Cognitive enhancement for persons with schizophrenia — Planning day, held on June 5, 2008, to review the evidence on the practical impact of cognitive enhancement for persons with schizophrenia and the implications of this evidence for the investment of finite public mental health funds. Topics included the conditions under which cognitive enhancement would be expected to significantly impact a person’s everyday functioning, what wraparound interventions were necessary to improve functional outcomes, how the impact varied by type of cognitive enhancement intervention, and how to monitor programs to determine whether the interventions were implemented and sustained. Invited experts included Morris Bell, Ph.D., ABPP; Alan Bellack, Ph.D.; Keith Cicerone, Ph.D., ABPP; Lisa Dixon, M.D., M.P.H; Robert Drake, M.D., Ph.D.; Susan McGurk, Ph.D.; Alice Medalia, Ph.D.; Kim Mueser, Ph.D.; Steven Silverstein, Ph.D.; and T. Scott Stroup, M.D., M.P.H. To see a summary of the meeting, please see below.
Attendees:

**OMH**
Susan Essock, Ph.D.
Robert Myers, Ph.D.

**Columbia University**
Alice Medalia, Ph.D.

**Yale University School of Medicine**
Morris Bell, Ph.D., ABPP

**University of Medicine & Dentistry of New Jersey**
Steven Silverstein, Ph.D.

**University of Maryland School of Medicine**
Alan Bellack, Ph.D.
Lisa Dixon, M.D., M.P.H.

**University of North Carolina at Chapel Hill**
T. Scott Stroup, M.D., M.P.H.

**Dartmouth Medical School**
Robert Drake, M.D., Ph.D
Susan McGurk, Ph.D.
Kim Mueser, Ph.D.

**JFK-Johnson Rehabilitation Institute**
Keith Cicerone, Ph.D., ABPP

**Relevance to New York State Office of Mental Health (NYOMH)**

With improvements in pharmacology and psychiatric rehabilitation, cognitive deficits remain a barrier to recovery for some consumers. To bring emerging promising practices to frontline clinicians, some NYOMH service providers and private not-for-profit agencies have started using various approaches to cognitive enhancement, and cognitive enhancement has been added to the personalized recovery oriented services (PROS) license as an optional service.

To date, formal cognitive enhancement and remediation services offered by OMH service providers typically have focused on computer-based technologies with a wraparound of appropriate individualized assessments. Informal feedback and observations from both providers and consumers suggest that these strategies are popular with consumers, can increase self-esteem among participants, and can help with functional outcomes when linked to a specific goal.

NYOMH is interested in learning which ingredients of cognitive enhancement are necessary for demonstrated improvements (e.g., computer-based technology, high quality assessment, other techniques).
Overview and review of the data

Experts caution that what is called cognitive enhancement differs widely across studies—different studies target different cognitive symptoms, using different interventions, for differing amounts of time.

Enhancing functional outcomes (work, social relationships, living independently): what is known

A meta-analysis of 26 randomized, controlled trials (RCTs) of cognitive enhancement in schizophrenia including 1,151 participants (McGurk et al., 2007) found that:

- Cognitive enhancement was associated with significant improvements in cognitive performance (effect size = 0.41), psychosocial functioning (effect size = 0.36), and symptoms (effect size = 0.28).
- The effects of cognitive enhancement on psychosocial functioning were significantly stronger in studies that provided adjunct psychiatric rehabilitation compared to those that provided cognitive enhancement alone.
- In five of six studies providing both psychiatric rehabilitation and cognitive enhancement, cognitive enhancement improved outcome beyond the effect of psychiatric rehabilitation alone.

Evidence supporting incremental impact of cognitive enhancement interventions on functioning

An RCT of 90 individuals with serious mental illness—most with schizophrenia—comparing the cognitive component of Integrated Psychological Therapy (IPT) to supportive group therapy found that those receiving cognitive enhancement showed significant improvements on a measure of interpersonal problem-solving skills (Spaulding et al., 1999).

In an RCT of 121 individuals with schizophrenia and cognitive deficits, a comparison of cognitive enhancement therapy (including computer-assisted training with social cognitive group exercises) to enriched supportive therapy found significant gains in measures of cognitive functioning and social adjustment in participants who received cognitive enhancement (Hogarty et al., 2004). These gains remained 1 year later, with early improvement in processing speed partially mediating the long-term impact of cognitive enhancement therapy on social adjustment (Hogarty et al., 2006).

In an RCT of 138 individuals with schizophrenia comparing computer-assisted cognitive strategy training (CAST), focusing on attention, verbal memory, and planning plus vocational rehabilitation for training of self-management skills for negative symptoms plus rehabilitation, to vocational rehabilitation alone, those receiving CAST demonstrated greater improvement in attention and verbal memory, which was associated with a higher rate of successful job placement (employment for more than 3 months) 1 year later (Vauth et al., 2005).
The take-home message is that no single cognitive enhancement program will work for everyone. A variety of different approaches demonstrated a positive impact on functional outcomes measured in a variety of ways.

Cautions

Practitioners are cautioned to proceed carefully with this emerging promising area. Specifically:

- Avoid premature adoption before designing studies that parse out components to determine which aspects of cognitive enhancement are necessary and sufficient for improved outcomes.
- Develop a manual to standardize treatment and provide fidelity measurements.
- Design scientifically fair studies (such as the Clinical Antipsychotic Trials of Intervention Effectiveness [CATIE]).
- Design studies that also track long-term recovery; don’t get lost in short-term or intermediate goals.

Parallels to Traumatic Brain Injury (TBI)

Cognitive enhancement is a system of therapeutic activities based on brain behavior relationships. Its goal is to achieve functional change by re-establishing learned patterns of behavior, establishing new patterns of cognitive activity, establishing external compensatory mechanisms, and enabling people to adapt to their cognitive disability to improve overall functioning.

However, the relationship between cognitive functioning and global functioning is not evident in the literature, and strikingly little is known about who benefits from which interventions.

Group discussion of policy-relevant questions

The following questions were discussed:

1) Under what conditions can a cognitive-enhancement (cognitive remediation) intervention be expected to have a significant impact on a person’s everyday functioning?
   - When it is linked with an evidence-based practice (EBP) where the functional goal is clear and set a priori (consensus).
   - Where evidence suggest that cognition can enhance the ability to benefit from the EBP (consensus).
   - After an individual participating in an EBP has not made the gains hoped for without cognitive enhancement services (this recommendation fell short of consensus).
   - Possibly this intervention should be reserved for individuals without grave intellectual disabilities; the literature on this topic only includes people with an IQ above 70.
2) How does impact vary by type of cognitive enhancement intervention and by type of collateral intervention (i.e., what else, if anything, must be present for cognitive enhancement to improve functional outcomes)?
   - In the TBI literature, cognitive enhancement therapy is defined operationally as what is reimbursable via a CPT code that addresses cognition—cognitive skills, attention, memory, and executive functioning are addressed.
   - Cognitive enhancement is not something everyone receives and it cannot be limited to a single intervention; an expert is needed to match cognitive enhancement treatment to outcome.

3) What type of program monitoring could determine whether the types of cognitive enhancement interventions occurring under PROS are, indeed, those that reasonably can be expected to be helpful to consumers in their everyday lives? What are the simplest ways to determine whether these interventions are being implemented and sustained?
   - Documentation of how cognitive enhancement fits into overall goals and how it interfaces with other treatments provided in centers.
   - Documentation that cognitive enhancement strategy is individualized and linked to a clear functional goal.
   - Need to develop manualized intervention with affordable staff training and fidelity measures.
   - Develop statewide system of outcomes monitoring that can be summarized for providers with suggestions for improving fidelity. A shared decision-making tool can provide one source of data.

Implications for a research agenda

- Research to provide more data on the incremental benefit of cognitive enhancement beyond an otherwise comprehensive package of care.
- Research to provide data delineating the necessary and sufficient principles of cognitive enhancement (e.g., Do you need this computer piece? What is the benefit of neuropsychological testing?) and how they contribute to outcomes such as work and the ability to live independently. However, the number of participants required for such a study might make it unfeasible.
- Research examining a variety of cognitive enhancement approaches in addition to computer-based training.
- Research including intervening variables—for example, hope, self-efficacy, therapeutic alliance—that might mediate the effect of cognitive enhancement on outcomes.

Next steps

- OMH might consider creating a brief sketch of a cognitive enhancement workbook or toolkit that includes assessment and intervention phases with all cognitive enhancement tools and options, including pointers to other toolkits such as wellness.
This brief sketch would then be vetted by a small core group (e.g., Susan McGurk, Bob Drake, Lisa Dixon, Alice Medalia) before being distributed more broadly for comment.

- Draft an article that summarizes the findings of this meeting.

References


