Policy Number	**PSY301.021**
Policy Effective Date	**05/15/2024**
Policy End Date	**05/14/2025**

Applied Behavior Analysis (ABA) for Autism Spectrum Disorder (ASD) Diagnosis

Table of Contents

Related Policies (if applicable)
None

Disclaimer

Carefully check state regulations and/or the member contract.
Each benefit plan, summary plan description or contract defines which services are covered, which services are excluded, and which services are subject to dollar caps or other limitations, conditions or exclusions. Members and their providers have the responsibility for consulting the member's benefit plan, summary plan description or contract to determine if there are any exclusions or other benefit limitations applicable to this service or supply. **If there is a discrepancy between a Medical Policy and a member's benefit plan, summary plan description or contract, the benefit plan, summary plan description or contract will govern.**

Legislative Mandates

EXCEPTION: For Illinois only: Illinois Public Act 103-0458 [Insurance Code 215 ILCS 5/356z.61] (HB3809 Impaired Children) states all group or individual fully insured PPO, HMO, POS plans amended, delivered, issued, or renewed on or after January 1, 2025 shall provide coverage for therapy, diagnostic testing, and equipment necessary to increase quality of life for children who have been clinically or genetically diagnosed with any disease, syndrome, or disorder that includes low tone neuromuscular impairment, neurological impairment, or cognitive impairment.

Coverage

NOTE 1: State Legislation may apply. Carefully check for legislative mandates that may apply for each plan.

NOTE 2: When coverage of Applied Behavior Analysis (ABA) and/or Early Intensive Behavioral Intervention (EIBI) is state-mandated or specifically included in a member's benefit plan for treatment of Autism Spectrum Disorder, the following criteria will be applied for:

A. Initial Assessment, or
B. Initial therapy, or
C. Continued therapy, or
D. Discontinuation of therapy.

A. Criteria for Initial Assessment (ALL criteria must be met):

1. The medical records include both a confirmation that a recent (initial or updated within 36 months) Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnosis of autism spectrum disorder (ASD) has been established by formal developmental and/or psychometric evaluation (**see NOTE 3**), and a recommendation for ABA from:
   - A qualified diagnostic physician or diagnostic specialist (i.e., primary care physician whose specialty is family practice, internal medicine, or pediatrics; or
   - A physician who is board certified in developmental behavioral pediatrics, neurodevelopmental pediatrics, child neurology, or adult or child psychiatry; or
   - A licensed clinical psychologist, doctoral level; AND
2. The diagnosis of ASD and initiation of ABA treatment are within any applicable guidelines specified in the member's benefit plan design or state mandate for treatment; AND
3. Behavioral or skill-deficits are present that:
   - Present a health or safety risk to self or others (such as but not limited to self-injury, aggression toward others, destruction of property, stereotyped and/or repetitive behaviors, elopement, and severe disruptive maladaptive behavior) but this health or safety risk does not necessitate out of home placement; OR
   - Interfere with significant home, community, or age-appropriate activities; such as absence of developmentally appropriate adaptive, social, or functional skills that are fundamental to maintaining health, social inclusion, and increased independence; AND
4. The member has sufficient cognitive, intellectual, and verbal abilities to reasonably expect active participation in treatment aimed at developing improved independence and functional abilities.

NOTE 3: Letters of medical necessity, visit or encounter notes, prescriptions or referral notes **are not** the same as a differential diagnosis obtained via the use of a diagnostic instrument, independent medical judgement describing how diagnostic criteria is met via direct observation of the member, and a review of collateral documents and documented within the formal developmental and/or psychometric evaluation done by a qualified diagnostic physician or diagnostic specialist.

B. Criteria for Initial Therapy (ALL criteria must be met):

1. Determination of medical necessity is not based on severity rating of diagnosis. However, the norm or criterion referenced skills assessment(s) must demonstrate clinically significant deficits (two standard deviations below the average score range; developmental functioning significantly below expected functioning for chronological age); AND

2. Additional skills based/criterion referenced skills assessments, such as The Assessment of Basic Language and Learning Skills (ABLLS), Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) if desired for program development; (Checklists or curriculums may be used as supplements but should not be used as stand-alone measures as they do not yield a result that establishes the presence of age- or developmental stage-based clinically significant deficits); AND
3. The member's primary caregivers agree to actively participate in the ABA treatment process; AND
4. The intensity of treatment is not more than the member is able to tolerate, remain engaged, and physically available to receive; AND
5. In accordance with practice guidelines, a formal treatment plan has been developed with all the "Critical Features of a Treatment Plan" including:
    - The proposed treatment by type; and
    - ABA treatment history, duration, and other therapies/community-based resources the member is accessing; and
    - Demographic information, educational and vocational settings; and
    - The frequency of the proposed treatment, transition, and discharge criteria; and
    - The anticipated duration of the treatment; and
    - Current (within 30 days of submission of the formal treatment plan) standardized norm referenced skills assessment that measures the symptoms associated with a diagnosis of Autism (e.g., Vineland Adaptive Behavior Scales 3); and
    - The estimated dates of mastery stated in individualized goals; AND
6. Goals should include baseline dates, data, current dates, data, and graphs (within 30 days of submission of the formal treatment plan), for maladaptive behavior; AND
7. Objectives that are measurable and tailored to the patient; AND
8. The interventions emphasize generalization of skills and focus on the development of spontaneous social communications, adaptive skills, and appropriate behaviors; AND
9. The interventions are consistent with ABA techniques to be performed by licensed and/or ABA certified/State Licensed Behavior Analysts (LBA) provider; and if applicable
10. An individual acting under the supervision of a qualified ABA Provider; AND
11. Parent or caregiver training and support is incorporated into the treatment plan as measurable goals; and
    - Parent or caregiver training and support includes generalization of interventions via goals previously mastered by technicians in safe and analog settings, generalization of settings via community-based homework between parent training sessions and/or determination of the function of problem behavior or skill deficit analysis in the community, attended by parent/caregiver(s) and Board-Certified Behavior Analyst (BCBA)/program supervisor only.

C. Criteria to Continue Therapy (ALL criteria must be met):

1. The member continues to meet the criteria defined in the initial criteria above, or there is the appearance of new problems or symptoms that meet initial criteria; AND

2. There is a reasonable expectation by the primary treating provider that the member will benefit from the continuation of therapy services; AND
3. There is reasonable evidence that member is a good candidate for less supervision (1 clinician to 8 patients) found in evidenced based protocols for group social skills treatment, such as attainment of prerequisite communication skills and no danger to self or other's problem behavior; AND
4. There should be specific goals and planned programming to support group treatment requests; AND
5. Quantitative data, additional testing and developmental assessments tied to specific goals/objectives are updated (**see NOTE 4**) (within 30 days of submission of the formal treatment plan), documented in the member's treatment plan and submitted to support the ongoing need for ABA (e.g., Vineland Adaptive Behavior Scale (Vineland 3); AND
6. There is a transition plan for group treatment consistent with research on social skills training in group settings, i.e., findings have been limited to specific protocols used in durations ranging from 30 minutes to 120 minutes per day for 36 weeks; AND
7. There is evidence the member's primary care givers are and will continue to actively participate in treatment, as documented by goal mastery and skills gained by parent or attendance in 80% of scheduled parent, caregiver, or guardian training sessions and homework assignments in between; AND
8. The treatment plan is updated at least every four (4) to six (6) months; AND
9. Per the practice guidelines and BCBA ethics code, providers are ethically bound to outline at the outset of treatment the criteria to reduce services and/or discharge. Objectively measurable criteria such as attainment of an assessment score or reduction of problem behavior as well as a plan if treatment is no longer beneficial such as lack of progress across authorization periods or if caregivers are not in alignment with treatment goals or methodology should be documented. Thus, the current treatment must demonstrate reasonable expectations of achieving measurable improvement toward treatment objectives and decreasing the gap between the member's chronological and developmental ages or provide referrals to another level of care, service, or service provider to maintain maximal functional activity in performing daily activities; AND
10. As improvements are noted, there is evidence of transition and aftercare planning, as the practitioner guidelines indicates that this planning should be defined at the outset of services and be updated throughout the treatment process, including:
    - A gradual reasonable expectation of reduction in the intensity of services per month; and
    - More attention given to the primary care givers training to ensure there is maintenance of skills in implementing ABA; and
    - Coordination of care with physical health and/or Behavioral Health (BH) providers who will follow the member after the formal ABA program is completed; AND
11. For member's not making progress in treatment and who have not demonstrated a reasonable expectation of achieving measurable mastery of goals and/or objectives, there is a documented plan to address identified barriers; AND

12. Although location of services is not an exclusion, ABA treatment does not simultaneously take place with class-room participation. Services must be medically necessary and cannot be reasonably targeted in the home or clinic, if applicable; AND
13. ABA Treatment is not a duplication of service or provided in an inpatient residential treatment facility.

NOTE 4: Periodic assessments from other professionals may be helpful in guiding treatment or assessing progress. Examples might include an assessment of general intellectual functioning, medical status, and academic performance, among others. In addition to no longer meeting diagnostic criteria of autism as a reason to discharge a client from ABA services, this check-up of diagnosis is required at a frequency that isn't overly cumbersome (less than 3 years) but provides parents with the opportunity to seek out appropriate diagnosis.

NOTE 5: Recent publications by the Counsel of Autism Service Providers, the Behavior Analyst Certification Board, and others have detailed which individuals would make good candidates for ABA delivered telehealth and other barriers and prior considerations that must be addressed before an individual would become a good candidate. Currently, there is empirical support for the efficacy telehealth provision of parent education, supervision of the technician, and assessment only. However, direct ABA services by a technician, group services, exposure codes for the treatment and assessment of severe problem behavior do not have empirical support for delivery via telehealth.

D. Criteria to Discontinue Therapy (when ANY of the following are present):

1. The member has met his or her individualized treatment goals/objectives and/or discharge criteria, which are expected to have been revised and updated throughout the treatment process; OR
2. The member can safely and appropriately be treated at a less intensive level of service that will likely produce equivalent therapeutic results to ABA treatment; OR
3. The treatment is making the symptoms persistently worse; OR
4. Evidence that the primary caretaker is NOT actively engaged in treatment such as no documented goal mastery or skills gained by parent or attendance in a minimum of 80% of the program scheduled parental training and support time; OR
5. In accordance with practitioner guidelines, when a lack of progress is noted across authorization periods or the member is not demonstrating measurable response to treatment; OR
6. The submitted clinical documentation reflects no clinically significant deficits or maladaptive behaviors which restrict the member's ability to access the least restrictive setting are present, which would demonstrate medical necessity for treatment.

Provider Criteria

A. License and/or Certification Requirements

<u>For the treatment supervisor /case manager /facilitator</u>:

1. Master's level, independently licensed clinician, who is licensed, certified, or registered by an appropriate agency in the state where services are being provided, for services treating ASD symptoms, with or without ABA service techniques; OR
2. Master's level clinician whose professional credential is recognized and accepted by an appropriate agency of the United States, (i.e., Board Certified Behavior Analyst [BCBA] or Board-Certified Behavior Analyst–Doctoral [BCBA-D]), to supervise and provide treatment planning, with ABA service techniques. The provider must have an appropriate state license in addition to their BCBA certification in those states that have ABA licensing requirements; OR
3. Master's level clinician with a plan state specific professional credential or certification.

Illinois only: 1) Developmental therapist with Certified Early Intervention Specialist credential or CEIS, or 2) If MD prescribes ABA, writes a MD order for services to be provided by a specific person.

For the para-professional/line therapist

1. Two years of college educated staff person with a Board-Certified Assistant Behavior Analyst (BCaBA) for the para-professional/therapist, OR
2. An individual acting under the supervision of a qualified ABA Provider described by the definition above.

NOTE 6: **Certification:**

- BCaBA, Registered Behavior Technician (RBT), and Board-Certified Autism Technician (BCAT)
  - Certification is encouraged because of the minimum standards of a criminal background check, 40 or more hours of training, and documented oversight by a certified and/or licensed provider, when working with this vulnerable population.
- Behavior Analyst Certification Board (BACB)
  - www.bacb.com – Website has standards for BCBA, BCaBA and RBT certification, practitioner guidelines, and the critical features of a treatment plan.

Procedures, service, and therapies that **are considered experimental, investigational and/or unproven** for the treatment of ASD include, but are not limited to:

- Elimination diets;
- Stem cell transplants;
- Nutritional supplements;
- Intravenous immune globulin infusion;
- Secretin infusion;
- Chelation therapy and/or Hyperbaric Oxygen Therapy (HBOT) (either alone or in combination);
- Behavioral Therapies:
  - Sensory Integration Therapy (SIT);
  - Auditory Integration Therapy (AIT);
  - Music therapy;

- Vision therapy;
- Touch or massage therapy;
- Social stories;
- Floor time;
- Facilitated communication;
- Hippotherapy (equine therapy), animal therapy, or art therapy;
- Relationship Development Intervention (RDI).

- To date, there is no empirical support that short-term, intermittent, high-intensity ABA programs (e.g., summer months only) result in long-term optimal treatment outcome efficacy. Further, medically necessary ABA is not a replacement for the structure and routine of school or custodial care of the member. Additionally, "wrap-around services" are not empirically supported nor the first line treatment for Autism Spectrum disorders.

NOTE 7: The following services **may be considered non-covered** per contract exclusions (This includes any of the following phases of therapy: Assessment, Initial therapy, Continued therapy or Discontinuation of therapy):

- Custodial care - care in any setting comprised of services and supplies, including room and board and other institutional services, provided to assist a member in activities of daily living and/or comfort with no reasonable expectation of cure or improvement of sickness or injury;
- Custodial care is defined as providing protective care without any clinical likelihood of improvement and/or there is evidence the treatment has primarily been used for respite care. As a person moves through the lifespan there are increased expectations on developmental assessments such that retaining the same abilities results in being further from normative peers as time passes. Per the practice guidelines and ethics code, Behavior Analysts are ethically required to discharge when a lack of progress across authorization periods is noted. A different level of care or service would be more appropriate to maintain maximum functional activity in performing daily activities. These alternative services may include but are not limited to: Long-term care facilities, Supported Group home living arrangements, State supported Living Services, Day-habilitation programs, Respite services, Home health nursing or CNA services, and/or personal attendant aide services.
- ABA treatment should not be used as a supportive aide service to help an individual while attending other programming or services that usually have a different treatment approach, conflicting goals, or environmental demands. The treating provider is able to reasonably control the environment and systematically implement therapy in a structured and consistent way to address any skills deficits present.
- Activities primarily of an educational nature or provided to access a school curriculum;
- Respite, shadow, or companion services;
- Any program or service performed in nonconventional settings (even if the services are performed by a licensed provider), including spas/resorts; Outward Bound; wilderness, summer camp or ranch programs; vocational settings, or recreational settings;
- Any other modalities not provided by a licensed behavioral health professional in accordance with nationally accepted treatment standards;

- More than one BCBA or Qualified Health Care Provider (QHCP) providing similar services on the same day(s). This does not refer to the technician(s) or direct service provider simultaneously rendering service with the BCBA or QHCP.
- ABA treatment is not provided as an ancillary and/or supportive service to assist the member in participating in some other primary activity or setting; AND
- Activities are not better described as another therapeutic service or outside the scope of practice of ABA (e.g., speech language therapy, occupational therapy, physical therapy, counseling, psychotherapy, etc.), even if the provider has expertise in the provision of ABA. Acceptance and Commitment Therapy (ACT) requires a verbal repertoire and relies on metaphor extensively to get at private events and verbal relationships. Arbitrary applicable relational responding or being able to relate things to one and another is central to this therapy type. Therefore, it is not appropriate or effective to move forward with this modality of psychotherapy or training when this skillset is not present. ACT is not used to teach communication or other skills to remediate the symptoms of autism but instead being used for self-actualization or other diagnoses typically treated by other professionals (e.g., psychologists) whose scope of practice includes treatment of these disorders such as depression and/or anxiety; AND
- Activities are not characterized as staff training or certification/licensure requirements. These are separate and distinct from ABA services rendered to an individual as part of their treatment. Direction of the technician regarding a specific member's care with the member present is not staff training; AND
- Group treatment is not intended to capture time spent during meals and breaks from ABA treatment, or times when staffing limitations result in inability to render 1:1 treatment.

NOTE 8: Members may qualify for government funded vocational training programs, respite services, and/or Individual Education Plan (IEP) services, for such programming. Services needed to access a school setting or curriculum which are covered under the federal IDEA and FAPE Laws (Individuals with Disabilities Education Act and Free Appropriate Public Education under section 504) may be excluded from coverage under the member's plan.

Convenience Items
Comfort items and/or over the counter products, including but not limited to, weighted blankets and weighted vests **are considered convenience items and are not covered benefits**.

Policy Guidelines

Adaptive Behavior Codes 0362T and 0373T involve assessment and direct treatment of severe maladaptive behavior, with the BCBA on-site. The settings must be customized to the behavior. Examples of customized, specialized, and high-intensity settings include a means of separating from other patients, use of protective gear, padded isolation rooms with observation windows and medical protocols for monitoring patient during and after high intensity episodes, an internal/external review board to examine adverse incidents, access to mechanical/chemical restraint, and frequent external review to determine if the patient needs a higher level of care

and whether this patient be safely treated in an outpatient setting. These codes cannot be used solely to provide additional staff and are not used in case of crisis or on an as-needed basis. This service may be provided in day treatment, intensive outpatient day treatment or inpatient facilities, depending on the behavior.

Description

What is Applied Behavior Analysis?

Applied Behavioral Analysis (ABA), an Early Intensive Behavioral Intervention (EIBI), encompasses behavior modification training programs that are based on the theory that behavior is learned through interaction between an individual and the environment. The goal of behavior management is to reinforce and increase desirable, functional behaviors while reducing undesirable, "maladaptive" behaviors. Lovaas therapy is an ABA-based program developed by Ivar Lovaas, Ph.D., at the University of California, Los Angeles (UCLA) Clinic for the Behavioral Treatment of Children. Lovaas therapy uses an ABA method called Discrete Trial Training, which consists of a series of distinct repeated lessons or trials taught one-to-one. Typically, the lessons are highly intensive, usually taking 30-40 hours per week, and are conducted by a trained therapist, usually in the family's home. Each trial consists of a request for the individual to perform an action, behavior, or response, and involves a consequence or reaction from the therapist. Positive reinforcement rewards vary and are matched to the individual child. The following can be included as part of the ABA treatment plan:

- Picture Exchange Communication Systems (PECS) was developed to help autistic children acquire functional communication skills. PECS uses ABA-based methods to teach children to exchange a picture for something they want—an item or an activity.
- Pivotal Response Treatment (PRT) is a "naturalistic" intervention model that targets pivotal areas of a child's development. In PRT, the child's intentional attempts at functional communication are rewarded with a natural reinforcer. For example, if a child attempts a request for a stuffed animal, the child receives the animal, not a piece of candy or other unrelated reinforcer. PRT is used to teach language, decrease disruptive behavior, and increase social, communication, and academic skills.

Other types of intensive interventions that use ABA techniques include (LEAP) Learning Experiences and Alternative Programs, (TEACCH) Treatment and Education of Autistic and Related Communication of Handicapped Children, the Denver program, and the Rutgers program. LEAP is a comprehensive program for young children that includes peer-mediated instruction, incidental teaching, self-management training, prompting strategies, and systematic parent training. TEACCH uses a structured teaching approach based on the idea that the environment should be adapted to the child, not the autistic child to the environment. The child's learning abilities are assessed using a Psycho Educational Profile (PEP) and, based on the child's functioning level, teaching strategies are designed to improve communication, social, and coping skills to help the child understand his environment and the behavior of other people. The Denver program is a developmental-based program that focuses on the development of communication and play skills, sensory activities, personal independence, and

reducing unwanted behaviors. The Rutgers program is an early intensive behavioral intervention program that is home-based and is similar to Lovaas therapy, except that the program staff doesn't deliver treatment directly; the staff provides training and follow-up to the family and school, with the goal to gradually integrate the child into the classroom.

Floor time is an educational model that builds an increasingly larger circle of interaction between the child and adult in a developmentally-based sequence. Floor time addresses emotional development, in contrast to other approaches that tend to focus on cognitive development. Floor time is often used in conjunction with other methods.

Social stories were developed as a tool for teaching social skills. The stories have three types of sentences: descriptive to explain what is happening, perspective to provide insight, and directive to suggest a response. The stories can be written by anyone, are specific to the child's needs, and are written in first person and present tense. The story should address the child's misunderstanding of situations that are frightening to him, produce tantrums or crying, or make the child withdraw, and should teach the child how to deal with those feelings.

Facilitated communication (FC) involves a facilitator who, by supporting the individual's hand or arm, helps the person communicate through use of a computer or typewriter. FC is very controversial; critics claim it is actually the ideas or thoughts of the facilitator that are being communicated.

Sensory integration therapy (SIT) focuses on desensitizing the child and helping him reorganize sensory information. The goal is to help the nervous system develop the ability to process sensory input more normally. Touch therapy is a particular method of massage.

Auditory integration training (AIT) involves listening through earphones to music that has been electronically modulated based on the individual's audiogram. AIT is thought to improve attention, auditory processing, and auditory comprehension.

Relationship Development Intervention (RDI) training was developed by a husband-and-wife team of clinical psychologists, Steven Gutstein, PhD, and Rachelle Sheely, PhD. The goal of RDI training is to teach the child how to develop social relationships with other people, starting with their parents. A consultant teaches the parents how they can help the child develop a social relationship with the parents and others, through various activities, e.g., playing games, mimicking facial expressions, etc.

Other interventions include music, art, and animal therapy (e.g., horseback riding, swimming with dolphins), administration of intravenous secretin or immune globulin, chelation therapy, special diets, and vitamin and mineral supplements. Music, art, and animal therapy are believed to improve communication skills, develop social interaction, reduce behavioral symptoms, and provide a sense of accomplishment. Use of immune globulin is based on the assumption that autism is caused by an autoimmune abnormality. Stem cell transplantations is being explored as a potential treatment for this disease due to immune and neural dysregulation studied in

ASD. Secretin, a peptide hormone that stimulates the pancreas and liver, is thought to be useful to manage autistic behavior based on theories of gastrointestinal disorders as the cause of autism. Chelation therapy, which uses medications to help the body eliminate toxins, is based on mercury exposure as a possible cause of autism. Restrictive or special diets are based on the idea that autism is caused by digestive disorders or food allergies. Nutritional supplements are based on the theory that vitamin B6 and magnesium can improve autistic behavior.

Service Intensity/Treatment Models
Requests for treatment, when ABA and/or EIBI is state-mandated or specifically included in a member's benefit plan, may be based on all of the following: 1) treatment criteria, 2) provider's treatment plan, 3) member's age, 4) severity of symptoms, including aberrant behaviors, and 5) developmental functioning as indicated by psychological testing such as Vineland or other skill assessment instruments to determine the service intensity and treatment models that best meet the members individual needs.

Comprehensive treatment requests are typically up to 30 total hours of weekly treatment (with a maximum of 40 hours) to include direct 1:1 ABA, group ABA, parent training, supervision and treatment planning on the member's severity, intensity, and frequency of symptoms. Treatment plans address deficits in all the core symptoms of autism. Parent training is an essential and required component of Comprehensive ABA treatment and this treatment is primarily directed to children 3 to 8 years old because Comprehensive ABA treatment has been shown to be most effective with this population.

Focused treatment requests are typically up to 15 total hours per week (with a maximum of 25 hours) based on the member's severity, intensity, and frequency of symptoms. Focused treatment typically targets a limited number of behavior goals requiring substantial support. Emphasis is placed on group work and parent training to assist the member in developing and enhancing his/her participation in family and community life, and developing appropriate adaptive, social or functional skills in the least restrictive environment.

Rationale

The most recent literature update was performed through June 2, 2023.

There is a growing body of evidence that intensive early intervention therapy before five years of age may lead to better overall outcomes. The "landmark" study of early intensive interventions with young children was done by Ivar Lovaas in the Young Autism Project at University of California, Los Angeles (UCLA) in 1987, with follow-up by McEachin and Lovaas in 1993. Lovaas reported outcomes of treating children under age four years with 40 hours per week of one-to-one behavioral training using Applied Behavioral Analysis (Discrete Trial Training) for two years. The training method focused on the acquisition of compliance behavior, imitation activities, language, and integration with peers using repeated discrete behavioral trials to accomplish the goals. After two years, almost 50% of the children in the treatment

group were functioning typically in intellectual and academic areas. At five-year follow-up, most had maintained their gains. The major criticisms of the study are nonuniform participant selection, lack of clear standard diagnostic criteria at entry, the required intensity level of the intervention for such young children, choice of outcome measures, and randomization issues. Also, Lovass noted that strict random assignment to each group was not done due to parent protest and ethical considerations.

In 1998, Sally J. Rogers of the Department of Psychiatry at the University of Colorado's School of Medicine described seven studies that attempted to replicate Lovass' findings. (1) She noted that although positive outcomes were reported in every trial, the evidence did not demonstrate that this approach met present criteria for well-established or efficacious treatment. The major flaws she noted were no follow-up and/or either no control group or no matched controls. She concluded that certain variables, e.g., age, IQ, language level, etc., may affect outcomes and be significantly related to treatment response.

Other Treatment Modalities

Relationship Development Intervention (RDI) training is relatively new and the only published materials found were studies conducted by the developers of RDI. The first article (Gutstein et al., 2007) describes a study that reviewed the progress of 16 children who participated in RDI between 2000 and 2005. (2) In the second article (Gutstein, 2009), RDI is described as "a program designed to empower and guide parents of children, adolescents and young adults with autism spectrum disorders (ASD) and similar developmental disorders to function as facilitators for their children's mental development. (3) RDI teaches parents to play an important role in improving critical emotional, social, and metacognitive abilities through carefully graduated, guided interaction in daily activities." The article also states that although a controlled, blinded study of RDI has yet to be done, preliminary research suggests positive results. Available evidence is insufficient to evaluate the effect of RDI on health outcomes; therefore, RDI is considered experimental, investigational and/or unproven.

In 2012, the American Academy of Pediatrics published "Nonmedical Interventions for Children with ASD: Recommended Guidelines and Further Research Needs", which was developed by an independent Technology Evaluation Panel based on a systematic review of scientific evidence. (Maglione et al. [4]) In their report, they state:

"The strength of evidence of efficacy of interventions designed to address the core deficits of autism varies among approaches. However, none of the evidence reaches the level of high strength according to established standards. Additional large, well-designed controlled trials are needed; at this point, the strength of evidence for even the most-studied intervention types and approach modalities is moderate. Few head-to-head trials have compared the effects of different intervention approaches and components, so we can conclude little about the superiority of specific programs (other than pointing out that certain approaches have little or no evidence of effectiveness). Few studies are powered to identify specific program components associated with efficacy, and few follow participants long-term. In addition, few studies of interventions for pre- or nonverbal children were reported in the literature... our own

guideline statements are based largely on expert opinion, with the systematic review as a starting point. Thus, recommendations may be based on a low to moderate level of evidence. To increase external validity, we only kept statements that everyone agreed or strongly agreed to...We also emphasize that not all children who attend these programs will make significant gains regarding core deficits; the scientific literature is not clear as to which individual participant characteristics are associated with success of various approaches."

Practice Guidelines and Position Statements

Supervision Requirements

The Behavior Analyst Certification Board (BACB) provides Practice Guidelines for Healthcare Funders and Managers addressing Case Supervision Activities. The Practice Guidelines note the following:

"Case supervision activities can be described as those that involve contact with the client or caregivers (direct supervision, also known as clinical direction) and those that do not (indirect supervision). Both direct and indirect case supervision activities are critical to producing good treatment outcomes and should be included in service authorizations. It should be noted that direct case supervision occurs concurrently with the delivery of direct treatment to the client. On average, direct supervision time accounts for 50% or more of case supervision." (5)

Additionally, the BACB includes an area addressing Dosage of Case Supervision which contains the following information:

"Although the amount of supervision for each case must be responsive to individual client needs, 2 hours for every 10 hours of direct treatment is the general standard of care. When direct treatment is 10 hours per week or less, a minimum of 2 hours per week of case supervision is generally required. Case supervision may need to be temporarily increased to meet the needs of individual clients at specific time periods in treatment (for example, initial assessment, and significant change in response to treatment)." (5)

The BACB also provides information regarding instructions for responsible certificants, and notes the purpose of supervision as well as addressing structure and small group supervision:

"*Purpose*. The purpose of supervision is to improve and maintain the behavior-analytic, professional, and ethical repertoires of the RBT and facilitate the delivery of high-quality services to his/her clients. Effective behavior-analytic supervision includes:

- Development of performance expectations
- Observation, behavioral skills training, and delivery of performance feedback
- Modeling technical, professional, and ethical behavior
- Guiding behavioral case conceptualization, problem-solving, and decision-making repertoires
- Review of written materials (e.g., behavior programs, data sheets, reports)
- Oversight and evaluation of the effects of behavioral service delivery
- Ongoing evaluation of the effects of supervision

Structure. Each RBT must obtain ongoing supervision for a minimum of 5% of the hours spent providing applied behavior-analytic services per month. Supervision must include at least 2 face-to-face, synchronous contacts per month, during at least one of which the supervisor observes the RBT providing services. In-person, on-site observation is preferred. However, this may be conducted via web cameras, videoconferencing, or similar means in lieu of the supervisor being physically present. Although only one observation is required, the BACB encourages direct observation of service delivery as much as possible. At least 1 of the 2 supervision sessions must be individual (i.e., RBT and supervisor), but the other may occur in a small-group meeting.

Small Group Supervision. Some supervision may be conducted in small groups. Small groups are interactive meetings in which 2-10 RBTs who share similar experiences participate." (6)

2018 Update

In 2017, a document titled: "Evidence-Based Practices for individuals with Autism Spectrum Disorder: Recommendations for Caregivers, Practitioners, and Policy Makers" from an Ontario Scientific Expert Taskforce was released. (7)

This is an in-depth, very comprehensive review of Applied Behavior Analysis (ABA) interventions across age groups and targeted domains for individuals with Autism Spectrum Disorder (ASD). The report is the most recent of its type and provides significant guidance into how decisions should be made when determining "…the nature, intensity, effectiveness, and duration of services for individuals with ASD". It also draws conclusions via the research about who should deliver these services and required supervision.

The research review produced a 'narrowing' of targeted domains and split between two major focus areas where interventions should produce an increase in skills or a decrease in behaviors. The focus area where 'skills increased' included the following twelve domains: Social/Interpersonal, Academic, Communication, Cognitive/Higher Cognitive Functions, Learning/School Readiness, Motor, Personal Responsibility/Adaptive, Play, Self-Regulation, Joint Attention, Vocational, and Placement. The focus area where 'behaviors decreased' included the following three domains: Challenging behavior, Restricted, Repetitive, Non-Functional Behavior/Interests, and Sensory/Emotion Regulation.

With these identified domains in mind, the committee cross referenced domains to specific age groups and evidence-based interventions. To get the specific identified interventions per age group for a specific domain, please refer to the actual report. According to recent outcome studies, literature reviews, and meta-analyses (Ontario Association for Behaviour Analysis, 2017 [7]; Orinstein A.J., et al., 2014 [8]; Reichow B. 2012 [9]), the average treatment duration for a comprehensive ABA program is 2-4 years. The patients either discharge after achieving optimal outcome, titrate to a Focused ABA program intensity (10-20 hours/week), or discharge due to lack of progress, at that point. There is currently no empirical support for a comprehensive level of intervention for patients aged 15 and above (7). Moreover, the domains in which there are evidenced based interventions decreases as the patient ages. For example, in the

social/interpersonal domain, there are 25 evidence-based interventions. However, there are no published studies that met criteria for inclusion showing any ABA intervention/methodology as an effective intervention for this domain. The report does note: “Within the range of dates sampled, many of the high-quality studies conducted with this population were not included. In addition, far fewer studies evaluating the effectiveness of ABA interventions for adults with ASD have been published. Therefore, many ABA interventions do not yet meet the evidence-based intervention criteria for this population. These findings should not be interpreted to mean that ABA interventions are not affective for adults with ASD.” However, without the existence of high quality studies that contain sufficient experimental vigor, it is not a foregone conclusion that adult patients can benefit from ABA intervention for social / interpersonal skills. The same decreasing pattern of lack of empirical support as patients age. For patients over the age of 22, there is an absence of a single evidence-based study for the domains of Academic, Cognitive/Higher Cognitive Functions, Learning/School Readiness, Motor, Play, Joint Attention, Vocational, Placement, Reduction of maladaptive including Restricted, Repetitive, Non-Functional Behavior/Interests, and Sensory/Emotion Regulation.

In the 2014 study, the authors Blacklock, Perry, and Geier investigated the effects of intensive behavioral intervention for 68 children (ages 6 to 13 years old). (10) Participants had to have begun services at 6 years and older and receiving at least 10 months of service. Results show that as a group, children did not show statistically significant gains in IQ, cognitive rate of development, adaptive behavior standard scores, or age equivalent scores. However, it should be noted that their mental age score and adaptive rate of development increased significantly. While the children are gaining some cognitive skills compared to when they started, they are still vastly behind the cognitive skills of their peers. Overall, the children in this study did not experience the same benefits from intensive behavioral interventions as has been reported with younger children. It was also reported that the younger children in the study, those between 6 and 7, compared to those over 8 had better outcomes, whereas the older children (over age 8) had uniformly poor outcomes.

Researchers Bosch and Fuqua (2001) outline in an article that target behaviors in treatment plans can be looked at through the lens of a behavioral cusp as a tool to help select and prioritize goals. The authors outline each of the following five criteria noted below (11):

- Access to new reinforcers, contingencies, or environments involved behaviors that will not only produce the projected consequences, but that also the consequence being produced will function as a reinforcer.
- Generativeness addresses whether or not the acquisition of the skill in question will lead to the potential of the development of more complex response classes.
- Competition with inappropriate responses are behaviors that will either interfere or replace inappropriate behaviors.
- Number and relative importance of people affected evaluates the response benefit to others.
- Social validity of the behavior will depend on whether or not the behavior meets the demands of the social community of which the learner is a member.

The study from Close et al. (2012) aimed to investigate descriptive characteristics and co-occurring neurodevelopmental and psychiatric conditions in young children, children, and adolescents with a current and consistent or past but not current (PBNC) diagnosis of ASD and how such characteristics and conditions may cause a change in diagnosis of an ASD patient. (12) It is known that co-occurring conditions occur more frequently in children with ASD compared to typically developing children or those with developmental delays or genetic disorders. The study assessed variables such as the child's sex, race, ethnicity, parent's education, whether or not the child has a current individualized education plan (IEP) as well as current health insurance and consistency of health insurance in the past year. Co-occurring conditions included ADHD, learning disability, developmental delay, speech problems, hearing problems, anxiety, depression, behavioral problems and seizures or epilepsy. The study divided children's age groups into 3 categories. These were from ages 3-5, 6-11, and 12-17. They suggested that some co-occurring neurodevelopmental and/or psychiatric conditions may discriminate young children, children and adolescents with ASD currently versus a PBNC (previous but not current) ASD. Children ages 3-5 with current ASD had 11.07 times higher odds of having a current learning disability, 9.20 times higher odds of developmental delays and 4.76 times more odds of having co-occurring conditions. Children ages 6-11 showed 3.85 times more odds of speech problems, current anxiety, and past hearing problems. Adolescents with a current diagnosis had 4 times greater odds of having current speech problems, 10 times greater odds of mild seizures/epilepsy, and lower odds of past hearing problems. However, all statistics should be considered with confounding variables and may not fully reflect the actual percentages of the greater population. In addition, the mechanisms that underlie these changes are unclear.

A study from Dixon et al. (2016) evaluated the relationship between mastery of learning objectives and elements of ABA supervision. Three considerations were tested: whether the supervisor had a Behavior Analyst Certification Board (BACB) certification, their number of years of experience and their caseload. (13) A significant relationship was identified between the number of mastered learning objectives and the number of supervision hours, however, due to the fact that supervision hours were generally provided in a direct ratio to treatment hours, participants who received a higher amount of treatment hours also received a higher amount of supervision. Treatment hours alone have been proven to have a strong impact of on treatment outcomes, hence creating a confounding variable. A multiple regression analysis was performed to outweigh the variable. It was also found that variance within the bounds of typical supervision intensity resulted in a relatively small improvement in mastered learning objectives. A significant correlation was also found that 73.7% greater mastery of learning objectives in supervisors with a BCBA vs. those without. A supervisor's years of experience overseeing ASD cases were shown to have significant effect on the mastery of learning objectives. Supervisor caseloads were not found to have a significant relationship to the number of mastered learning objectives. Many variables are shown to have an effect on treatment and supervision, one of the most important being how funding sources are allocated, which may have a large effect on hours and hence, learning outcomes.

Researchers Gould et al. (2011) outlined the following eight areas of human functioning which included: 1) social, 2) motor, 3) language, 4) adaptive, 5) play, 6) executive functions, 7)

cognition, and 8) academic skills. (14) The authors stressed that just a comprehensive curriculum alone that targets each of the eight skill areas is not sufficient and will not as a stand-alone item ensure quality treatment. Given that individuals on the spectrum have a wide range of deficits across skill areas, it is paramount that practitioners design an individualized program to maximize treatment outcomes and for each individual to receive optimal comprehensive services. A comprehensive assessment is essential to determine the unique needs of the individual. It is also recommended that when designing treatment that a priority should be given to behavioral cusps or pivotal responses that will either "open doors" for an individual to learn other skills and can access other learning opportunities or will remain functional for the individual across settings and over time.

In the 2009 report, authors Granpeesheh et al. indicated that the number of treatment hours and the child's age showed a linear relationship with the number of mastered behavioral objectives. (15) That is to say, that an increase in treatment hours and a decrease in child age predicted an increase in the number of mastered behavioral objectives. When participants were placed into groups based upon age, three distinct differences in the relationship between treatment hours and treatment outcome were observed. The youngest group showed the greatest response to treatment at low levels of intensity and similar level of gains as the middle age group at high levels of intensity. Like the youngest group, the middle age group showed a similar increasing trend such that there was no point of diminishing-returns from increased treatment hours. This trend is naturally limited though to the actual range of treatment hours provided in our sample (up to 42 h per week). Children in the highest age group (7–12 years) did not show a significant relationship between treatment hours and the number of behavioral objectives mastered. That is, participants in this age group showed a relatively flat line in that approximately 17 behavioral objectives were mastered each month regardless of if the child was receiving high or low levels of treatment hours.

These data have a number of implications. First is that these treatment-specific and child-specific variables are not independent but will influence one another such that the number of treatment hours matters greatly to children under 7 but less so to those above 7 years of age. Maximizing the treatment hours during the younger ages could potentially yield much greater efficiency in treatment gains. Another important implication of these data is that for children under 7, there was not a point at which participants began to burn-out from treatment. Rather, the authors observed that there was an increasing trend, such that the rate of learning was much higher for those children receiving relatively high levels of treatment (40 h per week).

While prevalent in the population of individuals with autism spectrum disorder, medical comorbidities are not always investigated fully. However, in order to properly construct interventions in the context of ASD and the potential comorbidities, clinicians must understand the comorbidities in full, which requires extensive investigation into the individual's history. Isaksen and colleagues (2013) investigated the backgrounds of 79 individuals through physical and biomedical testing as well as documentation of the medical and developmental histories of each participant. (16) Testing included assessment of birth characteristics, genetic testing, assessment of sleep and feeding patterns, and neurological testing among others. The results

demonstrated a variety of medical abnormalities present across the participants with a high number have chromosomal abnormalities as well as reported complications during birth. Overall, the findings align with current literature which states the prevalence of comorbidities is high as well as adds to current knowledge with the findings concerning chromosomal abnormalities in the investigated participants. Medical investigation is a crucial component to understanding individuals diagnosed with ASD and should continue through noninvasive procedures in order to understand the full extent of potential comorbidities.

Comorbidity has been defined as the occurrence of two or more forms of psychopathology in the same person and has received a considerable amount of attention in child literature. Matson and Nebel-Schwalm (2007) discuss a few of the major groups of comorbid diagnoses including mood disorders, phobias, obsessive-compulsive disorder (OCD), anxiety, obsessions, and psychosis within ASD. (17) Depression is probably the most frequent form of comorbid psychopathology with ASD. Depression may put a person with ASD at a higher risk for suicide, greater levels of withdrawal, non-compliance, and aggression. Literature addressing ASD and bipolar disorder is very limited. In addition, there is a paucity of studies focusing on fears and phobias among children with ASD, however a few case studies have (Evans, 2005) found that children with ASD have demonstrated a different set of fear and phobia priorities than other children studied. OCD is another comorbid diagnosis discussed, however, more than any other disorder, concern about whether OCD can be separate from ASD had been debated due to the overlap in diagnostic criteria. The available evidence does suggest the possibility of comorbidity in ASD. However, some conditions can be more easily distinguished from ASD than others. Five points are proposed to begin this analysis, they are as follows: waxing and waning and change of symptoms, defining core symptoms, identification of comorbidity by multiple investigators, development of scaling methods to assess comorbidity, and the need for differential diagnosis studies.

Authors Najdowski et al. (2014) outline the importance of comprehensive assessment, stressing that the assessment should include the following eight areas: 1) social, 2) motor, 3) language, 4) adaptive, 5) play, 6) executive functions, 7) cognition, and 8) academic skills. The results of the assessment are then used to determine the most beneficial comprehensive and individualized curriculum for the individual. (18) By using an appropriate assessment, problems like teaching skills that are age-inappropriate, too advanced or nonfunctional can be avoided. Failing to design a balanced curriculum will hinder progress and prohibit the individual from maximizing his or her potential.

Recommendations about skill selection are also offered. The authors encourage the following areas to be considered when determining skill areas and targets to teach 1) barriers to learning, 2) level of functioning, 3) acquisition rate, 4) functionality of the skill, 5) social validity, 6) age of the child, 7) prerequisites, 8) pivotal skills and behavioral cusps, 9) complementary skills, 10) treatment hours and duration, 11) treatment provider, and 12) resources. In specific regards to treatment hours and duration Najdowski et al. provides recommendations for the number of goals to address dependent upon the number of hours that are available to the individual by stating, “In our practice, we typically select 15 to 20 targets for children receiving 30 h of

therapy per week, and between 20 and 25 targets for children receiving 40 h of therapy per week. For children receiving less therapy hours, we usually select fewer skill targets to address at any one time—generally no more than ten targets for 15 h of therapy per week".

Authors Perry et al. (2013) conducted two studies to investigate how chronological age and IQ at the start of intensive behavioral intervention (IBI) impacts outcome. (19) The first study looked at data for 207 participants (age range of 2 to 14.5 years) and found that initial IQ was strongly related to most outcomes. They also found that even after controlling for initial IQ, younger age was predictive of better cognitive outcomes. Children who were over the age of 8 and those who had very low initial IQs (under 30) regardless of age had uniformly low IQs at both testing times.

In the second study, the authors examined the change over time in the areas of cognitive and adaptive functioning of matched group of younger children (ages 2 to 5) and older children (ages 6 to 13) that had equal IQ at intake and had an equal duration of treatment. In terms of IQ, the younger children made gains of 17 points on average, whereas the older children only gained 2 points on average. In the discussion the authors point out that children over the age of about 8 and/or those with a low IQ (below 30) at entry had uniformly poor outcomes. They suggest that, "These children seem like inappropriate candidates for IBI and may benefit as much or more from other ABA-based behavioral/educational programs".

The conceptual analysis from Valdovinos, and Kennedy (2004) discussed how side effects of medications may alter behaviors and motivating operations. (20) It is known that psychotropic medications produce at least two types of effects on behavior, these are the primary effects of the drugs on target behaviors and side effects that change the target or other behaviors. The issues lie in the fact that side effects might affect behaviors in ways that are difficult to predict. Possible behavioral processes involved are motivating operations, stimulus control and response-reinforcer relations. The presence of a side effect may also serve as a stimulus that occasions responding as either a discriminative or conditional discriminative stimulus. Medication may produce stimuli that function as positive or negative reinforcers, hence increasing the probability of behavior, or may function as punishers for behavior, decreasing the probability of behaviors. They may also alter the effectiveness of stimuli as consequences through establishing or abolishing operations, making stimuli more or less reinforcing or punishing. The article provided examples which functionally evaluated behavior-environment relations prior to and during the administration of medication concluding that this is the most likely means of identifying the side effects of medication on behavior.

Volkmar and McPartland (2014) outline the progression of the autism diagnosis from the DSM-III to the DSM-V and the most recent changes which impact the ways in which ASD is classified and treated. (21) The DSM-V has been updated to include a group of specifiers in order to better classify ASD. One specifier is aimed at providing a better conceptualization of severity as it relates to the level of support required by the individual and is broken down into three levels: 1=support, 2=substantial support, 3=very substantial support. However, an individual's diagnosis classification does not automatically qualify them for the highest level of support, and

this is clearly stated in the current criteria of the DSM-V. Support is determined by a collective examination of the individual's diagnosis, their abilities, and the hierarchy of intervention objectives. Due to the highly variable presentation of developmental level and symptoms associated with ASD, this change to the DSM-V allows support to be tailored to the needs of the individual as opposed to the severity of their diagnosis.

The purpose of this study from Weiss (1999) was to examine how rates of skill acquisition differ across children diagnosed with autism spectrum disorder and how initial rates of skill acquisition could predict later learning outcomes. (22) Twenty children currently receiving in-home ABA services were participants in the study over a two-year period; all data was collected in clinical sessions and no participants were assigned to a control group. Pre and post treatment measures included the Childhood Autism Rating Scale (CARS), Vineland Adaptive Behavior Scales (VABS), and evaluation of the mastery of nine skills which were determined to be important to the early learning of individuals, including non-verbal imitation, expressive labels and social questions. As expected, the results showed variable outcomes in skill acquisition across the different participants as noted by the differing scores on the CARS and VABS assessments as well as progress in acquisition of skills. Additionally, it was found that the first five items acquired by the child was positively correlated with the rate of skill acquisition across all items. Overall, the results do show the rate of skill acquisition in the beginning of treatment remained fairly stable throughout the initial two years of in-home ABA treatment which may indicate the ability of early skill acquisition to predict outcomes in later years. These findings could also indicate the need for variations in treatment to be implemented earlier for learners who do not have fast learning rates in order to best support individual learning needs and help all children benefit from treatment.

In a study from Weiss and Delmolino (2006) the study suggests that the initial learning rate of young children with autism receiving early, intensive, home-based behavioral intervention are moderately correlated with outcome variables after 4 years of treatment. (23) Children who initially learned quickly continued to demonstrate rapid acquisition rates. Initial learning rates were positively correlated with the child's scores on the CARS (Childhood Autism Rating Scale) and Vineland Adaptive Behavior Scale (VABS) four years into treatment. Treatment data reflecting rate of initial acquisition of skills was significantly correlated with school placement, severity of autism symptomology and adaptive behavior profiles four years into treatment. Children who had faster early skill acquisition showed greater gains in adaptive functioning, fewer or less severe symptoms of autism and less restrictive educational placements after 4 years. During the first two years, children received approximately 40 hours a week of in-home services, however in years 3 and 4, school-based treatment was combined with home services, where home based averaged around 20 hours a week. The Rutgers Autism Program was used as the model for treatment. The present study showed highly variable outcomes for learning with autism exposed to intensive treatment, which is consistent with existing literature. While all children made extensive gains on measures of autism symptomatology, changes in adaptive behavior were more variable. While approximately half of the children were fully included in their educational placements, the remainder continued to require highly specialized instruction to learn skills. Children who learned skills faster showed higher VABS scores post-treatment and

showed more improvement in their VABS scores, children who had slower learning rates did not improve as dramatically on the VABS. Children who took longer to master Verbal Imitation items had higher CARS scores at the outset; however, learning rate on this program was not related to the amount of improvement in CARS scores. However, throughout all the different measures, there was considerable variability across children in terms of skill acquisition.

Authors Burgess and Gutstein (2007) point out that there are no studies to date that have identified indicators predictive of Quality of Life (QoL) for children or adults with autism; however, by accessing other QoL measures in related samples they have generated some possible predictors of QoL in autism. (24) The generated possible predictors include: (a) social support; (b) academic success and preparation for satisfactory employment; (c) family life; and (d) self-determination. When applying the construct of social supports in autism, instead of assessing the total number of friends a child with autism has, look at the quality of the friendship as that is a stronger predictor of satisfaction or loneliness. When conducting skill assessments and developing goals and objectives surrounding social skills it is important to consider that the learner not only understands the rules but can also apply them by engaging with peers. While academic achievement is often included as a predictor for QoL in child populations, some studies indicate that future employability may be a better predictor. While the learner may have completed mainstream education, if the social component of employment and adaptability to new work environments is lacking then employment can be challenging. ASD not only impacts the individual with the diagnosis but the family of the individual as well, especially in regard to caregiver burden.

Burgess and Gutstein (2007) also categorized caregiver burden into the following dimensions: (a) disturbed family relations, (b) financial costs, (c) poor social performance, (d) assistance in activities of daily living, and (e) problem behavior. Caregiver burden is an area of particular relevancy in autism, as a diagnosis of ASD is often throughout the lifetime of the individual, thus requiring lifelong services and support from family. In the area of self-determination, the authors included the concepts of control, choice, and personal autonomy. (24) Treatment planning and daily activity plans should examine how often children are presented with choices and opportunities for personal growth and self-management. All of the aforementioned quality of life measures should be utilized as a way to evaluate treatment outcomes.

Discrete trial training (DTT) is a common structure for conducting therapy sessions for individuals with ASD. However, the standard ten-trial teaching method may not be suitable for all individuals. With prevalence in the use of DTT to teach skill acquisition targets to young children with ASD, it would be fortuitous to ensure the programming being administered is appropriate for the client in question. In 2005, Ferraioli et al. created several decision trees to guide the decision-making process of determining whether discrete trial training is appropriate for the individual's learning process. (25) The decision trees outlined several options for deciding on the course of treatment based on different contexts such as the failure of programming to generalize, no skill acquisition, or inconsistent progress. DTT is not appropriate for all clients, and if modifications to the traditional DTT structure or another programming style, such as natural environment training (NET), are necessary to improve client performance,

the given decision models provide guidance towards how the programming can be restructured for the client's benefit.

In 2006, Cosden et al. outlined the definitions, importance, and application of strength-based assessment as a crucial consideration for clinicians and researchers. (26) Strength-based assessment is defined by the goodness of fit between a client's unique history and the interventions prescribed to them, the environment, as well as the family's individual needs and abilities. The authors outline the current measures available to assess the strengths of an individual as well as how strength-based assessment relates to the specific population of children with learning and behavior disorder. In order to demonstrate the importance of this assessment, the authors provide two case studies of young children in order to demonstrate how traditional and strength-based assessments differ when considering interventions to address client deficits. Finally, the authors propose this as an area which has evidence to support its use and can benefit from further research in the areas of enhancing stakeholder-clinician relationships and modifying the clinician-client relationship. Overall, strength-based assessment provides a clear depiction of the strengths of various stakeholders including the direct client and their family, and while there is evidence to support this assessment, future research involving enhancement of relationship between various stakeholders is still necessary.

Normative development of children includes the display of disruptive behavior to a degree, however disruptive behavior outside these expected levels indicates the need for clinical intervention. Degnan et al. (2008) in a longitudinal study examined measures of disruptive behavior, child-mother interactions, frustration reactivity, and physiological emotion regulation in children over a four-year developmental period, ages two to five. (27) These children displayed disruptive behavior, some of which was outside normative development; the purpose of the study was to determine if clear patterns in the disruptive behavior were apparent across the 318 participants. In order to assess the behavior over time, the researchers assessed the various measures at baseline and when the child reached two, four, and five-years of age. Mothers participated with their children, with the interaction between mother and child video-recorded for later coding. The results demonstrated four distinct behavioral profiles for the participants: high, moderate, normative, and low. The interactions between maternal control, reactivity, and emotional regulation determined the placement of the children in one of the profiles. Overall, this study highlighted the key factors which differentiate normative disruptive behavior from disruptive behavior presentations which may indicate a need for clinical intervention.

In many cases, maladaptive behaviors are often approached with the intent of being lowered to rates of zero per hour through the course of ABA treatment. However, this does not always align with the trajectory of normative maladaptive behavior for children depending on age and environmental circumstance. Consistently, research concurs that it is the duration, frequency, and triggering consequences which determine the normative or abnormal nature of a child's misbehavior. Ogundele (2018) discussed the various behaviors which may be of concern to parents or teachers when displayed by a young child. (28) He provides the example of anxiety in the context of emotional problems a child may face, citing "Mild to moderate anxiety is a

normal emotional response to many stressful life situations. Anxiety is only regarded as a disorder when it is disproportionately excessive in severity in comparison to…the triggering circumstances". (28) These behaviors can be displayed without cause for clinical intervention, although can be considered challenging when they rise to abnormal developmental levels and impede the ability of an individual access their environment with ease.

In a study by Parry-Cruwys et al. (2011) the authors examined the presentation of task-related behavior under various schedules of reinforcement in the natural environment. (29) Participants included six boys in special education programs and were chosen due to present repertoires of academic and leisure activities. The researchers evaluated resistance to distraction according to variable interval seven (VI7) and variable interval thirty (VI30) schedules of reinforcement. In baseline, the schedules of reinforcement were randomly selected for order with no distracting variables present; the intervention phase followed a multi-element design with the same baseline and intervention conditions as well as a distracting variable present in the environment. Results demonstrated the richer schedule of reinforcement as being more effective with the majority of the participants, thereby demonstrating a greater resistance to distraction. While effective, further research on schedule thinning was recommended by the researchers in addition to investigation of other variables which could influence behavior in the natural environment.

Taylor and Fisher's (2010) article outlines areas of consideration when beginning intervention with children diagnosed with ASD as well as consideration post-first year of treatment. (30) First, the authors recommend addressing the motivation of the various stakeholders involved in treatment. This relates to the reinforcers currently in the history of the individuals and must be known in order to best organize treatment in terms of what is valued by various stakeholders. Second, the authors recommend looking to the family resources and parenting styles, as parents and caregivers are important stakeholders in the treatment process. Parents and caregivers are crucial to the treatment process, and understanding the resources or limitations of a family system can directly impact adherence to and success of treatment. Finally, Taylor and Fisher recommend looking to the child's profile including their current abilities and age. This is a crucial step in order to determine where to begin treatment in terms of skills to be taught and behaviors to address.

In their consideration after the first year of treatment, Taylor and Fisher recommend considering progress, re-assessment of resources and priorities, and considering the next steps of treatment. Progress data is essential to understanding the skills acquired in the first year of treatment as well as those which are in progress or those which have not progressed as expected. Additionally, re-assessment of parents and their resources can be crucial as family dynamics may have shifted along with priorities. This might also explain client response to treatment for better or worse, and what potential changes need to be considered in order to best support the various stakeholders. Finally, looking to the future steps of treatment is essential in order to build upon previously learned skills and increase generalization to the natural environment once skills are acquired.

The purpose of the article from Verdugo et al. (2005) was to outline quality of life (QoL) as it relates measurement and how these measurements are and should be utilized to inform clinical decisions. (31) Quality of life has been found to be universally important to individuals of all abilities, and a key component to understanding another's life and well-being. Additionally, quality of life measures links the group to the individual by this shared understanding about quality of life as a concept. One key difficulty discussed by the authors is the inability of measures to cover all cultures and lifestyles. Similarly, this is consistent with other measures and necessitates that quality of life measures be adapted to different cultures if they are to be widely used. As found by previous researchers, quality of life is described to have over twenty purposes across disciplines, which indicates the cross-discipline understanding is somewhat sensitive, and cross-cultural uses of quality of life measures can and should follow suit. Overall, quality of life has been found to be a varied but crucial measure which can inform decisions across disciplines. Further, the evolution of quality of life as a construct has moved from a socially unifying construct to a clinical measure which can guide interventions, specifically for individuals with intellectual disabilities.

2020 Update

In a physician survey, Golnik and Ireland (2009) noted that previous studies suggested over half of children with autism are using complementary alternative medicine (CAM). (32) The study included that physicians responded (n = 539, 19% response rate) to a survey regarding CAM use in children with autism. Physicians encouraged multi-vitamins (49%), essential fatty acids (25%), melatonin (25%) and probiotics (19%) and discouraged withholding immunizations (76%), chelation (61%), anti-infectives (57%), delaying immunizations (55%) and secretin (43%). Physicians encouraging CAM were more likely to desire CAM training, inquire about CAM use, be female, be younger, and report greater autism visits, autism education and CAM knowledge. Physicians were more likely to desire CAM training, inquire about CAM and view CAM as a challenge for children with autism compared to children with other neurodevelopmental and chronic/complex conditions.

In a retrospective analysis of clinical data, Hagopian et al. (2015) evaluated individuals with automatically reinforced self-injurious behavior (SIB). (33) They noted the following: Self-injurious behavior (SIB) is maintained by automatic reinforcement in roughly 25% of cases. Automatically reinforced SIB typically has been considered a single functional category and is less understood than socially reinforced SIB. Subtyping automatically reinforced SIB into functional categories has the potential to guide the development of more targeted interventions and increase our understanding of its biological underpinnings. The current study involved an analysis of 39 individuals with automatically reinforced SIB and a comparison group of 13 individuals with socially reinforced SIB. Automatically reinforced SIB was categorized into 3 subtypes based on patterns of responding in the functional analysis and the presence of self-restraint. These response features were selected as the basis for subtyping on the premise that they could reflect functional properties of SIB unique to each subtype. Analysis of treatment data revealed important differences across subtypes and provides preliminary support to warrant additional research on this proposed subtyping model.

In an article from LaFrance et al. (2019) the authors reviewed the definitions, philosophical underpinnings, and national requirements pertaining to both scopes of practice (i.e., model licensing acts, legislation, and regulatory boards) and training (i.e., task lists, accreditation standards and course requirements, and exam blueprints) of 4 behavioral health professions, in an effort to provide clarity about the unique contributions of several professions within the context of multidisciplinary treatment. (34) The professions selected (behavior analysis, psychology, speech-language pathology, and occupational therapy) are likely to provide treatment alongside one another and often to the same clients. In a review of documents pertaining to scopes of practice and training for each profession, the authors found overlapping content. However, the similarities between professions diminished when they reviewed more specific guidelines such as learning objectives, educational requirements (i.e., coursework), supervised clinical experience (e.g., internships), and national examinations. This was especially true when considering each profession's underlying approach to treatment (i.e., philosophical underpinnings) and, hence, service activities. The authors discussed their findings in light of service overlap and make a call for greater collaboration between professions, as related to the separate content knowledge and expertise of professionals in each field and the impact on client outcomes.

In a review from Brown and Bebko (2012) the authors note beginning with Kanner's (1943) seminal article on autism, through the current DSM-IV-R criteria for the disorder, children have been described as having difficulty with seeing overall gestalts, due to excess attention to the constituent part. (35) In current terms, the authors state, children with autism have been found to process objects at the local level differently, which in some cases leads to their missing more global information or understanding. These local processing biases have been proposed to lead to overselectivity, enhanced discrimination, poor generalization, and poor categorization. There has been extensive research on these separate topics over the past 40 years. The current article provides a concise review and synthesis of key research findings from these areas. Problems with previous methodology and areas in need of further research are discussed.

In an article that provides a theoretical rationale for enhancing father–child involvement in early autism intervention that may lead to improved outcomes in child communication and symbolic play and have cascading benefits for families in reducing stress and enhancing coping mechanisms, Flippin and Crais (2011) conducted a systematic reviews of the literature to (a) identify the extent of father involvement in parent training programs for children with autism, (b) identify the contributions of parents to the symbolic play outcomes of their children with ASD and other disabilities, and (c) examine differences in stress and coping experienced by mothers and fathers of children with ASD. (36) The authors noted that fathers of children with ASD are underrepresented in both early intervention and research. However, fathers have unique interaction styles that make important contributions to the language and symbolic play development of typically developing children. Fathers may make similar contributions to the development of their children with ASD, who struggle with social-communicative deficits, particularly in the areas of language and symbolic play. The authors discuss possible barriers to father participation in early autism intervention and recommendations were offered for making parent-implemented early intervention for children with ASD more amenable to fathers.

Horner and Day (1991) examined the role of response efficiency in functional equivalence training. Response efficiency was examined in terms of three variables: (a) physical effort, (b) schedule of reinforcement, and (c) the time delay between presentation of the discriminative stimulus and reinforcer delivery. (37) Three experiments addressed the role of response efficiency in the application of functional equivalence training. Functional equivalence training includes conducting a functional assessment of the problem behavior. Variables that predict and maintain the problem behavior are defined, and socially appropriate, functionally equivalent skills are identified and taught. The authors noted that the logic is that if the learner has a socially appropriate way to achieve the same function, he or she will be less likely to use problem behaviors. Each of the three experiments involved a person who performed a set of problem behaviors and a functional assessment of the problem behaviors. A socially appropriate alternative response was taught, but this new response was less efficient than the problem behavior on one of the efficiency variables (effort, schedule, delay in time). The new behaviors did not compete successfully with the problem behaviors until a new, more efficient, alternative behavior was taught. These results were discussed in terms of our understanding of response covariation and the need in applied contexts to include response efficiency in any functional analysis assessment.

In a review from Koegel et al. (2001). The authors discuss several core pivotal areas that appear to be influential in intervention for autism. (38) Literature and outcome data were reviewed with respect to several core areas that appear to be particularly helpful in intervention for autism, including improving motivation, responsivity to multiple cues, self-management, and self-initiation of social interactions. A conceptual framework was described, and outcome data were reviewed suggesting that when children with autism are motivated to initiate complex social interactions, it may reverse a cycle of impairment, resulting in exceptionally favorable intervention outcomes for many children. Because the peripheral features of autism can be numerous and extensive, the concept of intervention for pivotal areas of functioning may be critical if children are to be habilitated in a time- and cost-efficient manner.

The purpose of the study by Ruble et al. (2010) was to develop an Individual Education Program (IEP) evaluation tool based on Individuals with Disabilities Education Act (IDEA) requirements and National Research Council recommendations for children with autism; determine the tool's reliability; test the tool on a pilot sample of IEPs of young children; and examine associations between IEP quality and school, teacher, and child characteristics. (39) IEPs for 35 students with autism (Mage = 6.1 years; SD = 1.6) from 35 different classrooms were examined. The IEP tool had adequate interrater reliability (ICC = .70). Results identified no statistically significant association between demographics and IEP quality, and IEPs contained relatively clear descriptions of present levels of performance. Weaknesses of IEPs were described and recommendations provided.

The purpose of the Koegel and Rincover's study (1974) was to investigate systematically the feasibility of modifying the behavior of autistic children in a classroom environment. In the first experiment, eight autistic children were taught certain basic classroom behaviors (including

attending to the teacher upon command, imitation, and an elementary speaking and recognition vocabulary) that were assumed to be necessary for subsequent learning to take place in the classroom. (40) Based on research documenting the effectiveness of one-to-one (teacher-child ratio) procedures for modifying such behaviors, these behaviors were taught in one-to-one sessions. The authors note it was, however, found that behaviors taught in a one-to-one setting were not performed consistently in a classroom-sized group, or even in a group as small as two children with one teacher. Further, the children evidenced no acquisition of new behaviors in a classroom environment over a four-week period. Therefore, Experiment II introduced a treatment procedure based upon "fading in" the classroom stimulus situation from the one-to-one stimulus situation. Such treatment was highly effective in producing both a transfer in stimulus control and the acquisition of new behaviors in a kindergarten/first-grade classroom environment.

In an article from Leaf et al. (2012) the authors noted that deficits in social skills are a common problem for children with autism. (41) One method of developing appropriate social skills in children with autism has been group instruction. To date, however, group instruction has produced mixed results. The purpose of this article was to describe a promising method of teaching social skills to children in small groups.

In a study from Lerner et al. (2011) the authors examined the effectiveness of a novel intervention called 'socio-dramatic affective-relational intervention' (SDARI), intended to improve social skills among adolescents with Asperger syndrome and high functioning autism diagnoses. (42) SDARI adapts dramatic training activities to focus on in vivo practice of areas of social skill deficit among this population. SDARI was administered as a six-week summer program in a community human service agency. Nine SDARI participants and eight age- and diagnosis-group matched adolescents not receiving SDARI were compared on child- and parent-report of social functioning at three-week intervals beginning six weeks prior to intervention and ending six weeks post-intervention. Hierarchical Linear Modeling (HLM) was used to estimate growth trends between groups to assess treatment outcomes and post-treatment maintenance. Results indicated significant improvement and post-treatment maintenance among SDARI participants on several measures of child social functioning. Implications for practice and research were discussed.

In a study from Lopata et al. (2006) preliminary data from an ongoing research project evaluating a summer treatment program for children with Asperger disorder (AD) was presented. (43) The purpose of this study was to evaluate the effectiveness of a cognitive–behavioral treatment program on the social behaviors of 6- to 13-year-old children with AD. Overall program effectiveness was the focus of analyses at that time, but two treatment configurations were also tentatively compared: social skills instruction only (SS) versus social skills instruction and behavioral treatment (SS+BT). Results of the study indicated significant improvement in social skills for the overall program based on parent and staff reports. In addition, parents reported a significant improvement in adaptability and reduction in unusual behavior for their children. In contrast, staff reports reflected no significant change in adaptability and an increase in unusual behaviors. Comparison of the two treatment

configurations indicated no significant difference between SS and SS+BT. Implications for treatment and future research were provided.

Lopata et al. (2008) presented findings from the final two years of a four-year study investigating a manualized social treatment program for high-functioning children with autism spectrum disorders. (44) The study sought to 1) replicate and expand findings from years one and two; 2) compare outcomes of participants who received response-cost feedback versus non-categorical feedback; and 3) provide further evidence of program feasibility. Results indicated significant improvements in social skills and problem behaviors, however no significant differences for face emotion recognition. Measures of several socially-related behaviors yielded mixed results based on rater. While parent ratings did not appear to favor one feedback format, staff ratings appeared to favor the response-cost format on some measures. Results also provided support for program feasibility.

In a review article from Reichow and Volkmar (2010) best evidence synthesis of interventions to increase social behavior for individuals with autism was evaluated. (45) Sixty-six studies published in peer-reviewed journals between 2001 and July 2008 with 513 participants were included. The results are presented by the age of the individual receiving intervention and by delivery agent of intervention. The findings suggest there is much empirical evidence supporting many different treatments for the social deficits of individuals with autism. Using the criteria of evidence-based practice proposed by Reichow et al. (Journal of Autism and Developmental Disorders, 38:1311–1318, 2008), social skills groups and video modeling have accumulated the evidence necessary for the classifications of established EBP and promising EBP, respectively. Recommendations for practice and areas of future research were provided.

Group behavioral classroom instruction for children with developmental disabilities has been shown to allow for increased efficiency, approximation to naturalistic arrangements, and enhanced opportunity for interaction, social teaching, and observational learning. In a study from Taubman et al. (2001) the effectiveness of a group instructional extension of one to one discrete trial teaching, which involves the overlapping of trials between students along with the use of sequential and choral group teaching was examined. (46) A multiple baseline design across tasks was employed to examine the effectiveness of the group instructional approach in promoting acquisition of educational skills among preschoolers with autism and other developmental disabilities. A time sample interval assessment of components of the group instruction was also conducted. The approach was demonstrated to consistently increase correct responding across the task areas. Results were discussed in terms of the advantages of the group instructional approach as an adjunct to one to one discrete trial instruction.

In an article by Taylor and DeQuinzio (2012) the authors note that a skill essential for successful inclusion in general education settings is the ability to learn by observing others. Research, however, has documented children with autism display significant deficits in the fundamental skills necessary for observational learning. (47) Their article outlines the skills essential for observational learning from an operant learning perspective, the research base on teaching observational learning to children with autism and suggests practical strategies to increase

these skills in children with autism so they may more fully benefit from inclusion in general education settings.

Hixson (2004) noted that much behavior development is cumulative and hierarchical in that subsequent learning is dependent on prior learning. (48) The behavior or behavioral changes that produce subsequent important behavioral changes are referred to as basic behavioral repertoires or behavioral cusps. This progression of learning is called “cumulative-hierarchical learning,” and it may be an important concept for understanding much complex human behavior. Despite its potential importance, there has been little systematic study of the concept within behavior analysis or psychology in general, which limits our understanding of complex human behavior. One reason for the lack of research may be the difficulty in studying cumulative-hierarchical learning and identifying behavioral cusps. Methods to study cumulative hierarchical learning are described.

In an article by Smith et al. (2006) the authors observe that cumulative-hierarchical learning (CHL) and behavior, a premise first introduced by Staats in 1975, describes how higher-level behavioral patterns and structures can emerge from interactions among a set of lower-level actions. (49) Proponents of CHL emphasize the importance of pivotal response interventions, behavior repertoires, generative learning, and the development of behavioral cusps, the human equivalent of the computer world’s killer application, or “killer app” (Wikipedia, n.d.). Rosales-Ruiz and Baer (1997) defined a behavioral cusp as an entry point for pivotal behavioral change that, once initiated, so profoundly alters, displaces, or transforms one’s behavioral repertoire that it renders preexisting behavioral repertoires obsolete. In the article, the authors demonstrate how behavioral cusps can be used to construct CHL behaviors and repertoires of persons with autism and other pervasive developmental disorders within and across five pivotal behavioral elements. The authors also describe how behavioral cusps could be used to improve the quality of the collaborative conversations during person-centered planning sessions.

2021 Update

In an article by Braumes et al., (2020) the authors note that Applied Behavior Analysis (ABA) services have been provided primarily in the fields of healthcare and education across various settings using in-person service delivery model. Due to the COVID-19 pandemic, the necessity of and demand for ABA services using telehealth have increased. The purpose of the present paper was to cross-examine the ethical codes and guidelines of different, but related fields of practice, and to discuss potential implications for telehealth-based ABA service delivery. Braumes et al., (2020) reviewed the telehealth-specific ethical codes and guidelines of the American Psychological Association, the American Academy of Pediatrics, and the National Association of Social Workers along with the related ABA literature. These organizations addressed several useful and unique ethical concerns that had not been addressed in ABA literature. Braumes et al., (2020) also developed a brief checklist for ABA practitioners to evaluate their telehealth readiness by meeting the legal, professional, and ethical requirements of the ABA services. (50)

In an article by Colombo et al., (2020) the authors note that in the United States, ABA is broadly recognized as a medically necessary treatment for individuals diagnosed with autism and related disorders (Association of Professional Behavior Analysts, 2020, Guidelines for practicing applied behavior analysis during COVID-19 pandemic). Colombo et al., (2020) argue that this designation should not be called into question in light of a particular disaster and that it is critical to consider that an interruption of services can have long-lasting effects on the treatment of the individual (practitioners are ethically obligated to uphold the continuity of services while doing no harm). This dilemma might be ameliorated by a decision model that considers the prioritization of immediate needs, the vulnerability of clients, and the competency of service providers. Just as the medical field prioritizes immediate needs during crisis situations and defers routine appointments (e.g., physicals, checkups), the ABA field can make similar evidence-based decisions. The purpose of the current article is to provide a decision model for ABA practitioners who find themselves questioning the need for essential service delivery during the current COVID-19 pandemic. The impact of this model goes beyond the needs of this crisis and can be applied to any emergency situation where services are at risk of interruption. (51)

In an article by Cox et al., (2020) the authors note recent executive orders have led some ABA providers to interpret themselves as “essential personnel” during the COVID-19 pandemic. In this article, the authors argue against a blanket interpretation that being labeled “essential personnel” means that all in-person ABA services for all clients should continue during the COVID-19 pandemic. Cox et al., (2020) believes this argument holds even if ABA providers are not in a jurisdiction currently under an active shelter-at-home or related order. The authors provide a brief description of risks associated with continued in-person ABA service delivery, as well as risks associated with the temporary suspension of services or the transition to remote ABA service delivery. For many clients, continued in-person service delivery carries a significant risk of severe harm to the client, family and caregivers, staff, and a currently overburdened health care system. In these situations, ABA providers should temporarily suspend services or transition to telehealth or other forms of remote service delivery until information from federal, state, and local health care experts deems in-person contact safe. In rare cases, temporary suspension of services or a transition to remote service delivery may place the client or others at risk of significant harm. In these situations, in-person services should likely continue, and ongoing assessment and risk mitigation are essential. (52)

In an article by Gifford et al., (2012) the authors note the details of a small n study. Telehealth allows behavioral health care and specialty services to be extended to rural residents. Telehealth is an important resource for the Alaskan healthcare system, which is tasked with providing services to culturally diverse populations living in remote areas. Training competent providers to deliver telehealth services is vital for the implementation of successful telehealth programs. The authors note the literature is lacking in the area of provider behavioral telehealth competency training. The following methods were noted by the authors: This study assessed the impact of a Behavioral Telehealth Ethical Competencies Training program on 16 behavioral health providers' development of behavioral telehealth competency. A total of 14 competencies were developed, which required participants to understand the roles and

responsibilities of a behavioral telehealth coordinator working at the distal site as well as the roles and responsibilities of the therapist. Video vignettes evaluating the 14 competencies, self-reported competence surveys and follow-up surveys of progress on telehealth goals were utilized to assess effects of the training. Results indicated participants' behavioral telehealth competencies increased following training. Participants reported positive perceptions regarding their competency and achieved progress on the majority of behavioral telehealth goals set during the training. The authors concluded that this study provides a baseline for developing a best practice model for behavioral telehealth service delivery by identifying specific provider competencies for administering effective behavioral telehealth services. A unique continuing education training model, led by content experts including university professors and Alaska Native Elders, incorporating behavioral telehealth, rural ethics, cultural competency, and vicarious trauma training is described. Lastly, this study details the use of an innovative video vignette assessment instrument for evaluating the effectiveness of continuing education training. (53)

In an article by Lerman et al., (2020) the authors note that the use of telehealth technologies to provide clinical services to families of children with autism and other developmental disabilities is a rapidly growing area of research. In particular, remote training of caregivers via video conferencing appears to be a promising approach for disseminating behavior-analytic interventions. Although remote training offers a number of advantages, it brings a variety of challenges that are unique to this modality. The field would benefit from information on problems that practitioners may encounter when providing these services and how to train caregivers effectively. In this paper, the authors reported on the experiences of 18 practitioners who provided caregiver training via telehealth from four different sites across a 4-year period. The authors describe a variety of technical and clinical issues that arose during service delivery, suggest strategies for preventing and remediating problems, and include case descriptions and data to illustrate our experiences. This information may help prepare practitioners to deliver telehealth services and guide further research in this area. (54)

In an article by Novak et al., (2019) the authors note that a current study evaluated the effectiveness of a mobile application, Camp Discovery, designed to teach receptive language skills to children with ASD based on the principles of applied behavior analysis. Participants (N = 28) were randomly assigned to an immediate-treatment or a delayed-treatment control group. The treatment group made significant gains, $p < .001$, $M = 58.1$, $SE = 7.54$, following 4 weeks of interaction with the application as compared to the control group, $M = 8.4$, $SE = 2.13$. Secondary analyses revealed significant gains in the control group after using the application and maintenance of acquired skills in the treatment group after application usage was discontinued. Findings suggest that the application effectively teaches the targeted skills. (55)

In an article by Pollard et al., (2017) the authors note that telehealth service delivery models have become increasingly popular in the provision of behavior analytic services. Telehealth provides an opportunity to enhance care by providing clinicians and consumers with the ability to bridge issues related to geography by improving access to behavioral health care and reducing health disparities between urban and rural populations. As technology advances, this

raises for consideration ethical challenges that may arise within this new model. The authors note further, changes in the clinical and business infrastructure may be warranted to ensure safe, effective, and quality treatment for consumers. This paper explores ethical concerns when designing a telehealth service model within a behavior analytic organization. Recommendations related to the development of clinical and business infrastructure are provided to guide clinicians and organizations to promoting ethically sound services. (56)

In an article by Rios et al., (2018) the authors note teleconsultation is a method of providing services using remote technology. In rural areas it can be the solution to close the gap in service provision. In this paper, the authors detailed the technical factors that individuals who are attempting to engage in teleconsultation should consider. In addition, the authors provided some recommendations based on current trends and best practices and discussed implications for future use of such technologies. (57)

In an article by Rodriguez et al., (2020) (58) the authors note that with healthcare funders increasing approval of telehealth service as an emergency measure to provide continuity of care during the COVID-19 crisis, practicing behavior analysts have an unprecedented opportunity to demonstrate that essential, medically necessary behavior analytic services can be provided via telehealth in a manner that maintains treatment integrity and produces meaningful client outcomes. This telehealth treatment selection guide was designed to assist practicing behavior analysts in determining an appropriate protocol for delivery of 1:1 telehealth service (i.e., a behavior technician providing instruction directly to a client, with or without assistance by the client's caregiver, through video conferencing). This tool aims to help behavior analysts make thoughtful clinical decisions to maintain continuity of care for the vulnerable ASD population, while adhering to safety measures providing protection to society.

In an article by LeBlanc et al., (2016) the authors note that practicing behavior analysts frequently assess and treat problem behavior as part of their ongoing job responsibilities. Effective measurement of problem behavior is critical to success in these activities because some measures of problem behavior provide more accurate and complete information about the behavior than others. However, not every measurement procedure is appropriate for every problem behavior and therapeutic circumstance. The authors summarize the most commonly used measurement procedures, describe the contexts for which they are most appropriate, and propose a clinical decision-making model for selecting measurement produces given certain features of the behavior and constraints of the therapeutic environment. (59)

In an article by Reeve and Carr (2000), the authors note that the potential for using functional communication training (FCT) as a means of preventing minor problem behaviors from escalating to more serious ones was investigated. Eight children who exhibited minor problem behaviors at home or at school participated in small learning groups focused on teaching language skills. Four of these children participated in groups in which the teacher employed FCT (i.e., functional communication skills to gain attention were taught and reinforced). The other four children participated in a control group receiving expressive language training (ELT; i.e., children were taught to answer "wh" questions). Children in the ELT group were subsequently

switched to FCT in an extended intervention phase. The children who participated in the FCT group generally did not exhibit increases in either the intensity or frequency of problem behaviors over time. The level of their problem behavior remained low. However, children in the ELT group exhibited increases in both intensity and frequency of problem behaviors. Their problem behavior decreased after they were switched to FCT. In sum, FCT appeared to prevent minor problem behaviors from escalating to more serious ones. Critical variables in producing these results are discussed, as is the role of coercion processes. Heuristic suggestions are made for extending the investigation of FCT as a preventive strategy. (60)

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	0362T, 0373T, 97151, 97152, 97153, 97154, 97155, 97156, 97157, 97158
HCPCS Codes	G8539, G9012, H0031, H0032, H2012, H2013, H2014, H2019, H2020, S5108, S5110, S5111, S9480, T1023, T1024, T1025, T1026, T1027, T2013, T2020, T2022, T2023, T2024, T2025

*Current Procedural Terminology (CPT®) ©2022 American Medical Association: Chicago, IL.

References

1. Rogers SJ. Empirically supported comprehensive treatments for young children with autism. J Clin Child Psychol. 1998 Jun; 27(2):168-179. PMID 9648034
2. Gutstein SE, Burgess AF, Montfort K. Evaluation of the relationship development intervention program. Autism. 2007 Sep; 11(5):397-411. PMID 17942454
3. Gutstein SE. Empowering families through relationship development intervention: an important part of the biopsychosocial management of autism spectrum disorders. Ann Clin Psychiatry. 2009 Jul-Sep; 21(3):174-182. PMID 19758538
4. Maglione MA, Gans D, Das L, et al. Nonmedical interventions for children with ASD: recommended guidelines and further research needs. Pediatrics. 2012 Nov; 130 Suppl 2:S169-178. PMID 23118248
5. Applied Behavior Analysis Treatment of Autism Spectrum Disorder: Practice Guidelines for Healthcare Funders and Managers. 2020 The Council of Autism Service Providers,® Inc. (CASP®), all rights reserved. Ver. 2.0. Available at <https://www.casproviders.org> (accessed September 14, 2022).
6. Behavior Analyst Certification Board©. Maintaining the RBT Credential. Available at <http://www.bacb.com> (accessed October 25, 2018).

7. Ontario Association for Behaviour Analysis (2017). Evidenced Based Practices for Individuals with Autism Spectrum Disorder: Recommendations for Care Givers, Practitioners, and Policy Makers. Ontario, Canada. Available at <http://www.ontaba.org> (accessed May 4, 2018).
8. Orinstein AJ, Helt M, Troyb E, et al., Intervention for optimal outcome in children and adolescents with a history of autism. J Dev Behav Pediatr. 2014 May; 35(4):247-256. PMID 24799263
9. Reichow B. Overview of meta-analyses on early intensive behavioral intervention for young children with autism spectrum disorders. J Autism Dev Disord. 2012 Apr; 42(4):512-520. PMID 21404083
10. Blacklock K, Perry A, Geier JD. Examining the Effectiveness of Intensive Behavioural Intervention in Children with Autism Aged 6 and older. J Dev Disabil. 2014; 20(1): 37-49. Available at <https://oadd.org> (accessed October 7, 2022).
11. Bosch S, Fuqua RW. Behavioral cusps: a model for selecting target behaviors. J Appl Behav Anal. 2001 Spring; 34(1):123-125. PMID 11317984
12. Close H A, Lee LC, Kaufmann CN, et al. Co-occurring conditions and change in diagnosis in autism spectrum disorders. Pediatrics. 2012 Feb; 129(2):e305-e316. PMID 22271695
13. Dixon DR, Linstead E, Granpeesheh D, et al. An evaluation of the impact of supervision intensity, supervisor qualifications, and caseload on outcomes in the treatment of autism spectrum disorder. Behav Anal Pract. 2016 Jun 9; 9(4):339-348. PMID 27920965
14. Gould E, Dixon DR, Najdowski AC, et al. A review of assessments for determining the content of early intensive behavioral intervention programs for autism spectrum disorders. Res Autism Spectrum Disord. 2011 Jul; 5(3):990-1002.
15. Granpeesheh D, Dixon DR, Tarbox J, et al. The effects of age and treatment intensity on behavioral intervention outcomes for children with autism spectrum disorders. Res Autism Spectrum Disord. 2009 Dec; 3(4):1014-1022.
16. Isaksen J, Bryn V, Diseth TH, et al. Children with autism spectrum disorders-the importance of medical investigations. Eur J Paediatr Neurol. 2013 Jan; 17(1):68-76. PMID 22954514
17. Matson JL, Nebel-Schwalm MS. Comorbid psychopathology with autism spectrum disorder in children: An overview. Res Dev Disabil. 2007 Jul-Sep; 28(4):341-352. PMID 16765022
18. Najdowski AC, Gould ER, Lanagan TM, et al. Designing curriculum programs for children with autism. In Handbook of early intervention for Autism Spectrum Disorders (2014). (pp. 179-204). Springer, New York, NY.
19. Perry A, Blacklock K, Geier JD. The relative importance of age and IQ as predictors of outcomes in Intensive Behavioral Intervention. Res Autism Spectrum Disord. 2013 Sep; 7(9):1142-1150.
20. Valdovinos MG, Kennedy CH. A behavior-analytic conceptualization of the side effects of psychotropic medication. Behav Anal. 2004 Fall; 27(2):231-238. PMID 22478431
21. Volkmar FR, McPartland JC. From Kanner to DSM-5: Autism as an evolving diagnostic concept. Annu Rev Clin Psychol. 2014; 10:193-212. PMID 24329180
22. Weiss MJ. (1999). Differential rates of skill acquisition and outcomes of early intensive behavioral intervention for autism. Behav Interv: Theory & Practice in Residential & Community-Based Clinical Programs. 1999; 14(1):3-22.

23. Weiss MJ, Delmolino L. The relationship between early learning rates and treatment outcome for children with autism receiving intensive home-based applied behavior analysis. Behav Anal Today. 2006; 7(1):96-109.
24. Burgess AF, Gutstein SE. Quality of life for people with autism: Raising the standard for evaluating successful outcomes. Child Adolesc Ment Health. 2007 May; 12(2):80-86. PMID 32811109
25. Ferraioli S, Hughes C, Smith T. A Model for Problem Solving in Discrete Trial Training for Children with Autism. J Early Intens Behav Intervent. 2005; 2(4):224-246.
26. Cosden M, Koegel LK, Koegel RL, et al. Strength-based assessment for children with autism spectrum disorders. Res Pract Persons Sev Disabil. 2006; 31(2):134-143.
27. Degnan KA, Calkins SD, Keane SP, et al. Profiles of disruptive behavior across early childhood: Contributions of frustration reactivity, physiological regulation, and maternal behavior. Child Dev. 2008 Sep-Oct; 79(5):1357-1376. PMID 18826530
28. Ogundele MO. Behavioural and emotional disorders in childhood: A brief overview for paediatricians. World J Clin Pediatr. 2018 Feb 8; 7(1):9-26. PMID 29456928
29. Parry-Cruwys DE, Neal CM, Ahearn WH, et al. Resistance to disruption in a classroom setting. J Appl Behav Anal. 2011 Summer; 44(2):363-367. PMID 21709794
30. Taylor BA, Fisher J. Three important things to consider when starting intervention for a child diagnosed with autism. Behav Anal Pract. 2010 Fall; 3(2):52-53. PMID 22532894
31. Verdugo MA, Schalock RL, Keith KD, et al. Quality of life and its measurement: Important principles and guidelines. J Intellect Disabil Res. 2005 Oct; 49(Pt 10):707-717. PMID 16162115
32. Golnik AE, Ireland M. Complementary alternative medicine for children with autism: a physician survey. J Autism Dev Disord. 2009 July; 39(7):996-1005. PMID19280328
33. Hagopian LP, Rooker GW, Zarcone J R. Delineating subtypes of self-injurious behavior maintained by automatic reinforcement. J Appl Behav Anal. 2015 Sep: 48(3):523-543. PMID 26223959
34. LaFrance DL, Weiss MJ, Kazemi E, et al. Multidisciplinary teaming: Enhancing collaboration through increased understanding. Behav Anal Pract. 2019 Mar 26; 12(3):709-726. PMID 31976281
35. Brown SM, Bebko JM. Generalization, overselectivity, and discrimination in the autism phenotype: A review. Research in Autism Spectrum Disorders. 2012 Apr-Jun; 6(2):733-740.
36. Flippin M, Crais ER. The need for more effective father involvement in early autism intervention: A systematic review and recommendations. Journal of Early Intervention. 2011 Mar; 33(1):24-50.
37. Horner RH, Day HM. The effects of response efficiency on functionally equivalent competing behaviors. J Appl Behav Anal. 1991 Winter; 24(4):719-732. PMID 1839157
38. Koegel RL, Koegel LK, McNerney EK. Pivotal areas in intervention for autism. J Clin Child Psychol. 2001 Mar; 30(1):19-32. PMID 11294074
39. Ruble LA, McGrew J, Dalrymple N, et al. Examining the quality of IEPs for young children with autism. J Autism Dev Disord. 2010 December; 40(12):1459-1470. PMID 20373007
40. Koegel RL, Rincover A. Treatment of psychotic children in a classroom environment: 1. Learning in a large group. J Appl Behav Anal. 1974 Spring; 7(1):45-59. PMID 4465373

41. Leaf JB, Dotson WH, Oppenheim-Leaf ML, et al. A programmatic description of a social skills group for young children with autism. Topics in Early Childhood Special Education. 2012 Aug; 32(2):111-121.
42. Lerner MD, Mikami AY, Levine K. Socio-dramatic affective-relational intervention for adolescents with Asperger syndrome & high functioning autism: Pilot study. Autism. 2011 Jan; 15(1):21-42. PMID20923890
43. Lopata C, Thomeer ML, Volker MA, et al. Effectiveness of a cognitive-behavioral treatment on the social behaviors of children with Asperger disorder. Focus on Autism and Other Developmental Disabilities. 2006 Winter; 21(4):237-244.
44. Lopata C, Thomeer ML, Volker MA, et al. Effectiveness of a manualized summer social treatment program for high-functioning children with autism spectrum disorders. J Autism Dev Disord. 2008 May; 38(5):890-904. PMID 18058012
45. Reichow B, Volkmar FR. Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. J Autism Dev Disord. 2010 Feb; 40(2):149-166. PMID 19655240
46. Taubman M, Brierley S, Wishner J, et al. The effectiveness of a group discrete trial instructional approach for preschoolers with developmental disabilities. Res Dev Disabil. 2001 May-Jun; 22(3):205-219. PMID11380059
47. Taylor BA, DeQuinzio JA. Observational learning and children with autism. Behav Modif. 2012 May; 36(3):341-360. PMID 22569578
48. Hixson MD. Behavioral cusps, basic behavioral repertoires, and cumulative-hierarchical learning. Psychological Record. 2004 Summer; 54(3):387-403.
49. Smith GJ, McDougall D, Edelen-Smith P. Behavioral cusps: A person-centered concept for establishing pivotal individual, family, and community behaviors and repertoires. Focus on Autism and Other Developmental Disabilities. 2006 Winter; 21(4):223-229
50. Braumes A, Čolić M, Araiba S. Comparison of telehealth related ethics and guidelines and a checklist for ethical decision-making in midst of the COVID-19 pandemic. Behavior Analysis in Practice. 2020 Aug 17; 13(4):1-12. PMID 32837709
51. Colombo RA, Wallace M, Taylor R. (2020). An essential service decision model for ABA providers during crisis. Behavior Analysis in Practice. 2020 May 22; 13(2):306-311. PMID 32637293
52. Cox DJ, Plavnick JB, Brodhead MT. A proposed process for risk mitigation during the COVID-19 pandemic. Behavior Analysis in Practice. 2020 Apr 23; 13(2):1-7. PMID 32328220
53. Gifford V, Niles B, Rivkin I, et al. Continuing education training focused on the development of behavioral telehealth competencies in behavioral healthcare providers. Rural and remote health. 2012; 12:2108.
54. Lerman DC, O'Brien MJ, Neely L, et al. (2020). Remote coaching of caregivers via telehealth: Challenges and potential solutions. Journal of Behavioral Education.
55. Novack MN, Hong E, Dixon DR, et al. An evaluation of a mobile application designed to teach receptive language skills to children with autism spectrum disorder. Behavior Analysis in Practice. 2019; 12:66-77. PMID 30918771
56. Pollard JS, Karimi KA, Ficcaglia MB. Ethical considerations in the design and implementation of a telehealth service delivery model. Behavior Analysis: Research and Practice. 2017; 17(4):298-311.

57. Rios D, Kazemi E, Peterson SM. Best practices and considerations for effective service provision via remote technology. Behavior Analysis: Research and Practice. 2018; 18(3):277-287.
58. Rodriguez K A. Maintaining treatment integrity in the face of crisis: A treatment selection model for transitioning direct ABA services to telehealth. Behavior Analysis in Practice. 2020 May 18; 13(2):1-8. PMID 32426099
59. LeBlanc LA, Raetz PB, Sellers TP, et al. A proposed model for selecting measurement procedures for the assessment and treatment of problem behavior. Behavior Analysis in Practice. 2016; 9(1):77-83. PMID 27606232
60. Reeve CE, Carr EG. Prevention of severe behavior problems in children with developmental disorders. Journal of Positive Behavior Interventions. 2000; 2(3):144-160.

Additional References

61. McEachin JJ, Smith T, Lovaas OI, et al. Long-term outcome for children with autism who received early intensive behavioral treatment. Am J Ment Retard. 1993 Jan; 97(4):359-372; discussion 373-391. PMID 8427693
62. Bebko JM, Perry A, Bryson S, et al. Multiple method validation study of facilitated communication: II. Individual differences and subgroup results. J Autism Dev Disorder. 1996 Feb; 26(1):19-42. PMID 8819769
63. Ziring P, Brazdziunas D, Cooley W, et al. American Academy of Pediatrics: Auditory Integration Training and Facilitated Communication for Autism. Pediatrics. 1998 Aug; 102(2 Pt 1): 431-433. PMID 9685446
64. Filipek PA, Accardo PJ, Ashwal S, et al. Practice Parameter: Screening and Diagnosis of Autism: report of the Quality Standards Subcommittee of the American Academy of Neurology and the Child Neurology Society. Neurology. 2000 Aug 22; 55(4):468-479. PMID 10953176
65. Bassett K, Green C, Kazanjian A, et al. Autism and Lovaas treatment: a systematic review of effectiveness evidence. British Columbia Office of Health Technology Assessment. (2000 July) p. 1-58. Available at <http://www.open. library.ubc.ca> (accessed December 11, 2023).
66. Boyd RD, Corley MJ. Outcome survey of early intensive behavioral intervention for young children with autism in a community setting. Autism. 2001; 5(4):430-441. PMID 11777258
67. Committee on Children with Disabilities. Technical report: The pediatrician's role in the diagnosis and management of autistic spectrum disorder in children. Pediatrics. (2001 May) 107:5, e85. Available at <http://www.pediatrics. aappublications.org> (accessed September 11, 2021).
68. Ludwig A, Hartstall C. Intensive intervention programs for children with autism. HTA-8: Series B Health Technology Assessment. Alberta Heritage Foundation for Medical Research (2001 February) 1-40.
69. Scattone D, Wilczynski SM, Edwards RP, et al. Decreasing disruptive behaviors of children with autism using social stories. J Autism Devel Disord. 2002 Dec; 32(6):535-543. PMID 12553590
70. Dua V, and ASD Standards and Guidelines Working Group. Standards and Guidelines for the assessment and diagnosis of young children with autism spectrum disorder in British Columbia-an evidence-based report prepared for the British Columbia Ministry of Health

Planning. (2003 March) 1-41. Available at <http://www.phsa.ca> (accessed September 11, 2021).
71. Le Couteur, Ann. National autism plan for children (NAPC). National Initiative for Autism: Screening and Assessment. (2003 March) 1-134. Available at <http://www.autism.org.uk> (accessed October 24, 2018).
72. Ganz JB, Simpson RL. Effects on communicative requesting and speech development of the Picture Exchange Communication System in children with characteristics of autism. J Autism Dev Disord. 2004 Aug; 34(4):395-409. PMID 15449515
73. Sinha Y, Silove N, Hayen A, et al. Auditory integration training and other sound therapies for autism spectrum disorders. Cochrane Database Syst Rev. 2011 Dec 7; 2011(12):CD003681. PMID 22161380
74. Doughty C. What is the evidence for the effectiveness of behavioral and skill-based early intervention in young children with Autism Spectrum Disorder (ASD)? New Zealand Health Technology Assessment, NZHTA Tech Brief Series. Department of Public Health and General Practice (2004 April) 3:1, 1- 24. Available at <http://nzhta.chmeds.ac.nz/publications> (accessed September 12, 2021).
75. Sherer MR, Schreibman L. Individual behavioral profiles and predictors of treatment effectiveness for children with autism. J Consult Clin Psychol 2005 Jun; 73(3):525-538. PMID 15982150.
76. Behavioral intervention for children with autism. The Cleveland Clinic Health Information Center. Available at <http://www.clevelandclinic.org> (accessed October 25, 2018).
77. Myers SM, Johnson CP, AAP Council on Children with Disabilities. Management of children with autism spectrum disorders. Pediatrics. 2007 Nov; 120(5):1162-1182. PMID 17967921
78. Weitlauf, AS, McPheeters, M L, Peters, B, et al. Therapies for Children with Autism spectrum Disorder; Behavioral interventions Update. (Archived). Comparative Effectiveness Review No. 137 Executive Summary. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2012-00009-I.) AHRQ Publication No. 14-EHC036-EF. Rockville, MD: Agency for Healthcare Research and Quality; 2014 August. Available at <www.effectivehealthcare.ahrq.gov> (accessed December 11, 2023).
79. Volkmar F, Seigel M, Woodbury-Smith M, et al. American Academy of Child and Adolescent Psychiatry (AACAP) Committee on Quality Issues (CQI). Practice Parameter for the Assessment and Treatment of Children and Adolescents with Autism Spectrum Disorder. J Amer Acad Child and Adoles Psych. 2014 Feb; 53(2):237-257. PMID 24472258
80. Wetherby AM, Guthrie W, Woods J. et al. Parent-Implemented Social Intervention for Toddlers With Autism: An RCT. Pediatrics. 2014 Dec; 134(6):1084-1093. PMID 25367544
81. Beaudoin AJ, Sébire G, Couture M. Parent training interventions for toddlers with autism spectrum disorder. Autism Res Treat. 2014; 2014:839890. PMID 24895534
82. Bearss K, Johnson C, Smith T, et al. Effect of parent training vs parent education on behavioral problems in children with Autism Spectrum Disorder. JAMA. 2015 Apr 21; 313(15):1524-1533. PMID 25898050
83. Miller DC, Light JC, Sclosser RW. The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: a research review. Journal Speech Lang Hear Res. 2006 Apr; 49(2):248-264. PMID 16671842

84. Magiati I, Charman T, Howlin P. A two-year prospective follow-up study of community based early intensive behavioral intervention and specialist nursery provision for children with autism spectrum disorders. J Child Psychol Psychiatry. 2007 Aug; 48(8):803-812. PMID 17683452
85. Bradstreet JJ, Sych N, Antonucci N, et al. Efficacy of fetal stem cell transplantation in autism spectrum disorders: an open-labeled pilot study. Cell Transplant. 2014; 23 Suppl 1:S105-112. PMID 25302490
86. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, (5th Ed.). (2013). Arlington, VA: American Psychiatric Publishing.
87. National Research Council (2001) Educating Children with Autism. Committee on Educational Interventions for Children with Autism. Catherine Lord and James P. McGee, eds. Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.
88. Treating Autism, ESPA Research, & Autism Treatment Plus. Medical Comorbidities in Autism Spectrum Disorder: A Primer for Health Care Professionals and Policy Makers. Second Edition. 2014 July. 1-28. Available at <https://www.nationalautismassociation.org> (accessed December 11, 2023).
89. Behavior Analyst Certification Board. (2014). Professional and ethical compliance code for behavior analysts. Littleton, Co: Author. Available at <https://www.bacb.com> (accessed December 11, 2023).
90. Centers for Disease Control and Prevention. CDC's Developmental Milestones. Available at <https://www.cdc.gov> (accessed November 15, 2023).
91. Gould ER, Redmond V. (2014). Parent involvement. In Granpeesheh, D., Tarbox, J., Najdowski, A. C., & Kornack, J. (2014). Evidence-based treatment for children with autism: the CARD model. Elsevier.
92. Mager, R. F. (1997). Preparing instructional objectives. (3rd ed.). Atlanta, GA: CEP Press
93. National Autism Center. Findings and conclusions: National standards project, phase 2. (2015) Randolph, MA
94. Squires J, Bricker DD, Twombly E. Ages & stages questionnaires. (2009) Baltimore, MD, USA: Paul H. Brookes.
95. Fovel JT. (2002). The ABA program companion. New York, NY: DRL Books.
96. Leaf, RB, Taubman MT, McEachin J, et al. (2008). It's time for school!: Building quality ABA educational programs for students with autism spectrum disorders. New York, NY: DRL Books.
97. Cooper JO, Heron TE, Heward WL. (2014). Applied Behavior Analysis (2nd ed.). Essex: Pearson.
98. Minnesota Northland Association for Behavior Analysis. (2012, September). Standards of practice for applied behavior analysis in Minnesota. Available at <http://behavioraldimensions.com> (accessed December 10, 2020).
99. Weber E. Quantifying student learning: how to analyze assessment data. The Bulletin of the Ecological Society of America. 2009 October; 90(4):501-511.
100. Alresheed F, Hott BL, Bano C. Single Subject Research: A Synthesis of Analytic Methods. Journal of Special Education Apprenticeship. 2013 May; 2(1): n1.

101. California Association for Behavior Analysis. (March 2011). Report of the task force of the California association for behavior analysis: Guidelines for applied behavior analysis (ABA) services: Recommendations for best practices for regional center consumers. Available at <https://autism.senate.ca.gov> (accessed December 11, 2023).
102. Chambless DL, Hollon SD. Defining empirically supported therapies. J Consult Clin Psychol. 1998 February; 66(1):7-18. PMID 9489259
103. Lovaas OI. Behavioral treatment and normal educational and intellectual functioning in young autistic children. J Consult Clin Psychol. 1987; 55(1):3-9.
104. Eldevik S, Hastings RP, Hughes C, et al. Meta-analysis of early intensive behavioral intervention for children with autism. J Clin Child Adolesc Psychol. 2009 May; 38(3):439-450. PMID 19437303
105. Reichow B, Wolery M. Comprehensive synthesis of early intensive behavioral interventions for young children with autism based on the UCLA Young Autism Project model. J Autism Dev Disord. 2009 January; 39(1):23-41. PMID 18535894
106. Reichow B, Barton EE, Boyd BA, et al. Early Intensive Behavioral Intervention (EIBI) for Young Children with Autism Spectrum Disorders (ASD): A Systematic Review. Campbell Systematic Reviews. 2014:9
107. Reichow B, Hume K, Barton EE, et al. Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD) (Review). Cochrane Database of Syst Rev. 2018 May 9; 5(5):CD009260. PMID 29742275
108. Makrygianni MK, Reed P. A meta-analytic review of the effectiveness of behavioural early intervention programs for children with autistic spectrum disorders. Research in Autism Spectrum Disorders. 2010 Oct-Dec; 4(4):577-593.
109. US Public Health Service (1999) Mental Health: Report of the Surgeon General [chap. 3, section on Autism]. Available at <http://www.surgeongeneral.gov> (accessed November 9, 2020).
110. US Public Health Service (2000) Mental Health: Report of the Surgeon General's Conference on Children's Mental Health: A National Action Agenda (January 3, 2001)
111. Virues-Ortega J. Applied behavior analytic intervention for autism in early childhood: meta-analysis, meta-regression and dose-response meta-analysis of multiple outcomes. Clin Psychol Rev. 2010 June; 30(4):387-399. PMID 20223569
112. Ethics Guidance for ABA Providers During COVID-19 Pandemic. 2020 Behavior Analyst Certification Board, ® Inc., (BACB®), all rights reserved. Ver. 2020 June 10. Available at <https://www.bacb.com> (accessed on September 8, 2021).
113. Fischer A J, Clark R, Askings D, et al. (2017). Technology and telehealth applications. In J. K. Luiselli (Ed.), Applied behavior analysis advanced guidebook: A manual for professional practice (p. 135–163). Elsevier Academic Press.
114. The Modified Overt Aggression Scale (MOAS), Modified from Kay SR, Wolkenfeld F, Murrill LM. (1988). Profiles of aggression among psychiatric patients: I. Nature and prevalence. Journal of Nervous and Mental Disease.
115. Fein D, Barton M, Eigsti I, et al. Optimal Outcome in Individuals with a History of Autism. J Child Psychol Psychiatry. 2013 Feb; 54(2):195-205 PMID 23320807

116. Weinmann S, Schwarzbach C, Begemann M, et al. (2009) Behavioural and skill-based early interventions in children with autism spectrum disorders. GMS Health Technol Assess. 2009 Jul 29; 5:Doc10. Doi:10.3205/hta000072. PMID 21289897

Centers for Medicare and Medicaid Services (CMS)

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services (CMS) does not have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been developed since this medical policy document was written. See Medicare's National Coverage at <http://www.cms.hhs.gov>.

Policy History/Revision

Date	Description of Change
05/15/2024	Document updated with literature review. The following changes were made to Coverage: 1) Added a section for Criteria for Initial Assessment 2) Criteria changed to the following sections titled “B. Criteria for Initial Therapy”; “C. Criteria to Continue Therapy”; and “D. Criteria to Discontinue Therapy”; 3) Added an indication under the procedures, service, and therapies that are considered experimental, investigational and/or unproven for the treatment of ASD; 4) Added indications under NOTE 7 addressing services that may be considered non-covered; 5) Some NOTES were removed, NOTE 8 was added, and other NOTEs were renumbered. Added or Updated references: 90, 115, and 116.
05/01/2023	Document updated with literature review. The following changes were made in Coverage: To the section on Criteria for Initial Therapy 1) Added clarification to Note 3; 2) Removed the word “age” from #2 criteria; 3) Added the following to #3 bullet 2: “such as absence of developmentally appropriate adaptive, social, or functional skills that are fundamental to maintaining health, social inclusion, and increased independence”; 4) Clarifications added to several bullets under #7; and 5) To the section on Criteria to Continue Therapy #3 was added: 3. “There is reasonable evidence that member is a good candidate for less supervision (1 clinician to 8 patients) found in evidenced based protocols for group social skills treatment, such as attainment of prerequisite communication skills and no danger to self or other's problem behavior”; 6) Editorial clarifications made to Note 9. No new references added, some updated, others removed.
01/01/2022	Document updated with literature review. The following changes were made in Coverage: 1) Revised criteria under sections A) Criteria for Initial Therapy;

	B) Criteria to Continue Therapy; and C) Criteria to Discontinue Therapy; and 2) Added NOTEs 4 and 5 and updated NOTE 9. Added references 105-118; others updated.
05/01/2021	Document updated with literature review. The following changes were made to the Coverage section: 1) Under Criteria for Initial Therapy the section addressing requirements for formal treatment plan (with all the "Critical Features of a Treatment Plan") additional criteria have been added. 2) Criteria to Continue Therapy (ALL criteria must be met) had changes made in examples of testing, and additional criteria added. 3) Criteria to Discontinue Therapy (when ANY of the following are present): criteria has been added. 4) under Provider Criteria For the para-professional / line therapist, NOTE 5 has been added. Other NOTEs have been renumbered. References 65-104 added.
08/01/2019	Document updated with literature review. The following changes were made to the Coverage section: 1) Added and/or modified criteria in the following sections: Criteria for Initial Therapy, Criteria to Continue Therapy, Criteria to Discontinue Therapy, and Provider Criteria, 2) Added stem-cell transplants to the list of therapies that are considered experimental, investigational and/or unproven for the treatment of Autism Spectrum Disorder (ASD), 3) Added the following statement: Comfort items and/or over the counter products, including but not limited to, weighted blankets and weighted vests are considered convenience items and are not covered benefits, 4) Added NOTE 3 and 4, removed other NOTEs. Added references 35-64, some references removed.
01/01/2017	New document. Coverage for Applied Behavior Analysis (ABA) for Autism Spectrum Disorder (ASD) Diagnosis previously addressed on Policy PSY301.014 Autism Spectrum Disorders (ASD). Coverage remains experimental investigational and/or unproven unless coverage for ABA and other Early Intensive Behavioral Intervention (EIBI) is state-mandated or specifically included in a member's benefit plan. Criteria for initial therapy, continued therapy and discontinuation of therapy has changed. Provider Criteria has been added. The coverage wording of Pervasive Developmental Disorder has now been replaced with ASD.