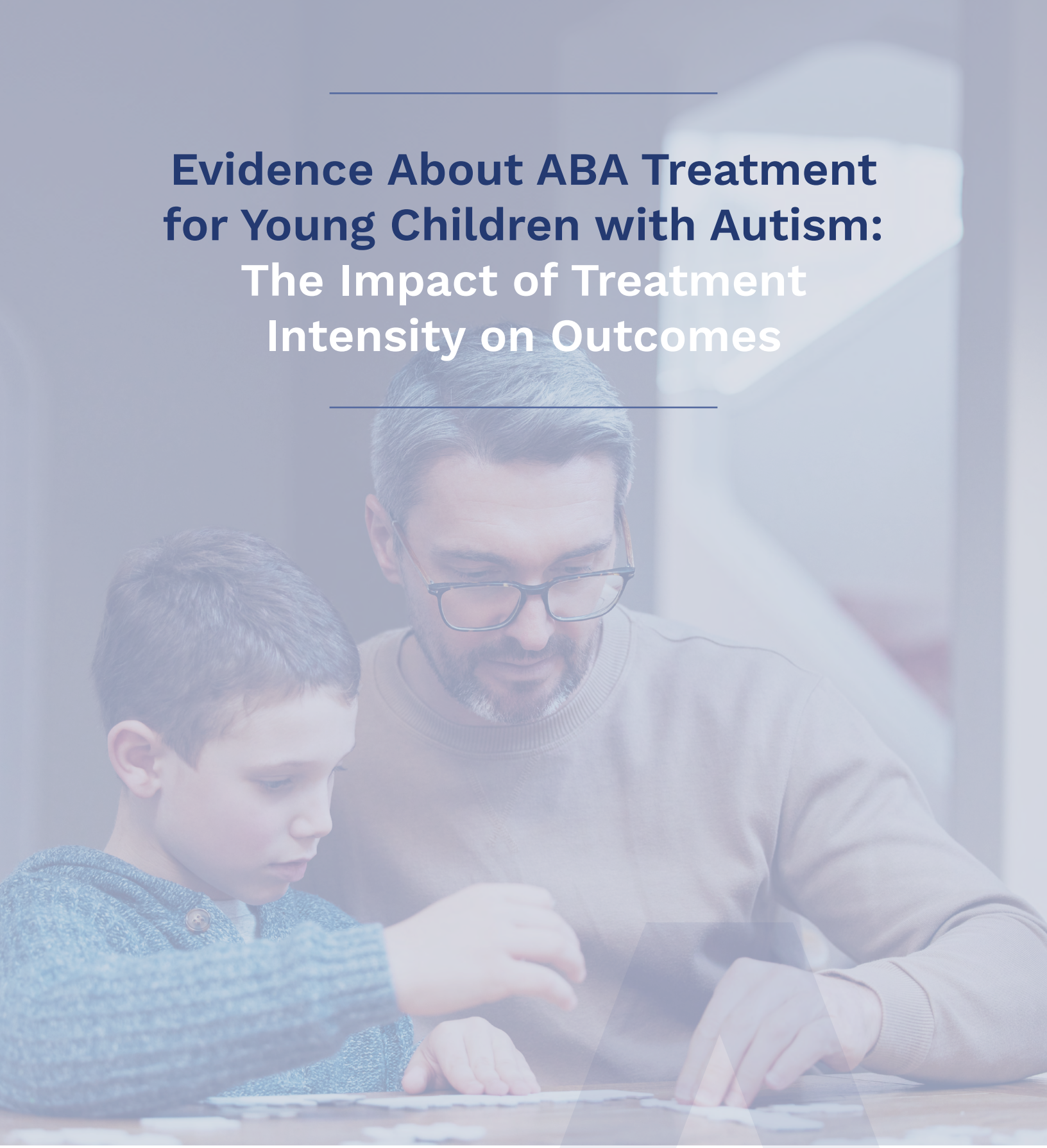
Evidence About ABA Treatment for Young Children with Autism: The Impact of Treatment Intensity on Outcomes



CASP The Council of Autism Service Providers

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Executive Summary

Autistic individuals and their families are best served when they are given complete, scientifically accurate information on which to base decisions about treatment and support. However, the amount of readily accessible but misleading, contradictory, or incomplete information often makes it difficult for stakeholders to understand and evaluate the treatment options for young children diagnosed with autism. Thus, practical information that clarifies the guidelines regarding applied behavior analytic (ABA) treatment for young children is needed for clinicians, families and caregivers, provider organizations, funders, and regulators.

This resource summarizes the evidence about early comprehensive intensive ABA treatment for children with autism and the generally accepted standards of care for this treatment as reflected in the *Applied Behavior Analysis Practice Guidelines for the Treatment of Autism Spectrum Disorder, 3rd edition* (CASP, 2024).[1] The purpose of this document is to assist practitioners, provider organizations, families, funders, and advocates in better understanding this treatment's well-established research base, especially the impact of treatment intensity on the outcomes of comprehensive ABA interventions for young autistic children.

A summary of what it means to engage in evidence-based practice as well as a framework for evaluating treatment outcome research is provided, along with a discussion of the evidence base regarding the impact of treatment intensity in ABA treatment for young children. It highlights one of the most recent meta-analyses by Eldevik and colleagues. These researchers analyzed data from more than 340 young children who received early comprehensive ABA treatment. This meta-analysis substantiates previous multiple systematic reviews and other meta-analyses showing the positive correlation between treatment intensity at different levels and outcomes for young children. The work by Eldevik et al. also contains information related to benchmarks that are important to all stakeholders.

This document also evaluates recent studies whose authors assert that high and low treatment intensities produce similar outcomes. It contextualizes those claims by identifying concerns about the methodology, design, and degree of understanding of early intensive ABA intervention for young children with autism in these studies.

Finally, it provides resources for discussions with parents and caregivers about the variables that influence the outcomes of early comprehensive intensive ABA for young children.

[1] The term "treatment" is used in this document synonymously with "intervention" and "services." Similarly, the term "patient" is intended to be synonymous with "client" and "consumer." The term "early comprehensive ABA treatment" is used instead of EIBI to eliminate confusion between ABA and other behavioral approaches. Finally, "practitioner" is used as a synonym for "clinician" or "behavior analyst."

Introduction

One of the most well-substantiated findings in ABA treatment for young children is the effect of higher treatment intensity on better outcomes (e.g., Virues-Ortega, 2010; Eldevik et al., 2010; Virues-Ortega et al., 2013). Higher treatment intensity, typically defined as the number of hours of direct treatment delivered to a patient each week for an extended period, has been consistently associated with better outcomes for young children who receive comprehensive ABA treatment. However, some recent publications have purported to provide evidence that treatment intensity is not differentially associated with better outcomes. (See Ostrovsky et al., 2023 and Sandbank et al., 2024).

While no study is without criticism, the assertions made in the studies by Ostrovsky et al. (2023) and Sandbank et al. (2024) are undermined by significant methodological limitations and a lack of understanding of ABA interventions for autism by some authors. Even more troubling, these assertions could be used to deny services at the intensity shown to maximize benefits or convince families that non-intensive or alternative interventions will produce the same outcomes as early comprehensive intensive ABA intervention for their children. There is also a risk that these studies could promote the harmful view that any amount or type of intervention works as well as any other, so it is appropriate to provide the least amount, easiest, or cheapest intervention possible.

Practitioners, consumers, policymakers, and funders must review any claims that treatment intensity does not matter in the context of the complete and extensive scientific evidence base which shows the opposite – that as recognized in the most recent edition of the generally accepted standards of ABA health care for autistic individuals, high-intensity treatment is associated with better outcomes than low-intensity treatment in early comprehensive intensive ABA programs. This supplemental resource to the standards of care provides further context by:

- discussing the nature and importance of generally accepted standards of care (GASC)
- describing the elements of evidence-based practice and the role of peer-reviewed research
- providing guidance on how to evaluate research on treatments
- defining early comprehensive intensive ABA intervention for autism, and summarizing the best available scientific evidence about intensity effects
- stating GASC specific to ABA treatment for young children
- critiquing publications that purport to show that intervention intensity has no bearing on outcomes for young autistic children

Generally Accepted Standards of Care

Definition Generally accepted standards of care (GASC) are the clinical practices for serving patients with a specified condition recognized by health care providers in the relevant clinical specialty. They are developed and defined *within the profession* by subject matter experts rather than externally by other stakeholders (e.g., funders, consumers, and professionals who practice in other areas). They incorporate the applicable scientific research evidence base and reflect a consensus among qualified professionals regarding the appropriate clinical practices for a specific patient population.

The GASC for ABA treatment for ASD are the *CASP ABA Practice Guidelines for the Treatment of Autism Spectrum Disorder (3rd edition)*. Practitioners use these guidelines to navigate the complexities of treatment planning and implementation. Practitioners who refer to and adhere to their profession's current GASC are better positioned to provide appropriate patient care. Funders and regulators also use this information to evaluate medical necessity.

A critical step in developing the standards and guidelines is considering and incorporating the best scientific evidence. While evaluating research has always been an integral part of ABA practice, the rapid growth in published research, expanding patient populations, and available treatment models make it difficult for individual clinicians to have the time or expertise to thoroughly and adequately evaluate all published research. The CASP (2024) practice guidelines are a vital reference for clinicians as they are produced using resources typically unavailable to most practitioners.

GASC are the guidelines and standards for appropriate health care for a specific patient population.

The development, revision, and use of GASC are common practices within medical and health care, with virtually every professional specialty area having developed specific guidelines for providing care to certain patient populations. For example, the American Diabetes Association has standards for screening, diagnosis, prevention, and treatment of diabetes and comorbid conditions that are reviewed annually (American Diabetes Association, 2023). Similarly, the American Psychological Association has developed GASC for the screening, diagnosis, and care of pediatric, teenage, and adult clients for depression (American Psychological Association, 2019).

Development and Revision Typically, a group of researchers and clinicians in the specialty area with in-depth expertise in the research and delivery of care within the specialty area to a specified patient population is selected to develop the GASC. The group reviews the best available information from scientific research and reaches a consensus about how to integrate the preponderance of the scientific evidence with expert opinion (Kinney, 2004). This means that GASCs are developed by professionals with substantial experience and knowledge about the subspecialty area who also possess the expertise required to evaluate the quality and quantity of the available research.

Guidelines and standards developed outside the appropriate process (e.g., by individuals lacking expertise in critical areas or who fail to consider the totality of the research base) do not meet the requirements to establish GASC. In addition, guidelines developed by those without fiduciary responsibilities to patients (e.g., private health insurance companies and liability insurers) may exhibit bias. They should be approached skeptically, as the contributors may have conflicts of interest (Cooke et al., 2017).

Once developed, GASC must be reviewed periodically by the qualified professional group and updated to incorporate new scientific findings, public policies, and changes in the evidence base.

Legal Significance The CASP (2024) guidelines hold clinical and legal importance. Failure to deliver care in accordance with these widely acknowledged professional standards has legal consequences for stakeholders, particularly consumers, funders, practitioners, and provider organizations as various statutes, regulations, and contractual definitions require adherence to GASC as a benchmark for medical necessity determinations. For instance, addendums to certain state mental health parity laws mandate that health plans rely on GASC developed by independent, nonprofit professional associations in the relevant clinical specialties in defining and reviewing for medically necessary services for patients with substance use disorders and mental health conditions, including autism.

It is therefore recommended that practitioners, provider organizations, funders, regulators, and consumers become highly familiar with the *CASP* Practice Guidelines *3rd edition* and this resource regarding the standards of care provided to patients and families. This includes reviewing the sections on scope, intensity, and duration in treatment planning; outcomes; collaboration and coordination of care; and transition and discharge planning. See also CASP Practice Guidelines, 3rd edition, Section 4.3 *"Collaboration in Care: Patient Priorities, Values, and Shared Decision-Making.*

Evidence-Based Practice

The strength of ABA has always been its reliance on the results of thorough scientific evaluations of procedures used in treatment planning and care delivery. Referencing the GASC (i.e., CASP, 2024) in patient care is arguably the first and most important step in engaging in evidence-based practice (EPB).

In this context, EBP refers to utilizing the best available scientific evidence and other credible sources, combined with clinical expertise and an understanding of the patient's characteristics, values, and circumstances, to guide decision-making regarding suitable patient care. This definition emphasizes to practitioners that EBP involves a series of actions, beginning with the identification of the best available evidence to develop, deliver, and evaluate patient services.

The centrality of EBP to the practice of ABA was described by Slocum et al. (2014), who proposed a definition like the one above. It is also reflected in several provisions of the Behavior Analyst Certification Board (BACB) *Ethics Code for Behavior Analysts* (2020). For example, the mandate to design and provide services that are "based on scientific evidence" or "based on existing research" appears in several standards (e.g., 2.01 *Providing Effective Treatment; 2.13 Selecting, Designing, and Implementing Assessments; 2.14 Selecting, Designing, and Implementing Behavior-Change Interventions; 5.03 Public Statements*). In addition, standard 3.12—Advocating for Appropriate Services—specifies that behavior analysts must advocate for "the appropriate amount and level of behavioral service provision and oversight required to meet defined client goals," which speaks directly to the importance of understanding the best available scientific evidence about treatment intensity.

Evaluating the Evidence

In evaluating the evidence for any assessment, treatment, or scientific claim (e.g., "intensity is associated with differential treatment outcomes for early comprehensive intensive ABA treatment provided to young children with autism"), it is important to note that the definition of "best available evidence" implies that the entire body of relevant scientific research has been considered. No single study can provide adequate information to determine what is most likely to benefit a patient. The following section discusses some components of the research evaluation process, starting with evaluating individual studies and progressing to examining systematic reviews. This process is relevant to the individual clinician who is reviewing a particular study as well as the experts responsible for developing GASC.

Evaluating a Single Study Credible evidence about the effects of treatments comes from studies with essential features of scientific inquiry (see Johnston et al., 2019, for additional information). Any individual study should be evaluated using at least the following criteria:

(a) was the study prospective or retrospective

(b) was the study controlled or uncontrolled (i.e., controlled manipulation of the independent variable to achieve experimental control)

(c) was the experimental question anchored in a meaningful and thorough understanding of existing research

(d) were the conclusions logical and reasonable given the research methods used and data collected

Each feature is examined below in the context of evaluating the effects of behavioral interventions.

(a) Prospective vs. Retrospective Prospective studies are designed before data are collected and conducted from a point in time forward. This allows the researcher to select optimal dependent measures; identify participants with known or important characteristics; define, measure, and record independent variable values; and employ various methods to manage sources of biases and confounds.

In contrast, retrospective studies are conducted after the data have already been collected. In retrospective studies, the researcher can only sort through whatever data already exists. Often, those data were collected for non-research purposes (e.g., patient records, documenting compliance with funders or regulators, billing). The researcher is less able to control the quality of measures, values of the independent variable, or biases that could impact the data.

Retrospective analyses can help plan prospective studies. They might also allow an organization to answer a question like, "How did this select group of patients do while receiving our services over this time period?" However, as with all retrospective studies, research is limited to whatever information was collected in the past. Because adherence to important characteristics of scientific inquiry is often limited, retrospective studies are more likely to provide incomplete information or conclusions that are more vulnerable to bias.

This is why prospective studies, which can incorporate scientific rigor more effectively, are necessary to evaluate whether a particular treatment influences outcomes.

Retrospective studies are not well suited to answering substantive questions such as "Is Treatment X superior to Treatment Y in reported patient outcomes?" or "Does the intensity of treatment produce differential outcomes?"

(b) Controlled vs. Uncontrolled Controlled studies require a well-defined treatment (i.e., experimental) condition and one or more well-defined control or comparison conditions. In a controlled treatment study, the conditions are designed to vary ONLY on the independent variable, such as the treatment(s) of interest or the variable being studied.

That can be achieved with group research design where groups of participants with similar characteristics experience different treatment conditions over a specified period (e.g., treatment versus no treatment, different amounts of treatment, two different treatments); (b) a single-case research design in which each participant experiences both the treatment and the control conditions repeatedly; or (c) a hybrid research design that combines elements of group and single-case designs.

In addition, in studies using group research designs, either participant selection procedures or statistical control methods are used to ensure that the treatment and comparison groups do not differ on any factors that might influence the study results (e.g., age, diagnosis, cognitive functioning, or other skills) at entry to the study so that subsequent differences can be attributed to the independent variable rather than participant differences between groups. Preferably, the researcher also evaluates and reports on the validity, accuracy, consistency, and believability of the measures (especially those that rely on human observations or perceptions) and the accuracy with which treatment and comparison procedures were implemented (i.e., procedural integrity).

The ability to control key variables in prospective studies also helps explain why retrospective records reviews or studies involving just one group of participants who experience a treatment have limited utility.

(c) Guided by Existing Research Researchers make many complex decisions when designing, conducting, analyzing, and interpreting an intervention study. Those decisions should reflect an in-depth knowledge and familiarity with the relevant existing research, especially regarding important participant characteristics, essential features of the treatment(s), the sensitivity of research designs, appropriateness of dependent measures, and relevance of the proposed research question, given what is already known about the treatment.

When a study on treatment intensity is designed without careful consideration of those factors, researchers might select inappropriate dependent measures, fail to account for patient characteristics that have been shown to impact outcomes, include inappropriate control conditions or levels of treatment intensity, or otherwise limit the extent to which logical conclusions can be drawn about whether the results were due to the intervention(s) of interest or confounding variables (e.g., scope covaries with treatment intensity).

(d) Conclusions Supported by Methods and Data The believability and practical usefulness of any conclusions and implications for practice from any study should be determined by much more than the reported results. When a researcher makes assertions about their findings (e.g., that an intervention produced "significant" changes in participants),

it is essential to ask whether those claims are warranted considering the research design, measures, and data analysis methods. It is also essential to examine the size of the reported changes, whether those changes were both clinically meaningful as well as statistically significant, and whether changes persisted across settings, time, and people. Evaluating the durability of behavior change attributed to treatments may be especially important for conditions like autism, where challenges and limitations may exist across the entire lifespan.

Suppose a researcher claims that an intervention produced the same results as another one with fewer hours of treatment or in less time. In that case, it is necessary to see how the two interventions were compared and how the reported results compare with the collective findings of previous well-controlled, prospective studies with similar features (e.g., intensity, scope of treatment, measures) in terms of the magnitude of effects, duration and maintenance of effects, and how many participants realized meaningful benefits. Finally, studies must be evaluated in terms of the extent to which the participants and conditions are similar to the patients and circumstances being served and whether the intervention and measurement procedures are described clearly enough to be replicated.

Evaluating the durability of behavior change may be especially important in autism as challenges and limitations may exist across the lifespan.

The maxim "extraordinary claims require extraordinary evidence" is at the heart of any science, including behavior analysis. If a study or researcher asserts findings about a treatment, their data must substantiate that claim using appropriate scientific methods. Claims about autism interventions that are more extreme or inconsistent with other findings from sound scientific studies require substantial evidence. They must be supported by multiple studies using exceptionally careful scientific methods. Adopting that skeptical stance helps prevent the kinds of harm that have been shown to result from false, misleading, or overstated claims about autism interventions (see asatonline.org for details and resources).

Evaluating the Overall Body of Research Even if a study possessed *all* of the desired features of a sound scientific evaluation described earlier, no single study can provide sufficient evidence to alter clinical practice standards. Replication is the foundation of all science, including ABA.

Thus, multiple credible, scientifically sound studies are required to make conclusions about variables such as treatment intensity. A typical study can only address one or two research questions, and the implications are limited to the participant population and other study aspects (e.g., setting and staffing). Multiple replications are necessary to determine if a study's findings might have broader applicability. The study's methodology must be repeated, and other researchers must replicate the findings. Analyses of the results of multiple replications by different sets of researchers are required to support broad, general conclusions about an intervention's effects—that is, to determine if an intervention is scientifically supported (Boness et al., 2021; Hume al., 2021; What Works Clearinghouse, 2022).

1. **Importance of Replication** Replications within and across studies increase confidence in the findings, strengthen the scientific research base, and advance our understanding of interventions -- their critical features, the individuals with whom they are likely to be effective and safe, and the clinical expertise and resources required to implement them correctly. When a substantial number of studies on a particular intervention have been conducted, results can be aggregated (combined) and integrated across all studies to produce a "big picture" of the evidence. The overall literature base concerns the intervention, not one or two studies. Inferences about the strength of evidence supporting an intervention are typically based on the number of times a finding has been evaluated in credible, scientifically sound studies conducted by multiple independent researchers. When a substantive number of studies with scientific merit have been conducted, there is the opportunity to review these studies collectively to understand the findings better. Determining how large and robust the effects were across studies is also important. However, understanding can also be advanced when there is a failure to replicate findings by identifying important differences in research methods, participants, or intervention procedures.

2. **Systematic Reviews and Meta-analyses** Evidence-based care requires finding and understanding the best available scientific evidence (i.e., a synthesis of the findings from all relevant, high-quality studies) regarding specific treatment(s) for a particular condition. That kind of information (e.g., synthesis) usually takes the form of a *systematic review or meta-analysis* of research conducted by individuals with expertise in the treatment(s), research methods, and methods for combining and synthesizing data from multiple studies. A meta-analysis is a specific type of review in which the results of multiple studies are combined statistically to produce quantitative estimates of the effects of a particular intervention, which are usually reported as "effect sizes" or "odds ratios." When the results are pooled to estimate the impact, the studies included in meta-analyses should be similar regarding the population, treatment, dependent measures, etc.

   Many systematic reviews and meta-analyses use structured protocols to identify and review relevant studies, evaluate their scientific or methodological rigor, and aggregate and analyze the data from multiple studies to determine the overall strength of the evidence about a treatment. A well-developed study review protocol is essential for identifying and categorizing studies appropriately, especially when comparing two or more types of interventions. See Page et al. (2021) for guidelines regarding conducting systematic reviews and meta-analyses described in the PRIMUS criteria.

   Some systematic review protocols include only or primarily studies using specific research designs (e.g., group designs, single-case studies, and randomized clinical trials). Others may include studies published in peer-reviewed journals and unpublished studies. For examples of these protocols and resulting conclusions, see the National Standards Project (National Autism Center, 2015), Steinbrenner et al. (2020), and What Works Clearinghouse (2022).

   In a traditional meta-analysis, aggregated group-level data are analyzed. A more sophisticated approach is to analyze data from each individual participant from the included studies. This is called an individual participant data (IPD) meta-analysis. It offers some notable advantages by enabling researchers to divide the participants into new groups and conduct more advanced statistical analyses.

Generally Accepted Standards of Care for the ABA Treatment for Young Autistic Children

The ability of ABA to successfully remediate the core symptoms and difficulties associated with a diagnosis of autism through the development, restoration, and maintenance of abilities has been documented in hundreds of peer-reviewed scientific studies published over the past 60 years. ABA has been shown to successfully treat older autistic persons and patients with conditions other than autism (e.g., Custer et al., 2021; Neil et al., 2021; Titlestad & Eldevik, 2019), and has been recognized as the standard of care for treating autism in young children by several authorities, including the *American Academy of Pediatrics and the American Academy of Child and Adolescent Psychiatry.*

Before reviewing GASC specific to ABA treatment for young children, it is important to understand the relationship between the scope of treatment and treatment intensity.

Relationship Between Scope and Intensity

To accomplish the overall goal of improving both the current and future functioning of young children with autism, the treatment plan must effectively address the relationship between the scope of treatment and the intensity of treatment. Scope of treatment refers to the breadth and depth of the overall treatment goals and the specific objectives and behavioral changes required to address the needs of each patient (see CASP, 2024, pp. 22-24 for additional information). Treatment intensity refers to the number of hours of direct service provided to the patient within a time period.

The *scope of treatment* can be conceptualized as existing on a continuum ranging from **comprehensive** representing one end and **focused** representing the other. Treatment that aims to accelerate learning trajectories and narrow the gaps in a young child's developmental trajectories to the greatest extent possible in multiple *critical* domains is, by definition, comprehensive in scope. Focused treatment, on the other hand, means that the goal of treatment is limited to changing a relatively small number of behaviors (e.g., establishing activity schedules for a morning self-care routine) in only a few domains (e.g., adaptive behaviors) Focused interventions are intended to produce a specific valuable therapeutic effect that is relatively narrow in scope. In contrast to early comprehensive intensive ABA treatment delivered to young children, focused ABA interventions do not typically aim to alter an individual's developmental trajectories in every domain or prioritize learning-to-learn repertoires. However, note that GASC recognize that other types of comprehensive treatment may also be appropriate for older populations (CASP, 2024).

Treatment intensity or dosage *refers to the number of hours of ABA treatment delivered directly to a patient.* It is reported in terms of average hours each week over a period of time. It does not include hours spent by the practitioner managing the patient's case, providing caregiver training, evaluating data and making changes to the treatment plan, overseeing protocols implemented by technicians and caregivers, or providing other services.[3] It also does not include hours spent receiving other therapies or services.[4] The number of direct service treatment hours is a proxy for the total number of therapeutic interactions (learning

[3] While these are essential activities that impact the quality of care, they are not included in measures of treatment intensity provided to the patient.
[4] In contrast, some payors sum direct patient services with the hours for caregiver support, clinical supervision, speech and language pathology services, hours in school, and other services. This is not the metric utilized in most studies of treatment intensity in ABA.

opportunities) in which the patient is actively engaged. Treatment intensity for each patient should reflect the number, complexity, breadth, and depth of treatment targets; the specificity of treatment protocols; and individual factors, including response to treatment.

Substantial research and clinical experience show that for most children with autism, the desired therapeutic effects of early intervention can only be achieved with treatment that is sufficiently intense to ensure that the child is engaged in many learning opportunities. While not perfectly correlated, treatment scope and intensity tend to be positively related.

Careful meta-analyses of multiple studies show clearly that high-intensity (i.e., 30-40 hours per week for at least two years) comprehensive ABA treatment is associated with larger measured improvements in intellectual, communication, and adaptive skills than is ABA treatment at lower intensity and duration or eclectic interventions (a mixture of therapies) of comparable intensity (e.g., Eldevik et al., 2010 and the section *"Evidence Base About Early Comprehensive Intensive ABA Treatment for Young Children with Autism"* in this document).

Figure 2 is modeled after one in the CASP Guidelines (CASP, 2024, p. 26) and illustrates the intersections of treatment scope and intensity with respect to different treatment models.

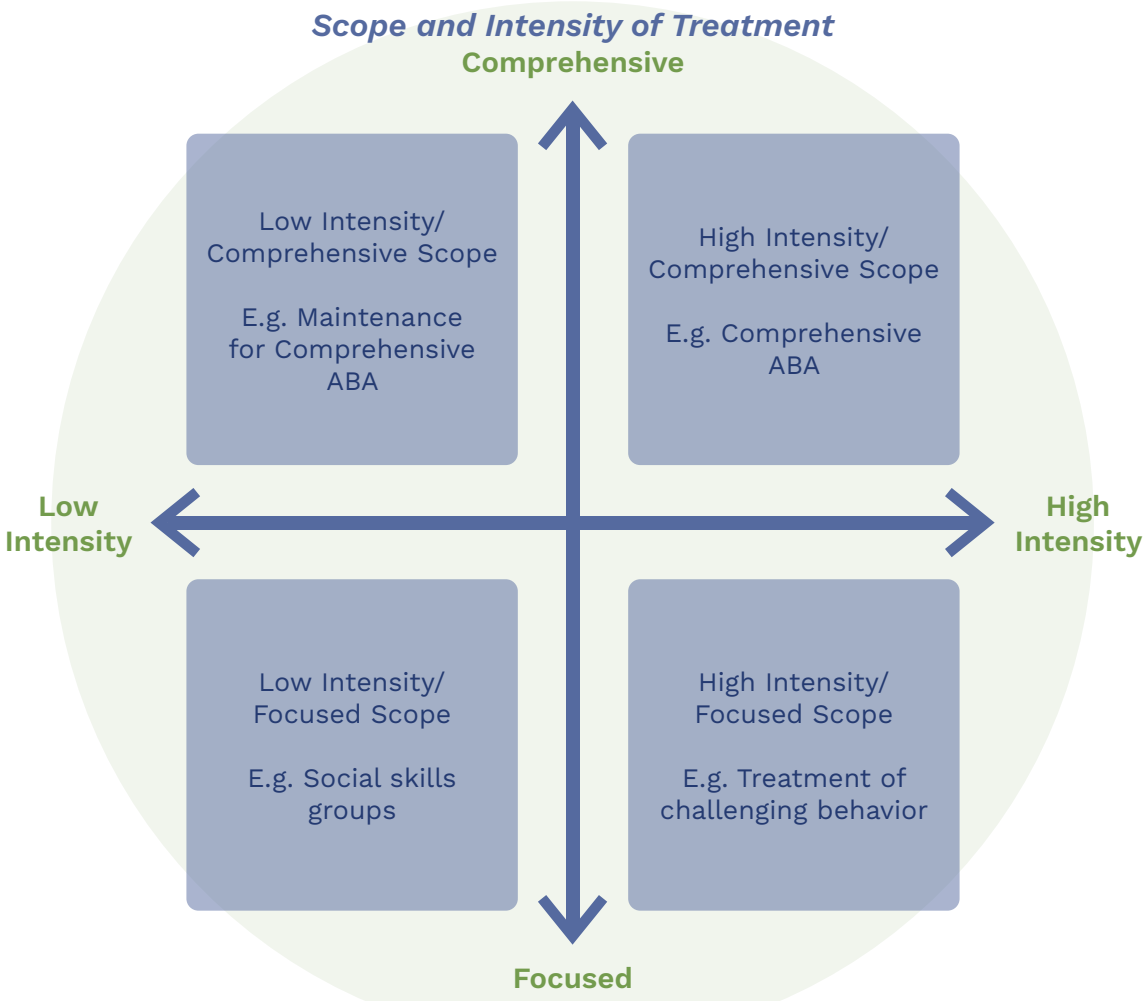


Figure 2. Relationship of scope and intensity in ABA treatment plans.

1. A focused treatment approach (e.g., the goal is to help a patient develop a few specific social skills with peers) might require 6-15 hours a week of treatment to produce meaningful improvements in that domain (lower left quadrant)

2. However, a focused treatment that addresses severe challenging behaviors and adaptive skill deficits that significantly jeopardize the safety and health of the patient or their caregivers may require high-intensity treatment of 25-40 hours per week. However, as Fisher et al. (2021) note, in some cases, 24-hour inpatient care is required (lower right quadrant.)

3. A comprehensive treatment program for young children aimed at improving developmental trajectories across all domains must almost always be high in intensity to provide enough opportunities to achieve changes in multiple learning trajectories (upper right quadrant).

   This is not only logical; this is the same conclusion drawn from the body of scientific research on ABA treatment intensity for young children with autism. (See *"Evidence Base About Early Comprehensive Intensive ABA Treatment for Young Children with Autism"* in this document.) When treatment goals are comprehensive in scope, the best available scientific evidence suggests that higher treatment intensity produces better treatment outcomes. This is further substantiated by Linstead et al. (2017). These researchers assessed the number of objectives mastered across eight domains by 1,468 children as a function of treatment, intensity, and duration. Results indicated a strong positive relationship between the number of mastered objectives and intensity and duration variables.

4. A treatment plan that is comprehensive in scope but low in intensity is appropriate in few cases. For example, it may be appropriate when the purpose of treatment is to maintain behavior change that has already occurred, and the data show that lower-intensity treatment can achieve that objective. Given that less direct treatment time translates into fewer learning opportunities, lower-intensity treatment is typically inappropriate if the goal is to establish the number of new skills that characterize a comprehensive treatment plan. (upper left quadrant).

The GASC for young children with autism who receive ABA treatment as reflected in the CASP guidelines can be summarized as follows:

1. *Begin ABA treatment as early as possible.* Early intervention takes advantage of the time-limited opportunity to close developmental gaps and possibly catch up to peers afforded by young children's "brain plasticity" (Dawson, 1999).

2. *Treatment should aim to accelerate the child's developmental trajectories to the greatest extent possible so as to enhance their current and future functioning across environments (e.g., home, community, school).*

3. *Autistic children's learning rates may need to be higher than those of their typically developing peers for some time if they are to have a good chance to close developmental gaps.*

   Early intensive treatment is essential because gaps in developmental trajectories tend to widen over time. For example, the average typically developing 2-year-old has a speaking vocabulary of approximately 50–150 words. By 3 years of age, the average speaking vocabulary has grown to approximately 1,000 words. New words are added at the rate of approximately 70 per month. When they are diagnosed, most young children with autism are developing language and other skills at about half the rate of their developing peers. Without effective early intervention, their development is likely to remain delayed. See Klintwall et al. (2015) for more context about developmental trajectories.

Figure 1. Domains typically included in early comprehensive ABA treatment plans.

4. *ABA treatment plans should be comprehensive in scope* to address the factors that impede development *across all critical domains,* including cognitive, social, communication, self-care, play, and other adaptive skills, as well as maladaptive behaviors.

5. *Treatment should target a broad array of behaviors foundational to independent learning (i.e., learning-to-learn repertoires) to improve present functioning and facilitate future learning, enhancing safety, health, and successful functioning in the short and long term* (Green et al., 2002; Eldevik et al., 2009, 2010). Establishing "learning to learn" skills provides the best opportunity for independent learning, accelerating learning trajectories and closing developmental gaps.

6. *Children should receive an average of 30-40 hours per week of direct intervention for two or more years.*

   Substantial treatment time allows for the large number of learning opportunities that are necessary for young children with autism to make up for delays in development. It is important to note that many children show considerable improvements after one year of early comprehensive intensive ABA treatment; however, research shows that many children benefit from continuing intensive treatment beyond the first year (e.g., Howard et al., 2014), and that at least two years of early comprehensive intensive ABA treatment is associated with the best outcomes (e.g., Eldevik et al., 2010). So treatment should continue for an additional year or more to maintain improvements and build on them to help prepare children for success in school, community, and other settings. See Appendix A for a sample daily schedule for early comprehensive intensive ABA treatment.

7. *As with all ABA treatments, care should be individualized and provided with a compassionate understanding of patient and family preferences, strengths, and needs.*

8. *Parents and other caregivers often have important contributions to make to the design and provision of treatment for young autistic children. They should be involved to the greatest extent feasible, but the child's access to ABA treatment should not be conditional on their parents' participation in delivering treatment to the child.*

Read the following section to understand better the scientific evidence supporting the comprehensive, intensive treatment recommendation in the CASP Guidelines.

Evidence Base About Early Comprehensive Intensive ABA Treatment for Young Children with Autism

The research on treatment outcomes for young children with autism who received comprehensive ABA began with well-documented case studies in the 1960s (e.g., Wolf et al., 1964; Wolf et al., 1967). Group studies involving more children designed to compare early intervention outcomes from ABA with other treatments were first published in the 1980s (e.g., Lovaas, 1987; Birnbauer & Leach, 1993). Many more studies have been conducted each decade (e.g., Cohen et al., 2006; Eikeseth, 2007; Peters-Scheffer et al., 2010; Howard et al., 2014; Stanislaw, et al. 2019; Wojcik et al, 2023). The growth in the number of studies has enabled the publication of multiple systematic reviews and meta-analyses analyzing the effects of variables such as age at the start of treatment, baseline levels, type of treatment, and intensity of ABA services on outcomes for young children with autism who received comprehensive ABA services (e.g., Eldevik et al., 2009; Eldevik et al., 2010; Virues-Ortega, 2010).

This section highlights the methods and findings of the most recent systematic review by Eldevik et al. (2024). As part of a multi-prong research effort, these researchers studied the effects of low, moderate, and high treatment intensity levels on outcomes for young children who received comprehensive ABA treatment. The following section outlines some of its features.

1. Data were analyzed from 341 children with autism who received early comprehensive intensive ABA of varying intensities from practitioners trained in ABA. The average age at intake was just over 3 years. The pooled data came from the participants in 15 peer-reviewed, prospective, controlled studies.[5]

2. Eldevik et al. included only studies where the treatment was comprehensive ABA for young children. That is, treatment had to be behavior analytic, address all skill domains, be individualized, and be directed by individuals with advanced training in ABA with young children (Green et al., 2002). Therefore, studies were excluded if they did *not* involve behavior-analytic treatment or addressed only a few domains. Meeting these criteria helped to ensure that the only difference among children was the intensity of the comprehensive ABA treatment. Children received an average treatment of 5-40 hours each week. See Table 1 for mean and median weekly treatment intensities for each group.

[5] Eldevik et al. (2024) also collected data from 51 children who received a mixture of methods for comparison. While children who received comprehensive, intensive ABA performed better on outcome measures than those who received alternative approaches of similar intensity, they are not reported here as this section focuses on treatment effects for children with autism who receive comprehensive ABA treatment. Contact the primary author for more information.

3. Eldevik et al. (2024) analyzed the individual scores for each child on *multiple* standardized norm-referenced measures, which assessed treatment effects across critical domains. Each assessment type had to demonstrate basic psychometric properties related to validity, reliability, and norming procedures.

   Using standardized measures that assessed different domains helped evaluate the treatment's effect on the multiple areas of functioning typically impacted by autism and addressed by a comprehensive treatment plan. These assessments are most often used in research on outcomes of ABA treatment for young children. They include the *Vineland Adaptive Behavior Scales* as a measure of adaptive behavior, global measures of intellectual functioning such as the *Bayley Scales of Infant Development* (Bayley, 2019), the *Wechsler Intelligence Scale for Children*, *Stanford-Binet Intelligence Scales* (Roid, 2003), and *The Childhood Autism Rating Scale* (CARS), which measures autism severity.[6] See also Ridout & Eldevik (2023) for a review of widely used outcome measures for the treatment of young autistic children.

4. Finally, these researchers evaluated outcomes after at least one year of treatment. However, most children received treatment that averaged between 18 months or 2 or more years (See Table 1). This duration requirement reflects the importance of ensuring that changes in functioning endured over time (i.e., were not transitory or inflated due to repeated test re-administration across a short period of time).

To evaluate the impact of treatment intensity on outcomes of comprehensive treatment, the 341 children were divided into three groups based on the average number of hours of direct treatment provided:

1. Low-intensity (averaged 5-12 hours per week)
2. Moderate-intensity (averaged 13-25 hours per week)
3. High-intensity (averaged 26-40 hours per week)

High (26–40 w/hrs)

Hours of ABA		Duration in months	
Mean	**Median**	**Mean**	**Median**
35.1	37.5	24.8	24.0

Moderate (13–25 w/hrs)

Hours of ABA		Duration in months	
Mean	**Median**	**Mean**	**Median**
18.9	20.0	18.5	14.0

Low (5–12 w/hrs)

Hours of ABA		Duration in months	
Mean	**Median**	**Mean**	**Median**
9.5	10.0	18.2	14.0

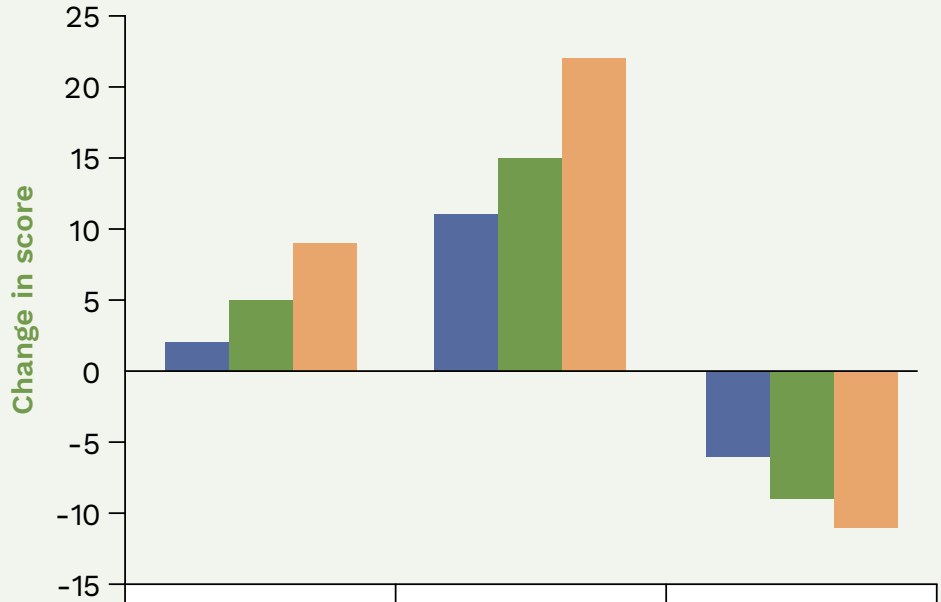
Table 1. The mean and median of weekly intensity (hours) and treatment duration (months) for low, moderate, and high-intensity treatment groups.

[6] See also Padilla et al., 2023 for a review of concerns regarding the psychometric properties of other instruments often used by behavior analysts.

Outcomes were reported as a change in scores from intake to post-intervention for the three domains assessed: (1) adaptive behavior composite, (2) cognitive functioning, and (3) autism severity. As in earlier meta-analyses (e.g., Virues-Ortega, 2010), there was a strong relationship between intensity levels and change across all measures (see Figures 3-5). Cognitive functioning improved by an average of 22 standard score points for children who received intensive, comprehensive treatment compared to 11 points for children in the low-intensity group. Similar findings were obtained for measures of adaptive functioning and autism severity. Children who received moderate levels of intervention showed gains that were lower than those in the high-intensity group but higher than those of children in the low-intensity group on all measures.

Given the overarching goal of early intervention to improve functioning across all relevant domains, treatment outcome studies should employ appropriate multiple measures to detect and quantify gains.

Figure 3: The mean change in standard scores (SS) for adaptive behavior and intellectual functioning, and raw scores of autism severity across three intensity levels of early comprehensive intensive ABA intervention.



	Mean Change Vineland ABC	Mean Change IQ	Mean Change CARS
Low (5–12 weekly hrs)	2	11	-6
Moderate (13–25 weekly hrs)	5	15	-9
High (26–40 weekly hrs)	9	22	-11

The relationship between intensity levels and outcomes was statistically significant, but it was also important to determine whether these changes were clinically meaningful and for which groups. One way to measure clinically meaningful change is to see if the scores at the end of treatment are in the non-clinical range (Jacobson & Truax, 1991). For adaptive behavior and intellectual functioning, scores must be within one standard deviation of the population mean (i.e., SS = 85 or higher). For the measure of autism severity, this means final CARS scores are in the no/minimal category on the CARS (i.e., raw scores below 30).

Again, the results show a significant relationship between group intensity levels and the percentage of children that score in the non-clinical range following intervention. See Figures 4-6.

Figure 4. The percentages of children scoring within the non-clinical range on measures of adaptive behavior at intake and following low, moderate, and high-intensity intervention, respectively. The percentages are shown on the y-axis, and the treatment intensity groups are along the x-axis.

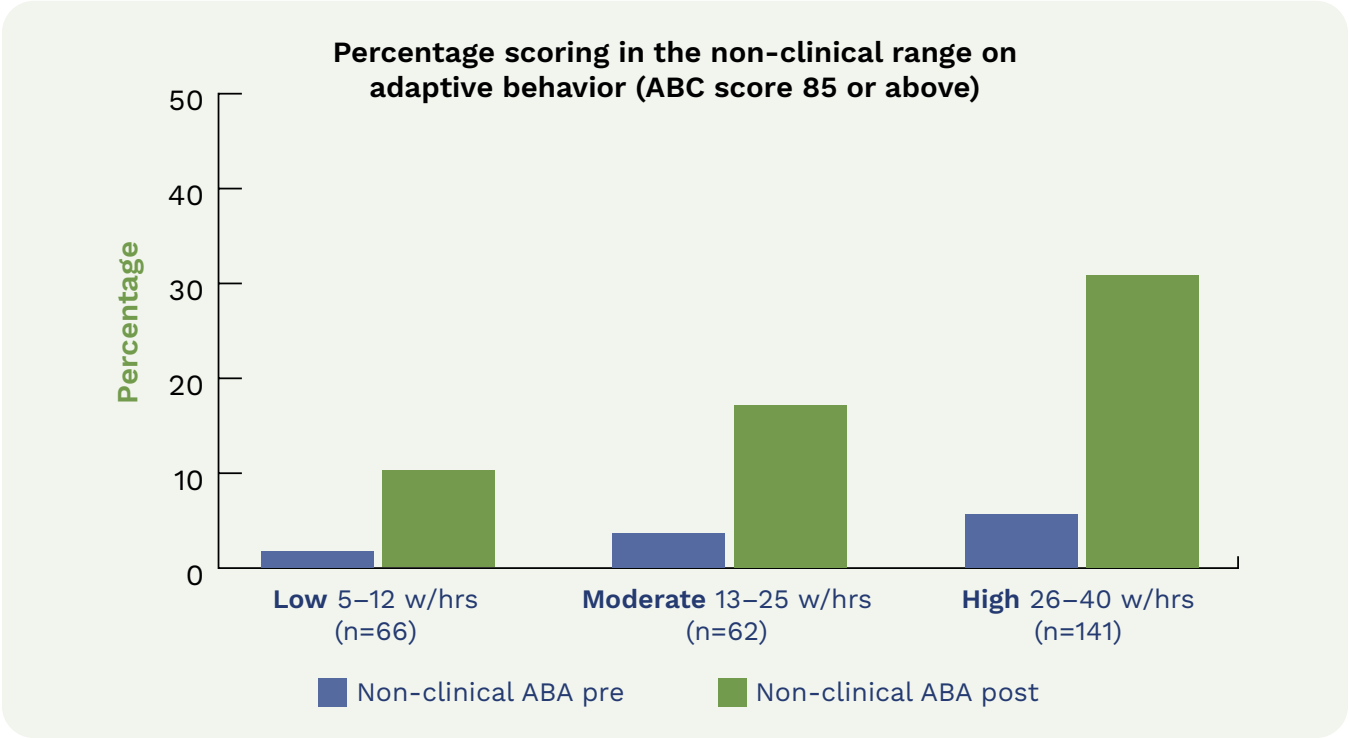


Figure 5. The percentages of children scoring within the non-clinical range on measures of intellectual functioning at intake and following low, moderate, and high-intensity intervention, respectively. The percentages are shown against the y-axis, and the intensity group is shown along the x-axis.

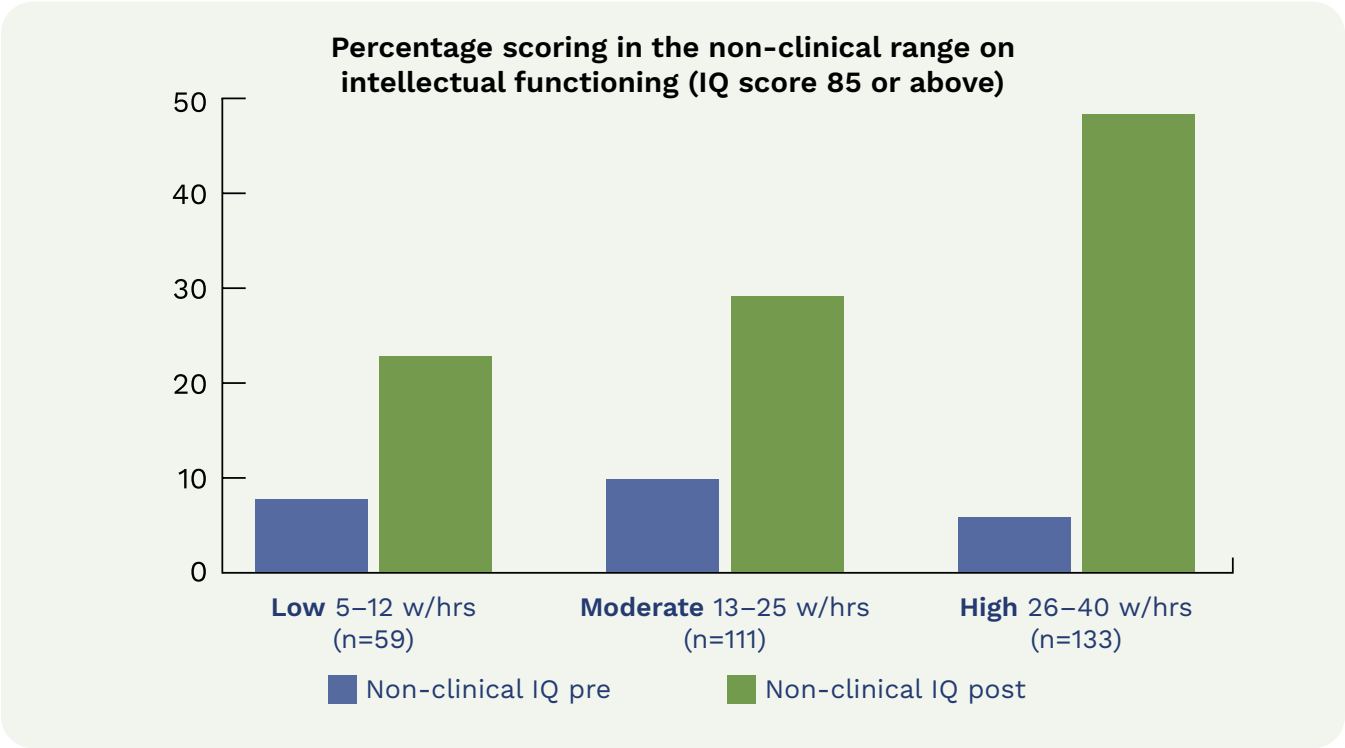
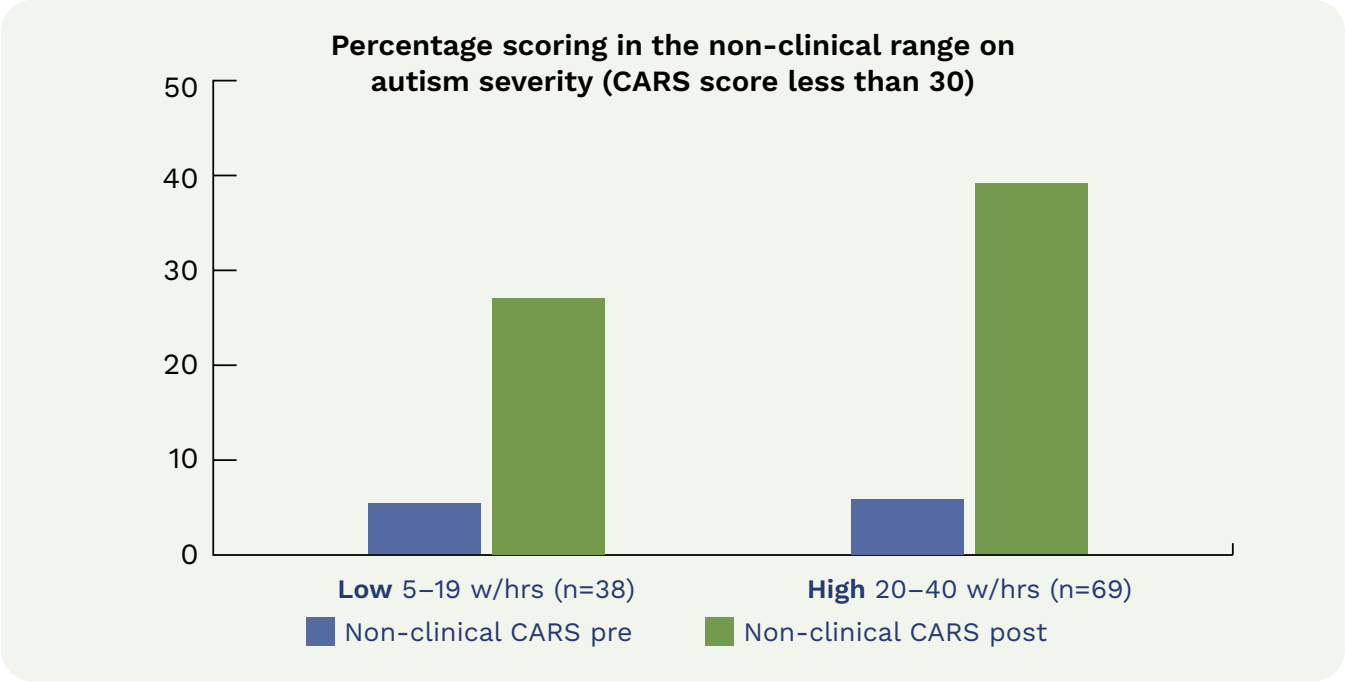


Figure 6. The percentages of children scoring within the No/Minimal range on a measure of autism severity (CARS) at intake and following low and high-intensity intervention, respectively. Due to a low number of children with autism severity data, only low and high-intensity levels are shown. The percentages are shown on the y-axis, and the intensity group is shown along the x-axis.



While the criteria proposed by Jacobson and Truax (1991) are stringent and only one of several approaches to determining whether the observed improvements are clinically significant, this metric and similar ones are important, given that "statistically significant" differences can sometimes translate into little difference in the quality of life experienced by children with autism and their families.

It is also important to note that these data are at the group level and that there are large individual variations within each group. In addition, children may exhibit clinically meaningful gains without necessarily falling within the non-clinical range on standardized assessments following intervention. For instance, clinically meaningful gains can be obtained when a child learns to communicate basic needs and desires using pictures or single words, acquires the skills to use the toilet independently, engages in games with peers, or displays reduced aggression towards oneself or others (Titlestad & Eldevik, 2019). Conversely, some children who scored within the non-clinical range may have improved only slightly. This scenario may occur when a child's score is just below the non-clinical range prior to the intervention, and post-intervention, the scores increase just enough to place them within the non-clinical range.

Benchmarks can be used to evaluate early comprehensive ABA programs as well as other comprehensive psycho-educational intervention programs for children with ASD.

Benchmarks

In addition, Eldevik et al. (2024) note that the data derived from their research, including the analyses of clinical significance, can be used to create benchmarks for evaluating interventions for children with ASD. Service providers, parents, and funding agencies could benefit from these and similar metrics. Such tools can help identify expected outcomes at the group level. They can also help communicate potential gains to caregivers and parents as part of informed consent about what can be expected from different intensity levels and the percentage of children who achieve them. See Table 2. These benchmarks can be used to evaluate not only early comprehensive ABA programs but also any comprehensive psycho-educational intervention programs for children with ASD.

Due to the large variability in outcomes, the benchmarks should be applied cautiously and only to larger groups of children (e.g., groups of at least 20). Table 2 suggests benchmarks for all three intensity levels for adaptive behavior, intellectual functioning, and autism severity.

Table 2. Suggested benchmarks for evaluating autism interventions of different intensities. The table shows the percentages of children that are expected to score in the non-clinical range following intervention. Also, the expected mean change in scores on adaptive behavior, intellectual functioning and autism severity are shown.

	Suggested Benchmarks					
	Low (5–12 weekly/hrs)		*Moderate (13–25 weekly/hrs)*		*High (26–40 weekly/hrs)*	
	Non-clinical range	Mean change	Non-clinical range	Mean change	Non-clinical range	Mean change
Adaptive Behavior	10.2%	2.2	17.1%	5.3	30.8%	9
Intellectual Functioning	20.2%	11.1	29.0%	14.6	48.2%	22
Autism Severity	20.0%	-6.1	46.6%	-8.6	21.2%	-10.6

Long-term follow-up from early comprehensive intensive ABA treatment

The durability and longevity of gains are important aspects of any treatment. Given that a primary goal is to improve long-term quality of life, this is perhaps even more true for early intervention. Although the treatment follow-up research base is comparatively limited, the results show that the benefits of early comprehensive intensive ABA remain in effect over time for most children.

Overall, the data indicate maintenance and stability in the outcomes achieved at the end of treatment. Children who received early comprehensive intensive ABA treatment continued to perform better than those who received alternative therapies long after treatment ended. See McEachin et al. (2013), O'Connor & Healy (2010), Perry et al. (2019), and Smith et al. (2021).

Furthermore, a follow-up study of 59 adolescents and teenagers conducted by Oren et al. (2014) noted that those who achieved optimal outcomes began intervention earlier as children, received higher-intensity services, and were more likely to have received ABA services rather than alternative therapies than those who were classified as "high functioning" as children at baseline. These findings emphasize the importance of discussing with caregivers how treatment decisions for their young children may affect functioning in adolescence and adulthood.

Children who receive early comprehensive intensive ABA treatment continue to function better than children who receive other treatments well after treatment ends.

Critique of Recent Publications

Authors of two relatively recent publications asserted that the intensity of treatment had no bearing on patient outcomes. Summaries and critiques of each study are provided below, but interested readers are encouraged to read and evaluate the studies themselves. Both articles can be accessed online: Ostrovsky (2023) and Sandbank et al. (2024).

Ostrovsky et al. (2023)

Ostrovsky and colleagues (2023) conducted a retrospective review of scores from the *Vineland Adaptive Behavior Scales-3rd* editions (VABS-3) administered to 178 clients of a healthcare provider.[7] The authors characterized their study as aiming to "understand whether children who receive more hours of ABA therapy achieve better outcomes," and their results are interpreted as challenging "prior research that demonstrated a linear dose-response relationship" (p. 753). Here are some of the general features of the study:

- The average age of the participants was substantially older, and the duration of treatment was shorter than what is included in most studies of early intervention ABA. The average age (presumably at intake) was reported to be 6 years and 9 months (standard deviation = 4 years) but with a range of up to 23 years. Thus, the researchers included data from adult participants as well as young children.
- The average time between VABS-3 administrations was reported as 272.7 days (standard deviation = 133.8 days) or 9 months (standard deviation = 4.5 months). Given those means and standard deviations, time in treatment for the majority of the participants prior to the 2nd administration ranged from 4.5 months to 13.5 months.
- The authors did not comment on whether ABA treatment was focused or comprehensive, so it is unclear whether any participants received comprehensive ABA treatment. If they did, it appears that they were grouped with participants who received focused treatment. That is, the authors conflated scope and intensity, obscuring the role of intensity per se.
- Ostrovsky et al. (2023) reported that the children in the study received an average of 27.53 hours per month (standard deviation = 15.16 hours/month) of in-person direct treatment). That converts to an average of 6.6 hours of direct treatment per week (27.53 hours/4.2 weeks). Total direct treatment hours also included .71 hours/month (10 minutes/week) delivered through telehealth.
- If the data were normally distributed, this average weekly intensity and the standard deviation reported by the authors suggest that more than 80% of the participants received direct treatment averaging between 2.9 and 10.1 hours per week. That has been defined as low intensity treatment by the majority of researchers working in this area (e.g., Eldevik et al., 2006; Lotfizadeh et al., 2020).

[7] Research suggests that results from the Parent/Caregiver forms of the VABS-3 should be interpreted with caution (Wilkinson et al., 2024) The second edition of the VABS was used in the large majority of other studies of early intensive ABA intervention for autism.

- The authors reported that the 178 participants had an average gain of +3.371 points on the VABS-3 adaptive behavior composite (ABC) standard score from Time 1 (presumably at intake or baseline) to Time 2. They found that change to be statistically significant. The notion that the majority of participants received low-intensity treatment is indirectly supported by comparing the gain in standard score with the benchmarks for different treatment intensities calculated by Eldevik et al., 2024 discussed previously.[9]

Given their stated goal of studying the effect of treatment intensity, Ostrovsky et al. (2022) divided the 178 participants in the study into two groups. The number of participants in each group and the actual average number of direct treatment hours provided to each group were not reported. Instead the authors described the two groups as receiving:

1. less than 40 hours of direct service *per month* (i.e., less than 10 hours/week)
2. more than 40 hours of direct service *per month* (i.e., more than 10 hours/week)

- Average scores for the two groups were compared at Time 1 and Time 2 across VABS-3 subdomains and the ABC composite. Ostrovsky et al. (2023) found no statistically significant differences between the average scores for the two groups. That finding is not surprising since many of the 178 participants received low-intensity treatment. In fact, it would have been surprising if differences had been found because no prior studies have reported that averaging slightly more vs. slightly less than 10 hours of early comprehensive ABA treatment per week produces differential effects. Additionally, while there may be other methodological concerns, the difference in treatment intensity between the two groups was apparently somewhat arbitrary and without clinical significance. In fact, the authors stated that the "40-hour threshold was used for analysis because this was the approximate mean of services delivered to all 178 participants" (p. 756).

- This study illustrates the inherent challenges of retrospective investigations where information collected for non-research purposes is reviewed after the fact, and researchers are limited to examining critical information about independent variables (such as treatment intensity and duration) and dependent measures that happen to be in their data set.

- In contrast, most of the studies described in the section titled *"Evidence Base About Early Comprehensive Intensive ABA Treatment for Young Children with Autism"* were prospective, controlled studies. The investigators defined research questions and independent variables in advance, taking into account findings from previous research. As indicated earlier, prospective studies are needed to address critical questions like the relation between treatment intensity and outcomes.

In summary, Ostrovsky et al.'s (2023) findings do not constitute a viable evaluation of the intensity effects of treatment outcomes.

[9] The average improvement on the Vineland 3 ABC standard score was statistically significant but also highlights the importance of distinguishing between statistical and meaningful clinical change. This is particularly important in the case of young children where the goal is to accelerate learning.

Sandbank et al. (2024)

Sandbank and colleagues (2024) conducted a meta-analysis to determine whether different intervention amounts were differentially associated with outcomes for young children with autism. The authors classified 144 studies into one of four types of non-pharmacological treatment: Naturalistic Developmental Behavior Interventions (NDBI), behavioral, technology-based, and developmental. Most, but not all, of the studies that involved behavior-analytic treatment were assigned to the "behavioral" category. The following comments focus only on the 48 studies classified as "behavioral."

Sandbank et al. used data from their previous meta-analysis of controlled group-design studies of interventions evaluating any outcome for children with autism up to 8 years of age (Sandbank et al., 2020). They had reviewers code each study in terms of the characteristics of the intervention and the participants, study methods, risk of bias, and outcomes. Interventions were further coded for daily intensity (in hours), duration (in days), and cumulative intensity (a combination of daily intensity and duration in hours).

Outcomes were coded in terms of the targeted domain(s) and whether they were proximal (short-term) in relation to the intervention target(s) or distal (long-term). Information from each study was used to calculate the difference between intervention and comparison groups on the outcome measure(s) at the end of the study, which Sandbank et al. quantified with an effect size statistic. The authors calculated statistical associations between effect sizes and intervention daily intensity, duration, and cumulative intensity.

Sandbank et al. concluded that their findings do not support "the assertion that intervention effects increase with increasing amounts of intervention" and advise professionals "that there is little robust evidence supporting the provision of intensive intervention" (p.763). They also stated that there was no clear association between treatment amount (intensity or dosage, and duration) and outcomes for any of the four treatment types, including those they categorized as "behavioral."

There are multiple reasons to question the authors' findings and conclusions, especially regarding ABA interventions for young autistic children. As context, recall the earlier statement that meta-analyses should analyze the results of studies that involve *similar* participants, treatment, and outcome measures. Some key concerns about the Sandbank et al. (2024) meta-analysis follow.

- **Most of the studies Sandbank et al. included in the behavioral category created did not involve comprehensive ABA treatment designed and delivered by qualified professionals.** Some of the treatments were non-behavior analytic; others were studies of interventions delivered to caregivers and peers rather than autistic children. Many involved focused rather than comprehensive ABA treatment (discussed further below). Sandbank et al. (2024) did not give any indication that they recognized the definition of early comprehensive ABA intervention that is widely accepted by researchers working in this area (Green et al., Brennan, & Fein, 2002; Eldevik et al., 2010, 2024) nor the well-established distinctions between focused and comprehensive treatment.

- **Sandbank et al. (2024) conflated intervention scope and intensity by combining focused and comprehensive interventions in the behavioral category.** As discussed previously, comprehensive ABA intervention for young children with autism targets multiple behaviors in multiple domains. That necessitates many hours of direct, active intervention for an extended duration to produce meaningful improvements for most children. In contrast, focused interventions typically address a small number of target behaviors and require fewer hours of intervention than comprehensive ABA (CASP, 2024).

  Research on the role of intensity in ABA treatment has focused almost entirely on intensity in the context of studies of comprehensive intervention for young autistic children. The majority of studies Sandbank et al. included in the behavioral category evaluated focused interventions. Only ⅓ of the studies included in the behavioral category involved treatment with the well-established defining features of comprehensive ABA.

  Only ⅓ of the "behavioral" studies in Sandbank et al. (2024) involved comprehensive ABA treatment delivered to young children with autism.

  Analyses of the relation between intervention intensity and outcomes must keep the scope of intervention constant (i.e., comprehensive) with only intervention intensity varying. Because Sandbank et al. (2024) lumped focused and comprehensive interventions together, it is not possible from logical or methodological perspectives to draw any conclusions about the role of intervention intensity from their analysis.

- **Outcome measures varied widely.** Some scores were from standardized and non-standardized assessments administered directly to autistic children. Others were indirect assessments completed by caregivers about themselves or their children. Some of those assessed caregiver behavior only.

- **The characteristics of the children (chronological ages, intellectual and other skills, overall functioning, and autism severity levels) also varied across studies.** Another group of autism researchers re-analyzed the Sandbank et al. data to determine if outcomes were related to children's pre-intervention intellectual skills (IQ scores). Their analysis showed "consistently significant, positive, and clinically meaningful associations between intervention quantity and outcomes when IQ is included in the models" (Frazier et al., 2024).

- **The authors omitted several controlled group-design studies of comprehensive early ABA treatment that satisfy the criteria for early comprehensive ABA treatment** (e.g., Birnbrauer & Leach, 1993; Ben Itzchak & Zachor, 2007; Eldevik et al., 2006; Eldevik et al., Eldevik et al., 2012; Eldevik et al., 2020; Gomes et al., 2019; Haraguchi et al., 2020; Howard et al., 2014; Lovaas, 1987; Stanislaw et al., 2020).

  As a rationale for excluding some studies from their meta-analysis, Sandbank et al. (2024) stated that such "studies confounded differences in intervention amount with differences in intervention approach" (p. E2). In fact, several of these studies were designed to evaluate whether the eclectic mix of therapies widely available to many

young children with autism would be as effective as intensive ABA intervention if the eclectic intervention were equally intensive. That is, within each study, the intervention amount (intensity) was the same (not different) for both intervention approaches and was fairly high (> 20 hours/week). The omission of those studies likely affected the Sandbank et al. analysis of the relation between intervention intensity and child outcomes.

In summary, in lumping together studies that varied in terms of their scope (comprehensive and focused), participants (children, peers, caregivers), and outcome measures (direct and indirect) and excluding several studies of comprehensive ABA intervention, ***Sandbank et al. (2024) mixed the proverbial apples and oranges on several important dimensions. The result was that the critical role of intensity in outcomes of ABA or other behavioral interventions for young children was obscured in their analyses.***

Summary and Conclusions

The current, robust scientific literature on the relationship between intervention intensity and early comprehensive ABA treatment outcomes informed this document and the recently published GASC for ABA behavioral healthcare services for autistic children (CASP, 2024). When the goal of treatment is narrowing developmental gaps for young children with autism, the percentage of children achieving this outcome is much greater with a comprehensive, intensive ABA program involving 30-40 hours per week of direct treatment. As it is not possible to identify in advance exactly how any young autistic child will respond to comprehensive ABA treatment, to maximize the benefits of treatment, GASC should be followed by providing early comprehensive intensive ABA treatment whenever possible.

As with any medical service, providing treatment at accepted intensity levels is not without costs and challenges, but ultimately, the patient's right to effective treatment is paramount. The American Medical Association (2023) defines medical necessity as the healthcare services that a prudent healthcare provider would provide to a patient to prevent, diagnose, or treat a condition that is:

(a) in accordance with generally accepted standards of practice,

(b) clinically appropriate and

(c) not primarily for the economic benefit of the health plans or other funders or the convenience of the patient or treating provider.

To ensure that patients receive quality care, all stakeholders must be discerning when evaluating research claims, even when they are heavily promoted. Researchers, practitioners, caregivers, patients, funders, and others hope to identify ways to make a treatment that is equally effective but easier, faster, and less expensive than early comprehensive intensive ABA treatment for young autistic children. However, recommending lower intensities for comprehensive ABA treatment is as inappropriate as prescribing sub-optimal dosage for any other health condition.

Recommending lower intensities for comprehensive ABA treatment is as inappropriate as prescribing sub-optimal dosage for any other health condition.

Research to improve treatments and produce better outcomes more efficiently is ongoing and may be successful in the future. When substantial evidence from well-conducted studies and reviews supports different recommendations, changes will be made to the GASC regarding treatment intensity and other clinical practices.

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Appendices

Sample Daily Schedule For Early Comprehensive Intensive ABA Treatment

Note that the specific domains, subdomains and targets are different across patients. In addition, most treatment targets incorporate skills from multiple domains and subdomains.

Cognitive

Matching identical objects	Imitation	Attending	Non-verbal problem solving
• 3-D object[b] • 2-D object[a]	• object mediated[b] • gross motor[a, b] • fine motor[a] • vocal (mastered only, monitor for prosody and loudness)[a]	• responds to choice[a, c] • **orients to name**[a, c] • **orients to environmental events**[a, c] • follows point[a]	• shifts strategy puzzle toy[a]

Language and Communication

Expressive vocabulary	Receptive vocabulary	Makes requests	Greetings
• **people**[a, b] • **household items**[a, b] • food[a] • **animals**[a, c] • clothing[a]	• **people**[a, b] • **household items**[a, b] • food[a] • **animals*** • clothing • toys	• **activity (swing, wagon ride**[a, c] • **break**[a, c]	• attends to and greets others

Learning Readiness

Follows 1-step directions	Sits/attends to activities
• **See updated list including parent notes**[a, c]	• picture book reading[a] • cartoons[a]

Self-Help

Eating (lunch and snack)
• tastes foods with textures and tastes[a, c] • independently drinks from variety of cups[a, c]

Self-Help

Walking without holding hands
• 12 inches adult[a, c]

Play and Social Skills

Peer engagement	Independent leisure	Sharing	Sibling/peer interaction
• parallel play with same/different toys[a, c]	• **chooses toys and interacts functionally**[a, c] • **completes 3 step closed end activities**[b]	• with non-preferred items[a, c]	• ball roll[a]

Behavior

Tolerance	Self-management	Transitions	Chooses SR+ from board
• tolerates delays 15 seconds[a, c] • proximity to others without distress[a, c]	• **uses 3 item token board**[d]	• medium preferred activity to low preferred activity[a, c]	

a=active | b=generalization/maintenance schedule | c=created and embedded/naturalistic opportunities during transitions, play, lunch
d=cold probe data collection only | **Bold** targets multiple x/a.m.and pm.

For children receiving **ABA therapy**, **hours matter**

Autistic kids who receive 30+ hours of ABA weekly are **twice as likely** to **close cognitive development gaps** compared to kids who receive less than 12 hours.[1]

They're also three times more likely to achieve **average everyday skills**.[1]

Cognitive and everyday skills include:

Observing and problem solving, such as learning by watching and responding to new experiences.

Communication, such as learning what things are called, sharing feelings, and asking for help.

Independence, such as toileting, teeth brushing, and cooperating with medical care and haircuts.

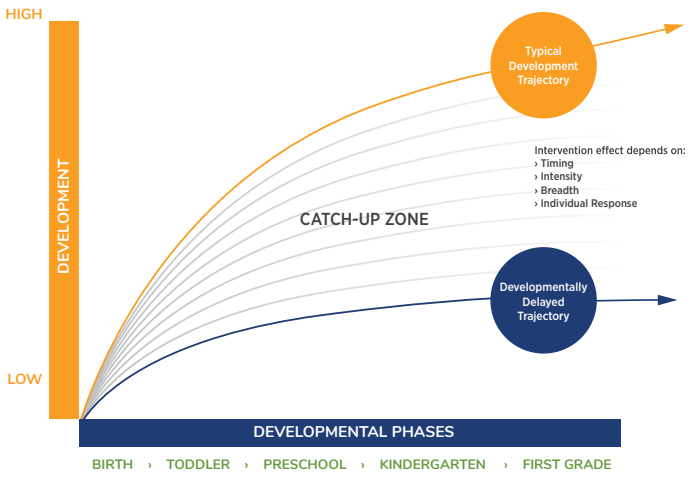
Participating in home life, such as engaging with parents and siblings and going on family outings.

The decision you make now about ABA hours could **decide your child's future**.

Time is precious. The **longer your child waits** for intensive ABA, the **harder it will be** to catch up.

After age 6, they're **less likely** to **close development gaps.**

Early intervention and autism[2]



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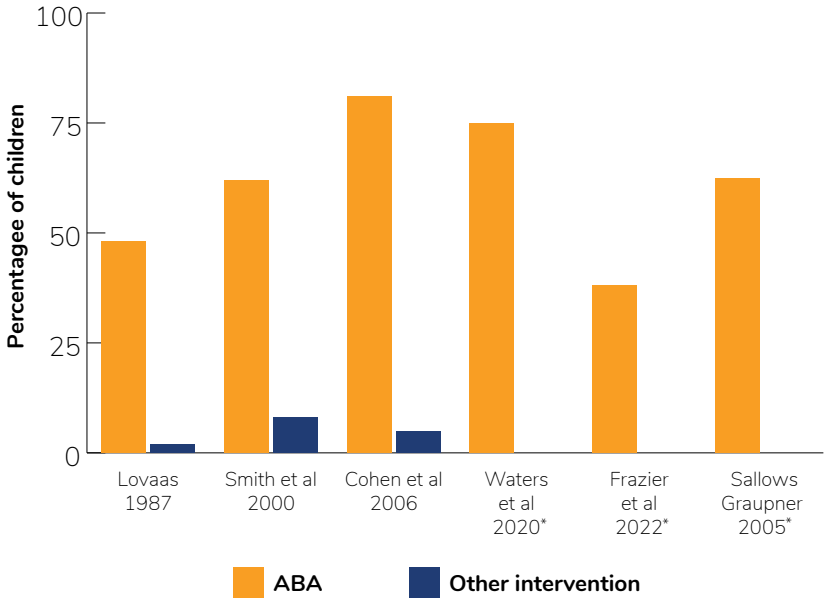
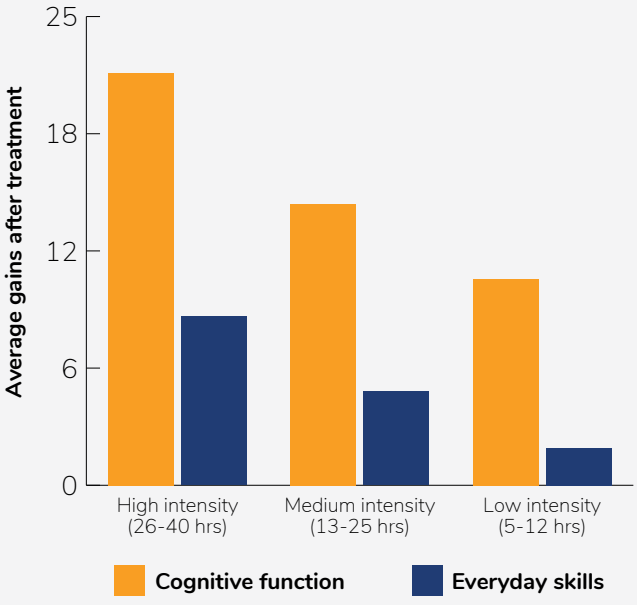
Autistic kids who receive ABA weekly are **significantly more likely** to be **prepared for general education** than their peers who receive other types of treatment.

Children who receive ABA require less support in general education after treatment



*These studies did not have a non-ABA comparison group

Impact of ABA intensity on gains in children's cognitive function and everyday skills



As ABA hours increase, so does children's cognitive function.

Like anything else in life, more practice means **more progress**.

The best thing you can do for your child today and for their future is to **enroll them in intensive ABA**. They'll be better **prepared** to **handle life's challenges**.

Information for Parents and Caregivers about ABA Treatment for Young Autistic Children

No one can guarantee how your child will respond to therapy, but following these guidelines gives them the best chance to achieve their highest level of independence and learning—now and in the future.

1. **Start treatment as soon as possible.** Early intervention takes advantage of the time-limited opportunity to close gaps in development and perhaps catch up to peers. This is because the brains of younger children are thought to be more malleable, a term called "brain plasticity" (Dawson, 1999).

2. **Developmental gaps grow bigger over time. This is why starting treatment early and providing many, many learning opportunities every week matters.**

To take just one area of development, the average 2-year-old has a speaking vocabulary of approximately 20 words. By the time they are 3 years old, the average speaking vocabulary has grown to 1,000 words. And new words are added at the rate of approximately 70 per month.

3. **Treatment should be comprehensive, cover important skill areas, and accelerate your child's development in all essential areas.** See below for some examples.

4. **Treatment should average 30-40 hours per week of direct therapy for two or more years.** Refer to our list of selected studies that explain why. Scan the QR code to read the CASP's White Paper on the role of treatment intensity in comprehensive ABA treatment for young children.

5. **Treatment should help your child become an independent learner.** Examples of these skills are the ability to imitate others, learn from watching what others do, and when and how to ask questions.

6. **Treatment should help improve your child's ability to function effectively in every critical environment** (home, school, community).

7. **Your child's care should be individualized and delivered with a compassionate understanding of your child's and family's preferences, strengths, and needs.**

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Importance of Early Intervention

Dawson, G. (2008). Early behavioral intervention, brain plasticity, and the prevention of autism spectrum disorder. *Development and Psychopathology, 20*(3), 775-803.

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Long-term results from Early, Comprehensive Intensive ABA Treatment

Orin, A. J., Helt, M., Troyb, E., Tyson, K. E., Barton, M. L., Eigsti, I. M., ... & Fein, D. A. (2014). Intervention for optimal outcome in children and adolescents with a history of autism. *Journal of Developmental & Behavioral Pediatrics, 35*(4), 247-256.

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Potential Topics for Clinicians to Discuss with Parents and Caregivers Regarding ABA Treatment for Young Children

Overview It can be challenging for parents and caregivers to navigate the "noise" surrounding treatment options for their child. You can help by providing reliable and accurate information about ABA to help families make informed decisions. Two handouts are designed to be shared with parents and caregivers: (1) the infographic, and (2) a review of the generally accepted standards of care (GASC) for early comprehensive intensive ABA treatment and related references. The talking points cover common questions and areas of discussion.

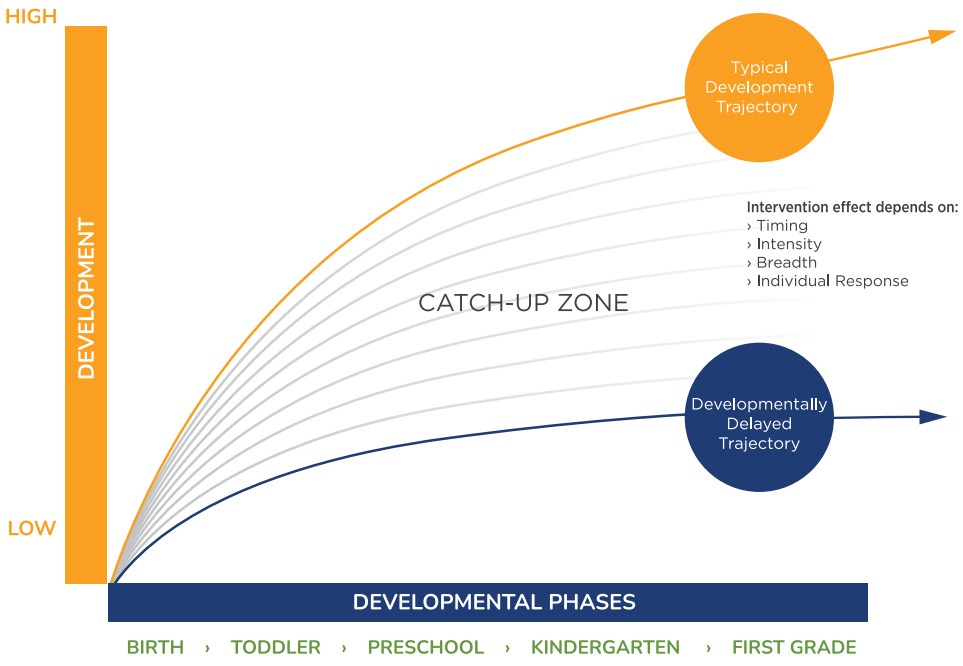
What is meant by early comprehensive intensive ABA treatment?

- "Early" refers to young children
- "Comprehensive" means that all areas of development are addressed in the treatment plan.
- "Intensive" means 30+ hours a week for 2 or more years.

What is the goal of early comprehensive intensive ABA treatment? Refer to the image from the infographic.

- Early ABA treatment aims to close gaps in development and bring skills closer to those their peers.
- Improvement is usually needed in many areas: social, communication, self-help, cognitive, behavioral, emotional regulation, self-management, and independence.

Early intervention and autism[2]



At what age should early comprehensive intensive ABA treatment begin?

- Treatment should start as soon as possible.
- Developmental gaps widen over time. It's easier to put children on a faster learning path when the gaps are small rather than large.
- Point out the brain's capacity for change. Due to brain plasticity, a young child's brain is believed to be particularly receptive to new learning. The benefits of early comprehensive intensive ABA treatment are maximized during this critical period.
- Children who begin treatment later do benefit from ABA treatment, but they may have a harder time catching up. (Klintwall et al., 2015)

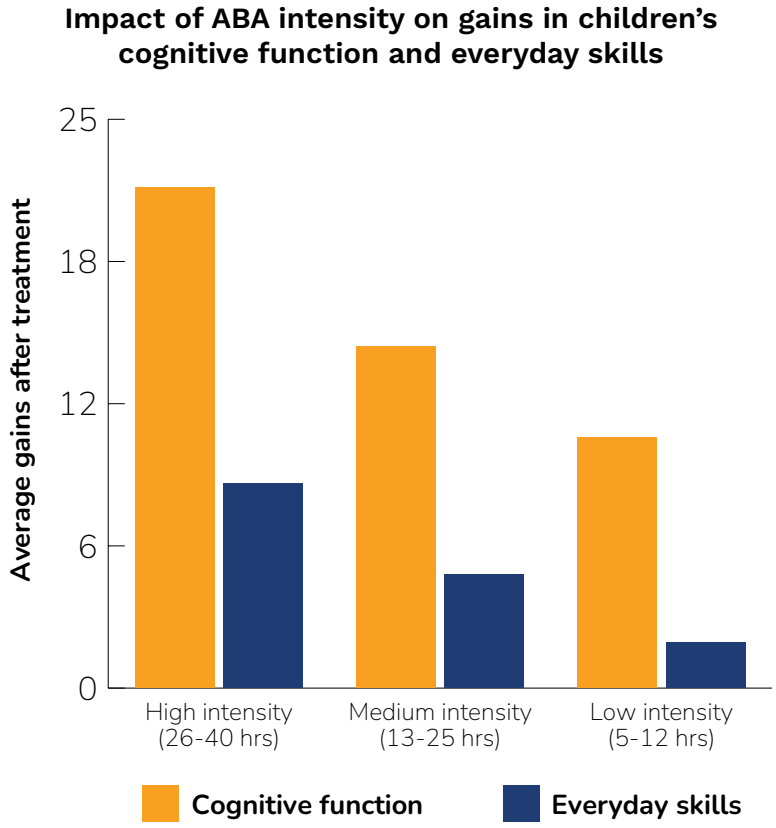
What skills are addressed in an early comprehensive intensive ABA treatment for young children?

- Young autistic children often show learning delays across many skill areas. Comprehensive ABA treatment addresses all areas to enhance overall functioning both now and in the future.

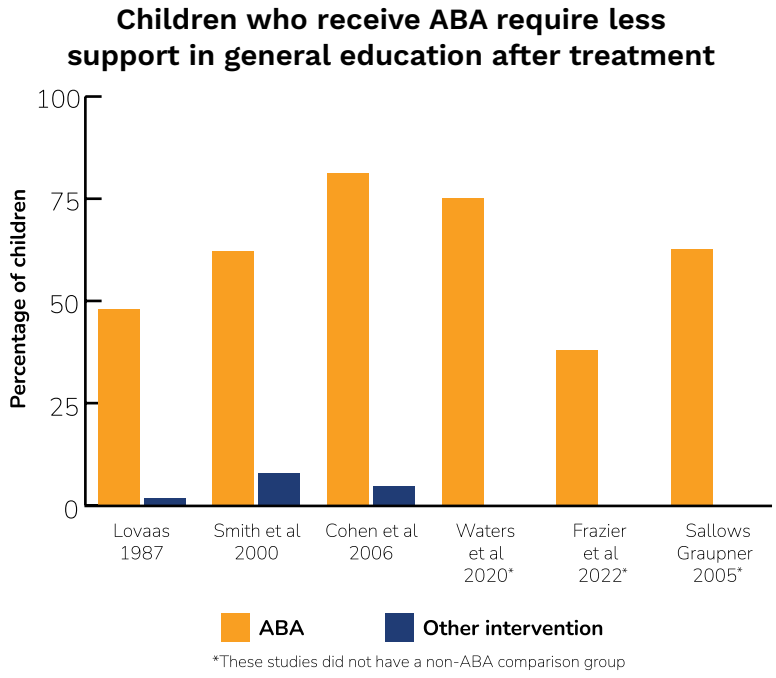
- ABA treatment also teaches foundational or "learning to learn" skills, enabling children to become independent learners after treatment. These skills include imitation, focusing on other people and activities in the environment, and asking questions.

What are the outcomes of early comprehensive intensive ABA treatment?

- Discuss average gains in cognitive and self-help functioning from 341 children who received ABA treatment at different intensity levels. Discuss the relationship between the size of the gain and the intensity of treatment. (Refer to infographic.)



- Discuss improved school readiness for children who received early comprehensive ABA Tx vs. other approaches.



Will my child achieve these outcomes from early comprehensive intensive, treatment?

- No one can guarantee how any individual child will respond to treatment. However, after a year or so of early comprehensive intensive ABA treatment, progress in narrowing gaps in development can be assessed.
- While research indicates that early comprehensive intensive ABA provides the best chance for improvement, we also know that not every child will score in the average or typical range of cognitive or self-help functioning after treatment.
- Regardless of the size of gains on tests, early comprehensive intensive ABA significantly increases the chances for significant developmental growth. See next point and also refer to the *"Information for Parents and Caregivers about ABA Treatment for Young Autistic Children."*
- Regardless of the size of the gains on test scores, every child shows growth during ABA treatment. Here are some of the ways families say their children benefit from ABA treatment:
    - improved language and communication (learning the names of things, asking for things, sharing feelings with others)
    - ongoing learning by watching others and asking questions
    - independence (toileting, teeth brushing, self-feeding, dressing; getting haircuts and cooperating in dental and medical care)
    - greater participation in family life (weekend activities, visits with family and friends) and
    - fewer behavioral challenges
- These skills also improve a child's chances of succeeding in school with fewer supports and in the community and help build the independence they will need as adults.
- Follow-up studies show that children who receive early, comprehensive ABA treatment continue to maintain the benefits of treatment during adolescence and the teenage years compared to children who received other therapies.

Why does early comprehensive treatment need to be intensive?

- The number of treatment hours is shorthand for the number of learning opportunities. During therapy, there are both structured and spontaneous opportunities to practice new learning in all the different areas where your child needs to grow.
- Research suggests that when treatment is less intensive, there are not enough learning opportunities to catch up in all areas. Fewer learning opportunities generally means slower progress or progress in fewer areas.

What if it is not possible to receive intensive treatment?

- There will always be challenges to ensuring early comprehensive intensive treatment. Life is full of unexpected turns of events. But, begin treatment without delay and strive to ensure that treatment is at the level to provide maximum benefits for you child.

CASP

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