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Analysis of the Evidence Base for ABA and EIBI for Autism

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A misimpression stands that the treatment of autism lacks evidence-based approaches. However, in actuality, Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) are possibly the best examples of evidence-based behavioral health care. In contrast to the folklore that one hears, independent reviews consistently agree that ABA and EIBI treatments for autism are effective, and that the extensive body of research meets high standards of evidence.

Two such independent reviews are highlighted here.

One well-known review was conducted for Division 53 of the American Psychological Association (the Society for Clinical Child and Adolescent Psychology). The following was concluded:

“Randomized controlled trials have demonstrated positive effects in both short-term and longer term studies. The evidence suggests that early intervention programs are indeed beneficial for children with autism, often improving developmental functioning and decreasing maladaptive behaviors and symptom severity at the level of group analysis.” (Page 8).

“Lovaas’s treatment meet Chambless and colleague’s (Chambless et al., 1998; Chambless et al., 1996) criteria for ‘well-established’” (Page 8).

“Across all the studies we cited, improvements in language, communication, and IQ, and reduction in severity of autism symptoms indicate that the core symptoms of autism appear malleable in early childhood” (page 30).

Rogers, S.J., & Vismara, L.A. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology*. 37, 8-38.

In another review, the state of Hawaii convened a Department of Health Task Force to identify evidence-based treatments in children’s mental health. The overarching goals of the task force were to broaden and update the summary of scientific information used to guide decisions about children’s care. The report provides an extensive review of the major randomized, controlled research findings for psychosocial treatments for children. The committee grouped its findings into “treatment families” of similar treatments for given disorders and represented these on a “Blue Menu” summary.

Regarding the treatment of autism, the “Hawaii Blue Menu” report stated:

“Two treatment families demonstrated Best Support. Intensive Behavioral Treatment was successful in three (3) studies, beating alternative treatments in two (2) of those, and beating a no-treatment control in one (1). Likewise, Intensive Communication Training was

also successful in three (3) studies, beating alternative treatments in two (2) of those, and beating a no-treatment control in one (1) study.” (Page 16).

“These results are quite promising in terms of effect size, although it should be noted that the outcome variables for these studies mainly involved reductions in the frequency of —autistic behaviors or increases in social communication or other forms of social exchange (e.g., turn taking). None of these studies claimed that children were —autism free following the intervention programs. Nevertheless, these findings represent an extraordinary improvement over the evidence base for interventions for autistic spectrum disorders in the previous Biennial Report.” (Page 18).

“The shape of the profile suggests that all successful treatments for autistic spectrum disorders involve teaching communication skills and modeling of appropriate communication or other behaviors. Other strategies include training in non-verbal communication (social skills), teaching parents and teachers to praise desired behaviors, and the setting of goals paired with the intensive rehearsal and reinforcement of behaviors consistent with those goals (i.e., discrete trial training).” (Page 19).

Chorpita, B.F. & Daleiden, E.L. (2007). *2007 Biennial report: Effective psychosocial interventions for youth with behavioral and emotional needs*. Child and Adolescent Mental Health Division, Honolulu: Hawaii Department of Health.

Here are two other statements from recent objective scientific reviews of EIBI.

“Recovery in children with ASD through behavioral and educational interventions seems possible in a significant minority of cases.” (page 360).

Helt, M., Kelley, E., Kinsbourne, M., Pandey, J., Boorstein, H., Herbert, M., & Fein, D. (2008). Can children with autism recover? If so, how? *Neuropsychology Review*. 18, 339-366. (The authors are psychologists and pediatricians at the University of Connecticut, Queen’s University, the New School, Children’s Hospital of Philadelphia, and Massachusetts General Hospital).

“The weight of currently available scientific evidence, however, indicates that ABA should be viewed as the optimal, comprehensive treatment approach in young children with ASD.”

Barbarese, W.J., Katusic, S.K., & Voigt, R.G. (2006). Autism: A review of the state of the science for pediatric primary health care clinicians. *Archives of Pediatric and Adolescent Medicine*, 160. 1167-1175. (The authors are pediatricians at the Mayo Clinic and at Harvard University).

Forty-five such independent, meta-analysis, and peer reviews are listed in a bibliography below. In none of these do the authors systematically refute the published evidence for ABA treatments of autism. The reviews are critical evaluations – in many cases, other non-ABA treatments are assigned to categories such as “insufficient evidence,” “unproven,” or even “potentially harmful.”

Yet every review cites the obvious positive results of ABA and EIBI and accepts them as proven. The most “negative” conclusions that are offered are:

- 1) ABA does not cure all children of autism
- 2) ABA is not the only established treatment, nor is it clearly the best treatment
- 3) There are not well-established means to identify the best candidates for treatment

It should be noted that the above conclusions can be drawn about any medical treatment that already enjoys full coverage, so they should not be cause for denying coverage for ABA.

However, the lay impression persists that there are “negative” reviews in the literature. But let’s look at what the “negative” reviews do say. The following is the *most skeptical* recent publication in the scientific literature. But see one of their concluding statements.

“There is little question now that early intensive behavioral intervention is highly effective for some children. However, gains are not universal, and some children make only modest progress while others show little or no change, sometimes after extremely lengthy periods in treatment.” (page 36).

Howlin, P., Magiati, I., & Charman, T. (2009). Systematic review of early intensive behavioral interventions for children with autism. *American Journal on Intellectual and Developmental Disabilities*. 114. 23-41. (The authors are professors at the Institute of Psychiatry, King’s College (London, UK) and University College, London, Institute of Child Health).

Other “negative” reviews may exclude the majority of ABA research, by applying highly restrictive criteria for what qualifies as evidence.

For example, there is the Comparative Effectiveness Review published by the AHRQ in 2011. But, while this report has also been cited as “negative,” see their main conclusions regarding ABA and EIBI interventions.

“Evidence supports early intensive behavioral and developmental intervention, including the University of California, Los Angeles (UCLA)/Lovaas model and Early Start Denver Model (ESDM) for improving cognitive performance, language skills, and adaptive behavior in some groups of children.” (page vi).

“Evidence suggests that interventions focusing on providing parent training and cognitive behavioral therapy (CBT) for bolstering social skills and managing challenging behaviors may be useful for children with ASDs to improve social communication, language use, and potentially, symptom severity.” (page vi).

The “negative” qualifiers of these conclusions are stated as:

“All of these studies need to be replicated, and specific focus is needed to characterize which children are most likely to benefit.” (page vi).

“Information is lacking on modifiers of effectiveness, generalization of effects outside the treatment context, components of multicomponent therapies that drive effectiveness, and predictors of treatment success.” (page vi).

In comparison to the above comments, these are the clearly negative conclusions about traditional biomedical treatments that are currently widely covered by insurance policies:

“No current medical interventions demonstrate clear benefit for social or communication symptoms in ASDs.” (page vi).

“Little evidence is available to assess other behavioral interventions, allied health therapies, or complementary and alternative medicine.” (page vi).

Warren, Z., Veenstra-VanderWeele, J., Stone, W., Bruzek, J.L., Nahmias, A.S., Foss-Feig, J.H., Jerome, R.N., Krishnaswami, S., Sathe, N.A., Glasser, A.M., Surawicz, T., & McPheeters, M.L. (April, 2011). Therapies for Children With Autism Spectrum Disorders. *Comparative Effectiveness Review No. 26*. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No.290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD:Agency for Healthcare Research and Quality. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

The AHRQ report reached these positive conclusions about ABA and EIBI despite excluding a large number of studies, including all studies published prior to 2000. Yet the AHRQ report still found 78 studies of behavioral interventions, which included 34 studies of EIBI that met their criteria for inclusion.

Other “negative” reviews cited are typically proprietary reports published privately. For example, the Kaiser Blue Cross report did not offer positive statements (Rothenberg & Samson, 2009). However in their methodology, they limited their analysis to only 16 studies, out of the hundreds available, and concluded that more research needs to be done. Interestingly, unlike the AHRQ review, this report did not comment on the comparable lack of data for psychotropic medications, yet insurance companies readily cover such treatment.

Three other areas of research, that were not addressed by the AHRQ report or the proprietary reports, are the following: cost-benefit analyses, meta-analyses of effect magnitude, and direct analyses of significant behavior improvement. Here are some sample conclusions from these fields of research.

Cost-Benefit Analyses

“Under our model parameters, expansion of IBI to all eligible children represents a cost-saving policy whereby total costs of care for autistic individuals are lower and gains in dependency-free life years are higher. (page 136).

Motiwala, S.S., Gupta, S., Lilly, M.D., Ungar, W.J., & Coyte, P.C. (2006). The cost-effectiveness of expanding intensive behavioural intervention to all autistic children in Ontario. *Healthcare Policy*, 1, 135-151.. (The authors are members of the Department of Health Policy, Management and Evaluation of the University of Toronto, ON).

Meta-Analyses of Magnitude of Effect

“Results suggested that long-term, comprehensive ABA intervention leads to (positive) medium to large effects in terms of intellectual functioning, language development, acquisition of daily living skills and social functioning in children with autism. Although favorable effects were apparent across all outcomes, language-related outcomes (IQ, receptive and expressive language, communication) were superior to non-verbal IQ, social functioning and daily living skills, with effect sizes approaching 1.5 for receptive and expressive language and communication skills. Dose-dependant effect sizes were apparent by levels of total treatment hours for language and adaptation composite scores.” (page 387).

Virues-Ortega, J. (2010). Applied behavior analytic intervention for autism in early childhood: Meta-analysis, meta-regression and dose–response meta-analysis of multiple outcomes. *Clinical Psychology Review*. 30, 387-399. (The author is a professor of psychology at the University of Manitoba).

Analyses of the Direct Effect of ABA on Clinically Significant Behavior Disorders

“The available intervention technology is reasonably effective at reducing problem behaviors performed by people with developmental disabilities, including autism. Reductions of 80% or greater were reported in half to two thirds of the comparisons. Reductions of 90% or greater were reported for all classes of problem behavior, and with individuals with all diagnostic labels.” (page 429).

Horner, R.H., Carr, E.G., Strain, P.S., Todd, A.W., & Reed, H.K. (2002). Problem behavior interventions for young children with autism: A research synthesis. *Journal of Autism and Developmental Disorders*. 32, 423-446. (The authors are professors at the University of Oregon, the State University of New York at Stony Brook, and the University of Colorado).

“Within the last 8 years, 66 studies with strong or acceptable methodological rigor have been conducted and published. These studies have been conducted using over 500 participants, and have evaluated interventions with different delivery agents, methods, target skills, and settings. Collectively, the results of this synthesis show there is much supporting evidence for the treatment of social deficits in autism.” (page 161).

Reichow, B. & Volkmar, F.R. (2010). Social Skills Interventions for Individuals with Autism: Evaluation for Evidence-Based Practices within a Best Evidence Synthesis Framework. *Journal of Autism and Developmental Disorders*. 40, 149-166. (The authors are professors at the Yale University Child Study Center, New Haven, CT).

Earnest researchers and clinicians welcome the challenge to even further extend the effectiveness of ABA to more children, and are continuing to innovate to do so. But it is clear that all professional circles now agree that there is generous and sufficient evidence to endorse public and private coverage of accountable ABA treatment and Early Intensive Behavioral Intervention.

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