

## OVERVIEW AND SUMMARY OF SCIENTIFIC SUPPORT FOR APPLIED BEHAVIOR ANALYSIS

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### Applied Behavior Analysis

Applied behavior analysis (ABA) is a discipline concerned with the application of behavioral science in real-world settings such as clinics, schools, and industry with the aim of improving socially important issues such as behavior problems and learning (Baer, Wolf, & Risley, 1968).

With regard to individuals diagnosed with intellectual and developmental disabilities including autism, ABA-based procedures can be loosely categorized as “**comprehensive**” or “**focused**.” It should be noted that these categories are broad and are mainly distinguished by the goals of treatment. Many children with autism and intellectual disabilities require both types of procedures.

**Comprehensive ABA interventions** are aimed at producing changes in specific skills that impact global measures of functioning including IQ, adaptive skills, and social functioning in children with autism. Typically, such treatment is provided for an extended period (often spanning several years) and is often a home- or center-based program (sometimes in an educational setting). Skills frequently targeted include attention, discrimination, language/communication, socialization, as well as more advanced educational skills (e.g., reading, math). These programs rely on the use of clear instructions, reinforcement, teaching small units of behavior, and repeated trials to maximize learning opportunities. When utilized with younger children, these interventions are often referred to as “early intensive behavioral interventions” (EIBI). Several research studies have demonstrated that center-based comprehensive ABA interventions are highly effective in improving IQ, adaptive skills, and social functioning when programming is delivered 25-40 hours per week. Research also suggests that these gains are more robust the earlier programming is initiated. Therefore, comprehensive ABA-based treatment is often sought out when a diagnosis of autism is made. Research on comprehensive interventions, or EIBI, is discussed in Part II: Scientific Support for ABA under the review papers heading.

**Focused ABA interventions** are generally more time-limited in nature because they are designed to address specific behavior deceleration concerns including aggression, self-injury, disruptive behavior, pica, and other challenging behaviors. Individuals with such problem behavior often meet criteria for certain psychiatric diagnoses, such as “Disruptive Behavior Disorder” or “Stereotypic Movement Disorder with Self-Injurious Behavior.” ABA-based treatment of these problems involves first conducting a functional behavioral assessment to identify the variables controlling problem behavior (i.e., the cause of the behavior). Then, this assessment information is used to guide the development of an individualized treatment(s). Typically, function-based treatments involve altering the environment to minimize problem behavior, establishing and reinforcing adaptive behaviors, and withholding reinforcement for problem behavior.

Focused interventions can also address other concerns such as anxiety and skills deficits (i.e., social skills and self-care deficits). These services are generally needed when attempts to address these concerns

using standard teaching and parenting practices are unsuccessful. Nearly four decades of research has shown that ABA-based treatment approaches are effective in reducing problem behavior and establishing appropriate skills with children and adults in home, school, and community settings and with individuals with different types of intellectual and developmental disabilities, including autism. Research on focused interventions is discussed in Part II: Scientific Support for ABA under the review papers heading.

Regardless of the specific category or goals of treatment, features common to all ABA-based approaches are: 1) the objective measurement of behavior, 2) use of procedures based on scientifically established principles of behavior, and 3) precise control of the environment to allow for the objective evaluation of outcomes. Any clinical procedure or research investigation adhering to these basic criteria can be considered to be an ABA-based procedure. This includes "functional behavioral assessment," approaches such as "Positive Behavioral Support," and forms of "Behavior Therapy" that rely on direct observation of behavior, procedures based on behavioral principles, and analysis of behavior-environment relations.

## **1. Scientific Support for Applied Behavior Analysis**

Over the past 40 years an extensive body of literature has documented the successful use of ABA-based procedures to reduce problem behavior and increase appropriate skills for individuals with intellectual disabilities (ID), autism, and related disorders. The literature consists of numerous controlled studies employing single-case experimental designs, consecutive controlled case-series studies, controlled group studies, and some randomized controlled trials.

### **1.1 Types of Research Designs**

A number of different research designs are used to evaluate treatments and answer other questions about treatment procedures. Each type of design has its own scientific and practical strengths and limitations, and each is ideally suited to answer particular types of questions. The designs are discussed further below.

#### **1.1.1 Single-case experimental designs**

Many studies demonstrating the outcomes obtained with ABA-based procedures use *single-case experimental designs* (also termed "single-subject designs"; Kazdin, 2010 & 2013) because this type of design is ideal for examining how the behavior of an individual changes as a function of changes in the environment – which is the subject of interest in the field of ABA. These studies often include a small number of individuals (typically between one to four). It should be noted that published studies using single-case experimental designs are not the same as "case reports" (often seen in clinical journals), which are typically simply descriptive in nature. Rather, studies using single-case designs are controlled studies where treatment is applied in a manner that allows one to demonstrate that the treatment was responsible for the change in behavior. These studies are methodologically rigorous because they involve direct observation of behavior and objective data collection where

behaviors are defined and counted (often using a computerized data collection system). A second observer also collects data independently to ensure reliable and accurate data collection.

The most common type of single-case design is a reversal design, which involves the following: a pre-treatment baseline level of behavior is obtained, then treatment is applied, and after a change is observed, the treatment is withdrawn, then reapplied to replicate the treatment effect (Kazdin, 2010; Kratochwill & Levin, 2010). The “replication” of the treatment effect illustrates that the treatment (and not some other event) is responsible for the change. This type of design has excellent “internal validity,” which refers to the extent to which the change in behavior can be attributed to the intervention and not some other variable. Single-case designs are limited, however, in that one cannot determine the extent to which the findings for one study are applicable to other individuals or situations (that is, it has weak “external validity”). It is possible that only cases for which treatment was successful were included in the published study (a concern termed “publication bias”). On the other hand, the ABA literature spans four decades and describes the efficacy of these treatments across a wide range of populations, settings, and problems. Collectively, this extensive body of literature provides strong evidence supporting the external validity of ABA-based interventions.

In the field of ABA, single-case experimental designs are not reserved for exclusive use in research studies. Rather, their use represents good clinical practice. During assessment, single-case designs permit one to identify what factors cause the behavior in question. These findings are then prescriptive for developing an individualized treatment. In addition, single-case designs enable one to determine whether a prescribed treatment (or what particular elements of a treatment) is responsible for behavior change. Isolating the active ingredients of treatment is crucial in saving time and resources.

### **1.1.2 Consecutive controlled case series designs**

Consecutive controlled case-series studies describe a series of cases where single-case experimental designs were used (see Rooker et al., 2013 for a recent example). These studies describe all individuals encountered who were treated with a certain procedure (regardless of whether the treatment was effective or not), and thus have better external validity than cases involving fewer participants. Because all the cases in the series evaluated treatment using single-case experimental designs, consecutive controlled case-series studies have excellent internal validity as well. Moreover, because a large number of individuals are included, they provide an opportunity to answer other questions, including determining what characteristics predict good outcomes. Several large scale consecutive controlled case series studies describing ABA-based assessment and treatment procedures have been published, and their findings nicely correspond to the broader body of single-case studies describing smaller numbers of individuals.

### **1.1.3 Group designs**

In contrast to single-case experimental designs where the individual’s behavior change during treatment is compared to his/her own behavior without treatment, *group designs* evaluate treatments based on a comparison of a group of individuals receiving one treatment relative to

another similar group of individuals who received no treatment (or a different treatment; Kazdin, 2003). In contrast to single-case designs, where the behaviors of an individual are observed extensively and repeatedly (often for many hours or days) before and after treatment, group designs involve fewer observations of each individual in the group but obtain these measures across large numbers of individuals. Statistical analyses are used to determine whether overall differences between the groups are large enough to conclude that they are not due to normal variation or “chance” (Cohen, Cohen, West, & Aiken, 2003).

The most rigorous type of group design is a *randomized controlled trial*, which involves randomly assigning participants to a particular group (e.g., treatment or no treatment), and observers who evaluate the outcomes of the treatment do not know whether the participant received treatment or not (i.e., observers are “blinded”). When certain types of treatments, such as medications are being evaluated, the participant may also be “blind” to which group s/he is assigned through the administration of an inactive pill (a placebo). Several group studies describing comprehensive ABA-based interventions for individuals with autism have been published, including some that have used randomization (e.g., Sallows & Graupner, 2005; Smith, Groen, & Wynn, 2000). The most appropriate design to use in a particular situation depends on numerous factors, including the research question, consideration of the relative costs and benefits to participants, and the current state of knowledge about the topic of interest.

## 1.2 Findings from Controlled Studies Employing Single-Case Experimental Designs

**1.2.1 Small-n Controlled Studies.** Over a thousand studies reporting on ABA-based assessment and treatment techniques have been published since the 1960’s. As discussed in the “types of research designs” section above, these controlled studies have strong internal validity as they use experimental designs that permit one to conclude that the intervention was responsible for the change in behavior. Studies on topics relevant to the use of ABA with persons with intellectual and developmental disabilities are most frequently published in journals such as: *Behavioral Interventions*, *Journal of Applied Behavior Analysis*, *Journal of Autism and Developmental Disorders*, *Journal of Intellectual Disability Research*, *Research in Developmental Disabilities*, *Research in Autism Spectrum Disorders*. Topics of these studies include communication training, social skills training, behavioral assessment and treatment of problem behavior (e.g., self-injury, aggression), educational instruction, early intensive behavioral intervention, etc. For further information, the reader is referred to these journals or to an on-line search engine (i.e., PsychINFO, Google Scholar).

**1.2.2 Consecutive Case-Series Studies.** As discussed on the types of research designs section above, consecutive controlled case-series studies describe a series of cases where single-case experimental designs were used with all individuals encountered (regardless of whether the treatment was effective or not).

**1.2.2.1 Functional Analysis of Problem Behavior.** Focused ABA interventions for problem behavior are designed for each individual based on an understanding of what antecedents may “trigger” problem behavior and what consequences may reinforce (reward) it. Functional behavioral

assessment can be performed using a range of procedures, including interviews, questionnaires, direct observation in the individual's natural setting, and / or systematically presenting situations that can function as potential triggers or rewards and observing and recording how behavior changes with these events. This latter type of procedure, called a functional analysis, is the most rigorous type of functional behavioral assessment. In most cases, the results can reveal why problem behavior occurs and persists – and thus provides a foundation for focused interventions targeting these behaviors.

Literature reviews by Hanley, Iwata, and McCord (2003) and Beavers, Iwata, and Lerman (2013) collectively identified 435 peer-reviewed articles where functional analysis of problem behavior was reported. Studies listed below represent a sample of the large-scale consecutive controlled case series studies involving functional analysis. These studies demonstrate that functional analysis is highly effective in identifying the controlling variables for problem behavior.

#### Functional analysis across a variety of settings (inpatient, residential)

Participants: 154 cases

Results: Conclusive assessment results in over 90% of cases

Reference: Iwata, B. A., Pace, G. M., Dorsey, M. F., Zarcone, J. R., Vollmer, T. R., Smith, R. G.,... Willis, K. D. (1994). The functions of self-injurious behavior: An experimental-epidemiological analysis. *Journal of Applied Behavior Analysis, 27*, 215-240.

#### Functional analysis in school settings

Participants: 69 cases

Results: Conclusive assessment results in over 90% of cases

Reference: Mueller, M. M., Nkosi, A., & Hine, J. F. (2011). Functional analysis in public schools: A summary of 90 functional analyses. *Journal of Applied Behavior Analysis, 44*, 807-818.

#### Functional analysis of severe problem behavior

Participants: 176 cases with severe problem behavior

Results: Conclusive assessment results in over 90% of cases

References: Hagopian, L. P., Rooker, G. W., Jessel, J., & DeLeon, I. G. (2013). Initial functional analysis outcomes and modifications in pursuit of differentiation: A summary of 176 inpatient cases. *Journal of Applied Behavior Analysis, 46*, 88-100.

**1.2.2.2 ABA-Based Focused Treatment for Problem Behavior.** Studies employing rigorous single-case experimental designs describing ABA focused interventions for problem behavior have been reported for four decades. The following sample of large-scale consecutive controlled case series studies provide further support for the effectiveness of these interventions. Findings from these studies parallel findings from reviews and meta-analysis of small-n studies.

#### Functional communication training for treatment of problem behavior

Participants: 19 inpatient cases with IDD

Results: 80% or greater reduction in problem behavior in 90% of cases

Reference: Hagopian, L. P., Fisher, W. W., Sullivan, M. T., Acquisto, J., & LeBlanc, L. A. (1998). Effectiveness of functional communication training with and without extinction and punishment: A summary of 21 inpatient cases. *Journal of Applied Behavior Analysis, 31*, 211-235.

#### Function-based treatment for severe problem behavior

Participants: 138 inpatient cases with IDD

Results: 90% or greater reduction in problem behavior in over 83% of cases

Reference: Asmus, J. M., Ringdahl, J. E., Sellers, J. A., Call, N. A., Andelman, M. S., & Wacker, D. P. (2004). Use of a short-term inpatient model to evaluate aberrant behavior: Outcome data summaries from 1996 to 2001. *Journal of Applied Behavior Analysis, 37*, 283-304.

#### Functional-based treatment delivered by care providers (mostly parents) for severe problem behavior

Participants: 42 outpatient cases with IDD

Results: 80% or greater reduction in problem behavior in 95% of cases

Reference: Kurtz, P. F., Fodstad, J. C., Huete, J. M., & Hagopian, L. P. (2013). Caregiver- and staff-conducted functional analysis outcomes: A summary of 52 cases. *Journal of Applied Behavior Analysis, 46*, 738-749.

#### Functional communication training for treatment of severe problem behavior

Participants: 50 inpatient and outpatient cases with IDD

Results: 80% or greater reduction in problem behavior in 86% of cases

Reference: Rooker, G. W., Jessel, J., Kurtz, P. F., & Hagopian, L. P. (2013). Functional communication training with and without alternative reinforcement and punishment: An analysis of 58 applications. *Journal of Applied Behavior Analysis, 46*, 708-722.

### 1.3 Review Papers

Broadly speaking, **review papers** summarize the published literature on a specific topic (e.g., diagnosis, type of assessment or treatment procedure). The reader is referred to recent reviews on comprehensive and focused ABA-based interventions for problems associated with autism:

- Anderson, C., Law, J. K., Daniels, A., Rice, C., Mandell, D. S., Hagopian, L., & Law, P. A. (2012). Occurrence and family impact of elopement in children with autism spectrum disorders. *Pediatrics, 130*, 870-877.
- Dawson, G., & Burner, K. (2011). Behavioral interventions in children and adolescents with autism spectrum disorder: A review of recent findings. *Current Opinion in Pediatrics, 23*, 616-620.
- Doehring, P., Reichow, R., Palk, T., Phillips, C. L., & Hagopian, L. (2012). Behavioral approaches to managing severe problem behaviors in children with Autism Spectrum and Related Developmental Disorders: A descriptive analysis. *Child and Adolescent Psychiatry Clinics of NA, 23*, 25-40.

- Lang, R., Mahoney, R., El Zein, F., Delaune, E., & Amidon, M. (2011). Evidence to practice: Treatment of anxiety in individuals with autism spectrum disorders. *Neuropsychiatric Disease and Treatment, 7*, 27-30.
- Myers, S. M., & Johnson, C. P. (2007). Management of children with autism spectrum disorders. *Pediatrics, 120*, 1162-1182.
- Reichow, B., & Volkmar, F. R. (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.

Recent reviews on ABA-based procedures for persons with intellectual and developmental disabilities (IDD):

- Brosnan, J., & Healy, O. (2011). A review of behavioral interventions for the treatment of aggression in individuals with developmental disabilities. *Research in Developmental Disabilities, 32*, 437-446.
- Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*, 147-185.
- Kahng, S., Iwata, B. A., & Lewin, A. B. (2002). Behavioral treatment of self-injury, 1964 to 2000. *American Journal on Mental Retardation, 107*, 212-221.
- Lang, R., Rispoli, M., Machalicek, W., White, P. J., Kang, S., Pierce, N.,... & Lancioni, G. (2009). Treatment of elopement in individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities, 30*, 670-681.
- Lilienfeld, S. O. (2005). Scientifically unsupported and supported interventions for childhood psychopathology: A summary. *Pediatrics, 115*, 761-764.
- Sturmey, P. (2002). Mental retardation and concurrent psychiatric disorder: Assessment and treatment. *Current Opinion in Psychiatry, 15*, 489-495.
- Tiger, J. H., Hanley, G. P., & Bruzek, J. (2008). Functional communication training: A review and practical guide. *Behavior Analysis in Practice, 1*, 16-23.

Review articles indicating that treatments for autism and intellectual disability derived from ABA-based procedures are empirically supported treatments also have been published in non-behavioral journals. For example, the journal *Current Opinion in Psychiatry* is a journal designed to assist clinicians and researchers by synthesizing the psychiatric literature. An article that reviewed the assessment and treatment of individuals with intellectual disabilities and psychiatric disorders concluded that:

*"Interventions based on applied behavior analysis have the strongest empirical basis, although there is some evidence that other therapies have promise"* (Sturmey, 2002, p. 489). Also, in the journal *Pediatrics*, the official journal of the American Academy of Pediatrics (AAP), an article offering guidelines on scientifically supported treatments for childhood psychiatric disorders concluded: *"The most efficacious psychosocial treatment for autism is applied behavior analysis"* (Lilienfeld, 2005, p. 762). The AAP issued a Clinical Report in *Pediatrics* regarding the management of children with autism, and the authors noted: *"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” (Myers, & Johnson, 2007, p. 1164). In the Archives of Pediatric and Adolescent Medicine, Barbaresi et al. (2006) concluded, “ABA should be viewed as the optimal, comprehensive treatment approach in young children with ASD.”*

Review papers finding support for ABA can be found in the following non-behavioral journals:

- *Current Opinion in Psychiatry* (Grey & Hastings, 2005; Sturmey, 2002)
- *Scientific Review of Mental Health Practice* (Herbert, Sharp, & Gaudiano, 2002)
- *American Journal on Mental Retardation* (Kahng, Iwata, & Lewin, 2002)
- *Psychiatric Times* (Erickson, Swiezy, Stigler, McDougle, & Posey, 2005)
- *Archives of Pediatric and Adolescent Medicine* (Barbaresi, Katusic, & Voigt, 2006)
- *Child and Adolescent Psychiatric Clinics of North America* (Doehring, Reichow, Palka, Phillips, & Hagopian, 2014)

#### 1.4 Meta-Analyses

In general, meta-analysis involves quantitative re-analysis of data reported in published studies. This requires standardizing treatment outcomes by statistically calculating “effect sizes” obtained within each study, for the purpose of evaluating data obtained across a group of studies on a particular treatment.

Similarly, seven meta-analyses (Campbell, 2003; Didden, Duker, & Korzilius, 1997; Harvey, Boer, Meyer, & Evans, 2009; Heyvaert, Maes, Van den Noortgate, Kuppens, & Onghena, 2012; Lundervold & Bourland, 1988; Ma, 2009; Weisz, Weiss, Han, Granger, & Morton, 1995) that collectively analyzed hundreds of studies concluded that ABA-based procedures were more effective for reducing problem behavior displayed by individuals with ID (as well as typically-developing individuals) than were alternative treatments. The large body of literature reviewed in these studies provides empirical evidence indicating that **focused** ABA interventions are effective at assessing and treating a variety of socially important behaviors emitted by individuals with a variety of diagnoses.

Furthermore, several meta-analytic studies also have found **comprehensive** ABA-based approaches for educating children with autism result in favorable outcomes (Eldevik, Hastings, Hughes, Jahr, Eikeseth, & Cross, 2010; Makrygianni & Reed, 2010; Reichow, 2012; Reichow, Barton, Boyd, & Hume, 2012; Virues-Ortega, 2010). In a recent meta-analytic study involving 22 studies, Virues-Ortega (2010) concluded: *“Results suggest that long-term, comprehensive ABA intervention leads to (positive) medium to large effects in terms of intellectual functioning, language development, and adaptive behavior of individuals with autism”* (p. 397).

#### 1.5 Systematic Evaluative Reviews

Systematic approaches for formally evaluating a body of research have been developed to determine if a particular intervention can be characterized as “empirically supported” or “established” based on the number, quality, and outcomes of published treatment studies. These efforts have been undertaken for

the purpose of guiding clinical practice, influencing regulations and standards, providing priorities for funding (for both research and treatment), and guiding professional training (see Mesibov & Shea, 2011). For example, the American Psychological Association (Task Force Promoting Dissemination of Psychological Procedures, 1995) described a process to identify “empirically supported treatments.” Those interventions with the highest level of support are characterized as “well-established” (Chambless, et al, 1996).

Evaluations of the most commonly used **focused** ABA-based interventions (functional communication training and noncontingent reinforcement) indicated that these interventions meet criteria as “well-established” empirically supported treatments (Carr, Severtson, & Lepper, 2009; Kurtz, Boelter, Jarmolowicz, Chin, & Hagopian, 2011). ABA-based treatments for pica (Hagopian, Rooker, & Rolider, 2011), and for treatment of phobic avoidance (Jennett & Hagopian, 2008) displayed by individuals with intellectual disabilities also have been characterized as “well-established.”

The *National Standard Project of the National Autism Center* developed a similar model to evaluate interventions for problems associated with autism (2009), which used the term “established” to describe interventions with the highest level of support. Using their evaluative method, the National Autism Center (2009) characterized **comprehensive** ABA-based interventions as being “established” treatments for autism.

Wong and colleagues (2013), as part of the *Autism Evidence-Based Practice Review Group*, describe a process for the identification of clinical practices that have sufficient empirical support to be termed “evidence-based.” The group stated in regards to the strength of evidence of ABA “*Twenty-seven practices met the criteria for being evidence-based (see table 7, page 20)...evidence-based practices consist of 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...*”

## 2. Scientific, Professional, and Government Organizations' Position on ABA

Based on the empirical evidence, many scientific, government, and professional agencies and organizations have concluded that ABA-based procedures represent best practices for individuals with autism and intellectual disability.

### 2.1 Scientific and Professional Organizations

Autism Speaks states that “*ABA is widely recognized as a safe and effective treatment for autism*”; and “*Behavior analysis is a scientifically validated approach to understanding behavior and how it is affected by the environment.*”

The American Association on Intellectual and Developmental Disabilities (formerly the American Association on Mental Retardation), the oldest and largest interdisciplinary organization of professionals concerned with intellectual disability and related disabilities, designated ABA-based procedures for the

treatment of behavioral problems with individuals with intellectual disability and related disorders as "**highly recommended**" (Rush & Frances, 2000).

American Academy of Child and Adolescent Psychiatry concluded: "*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*" (Volkmar et al., 2014).

Organization For Autism Research ("The Best of the OARacle"; see page 10) stated that "*...[ABA] is distinguished from other interventions because it has been proven effective in promoting skill development in persons with autism.*"

National Autism Center's National Standards Report (2009) noted that behavioral interventions based on ABA were found to have an **established level of evidence** to support their use. Examples include behavioral packages, antecedent packages, comprehensive behavioral treatment for young children, modeling, schedules, pivotal response training, and self-management packages.

The National Professional Development Center on Autism Spectrum Disorders provides a list of several treatment options or components founded in applied behavior analysis (e.g., antecedent-based intervention, differential reinforcement, discrete trial training, functional behavior assessment, functional communication training, extinction, prompting, reinforcement) which have been demonstrated to be efficacious in children with autism.

The Association for Science in Autism Treatment (ASAT) found that "*...ABA is effective in increasing behaviors and teaching new skills....ABA is effective in reducing problem behavior...and also indicates that, when implemented intensively (more than 20 hours per week) and early in life (beginning prior to the age of 4 years), ABA may produce large gains in development and reductions in the need for special services.*"

**2.2 Federal Agencies.** Various federal government agencies have also concluded that ABA-based procedures are well-established - particularly for individuals with intellectual disability and autism who display problem behavior.

The Centers for Disease Control (see types of treatment) indicated that 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 is used in many schools and treatment clinics....*"

The National Institute of Mental Health (NIMH) noted that ABA has become widely recognized as an effective treatment for individuals with autism (see treatment options section).

The National Institute of Child Health and Human Development stated that "*... applied behavior analysis (ABA), [is] a widely accepted approach that tracks a child's progress in improving his or her skills...*"

The Surgeon General of the United States stated, "*Thirty years of research demonstrated the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior*" (1999).

**2.3 State Agencies.** Several states have assembled task forces comprised of parents and professionals to develop guidelines and position statements. These committees identified ABA procedures as representing *best practices*:

#### **Task Force and Position Statements:**

The California Senate Select Committee on Autism and Related Disorders: During an informational hearing on Health Insurance Coverage for Autism Spectrum Disorders (ASD) in 2010 and 2011 the California Department of Insurance concluded that "...*Applied Behavioral Analysis (ABA) therapy is a medically necessary treatment for individuals with autism.*" Furthermore, it was determined that "*ABA therapy is neither experimental nor investigational; and leads to significant improvements in IQ, communication and language skills, and adaptive behaviors; as well as to reduction in self-injurious behaviors.*" The reviewers further noted, "*providing such essential health care treatment to children with autism results in enabling them to learn in school, succeed at work, and participate fully and productively in family and community activities, thereby providing a better quality of life for the patient and the family*".

New York State Department of Health ("Guidelines: Autism/Pervasive Development Disorders, Assessment and Intervention for Young Children (0-3), Chapter IV - Behavioral and Educational Approaches"): "*It is recommended that principles of applied behavior analysis (ABA) and behavior intervention strategies be included as an important element of any intervention program for young children with autism*"

Maine Administrators of Services for Children with Disabilities ("Report of the MADSEC Autism Task Force"; see page 21 of report): "*Over the past 30 years, several thousand published research studies have documented the effectiveness of ABA...across a variety of populations, interventionists, settings, and behaviors.*"

#### **Best Practice Guidelines and Technical Assistance Manuals recognizing the importance of applied behavior analysis:**

California Department of Education: Best Practice Guidelines for Designing Effective Programs for Individuals with Autism Spectrum Disorders "*Applied behavioral analysis is usually needed to assist a child to gain skills and reduce negative or undesirable behaviors*"

Autism Spectrum Disorders: Services in West Virginia Schools; Guidelines for Best Practice: Teaching strategies shall be based on peer reviewed and empirically validated evidence-based practices/methodologies for students with autism. "*At this time the science heavily favors, but is not limited to those based on the science of applied behavior analysis, defined as the application of*

*behavioral principles for the benefit of the learner and includes simultaneous evaluation of the effect of these applications”.*

### **3. National and State Legislation in Support of ABA-Based Services**

Over the years multiple federal and state legislative rulings have supported the efficacy of ABA-based approaches for addressing both focused treatments for individuals with intellectual disabilities and autism and comprehensive interventions. Readers are encouraged to search The National Conference of State Legislatures (NCSL), Autism Legislation Database for a comprehensive summary.

<http://www.ncsl.org/issues-research/health/autism-policy-issues-overview.aspx>

#### **3.1 Judicial Rulings in Support of Funding and Access to ABA-Based Services**

The following court proceedings found school districts financially responsible for all, or a portion of the costs associated with an in-home or center-based ABA-program. These funds were often reimbursed to families who were compelled to pay for these services out of pocket.

- *The Supreme Court of the U.S.: Florence County School District v. Carter (1993)*
- *M.R. v. New York (1997)*
- *United States District Court for the Northern District of Illinois: T.H. v Board of Education of Palatine Community Consolidated school District 15 (1999)*
- *United States Court of Appeals for the 4th Circuit: Jaynes et al. v. Newport News Public Schools, VA (2000)*
- *South Carolina Federal District Court: J.B. and M.B. v Board of Education for Horry County (2001)*
- *Federal District Court of Philadelphia: Bucks County Department of Mental Health v. DeMora*
- *United States Court of Appeals for the 9th District: Clark County Schools and the Nevada State Department of Education (2001)*
- *United States Court of Appeals for the 4th Circuit: Z.P. et al.(2005) v. Henrico County Public Schools, VA*
- *R.T. et al.(2006) v. Henrico County Public Schools, VA*
- *J.P. v. School Board of Hanover County, VA (2008)*
- Other pertinent proceedings:
- *Potter, et al. v. Blue Cross Blue Shield of Michigan (2013)*. S. Eastern District Judge Stephen Murphy III noted that “ABA therapy is supported by numerous authorities...” Judge Murphy also stated that “denial of insurance coverage for this therapy on the grounds that the therapy is “experimental” was arbitrary and capricious under federal law”.
- *U.S. District Court for the Eastern District of Michigan (2011)*. Class-action suit filed against Michigan Medicaid system for failing to make ABA-based therapies available to families.
- *District Court of Eastern Pennsylvania: P.V. et al v. School District of Philadelphia (2013)*. Placement or transfer of students with autism without parent approval violates IDEA.

#### **3.2 Federal Legislation**

The following laws offer support or recognition to the importance of ABA or ABA-based procedures:

- The Education of the Handicapped Act (1970)/ Individuals with Disabilities Education Act (IDEA, 1997/2004) requires that participating state and local educational agencies “assure that handicapped children and their parents are guaranteed procedural safeguards with respect to the provision of free appropriate public education.” Functional behavior assessment (FBA; the standard behavioral assessment procedure of ABA) was codified in IDEA (2004) which requires that an FBA inform behavior-intervention plans developed to ameliorate problem behavior in children with disabilities.

For a more comprehensive list of state and federal initiatives, readers are encouraged to review:  
<http://www.wrightslaw.com/caselaw.htm>

Insurance coverage laws: Federal and state initiatives have led to widespread insurance reform with respect to coverage of ABA services.

i. *Caring for Military Kids with Autism Act (2011)*: ABA treatment found to be medically necessary treatment, not educational

ii. *Burge v. United States of America (2012)*: ABA services were found to be medically necessary and TRICARE military insurance was found liable for costs associated with an ABA in-home program

iii. State Legislation: Since 2007, over half of the states in the U.S. have pursued insurance reform and have been successful in passing bills which require insurers to pay for autism services, with many explicitly listing ABA services.

For a comprehensive list of insurance reform, state-by-state, see these websites:

- <http://www.ncsl.org/issues-research/health/autism-and-insurance-coverage-state-laws.aspx>
- <http://www.autismspeaks.org/advocacy/insurance/faqs-state-autism-insurance-reform-laws>

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