



A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project

Combined treatment and medication management are more effective than behavioral treatment and community care in reducing children's Attention Deficit/Hyperactivity Disorder (ADHD) symptoms

CITATION: MTA Cooperative Group. (1999a). A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry*, 56,1073–1086.

LEVEL OF EVIDENCE: IA1a

RESEARCH OBJECTIVE/QUESTION

This research study attempted to answer 3 questions:

- 1) How do long-term medication and behavioral treatments compare with one another;
- 2) Are there additional benefits when they are used together?
- 3) What is the effectiveness of systematic, carefully delivered treatments vs. routine community care?

This report constitutes the first-ever description of the relative effectiveness of these treatments through 14 months.

DESIGN

X	RCT		Single case		Case control
	Cohort		Before–after		Cross-sectional

RCT = randomized control trial
4-group parallel design

SAMPLING PROCEDURE

	Random		Consecutive
X	Controlled		Convenience

4-phase entry procedure screened potential participants, determined ADHD diagnostic status, and assessed each recruit before randomization.

SAMPLE

N = 579	M age = 8.5 years (<i>SD</i> = 0.8 years)	Male = 465	Ethnicity: White = 351, African American = 115, Hispanic = 48	Female = 114
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PARTICIPANT CHARACTERISTICS

Children (of either gender) were between ages 7 and 9.9 years, in Grades 1–4, and in residence with the same primary caretakers for the past 6 months or longer. All met the DSM-IV criteria for ADHD combined type.

MEDICAL DIAGNOSIS/CLINICAL DISORDER

ADHD (combined type)

OT TREATMENT DIAGNOSIS

N/A

OUTCOMES

Effectiveness of treatment strategies for ADHD (combined treatment, medication management, behavioral treatment, and community care)

Measures	Reliability	Validity
ADHD symptoms	-Y, but NR	- Y, but NR
SNAP (parent and teacher)	NR	NR
Social Skills Rating System (SSRS) (parent and teacher)	NR	NR
Multidimensional Anxiety Scale for Children (MASC) (child self-report)	NR	NR
Parent–Child Relationship Questionnaire	NR	NR
Wechsler Individual Achievement Test (Reading, Math, and Spelling subscales)	NR	NR

NR = Not reported

Outcome—OT terminology

Performance components

- Cognitive integration and components
- Psychosocial skills and psychological components

Outcome—ICIDH–2 terminology

Impairments

INTERVENTION

- Behavioral treatment
- Medication management
- Combined treatment
- Community care

Description

Behavioral treatment:

Included parent training, child-focused treatment (summer camp), and school-based intervention

Medication management:

Began with a 28-day, double-blind, daily-switch titration of methylphenidate hydrochloride using 5 randomly ordered repeats each of placebo, 5 mg, 10 mg, and 15 or 20 mg (higher doses for children weighing >25 kg); doses given at breakfast and lunch with a half-dose in the afternoon. For participants not obtaining an adequate response, alternate medications were used.

Combined treatment:

Medication management + behavioral treatment

Community care:

Participants received none of the above treatments (instead were provided with a list of community mental health resources).

Who delivered

- Same therapist–consultant (not specified) conducted parent training and teacher consultation
- Pharmacotherapist
- Paraprofessional aid (behavioral intervention)

Setting

- School
- Clinical settings (different sites)

Frequency/Duration

Behavioral treatment:

Parent training: 8 individual sessions per family; began weekly on randomization concurrent with biweekly teacher consultation

Child-focused treatment:

8-week, 5 days per week, 9 hours per day

School-based treatment:

10–16 sessions of biweekly teacher consultation and 12 weeks of a part-time paraprofessional aid working directly with the child

Medication management:

3 times a day

Combined treatment:

By treatment end-point combined treatment, participants received lower daily doses of methylphenidate (31.2 mg) than did participants in medication management (37.7 mg).

Community care:

Most participants received medication averaging 2.3 doses per day.

Follow-up

N/A

RESULTS

- The study achieved a high degree of adherence to protocol (good compliance was facilitated by monthly pill counts, intermittent saliva measurements, and encouragement of families to make up missed visits).
- Statistical analysis: Random-effects regression techniques, 6 domains represented by 19 measures.
- Combined treatment and medication management did not differ significantly across any domain.
- Compared with behavioral treatment, combined treatment was superior in benefiting ADHD symptoms.
- Combined treatment also significantly outperformed behavioral treatment on oppositional/aggressive behaviors, parent-rated internalizing symptoms, and Weschler Individual Achievement Test reading achievement score.
- Analyses reveal that combined treatment and medication management were generally superior to community care (for ADHD symptoms), whereas behavioral treatment was not.
- In non-ADHD domains, medication management and behavioral treatment were superior to community care on 1 domain only (teacher-reported social skills and 1 measure of parent–child relations, respectively).
- In contrast, combined treatment was significantly superior to community care on all 5 non-ADHD domains of functioning (parent-reported oppositional/aggressive behaviors, internalizing symptoms, teacher-reported social skills, parent–child relations, and Weschler Individual Achievement Test reading achievement scores).

CONCLUSIONS

- All four groups showed marked reductions in symptoms over time, with significant differences among them in degrees of change. Combined treatment and medication management treatments were clinically and statistically superior to behavioral treatment and community care in reducing children's ADHD symptoms. Combined behavioral intervention and stimulant medication-multimodal treatment yielded no significantly greater benefits than did medication management for core ADHD symptoms.
- The study extends the findings of previous studies that demonstrated short-term, robust efficacy of medication management, showing that these benefits persist during treatment up to 14 months. In contrast to frequently expressed concerns, children given combined treatments and medication management tolerated medication well, including a 3rd dose given in the afternoon.
- Although combined treatment and medication management were generally superior to community care, community treatments usually included medication; hence, it is unclear which components of the 2 medication treatments may have rendered them more effective than community care.

LIMITATIONS

No placebo or nontreatment group to compare with the behavioral management group.

- Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.

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