

## **Multimodality Treatment of ADHD: Initial Findings of the MTA Study**

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In the mid-1990's, the Multimodality Treatment Study of ADHD (MTA) was designed (see Arnold et al, 1997) as multi-site randomized clinical trial comparing 4 treatment strategies: medication management (MedMgt), behavior modification (Beh), the combination of these two modalities (Comb), and an active control condition based on usual treatment available in the community (CC). A large sample of 579 ADHD children between the ages of 7 and 9 years were identified (see Hinshaw et al, 1997 with confirmed symptoms of Inattention and Hyperactivity/Impulsivity (i.e., with DSM-IV diagnoses of ADHD-Combined Type). Intensive treatment was provided over a period of 14 months. Data reduction methods on baseline assessments identified 19 key outcome variables to cover the theoretically important combinations of 3 sources (parent, teacher, and child) and 6 domains (ADHD symptoms, ODD-aggression symptoms, internalizing symptoms, social skills, parent-child relations, and academic achievement). The primary analyses revealed a statistically significant omnibus (overall) effect of Treatment for 10 of these marker variables. The general pattern of effects on the manifestation of symptoms of ADHD and ODD were clear:

1. What was the relative effectiveness of the two modalities of treatment? (MedMgt was superior to Beh).
2. Was multimodality treatment superior to unimodal treatment? (Comb was not significantly better than MedMgt, but it was superior to Beh).
3. Were the systematic MTA treatments better than treatment as usual? (Comb and MedMgt were better than CC, but Beh and CC did not differ).

Moderator analyses were performed to evaluate the impact of pre-existing conditions at randomization (MTA Group, 1999b). These analyses revealed that comorbid Anxiety Disorder moderated the treatment effects. Mediator analyses were performed to evaluate attendance/compliance with the intended treatments. Attendance/compliance in the MedMgt conditions did mediate treatment effects (good attendance was associated with better outcome), but attendance/compliance in the Beh treatment had no impact on outcome.

Even though 6 paired-comparisons are possible for comparison of the 4 treatment groups, basic statistical principles dictate that only 3 independent (non-redundant) contrasts are possible. Effect size estimates for orthogonal comparisons can be used to clarify the general pattern of group outcomes reported in the primary analyses for the impact of treatment on symptoms of ADHD and ODD (Comb~MedMgt>Beh~CC). The difference between the average outcome for the two treatments that included the MTA medication  $[(\text{Comb}+\text{MedMgt})/2]$  and the average of other two groups that did not  $[(\text{Beh}+\text{CC})/2]$  can be used to evaluate the impact of the MTA "Medication Algorithm". The effect size for this comparison was large (about 1.0 for symptoms of ADHD and ODD). A comparison of  $[\text{Comb}-\text{MedMgt}]$  can be used to address the issue of "Multimodality Superiority". This effect size was moderate (about .3 for symptoms of ADHD and ODD). The remaining contrast  $[\text{Beh}-\text{CC}]$  addresses the critical question about the relative efficacy of intensive psychosocial treatment alone versus the usual

treatments for ADHD provided during the time when the MTA study was conducted, which in a majority of the cases included stimulant medication. Since intensive psychosocial treatment is rare and treatment with stimulants is common, this represents “Psychosocial Substitution”. This effect size was negligible.

The MTA group is now addressing the longer-term effects at 24-month and 36-month assessment points. The full clinical and practical significance of the MTA study must await these analyses and long-term follow-up of this group of children with ADHD.

#### References

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