

Evidence for Effectiveness of ABA as a Treatment for Autism

Introduction

This document summarizes medical and scientific evidence for effectiveness of applied behavior analysis (ABA) as a treatment for autism spectrum disorder. It includes:

- Peer-reviewed literature
- Findings, studies or research conducted by or under the auspices of a federal government agency or a nationally recognized federal research institute
- Clinical practice guidelines that meet Institute of Medicine criteria
- Reports by other professional and governmental associations
- Expert analysis by autism researchers
- Legal rulings by courts of law
- Decisions by Regulatory Agencies

Documents listed in the first three categories (peer-reviewed literature, findings from federal government agencies or research institutes, and clinical practice guidelines meeting Institute of Medicine criteria) meet the requirements from Oregon Administrative Rules (OAR) 836-053-1325 for medical, scientific, and cost effectiveness evidence for use by Independent Review Organizations in External Review decisions to determine whether a treatment is medically necessary, or is an experimental / investigational treatment.

Peer-reviewed literature

Article:	Content / Findings:
Dawson G., "Behavioral interventions in children and adolescents with autism spectrum disorder: a review of recent findings." <i>Current Opinion in Pediatrics</i> , 2011; Vol 23: pp 616–620	<ul style="list-style-type: none">• Reviews and summarizes 27 studies published in peer-reviewed literature since January, 2010 on behavioral interventions for children and adolescents with autism spectrum disorder (ASD)• Key findings: behavioral interventions are effective for improving language, cognitive abilities, adaptive behavior, and social skills, and reducing anxiety and aggression.
McEachin J, et al. "Long-Term Outcome for Children With Autism Who Receive Early Intensive Behavioral Treatment." <i>American Journal on Mental Retardation</i> , 1993; Vol. 97, No. 4: pp 359-372	<ul style="list-style-type: none">• Follow-up to 1987 Lovaas study (below), assessing long-term progress of the same 38 children at a mean age of 11.5 years• Results showed that the experimental group (who received intensive behavioral intervention) preserved its' gains over the control group

Article:	Content / Findings:
<p>Lovaas O. "Behavioral Treatment and Normal Educational and Intellectual Functioning in Young Autistic Children." <i>Journal of Consulting and Clinical Psychology</i>, 1987; Vol. 55, No. 1: pp3-9</p>	<ul style="list-style-type: none"> • Examines the impact of intensive behavioral intervention (Applied Behavior Analysis, or ABA) • Compared an experimental group of 19 children who received 40 hours of ABA per week for two years to comparison groups • 9 out of 19 children in the ABA group attained average cognitive functioning, and were able to perform in school with minimal supports, compared to only 1 of 40 children in the control group
<p>Cohen, H., Amerine-Dickens, M. and Smith, T. "Early Intensive Behavioral Treatment: Replication of the UCLA Model in a Community Setting." <i>Journal of Developmental Pediatrics</i>, 2006; Vol. 27, No. 2: pp145-155</p>	<ul style="list-style-type: none"> • Replicated 1987 Lovaas study (above). Compared 21 children who received 35 to 40 hours of ABA per week to a control group of 21 age- and IQ-matched children in public school special education classes • ABA group obtained significantly higher IQ and adaptive behavior scores than control group • 6 of 21 ABA children were fully included in regular education without assistance at year 3, and 11 others were included with support (for 17 out of 21 placed in regular education), compared to only 1 of 21 comparison children in regular education
<p>Dawson, G. et al, "Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model." <i>Pediatrics</i>, 2010; Vol. 125, No. 1: pp17-23 http://pediatrics.aappublications.org/content/125/1/e17.full.pdf+html</p>	<ul style="list-style-type: none"> • Randomized controlled trial of Early Start Denver Model (ESDM), a developmental behavioral intervention based on developmental and ABA principles • 48 children with autism between 18 and 30 months of age were assigned to either intensive ESDM by trained therapists, or referred to community providers • Compared with children who received community intervention, children who received ESDM showed significant improvements in IQ, adaptive behavior, and autism diagnosis
<p>Maglione, M.A. et al, "Nonmedical Interventions for Children With ASD: Recommended Guidelines and Further Research Needs," <i>Pediatrics</i>, 2012;Vol. 130;S169 http://pediatrics.aappublications.org/content/130/Supplement_2/S169.full.html</p>	<ul style="list-style-type: none"> • Developed consensus guidelines on nonmedical interventions that address cognitive function and core deficits in children with autism • Guidelines were developed by a Technical Expert Panel (TEP) based on a systematic overview of research findings • "The TEP agreed that children with ASD should have access to at least 25 hours per week of comprehensive intervention to address social communication, language, play skills, and maladaptive behavior. They agreed that applied behavioral analysis ... have shown efficacy."

Article:	Content / Findings:
<p>Landa. R. J., and Kalb, L.G., "Long-term Outcomes of Toddlers With Autism Spectrum Disorder Exposed to Short-term Intervention," <i>Pediatrics</i> 2012;Vol. 130;S186 http://pediatrics.aappublications.org/content/130/Supplement_2/S186.full.html</p>	<ul style="list-style-type: none"> • Forty-eight patients with autism received a 6-month applied behavior analysis -based intervention beginning at age 2 • Cognitive (IQ) and communication ability, as well as severity of autism symptoms, were assessed by using standardized measures • Significant gains in IQ and Vineland Communication domain standard scores as well as a reduction in ASD severity were achieved
<p>Fein, D., et al, "Optimal outcome in individuals with a history of autism," <i>Journal of Child Psychology and Psychiatry</i> 54:2 (2013), pp 195–205 http://onlinelibrary.wiley.com/doi/10.1111/jcpp.12037/pdf</p>	<ul style="list-style-type: none"> • Analyzes the cases of 34 individuals who had a clear documented history of autism, yet no longer met criteria for autism as per the ADOS and clinical judgment • The results substantiate the possibility of "optimal outcome" from autism spectrum disorders and demonstrate an overall level of functioning within normal limits for this group • The authors noted that parents who "advocate vigorously for the best interventions" "may maximize the chance" for an "optimal outcome"

Findings, studies or research conducted by or under the auspices of a federal government agency or a nationally recognized federal research institute

Agency:	Report:	Finding:
<p>Federal Agency for Healthcare Research and Quality</p>	<p><u>Comparative Effectiveness Review # 26: Therapies for Children With Autism Spectrum Disorders</u>, Agency for Healthcare Research and Quality, AHRQ Publication No. 11-EHC029-EF, April 2011 http://www.effectivehealthcare.ahrq.gov/ehc/products/106/656/CER26_Autism_Report_04-14-2011.pdf</p>	<ul style="list-style-type: none"> • “Evidence supports early intensive behavioral and developmental intervention, including the University of California, Los Angeles (UCLA)/Lovaas model and Early Start Denver Model (ESDM) for improving cognitive performance, language skills, and adaptive behavior in some groups of children.” (p. vi) • “Within this category, studies of UCLA/Lovaas-based interventions report greater improvements in cognitive performance, language skills, and adaptive behavior skills than broadly defined eclectic treatments available in the community. However, strength of evidence is currently low.” (page ES-7)
<p>National Institute of Mental Health</p>	<p><u>Autism Spectrum Disorders Pervasive Developmental Disorders</u>, NIH Publication No. 08-5511, 2008 http://www.nimh.nih.gov/health/publications/autism/nimhautismspectrum.pdf</p>	<ul style="list-style-type: none"> • “Among the many methods available for treatment and education of people with autism, applied behavior analysis (ABA) has become widely accepted as an effective treatment.” (p. 19)
<p>National Academy of Sciences</p>	<p><u>Educating Children with Autism</u>, Committee on Educational Interventions for Children with Autism, National Research Council, ISBN: 0-309-51278-6, 2001 http://www.nap.edu/catalog/10017.html</p>	<ul style="list-style-type: none"> • “Forty years of single-subject-design research testifies to the efficacy of time-limited, focused applied behavior analysis methods in reducing or eliminating specific problem behaviors and in teaching new skills to children and adults with autism or other developmental disorders.” (p.120)
<p>Center for Medicaid and Medicare Services</p>	<p>IMPAQ International, LLC, <u>Final Report on Environmental Scan, Autism Spectrum Disorders (ASDs) Services Project</u>, March 9, 2010 http://www.impaqint.com/files/4-content/1-6-publications/1-6-2-project-reports/finalasdreport.pdf</p>	<ul style="list-style-type: none"> • Identified 15 ABA, Developmental, and other behavioral interventions as “Established”

Clinical practice guidelines that meet Institute of Medicine criteria

Organization:	Clinical Practice Guideline:	Finding:
<p>American Academy of Pediatrics</p>	<p>Scott M. Myers, MD, <u>Management of Children With Autism Spectrum Disorders</u>, Pediatrics, 2007 http://pediatrics.aappublications.org/cgi/reprint/120/5/1162</p>	<ul style="list-style-type: none"> • “The effectiveness of <u>ABA</u>-based intervention in ASDs has been well documented through 5 decades of research by using single-subject methodology and in controlled studies of comprehensive early intensive behavioral intervention programs in university and community settings. Children who receive early intensive behavioral treatment have been shown to make substantial, sustained gains in IQ, language, academic performance, and adaptive behavior as well as some measures of social behavior, and their outcomes have been significantly better than those of children in control groups.” [Emphasis added]
<p>American Psychological Association</p>	<p><u>Autism Treatment Options</u>, American Psychological Association website http://www.apa.org/topics/autism/treatment.aspx</p>	<ul style="list-style-type: none"> • “Medication and <u>behavioral interventions</u> can help children cope with autism. Since medications on their own rarely improve behavior, <u>behavioral interventions are crucial.</u>” [Emphasis added]
<p>New York State Department of Health</p>	<p><u>Clinical Practice Guideline Report of the Guideline Recommendations Autism / Pervasive Developmental Disorders Assessment and Intervention for Young Children (Age 0-3 Years)</u>, New York State Department of Health Early Intervention Program, 1999 http://www.nyhealth.gov/community/infants_children/early_intervention/disorders/autism/ http://www.nyhealth.gov/publications/4216.pdf</p>	<ul style="list-style-type: none"> • “It is recommended that principles of applied behavior analysis (ABA) and behavior intervention strategies be included as an important element of any intervention program for young children with autism. [A]” • “It is recommended that intensive behavioral programs include as a minimum approximately 20 hours per week of individualized behavioral intervention using applied behavioral analysis techniques (not including time spent by parents). [A]”

Organization:	Clinical Practice Guideline:	Finding:
<p>American Society of Child and Adolescent Psychiatry</p>	<p>American Academy of Child and Adolescent Psychiatry, "Practice Parameters For The Assessment And Treatment Of Children, Adolescents, And Adults With Autism And Other Pervasive Developmental Disorders," 1999. P. 37. http://www.aacap.org/galleries/PracticeParameters/Autism.pdf</p>	<ul style="list-style-type: none"> • "Early and sustained intervention appears to be particularly important, regardless of the particular philosophy of the program, so long as a high degree of structure is provided. Such programs have typically incorporated behavior modification procedures and <u>applied behavior analysis</u>. These methods build on a large body of research on the application of learning principles to the education of children with autism and related conditions. Procedures that strengthen desired behaviors and/or decrease undesired maladaptive behaviors are utilized in the context of a careful and individualized plan of intervention based on observation of the individual. <u>It is clear that behavioral interventions can significantly facilitate acquisition of language, social, and other skills</u> and that behavioral improvement is helpful in reducing levels of parental stress." [Emphasis added]
<p>United States Surgeon General, U.S. Department of Health and Human Services</p>	<p>Department of Health and Human Services. <u>Mental Health: A Report of the Surgeon General</u>. Rockville, MD: Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institute of Mental Health, 1999. http://www.surgeongeneral.gov/library/mentalhealth/chaapter3/sec6.html#autism</p>	<ul style="list-style-type: none"> • "Thirty years of research demonstrated the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior."

Reports by other professional and governmental associations

Organization:	Report:	Finding:
<p>National Autism Center The National Autism Center is May Institute’s center for the promotion of evidence-based practice http://www.nationalautismcenter.org/</p>	<p><u>National Standards Report</u>, National Autism Center, 2009 http://www.nationalautismcenter.org/pdf/NAC%20NSP%20Report_FIN.pdf</p>	<ul style="list-style-type: none"> • Developed by an expert panel, “based on a thorough review of the educational and behavioral treatment literature that targets the core characteristics and associated symptoms of ASD that was published between 1957 and the fall of 2007” • Identified “11 ‘Established’ Treatments: treatments that produce beneficial outcomes and are known to be effective for individuals on the autism spectrum. The overwhelming majority of these interventions were developed in the behavioral literature (e.g., applied behavior analysis, behavioral psychology, and positive behavior support).”
<p>Maine Departments of Health and Human Services and Department of Education, Children’s Services Evidence-Based Practice Advisory Committee http://www.maine.gov/dhhs/ocfs/cbhs/ebpac/index.shtml</p>	<p><u>Interventions for Autism Spectrum Disorders: STATE OF THE EVIDENCE</u>, October 2009 http://www.maine.gov/dhhs/ocfs/cbhs/ebpac/asd-report2009.pdf</p>	<ul style="list-style-type: none"> • Reviewed more than 150 studies of 43 different treatments for children with ASD, using a validated rubric, the <i>Evaluative Method for Determining Evidence-Based Practice in Autism</i> (Reichow, Volkmar, & Cicchetti, 2008), and assigned each intervention a level of evidence rating. • Found that applied behavior analysis for challenging behavior, communication, and social skills and earlier intensive behavioral intervention met criteria for “Established Evidence”
<p>The Missouri Autism Guidelines Initiative Missouri Department of Mental Health http://www.autismguidelines.dmh.mo.gov/default.htm</p>	<p><u>Autism Spectrum Disorders: Guide to Evidence-based Interventions: A 2012 Consensus Publication</u>, 2012 http://www.autismguidelines.dmh.missouri.gov/documents/Interventions.pdf</p>	<ul style="list-style-type: none"> • Describes evidence based interventions for individuals with autism spectrum disorders (ASDs) based on six recent nationally recognized systematic research reviews. • Concluded that many forms of Applied Behavior Analysis (ABA), such as Comprehensive Behavioral Treatment for Young Children, Early Intensive Behavioral and Developmental Approaches, and Focused Behavioral Interventions have been shown to be effective treatments for autism

Organization:	Report:	Finding:
<p>New Zealand Guidelines Group New Zealand Ministry of Health http://www.health.govt.nz/</p>	<p><u>Guideline Supplementary Paper -- New Zealand Autism Spectrum Disorder Guideline Supplementary Evidence on Applied Behaviour Analysis</u>, May 2010 http://www.health.govt.nz/system/files/documents/publications/asd-guideline-supplementary-paper.pdf</p>	<ul style="list-style-type: none"> • “Interventions and strategies based on applied behaviour analysis (ABA) principles should be considered for all children with ASD.” (Grade A) [The recommendation is supported by GOOD evidence (where there is a number of studies that are valid, applicable and clinically relevant)] • “Early intensive behavioural intervention (EIBI) should be considered as a treatment of value for young children with ASD to improve outcomes such as cognitive ability, language skills, and adaptive behaviour.” (Grade B) [The recommendation is supported by FAIR evidence (based on studies that are mostly valid, but there are some concerns about the volume, consistency, applicability and/or clinical relevance of the evidence that may cause some uncertainty, but are not likely to be overturned by other evidence).]

Expert analysis by autism researchers

Article:	Content / Findings:
<p>Larsson, E.V., “Is Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) an Effective Treatment for Autism? A Cumulative Review of Impartial Reports”, The Lovaas Institute for Early Intervention, 2013</p>	<ul style="list-style-type: none"> • Reviews research findings related to the effectiveness of EIBI and ABA therapy as a treatment for autism, against standard definitions of experimental or investigational treatments • Concludes that applied behavior analysis, behavior therapy, and early intensive behavioral intervention are all well-established interventions that can’t be considered experimental or investigational
<p>Larsson, E.V., “Applied Behavior Analysis (ABA) for Autism: What is the Effective Age Range for Treatment?”, The Lovaas Institute for Early Intervention, 2012</p>	<ul style="list-style-type: none"> • Provides a list of 237 references documenting the clinically important impact of Applied Behavior Analysis (ABA) with children and adolescents who are between the ages of 5 and 21

Legal rulings by courts of law

Case:	Content / Findings:
<p>McHenry v PacificSource</p> <p>Case CV-08-562-ST, United States District Court for the District of Oregon, 1/5/2010 and 9/28/2010</p>	<ul style="list-style-type: none"> • “ABA therapy is firmly supported by decades of research and application and is a well-established treatment modality of autism and other PDDs. It is not an experimental or investigational procedure” (document 59, 1/5/10, page 19) • “ABA therapy is not primarily academic or social skills training, but is behavioral training. Accordingly, it is not subject to the exclusions under the Plan for academic or social skills training.” (document 59, 1/5/10, page 27) • “McHenry is entitled to reimbursement for ABA therapy provided by Hoyt, effective February 5, 2010, and defendants are directed to process McHenry’s claims for ABA therapy provided by Hoyt on and after that date.” (document 118, 9/28/10, page 24)
<p>D.F.et al v Washington State Health Care Authority; PEBB</p> <p>Case No. 10-2-29400-7 SEA, Superior Court of Washington for King County, June 8, 2011</p>	<ul style="list-style-type: none"> • “From the evidence presented to the court, it is apparent that ABA therapy may provide benefit to some individuals.” • “The court concludes that, as a matter of law, plaintiffs are entitled to a declaration that specific exclusions contained in health benefit plans administered by the defendants that exclude coverage of Applied Behavior Analysis therapy, even when medically necessary and performed by licensed health providers, do not comply with Washington’s Mental Health Parity Act.... The Court further declares that under the Mental Health Parity Act defendants are required to cover medically necessary Applied Behavior Analysis therapy, as determined on an individualized basis, when provided by licensed therapists.” • “The Court reserves ruling, at this time, whether defendants are required to cover Applied Behavior Analysis therapy when provided by certified or registered – as opposed to licensed – health providers.”
<p>K.G. et al v. Florida Agency for Health Care Administration</p> <p>CASE NO. 11-20684-CIV-LENARD / O’SULLIVAN, United States District Court for the Southern District of Florida, March 26, 2012.</p>	<ul style="list-style-type: none"> • “I find that applied behavior analysis is medically necessary and not experimental I find that ... the determination by AHCA that ABA is experimental was unreasonable in its process, was arbitrary and capricious and unreasonable in its conclusion.” • “it is imperative that autistic children in Florida receive ABA immediately to prevent irreversible harm to these children’s health and development.” • “the State of Florida is hereby ordered to provide, fund, and authorize Applied Behavioral Analysis treatment ... to all Medicaid-eligible persons under the age of 21 in Florida who have been diagnosed with autism or Autism Spectrum Disorder, as prescribed by a physician or other licensed practitioner.”

Case:	Content / Findings:
<p>Berge v United States of America (Tricare)</p> <p>Civil Action No. 10-0373 (RBW), United States District Court for the District of Columbia, July 26, 2012</p>	<ul style="list-style-type: none"> • "... the assessments cited by the Agency suggest that behavioral modification therapy is the closest intervention medical professionals have identified as the standard means for treating autism. ... (ABA is "the dominant and preferred treatment modality" for autism). Therefore, this Court is left to wonder what forms of autism treatment would satisfy the Agency's regulatory requirement of being proven when the very sources the Agency relies upon to declare ABA therapy unproven cannot identify one form of treatment that is more effective than ABA therapy. Since the Agency has failed to articulate a reasoned explanation for its determination that ABA therapy is unproven, particularly in light of evidence before it suggesting the contrary, the Court must conclude that the Agency's determination is arbitrary and capricious." • "Agency's denial of ABA therapy coverage under the Basic Program is arbitrary and capricious" • "the Court will remand this case back to the Agency with instructions that ABA therapy coverage be provided to Basic Program beneficiaries"

Decisions by Regulatory Agencies

Government Agency / Report:	Content / Findings:
<p>State of California Department of Insurance, "Senate Select Committee on Autism & Related Disorders Informational Hearing on Health Insurance Coverage for Autism Spectrum Disorders (ASD): Current Regulatory Oversight of Behavioral Intervention Therapy", July 13, 2011</p> <p>http://www.insurance.ca.gov/0100-consumers/0070-health-issues/upload/PartISenateSelect-CommitteeSubmissionV2.pdf</p>	<ul style="list-style-type: none"> • "Based on the numerous decisions of CDI's independent medical reviewers concerning the medical necessity of behavioral health treatment, which includes Behavioral Intervention Therapies (BIT), such as Applied Behavioral Analysis therapy (ABA), CDI has concluded that ABA therapy is medically necessary treatment for individuals with autism." • "CDI's clinician reviewers consistently find that ABA therapy is neither experimental nor investigational; and leads to significant improvements in IQ, communication and language skills, and adaptive behaviors; as well as to reduction in self injurious behaviors." • "CDI regulated health insurers may not legally continue to deny ABA claims unless there is a clear basis for determining that for that specific patient at that point in time, ABA therapy is not medically necessary."