional care. Rapid-acting pharmacotherapies such as esketamine also provide important therapeutic benefits through distinct mechanisms. Collectively known as interventional psychiatry, these approaches represent a critical but underutilized component of modern psychiatric treatment. Other means of targeting brain processes, such as eye movement desensitization and reprocessing (EMDR) and mindfulness strategies, have also demonstrated increasing evidence of effectiveness, yet they have poor penetration as means of assisting individuals with SMI with trauma processing as well as emotional stability. This paper briefly outlines the scientific rationale for brain circuit-based care, reviews the evidence for key interventions, and identifies barriers to implementation within public systems. It also proposes a policy framework for state-level action, including infrastructure development, workforce training, and financing strategies to support scalable access.

HIGHLIGHTS

- There is a growing evidence base on the effectiveness of brain stimulation therapies to treat individuals with SMI. However, access to these innovative interventions remains highly uneven.
- Structural barriers related to infrastructure, workforce training, insurance coverage, and regulatory complexity have restricted the availability of brain stimulation therapies, EMDR, and mindfulness approaches primarily to academic medical centers and select private settings. As a result, many individuals with SMI are unable to access treatments that could reduce their symptom burden; improve their functioning; and decrease their reliance on high-acuity, high-cost services.

- This gap between evidence and access has important implications for state mental health systems. Expanding access to brain circuit therapeutics offers an opportunity to improve outcomes for individuals with SMI while reducing system strain. These interventions may reduce reliance on prolonged hospitalization, limit cumulative medication burden, and promote functional recovery.

POLICY CONSIDERATIONS

1. Expand and standardize health coverage for evidence-based brain therapeutics.
2. Develop regional centers of excellence to support delivery of innovative treatments within public systems.
3. Integrate brain circuit therapeutics into the continuum of care.
4. Invest in workforce training in interventional psychiatry and related disciplines.
5. Modernize reimbursement models to support advanced targeting and delivery approaches.
6. Address infrastructure and capital barriers to expand access.
7. Support data collection and outcomes monitoring to guide policy and clinical practice.

INTRODUCTION

There are approximately 14.6 million individuals living with serious mental illness (SMI) in the United States. SMI is defined as a diagnosable mental, behavioral, or emotional disorder that substantially interferes with a person's life and ability to function. According to the National Survey on Drug Use and Health, in 2024, approximately 29 percent of people with SMI did not receive any treatment in a given year.¹ Of those individuals with SMI who do receive treatment, a substantial proportion do not achieve adequate symptom relief with standard treatments. For example, major depressive disorder (MDD) affects approximately 8–10 percent of U.S. adults annually, and up to one-third of these individuals meet criteria for treatment-resistant depression.^{2,3,4,5} Large effectiveness studies such as Sequenced Treatment Alternatives to Relieve Depression (STAR*D) demonstrate that remission rates decline with each successive treatment step, with a substantial subset of individuals remaining symptomatic despite multiple medication trials.^{6,7} After an individual has tried three to four medications, their odds of getting well and staying well approach single digits.

Treatment resistance is not limited to MDD. Across diagnostic categories, a substantial proportion of individuals do not achieve adequate symptom control with standard treatments. Approximately 20–30 percent of individuals with schizophrenia have treatment-resistant illness despite antipsychotic therapy.^{8,9} Similarly, many individuals with bipolar disorder continue to experience recurrent mood episodes despite maintenance treatment, and up to 40–60 percent of individuals with obsessive-compulsive disorder do not respond adequately to first-line interventions.^{10,11} Treatment resistance is therefore a common, cross-diagnostic outcome in SMI.

The consequences of SMI extend beyond symptom burden. Mental health disorders are a leading cause of disability worldwide,¹² and individuals with SMI experience substantial functional impairment, including reduced ability to work, maintain relationships, and engage in daily activities. Employment rates among individuals with SMI remain markedly lower than in the general population, and these individuals experience increased rates of medical comorbidity and premature mortality, with life expectancy reduced by approximately 10–20 years.¹³

The system-level impact is equally significant. Individuals with SMI disproportionately utilize high-intensity services, including emergency departments, inpatient psychiatric units, and residential care. A relatively small subset of individuals with SMI accounts for a disproportionate share of health care utilization and cost, with mental disorders among the costliest conditions in the United States.^{14,15} This pattern contributes to bed shortages, prolonged hospital stays, and repeated cycles of crisis care without sustained improvement. Current treatment models are largely organized around behavioral interventions, psychotherapy, and

sequential trials of medications. While these approaches are effective for many individuals, they often do not provide sustained improvement for those with SMI. Higher levels of care, including partial hospital and inpatient settings, frequently intensify monitoring and support but do not reliably introduce more effective or rapidly acting interventions.

As a result, treatment is often characterized by repeated medication adjustments rather than timely escalation to procedural, circuit-targeted interventions. Over time, this approach can lead to diminishing returns, increasing medication burden, cumulative side effects, and prolonged periods of ineffective care. For individuals with treatment-resistant illness, the result is often persistent symptoms, functional impairment, and limited recovery.¹⁶

Innovative approaches to improve treatment outcomes in individuals with SMI outside of standard treatments exist, including treatments that address neuronal circuits in the brain known as brain stimulation therapies. This paper will provide an overview of brain stimulation therapies, review the evidence for key interventions, and identify barriers to implementation within public systems. Additional nonpharmacological therapeutic techniques that focus on targeting responses to trauma and emotional dysregulation are also briefly discussed. This paper will then also describe a potential policy framework for state-level action, including infrastructure development, workforce training, and financing strategies to support scalable access to these innovative treatments. (Though this paper references states, U.S. territories also may benefit from some of the approaches discussed.)

Nonpharmacological therapeutic techniques that address brain processing and function

There is a large body of evidence suggesting that certain symptoms, such as those stemming from trauma or those that involve emotional dysregulation, can respond to specific nonpharmacological targeted treatments that are currently underutilized in public settings, including eye movement desensitization and reprocessing (EMDR) as well as breathwork, meditation, and cold immersion techniques. Although these interventions are not the primary focus of this paper, it is important to mention them briefly in the context of helping public mental health leaders and others understand the growing body of work examining—and increasing acceptance of—highly protocolized and specialized forms of treatment that do not involve medications.

EMDR has been developing over many decades as an approach to trauma sequelae,¹⁷ having first been described in the literature in 1989.¹⁸ In this approach, a trained therapist asks the patient to track their finger or an object with their eyes, and then meets with the patient before and after discussing a traumatic event and associations to it. This technique offers a structured way of discussing negative and positive cognitions associated and not yet associated with a traumatic memory. The

goal is to reduce emotional distress pertaining to the traumatic memory. Some researchers have theorized that the mechanism of action for this approach involves brain circuitry associated with emotions that can be reshaped.

Although decades of research have demonstrated its efficacy, EMDR remains difficult to access in public-sector settings as well as in prisons and forensic settings.¹⁹ More work needs to be done to expand this research and help to make this type of approach more broadly available.

Breathwork practices that induce altered states of consciousness are beginning to gain attention as potential nonpharmacological alternatives to psychedelic-assisted therapies. Specific breathing techniques have been shown to help with symptoms of depression and post-traumatic stress disorder,²⁰ as well as anxiety.²¹ Studies are also beginning to examine meditation and cold immersion (the Wim Hof Method) as a means of addressing stress and the physiological characteristics associated with it.²²

These various nonpharmacological techniques are important additions to the toolbox of potential approaches to patient care. Since it is well known that individuals with SMI often have co-occurring trauma, and may experience depression, anxiety, or generalized stress that can heighten the symptom expression of the underlying mental illness, it is important for mental health leaders to remain open-minded and consider where these alternative types of modalities can be brought into the continuum of care. These methods clearly impact brain processing and function as they relate to targeted symptoms, yet it appears that these approaches are nonspecific in terms of targeting brain circuits. For this reason, they are not considered part of “interventional psychiatry.” Nonetheless, public-sector mental health systems will likely see more of these services becoming available, and they would do well to begin identifying means of incorporating them.

Interventional psychiatry as a subspecialty

The term *interventional* refers to medical subspecialties that leverage surgical, procedural, or device-based interventions to treat illnesses that have not improved with routine care. Fields such as interventional cardiology and interventional radiology have demonstrated that these approaches can improve clinical outcomes by expanding treatment options beyond preventive strategies and conventional care.^{23,24}

Interventional psychiatry began to coalesce in 2014, approximately 75 years after the earliest versions of electroconvulsive therapy (ECT).^{25,26,27} The idea was to improve the coordination, accessibility, and development of conceptually aligned brain stimulation treatments such as ECT, transcranial magnetic stimulation (TMS), vagus nerve stimulation (VNS), and deep brain stimulation (DBS).^{28,29,30,31,32} Shortly thereafter, rapid-acting pharmacotherapies such as intravenous brexanolone (used for postpartum depression) and intranasal esketamine (for treatment-resistant

depression or major depression with suicidal ideation) expanded the range of procedural treatment options.

Academic medical centers and private clinics have increasingly adopted the framework of interventional psychiatry by organizing procedural treatments within dedicated divisions or service lines. This model aims to reduce fragmentation in care delivery, expand access to specialized interventions, and facilitate clinically informed research. These treatments can produce substantial clinical benefits for individuals with SMI who have not benefited from standard care. However, the population-level impact of the treatments will depend on scalability, access, and integration into routine care pathways within public mental health systems, not solely within academic medical centers and private clinics.

Achieving this scale will require parallel investment in workforce development and training infrastructure. Interventional psychiatry involves specialized knowledge in device-based therapies and brain circuitry that extends beyond standard psychiatric training. Recent efforts to formalize the field—by establishing subspecialty certification pathways and dedicated fellowship programs, for example—represent important steps toward standardizing competencies and expanding the workforce.³³

In parallel, health systems must develop sustainable care models that support integration of interventional psychiatry treatments across outpatient, inpatient, and community settings. Key priorities include aligning reimbursement structures, clinical workflows, and referral pathways to ensure that individuals with SMI can access these treatments earlier and more efficiently. Without deliberate investment in workforce and care infrastructure, interventional psychiatry risks remaining a high-impact but capacity-limited model concentrated in academic centers.

In this policy context, we focus on brain stimulation interventions as a core domain of interventional psychiatry, given their shared mechanistic framework and established role in clinical care. Rapid-acting pharmacotherapies, including psychedelic-assisted therapies, with unique delivery systems will be covered in another paper in this series.

Clinical role in the treatment continuum

For individuals with mild to moderate mental health conditions, psychotherapy and behavioral interventions are often effective first-line treatments that can lead to meaningful and sustained improvement.^{34,35} However, individuals with moderate to severe mental health conditions often require pharmacological treatment to adequately manage symptoms.

Combining therapy and medications is often more effective than either approach alone, yet this combination remains insufficient for many individuals with SMI.³⁶ In these cases, subsequent care typically involves sequential medication trials or augmentation strategies. However, the likelihood of substantial and durable clinical benefit diminishes with each unsuccessful treatment step.^{37,38}

Interventional psychiatry treatments are generally prescribed late in the course of illness, often after multiple unsuccessful medication trials and, in some cases, after repeated hospitalizations.^{39,40} This delay has significant clinical consequences: Longer duration of untreated or inadequately treated illness is associated with greater functional impairment, reduced likelihood of remission, increased chronicity, and, in some cases, evidence of neurobiological changes.^{41,42,43,44,45,46,47} The importance of timely and effective interventions is particularly pronounced for illnesses that emerge during critical developmental periods.⁴⁸

Interventional psychiatry treatments consistently produce larger and more rapid clinical improvements than conventional treatment strategies that rely on sequential medication trials. This pattern is supported both by randomized trials demonstrating substantial effect sizes in individuals with SMI and by head-to-head studies in which interventional approaches outperform pharmacological treatments in treatment-resistant populations.^{49,50,51,52,53,54,55,56,57,58}

Earlier integration of interventional psychiatry into care pathways has the potential to shorten the time to effective treatment, reduce cumulative medication burden and its associated adverse effects, decrease reliance on emergency and inpatient services, and improve functional recovery and long-term outcomes. Interventional psychiatry treatments should not be reserved as last-resort options but should be integrated as core components of a comprehensive, stage-based continuum of care for individuals with SMI. By producing rapid and meaningful clinical improvement, interventional treatments may also enable individuals with SMI to more fully benefit from ongoing care such as psychotherapy, pharmacotherapy, and behavioral interventions.

Current gaps in access and integration

Despite growing evidence and increasing clinical adoption, interventional psychiatry remains unevenly integrated into public mental health systems. Access is limited by several structural barriers:

- **Infrastructure constraints:** Many treatments require specialized equipment, clinical space, and operational support, often limiting availability to academic medical centers or well-resourced private practices.⁵⁹
- **Workforce limitations:** The number of clinicians trained in interventional techniques remains limited, and formal training pathways are still evolving. In addition, referrals to interventional treatments may be delayed or limited because referring providers (e.g., psychiatrists, therapists, primary care physicians, etc.) have limited familiarity with these interventions.
- **Financing and coverage variability:** Insurance coverage, particularly within Medicaid, is inconsistent across states and across treatment modalities.
- **Care fragmentation:** Interventional services are often siloed from general psychiatric care, creating barriers to referral, coordination, and continuity.

As a result, individuals served by public mental health systems—who are more likely to have SMI—are often the least likely to access these interventions. This mismatch between clinical need and access highlights a central challenge and opportunity for the field.

Brain circuit dysfunction as treatment target

Psychiatric disorders are diagnosed based on symptom patterns outlined in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), a classification system published by the American Psychiatric Association. This common language facilitates reliable clinical diagnosis^{60,61,62} but offers limited insights into the pathophysiology of psychiatric illnesses. To gain such insights, neuroscientists are often guided by the Research Domain Criteria (RDoC) from the National Institute of Mental Health.⁶³ The RDoC structure enables researchers to study psychiatric disorders using various units of analysis, from genes to behaviors.

Brain circuits have been highlighted as the RDoC unit of analysis that holds promise for changing clinical practice in psychiatry.⁶⁴ Brain circuits can be broadly defined as specific sets of interconnected neurons that work together to perform specific brain functions.⁶⁵ Advances in computational neuroscience and neuroimaging are starting to reveal which brain circuits are associated with which psychiatric symptoms. Studying these brain circuits is not merely an academic exercise with hypothetical future benefits; brain stimulation techniques that modulate these circuits (sometimes referred to as brain circuit therapeutics) are already impacting clinical care.^{66,67}

Conceptualizing psychiatric disorders as brain circuit disorders does not reduce the importance of the DSM diagnostic system. There is very little evidence that neuroimaging tools used to study brain circuitry can diagnose or monitor psychiatric illnesses. Instead, neuroimaging could be considered as a treatment planning tool for brain stimulation therapies. Surgeons who see a tumor through magnetic resonance imaging (MRI) do not use the MRI to diagnose a tumor, but they do use such imaging to guide biopsy or tumor resection.⁶⁸ Interventional psychiatrists are now starting to use MRI scans in a similar way, leveraging connectivity patterns to make decisions about brain circuit interventions. Reframing psychiatric care in this way offers an opportunity to enhance, rather than disrupt, current practice. Combining symptom-based assessment with targeted, circuit-informed intervention has much promise, and mental health leaders who are aware of these advances can help shape policy that fosters expanded access within public mental health systems to the full range of effective treatments while maintaining a patient-centered approach to care.

BRAIN CIRCUIT THERAPEUTICS

Electroconvulsive therapy

Overview and clinical role

Electroconvulsive therapy (ECT) is an intervention that involves medically inducing a seizure under general anesthesia. It is the noninvasive brain stimulation procedure that has been in longest continuous use, dating back to 1938.⁶⁹ Initially developed for schizophrenia, ECT is now indicated for a broad range of severe psychiatric conditions, including major depressive episodes (unipolar and bipolar), acute mania, persistent psychotic disorders, and catatonia.^{70,71}

ECT is widely considered the most effective intervention for the acute management of severe depressive episodes. It is most commonly used for individuals with treatment-resistant illness, but it is also indicated when rapid clinical improvement is required due to life-threatening conditions such as suicidality, malnutrition (inanition), acute manic delirium, or self-injurious behavior in catatonia.^{72,73,74}

The speed of response to ECT distinguishes it from other psychiatric treatments. For example, reductions in depression severity of approximately 25 percent have been observed after a single ECT session.⁷⁵ This magnitude of improvement is comparable to what is typically seen after two weeks of daily TMS.⁷⁶ Though ECT devices and application today differ from past uses, this approach does have a controversial history.⁷⁷

Evidence base and clinical impact

ECT has one of the most robust evidence bases in psychiatry, with response rates typically ranging from 60 to 80 percent and remission rates from 40 to 60 percent, depending on patient population and methodology.^{78,79} Its effectiveness in certain conditions persists even in highly treatment-resistant populations, where alternative interventions often yield limited benefit. In addition to its ability to decrease symptoms of treatment-resistant depression, studies have also shown its potential effectiveness in reducing self- or other-directed violence seen in some people with SMI,^{80,81} as well as in addressing treatment-resistant schizophrenia,⁸² sometimes in combination with other agents such as clozapine.⁸³ At the same time, prior treatment resistance is associated with reduced antidepressant response to ECT and a higher likelihood and faster onset of relapse following remission.^{84,85,86} These findings underscore both the importance of ECT for people with treatment-resistant depression and the potential benefits of earlier intervention, before illness becomes more entrenched.

Beyond symptom improvement, ECT has been associated with reductions in suicide risk and all-cause mortality in large observational studies,^{87,88} highlighting its role as a lifesaving intervention in high-risk populations. These improvements extend

beyond symptom reduction and may support recovery, functional improvement, and reengagement in daily life. Despite ECT's being one of the few psychiatric interventions with evidence for reducing mortality, it remains inaccessible to many individuals with SMI who could benefit from it.

Misconceptions and stigma

ECT remains one of the most stigmatized treatments in medicine.^{89,90} Historical practices and negative portrayals in the media have contributed to persistent misconceptions, often emphasizing cognitive side effects while overlooking the recent substantial improvements in safety, tolerability, and technique.^{91,92} Modern ECT is delivered under general anesthesia with individualized dosing and careful physiological monitoring. Side effects such as transient confusion and memory disturbances can occur.⁹³ Stigma surrounding ECT contributes to its lack of availability and acceptance among patients, resulting in underutilization even in cases where ECT is clinically indicated. These misconceptions and stigma also influence provider referral patterns and policy decisions around the treatment's use.⁹⁴

Access and system-level barriers

Access to ECT is highly variable and often limited within public mental health systems, including within state psychiatric hospitals. In addition to the misconceptions around the treatment, delivery requires specialized facilities, anesthesia support, and trained personnel, which frequently restricts availability to tertiary care centers.⁹⁵ These treatment services are often not well integrated into outpatient and community-based care pathways, further limiting access. Geographic differences in availability are substantial, with higher concentrations of ECT providers in certain regions and limited access in others.⁹⁶ Transportation can also be a barrier because individuals cannot drive after receiving the treatment.

Variability in state regulations governing consent and administration can delay access to ECT. State laws governing ECT vary widely, ranging from minimal regulation to highly restrictive requirements involving court authorization, guardianship proceedings, mandatory waiting periods, age restrictions, or multiple independent psychiatric evaluations.⁹⁷ Legal and regulatory barriers to timely treatment in emergency situations and variability across jurisdictions in processes for court-ordered or substituted consent for patients who lack decision-making capacity can be daunting and administratively demanding for providers, creating barriers that are at times insurmountable given the limited resources in public mental health systems. In some states, patients lacking decision-making capacity may not receive ECT without court authorization, while certain jurisdictions have limited or no emergency exceptions.⁹⁸ These issues can delay or limit access to ECT even when it is urgently indicated for life-threatening conditions such as severe suicidality, catatonia, or inability to maintain nutrition. Together, these structural barriers, which disproportionately affect individuals served by public systems, delay access to care.

Policy considerations

The status of ECT illustrates a broader challenge in public mental health systems, where highly effective treatments may remain underutilized due to structural barriers rather than a lack of evidence of their effectiveness.

Key policy considerations include the following:

- **Infrastructure investment:** Expanding ECT capacity for acute and maintenance treatment within state hospitals and regional centers
- **Workforce development:** Training clinicians and support staff in ECT delivery
- **Education:** Educating patients and family members about potential roles of ECT in treatment
- **Access:** Addressing geographic differences and availability in rural areas
- **Regulatory alignment:** Streamlining consent and administrative processes while maintaining safeguards (for example, harmonizing state-level consent and administrative processes while preserving safeguards for informed consent, independent review, and protection of patients lacking decision-making capacity)
- **Earlier integration:** Incorporating ECT earlier in treatment pathways when appropriate for individuals with SMI
- **Emergency access pathways:** Establishing clear, timely, and standardized processes for court-ordered or substituted consent to enable access to ECT for patients who lack decision-making capacity in life-threatening situations

ECT POLICY HIGHLIGHTS

- **Effective acute intervention:** ECT remains the most effective treatment for severe depressive episodes, including treatment-resistant depression.
- **Rapid clinical impact:** Symptom improvement can occur within days, making ECT critical for life-threatening presentations.
- **Effect modified by treatment resistance:** Outcomes in depression treatment are strongest when ECT is used before illness becomes highly refractory, supporting earlier consideration in care pathways.
- **Utility in treatment-resistant psychosis:** Evidence shows that ECT may be helpful with chronic psychosis, especially where self- and other-directed aggression is involved.
- **Reduces mortality risk:** ECT is associated with decreased suicide and all-cause mortality.^{99,100}
- **Access is limiting factor:** Infrastructure, workforce, stigma, and regulatory barriers—not a lack of evidence of effectiveness—drive underutilization.

Transcranial magnetic stimulation

Overview and clinical role

Transcranial magnetic stimulation (TMS) is a noninvasive neuromodulation technique that uses pulsed magnetic fields to induce electrical currents in superficial cortical neurons. Unlike ECT, TMS does not require anesthesia, does not routinely require medications to be adjusted or discontinued, does not intentionally induce seizures, and can be delivered in an outpatient setting without post-treatment monitoring or transportation requirements.^{101,102} TMS has been cleared by the Food and Drug Administration (FDA) for treatment of MDD, anxious depression, obsessive-compulsive disorder, and smoking cessation.¹⁰³ It is typically used for individuals who have not responded to at least one antidepressant medication, although in practice it is often introduced later in the course of illness due to insurance requirements and other access barriers.

Traditionally, TMS has been delivered once daily over several weeks (e.g., 30–36 sessions over 6–8 weeks). However, newer accelerated TMS (aTMS) protocols that use MRI guidance deliver multiple treatment sessions per day over a shorter time frame (e.g., 5 days), substantially reducing treatment duration and potentially increasing the magnitude of clinical response. These approaches represent a shift from cumulative dosing over weeks to high-intensity, time-compressed delivery, with the goal of achieving faster and potentially more robust antidepressant effects.^{104,105,106,107}

In contrast to treatments that rely on systemic pharmacological effects, TMS directly targets brain regions within circuits implicated in mood regulation. Most commonly this includes the left dorsolateral prefrontal cortex, a key node in depression-related networks. Increasingly, both conventional TMS and aTMS are being conceptualized as brain circuit interventions with effectiveness that depends on the precision of targeting and the intensity of delivery. By compressing treatment into days rather than weeks, aTMS directly addresses one of the primary access barriers in public systems: the time burden of care. Shorter treatment duration may also improve adherence and completion rates, which are critical determinants of real-world effectiveness of TMS in public mental health systems.

Evidence base and clinical impact

TMS has accumulated a substantial and growing evidence base, including randomized controlled trials, large multisite studies, and real-world registry data. In treatment-resistant depression, response rates are typically estimated at approximately 50–60 percent, with remission rates around 30–35 percent.^{108,109} TMS augmentation has been shown to be superior to continued medication switching or medication-based augmentation strategies.^{110,111} Despite this finding, many individuals with SMI are required to fail multiple additional medication trials and augmentation strategies before accessing TMS, prolonging ineffective care.

TMS is also associated with a favorable safety and tolerability profile. Common side effects include scalp discomfort and mild headache, while serious adverse events such as seizures are rare, occurring in approximately 1 in 30,000 treatments.^{112,113} Unlike many pharmacological treatments, TMS does not produce systemic side effects such as weight gain, sedation, or metabolic disturbance. These advantages may translate into improved functioning, including the ability to return to work, school, and social roles.

Advances in targeting and delivery

Traditional TMS targeting relies on scalp-based approximations of the dorsolateral prefrontal cortex region of the brain, such as the “5 cm rule” or Beam F3 method.¹¹⁴ Although these approaches are practical and widely used, they do not account for individual variability in brain anatomy or functional connectivity.

Emerging evidence suggests that treatment outcomes are influenced by the relationship between the stimulation site and underlying brain circuits, particularly connectivity to regions such as the subgenual cingulate cortex.^{115,116,117,118} This finding has led to increasing interest in MRI-guided and connectivity-informed targeting approaches. There is also emerging evidence that MRI-guided and connectivity-informed approaches may enable more individualized targeting based on circuit-level dysfunction and symptom profiles.¹¹⁹

aTMS protocols call for multiple sessions per day over a shorter time frame, producing more rapid and substantial clinical improvement. Early trials, including those involving Stanford neuromodulation therapy, have demonstrated large effect sizes and rapid antidepressant responses, leading to [FDA clearance](#) of a neuromodulation system and the creation of Current Procedural Terminology billing codes for functional-connectivity MRI-guided TMS.¹²⁰ There is emerging evidence that MRI guidance significantly improves clinical outcomes, but conventional scalp-based guidance has also shown strong results.¹²¹

Additional protocols continue to emerge. For example, single-session or ultra-brief accelerated paradigms such as optimized, neuroplasticity-enhanced depression (ONE-D) treatment are under investigation.^{122,123} While current data remain limited, these approaches highlight the possibility of dramatically reducing treatment duration, which could substantially improve access and scalability if validated.

Taken together, these developments suggest that TMS is evolving from a fixed protocol into a precision-based, flexible platform in which targeting, dose, and timing can be optimized to improve both speed and magnitude of clinical response.

Access and system-level barriers

Despite the substantial evidence base and favorable safety profile, access to TMS remains limited within public mental health systems. Real-world Medicare data suggest that fewer than 1 percent of individuals who may be eligible for TMS

actually receive it, highlighting a significant gap between evidence and access.¹²⁴ Several structural barriers contribute to this gap:

- **Insurance requirements:** Many payors require multiple failed medication trials before authorizing TMS, delaying access for individuals who may benefit earlier.
- **Coverage variability:** Medicaid coverage for TMS varies across states and is often more restrictive than commercial insurance.
- **Infrastructure needs:** TMS requires specialized equipment and clinic space, which may not be available in community or state-operated settings.
- **Workforce constraints:** Delivery requires trained clinicians and technicians, and workforce capacity remains limited. Additionally, referring providers may have limited familiarity with the safety, efficacy, indications, and referral pathways.
- **Time burden:** Standard protocols require daily treatments over several weeks, creating access challenges for many individuals with SMI. Recently developed accelerated protocols compress this treatment time into a single week but still require 5 consecutive 10-hour treatment days. Lack of access to transportation to sites for treatment can additionally create barriers, even though TMS does not require assisted transportation.

These barriers disproportionately affect individuals served by public systems, who are more likely to have severe, treatment-resistant illness but less likely to access TMS. At the same time, the policy and reimbursement landscape is beginning to shift. New procedural and billing codes for accelerated and MRI-guided TMS have been introduced, and some major payors are beginning to implement coverage pathways for these newer approaches. These developments signal increasing recognition of TMS as a scalable, medically necessary intervention. However, implementation remains uneven, and failure to align reimbursement with emerging evidence risks locking public systems into outdated, less effective treatment models.

Policy considerations

TMS represents a unique opportunity for public mental health systems: a well-tolerated, noninvasive, scalable, and evidence-based intervention that can be delivered in outpatient settings and integrated into existing care infrastructure. TMS has the potential to reduce healthcare costs by shifting care from high-cost crisis services to outpatient treatment settings.¹²⁵

Key policy considerations include the following:

- **Expanding coverage:** Reducing step therapy or “fail first” requirements
- **Aligning reimbursement with innovation:** Supporting billing pathways for accelerated, high-dose, and connectivity-informed TMS (Scalp-based targeting remains a reasonable option in settings without access to MRI or neuronavigation, given the existing evidence.)

- **Investing in infrastructure:** Developing TMS programs in state hospitals, community mental health centers, and regional hubs, as well as urgent care settings, given emerging data on accelerated benefits
- **Workforce development:** Training clinicians and technicians to deliver TMS safely and effectively
- **Improving access pathways:** Integrating TMS earlier in treatment algorithms and within crisis stabilization and step-down care models

TMS POLICY HIGHLIGHTS

- **Effective and clinically meaningful:** TMS provides clinically meaningful benefit for treatment-resistant depression, with outcomes improving through advances in targeting, dose, and delivery.
- **Delivery matters:** Randomized evidence demonstrates that accelerated, connectivity-informed TMS can substantially enhance treatment effects, although scalp-based targeting may also yield improvement.¹²⁶
- **Scalable and outpatient-based:** TMS can be delivered without anesthesia or hospitalization, making it adaptable to community and public system settings.
- **Innovation outpacing policy:** Accelerated protocols, advanced targeting methods, and emerging paradigms (e.g., ONE-D) are evolving faster than reimbursement systems.
- **Access lags behind evidence:** Insurance, infrastructure, and workforce barriers continue to limit availability, particularly in public systems.

Other brain circuit therapeutics

In addition to ECT and TMS, a range of other brain circuit therapeutics are being developed and implemented for individuals with severe and treatment-resistant psychiatric illness. These approaches include vagus nerve stimulation, deep brain stimulation, and MRI-guided focused ultrasound (MRgFUS), among others. These modalities differ in mechanism and invasiveness, yet they share a common principle: direct modulation of neural circuits implicated in psychiatric symptoms. Many of these interventions extend beyond the spatial or mechanistic limitations of TMS, enabling access to deeper or more distributed brain networks. The FDA has approved or cleared some devices, and research and review of other applications continues.

Transcranial electrical stimulation

Transcranial electrical stimulation (tES), including transcranial direct current stimulation (tDCS) and transcranial alternating current stimulation (tACS), delivers low-intensity electrical currents through scalp electrodes to modulate cortical activity.^{127,128,129} These modalities are safe, portable, and relatively inexpensive, attributes that may reduce reliance on clinic-based care and improve accessibility.^{130,131,132,133}

Among tES modalities, tDCS has been the most extensively studied. The FDA recently cleared a home-based tDCS system for MDD using a conventional once-daily dosing schedule (2 mA, 36 sessions over 10 weeks).¹³⁴ This important regulatory milestone introduces the possibility of remotely delivered neuromodulation at scale. However, the clinical effects of tDCS remain modest relative to those of TMS and ECT.^{135,136}

These findings highlight a central trade-off: tDCS offers substantial advantages in scalability and access but currently demonstrates smaller effect sizes than other neuromodulation approaches. Ongoing work exploring optimized dosing, targeting, and accelerated protocols may help improve its clinical efficacy while preserving its accessibility advantages.

Vagus nerve stimulation

Vagus nerve stimulation (VNS) is an FDA-approved implantable neuromodulation therapy that delivers electrical impulses to the vagus nerve, indirectly modulating brain circuits involved in mood, autonomic regulation, and inflammation. VNS was approved for treatment-resistant depression in 2005.

Unlike ECT or TMS, the therapeutic effects of VNS typically emerge gradually over months. However, longitudinal studies suggest that clinical benefit may increase over time, with sustained improvements observed over several years in individuals with treatment-resistant depression.¹³⁷

Evidence from randomized controlled trials has been mixed, with limited separation from control conditions during short-term follow-up.¹³⁸ More recent analyses highlight a key limitation of this evidence base: Many studies have evaluated VNS using short-term end points that do not adequately capture its delayed and cumulative effects and in some cases do not clearly distinguish acute from longer-term outcomes. This misalignment between time to effect and trial design complicates interpretation of efficacy and contributes to uncertainty in coverage decisions.^{139,140}

From a policy perspective, VNS illustrates a recurring challenge: Interventions with delayed onset but durable benefit are difficult to evaluate within conventional clinical trial frameworks and reimbursement models, particularly within public systems that prioritize short-term outcomes.

Noninvasive VNS approaches, including auricular and cervical stimulation, have also been developed. Early studies suggest potential antidepressant effects, though their appropriate role in psychiatric care remains under investigation.^{141,142} Recent pilot work has explored accelerated transcutaneous auricular VNS (taVNS) paradigms delivered over hours to days, demonstrating feasibility and short-term symptom improvement in small samples, though controlled data are needed to establish efficacy and durability.¹⁴³

Deep brain stimulation

Deep brain stimulation (DBS) is an invasive neuromodulation technique involving surgical implantation of electrodes into deep brain structures. Originally developed for movement disorders such as Parkinson's disease, DBS is being investigated for severe psychiatric conditions, including obsessive-compulsive disorder and MDD. Long-term follow-up studies have demonstrated sustained clinical benefit in a subset of highly treatment-resistant patients, supporting the potential durability of DBS effects.^{144,145,146}

DBS enables direct modulation of neural circuits that are inaccessible to noninvasive techniques, with programmable and adjustable stimulation parameters. In psychiatry, its use remains limited to highly selected cases, including those treated under humanitarian device exemptions. Barriers to broader implementation include

- surgical complexity and cost,
- limited large-scale randomized trial data, and
- challenges in identifying optimal targets and patient selection criteria.

Despite these challenges, DBS represents an important platform for advancing circuit-based models of psychiatric illness and may play a role in highly refractory cases.

MRI-guided focused ultrasound

MRI-guided focused ultrasound (MRgFUS) is an emerging technology that enables noninvasive targeting of deep brain structures using acoustic energy. Depending on the parameters applied, MRgFUS can either modulate neural activity or create precise focal lesions.

This approach offers a unique combination of depth, precision, and noninvasiveness, potentially addressing key limitations of both TMS (depth) and DBS (invasiveness). In neurological conditions such as essential tremor, MRgFUS has demonstrated efficacy in randomized trials and, in selected cases, offers a noninvasive alternative to DBS.^{147,148,149,150} By contrast, psychiatric applications (e.g., obsessive-compulsive disorder) are under active investigation. Although still in early stages of development, MRgFUS highlights the rapid expansion of tools available for circuit-based intervention.

Policy considerations

These emerging modalities expand the range of potential interventions for treatment-resistant psychiatric illness but are not yet widely integrated into public mental health systems. Key policy considerations include the following:

- **Supporting innovation pathways:** Facilitating clinical trials and early adoption within state systems
- **Developing coverage frameworks:** Creating mechanisms to evaluate and reimburse emerging therapies with evolving evidence bases

- **Defining appropriate use cases:** Identifying the patient populations most likely to benefit from more invasive or experimental interventions
- **Ensuring access:** Preventing the concentration of advanced therapies in limited academic or private settings

These emerging brain circuit therapeutics underscore the trajectory of the field: toward increasingly precise, mechanism-based interventions. Ensuring that public mental health systems can adapt to and incorporate these advances will be essential to maintaining relevance and improving outcomes for individuals with SMI.

POLICY HIGHLIGHTS OF OTHER BRAIN CIRCUIT THERAPIES

- **Expands treatment landscape:** Emerging modalities provide additional options for individuals who do not respond to existing interventions.
- **Greater precision and depth:** Technologies such as DBS and MRgFUS extend the reach of circuit-based interventions beyond superficial cortical targets.
- **Evidence and access misaligned:** Promising therapies often face delays in coverage and implementation due to evolving evidence standards.
- **Limited current scalability:** Most modalities remain restricted to specialized centers and highly selected patient populations.
- **Future system impact:** Continued development may significantly expand the range of effective interventions for severe and treatment-resistant illness.

ETHICAL AND LEGAL CONSIDERATIONS

The expansion of brain circuit therapeutics within public mental health systems raises important ethical and legal considerations. These issues are particularly relevant given the severity of illness they aim to address, the use of procedural interventions, and the variability in decision-making capacity among individuals with SMI who may be offered these treatments. Addressing these considerations proactively is essential to ensuring that expanded access is both effective and ethically grounded.

Use in involuntary treatment settings

Brain stimulation therapies are often considered for individuals with severe, treatment-resistant illness, including those receiving care involuntarily or under court orders. This context raises complex questions regarding autonomy, capacity, and the appropriate use of procedural interventions when individuals with SMI may lack the ability to provide informed consent or may be mandated to undergo particular treatments.¹⁵¹

Existing legal frameworks governing involuntary treatment vary by state but generally require demonstration of impaired decision-making capacity and/or risk of harm to self or others, unless there are other compelling government interests at stake and other parameters are met, such as under *Sell v. U.S.* for restoration of competence to stand trial,¹⁵² or in environments where dangerousness and institutional safety are a factor, such as in prisons under *Washington v. Harper*.¹⁵³ Within these frameworks, treatments such as ECT have established legal precedent and structured processes for administration under court authorization or, in some jurisdictions, substituted judgment standards.¹⁵⁴ In contrast, newer modalities such as TMS and emerging neuromodulation approaches are less consistently addressed in current statutes and policies, creating uncertainty in their use within involuntary treatment settings.^{155,156,157} In fact, they may not be addressed at all in case law or statutes, leaving providers at a loss as to whether they can be utilized at all in these complex situations.

From an ethical perspective, the use of brain circuit therapeutics in involuntary treatment settings requires careful balancing of

- **beneficence**, particularly when effective treatments are available for life-threatening conditions;
- **respect for autonomy**, including efforts to engage individuals with SMI in shared decision-making whenever possible; and
- **least restrictive care**, ensuring that interventions are proportionate to clinical need and used only when less invasive options are insufficient.¹⁵⁸

At the same time, failure to provide access to effective treatments may itself raise ethical concerns. Prolonged exposure to severe, inadequately treated illness—particularly in the context of repeated hospitalization, functional decline, or elevated suicide risk—may represent a form of harm when effective interventions are available but inaccessible.^{159,160}

It is important to remember that the legal and regulatory parameters around ECT, for example, came about due to the perceived risk–benefit ratio and intrusiveness of ECT itself. As newer interventions have different safety profiles and levels of perceived intrusiveness, it is conceivable that oversight by legal authorities may be different (just like medications for medical conditions may require less legal oversight for people with decisional impairments). As evidence for these interventions continues to evolve, legal and policy frameworks will need to adapt to ensure that individuals with SMI in involuntary treatment settings are neither exposed to inappropriate use nor excluded from clinically indicated, potentially lifesaving care.

Informed consent

Informed consent is a central ethical requirement for all medical treatments, including brain circuit therapeutics.^{161,162} The procedural nature of many of these

interventions, combined with historical stigma and variability in public understanding, makes clear, consistent, and well-structured consent processes especially important.

Key elements of informed consent include the following:

- explanation of the nature and purpose of the treatment
- discussion of potential benefits and risks, including common and serious side effects
- presentation of alternative treatment options and the risks of no treatment
- assessment of patient understanding and decision-making capacity

For interventions such as ECT and TMS, misconceptions about safety, mechanism, and side effects are common and may influence patient decision-making. Clinicians must therefore provide accurate, balanced information that addresses both the risks and benefits of the recommended treatment and alternatives, as well as the risks of untreated illness.

In individuals with impaired decision-making capacity, consent processes may involve legally authorized representatives such as healthcare proxies, guardians deciding based on the best interests of the patient, decision makers under more rigorous substituted judgment standards, or court oversight, depending on jurisdiction. These processes should prioritize alignment with the patient's prior expressed preferences whenever possible, while ensuring that decisions that are made are medically appropriate and recommended. Standardizing consent processes across settings may help reduce variability in access and ensure that patients receive consistent, high-quality information when considering these treatments.

Policy considerations

As brain circuit therapeutics become more widely implemented, ethical and legal frameworks must keep pace with clinical practice. Key policy considerations include the following:

- **Standardizing consent processes:** Developing clear, consistent guidelines for informed consent across treatment modalities and care settings
- **Clarifying legal pathways:** Updating state statutes and institutional policies to address newer interventions such as TMS and emerging neuromodulation techniques as needed
- **Protecting patient rights:** Ensuring appropriate safeguards in involuntary treatment contexts, including oversight and review mechanisms
- **Education:** Educating patients and family members about these technologies and their uses
- **Promoting access:** Avoiding the exclusion of individuals with SMI from beneficial treatments based solely on legal status or treatment setting

- **Supporting clinician training:** Providing education on ethical decision-making, capacity assessment, and consent processes specific to interventional psychiatry

ETHICAL AND INFORMED CONSENT POLICY HIGHLIGHTS

- **Ethical complexity:** Use of brain circuit therapeutics in severe illness often involves questions of capacity, autonomy, and risk.
- **Uneven legal frameworks:** Established pathways exist for ECT, but newer interventions are less clearly addressed in current statutes and regulatory schemes.
- **Informed consent:** Clear, accurate, and balanced communication is essential to patient-centered care.
- **Involuntary treatment settings safeguards:** Oversight mechanisms must balance patient protection with access to effective treatment.
- **Access as an ethical issue:** Failure to provide evidence-based interventions to high-need populations may perpetuate harm.

IMPLEMENTATION CONSIDERATIONS

Expanding access to brain circuit therapeutics within public mental health systems will require coordinated investments across infrastructure, workforce, and financing. Although the clinical evidence supporting these interventions continues to grow, implementation, resources, stigma, and infrastructure needs remain the primary barriers to broader impact. State systems are uniquely positioned to lead this integration, particularly for individuals with serious and treatment-resistant illness.

Infrastructure

State hospital-based programs

State hospitals represent a critical entry point for integrating brain circuit therapeutics into public systems. These settings care for individuals with the highest acuity and treatment resistance, making them well suited for interventions such as ECT and aTMS. Developing or expanding interventional psychiatry programs within state hospitals can improve access to evidence-based treatments for high-need populations, particularly for severe mood disorders and catatonia, where interventions such as ECT can produce rapid clinical improvement and potentially reduce prolonged hospitalization.¹⁶³ ECT also can decrease readmissions by improving treatment effectiveness during inpatient episodes, particularly when paired with structured transition to outpatient continuation care.¹⁶⁴

State hospital programs of the future could potentially function as regional interventional psychiatry hubs, supporting referral networks from community

mental health centers, providing specialized oversight for complex interventions, and serving as training sites for clinicians. Regionalized models may be particularly important for interventions such as ECT, where maintenance of specialized expertise, anesthesia support, equipment, quality oversight, and clinician training can be difficult for smaller or resource-limited facilities to sustain independently. Similar models are emerging in the TMS field through organizations such as the [Foundation for the Advancement of Clinical TMS](#), which supports expansion of TMS infrastructure in underserved areas, clinician training, patient assistance funding, and initiatives aimed at improving access for financially disadvantaged patients.

Facility requirements

Delivering brain circuit therapeutics requires dedicated clinical space and adherence to safety and operational standards, which vary by modality:

- **ECT:** Requires procedural suites, anesthesia support, recovery areas, and monitoring capabilities
- **TMS:** Requires outpatient treatment rooms with appropriate safety measures, scheduling capacity for repeated sessions, and space for equipment and staff
- **Emerging modalities:** May require imaging integration, surgical capacity, or specialized monitoring, depending on the intervention

Facility and ambulatory office space planning should account for patient flow, treatment frequency, and integration with existing services. Co-location with outpatient and partial hospital programs may improve continuity of care and reduce barriers to access.

Equipment

In addition to having well-trained and qualified staff, implementation of interventional psychiatry services requires substantial infrastructure and equipment investment, particularly for TMS and ECT systems. Key considerations include acquisition and maintenance costs, equipment lifespan and upgrade cycles, and compatibility with evolving treatment protocols such as aTMS and neuronavigation-guided targeting. These costs should be evaluated in the broader context of potential downstream benefits, including improved clinical outcomes and reduced hospital utilization associated with timely access to effective treatment.¹⁶⁵

Because interventions such as ECT often require specialized infrastructure, anesthesia support, multidisciplinary expertise, and ongoing quality oversight, regionalized and shared-resource care models may help mitigate implementation barriers for smaller or resource-limited systems. Existing accreditation frameworks for ECT services, such as the [Royal College of Psychiatrists' Electroconvulsive Therapy Accreditation Service](#), emphasize standardized infrastructure, staff training, peer review, and continuous quality improvement across treatment centers.

Workforce

Psychiatry training

Workforce limitations are a major constraint on the expansion of brain circuit therapeutics. Formal training in interventional psychiatry remains variable, and many clinicians lack exposure to these treatments during residency. Expanding training pathways is essential and may include incorporation of interventional psychiatry into residency curricula, development of fellowships or certification programs, continuing education for practicing clinicians, and education of referring providers to improve recognition of indications and streamline referral pathways. Training should emphasize not only procedural skills but also patient selection, safety, ethical considerations, and integration into longitudinal care. Recent consensus efforts have emphasized that brain stimulation has matured sufficiently to warrant formal subspecialty training and accreditation pathways.¹⁶⁶ Resources such as the [Interventional Psychiatry Consortium](#) could facilitate training as well as broader network establishment.

Advanced practice clinicians

Advanced practice clinicians (APCs), including nurse practitioners and physician assistants, can play a critical role in expanding access to interventional treatments. Depending on state regulations and institutional policies, APCs may contribute to patient evaluation and screening, treatment delivery (particularly for aspects of TMS delivery), and monitoring and follow-up care. Leveraging APCs can increase capacity, improve efficiency, and support team-based care models, particularly in resource-constrained settings.

Financing

Financing remains one of the most significant barriers to implementation. Medicaid coverage for brain circuit therapeutics varies widely across states and across treatment modalities. Common challenges include inconsistent coverage for TMS and limited coverage for advanced protocols, restricted access to ECT in certain settings or populations, lack of coverage for emerging or investigational treatments, step therapy requirements that delay access to indicated interventions, and site-of-service restrictions that limit delivery in community or outpatient settings. These gaps disproportionately affect individuals served by public systems, who are more likely to have severe illness but less access to advanced treatments.

Addressing financing barriers may require states to amend their Medicaid programs. Options include support for accelerated and targeted approaches, evaluation of bundled or episode-based payment models that reflect the full course of treatment, and recognition of potential cost offsets from reduced hospitalization and improved outcomes. These considerations are particularly important given emerging real-world evidence in the context of treatment-resistant depression that TMS is associated with reduced high-acuity health care utilization, including fewer inpatient

admissions and emergency department visits, as well as lower overall episode-of-care costs compared to non-TMS treatment pathways.¹⁶⁷

Expanding brain circuit therapeutics within public mental health systems will require deliberate coordination across infrastructure, workforce, and financing domains. With appropriate investment and policy alignment, these interventions can be integrated into routine care and improve outcomes for individuals with SMI.

POLICY CONSIDERATIONS

Advances in brain circuit therapeutics have created a clear opportunity to improve outcomes for individuals with SMI. However, without deliberate policy action, these interventions will remain unevenly distributed and underutilized. The following policy considerations could support state mental health leaders in integrating brain circuit therapeutics into public systems in a manner that is scalable and aligned with current evidence.

Expand Medicaid coverage for evidence-based brain therapeutics

Medicaid is one lever to expand access to interventional treatments. States could consider the following approaches:

- expanding coverage for evidence-based interventions, including ECT and TMS
- reducing step therapy requirements that delay access to clinically indicated treatments
- standardizing coverage across regions and care settings
- aligning reimbursement with current evidence, including accelerated and connectivity-informed TMS approaches

Develop regional centers of excellence

States can invest in regional hubs capable of delivering a full spectrum of brain circuit therapeutics. These centers can focus on the following:

- providing access to high-acuity and treatment-resistant populations
- serving as referral hubs for community providers
- supporting training and workforce development
- facilitating data collection and quality improvement
- supporting telehealth-enabled consultation and referral pathways

Locating these centers within or adjacent to state hospitals can maximize access for high-need populations while enabling step-down into community care.

Integrate brain circuit therapeutics into the continuum of care

Interventional treatments could be incorporated into standard care pathways rather than reserved as last-resort options. Examples of how to integrate these therapies into the continuum of care include the following:

- integrating TMS and ECT into crisis stabilization and step-down programs

- developing referral pathways from emergency departments and inpatient units
- supporting earlier use in treatment algorithms for appropriate individuals with SMI
- ensuring continuity of care following acute treatment, including maintenance and outpatient follow-up

These approaches may reduce reliance on repeated hospitalization and prolonged ineffective treatment trials.

Invest in workforce training in interventional psychiatry and related disciplines

Expanding access will require a trained workforce across disciplines. To that end, policymakers and state leaders in mental health should consider the following measures:

- supporting incorporation of interventional psychiatry into residency training
- funding fellowship or certification pathways, especially those that prioritize public-sector experiences that can build in interventional approaches
- leveraging APCs to expand delivery capacity
- educating referring providers to improve recognition of indications and streamline referral pathways

Workforce development could include training in clinical delivery, patient selection, safety monitoring, and ethical considerations across settings, including voluntary and involuntary treatment settings.

Modernize reimbursement models to support advanced targeting and delivery approaches

Current reimbursement models often lag behind advances in treatment delivery. States and payers could consider the following approaches:

- supporting billing pathways for accelerated, high-dose, and image-guided TMS
- evaluating bundled or episode-based payment models
- incentivizing adoption of more efficient and effective treatment protocols that can be monitored for improved outcomes

Address infrastructure and capital barriers

Up-front investment in equipment and facilities is needed to expand access. States should consider the following steps:

- providing capital funding or financing mechanisms for TMS and ECT equipment
- supporting co-location of services within outpatient, inpatient, and community mental health settings
- exploring shared or regional resource models to improve efficiency

These investments could be evaluated in the context of potential cost offsets from reduced inpatient and emergency service utilization.

Support data collection and outcomes monitoring

Ongoing evaluation can guide policy and clinical practice. In expanding access to interventional modalities in the continuum of care, states would benefit from the following:

- supporting collection of real-world outcomes data
- tracking utilization, clinical outcomes, and cost metrics
- facilitating partnerships with academic centers for analysis
- developing standardized outcome measures and reporting frameworks across sites to support benchmarking, quality improvement, and outcomes research

Data-driven approaches can inform continuous improvement and strengthen the case for sustained investment.

CONCLUSION

Public mental health systems face a persistent gap between the needs of individuals with SMI and the effectiveness of standard treatment pathways. Brain circuit therapeutics—including ECT, TMS, and related interventions—offer a clinically meaningful opportunity to address this gap, particularly for individuals who do not achieve sustained improvement from medications and psychotherapy alone. Despite a growing evidence base, these interventional treatments remain unevenly accessible due to limitations in infrastructure, workforce capacity, and financing, as well as regulatory complexity.

State-operated facilities are well positioned to address these barriers by integrating brain circuit therapeutics into existing care pathways, serving as regional hubs for delivery, and supporting referral networks from community providers. Expanding access will likely require coordinated investment in equipment, workforce training, and reimbursement models, along with clear clinical pathways that enable timely escalation to these interventions. At the same time, complementary approaches that target brain processes through noninvasive means, such as EMDR and mindfulness-based strategies, should be considered as part of a broader continuum of circuit-informed care.

With deliberate implementation, state systems can move beyond a reliance on sequential medication trials and episodic crisis care toward a more integrated model that incorporates procedural and circuit-based interventions. Doing so has the potential to improve clinical outcomes, reduce reliance on high-acuity services, and better align public mental health care with current scientific understanding of psychiatric illness. Viewed through a systems lens, these expenditures function as targeted investments that can yield downstream value through improved clinical outcomes, greater functional recovery, and more efficient use of public resources.

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ACKNOWLEDGMENTS

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