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Is Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) an Effective Treatment 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. Impartial independent review panels consistently agree 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 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 yearlong 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 have become part of the mainstream community standard of care. The conclusions from 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 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.

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. Followup 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.”

In contrast, their conclusions about a 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.”

The New York Department of Health also concluded:

“[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).

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.

Also 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 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.

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 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 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 the more detailed accompanying technical report, the AAP 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 AAP 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.

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.

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.”

Barbarese, 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.

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.” (page 136).

Motiwala, 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.

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.

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 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; (pg 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 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.

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. For example in a review of children referred to a number of leading comprehensive medical evaluation clinics throughout the Northeastern US, a review by pediatricians and psychologists 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 concluded. They 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.

The **NIMH (National Institute of Mental Health)** states:

“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 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.

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., prebachelor’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 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 further, by comparison, the AHRQ 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.

Autism Speaks states:

“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.

The **US CDC (Centers for Disease Control)** states:

“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.

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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