



# CIGNA MEDICAL COVERAGE POLICY

The following Coverage Policy applies to all plans administered by CIGNA Companies including plans administered by Great-West Healthcare, which is now a part of CIGNA.

**Subject Intensive Behavioral Interventions**

**Effective Date ..... 12/15/2010**  
**Next Review Date ..... 12/15/2011**  
**Coverage Policy Number ..... 0499**

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## Hyperlink to Related Coverage Policies

Attention-Deficit/Hyperactivity Disorder (ADHD): Assessment and Treatment

Autism Spectrum Disorders/Pervasive Developmental Disorders: Assessment and Treatment

### INSTRUCTIONS FOR USE

Coverage Policies are intended to provide guidance in interpreting certain **standard** CIGNA HealthCare benefit plans as well as benefit plans formerly administered by Great-West Healthcare. Please note, the terms of a participant's particular benefit plan document [Group Service Agreement (GSA), Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a participant's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a participant's benefit plan document **always supercedes** the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable group benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. Proprietary information of CIGNA. Copyright ©2010 CIGNA

## Coverage Policy

Many benefit plans specifically exclude behavioral training or services that are considered educational and/or training in nature. In benefit plans where this exclusion is present, services that are considered behavioral training such as intensive behavioral interventions would not be covered. In addition, coverage of intensive behavioral interventions and/or treatment of autism spectrum disorders (ASD) may be governed by state and/or federal mandates. Please refer to the applicable benefit plan document to determine terms, conditions and limitations of coverage.

**CIGNA does not cover intensive behavioral interventions (e.g., early intensive behavior intervention [EIBI], intensive behavior intervention [IBI], Lovaas therapy, applied behavior analysis [ABA]) for any indication because it is considered experimental, investigational or unproven.**

## General Background

Intensive behavioral interventions are comprehensive treatment programs that utilize a combination of interventions with the aim of treating skill development and behavior problems. They have been proposed to treat autism spectrum disorders as well as other conditions that involve behavioral difficulties. The programs emphasize early intervention, individualization of treatment and an intensive approach. The programs may also be referred to as early intensive behavior intervention (EIBI), intensive behavior intervention (IBI) or early intensive behavioral treatment (EIBT). At times, the terms EIBI, IBI, EIBT are used interchangeably with applied

behavior analysis (ABA), Lovaas therapy or Lovaas University of California Los Angeles (UCLA) Program. These programs started in the 1980s, as researchers began to report positive outcomes of early intensive behavior intervention programs, including increases in developmental levels, gains in intelligence quotient (IQ) scores, improvements in social behavior, and decreases in signs of autism.

These programs incorporated behavior modification and applied behavior analysis. Behavior analysis is a behavioral assessment of the child and environmental conditions that may be used to help the child develop higher skills through behavioral procedures. These methods are based on research in the application of learning principles to the education of autistic children and incorporate behavior modification, training and education. The Lovaas Model of Applied Behavior Analysis is a form of ABA initially started at UCLA and currently provided at various Lovaas clinics. Procedures that strengthen desired behaviors and/or decrease undesirable behaviors are used as part of an individualized intervention plan (Volkmar, et al., 1999). The programs are intensive and range from 15 to 40 hours per week, delivered over a long period of time. The programs are increasingly utilized by school systems as an intervention that is part of the individualized educational plan (IEP). In younger children these treatments may also be provided in the home. The intensive behavior programs focus on identifying behaviors that interfere with normal developmental processes, understanding the relationship between a behavior and the child's environment and modifying those behaviors in such a way so as to improve the child's functional capacity. Treatment goals focus on improving adaptive behavior, language/communication skills, decreasing problem behaviors, as well as improving cognitive/intellectual status and academic/developmental achievements. Treatment provided with the primary objective of improving academic performance and cognitive/intellectual status is considered educational or training in nature.

Definitive patient selection criteria, including patient characteristics, have not been established for these interventions. There are questions remaining regarding the optimum duration and intensity of the treatment. The therapy may be provided by a variety of professionals including psychologists, speech-language pathologists, physicians, social workers, teaching professionals, and behavioral therapists. There is a formal credentialing process of professional behavior analysts through the Behavior Analyst Certification Board® (BACB) for Board Certified Behavior Analysts® (BCBA) or Board Certified Assistant Behavior Analysts® (BCaBA). This certification is relatively new and not all providers have gone through the education and certification process. While there are formal programs for Applied Behavior Analysis, many providers who render this treatment have not received this training.

Intensive intervention programs other than those that focus on behavior analytic treatment have also been developed. The TEACCH program (Treatment and Education of Autistic and Related Communication Handicapped Children) has been implemented in many special education programs for autistic children, and includes behavioral analytic approaches for some skills but uses other interventions as well. The focus of the Colorado Health Sciences program (Denver Model) is learning through play based on Piaget and object relations theories. Behavior analytic techniques are included for behavior management. The Rutgers program is known as the Douglas Developmental Disabilities Center (based at Rutgers university), has three programs small-group segregated preschool, and integrated preschool and intensive home-based intervention, and uses ABA techniques and similarities to the Lovaas program. Families are trained in the program and provide the treatment or hire staff trained in the program. The Learning Experiences and Alternative Program (LEAP) includes both a preschool program and a behavioral skill training program for parents, as well as national outreach activities. The program includes an individualized curriculum that targets goals in social, emotional, language, adaptive behavior, cognitive, and physical developmental areas (National Research Council [NRC], 2001).

### **Intensive Behavioral Interventions for Autism Spectrum Disorders**

The autism spectrum disorders (ASD) are a range of complex behavioral disorders that are also referred to as pervasive developmental disorders (PDD). The disorders range from the condition referred to as autism or autistic disorder to Asperger's syndrome. Two other disorders in the spectrum are Rett's disorder and childhood disintegrative disorder. When a child has symptoms of autistic disorder or Asperger's syndrome, but does not meet the specific criteria for either, the diagnosis is described as pervasive developmental disorder not otherwise specified (PDD-NOS), which is also referred to as atypical PDD or atypical autism. All of these disorders are characterized by varying degrees of impairment in communication skills, reciprocal social interactions, and restricted, repetitive and stereotyped patterns of speech, interests and behavior (National Institute of Mental Health [NIMH], 2004/2010).

There are no medical interventions that are effective in achieving a cure for autism; however, the condition may be managed through a combination of behavioral, pharmacological and educational interventions. The American Academy of Child & Adolescent Psychiatry (AACAP) practice parameters regarding assessment of children, adolescents and adults with autism and other pervasive developmental disorders note that treatments proposed should be based on solid, high-quality empirical evidence (Volkmar, et al., 1999). The AACAP guidelines note that educational services (e.g., including special education, some forms of behavior modification and other services) are the central and integral aspect of the treatment for ASD. Psychosocial interventions include parent training that involves behavior modification techniques and referral to support groups. It has been noted in the literature that there is no single approach that is best for all individuals with ASD.

### **Literature Review—Intensive Behavioral Interventions for Autism Spectrum Disorders**

The outcomes utilized in the research for intensive behavioral interventions include measurements that address adaptive behavior, language/communication skills, problem behaviors, parental/family well-being, as well as measurements for cognitive/intellectual status and academic/developmental achievement (ECRI, 2009). A widely used measure of adaptive behavior used in many of the studies is the Vineland Adaptive Behavior Scales for measurement of adaptive behavior. This scale provides measurement in the following domains: communication; daily living skills; socialization; and for children under five years of age, motor skills. These scales are a well-studied, validated instrument completed during an interview with a parent or teacher (ECRI, 2009). Measures for intellectual/cognitive abilities include the Bayley scales and Standard Binet Intelligence Scale. The Bayley scales is designed for children up to 42 months of age and is appropriate for children with intellectual disabilities or those whose language skills are not sufficiently advanced to take a full-scale intelligence test. The Reynell developmental language-scales are utilized for assessment of language-communication outcome measurements.

### **Systematic Reviews/Technology Assessments:**

Virués-Ortega (2010) reported on a meta-analysis of 22 clinical trials of ABA intervention for children with autism. The results suggest that long-term, comprehensive ABA intervention leads to (positive) medium to large effects in terms of intellectual functioning, language development, acquisition of daily living skills and social functioning in children with autism. It was noted that although favorable effects were found across all outcomes, language-related outcomes (IQ, receptive and expressive language, communication) were superior to non-verbal IQ, social functioning and daily living skills, with effect sizes approaching 1.5 for receptive and expressive language and communication skills. There were several methodological issues relating to the ABA trials. Control groups were generally those who received eclectic interventions. There was seldom randomization to group assignment found in the studies. In general, quality standards were inconsistently observed including standards specific to this field, e.g., comparable pre-intervention IQ across groups and treatment fidelity standards.

An evidence report published by ECRI Institute examined comprehensive educational and behavioral interventions for autism spectrum disorders (ASD) (ECRI, 2009). Seven controlled randomized and non-randomized studies involving 261 children were included in this report. Three studies compared early intensive behavioral intervention (EIBI) to standard care; three compared EIBI to an intensive “eclectic” or mixed intervention; and two compared clinic-directed EIBI to parent-directed EIBI. The review included quantitative assessment and qualitative conclusion. The outcomes evaluated included cognitive/intellectual status, language/communication skills, adaptive behavior, problem behaviors, academic/developmental achievement, and parental/family well-being. Findings of the review included:

- Regarding the question of the interventions improving outcomes for cognitive/intellectual status when compared to no treatment, wait-list, or standard care it was noted that:
  - After one year of treatment children with ASD who receive EIBI score higher on IQ tests than children who receive standard care. The estimated effect size is a standardized mean difference (SMD of 0.750 (CI 0.32 to 1.199,  $p < 0.001$ ) which corresponds to a between-group difference of 14.8 points in overall IQ.
  - Children with ASD who receive EIBI are more likely to achieve an IQ score within normal range for typically developing children than children who receive standard care. The estimated effect size is an odds ratio of 2.616 (95% CI 1.160 to 5.902,  $p = 0.021$ )
- Regarding the question of the interventions improving outcomes for adaptive behavior when compared to no treatment, wait-list, or standard care it was noted that after one year of treatment, children with ASD who receive EIBI perform more adaptive behaviors as indicated by higher scores on the Vineland Adaptive Behavior Composite Scale than children who receive standard care the estimated effect size

is an SMD of 0.952 (95% 0.507 to 1.400,  $p < 0.001$ ) which corresponds to a between-group difference of 10.7 points.

- The evidence was found to be insufficient to determine whether children with ASD who receive EIBI continue to demonstrate these effects at later follow-up times (>one year). For the remainder of the outcomes, the limited size and quality of the evidence prevented the drawing of conclusions.
- Regarding the question of one comprehensive education or behavioral intervention more effective than another in improving outcomes for children with ASD the report noted the a conclusion could not be made due to either clinical differences between the studies or limited size and quality of the evidence.
- Regarding the question of home-based interventions whose structure and intensity are similar to comprehensive educational or behavioral interventions provided in other settings (e.g., center, clinical) and whether it is more effective in improving outcomes the report noted that differences in the studies precluded determination of whether one method of delivery is more effective than the other.

**Level of evidence: 2**

Spreckley et al. (2009) reported on a systematic review and meta-analysis of the effectiveness of applied behavior intervention (ABI) programs for preschool children with ASD in areas of cognitive, adaptive behavior, and language development. Thirteen studies met the inclusion criteria. Six of these studies were randomized or quasi-randomized controlled trials with adequate methodological quality. Four of the studies had adequate data to enable meta-analysis to be performed. The meta-analysis of these studies indicated that ABI did not result in significant improvement in cognitive, language, or adaptive behavioral outcomes when compared with standard care. The analysis concluded that compared with standard care, in the cognitive/intellectual area, ABI programs did not significantly improve the cognitive outcomes of children in the experimental group who scored a standardized mean difference (SMD) of 0.38 (95% confidence interval [CI]  $-0.09$  to  $0.84$ ;  $p = .1$ ). In area of language: no additional benefit was found over standard care for expressive language; SMD of 0.37 (95%CI  $-0.09$  to  $0.84$ ;  $p = .11$ ), for receptive language: SMD of 0.29 (95%CI  $-0.17$  to  $0.74$ ;  $p = .22$ ). In the area of adaptive behavior: SMD of 0.30 (95%CI  $-0.16$  to  $0.77$ ;  $p = .20$ ). Limitations included: high variability in the studies included; difficulty establishing control groups; no standardization of the comparison intervention; poor homogeneity; limited information on retention in the intervention groups; and lack of strict inclusion and exclusion criteria. **Level of evidence: 2**

A systematic review was performed by Blue Cross Blue Shield Association (BCBSA), Technology Evaluation Center (TEC) (2009) that examined the research literature on the use of early intensive behavioral intervention (EIBI) based on Applied Behavior Analysis among young children with autism, pervasive developmental disorder, or Asperger's disorder. The review included sixteen studies that included two randomized, controlled trials, nine nonrandomized comparative studies; and five single-arm studies with no studies found that included children with Asperger's disorder. It was noted that overall the quality and consistency of results of the body of evidence are weak and that consequently no conclusions can be drawn from this literature on how well EIBI works. The findings included:

- Regarding the question of how effective is EIBI in improving the functioning of children with ASD and how it compares to other early intervention approaches: two randomized, controlled trials provided some evidence; however, however, there were weaknesses in research design, differences in the treatments and outcomes compared, and inconsistent results. The evidence is insufficient to determine whether or not EIBI is more effective than alternative approaches for children with ASDs.
- Regarding the question if patient characteristics can be identified that predict better outcomes from EIBI: this question cannot be answered. Age and cognitive functioning (measured with IQ) at intake were the most commonly studied characteristics in the studies. Three of the four studies examining the impact of pretreatment cognitive functioning found that it significantly predicted outcomes, while one (a randomized, controlled trial) did not. The findings on age were variable, with some studies suggesting that younger age at the start of therapy is a predictor of better outcomes, while other studies found no difference based on initial age.
- Regarding the question of whether the effect of EIBI varies with intensity of treatment: the findings in this area were inconsistent and no conclusions can be drawn.
- Additional research is needed to identify those characteristics of treatments (e.g., content, technique, intensity, starting and ending age) that maximize its effectiveness.

Seida et al. (2009) conducted a review of systematic reviews of the effectiveness of psychosocial interventions for ASD. The review included 30 systematic reviews. The majority of reviews evaluated interventions based on

behavioral therapy (n=9) or communication-focused therapies (n=7). Positive outcomes were reported in most of the reviews; however methodological quality of the reviews was generally poor. The review included five broad types of psychosocial treatments: interventions based on behavioral theory such as applied behavior analysis, communication-focused interventions, parent-mediated interventions, sensory motor interventions, and social skills development interventions. It was noted that all of the nine reviews on behavioral therapy interventions were rated as having low methodological quality. In particular the reviews lacked a comprehensive search strategy, reliable study selection and assessment of the quality of primary studies. While some reviews conclude that there robust evidence to support an intervention, there remains little information of the relative effectiveness of one intervention compared with another.

Eldevik et al. (2009) reported on a systematic review of EIBI for children with autism. The review included nine studies which were controlled designs either having a comparison or a control group. A meta-analysis was completed that for a standardized mean difference effect size for two available outcome measures: change in full-scale intelligence and/or adaptive behavior composite. The average effect size was 1.10 for change in full-scale intelligence (95% confidence interval - .87, 1.34) and .66 (95% confidence interval= .41, .90) for change in adaptive behavior composite. Limitations of this study include: the number of studies may be considered small; and the literature lacks comparisons between EIBI and other approaches, other than the eclectic one. Also, while there appears to be a clear difference in outcome between EIBI and the comparison intervention, it may be due to differences in the amount and frequency of supervision and training—there was not have enough data to control for this in the present study. The authors' note that based on the information in the studies included, it is apparent that the EIBI group in general received more frequent and more total hours of supervision and training which is a threat for the validity of conclusions about the superiority of EIBI in relation to comparison intervention. The authors conclude that while EIBI did produce large to moderate effect size in this review, randomized controlled trials comparing EIBI to other interventions are still needed, in particular, where the comparison intervention is of similar intensity and where staff receive similar training and supervision.

Howlin et al. (2009) conducted a systematic review of controlled studies of EIBI for young children with autism. The review included 11 studies, with two being randomized controlled trials. The studies varied with respect to the characteristics of children involved, the duration and intensity of interventions, and the methods used to assess outcome. The only variable reported consistently across all studies was IQ, and this measure was derived from different tests between and within studies. The authors noted that while EIBI is highly effective for some children, gains are not universal and some children make only modest progress while others show little or not change, at times with extremely lengthy periods in treatment. It is not clear for which children EIBI is most and least effective. There is an indication that the immediate impact of EIBI decreases over time, with the first year of treatment appearing to result in the most substantial gains. It is not clear what the optimal duration of therapy and the age at which is should begin. The authors also noted that, "there is also a need to demonstrate that EIBI is substantially more effective than alternative, high quality autism specific interventions, such as specialized preschool provision". It is noted in the review that in most of the studies that the alternative intervention has generally been of lower intensity and/or lesser quality than the EIBI program to which it is compared.

Reichow and Wolery (2008) conducted a comprehensive synthesis of early intensive behavioral interventions (EIBI) for young children with autism based on the UCLA Young Autism Project Model. The synthesis was comprised of three components: descriptive analyses; effect size analyses; and a meta-analysis. The review included data from 14 samples from 13 research reports. The selection of studies for this review involved seven inclusion criteria: study specified the EIBI was based on the UCLA model based on a replication of Lovaas; participants had diagnoses of autistic disorder, autism spectrum disorders (ASD), PDD, PDD-NOS; participants had a mean chronological age less than 84 months at the beginning of treatment; mean duration of EIBI was greater than or equal to 12 months; at least one child outcome measure was reported; experimental research designs (e.g., pre-test/post-test multiple-group design) or quasi-experimental research designs (i.e., nonequivalent control group design, one-group pre-test/post-test design) were used and (g) publication in English in a peer-reviewed journal. Effect sizes were calculated for the outcome data from the constructs of IQ, adaptive behavior, expressive language, and receptive language. The mean effect size was 0.69 ( $p < 0.001$ ) which took into account effect sizes for IQ, adaptive behavior, expressive language, and receptive language. There were more samples (12 of 14) that had sufficient data to calculate the effect sizes for IQ than for the other measures. Limitations of the review included that the inclusion criteria were narrow. In addition the studies included limitations such as: participants were not selected randomly, they were not assigned randomly to groups, study sizes were small, narrow and questionable measures were used and treatment fidelity data were

not reported. The authors concluded that, "No comparisons between EIBI and other widely recognized treatment programs have been published. Without comparisons between EIBI and empirically validated treatment programs, it is not possible to determine if EIBI is more or less effective than other treatment options."

**Studies:** Remington et al. (2007) reported on a non-randomized study of preschool children with autism treated either with early intensive behavioral intervention or treatment as usual. Children in the intervention group (n=23), that were identified on the basis of parent preference, received home-based early intensive behavioral intervention for two years. One-to-one teaching based on applied behavior analysis for 25.6 hours per week on average was delivered by trained tutors and parents. The comparison group (n=22) received their local education authorities' standard provision for young children with autism—a variety of interventions designed to ameliorate the impact of autism and enhance functioning, none of which were intensive or delivered on one-to-one basis for most of the time. Prospective assessment was performed before treatment, after 1 year of treatment, and again after 2 years. Norm-referenced instruments were used to gather the cognitive, language, and behavioral outcome data. The measurements included: for intellectual functioning the Bayley scales and Standard Binet Intelligence Scale fourth edition was used. The Bayley scales is designed for children up to 42 months of age and is appropriate for children with intellectual disabilities or those whose language skills are not sufficiently advanced to take a full-scale intelligence test. The Reynell developmental language-scales-third edition was utilized for language assessment. Adaptive skills were measured with the Vineland Adaptive Behavior Scale-Survey Form. In the area of child behavior the Positive Social subscale of the Nisonger Child Behavior Rating form along with the parent report versions of the Developmental Behavior Checklist were used. In the area of intellectual functioning and IQ, there was a significant main effect of group ( $p=.008$ ), but no interaction effect. Significant group effects (but no interactions) were also found for Vineland Daily Living Skills ( $p=.016$ ), and Vineland Motor Skills ( $p=.040$ ), but not for the Vineland Composite score or the Socialization and Communication domains. In all cases, the children receiving early intensive behavioral intervention appeared to out-perform the children in the comparison group. At baseline assessments the groups did not differ, but after 2 years, it was noted that there were strong differences that favored the intensive behavioral intervention in areas of intelligence, language, daily living skills, positive social behavior, and a statistical measure of best outcome for individual children.

Ben-Itzhak and Zachor (2007) reported on a study that assessed the relation between pre-intervention variables including cognition, socialization and communication, to outcome in young children with autism. The study included 25 children with autism who were enrolled in intensive behavior intervention. The children attended a center-based applied behavior analysis (ABA) program. A trained behavior analyst planned and supervised the individual intervention curriculum of each child and the treatment was provided one-on-one by skilled behavioral therapists for at least 35 weekly hours. The treatment included parents taught how to use behavioral methods at home and working with the program supervisor on developmental goals for use in natural environments. The children were separated into groups based on IQ scores and on the severity of social interaction and communication deficits. Six developmental-behavioral domains were assessed at pre- and post-one year of intervention times. The domains included imitation, receptive language, expressive language, nonverbal communication skills, play skills and stereotyped behaviors. After one year of intervention, significant progress was noted in all the six developmental-behavioral domains. Children with higher initial cognitive levels and children with fewer measured early social interaction deficits demonstrated an increased acquisition of skills in three developmental areas, receptive language expressive language and play skills. Better progress in receptive language skills was seen in both groups. Improved progress in expressive language was associated with the child's social abilities, while more significant progress in play skills was related to pre-intervention cognitive level.

Magiati et al. (2007) conducted a prospective study to compare outcome for pre-school children with ASD receiving autism-specific nursery provision or home-based early intensive behavioral intervention (EIBI) in a community setting. The study included 44 children, (aged 23- to 53-months) with ASD. Twenty-eight children were in EIBI home-based programs and 16 in autism-specific school based nursery provision which included a minimum of 15 hours per week. Cognitive, language, play, adaptive behavior skills and severity of autism were assessed initially and two years later. Improvements were noted in both groups in age equivalent scores but standard scores changed little over time. At follow-up, no significant group differences were noted in cognitive ability, language, play or severity of autism. The only difference approaching significance ( $p=.06$ ), in favor of the EIBI group, was for Vineland Daily Living Skills standard scores. There were large individual differences in progress, with intake IQ and language level best predicting overall progress.

Eikeseth et al. (2007) reported on outcomes for children who began intensive behavioral treatment between ages four and seven (mean age of 5.5 years). The children were assigned to either a behavioral treatment (n=13) or eclectic treatment (n=11 boys) based on staff availability. Children in both groups received treatment for a minimum of 20 hours a week from trained therapists at their local schools. The children in the behavioral group received ABA and the children remained in education programs that combined a variety of interventions (e.g., ABA, TEACCH, sensory integration and other approaches). In 2007, results were reported when the children had mean age of eight years, two months and follow-up was 31.4 months in the behavioral group and 33.3 in the eclectic group. When the children entered school the hours were reduced to a mean of 18 hours for the behavioral group and 16 hours for the eclectic group. Intellectual functioning was evaluated with the WPPSI-R, Wechsler Intelligence Scale for Children-Revised, or Bayley Scales of Infant Development-Revised. The behavioral treatment group showed larger increases in IQ and adaptive functioning than did the eclectic group ( $p < .05$ ). The largest gain was noted in IQ. The behavioral treatment group also displayed fewer aberrant behaviors and social problems at follow-up. The behavioral treatment group showed an increase of 25 points (from 62 to 87) as compared to 7 points (from 65 to 72) in the eclectic treatment group. Gains on the Vineland Adaptive Behavior Scales ranged from 9 points for Daily Living Skills to 20 points for Communication; in contrast, mean scores in the eclectic treatment group declined 6 to 12 points. Limitations of the study included that it was quasirandom rather than random group assignment, small sample size, and no direct quality control measures of treatment. The author notes that replications of the study are needed.

Sallows and Graupner (2005) reported on a study of children with autism that were randomly assigned to a clinic-directed group, replicating the parameters of the early intensive behavioral treatment developed at UCLA, or to a parent-directed group that received intensive hours but less supervision by equally well-trained supervisors (Wisconsin Early Autism Project [Madison]). Twenty-three children were assigned to either clinic-directed group (n=13) replicating parameters of the UCLA intensive behavioral treatment or to the parent-directed group (n=10), which was intended to be a less intensive treatment. Children in the clinic group received an average of 39 hours of direct treatment in the first year and 37 in the second year with gradual decrease in hours as children entered school. The average for the parent-directed group was 32 hour in first year, 31 in the second year with one family choosing to receive 14 hours both years. Among the 23 children, the average Full Scale IQ increased from 51 to 76. After one year of treatment eight of the children reached IQ of 85 or higher, (five clinic-directed and three parent directed) and three children reached this level after three to four years of treatment (three parent-directed) which was a total of 11 or 48% of the children. It was noted that children with higher pre-treatment IQs were more likely to reach four year IQs in the average range. It was noted that these children also demonstrated increases in language and adaptive areas —succeeding in regular first or second grade classes, demonstrating generally average academic abilities, spoke fluently and had peers with whom they played regularly. The parent-directed children did approximately as well as the clinic-directed children which was unexpected. It was noted that low IQ (below 44) and absence of language (no words of 36 months) predicted limited progress. It is planned that these children will be followed for several more years to determine outcome in adolescence and adulthood. At this time, it does not appear that follow-up studies have been published.

Howard et al. (2005) studied the effects of three treatment approaches on preschool-age children with autism spectrum disorders (ASD). Intensive behavior analytic intervention (IBT) with a 1:1 adult: child ratio at 25–40 hours a week was provided to 29 children in community, home and school setting. Intensive “eclectic” intervention, which was a combination of methods (combination of TEACCH, sensory integration therapy and some applied analysis methods) with a 1:1 or 1:2 ratio, at 30 hours a week was provided to a comparison group (n=16) in public special education classrooms (AP group). A second comparison group (GP) (n=16) in a non-intensive public early intervention programs received a combination of methods, provided in small groups, at 15 hours per week. Standardized tests for cognitive ability and intellectual functioning included the Bayley Scales of Infant Development. The Reynell Developmental Language Scales was used to assess receptive and expressive language development. Adaptive skills were measured with the Vineland Adaptive Behavior Scales. Testing was administered at intake and approximately 14 months after treatment began. At intake the groups were similar on key variables. It was noted that at follow-up, there did not appear to be statistically significant differences between the mean scores of children in the AP and GP groups. The IBT group had higher mean scores in all domains than the AP and GP groups that appeared to be statistically significant. An exception to this general finding was in the motor skills domain, which did not produce a statistically significant group difference when results were expressed as learning rates. At follow-up, the IBT group had mean standard scores in the normal range on cognitive, non-verbal, communication, and motor skills, whereas the only mean score in the normal range for the AP and GP groups was in motor skills. Limitations of the study included:

assignment was parent-determined, not random; the examiners who performed the assessments were not blind as to the group assignments at follow-up testing; results were analyzed in terms of performances on standardized, norm-referenced assessments conducted in formal testing situations, rather than repeated direct observational measurement of behavior in situ that characterized applied behavior analysis.

Sheinkopf and Siegel (1998) conducted a small (n=22) prospective, case-matched controlled trial which partially replicated the UCLA project. Children received less intensive treatment, an average of 18 to 25 hours/week, and providers received less supervision from senior staff. After treatment, all children in the experimental group (n=11) had IQ estimates above 65 (one had missing data). By contrast, only 6 of the 11 children in the control group (n=11) had IQ above 65 at follow-up. The study suggested that treatment need not be as intensive as that provided in the UCLA Lovaas study to be effective. Definitive conclusions could not be made, however, because of the small sample size.

Lovaas therapy is based on a prospective, quasi-randomized trial published by O. Ivar Lovaas in 1987. In the University of California, Los Angeles (UCLA) Young Autism Project, subjects were assigned to an intensive-treatment experimental group (n=19) or control group (n=19) (Lovaas, et al., 1987). Outcome measures were limited to IQ and school placement. Student therapists trained in the technique provided more than 40 hours of one-on-one treatment per week in the home, school or community for two or more years to those assigned to the experimental group. Parents received extensive training in the treatment procedures and worked as part of the treatment team to ensure that treatment continued during most of the child's waking hours. The primary teaching method relied on discrete trial discrimination learning and compliance with simple commands. Aggressive and self-stimulatory behaviors were ignored and appropriate behaviors were reinforced. In some cases physical punishment (slap on the thigh) or verbal reprimands (a loud "No!") were used to decrease inappropriate behavior. Children in the minimal treatment group received up to 10 hours per week of one-on-one behavioral treatment combined with special education. A second control group was created by selecting 21 children from a larger group (62) of young autistic children treated at another facility. These participants were never referred to or evaluated by the Lovaas team. Data from this control group were included in the study to guard against the possibility that subjects referred to the UCLA study were likely to have more or less favorable outcomes. The mean age and sex of participants in the second control group were not reported, nor were details on the specific treatment provided. The lack of random assignment to experimental or control groups and the fact that subjects were assigned based on proximity to the UCLA campus and on staff availability raises the possibility of selection bias. The UCLA Lovaas study reported that 47% of those in the intensive treatment group achieved normal intellectual and educational functioning, with normal IQ scores and successful first-grade performance in public schools. Another 42% were reported as mildly retarded and assigned to classes for the language delayed, and only 10% were deemed profoundly retarded and assigned to classes for the autistic/retarded. No children in the minimal-treatment control group and only one of 21 in the second control group (5%) achieved normal educational and intellectual functioning. A total of 45% were reported as mildly retarded and placed in language-delayed classes, and 53% were severely retarded and placed in autistic/retarded classes. Based on the results of this study, the researchers felt that Lovaas therapy was an effective treatment option for children with autism. A follow-up study (McEachin, et al., 1993) was conducted to assess the long-term effects of therapy provided in the Lovaas trial and concluded that long-lasting and significant gains could be made with early intensive behavioral treatment.

There were a number of methodological flaws identified in the above Lovaas and McEachin studies, including:

- very small sample size
- group assignment based on staff availability, not truly randomized
- sample not representative of autism population (higher level of functioning, children on medications excluded, ratio of males to females not representative of that in population)
- autism subset classification of subjects not available
- different IQ tests used for different children at intake (examiner selection)
- social functioning not assessed after treatment; no outcome measures other than IQ scores and school placement

A review of the literature by Smith (1999) regarding outcomes of early intervention for children with autism indicates that there were several school-based studies performed on the subject of LEAP (Learning Experiences: an Alternative Program), and the Princeton Child Development Institute (PCDI) program. The

studies were conducted using intensive behavioral therapy during the 1980s and early 1990s, yielding inconsistent results (Smith, 1999). Improvements were reported, but the nature of the improvements varied significantly across studies (Smith, 1999). No clear correlation could be made between treatment intensity, treatment model and outcome (Smith, 1999). All of these studies contained many methodological weaknesses, including small numbers of patients and a lack of a procedure to randomly assign participants to groups. Participants were diagnosed as autistic by independent clinicians, but in most of these studies a standardized diagnostic tool, the Childhood Autism Rating Scale (CARS), was not used. Some children may not have met generally accepted autism diagnostic criteria (Smith, 1999).

### **Intensive Behavioral Interventions for Other Conditions**

Although intensive behavioral interventions were developed initially to treat children with autism spectrum disorders (ASD) it has been recently proposed to treat children with other conditions, including learning disabilities and Attention-Deficit/Hyperactivity Disorder (ADHD). There is a lack of scientific evidence to support the efficacy of the programs for ADHD, learning disabilities or other conditions.

### **Professional Societies/Organizations**

**Alberta Heritage Foundation for Medical Research (AHFMR):** The AHFMR published a technology assessment of intensive intervention programs based on reviews by the British Columbia Office of Health Technology Assessment (BCOHT), Emergency Care Research Institution (ECRI), and a review of 12 peer-reviewed outcome studies published by Tristram Smith (Ludwig and Harstall, 2001). The assessment evaluated Lovaas therapy, TEACCH, the Rutgers Program, the Denver Program and the LEAP Program, and concluded that there is insufficient evidence to establish a relationship between the intensity and duration of any intensive intervention treatment program and outcome measures, such as intelligence tests, language development and adaptive behavior tests. The assessment noted that, "Because of the methodological limitations and weaknesses of existing research, evidence remains limited on the efficacy and effectiveness of one intervention in comparison to another. It does appear that children improve in functioning (as measured by various indices) with behavioural intervention programs. However, it remains to be determined if any one program is more effective than another program."

**American Academy of Child & Adolescent Psychiatry (AACAP):** The AACAP published practice parameters for the assessment and treatment of children, adolescents, and adults with autism and other pervasive developmental disorders (Volkmar, et al., 1999). The parameters note that treatments proposed for these conditions should be based on solid, high-quality empirical evidence). The guidelines note that educational services (e.g., including special education, some forms of behavior modification and other services) are the central and integral aspect of the treatment for ASD. Psychosocial interventions include parent training that involves behavior modification techniques and referral to support groups. It has been noted in the literature that there is no single approach that is best for all individuals with ASD.

**American Academy of Pediatrics (AAP):** A clinical report for the management of children with autism spectrum disorders (ASD) was published by the American Academy of Pediatrics (AAP) (Myers, et al., 2007). The report notes that, "Educational interventions, including behavioral strategies and habilitative therapies, are the cornerstones of management of ASDs. These interventions address communication, social skills, daily-living skills, play and leisure skills, academic achievement, and maladaptive behaviors." The AAP report notes that these programs may differ in philosophy and relative emphasis on particular strategies. The early childhood educational programs share many common goals. There is an increasing consensus that important principles and components of effective early childhood intervention for children with ASDs include the following (Myers, et al., 2007):

- An entry into intervention as soon as an ASD diagnosis is seriously considered rather than deferring until a definitive diagnosis is made
- A provision of intensive intervention, with active engagement of the child at least 25 hours per week, 12 months per year, in systematically planned, developmentally appropriate educational activities designed to address identified objectives
- A low student-to-teacher ratio to allow sufficient amounts of one-to-one time and small-group instruction to meet specific individualized goals
- An inclusion of a family component, including parent training as indicated

- A promotion of opportunities for interaction with typically developing peers to the extent that these opportunities are helpful in addressing specified educational goals
- An ongoing measurement and documentation of the individual child's progress toward educational objectives, resulting in adjustments in programming when indicated
- An incorporation of a high degree of structure through elements such as predictable routine, visual activity schedules, and clear physical boundaries to minimize distractions
- An implementation of strategies to apply learned skills to new environments and situations (generalization) and to maintain functional use of these skills
- The use of assessment-based curricula that address the following:
  - functional, spontaneous communication
  - social skills, including joint attention, imitation, reciprocal interaction, initiation, and self-management
  - functional adaptive skills that prepare the child for increased responsibility and independence
  - reduction of disruptive or maladaptive behavior by using empirically supported strategies, including functional assessment
  - cognitive skills, such as symbolic play and perspective taking
  - traditional readiness skills and academic skills as developmentally indicated

In regard to the efficacy of education interventions, the AAP report notes that the treatment “should be based on sound theoretical constructs, rigorous methodologies, and empirical studies of efficacy. 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. However, there is still a need for additional research, including large controlled studies with randomization and assessment of treatment fidelity. Empirical scientific support for developmental models and other interventions is more limited, and well-controlled systematic studies of efficacy are needed.” (Myers, et al., 2007).

**National Research Council (NRC):** The assessment by the NRC on educational intervention for children with autism included a review of comprehensive programs for the treatment of ASD (NRC, 2001). They note that although there are limitations in outcome research, it is likely that many children benefit substantially from the programs. They include a review of ten model programs in their report, but note that not all existing programs are included. The report notes that “while substantial evidence exists that treatments can reach short-term specific goals in many areas, gaps remain in addressing larger questions of the relationships between particular techniques, child characteristics, and outcomes.”

**New Zealand Health Technology Assessment (NZHTA):** NZHTA reviewed “the most recent and best evidence” for the effectiveness of behavioral and skill-based early intervention in the treatment of young children with Autism Spectrum Disorder (Doughty, 2004). The NZHTA determined that the majority of recent primary studies reviewed documented some improvement associated with the intervention; however, it remains to be determined whether any specific early and/or intensive intervention program is more effective than others. The included studies covered a range of interventions, and it was not clear that the definition of intensive behavioral treatment, parent training, or parent-managed behavioral therapy were uniform across studies. Details regarding intensity and duration of interventions were not documented in all studies, and most sample sizes were small. The NZHTA concluded that, given these and other limitations, the primary studies provide only very preliminary evidence regarding the effectiveness of behavioral and skill-based early interventions, and that further research with larger sample sizes from multi-site collaborations using identical methods and outcome measures is needed.

**Scottish Intercollegiate Guidelines Network (SIGN):** Evidenced-based clinical guidelines for the assessment, diagnosis and clinical interventions for children and young people with autism spectrum disorders have been published by SIGN (2007). Regarding intensive behavioral programs they note that most intensive behavioral programs for autism spectrum disorders (ASD) are based on principles of behavior modification using applied behavior analysis (ABA). The programs are intensive, usually involving 20-140 hours or intervention per week. The most well known is the Lovaas program. The recommendation is that the Lovaas program should not be presented as an intervention that will lead to normal functioning. They report did recommend “behavioural interventions be considered to address a wide range of specific behaviors in children

and young people with ASD, both to reduce symptom frequency and severity and to increase the development of adaptive skills.”

### Summary

There is insufficient evidence in the published peer-reviewed medical literature to demonstrate the comparative effectiveness and impact of intensive behavioral interventions (e.g., early intensive behavior intervention [EIBI] intensive behavior intervention [IBI], Lovaas therapy, applied behavior analysis [ABA]) on long term outcomes for improvements in functional adaptation, communication skills, intellectual function, or other measures for children with autism or other conditions. There is a significant amount of variation in the different types of intensive behavioral interventions, particularly in areas of approach, intensity, delivery, duration, and scope of the treatment. This variation, along with the quality and consistency of the published studies, leads to difficulty in interpretation of the research regarding this intervention. The comparative effectiveness of specific intervention strategies, the duration and intensity of the interventions and the characteristics of children who respond have not been established.

### Coding/Billing Information

**Note:** This list of codes may not be all-inclusive.

**There are no specific codes that represent Intensive Behavioral Interventions/ABA. Intensive Behavioral Interventions/ABA may be submitted using various codes including, but not limited to the codes below. Intensive Behavioral Interventions/ABA are considered Experimental/Investigational/Unproven and not covered regardless of the code submitted.**

90804	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 20 to 30 minutes face-to-face with the patient
90805	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 20 to 30 minutes face-to-face with the patient; with medical evaluation and management services
90806	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 45 to 50 minutes face-to-face with the patient
90807	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 45 to 50 minutes face-to-face with the patient; with medical evaluation and management services
90808	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 75 to 80 minutes face-to-face with the patient;
90809	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility, approximately 75 to 80 minutes face-to-face with the patient; with medical evaluation and management services
90810	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an office or outpatient facility, approximately 20 to 30 minutes face-to-face with the patient;
90811	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an office or outpatient facility, approximately 20 to 30 minutes face-to-face with the patient; with medical evaluation and management services
90812	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an office or outpatient facility, approximately 45 to 50 minutes face-to-face with the patient;
90813	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an

	office or outpatient facility, approximately 45 to 50 minutes face-to-face with the patient; with medical evaluation and management services
90814	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an office or outpatient facility, approximately 75 to 80 minutes face-to-face with the patient;
90815	Individual psychotherapy, interactive, using play equipment, physical devices, language interpreter, or other mechanisms of non-verbal communication, in an office or outpatient facility, approximately 75 to 80 minutes face-to-face with the patient; with medical evaluation and management services

<b>HCPCS Codes</b>	<b>Description</b>
H0046	Mental Health Services, not otherwise specified
H2014	Skills training and development, per 15 minutes
H2017	Psychosocial rehabilitation services, per 15 minutes
H2018	Psychosocial rehabilitation services, per diem
H2019	Therapeutic behavioral services, per 15 minutes
H2020	Therapeutic behavioral services, per diem

<b>ICD-9-CM Diagnosis Codes</b>	<b>Description</b>
	All codes

\*Current Procedural Terminology (CPT®) © 2010 American Medical Association: Chicago, IL.

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## Policy History

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<u>Pre-Merger Organizations</u>	<u>Last Review Date</u>	<u>Policy Number</u>	<u>Title</u>
CIGNA HealthCare	12/15/2009	0499	Intensive Behavioral Interventions

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Connecticut General Life Insurance Company has acquired the business of Great-West Healthcare from Great-West Life & Annuity Insurance Company (GWLA). Certain products continue to be provided by GWLA (Life, Accident and Disability, and Excess Loss). GWLA is not licensed to do business in New York. In New York, these products are sold by GWLA's subsidiary, First Great-West Life & Annuity Insurance Company, White Plains, N.Y.