Early Intervention Critical to Autism Treatment

Historically, autism has been a difficult developmental disorder to treat. It is characterized by significant developmental delays in language and communication skills, abnormalities in language when it develops without professional intervention, significant abnormalities in social behavior, and a range of problem behaviors including stereotyped, destructive, and disruptive behavior patterns. In addition, children with autism often function within the mentally retarded range of general intellectual ability, failing to benefit from conventional social and educational experiences that allow other children opportunities for growth and learning.

Because of the pervasive and refractory nature of this disorder, and with recent advances in the psychological and educational treatment of children...
with autism, it is increasingly critical that children be diagnosed as early as possible and referred to appropriate, effective intervention services. Early intensive behavioral intervention (EIBI), using the principles of applied behavior analysis (ABA), has become the gold standard psychological and educational treatment for children with autism. Given the number of medical comorbidities and multiple possible etiological paths for an autism-related disorder, the effectiveness of treatment and ultimate outcome will vary.¹

This article describes EIBI and the research behind the treatment, and presents quality standards for service delivery. This information is based upon experiences with the Comprehensive Autism Center at Columbus Children's Hospital in Columbus, Ohio.

**EARLY INTENSIVE BEHAVIORAL INTERVENTION (EIBI)**

Professor O. Ivar Lovaas at the University of California, Los Angeles, helped popularize the behavioral treatment of young children with autism. In his 1987 study, Lovaas reported nearly half the children with autism receiving at least 2 years of one-on-one behavioral instruction for 40 hours per week had achieved age-appropriate educational, intellectual, and adaptive behavior outcomes.² Other studies have supported this finding.³⁻⁵ Lovaas’ approach, conventionally and accurately known as ABA, discrete trial training (DTT), intensive behavioral intervention (IBI), or early intensive behavioral intervention (EIBI), has been used increasingly in teaching children with autism how to learn by focusing on the building blocks of language development, imitation, and matching through reinforced practice.

Both teaching methods and curriculum are important in an EIBI program. The curriculum is comprehensive in nature, targeted at ameliorating the core deficits of autism, which are communication and social delays and the associated intellectual impairment. This also may include, however, any other area of deficit that the child may display. Children are taught skills including basic discrimination and analytical, communicative, daily living, socialization, play, fine and gross motor control, and pre-academics. The first thing a child learns is how to learn.

Teaching the child to pay attention to teachers, sometimes called tutors or therapists, and instructional materials is a critical first step that may take weeks with some children. The teachers respond consistently to the child in order to eliminate disruptive, stereotyped, and destructive behaviors. Teachers ignore unwanted behaviors, and alternate, more appropriate behaviors are reinforced with contingent access to favorite foods, toys, or social praise. These rewards, referred to as positive reinforcers, are also used to increase the child’s successful completion of the instructional tasks. Behavior followed by reinforcement increases both in frequency and future likelihood under similar circumstances.

The child is taught new skills in a systematic, step-by-step fashion that is designed not to be too challenging or threatening. A variety of prompts are used to help the child succeed. These prompts are faded over time to increase the child’s independence with the new material. Instruction is paced quickly, which helps keep the child engaged and interested in the learning activities.

The instructional sessions are a mix of structured, teacher-directed activities and free play. They initially are conducted exclusively within the child’s home, but later some sessions are conducted within community and school settings. In the school setting, an aide from the program accompanies the child into a classroom, serving to facilitate successful inclusion into the classroom activities and socialization with peers. Parents are extensively trained in the behavioral teaching methods and are integral members of the treatment team.⁶⁻⁸

**MODELS OF SERVICE DELIVERY**

IBI can be delivered in two formats, clinic-directed services and consultation services.

**Clinic-Directed Services**

In the clinic-directed model, all services are provided by the agency, including 35 to 40 hours of one-on-one teaching conducted by behavioral intervention aides. Aides are typically undergraduates or recent graduates in psychology, special education, speech therapy, or a related field. The team is led by a senior behavioral intervention aide, who manages the weekly schedule, monitors the services provided by each aide, creates and organizes teaching materials, and tabulates progress data on a weekly and quarterly basis. The senior aide typically works directly with the child for approximately 8 to 10 hours per week and provides another 4 to 10 hours per week of indirect service. The senior aide typically has completed a bachelor’s degree in psychology, special education, or a related field.

The clinical lead is a case supervisor, who determines weekly treatment goals and teaching procedures, trains the team in treatment strategies, conducts parent
training, and coordinates with other treatment professionals. The case supervisor has a bachelor’s or master’s degree in psychology, special education, or a related field and provides about 5 hours per week of service for each child. Some of this is direct time with the parent or child and some indirect, in supervision of the treatment team. Case supervisors are typically registered with the state’s board of psychology as psychology aids and serve under the program director’s psychology license.

The psychologist, or program director, supervises the entire staff, develops the overall treatment plan, and provides support and training to parents. This service originated in the field of psychology, so most program directors are doctoral level psychologists. However, some program directors may have a master’s degree in psychology or a doctoral or master’s degree in special education. The program director sees the child for several hours on at least a quarterly basis and meets with the case supervisor on a weekly or bi-weekly basis to review all cases. The program director also reviews and approves all documentation.

In the clinic-directed format, the child receives 35 to 40 hours of treatment within his home and school and attends a weekly team meeting of 1 to 2 hours in length. The team, including the staff, the child, and at least one parent, convenes for team meetings to discuss changes in the treatment plan and to receive training on treatment strategies. In addition to these basic services, parent training is conducted on a monthly basis, and other indirect services (eg, school observations, school meetings, meetings with other professionals, report writing, supervision) are provided.

Consultation Services

The second format of EIBI is the consultation model. This model is far more prevalent, although the Lovaas treatment outcomes data were based on the clinic-directed model. In this format, the parents are responsible for recruiting, hiring, and paying for the aides and senior aide. The agency then provides a case supervisor (often referred to as a consultant in this format of service) and, optimally, a psychologist.

The consultant conducts an initial consultation, typically 2 to 3 days in length, to assess the child’s strengths and weaknesses, create treatment goals, designate the optimal treatment strategies, and train the team and parents in these strategies. The consultant returns on a regular basis, usually in the range of every 2 to 6 weeks, to evaluate the child’s progress and redesign the treatment plan as needed. The psychologist supervises the consultant’s work through supervision meetings, document review, and periodic visits with the client.

Additional Resources on the Behavioral Treatment of Autism

The following Web sites may be helpful to parents and pediatricians who want to learn more about applied behavior analysis treatment in autistic spectrum disorders.

- A comprehensive guide to all aspects of behavior analysis can be found at the Web site for the Cambridge Center for Behavioral Studies at www.behavior.org.

- The Surgeon General’s report on children and mental health, in which behavioral treatment of autism is cited, is located at www.surgeongeneral.gov/library/mentalhealth.

- The New York State Department of Health Early Intervention Program provided clinical guidelines that concluded that behavioral instruction was the only treatment approach for autism that has been adequately studied. These guidelines may be viewed at www.health.state.ny.us/nyshib/eip/menu.

- Information regarding special education advocacy for children with autism may be found at www.wrightslaw.com.

- A comprehensive catalog of educational materials and other resources used in applied behavior analysis treatment programs may be found at www.difflearn.com.

- The Behavior Analysts Certification Board has been established to provide uniform standards for professionals working as behavior analysts. More information about this organization is available at www.bacb.com.

- A comprehensive list of ABA providers, maintained by a parent of a child with autism, is available at http://irsaffran.tripod.com/consultants.html#USA.

- The Association of Behavior Analysis is a national organization that facilitates research, oversees standards in practice, provides educational and continuing educational opportunities, and publishes the Journal of Applied Behavior Analysis. More information may be found at www.abainternational.org.
The consultation client receives approximately 8 to 15 hours per months of service, with 6 to 10 hours of direct client contact, which includes consultations, school/home/session observations, parent training, and meetings with school personnel or other professionals. The client also receives another 2 hours of indirect contact between visits (ie, email, phone, or video consultations), and another several hours of supervision and report writing. The child should receive 35 to 40 hours per week of direct one-on-one teaching with tutors hired by or volunteering for the family.9

MAKING REFERRALS TO EIBI

EIBI programs should be initiated with children as soon as a diagnosis is made, optimally before age 3. The window of opportunity to achieve the most learning and neurological impact begins to close rapidly around age 6 to 7. While behavioral treatment strategies in general (as opposed to Intensive Behavioral Intervention) can be effective for individuals of all ages in combating difficult behaviors and in building new skills, it can be argued strongly that the sooner EIBI begins, the more substantial the lasting treatment gains will be. This can be attributed to neurodevelopmental factors, such as the increased plasticity of the brain at younger ages. While there is increasing evidence that structural changes can be effected even in adult brains, consensus remains that the greatest opportunity for permanent and substantial change comes in early childhood.10

In addition to neurological factors, practical matters make early intervention more effective. The less time a child has practiced negative and pathological behaviors, the easier these behaviors are to change. In addition, it is easier to manage, reduce, and prevent recurrence of aggressive behavior in a smaller child than to attempt these interventions with an older and more physically mature child. It is also easier to work on the social skills component of EIBI when the children are young, because their peers' social behaviors are less sophisticated. Peers are often also more open to intervention strategies.

There may be inhibiting factors to early referrals for IBI services. Some referring physicians are concerned about coming to diagnostic conclusions too early, and possibly diagnosing the child incorrectly. However, some new tools, such as the Checklist for Autism in Toddlers – Revised, allow for fairly accurate early screening.11 This may also be avoided by referral to a developmental specialist who may have more experience in making the diagnosis even at young ages. It should also be noted that, while there are risks to misdiagnosing the young child, there are also competing risks related to delaying appropriate interventions.

Schedule Matters

To paraphrase the consensus of thinkers as far back as Aristotle, children become that which they do and get better only at that which they practice. For these fundamental reasons, the intensity of ABA treatment and long-term follow-up after EIBI are important. An early intensive behavioral intervention program is generally characterized as a 3- to 4-year, 40-hour-a-week program. Physicians may hesitate to refer

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children with autism to EIBI programs because of the number of treatment hours. However, when 10 hours per week of this same intervention was assessed, the children showed no better improvement than those with no behavioral intervention at all.

Some feel that the intensity of the service may be inappropriate for very young children, or for higher functioning children. It should be noted that the treatment, in its optimal form, is highly individualized in terms of content. If a child is younger than 3, the treatment hours start at roughly 20 hours per week and gradually increase to 40 hours per week by the time the child is about 3 years old. In addition, the treatment for such young children emphasizes imitation play, social interaction, matching games, and the prevention of inappropriate behaviors for several months, and only gradually increases its focus on language and more complex cognitive tasks.
For higher functioning children, the treatment intensity may be crucial to a positive outcome. To accommodate the child's skills, treatment goals are altered to match his or her strengths and weaknesses. Treatment may also include a component of group socialization, in which the child would attend a classroom program accompanied by one of the treatment providers from the home-based program.

In other words, the treatment hours can be distributed across various contexts (ie, home, community, school) according to the child's age and learning needs. It is rare that a child with a higher level of functioning would require fewer service hours. Instead, treatment goals are correspondingly changed and in some cases include a goal of reaching a typical level of functioning.

**Duration of Treatment**

Typically, the goal of EIBI is to provide an intensive program for a child with autism at a young age so the child may benefit maximally from a classroom placement when of elementary school age (ie, first or second grade). Therefore, the intervention is typically at least 2 years in duration and sometimes as long as 4 years. Over time, the intervention is conducted more extensively in the group or school setting. The goal is to assist the child in being placed into and benefiting from the least restrictive classroom possible by second grade, and then to transition services primarily to the school district personnel.

Once the EIBI program is completed, it has become customary for psychologists to provide consultative support, guidance and periodic checks for many years after the beginning of ABA treatment. Continuous support through the grade school years is often necessary. A student's IQ may be in the normal range, and he or she may be attending school in a regular classroom, but the child may still have residual problems. If those problems are left alone, to the extent that they are practiced by the child, they may worsen.

Additionally, refinement of a child's skills needs to be accomplished, such as expanding of vocabulary, developing casual conversation, and teaching the child how to participate in sports, tolerate other children, or make friends. In this sort of follow-up treatment, the techniques are far less structured, and the children are able to learn from more conventional, instructional, and therapeutic supports.

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### Factors to Consider When Evaluating the Quality of EIBI Programs

#### Provider Qualifications

- What are the qualifications of the program director?
- What training and experience in IBI (as opposed to general work in behavior analysis, developmental disabilities, or school settings), has the program director had?
- What level of experience and training do the case supervisors/consultants have?
- What supervision does the program director provide to the case supervisors/consultants?
- Are the case supervisors/consultants registered with the state board of psychology or some other governing agency?
- Are the program director and case supervisors/consultants qualified for BCBA or BCABA certification?

#### Service Parameters

- How many hours of service per month are provided?
- Are support services provided, such as parent training, school observations, aide overlap and training, professional coordination, and IEP attendance?
- What is each provider's caseload?
- What is the call-back policy when questions arise?
- Are other clients satisfied with the services?
- Are other professionals in the community satisfied with the services?

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**A RANGE OF OUTCOMES**

The most positive outcome of EIBI programs is achieved when a child goes from the mentally retarded range of intelligence, defined by an IQ below 70 with correspondingly impaired adaptive behavior, to the normal range, in which an IQ of 100 is considered an average score, and the ability to function within a typical classroom without assistance.

Long-term outcome research from the UCLA study indicates that a sizeable minority of children with autistic spectrum disorders (ASD) and developmental delay can show some degree of
catch-up in learning things their peers learned in early childhood. In some cases, the amount of catch-up might be sufficient for them to be successfully placed with same-age peers. It also may enable the children to benefit from the same sort of education without the services or supports that autistic students typically need. Children with higher initial IQs at the start will usually make nice gains in terms of normalizing their learning processes and behavior. Factors that boost success rates include starting earlier, more intervention, and full parental participation.

However, even under the most optimistic estimates of how many children will benefit from early treatment with ABA and to what extent, the majority of these children will remain classified as autistic and mentally retarded in terms of overall development. At that point, it may be appropriate to adopt an approach of providing dignified supports in situations that look as normal as possible, similar to a model developed in North Carolina called Treatment and Education of Autistic and Related Communication Handicapped Children (Division TEACCH).

In addition to classroom services, many parents continue individualized ABA tutoring throughout the child's developmental period in order to teach additional desired skills. The child may also require additional educational services, eventual vocational services, and quite possibly domiciliary services at some point.

IMPEDIMENTS TO MAKING REFERRALS TO EIIB

Recently, the American Academy of Pediatrics Committee on Children with Disabilities described the physician's role in the diagnosis and management of autism, and noted that, while the pediatrician is first challenged by the process of making a diagnosis, the challenge continues in the referral to services. The committee attributed the main difficulty to the fact that treatment guidelines for this disorder have not yet been published in the general pediatric literature. While this is the case, there may be further roadblocks to proper referrals.

The misconception that children appear robotic is based on observations that children in training programs for behavior modification wait for a cue, and then respond to that cue as they have been taught. The teaching may seem overly repetitive, but it is no different in concept from an activity such as fire-drill training, in which everyone lines up and walks outside of the building. Schoolchildren line up for a fire drill to make sure everybody is accounted for and evacuated in an orderly manner. During the initial instructions in an EIIB program, it is very much the same concept. We want to ensure that the behavior is all there, reliably and completely learned. Once students have learned the behavior sequence well, the next steps are to make it fluid, flexible, and generalized.

Another issue that concerns some parents is the alleged lack of generalization thought to characterize behavioral treatment, a concern similar to the one just discussed. The lack of generalization is something that can be observed with respect to any instruction done in discrete little bits, and it is quite typical of learning in its earliest stages. Anyone looks robotic and hesitates to perform actions in new situations as, for example, when first learning how to drive a car. Even after seemingly learning the basics of driving, a novice driver must still struggle to translate information into action. Again, these performance problems are characteristic of any learning in its early stages. The solution is not to avoid teaching but to practice the skills additionally under varying conditions so that it all becomes adaptively generalized and seamlessly fluent. This
generalization process is a part of any good EIBI program.

Another common misconception of ABA is that the teaching relies on punishment. Parental concern about the flagrant use of punishment, or any restrictive treatment, for that matter, is understandable. However, the use of positive behavioral strategies is now the norm in good EIBI programs. ABA for young children with autism and related disorders is based on reinforced practice of the tasks the child should be doing but is not. This has the effect of displacing much of the pathological, stereotyped, or destructive behavior that otherwise may preoccupy these children. Reinforced practice of appropriate behavior often makes the children look forward to therapy and to learning, and as a side effect, decreases the social withdrawal that is so characteristic of untreated autism. Being around people and performing the activities practiced in therapy must become intrinsically rewarding for the child if these activities are going to become the foundation for more normalized learning in the future. This is best achieved by relying on positive motivation during therapy.

Limited Availability Of Services and Difficulty Establishing Standards

The primary reason for lack of referral to EIBI is a lack of service providers. An increase incidence of autism is being reported, which has contributed to parents accessing EIBI service providers in larger numbers. EIBI requires the expertise of a behavioral psychologist with additional knowledge of developmental processes and child psychopathology. The availability of such professionals is scarce, especially outside of major urban centers.

In many major cities, behavioral intervention programs are offered by private behavioral intervention agencies, hospital programs, university programs, or out-of-town consultation services. Locating these service providers and determining their competency is difficult for referring physicians and families. Because the services are intensive and require specially trained staffs, most agencies and programs are small and hard to find. This field still represents an emerging specialty practice.

Once an agency has been identified, issues of competency are even harder to determine. Parameters for training, supervision, service hours, and case loads are considerations when evaluating the competency of agency services. When evaluating the competency of EIBI services, it is important to determine the competency factors related to the two top-level positions: the case supervisors, or consultants, and the program directors. Some special education undergraduate and graduate programs are beginning to teach the required behavioral teaching methods needed for IBI. However, because no graduate programs yet specialize in IBI for children with autism, an extensive amount of supervised training is necessary to be competent as a director.

The Association for Behavior Analysis has created a certification program to indicate that a graduate course of study reflects the state-of-the-art techniques, but this certification is being used only sporadically thus far. A private certification board, the Behavior Analyst Certification Board, provided standards and examinations for a bachelor's level certification, Board Certified Assistant Behavior Analyst, BCABA, and a graduate level certification, Board Certified Behavior Analyst, BCBA. Adoption of these credentials varies by state, but they have been in place the longest in Florida.

Psychology licensing generally permits practice in behavior analysis, but training and experience in this area is highly individual. Some psychologists have the doctoral level advanced credential in behavioral psychology provided through the American Board of Professional Psychology, although this form of voluntary certification is relatively recent.

However, these certifications do not guarantee that the person has had high-quality practical and supervised experience in implementing IBI. Since an IBI program consists of many hours per week of direct instruction to the child and covers almost every area of functioning, the service delivery must be geared toward ensuring that the child is successful and that the program is individualized to meet his or her needs. In addition, because extensive individualization of teaching strategies is required for most children with autism, having broad and extensive training experience is necessary to run a program competently. With this level of intensity in the program, the risks of inadequate training are not insignificant.

Funding for EIBI Programs

Cost is also often a limiting factor. The cost of implementing an EIBI program can be upwards of $60,000 per year. This kind of behavioral treatment for autism still is not often covered by health insurance, though some positive precedents have been set. Public school systems, mandated by law to provide a free and appropriate education that results in a meaningful and measurable benefit for the child, are reluctant to provide EIBI services. Often there is a values clash, and schools state that they don't believe in ABA. Schools also cite cost as a factor in not providing EIBI. Some parents choose to pursue their right to due process with hopes of having the schools pay for an EIBI program. However, educational due process is a financially expensive and emotionally taxing experience, and parents are often unsuccessful.
Parents may be encouraged to pursue other funding sources, such as Medicaid waiver programs established for individuals with disabilities. These waiver programs are typically not established to provide EIBI services but may be able to be adapted to cover at least a portion of the costs associated with such programs (e.g., they may cover respite services, aide services, transportation, materials, etc.). Other sources, such as county, state, and federal funds controlled by local government-run developmental disabilities agencies, may be used to provide individuals with disabilities specialized services, such as psychological interventions and speech therapy. The case supervisor and psychologist's services may be covered by such funding.

Although the up-front expenses for ABA treatment can be steep, a case can be made that long-term cost savings can be substantial. Effective early intervention can decrease long-term care costs in two ways. First, behavioral treatment likely serves to reduce the autistic child's desire to escape from social interaction. This serves to prevent destructive behavior, such as aggression and self-injury, through exposure to social interaction and social learning. Second, if varying rates of effectiveness of behavioral intervention are considered, cost-benefit models estimate that there can be significant cost savings during the life span of a person with autism. Initial costs for early intensive behavioral intervention are offset by less expensive treatment costs later in life for a child who had early ABA treatment. These children are likely to require less restrictive educational and residential placements, and will be at lower risk for medical costs associated with destructive behavior.18

SUMMARY
It is still not universally accepted within the scientific community that the habilitation of autistic children is possible, or that their ability to function without supports in regular education by third, fourth, or fifth grade happens as a direct result of EIBI. However, using the outcome studies that have been reported, the rate of children reaching a best-outcome status appears to be between about 10% and 47%.19

There is a more global way to look at the effects of EIBI or behavioral intervention. Even if the child retains many characteristics of autism, the usual outcome of treatment is that the child learns useful skills. Behavioral intervention results in effective and efficient learning, which is precisely what it aims to accomplish and what behavioral techniques have been developed to do.

Children and families have been able to achieve much more than many would ever have believed before EIBI became a realistic possibility.

REFERENCES