Table H-5. Findings on pharmacologic versus nonpharmacologic interventions for ADHD

| **Study****(Companion)****N****Qualitya****Design****Age Categoryb** | **Type of ADHD****Diagnosis Criteria****Age range in years** **% Male** | **Intervention** | **Comparison** | **Follow-up Times** | **Findings–Intervention** | **Findings–Comparison** |
| --- | --- | --- | --- | --- | --- | --- |
| **Academic performance** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | WIAT readingMean = 96.1 (SD = 14.2)p=.8541WIAT math = 91.5 (SD = 14.8)p=.5156GPA = 2.79 (SD = .57)p=.3354 | WIAT readingMean = 96.2 (SD = 13.2)WIAT math = 96 (SD = 17)GPA = 2.83 (SD = .56)WIAT readingMean = 94.7 (SD = 14.5)WIAT math = 94.7 (SD = 17.4)GPA = 2.7 (SD = 0.56)WIAT readingMean = 95.6 (SD = 13.4)WIAT math = 95.7 (SD = 15.9)GPA = 2.71 (SD = 0.59) |
| **Aggression** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | Aggression conduct parent measure rated 1 (never) to 4 (often)Mean = 1.17 (SD = .22 )p=.4511 | Aggression conduct parent measure rated 1 (never) to 4 (often)Mean = 1.13 (SD = .17)Aggression conduct parent measure rated 1 (never) to 4 (often)Mean = 1.15 (SD = .24)Aggression conduct parent measure rated 1 (never) to 4 (often)Mean = 1.15 (SD = .23) |
| **Behavior changes** |
| Gelade, 201626112GoodRCTb | Combined TypeDSM-IV-TR9.63 years (SD1.76)76% Male  | Neurofeedback training | MPH | 12 weeks | SWAN-Inattention (parent)Mean = -0.32 (95% CI: -0.53, -0.10)SWAN-Hyperactivity/Impulsiveness (parent)Mean = -0.29 (95% CI: -0.50, -0.07)SWAN-Inattention (teacher)Mean = -0.10 (95% CI: -0.31, -0.11)SWAN-Hyperactivity/Impulsiveness (teacher)Mean = -0.03 (95% CI: -0.28, 0.23) | SWAN-Inattention (parent)Mean = -0.78 (95%CI: -1.03 to ‑0.53)SWAN-Hyperactivity/Impulsiveness (parent)Mean = -0.52 (95% CI: -0.74 to ‑0.30)SWAN-Inattention (teacher)Mean = -0.95 (95% CI: -1.23 to ‑0.68)SWAN-Hyperactivity/Impulsiveness (teacher)Mean = -0.70 (95% CI: -1.05 to ‑0.34) |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | Irritability by the end of the study period (clinical assessment)% patients with outcome = 23.33 | Irritability by the end of the study period (clinical assessment)% patients with outcome = 0Irritability by the end of the study period% patients with outcome = 0 |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | Anxiety# patients with outcome = 5  | Anxiety# patients with outcome = 1  |
| **Changes in appetite** |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | Appetite suppression by the end of the study period% patients with outcome = 70 | Appetite suppression by the end of the study period% patients with outcome = 33.3Appetite suppression by the end of the study period% patients with outcome = 6.7 |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | Decreased appetite# patients with outcome = 13Increased appetite# patients with outcome = 4 | Decreased appetite# patients with outcome = 1Increased appetite# patients with outcome = 5 |
| Salehi, 20102950GoodRCTb | Combined TypeDSM-IV-TR 6-14 years78% Male | MPH (up to 30 mg/day)  | Ginkgo biloba | 6 weeks | Decreased appetite# patients with outcome = 5 | Decreased appetite# patients with outcome = 19 |
| **Changes in standardized symptom scores** |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | ADHD-RS total score – 6 monthMean = 25.43 (SD = 4.84)ADHD-RS inattention – 6 monthsMean = 11.73 (SD = 1.78)ADHD- RS hyperactivity – 6 months Mean = 13.7 (SD = 3.71)ADHD- RS – total – 12 monthMean = 25.83 (SD = 4.67)ADHD-RS inattention – 12 monthMean = 12.03 (SD = 1.71)ADHD-RS hyperactive – 12 monthMean = 13.8 (SD = 3.68) | ADHD-RS total score – 6 monthMean = 28.17 (SD = 7.92)ADHD-RS inattention – 6 monthsMean = 12.33 (SD = 2.83)ADHD-RS hyperactivity – 6 months Mean = 15.83 (SD = 5.78)ADHD-RS – total – 12 monthMean = 27.77 (SD = 7.84)ADHD-RS inattention – 12 monthMean = 12.17 (SD = 2.7)ADHD-RS hyperactive – 12 monthMean = 15.6 (SD = 5.68)ADHD-RS total score – 6 monthMean = 25.5 (SD = 5.01)ADHD-RS inattention – 6 monthsMean = 11.7 (SD = 2.17)ADHD-RS hyperactivity – 6 months Mean = 13.8 (SD = 3.28)ADHD-RS – total – 12 monthMean = 24.33 (SD = 5.09)ADHD-RS inattention – 12 monthMean = 11.3 (SD = 1.95)ADHD-RS hyperactive – 12 monthMean = 13.03 (SD = 3.44) |
| Duric 201230(Duric, 201431)91PoorRCTb | Attention and HyperactiveICD-10 Diagnosis Criteria6-18 years 80% Male | MPH (dose not reported)MPH + Neurofeedback | Neurofeedback | 10 weeks | Total: Barkley Rating Scale for parent’s Mean w/in group change = 7.995% CI = 4.5-11.4p=0.31 | Total: Barkley Rating Scale for parent’s Mean w/in group change = 8.695% CI = 5.0-12.2 |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | ADHD-RS ParentMean w/in group change = 13.3 (SD = 3.2) | ADHD-RS ParentMean w/in group change = 14.1 (SD = 2.9) |
| Salehi, 20102950Good RCTb | Combined TypeDSM-IV-TR 6-14 years78% Male | MPH (up to 30 mg/day)  | Ginkgo biloba | 6 weeks | Parent ADHD Rating Scale-IVMean = 26 ( 13,38)p<0.01Teacher ADHD Rating Scale-IV Mean = 25 (15,35) p<0.001 | Parent ADHD Rating Scale-IVMean = 16 ( 5, 27)Teacher ADHD Rating Scale-IV Mean = 11 (4, 20)  |
| Moreno-Garcia, 20153257FairRCTb | Combined, Inattentive and Hyperactive/ImpulsiveDSM-V7-14 years77.2% Male | Standard Pharmacological Treatment | NeurofeedbackBehavioral treatment | 20 weeks | Integrated Visual and Auditory Continuous Performance Test (IVA/CPT) – Full Scale AttentionMean = 2.1 (SD = 16.88)p=.002p=0.013 | Integrated Visual and Auditory Continuous Performance Test (IVA/CPT) – Full Scale AttentionMean = -28.57 (SD = 11.67)Integrated Visual and Auditory Continuous Performance Test (IVA/CPT) – Full Scale AttentionMean = -3.88 (SD = 16.24) |
| **Chemical leukoderma** |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | ADHD-RS TeacherMean w/in group change = 12.3 (SD = 3.1) | ADHD-RS TeacherMean w/in group change = 13.9 (SD = 2.3) |
| **Depression or anxiety** |
| Salehi, 20102950Good RCTb | Combined TypeDSM-IV-TR 6-14 years78% Male | MPH (up to 30 mg/day)  | Ginkgo biloba | 6 weeks | Sadness# patients with outcome = 2Anxiety# patients with outcome = 7 | Sadness# patients with outcome = 7Anxiety# patients with outcome = 9 |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | Depression (CDI)Mean = 5.78 (SD = 7.84)Anxiety (MASC)Mean = 77.7 (SD = 14.9) | Depression (CDI)Mean = 7.84 (SD = 7.24)Anxiety (MASC)Mean = 82.8 (SD = 16.7)Depression (CDI)Mean = 8 (SD = 7.66)Anxiety (MASC)Mean = 84.1 (SD = 18.3)Depression (CDI)Mean = 7.19 (SD = 7.73)Anxiety (MASC)Mean = 85.8 (SD = 19.7) |
| **Elevated blood pressure** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | SBP at 14 monthsMean = 102.4 (SD = 9.7)DBP at 14 monthsMean = 67.6 (SD = 9.6) | SBP at 14 monthsMean = 103.2 (SD = 10.3)DBP at 14 monthsMean = 68.9 (SD = 9.1)SBP at 14 monthsMean = 102.6 (SD = 10.2)DBP at 14 monthsMean = 66.5 (SD = 10.4)SBP at 14 monthsMean = 104.1 (SD = 10.6)DBP at 14 monthsMean = 67.8 (SD = 8.8) |
| **Functional impairment** |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | CGI-severity – parents- 6 monthsMean = 4 (SD = 0.98)CGI-clinician – 6 monthsMean = 4 (SD = 1.08)CGI-parent – 12 monthMean = 4.1 (SD = 1.06)CGI-clinician – 12 monthMean = 4.1 (SD = 1.06) | CGI-severity – parents- 6 monthsMean = 3.97 (SD = 1.33)CGI-clinician – 6 monthsMean = 4.1 (SD = 1.32)CGI-parent – 12 monthMean = 3.7 (SD = 1.51)CGI-clinician – 12 monthMean = 3.7 (SD = 1.51)CGI-severity – parents- 6 monthsMean = 3.23 (SD = 0.866)CGI-clinician – 6 monthsMean = 3.23 (SD = 0.86)CGI-parent – 12 monthMean = 3.63 (SD = 0.85)CGI-clinician – 12 monthMean = 3.63 (SD = 0.85) |
| **Gastrointestinal symptoms** |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | Dyspepsia by the end of the study period% patients with outcome = 0 | Dyspepsia by the end of the study period% patients with outcome = 0Dyspepsia by the end of the study period% patients with outcome = 40 |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | Nausea# patients with outcome = 16Stomach pain# patients with outcome = 12 | Nausea# patients with outcome = 2Stomach pain# patients with outcome = 2 |
| **Incarceration** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | Arrested once% patients with outcome = 22.4p=.735Arrested 2 or more times % patients with outcome = 10.3 p=.735 | Arrested once% patients with outcome = 17.4Arrested 2 or more times % patients with outcome = 7.8 Arrested once% patients with outcome = 18.9Arrested 2 or more times % patients with outcome = 5.7 Arrested once% patients with outcome = 22.9Arrested 2 or more times % patients with outcome = 7.8  |
| **Increased heart rate** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 14 months | Heart rate at 14 monthsMean = 84.2 (SD = 12.4) Incidence of Tachycardia at 14 months% patients with outcome = .8 | Heart rate at 14 monthsMean = 79.1 (SD = 12) Incidence of Tachycardia at 14 months% patients with outcome = .8Heart rate at 14 monthsMean = 84.6 (SD = 12.2) Incidence of Tachycardia at 14 months% patients with outcome = 2.2Heart rate at 14 monthsMean = 78.9 (SD = 12.9) Incidence of Tachycardia at 14 months% patients with outcome = 2.5 |
| **Motor vehicle collisions** |
| Molina, 200924(Vitiello, 201225)579FairRCTb | Combined TypeDSM-IV7.0-9.9 years80% Male | Medication management | Behavioral training (parent group, parent individual, classroom (student), and teacher sessions)Combination: Medication management and Behavioral training Usual care | 8 years | Accidents, citations, ticket% patients with outcome = 28.6 | Accidents, citations, ticket% patients with outcome = 19.7Accidents, citations, ticket% patients with outcome = 19Accidents, citations, ticket% patients with outcome = 21.5 |
| **Sleep disturbance** |
| Barragan, 20142790PoorRCTb | Any subtypeDSM-IV-TR6-12 years67.0% Male | MPH (maximum 1 mg/kg/day) | Omega-3/6 fatty acid supplementation (6 capsules/day)MPH (maximum 1 mg/kg/day and omega-3/6 fatty acid supplementation (6 capsules/day) | 1 year | Insomnia by the end of the study period% patients with outcome = 20 | Insomnia by the end of the study period% patients with outcome = 0Insomnia by the end of the study period% patients with outcome = 0 |
| Gelade, 201626112GoodRCTb | Combined TypeDSM-IV-TR9.63 years (SD1.76)76% Male | Neurofeedback training | MPH | 12 weeks | SDSCMean = -2.16 (95% CI: -4.82, 0.51) | SDSCMean = -0.54 (95% CI: -2.90, 1.81) |
| Li, 20112872GoodRCTb | NRDSM-IV6-13 years65.3% Male | MPH 1 mg/kg/day | Ningdong granule (a traditional Chinese medicine preparation) | 8 weeks | Trouble falling asleep# patients with outcome = 9Hypersomnia# patients with outcome = 0 | Trouble falling asleep# patients with outcome = 1Hypersomnia# patients with outcome = 6 |
| Salehi, 20102950Good RCTb | Combined TypeDSM-IV-TR 6-14 years78% Male | MPH (up to 30 mg/day)  | Ginkgo biloba | 6 weeks | Insomnia# patients with outcome = 3 | Insomnia# patients with outcome = 12 |
| **Weight decrease** |
| Salehi, 20102950Good RCTb | Combined TypeDSM-IV-TR 6-14 years78% Male | MPH (up to 30 mg/day)  | Ginkgo biloba | 6 weeks | Weight loss# patients with outcome = 3 | Weight loss# patients with outcome = 8 |

a See Methods section “Quality Assessment of Individual Studies” for definitions of quality assessment ratings.

b Age categories: a = children aged ≤6 years, b = children aged 7-17, c = children of all ages ≤17.

Abbreviations: CDI=Children’s Depression Inventory; DSM=Diagnostic and Statistical Manual of Mental Disorders; MASC=Multidimensional Anxiety Scale for Children; MPH=methylphenidate; WIAT=Wechsler Individual Achievement Test