

Cost-Effectiveness of Clinically Proven Treatment Strategies for Attention-Deficit/Hyperactivity Disorder (ADHD): Impact of Coexisting Conditions

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Overview

Most patients with ADHD suffer from coexisting conditions, notably oppositional defiant disorder and conduct disorder ("externalizing", in ~50-60%) or anxiety and depression ("internalizing", in 12-26%). Although comorbidity may moderate treatment effectiveness, its impact on the cost-effectiveness of treatment strategies for ADHD is poorly understood.

Objectives:

To combine data on symptom normalization and functional improvement from the NIMH MTA Study (enrolling n=579 children with ADHD according to DSM-IV-criteria) with data on resource utilization, in order to explore the relevance of coexisting conditions for cost-effectiveness of MTA-type treatment strategies, i.e., medication management (MedMgt), intense behavioral management (Beh), and the two combined (Comb), versus (United States) community care (CC) and a hypothetical "Do Nothing" alternative (time horizon 14 months).

Methods:

Patient subgroups were defined by coexisting conditions: pure ADHD (n=184, ~32%), ADHD and internalizing (n=81, ~14%) or externalizing (n=172, ~30%) comorbidities only, or ADHD and both comorbidities (n=142, ~25%). Resource utilization data from the MTA Study were combined with country-specific unit costs (Germany, Netherlands, Sweden, United Kingdom, and United States; year 2005). SNAP-IV scores <1 defined symptomatic "responders", whereas functional improvement was measured as effect size (ES) changes in Columbia Impairment Scale scores. Cost-effectiveness was determined calculating incremental cost-effectiveness ratios (ICERs) and cost-effectiveness acceptability curves (CEACs).

Results:

Symptomatic Normalization:

In terms of symptomatic improvement, MedMgt represented the economically most attractive strategy across jurisdictions and comorbidities (ICERs versus CC ranging from 100€ to 5,000€ per patient "normalized", dominating Beh).

Functional Impairment:

In terms of functional improvement, MedMgt was attractive at low levels of willingness-to-pay, whereas Beh was more attractive at somewhat higher levels of willingness-to-pay for patients with internalizing comorbidity, and Comb became more attractive at higher levels of willingness-to-pay in the presence of externalizing comorbidities.

Conclusions:

Therapeutic objectives may greatly influence cost-effectiveness. The observed pattern of cost-effectiveness by comorbidity exhibited remarkable similarities across jurisdictions, despite differences in standards of care and unit costs. Further research is needed to determine the relative merits of better-targeted, less expensive behavioral interventions.

ICERs by Coexisting Conditions

Symptomatic Normalization

Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
Germany	MedMgt vs CC € 2,363	€ 1,688	€ 2,313	€ 3,199
Beh vs MedMgt	€ 100,253	inferior	€ 136,557	€ 53,148
Beh vs CC	€ 129,791	€ 49,721	inferior	€ 50,771
Comb vs CC	€ 30,253	€ 25,671	€ 33,967	€ 27,821
Comb vs Beh	€ 3,680	€ 6,806	€ 3,453	€ 5,374
CC vs DoNothing	€ 3,232	€ 2,869	€ 3,218	€ 4,815
Beh vs DoNothing	€ 36,316	€ 30,062	€ 60,400	€ 31,710
MedMgt vs DoNothing	€ 2,758	€ 2,006	€ 2,748	€ 3,863
Comb vs DoNothing	€ 20,112	€ 19,156	€ 21,154	€ 21,851

Functional Improvement

Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
Germany	MedMgt vs CC € 1,855	€ 1,500	€ 2,087	€ 1,028
Beh vs MedMgt	€ 1,050,910	inferior	€ 87,441	€ 197,779
Beh vs CC	€ 42,528	€ 11,543	inferior	€ 17,863
Comb vs CC	€ 34,526	€ 30,975	€ 37,113	€ 18,623
Comb vs Beh	€ 14,253	inferior	€ 3,594	€ 123,348
Beh vs MedMgt	inferior	€ 28,654	inferior	€ 204,862
CC vs DoNothing	€ 1,227	€ 2,847	€ 989	€ 1,143
Beh vs DoNothing	€ 12,386	€ 9,930	€ 14,684	€ 8,678
MedMgt vs DoNothing	€ 1,436	€ 2,176	€ 1,261	€ 1,098
Comb vs DoNothing	€ 12,566	€ 21,583	€ 10,771	€ 9,088

Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
Netherlands	MedMgt vs CC € 410	€ 628	€ 514	€ 243
Beh vs MedMgt	€ 832,912	inferior	€ 68,739	€ 157,376
Beh vs CC	€ 32,898	€ 8,865	inferior	€ 13,890
Comb vs CC	€ 26,375	€ 23,888	€ 28,082	€ 14,458
Comb vs Beh	€ 9,848	inferior	€ 2,258	€ 72,443
Beh vs MedMgt	inferior	€ 21,328	inferior	€ 126,576
CC vs DoNothing	€ 1,326	€ 3,110	€ 1,088	€ 1,215
Beh vs DoNothing	€ 8,857	€ 7,778	€ 11,723	€ 6,830
MedMgt vs DoNothing	€ 1,023	€ 1,530	€ 988	€ 801
Comb vs DoNothing	€ 9,856	€ 16,936	€ 6,884	€ 7,164

Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
Sweden	MedMgt vs CC € 926,350	inferior	€ 75,754	€ 178,204
Beh vs CC	€ 34,409	€ 9,389	inferior	€ 14,658
Comb vs CC	€ 31,928	€ 29,448	€ 33,580	€ 17,413
Comb vs Beh	€ 25,289	inferior	€ 5,574	€ 380,719
Beh vs MedMgt	inferior	€ 18,674	inferior	€ 158,389
CC vs DoNothing	€ 2,967	€ 6,869	€ 2,692	€ 2,377
Beh vs DoNothing	€ 11,170	€ 8,687	€ 13,323	€ 7,870
MedMgt vs DoNothing	€ 2,736	€ 4,054	€ 2,582	€ 2,055
Comb vs DoNothing	€ 12,531	€ 21,489	€ 10,389	€ 9,133

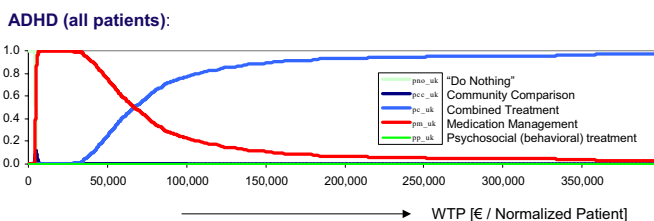
Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
UK	MedMgt vs CC € 3,720	€ 2,990	€ 3,804	€ 4,720
Beh vs MedMgt	€ 3,800	inferior	€ 87,885	€ 36,549
Beh vs CC	€ 105,839	€ 49,529	inferior	€ 41,008
Comb vs CC	€ 2,621	€ 24,048	€ 26,532	€ 26,105
Comb vs Beh	€ 7,342	€ 10,715	€ 5,753	€ 11,530
Beh vs MedMgt	inferior	inferior	inferior	inferior
CC vs DoNothing	€ 4,907	€ 5,372	€ 6,816	€ 9,951
Beh vs DoNothing	€ 30,047	€ 25,775	€ 57,596	€ 28,114
MedMgt vs DoNothing	€ 5,177	€ 3,813	€ 5,209	€ 7,022
Comb vs DoNothing	€ 19,786	€ 18,713	€ 20,957	€ 21,056

Country	ADHD ("all")	ADHD & Internalizing	ADHD & Externalizing	ADHD & Both Comorbidities
US	MedMgt vs CC € 609	€ 971	€ 402	€ 1,259
Beh vs MedMgt	€ 66,148	inferior	€ 71,682	€ 28,688
Beh vs CC	€ 65,463	€ 30,463	inferior	€ 25,458
Comb vs CC	€ 15,562	€ 13,706	€ 17,212	€ 14,794
Comb vs Beh	€ 2,060	€ 4,937	€ 2,192	€ 4,364
Beh vs MedMgt	inferior	inferior	inferior	inferior
CC vs DoNothing	€ 4,094	€ 5,978	€ 4,185	€ 5,819
Beh vs DoNothing	€ 19,743	€ 18,839	€ 35,732	€ 17,312
MedMgt vs DoNothing	€ 2,185	€ 3,276	€ 2,220	€ 3,140

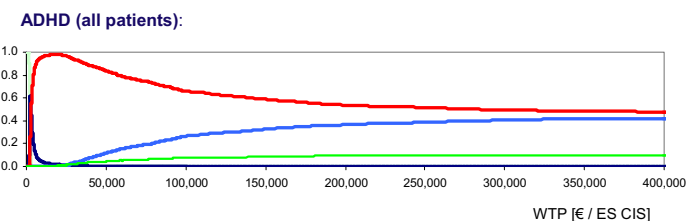
Impact of Coexisting Conditions (CEACs)



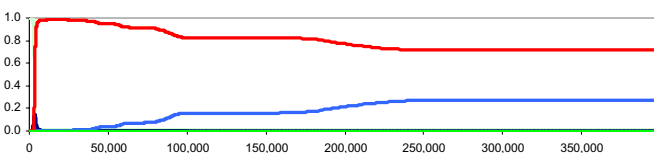
Symptomatic Improvement



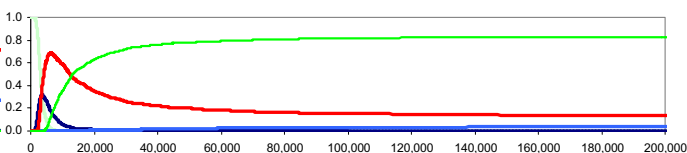
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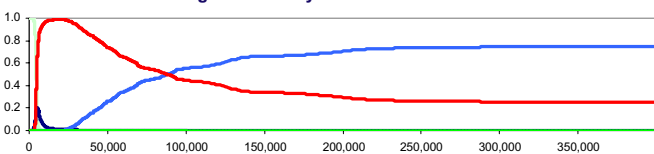
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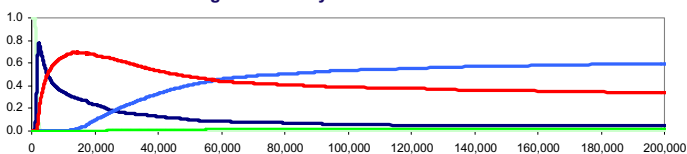
ADHD and Internalizing Comorbidity:



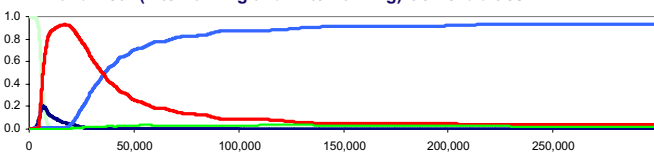
ADHD and Externalizing Comorbidity:



ADHD and Externalizing Comorbidity:



ADHD and Both (Internalizing and Externalizing) Comorbidities:



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