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Are Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) Effective, Medically Necessary Treatments for Autism?

A Cumulative History of Impartial Independent Reviews

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Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) for autism are quite possibly the best examples of evidence-based behavioral health care. For over 30 years, all types of impartial independent review panels have continued to conclude that ABA and EIBI treatments for autism are effective, and that the extensive body of research meets high standards of scientific evidence. These reviews also report that ABA and EIBI significantly improves the net health outcome in autism spectrum disorders in substantial and far-ranging ways.

What is striking about the independent reviews of EIBI and ABA for autism is that the more careful the scrutiny, the more emphatic are the conclusions. For example, the New York, the Maine, and the US AHRQ commissions embarked upon year-long independent reviews of the scientific support of *ALL* possible interventions for autism. Each panel stringently applied scientific standards of proof to all interventions and found that *ABA-based therapies alone, of all possible treatments for children with autism, had been proven effective.*

As a result, the practice of ABA and EIBI has become part of the mainstream community standard of care. Sample conclusions from these many years of independent review are quoted below in chronological order.

In 1987, researchers at the **University of North Carolina** reviewed the early intervention literature to identify the best practices at the time. They wrote:

“Lovaas's (1980, 1982) experimental design included both an intensive treatment group that received 40 hours or more of treatment per week and a less intensive treatment group that received 10 hours of treatment per week. In other respects the nature of intervention was the same for all children. As summarized in Table 4, the intensive application of this approach resulted in substantial improvement for about half the autistic children. They attained IQs, school placements, and social-emotional ratings not different from normal peers. Children receiving a less intensive version of this approach did not, in any of 19 cases, achieve such gains.”

Simeonsson, R. J., Olley, J. G., & Rosenthal, S. L. (1987). Early intervention for children with autism. In M. J. Guralnick & F. C. Bennett (Eds.) *The effectiveness of early intervention for at-risk and handicapped children*. (pp. 275-296). Orlando FL: Academic Press.

In 1994, **Bernard Rimland** wrote in the Autism Research Review International concerning such results:

“we are beginning to hear increasingly about recovery. The matter deserves our close attention. Reports of recovery, partial recovery, or near-recovery, come from several sources.”

Rimland, B. (1994). Recovery from autism is possible. *Autism Research Review International*, 8, 3.

In 1997, in the first **Handbook of Autism and Pervasive Developmental Disorders**, the researchers wrote:

“During the past 10 years, behavioral interventions have become the predominant treatment approach for promoting the social, adaptive, and behavioral functioning of children and adults with autism. The sophistication

of these strategies has increased substantially, reflecting advancements in technique and refinements in behavioral assessment.”

Bregman, J.D. & Gerdtz, J. (1997). Behavioral Interventions. In D. J. Cohen & F. R. Volkmar, (Eds.), *Handbook of Autism and Pervasive Developmental Disorders* (pp. 606-630). New York: Wiley.

In 1998, the **Autism Society of America**, in their informational paper on ABA approaches, stated:

“Properly designed and executed ABA programs contain many if not all of the components of effective treatment approaches found to be most successful in treating children with autism... Research and anecdotal evidence indicate that ABA programs produce comprehensive and lasting improvements in many important skill areas.”

Autism Society of America (1998) Intensive Behavioral Intervention. Informational handout downloaded from www.autism-society.org

In 1998, Division 53 of the **American Psychological Association** (the Society for Clinical Child and Adolescent Psychology) conducted a Task Force on Empirically Supported Child Psychotherapy. For autism, they found:

“The literature on effective focal treatments in autism is plentiful and published in a variety of journals, in the fields of developmental disabilities, applied behavior analysis, and discipline-specific journals. These studies generally consist of single-subject multiple-baseline designs or small sample treatment designs. Behavioral treatment approaches are particularly well represented in this body of literature and have been amply demonstrated to be effective in reducing symptom frequency and severity as well as in increasing the development of adaptive skills.” (p. 168).

Rogers, S. J. (1998) Empirically supported comprehensive treatments for young children with autism. *Journal of Clinical Child Psychology*, 27, 168-179.

In 1999, the **US Surgeon General** issued a lengthy report on the Mental Health in America. In the section on autism, he concluded:

“Thirty years of research demonstrated the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior.”

“A well-designed study of a psychosocial intervention was carried out by Lovaas and colleagues. Nineteen children with autism were treated intensively with behavior therapy for 2 years and compared with two control groups. Follow-up of the experimental group in first grade, in late childhood, and in adolescence found that nearly half the experimental group but almost none of the children in the matched control group were able to participate in regular schooling. Up to this point, a number of other research groups have provided at least a partial replication of the Lovaas model” (p. 164).

Satcher, D. (1999). *Mental health: A report of the surgeon general*. U.S. Public Health Service. Bethesda, MD.

In 1999, the **New York State Department of Health** convened a panel of nationally regarded experts and consumers who were charged with evaluating the scientific evidence in support of all available treatments for autism. This panel produced a large monograph that exhaustively reviewed the evidence in support of each treatment. The New York State Department of Health then published a three-volume report based upon its extensive analysis of the available treatments. It also found that only ABA-based treatments had sufficient scientific support to merit endorsement. The three volumes include “The Technical Report,” which contains the most complete information, including all the evidence tables from the articles reviewed, a full report of the research process, and the full text of all the recommendations. “The Report of the Recommendations” gives the background information, the full text of all the recommendations and a summary of the supporting evidence. “The Quick Reference Guide” gives a summary of background information and a summary of the major recommendations, and is also written in a less technical manner. Sample statements from the Quick Reference Guide follow. While this panel found little support for most available treatments, their conclusion for ABA, after regarding the evidence of efficacy is:

“It is recommended that principles of applied behavior analysis (ABA) and behavior intervention strategies be included as important elements in any intervention program for young children with autism.”

“[Based upon strong scientific evidence] it is recommended that principles of applied behavior analysis and behavior intervention strategies be included as an important element of any intervention program for young children with autism... [Based upon strong scientific evidence] 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)... It is recommended that all professional and paraprofessionals who function as therapists...receive regular supervision from a qualified professional with specific expertise in applied behavioral approaches... [Based upon strong scientific evidence] it is important to include parents as active participants in the intervention team to the extent of their interests, resources, and abilities... [Based upon strong scientific evidence] it is recommended that training of parents in behavioral methods for interacting with their child be extensive and ongoing and include regular consultation with a qualified professional...” (pp. 138-140).

In contrast, the Department of Health's conclusions about a then-common treatment for autism, sensory integration therapy, is characteristic of their conclusions about all other treatments, to wit:

"No adequate evidence has been found that supports the effectiveness of sensory integration therapy for treating autism. Therefore, sensory integration therapy is not recommended as a primary intervention for young children with autism."

New York State Department of Health Early Intervention Program. (1999). *Clinical Practice Guideline Report of the Recommendations for Autism/Pervasive Developmental Disorders*. New York State Department of Health, Albany, NY.

In 1999, a **Practice Parameters Consensus Panel** of the following Professional Organizations and Agencies was convened.

American Academy of Neurology
 American Academy of Family Physicians
 American Academy of Pediatrics
 American Occupational Therapy Association
 American Psychological Association
 American Speech-Language Hearing Association
 Society for Developmental and Behavioral Pediatrics
 Autism Society of America
 National Alliance for Autism Research
 National Institute of Child Health & Human Development
 National Institute of Mental Health:

The practice parameters consensus panel on the diagnosis of autism stated that it was formed because:

"The press for early identification comes from evidence gathered over the past 10 years that intensive early intervention in optimal educational settings results in improved outcomes in most young children with autism, including speech in 75% or more and significant increases in rates of developmental progress and intellectual performance."

While the focus of this report was on diagnosis, the consensus panel made a number of significant statements about the need for early and intensive treatment. For example:

"However, these kinds of outcomes have been documented only for children who receive 2 years or more of intensive intervention services during the preschool years. (page 440)"

"Autism must be recognized as a medical disorder, and managed care policy must cease to deny appropriate medical or other therapeutic care under the rubric of "developmental delay" or "mental health condition. (page 472)"

"Existing governmental agencies that provide services to individuals with developmental disabilities must also change their eligibility criteria to include all individuals on the autistic spectrum, whether or not the relatively narrow criteria for Autistic Disorder are met, who nonetheless must also receive the same adequate assessments, appropriate diagnoses, and treatment options as do those with the formal diagnosis of Autistic Disorder. (page 472)"

Filipek, P.A. et al. (1999). The screening and diagnosis of autistic spectrum disorders. *Journal of Autism and Developmental Disorders*. 29, 439-484.

In 1999, A practice parameters panel of the **American Academy of Child and Adolescent Psychiatry** found:

"At the present time the best available evidence suggests the importance of appropriate and intensive educational interventions to foster acquisition of basic social, communicative, and cognitive skills related to ultimate outcome... Early and sustained intervention appears to be particularly important, regardless of the philosophy of the program, so long as a high degree of structure is provided. Such programs have typically incorporated behavior modification procedures and applied behavior analysis... These methods build upon a large body of research on the application of learning principles to the education of children with autism and related conditions... It is clear that behavioral interventions can significantly facilitate acquisition of language, social, and other skills and that behavioral improvement is helpful in reducing levels of parental stress." (p. 476).

"Considerable time (and money) is required for implementation of such programs, and older and more intellectually handicapped individuals are apparently less likely to respond." (p. 515)

Volkmar, F., Cook, E.H., Pomeroy, J., Realmuto, G. & Tanguay, P. (1999). Practice parameters for the assessment and treatment of children, adolescents, and adults with autism and other pervasive developmental disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38 (Supplement), 32s-54s.

In 2000, another year-long exhaustive review, the **Maine Administrators of Services** for Children with Disabilities found:

“Early interventionists should leverage early autism diagnosis with the proven efficacy of intensive ABA for optimal outcome and long-term cost benefit... (p. 29).

“The importance of early, intensive intervention for children with autism cannot be overstated... Furthermore, early, intensive, effective intervention offers the hope of significant cost/benefit.” (p. 6).

“Over 30 years of rigorous research and peer review of applied behavior analysis’ effectiveness for individuals with autism demonstrate ABA has been objectively substantiated as effective based upon the scope and quality of science.” (p. 29).

Maine Administrators of Services for Children with Disabilities (2000). *Report of the MADSEC Autism Task Force*. MADSEC, Manchester, ME.

In 2000, an extensive report on the facts of litigation by parents who were seeking health-care funding in **British Columbia, the Supreme Court** made the following conclusions. In a subsequent ruling, the Court found that it was more appropriate for the executive to set policy than to have it imposed upon them by the courts, but its conclusions on the facts remain:

“What children experience in their early years will shape the rest of their lives. We now know from research in a variety of sectors, that children's early brain development has a profound effect on their ability to learn and on their behaviour, coping skills and health later in life.”

“Research also indicates that intensive early behavioural intervention with children with autism can make a significant difference in their ability to learn and keep pace with their peers. With the intervention many children with autism will make considerable gains by grade one.”

“[1] These words embody the philosophy underlying the Ontario Government's "Intensive Early Intervention Program For Children With Autism" commenced in 1999, and numerous programmes undertaken in other provinces, the United States and several countries.”

“[156] The Crown discriminates against the petitioners contrary to s. 15(1) by failing to accommodate their disadvantaged position by providing effective treatment for autism. It is beyond debate that the appropriate treatment is ABA or early intensive behavioural intervention.”

Auton et al. v. AGBC. (2000). British Columbia Supreme Court 1142.

In 2001, the **American Academy Of Pediatrics** issued a policy statement entitled, “The Pediatrician's Role in the Diagnosis and Management of Autistic Spectrum Disorder in Children.” The AAP regularly issues policy statements to guide and define the child health care system. The more recent AAP Clinical Report is also cited below. This policy statement from 2001 is included to help illustrate that the general professional consensus on the evidence for intensive early intervention had begun to turn by this earlier date. This policy statement is accompanied by a lengthy technical report. In both papers, the AAP clearly defines accepted treatments as behavioral interventions, and draws heavily on the ABA literature to support their findings. For example, in the introduction to the treatment section, the AAP makes two central statements, as follows:

“There is a growing body of evidence that intensive early intervention services for children in whom autism is diagnosed before 5 years of age may lead to better overall outcomes... Behavioral training, including teaching appropriate communication behaviors, has been shown to be effective in decreasing behavior problems and improving adaptation.” (pp. 8-10).

“Currently accepted strategies are to improve the overall functional status of the child by enrolling the child in an appropriate and intensive early intervention program that promotes development of communication, social, adaptive, behavioral, and academic skills; decrease maladaptive and repetitive behaviors through use of behavioral and sometimes pharmacologic strategies... Early diagnosis resulting in early, appropriate, and consistent intervention has also been shown to be associated with improved long-term outcomes... Behavioral training, including communication development, has been shown to be effective in reducing problem behaviors and improving adaptation.” (p.1223).

American Academy of Pediatrics (2001). Policy Statement: The Pediatrician's Role in the Diagnosis and Management of Autistic Spectrum Disorder in Children (RE060018) *Pediatrics*, 107, 1221-1226.

In 2001, the more detailed accompanying technical report, the **American Academy Of Pediatrics** states:

“There is a growing body of evidence that intensive early intervention services for children in whom autism is diagnosed before 5 years of age may lead to better overall outcomes. (page 8)”

The most heavily emphasized treatment strategy in the technical report is “behavioral management,” about which the **American Academy Of Pediatrics** states:

“One of the mainstays of the management of ASD in children at any age is the implementation of behavioral training and management protocols at home and at school. Behavioral management must go hand-in-hand with structured teaching of skills to prevent undesirable behavior from developing. Behavioral training, including

teaching appropriate communication behaviors, has been shown to be effective in decreasing behavior problems and improving adaptation. (page 10)”

Committee on Children With Disabilities (2001). Technical Report: The Pediatrician's Role in the Diagnosis and Management of Autistic Spectrum Disorder in Children. *Pediatrics*, 107, e85.

In 2001, the **National Research Council** convened a panel of perhaps the most well recognized national experts in the treatment of autism. The United States Department of Education commissioned the National Research Council to provide input into the controversy circling around the press for school funding for behavior therapy and early intervention. In turn the National Research Council engaged the services of a large number of respected researchers in the field of autism. This panel was also charged with integrating the scientific literature and creating a framework for evaluating the scientific evidence concerning the effects and distinguishing features of the various treatments for autism. The resulting report clearly focused on ABA-based interventions. For example, the chapter on “comprehensive programs” identifies ten “well-known model approaches,” all of which are ABA-based. A sample of the many statements, upon which it can be fairly said that the primary focus of the book is on ABA-based treatment, are offered here:

“There is general agreement across comprehensive intervention programs about a number of features of effective programs... The consensus across programs is generally strong concerning the need for: early entry into an intervention program... Overall, effective programs are more similar than different in terms of levels of organization, staffing, ongoing monitoring, and the use of certain techniques, such as discrete trials, incidental learning, and structured teaching periods... there is substantial research supporting the effectiveness of many specific therapeutic techniques and of comprehensive programs in contrast to less intense, nonspecific interventions.”

“There is now a large body of empirical support for more contemporary behavioral approaches using naturalistic teaching methods that demonstrate efficacy for teaching not only speech and language, but also communication... Some advantages of the behavioral research on teaching social skills have been the measurement of generalization and maintenance, attention to antecedents and consequences, and use of systematic strategies to teach complex skills by breaking them down into smaller, teachable parts.” (p. 53).

“Outcomes of discrete trial approaches have included improvements in IQ scores, which are correlated with language skills, and improvements in communication domains of broader measures... Behavioral interventions use the powerful tools of operant learning to treat symptoms of autism spectrum disorders. (p. 53).

“Early research on the benefits of applied behavior analysis by Lovaas and his colleagues (1973) showed that children with autism who returned to a home prepared to support their learning maintained their treatment gains better than children who went to institutional settings that failed to carry over the treatment methods. (page 35)”

“There is now a large body of empirical support for more contemporary behavioral approaches using naturalistic teaching methods that demonstrate efficacy for teaching not only speech and language, but also communication. (page 53)”

“Behavioral interventions use the powerful tools of operant learning to treat symptoms of autism spectrum disorders. (page 68)”

“Some advantages of the behavioral research on teaching social skills have been the measurement of generalization and maintenance, attention to antecedents and consequences, and use of systematic strategies to teach complex skills by breaking them down into smaller, teachable parts. Some drawbacks of traditional behavioral approaches are the complex data systems that often accompany them and that may impede their use in more typical settings, as well as the lack of training in their use that most staff members on early childhood teams receive. (page 72)”

The conclusions and recommendations of the report revolve around how to set up easily accessible funding and training for more teachers. While the report clearly endorses school department funding for intensive early intervention with behavior therapy, it also suggests that health-care based funding, such as the U.S. Medicaid program would also be appropriate:

“A state fund for intensive intervention, or more systematic use of Medicaid waivers or other patterns of funding currently in place in some states, should be considered. (page 224)”

National Research Council (2001). *Educating Children with Autism*, Committee on Educational Interventions for Children with Autism, Division of Behavioral and Social Sciences and Education, Washington, D.C.: National Academy Press.

In 2006, a review by **Mayo Clinic and Harvard** pediatricians found:

“The weight of currently available scientific evidence, however, indicates that ABA should be viewed as the optimal, comprehensive treatment approach in young children with ASD.”

Barbaresi, W. J., Katusic, S. K., & Voigt, R. G. (2006). Autism: A review of the state of the science for pediatric primary health care clinicians. *Archives of Pediatric and Adolescent Medicine*, 160. 1167-1175.

In 2006, researchers at the Department of Health Policy, Management and Evaluation of the **University of Toronto**, ON found:

“Under our model parameters, expansion of IBI to all eligible children represents a cost-saving policy whereby total costs of care for autistic individuals are lower and gains in dependency-free life years are higher.” (p. 136).

Motiwalla, S. S., Gupta, S., Lilly, M. D., Ungar, W. J., & Coyte, P. C. (2006). The cost-effectiveness of expanding intensive behavioural intervention to all autistic children in Ontario. *Healthcare Policy*, 1, 135-151.

In 2007, the **Hawaii Department of Health** Empirical Basis to Services Task Force found:

“These results are quite promising in terms of effect size, although it should be noted that the outcome variables for these studies mainly involved reductions in the frequency of autistic behaviors or increases in social communication or other forms of social exchange (e.g., turn taking). None of these studies claimed that children were autism free following the intervention programs. Nevertheless, these findings represent an extraordinary improvement over the evidence base for interventions for autistic spectrum disorders in the previous Biennial Report.”

“Two treatment families demonstrated Best Support. Intensive Behavioral Treatment was successful in three (3) studies, beating alternative treatments in two (2) of those, and beating a no-treatment control in one (1). Likewise, Intensive Communication Training was also successful in three (3) studies, beating alternative treatments in two (2) of those, and beating a no-treatment control in one (1) study. ...The shape of the profile suggests that all successful treatments for autistic spectrum disorders involve teaching communication skills and modeling of appropriate communication or other behaviors. Other strategies include training in non-verbal communication (social skills), teaching parents and teachers to praise desired behaviors, and the setting of goals paired with the intensive rehearsal and reinforcement of behaviors consistent with those goals (i.e., discrete trial training).” (pp. 16-19).

Chorpita, B. F. & Daleiden, E. L. (2007). 2007 Biennial report: Effective psychosocial interventions for youth with behavioral and emotional needs. Child and Adolescent Mental Health Division, Honolulu: Hawaii Department of Health.

In 2007, the **California Blue Ribbon Commission** on Autism found:

“Early identification and intervention for ASD is critical for children to reach their full potential and reduce their level of disability and dependence. Although the outcomes of interventions and treatment for ASD vary with each child, there is widespread agreement in the field based on a large body of research that it is important for children with ASD to receive intensive interventions during early childhood. (page 26)”

“Children with ASD who have improved functioning as a result of early intervention services may have less intensive and costly service needs for the rest of their lives, thereby reducing hardships on families and costs for systems of care to serve these individuals during adulthood. For this reason, investments in early identification and intervention services are considered an important, cost-effective approach for society. (page 27)”

“Health plans may deny services for ASD for reasons related to medical necessity that are at odds with medical science. For example, some plans have denied ASD interventions on the basis that ASD is a disorder of brain development that is present from birth and therefore not amenable to medical treatments or interventions. This ruling by some health plans seems to contradict the numerous and mounting scientific evidence that ASD may be associated with multiple factors, usually become evident in the second or third year of life, are frequently associated with demonstrable changes in brain function, and appear to be caused by the interactions of genetic and environmental factors. (page 33)”

“Another reason for denial of services by some health plans is that ASD is a chronic disorder and therefore not amenable to acute treatments or cure. Such reasoning seems at odds with the coverage that health plans routinely provide for numerous other chronic illnesses (such as diabetes and congestive heart failure) that are also frequently incurable. Thus, the frequent denial of these services for ASD by some health plans may be inconsistent both with current scientific evidence as well as with the standards and approaches applied to other illnesses and medical conditions. (page 34)”

The report specifically addresses the value of ABA:

“Behavioral interventions that include pivotal response therapy, applied behavioral analysis, and directed response interventions have also proven therapeutic value in the treatment of ASD. (page 34)”

“There is also compelling evidence that many children with ASD can respond to and improve with intensive behavior modification therapy. Although the exact mechanism of action is the subject of ongoing research, there is evidence of improved brain plasticity in children with autism as the result of early interventional therapy. (page 39)”

“Often this therapy is provided in the home environment and may require multiple professionals working simultaneously with the child and the family for up to 40 or more hours per week. The duration of these services varies widely, but most children with ASD will require early intensive behavior intervention for a minimum of several years as well as ongoing interventions and supports throughout their lifetimes. In addition, parent education is recommended so that intervention may be ongoing throughout the child’s waking hours. (pages 39-40)”

The California Legislative Blue Ribbon Commission on Autism (2007). *Report: An Opportunity to Achieve Real Change for Californians with Autism Spectrum Disorders*. Sacramento, CA: The Legislative Office Building ([HTTP://senweb03.sen.ca.gov/autism](http://senweb03.sen.ca.gov/autism)).

In 2007, in a second Clinical Report of the **American Academy Of Pediatrics** Council on Children With Disabilities: Management of children with autism spectrum disorders, the overall impact is inescapable: Children with autism are best treated by continuous, integrated behavior therapy throughout their daily lives, and can make great gains when treated so. The definitive research cited is for the ABA research. By contrast this report also clearly cites the nonbehavioral interventions that have insufficient evidence to support them, or may even be harmful. The report also clearly reviews the critical variables of effective intensive early intervention. For example, the AAP makes the following central statement about Applied Behavior Analysis (ABA):

“The effectiveness of ABA-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. (pg. 1164)”

Then, regarding specific behavioral interventions, the AAP makes the following statements:

“DTT methods are useful in establishing learning readiness by teaching foundation skills such as attention, compliance, imitation, and discrimination learning, as well as a variety of other skills. (pg. 1164)”

“Naturalistic behavioral interventions, such as incidental teaching and natural language paradigm/ pivotal response training, may enhance generalization of skills. (pg. 1164)”

“Functional assessment is a rigorous, empirically based method of gathering information that can be used to maximize the effectiveness and efficiency of behavioral support interventions. (pg. 1164)”

“A variety of approaches have been reported to be effective in producing gains in communication skills in children with ASDs. Didactic and naturalistic behavioral methodologies (e.g., DTT, verbal behavior, natural language paradigm, pivotal response training, milieu teaching) have been studied most thoroughly. (pg. 1165)”

“Traditional, low-intensity pull-out service delivery models often are ineffective, and speech-language pathologists are likely to be most effective when they train and work in close collaboration with teachers, support personnel, families, and the child’s peers to promote functional communication in natural settings throughout the day. (pg. 1165)”

“There is some objective evidence to support traditional and newer naturalistic behavioral strategies and other approaches to teaching social skills. (pg. 1165)”

“Proponents of behavior analytic approaches have been the most active in using scientific methods to evaluate their work, and most studies of comprehensive treatment programs that meet minimal scientific standards involve treatment of preschoolers using behavioral approaches. (pg. 1166)”

“Three studies that compared intensive ABA programs (25–40 hours/week) to equally intensive eclectic approaches have suggested that ABA programs were significantly more effective. (pg. 1166)”

“It is now recognized that parents play a key role in effective treatment. Physicians and other health care professionals can provide support to parents by educating them about ASDs; providing anticipatory guidance; training and involving them as cotherapists; (p. 1174)”

Myers, S. M., Johnson, C. P. & the American Academy of Pediatrics Council on Children With Disabilities, (2007). Management of children with autism spectrum disorders. *Pediatrics*. 120, 1162–1182. Available online at <http://aappolicy.aappublications.org/cgi/reprint/pediatrics;120/5/1162.pdf>. Accessed November 27, 2007.

In 2008, in a second review, the Division 53 of the **American Psychological Association** Task Force on Empirically Supported Child Psychotherapy again found:

“Randomized controlled trials have demonstrated positive effects in both short-term and longer term studies. The evidence suggests that early intervention programs are indeed beneficial for children with autism, often improving developmental functioning and decreasing maladaptive behaviors and symptom severity at the level of group analysis... Lovaas’s treatment meet Chambless and colleague’s criteria for ‘well-established’” (p. 8).

“Across all the studies we cited, improvements in language, communication, and IQ, and reduction in severity of autism symptoms indicate that the core symptoms of autism appear malleable in early childhood.” (p. 30).

Report for Division 53 of the American Psychological Association (the Society for Clinical Child and Adolescent Psychology): Rogers, S. J., & Vismara, L. A. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology*. 37, 8-38.

In 2008, a combined group of pediatricians and psychologists published a study in **Neuropsychology Review** of children referred to their comprehensive medical evaluation clinics across the Northeastern US, in which they compared a group of such “optimal outcome” (OO) children with a group of typical children, and with a group of “high functioning autism” (HFA) children, at least three years after treatment had ended. While the common finding is that one third to one half of the children dramatically outperform controls, there is also evidence that a subset even reach typical levels of functioning. These results are important to note, because the results of these studies are not that the children are scoring barely higher than the controls. Instead, the results are clinically significant in that a substantial number of the children are reaching socially important levels of functioning. This group found:

“The pattern of test results was consistent across all measures: On all measures, the typically-developing children had the highest average scores, followed by the optimal-outcome group, and the HFA group showed the lowest level of functioning on all tasks. Additionally, the optimal outcome group, as a whole, scored within the normal range on all tasks and only the high-functioning ASD group scored in the impaired range on some of the standardized tests. The OO group also scored lower than the typically developing group (but well within the average range) on parent ratings of attention problems, atypical behavior, and depression. On the numerous other tasks that we used to assess these groups, the children in the optimal-outcome group were statistically indistinguishable from their typically developing peers. In sum, we appear to have found a group that, with the possible exception of some very subtle pragmatic deficits, is currently functioning at the same level as their typically developing peers, and we are continuing to follow this group.”

Helt, M., Kelley, E., Kinsbourne, M., Pandey, J., Boorstein, H., Herbert, M., & Fein, D. (2008). Can children with autism recover? If so, how? *Neuropsychology Review*. 18, 339-366.

In 2008, the **NIMH (National Institute of Mental Health)** stated:

“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. ...The basic research done by Ivar Lovaas and his colleagues at the University of California, Los Angeles, calling for an intensive, one-on-one child-teacher interaction for 40 hours a week, laid a foundation for other educators and researchers in the search for further effective early interventions to help those with ASD attain their potential.”

National Institute of Mental Health (2008). Autism Spectrum Disorders: Pervasive Developmental Disorders. NIH Publication no. 08-5511.

A 2009 review by US and British pediatricians in **the Lancet** found:

“The most well researched treatment programmes are based on principles of applied behaviour analysis. Treatments based on such principles represent a wide range of early intervention strategies for children with autism—from highly structured programmes run in one-on-one settings to behaviourally based inclusion programmes that include children with typical development. The first types of behavioural treatment programmes developed and examined were very structured, intensive, one-on-one programmes called discrete trial training, which were highly effective for up to half of children enrolled in four randomised clinical trials and six studies with closely matched comparison groups done in the past 20 years.”

“These intensive programmes are expensive, and children have difficulty generalising the information from a very structured session to group and community settings. Less structured, more naturalistic behavioural programmes have been developed, such as pivotal response training and incidental teaching. In individual and nonrandomised group studies, researchers noted that about half of children have good outcomes in these types of programmes. Presently, even structured sessions typically include naturalistic methods for increasing generalisation and maintenance. A combination of these behavioural methods is more effective than is usual care for improvement of outcomes for children with autism. Parent-mediated interventions have been shown in controlled studies to be an important aspect of intervention. Investigators identified that generalisation and maintenance of behaviour changes were improved when parents were trained in highly structured behavioural methods. As behavioural programming for children with autism evolved from teaching one behaviour at a time to a broadened focus of increasing general motivation and responsiveness, parent education also began to change. Parents were taught naturalistic strategies that were easier to use in the home, needed fewer hours of training, increased both leisure and teaching time, and improved parent satisfaction and enjoyment of the treatment.”

Levy, S. E., Mandell, D. S., & Schultz, R. T. (2009). Autism. *Lancet*. 374, 1627-1638.

In 2009, the **National Autism Center** conducted a review of all available behavioral interventions and drew conclusions about all specific treatments that had their own identifiable evidence base. The Center found the following treatments to meet their criteria for “Established Treatments:” Antecedent Package, Behavioral Package, Comprehensive Behavioral Treatment for Young Children, Joint Attention Intervention, Modeling, Naturalistic

Teaching Strategies, Peer Training Package, Pivotal Response Treatment, Schedules, Self-management, and Story-based Intervention Package. As a specific example, the Center found 22 studies that supported Comprehensive Behavioral Treatment for Young Children, and described it as follows:

“This treatment reflects research from comprehensive treatment programs that involve a combination of applied behavior analytic procedures (e.g., discrete trial, incidental teaching, etc.) which are delivered to young children (generally under the age of 8). These treatments may be delivered in a variety of settings (e.g., home, self-contained classroom, inclusive classroom, community) and involve a low student-to-teacher ratio (e.g., 1:1). All of the studies falling into this category met the strict criteria of: {a} targeting the defining symptoms of ASD, {b} having treatment manuals, {c} providing treatment with a high degree of intensity, and {d} measuring the overall effectiveness of the program (i.e., studies that measure subcomponents of the program are listed elsewhere in this report). These treatment programs may also be referred to as ABA programs or behavioral inclusive program and early intensive behavioral intervention.”

National Autism Center. (2009). *Findings and conclusions: National standards project*. Randolph, MA: Author.

In 2010, two leading authorities on autism spectrum disorders from the **Yale University Child Study Center** published their review of evidence-based practices for social skills interventions for autism. They found 66 studies that met their criteria, and summarized their findings as follows:

“The methods and techniques of ABA were the most common intervention type utilized by the studies in this synthesis. Interventions based on ABA were delivered by many intervention agents (i.e., parents, peers, non-parental adults) across ages and levels of cognitive functioning. The largest number of studies came from the preschool group, where ABA has a long history of being used to improve the social skills of young children with autism.”

“The most common elements of interventions based on ABA included prompting and reinforcement arrangements, imitation and modeling paradigms, and self-monitoring. ABA was often used to augment other intervention types (e.g., video modeling, visual, peer training), demonstrating the flexibility and utility of the techniques. In sum, there is much support for the use of interventions based on ABA, and the use of these techniques should continue to be used in practice.” (p. 159)

Reichow, B. & Volkmar, F. (2010). Social skills interventions for individuals with autism: evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders*, 40, 149–166.

In 2011, a subsequent review by the **Hawaii Department of Health Empirical Basis to Services Task Force** again found:

“The best support favored Intensive Behavioral Treatment and Intensive Communication Training, although the effect sizes were relatively small. Both of these treatment approaches were rated as highly trainable, tested among youths of various ethnic backgrounds, in various format types (e.g., individual and group) and settings (e.g., school, clinic, home, and community), as well as by different therapist types (e.g., pre-bachelor’s-level therapists, master’s-level therapists, and doctors). The duration of both Level 1 treatments was at least a year. Another promising characteristic of these two approaches is that they were both tested on boys as young as one and two years old.”

Chorpita, B.F. et al. (2011). Evidence-based treatments for children and adolescents: An updated review of indicators of efficacy and effectiveness. *Clinical Psychology Science and Practice*. 18, 154-172.

A 2011 review by the **US Agency for Health Care Research and Quality** found that ABA and EIBI had sufficient evidence to support a recommendation for practice:

“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. ...Evidence suggests that interventions focusing on providing parent training and cognitive behavioral therapy (CBT) for bolstering social skills and managing challenging behaviors may be useful for children with ASDs to improve social communication, language use, and potentially, symptom severity.”

But perhaps more importantly, in comparison, the **US Agency for Health Care Research and Quality** also reviewed all alternative available treatments. They reached clearly negative conclusions about all other treatments that are currently widely covered by insurance policies:

“No current medical interventions demonstrate clear benefit for social or communication symptoms in ASDs. ...Little evidence is available to assess other behavioral interventions, allied health therapies, or complementary and alternative medicine. ...repetitive behavior showed improvement with both risperidone and aripiprazole. Both medications also cause significant side effects, however, including marked weight gain, sedation, and risk of extrapyramidal symptoms (side effects, including muscle stiffness or tremor, that occur in individuals taking

antipsychotic medications). These side effects limit use of these drugs to patients with severe impairment or risk of injury.”

Warren, Z., Veenstra-VanderWeele, J., Stone, W., Bruzek, J. L., Nahmias, A. S., Foss-Feig, J. H., Jerome, R. N., Krishnaswami, S., Sathe, N. A., Glasser, A. M., Surawicz, T., & McPheeters, M. L. (April, 2011). *Therapies for Children With Autism Spectrum Disorders. Comparative Effectiveness Review No. 26*. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No.290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

In 2012, the **American Academy Of Pediatrics** submitted the following testimony on ABA for autism:

“ASD is a medical/neurodevelopmental condition with behavioral symptoms that are directly addressed by applied behavior analysis methods. ABA has proved effective in addressing the core symptoms of autism as well as developing skills and improving and enhancing functioning in numerous areas that affect the health and well-being of people with ASD. The effectiveness of ABA-based interventions in ASDs has been well documented through a long history of research in university and community settings... In short, though more research is needed, ABA has both long-term empirical and research data to demonstrate its effectiveness in helping children who are diagnosed with ASD, and AAP has endorsed the use of ABA treatments when determined appropriate by physicians within a medical home, in close consultation with families.”

Tait, V. F. (2012). Testimony of Vera F. Tait, MD, FAAP on behalf of the American Academy of Pediatrics before the Subcommittee on Personnel, Senate Armed Services Committee. Washington, DC June 20, 2012.

In 2012, **Autism Speaks** concluded:

“Behavior analysis is a scientifically validated approach to understanding behavior and how it is affected by the environment. In this context, “behavior” refers to actions and skills. “Environment” includes any influence – physical or social – that might change or be changed by one’s behavior. On a practical level, the principles and methods of behavior analysis have helped many different kinds of learners acquire many different skills – from healthier lifestyles to the mastery of a new language. Since the 1960s, therapists have been applying behavior analysis to help children with autism and related developmental disorders. ...Today, ABA is widely recognized as a safe and effective treatment for autism. It has been endorsed by a number of state and federal agencies, including the U.S. Surgeon General and the New York State Department of Health. Over the last decade, the nation has seen a particularly dramatic increase in the use of ABA to help persons with autism live happy and productive lives. In particular, ABA principles and techniques can foster basic skills such as looking, listening and imitating, as well as complex skills such as reading, conversing and understanding another person’s perspective.”

Autism Speaks (2012). *Applied Behavior Analysis (ABA)*. Downloaded from <http://www.autismspeaks.org/what-autism/treatment/applied-behavior-analysis-aba> on November 2, 2012.

In 2012, the **US CDC (Centers for Disease Control)** stated:

“A notable treatment approach for people with an ASD is called applied behavior analysis (ABA). ABA has become widely accepted among health care professionals and used in many schools and treatment clinics. ABA encourages positive behaviors and discourages negative behaviors in order to improve a variety of skills. The child’s progress is tracked and measured.”

Centers for Disease Control (2012) *Autism Spectrum Disorders*. Downloaded from <http://www.cdc.gov/ncbddd/autism/treatment.html> on November 2, 2012.

In 2014, the **Wisconsin Department of Health Services** conducted a determination of whether applied behavior analysis is a proven and effective treatment for children with autism. Their conclusion was:

“The sheer volume of independent, published and peer-reviewed articles, in addition to acknowledgement by authoritative bodies such as the National Professional Development Center on Autism Spectrum Disorders and the National Autism Council’s National Standards Report, and positive position statements from professional organizations establish applied behavior analysis as a level one, well-established treatment for individuals with autism spectrum disorders and with other developmental disabilities across a span of ages.”

Wisconsin Department of Health Services Autism and other Developmental Disabilities Treatment Intervention Advisory Committee (2014, August). *Determination of applied behavior analysis as a proven and effective treatment for individuals with autism spectrum disorder and/or other developmental disabilities*. Available at: tiac.wisconsin.gov/tiacfiles/pdf/aba.pdf

In 2014, Autism Evidence-Based Practice Review Group of the **North Carolina Frank Porter Graham Child Development Institute** set about to describe a process for the identification of evidence-based practices (EBPs) and also to delineate practices that have sufficient empirical support to be termed evidence-based. After reviewing 29,106 published articles, they found 1,090 that met their criteria, resulting in the identification of 27 evidence-based practices that consisted of focused interventions:

“that are fundamental applied behavior analysis techniques (e.g., reinforcement, extinction, prompting), assessment and analytic techniques that are the basis for intervention (e.g., functional behavior assessment, task analysis), and combinations of primarily behavioral practices used in a routine and systematic way that fit together as a replicable procedure (e.g., functional communication training, pivotal response training).” (p. 19).

“Fifteen of the EBPs have over 10 studies providing empirical support for the practice, and among those, the foundational applied behavior analysis techniques (e.g., prompting and reinforcement) have the most support. Antecedent-based interventions, differential reinforcement, and video modeling also have substantial support with over 25 studies supporting their efficacy. The number and variety of these replications speak to the relative strength of these EBPs.” (p. 29)

“The identification of focused intervention practices that have substantial evidence of efficacy provides the basis for designing comprehensive evidence-supported programs for children and youth with ASD... Developers of some comprehensive treatment models, such as the Lovaas Model and the Early Start Denver Model, have conducted randomized efficacy studies that provide empirical support for their program models, which would qualify them as evidence-based programs.” (p. 32)

Wong, C., Odom, S. L., Hume, K. Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2014). *Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder*. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group. Available at: autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/2014-EBP-Report.pdf

In 2014, the **US Agency for Health Care Research and Quality (AHRQ)** updated its comparative effectiveness review and concluded:

“Since our previous review in 2011, we have seen a significant increase in the quality of studies investigating behavioral interventions. Of the 45 comparative studies of behavioral interventions (29 RCTs) in the 2011 review, we considered only two as good quality. Among the new studies of behavioral interventions described in this current review, 19 studies are good quality, and 48 of the 65 included studies are RCTs.”

“These improvements allow us to make some stronger conclusions about certain elements of the behavioral intervention literature. Considerable and consistent evidence suggests that early behavioral and developmental intervention based on the principles of ABA delivered in intensive (>15 hours per week) and comprehensive (i.e., addressing numerous areas of functioning) form can significantly affect the development of some children with ASD.”

“The current review includes RCTs of the UCLA/Lovaas-focused approach, a developmentally focused ESDM approach, a school delivered training (LEAP), as well as prospective comparisons of eclectic variants of ABA approaches.”

“Across approaches, children receiving early intensive behavioral and developmental interventions have demonstrated improvements in cognitive, language, adaptive, and ASD impairments compared with children receiving low-intensity interventions and eclectic non-ABA based intervention approaches.” (p. 103)

Weitlauf, A. S., McPheeters, M. L., Peters, B., Sathe, N., Travis, R., Aiello, R., Williamson, E., Veenstra-VanderWeele, J., Krishnaswami, S., Jerome, R., & Warren, Z. (2014) Therapies for Children with Autism Spectrum Disorder: Behavioral Interventions Update. *Comparative Effectiveness Review No. 137*. AHRQ Publication No. 14-EHC036-EF. Rockville, MD: Agency for Healthcare Research and Quality; August 2014. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

For the sake of comparison with the above, when an impartial review identifies areas for further research, it is important to recognize that there is very little evidence to support any other treatment approach for autism. So, three years later in 2017, the **US Agency for Health Care Research and Quality (AHRQ)** would report on the available evidence for all other medical therapies for autism. Their central findings on the strength of evidence for medical treatments was:

The methodologic rigor of studies has increased substantially compared with those studies reported in our 2011 review of therapies for children with autism spectrum disorder (ASD).⁶ However, while studies were generally well conducted, evidence remains insufficient for most interventions due to small sample sizes, lack of long term follow-up, and heterogeneous agents and populations. Despite the number of new studies, we can make few conclusions beyond those reached in our 2011 review. Evidence supports the effectiveness of antipsychotics in improving challenging behaviors, but with significant harms. Methylphenidate also improves hyperactivity but with significant harms. Evidence is promising for the ADHD medication atomoxetine. More studies have addressed combination approaches, but data are inadequate to draw conclusions. Data were limited and inconsistent for other interventions.

Williamson E, Sathe NA, Andrews JC, Krishnaswami S, McPheeters ML, Fonnesebeck C, Sanders K, Weitlauf A, Warren Z. Medical Therapies for Children With Autism Spectrum Disorder—An Update. *Comparative Effectiveness Review No. 189*. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290- 2015-00003-I.) AHRQ Publication No. 17-EHC009-EF. Rockville, MD: Agency for Healthcare Research and Quality; May 2017. www.effectivehealthcare.ahrq.gov/reports/final.cfm. doi: 10.23970/AHRQEPCCER189.

In 2014, the **American Academy of Child and Adolescent Psychiatry** issued its Practice Parameter for the Assessment and Treatment of autism. It made the following recommendation:

“The clinician should help the family obtain appropriate, evidence-based, and structured educational and behavioral interventions for children with ASD. Structured educational and behavioral interventions have been shown to be effective for many children with ASD and are associated with better outcome.” (p. 244)

“Early Intensive Behavioral Intervention is intensive and highly individualized, with up to 40 hours per week of one-to-one direct teaching, initially using discrete trials to teach simple skills and progressing to more complex skills such as initiating verbal behavior. A meta-analysis found Early Intensive Behavioral Intervention effective for young children but stressed the need for more rigorous research to extend the findings.”

“Behavioral techniques are particularly useful when maladaptive behaviors interfere with the provision of a comprehensive intervention program. In such situations, a functional analysis of the target behavior is performed, in which patterns of reinforcement are identified and then various behavioral techniques are used to promote a desired behavioral alternative.”

“ABA techniques have been repeatedly shown to have efficacy for specific problem behaviors, and ABA has been found to be effective as applied to academic tasks, adaptive living skills, communication, social skills, and vocational skills. Because most children with ASD tend to learn tasks in isolation, an explicit focus on generalization is important.” (p. 245)

Volkmar, F., Siegel, M., Woodbury-Smith, M., King, B., McCracken, J., State, M., & the American Academy of Child and Adolescent Psychiatry (AACAP) Committee on Quality Issues (CQI). (2014). Practice Parameter for the Assessment and Treatment of Children and Adolescents with Autism Spectrum Disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 53, 237–257.

In 2015, a large multi-disciplinary group of autism researchers published a consensus statement in the **Journal of Autism and Developmental Disorders** regarding the empirical and theoretical bases of Naturalistic Developmental Behavioral Interventions (NDBIs) with toddlers. This report emphasized the breadth of the scope of ABA, in utilizing data-based generalization and naturalization principles. In their conclusions they stated:

“evidence-based NDBIs are based upon well-established principles of applied behavior analysis. Thus, they represent ABA treatment. All of the NDBIs utilize a three-part contingency (antecedent-response-consequence) to help the child understand when to respond and to provide feedback to the child.” (p. 2417)

“all NDBIs require the systematic use of adult prompts to promote new skills and systematic delivery of contingent reinforcers, which, along with systematic ongoing data collection, defines primary differences between NDBIs and developmental interventions that do not incorporate ABA principles.” (p. 2419)

“The NDBIs described in this paper are efficacious treatments based firmly in ABA and supported by a large body of evidence. It can be solidly argued that funding that provides coverage of ABA treatment should cover NDBIs.” (p. 2423)

Schreibman, L., Dawson, G., Stahmer, A. C., Landa, R., Rogers, S. J., McGee, G. G., Kasari, C., Ingersoll, B., Kaiser, A. P., Bruinsma, Y., McNerney, E., Wetherby, A., & Halladay, A. (2015). Naturalistic Developmental Behavioral Interventions: Empirically Validated Treatments for Autism Spectrum Disorder. *Journal of autism and developmental disorders*, 45(8), 2411–2428.

In 2015, the **American Psychological Association** Division 53: Society of Clinical Child and Adolescent Psychology reported that behavior therapy currently has the most research evidence for the treatment of young children with autism. Specifically the Society offered the following description of evidence-based treatment programs for autism:

“The Lovaas Model of Applied Behavior Analysis is a behavioral treatment program for children with autism. The Lovaas Model utilizes a variety of evidence-based practices, including reinforcing appropriate behaviors, task analysis, shaping and chaining, discrete trial teaching, incidental teaching, functional behavior assessment, and peer integration. The program is both intensive and comprehensive.”

“Research indicates up to 40 hours of therapy per week is beneficial. Skills are taught across all developmental domains-- from communication, speech and language, to academics, self-help, and play. Parent training and involvement is critical to the program's success. The initial years of treatment are often devoted to one-on-one instruction in the home (i.e., a young child's primary learning environment) with generalization of skills throughout the day by parents. As children demonstrate school readiness skills, treatment involves the integration of the child into the school environment.”

American Psychological Association Division 53: Society of Clinical Child and Adolescent Psychology. (2015). *Review of Evidence-Based Mental Health Treatment for Children and Adolescents*.
effectivechildtherapy.com/sccap/?m=sPro&fa=pro_ESTOptions#sec13 Accessed June 28, 2015

In 2015, the **National Center for Autism** updated their earlier review of the evidence to include studies published between 2007 and 2012. The Center again found the following behavioral interventions that had their own unique

established level of evidence: Behavioral Interventions, Cognitive Behavioral Intervention Package, Comprehensive Behavioral Treatment for Young Children, Language Training (Production), Modeling, Natural Teaching Strategies, Parent Training, Peer Training Package, Pivotal Response Training, Schedules, Scripting, Self-Management, Social Skills Package, and Story-based Intervention. Each of these interventions had to be supported by studies that met the criteria of the Scientific Merit Rating Scale (SMRS) and the Strength of Evidence Classification System, as follows:

“The SMRS involves five critical dimensions of experimental rigor that can be applied to determine the extent to which interventions are effective. They are: {a} research design, {b} measurement of the dependent variable, {c} measurement of the independent variable or procedural fidelity, {d} participant ascertainment, and {e} generalization and maintenance.” (p. 22)

“Sufficient evidence is available to confidently determine that an intervention produces favorable outcomes for individuals on the autism spectrum. That is, these interventions are established as effective.” (p. 34)

National Autism Center. (2015). *Findings and conclusions: National standards project, phase 2*. Randolph, MA: Author.

In 2017, the **Ontario Association for Behavior Analysis** conducted a review of the research evidence and best practices for the treatment of autism spectrum disorder. The main recommendations and findings of this task force were:

“Only those interventions that meet the standards of evidence-based practice should be supported. Commentary: As noted in previous reports, the vast majority of evidence-based interventions consist of applied behaviour analysis (ABA) or incorporate established behaviour analytic procedures. These interventions are often described as either focused ABA interventions or comprehensive ABA interventions.” (p. 93)

“The interventions that we have accepted as evidence based are shown in Tables 6 and 7 and are: comprehensive behavioral treatment for young children (EIBI) and the following focused ABA interventions: cognitive behavioural intervention, differential reinforcement (DRA, DRI, DRO), discrete trial teaching, extinction, functional behaviour assessment, language training, modeling, naturalistic teaching, parent training, peer-mediated intervention, Pivotal Response Treatment® (PRT), visual schedules, scripting, self-management, social skills training, story-based intervention, prompting, reinforcement, response redirection, structured play groups, task analysis, time delay, video modeling, exercise, functional communication training, Picture Exchange Communication System® (PECS), and technology-based intervention.” (p. 94)

Ontario Association for Behaviour Analysis. (2017). *Evidence-Based Practices for Individuals with Autism Spectrum Disorder: Recommendations for Caregivers, Practitioners, and Policy Makers*. Toronto, ON: Author.

In 2018, the **Cochrane Database of Systematic Reviews** systematically reviewed the evidence for the effectiveness of EIBI in increasing functional behaviors and skills, decreasing autism severity, and improving intelligence and communication skills for young children with ASD, and made the following summary statements:

“The rising prevalence of autism spectrum disorders (ASD) increases the need for evidence-based behavioral treatments to lessen the impact of symptoms on children’s functioning. At present, there are no curative or psychopharmacological therapies to effectively treat all symptoms of the disorders. Early intensive behavioral intervention (EIBI) is a treatment based on the principles of applied behavior analysis. Delivered for multiple years at an intensity of 20 to 40 hours per week, it is one of the more well-established treatments for ASD.”

“It is important that providers of EIBI are aware of the current evidence and use clinical decision-making guidelines, such as seeking the family’s input and drawing upon prior clinical experience, when making recommendations to clients on the use EIBI. Additional studies using rigorous research designs are needed to make stronger conclusions about the effects of EIBI for children with ASD.”

Reichow, B., Hume, K., Barton, E. E., & Boyd, B. A. (2018). Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD). *Cochrane Database of Systematic Reviews 2018*, Issue 5. Art. No.: CD009260. DOI: 10.1002/14651858.CD009260.pub3.

In 2020, the third Clinical Report of the **American Academy Of Pediatrics** Council on Children With Disabilities: continued to endorse ABA, stating:

“Most evidence-based treatment models are based on principles of ABA... ABA programs are typically designed and supervised by professionals certified in behavior analysis. The majority of states at this time have licensure for board-certified behavior analysts with provisions for payment by insurance... A comprehensive ABA approach for younger children, also known as early intensive behavioral intervention, is supported by a few randomized controlled trials (RCTs) and a substantial single-subject literature... Children younger than 12 years receiving more hours per week of ABA were found to be more likely to achieve the individualized goals identified in their programs. In retrospective studies, more intense ABA therapy was associated with achieving optimal developmental outcomes” (p. 21-22).

“Common factors in combined developmental and behavioral approaches include use of principles of ABA to reinforce skill building; a systematic approach with a manual for training practitioners who would use the intervention in a standard fashion; individualized treatment goals for the child and means of measuring progress;

child-initiated teaching, imitation, and modeling; and adult prompting that fades over time to promote independence.” (p. 23)

“Increasing evidence reveals that focused interventions delivered by trained parents or other caregivers can be an important part of a therapeutic program. More RCTs have been published on parent-mediated therapies than on other nonpharmacologic interventions.” (p. 23)

“Empirical support exists for the effectiveness of parent education and behavioral interventions for children with ASD and sleep disturbances.” (p. 30)

“Strong evidence from RCTs supports the use of cognitive behavioral therapy for anxiety symptoms in school-aged children with ASD, especially those with typical-range intelligence.” (p. 33).

“Behavioral approaches are recommended as the first line of treatment of symptoms of OCD, depending on the language and cognitive level of the patient.” (p. 35)

“In the case of aggressive, self-injurious, and disruptive behaviors, the primary care provider needs to assess the safety of the child and family in an ongoing fashion. Referral to community services and for behavioral intervention should take place if behaviors are unsafe or if the patient is not responding to the treatment plan.” (p. 36)

In contrast, in the same report, the **American Academy Of Pediatrics** also reviewed all other treatments and found little support for the alternatives. For example, it stated:

“Commonly used sensory-based interventions, including brushing of the skin, proprioceptive stimulation by using weighted vests, or kinesthetic stimulation (such as swinging or use of specialized seating, such as a therapy ball, to modulate level of arousal), are not yet supported in the peer-reviewed literature.” (p. 27)

Hyman, S. L., Levy, S. E., & Myers, S. M., AAP Council on Children with Disabilities, Section on Developmental and Behavioral Pediatrics (2020). Identification, Evaluation, and Management of Children With Autism Spectrum Disorder. *Pediatrics*. 145(1):e20193447, 1-64.

In 2020, the **North Carolina Frank Porter Graham Child Development Institute’s** National Clearinghouse on Autism Evidence and Practice Review Team issued its third iteration of its systematic review of the intervention literature. The purpose of the current review was to identify focused intervention practices that have evidence of efficacy in promoting positive outcomes for learners with autism. It stated:

“The purpose of this report is to describe a set of practices that have clear evidence of positive effects with autistic children and youth.”

Focused intervention practices that met the evidence criteria were designated as “evidence-based practices” (EBPs). The review found the following ABA intervention practices to be EBPs:

“Antecedent-Based Interventions; Augmentative and Alternative Communication; Behavioral Momentum Intervention; Cognitive Behavioral/ Instructional Strategies; Differential Reinforcement of Alternative, Incompatible, or Other Behavior; Direct Instruction; Discrete Trial Training; Extinction; Functional Behavioral Assessment; Functional Communication Training; Modeling; Naturalistic Intervention; Parent-Implemented Intervention; Peer-Based Instruction and Intervention; Prompting; Reinforcement; Response Interruption/Redirection; Social Skills Training; Task Analysis; Technology-Aided Instruction and Intervention; Time Delay; and Video Modeling.”

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with Autism*. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team.

In 2020, the **American Psychological Association** Division 53: Society of Clinical Child and Adolescent Psychology reported the following update:

“The following treatments have the strongest research support demonstrating they work well in children and/or adolescents with a specific disorder. These treatments have been studied by independent teams working at different research settings.”

“Applied behavior analysis (ABA) uses learning principles to teach socially significant behaviors in real-life settings... This individualized, adult-led intervention addresses communication, social skills, self-management, cognition, and pre-academic skills such as imitation, matching, letter, and number concepts. When used with younger children, ABA interventions are often referred to as “early intensive behavioral interventions” (EIBI). ABA is considered an effective treatment for autism spectrum disorder.”

“Teacher-implemented, focused ABA with developmental social pragmatic language intervention is another form of ABA that has been shown to work in treating social-communication skills associated with autism spectrum disorder. This type of therapy involves the same principles as ABA, but includes focused treatments delivered by classroom teachers. It employs joint engagement in play activities with parents and teachers that positively impact social-communication skills in children.”

Society of Clinical Child and Adolescent Psychology (2020, June). *Effective Child Therapy: Evidence-based mental health treatment for children and adolescents*. Available at: <https://effectivechildtherapy.org/concerns-symptoms-disorders/disorders/autism/#effective-treatments> Accessed April 19, 2021.

Conclusion

These results aren't occasional findings. As has been repeatedly stated in many peer-reviewed research reports and in many medical editorials and medical review panel recommendations, Applied Behavior Analysis, Behavior Therapy, and Early Intensive Behavioral Intervention treatments are the only substantiated treatment for children with autism. It is the widely held conclusion of ABA researchers, expert independent review committees, and the central consumer advocacy agencies in the field of autism that Applied Behavior Analysis consists of a large body of valid scientific evidence demonstrating that the technology improves the net health outcome as much as or more than established alternatives, and that these results have been readily attained outside the investigational settings.

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