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There is a long-standing debate among interventionists, researchers, policy makers, and parents of children with autism spectrum disorder (ASD) about the number of hours of intervention necessary for optimal outcomes for young children with ASD. This debate largely applies to Early Intensive Behavioral Intervention (EIBI), with often urgent calls to increase the dose, or intensity, of in-home treatment with a behavioral interventionist in the hopes of improving child outcomes. EIBI is based on the premise that intensive treatment initiated at a young age will lead to improved outcomes, and indeed there are a number of studies that have demonstrated improved outcomes for young children with ASD who received anywhere from 15 to 40 weekly hours of EIBI (Dawson et al., 2010; Eikeseth, Smith, Jahr, & Eldevik, 2002; Granpeesheh, Dixon, Tarbox, Kaplan, & Wilke, 2009; Sallows & Graupner, 2005). Advocacy efforts have led to policy and practice recommendations that young children with ASD receive many EIBI treatment hours. However, a close examination of the data that led to these recommendations suggests that simply increasing hours of service is likely not necessary or even appropriate for all children and families.

What do we know about the effect of EIBI dose on outcomes?

Conventional wisdom that 40h is the optimal treatment dose originates with the original report on EIBI for young children with ASD (Lovaas, 1987), which compared outcomes for participants in a high intensity (i.e. an *average* of 40h per week) experimental group with those of children enrolled in two “minimal treatment” (i.e. 10h per week) comparison groups (one associated with the study program and one community-based). Following 2 or more years of intervention, those in the high-intensity group showed more favorable outcomes with respect to IQ and school placement than the two lower intensity groups. The lower intensity group associated with the Young Autism Project at University of California, Los Angeles (UCLA) did not differ from the group receiving standard community-based services.

The success described in the first follow-up of the Lovaas study (McEachin, Smith, & Ivar Lovaas, 1993) and subsequent replication studies generated great

excitement about the potential for behavioral intervention to change outcomes for children with ASD, and the Lovaas model was heralded as a “gold standard” of care—often along with a recommended minimum dose of 40h per week. More recent studies have greatly varied the number of hours of intervention children receive while still showing positive outcomes. Studies demonstrating the positive effects of EIBI on IQ, communication, and behavior use various minimum hours for participation, including 4h per week (Granpeesheh et al., 2009), 10h per week (Eldevik, Eikeseth, Jahr, & Smith, 2006; Peters-Scheffer, Didden, Mulders, & Korzilius, 2010), and 20–40h per week (Eikeseth et al., 2002; Sallows & Graupner, 2005; Smith, Klorman, & Mruzek, 2015).

Few subsequent studies have directly assessed the relationship between intensity and outcome. Smith and colleagues (1997) conducted a retrospective chart review of 21 children who received either “intensive” (i.e. 30+ h per week) or “minimal” (i.e. 10h or fewer per week) EIBI. While the intensive dose group outperformed the minimal dose group on IQ and speech production, there were no group differences on behavior problems. In addition—and similar to the original Lovaas study—the authors noted that “large individual differences are evident among the children in the experimental group” (p. 242), such that there were no universal improvements across all participants in this small sample. Granpeesheh and colleagues (2009) evaluated treatment intensity within the context of child age at service entry, and demonstrated that increased dose was associated with increased goal mastery, particularly for younger children, although the range of treatment intensity was quite large (i.e. 20–169h per month). Finally, a meta-analysis (Reichow & Wolery, 2009) supported an association between treatment intensity and IQ. However, this finding was based on only two studies. None of these studies examined the effect of the number of hours of intervention on family functioning or access to care.

Neither recommendations for specific intensity of intervention nor the meta-analyses described above consider treatment quality and do not comprehensively report on methodological rigor of the research. Measures of intervention quality and quality of research design, such as treatment fidelity, treatment acceptability, use of large and representative sample sizes, and inclusion of meaningful

outcome measures, are largely absent from the current literature on treatment dose for children with ASD. Careful consideration of these important measures of quality and ecological validity is essential for ensuring that treatments for individuals with ASD produce meaningful changes. Community agencies may implement EIBI with low fidelity, not implementing the intervention as designed (Suhrheinrich et al., 2013; Suhrheinrich, Stahmer, & Schreibman, 2007). How EIBI is implemented in community programs is important given identified links between accurate implementation and optimal treatment outcomes (Pellecchia et al., 2015; Schoenwald, Sheidow, Letourneau, & Liao, 2003). Therefore, improving the quality of community EIBI may be as critical as understanding how to determine intervention intensity, as high intensity, low quality intervention is not likely to achieve outcomes similar to those seen in research studies.

There is general consensus that intervention should be individualized based on child characteristics and family factors, but the available evidence provides limited insight into how to best accomplish this. Emerging research into predictors of success in EIBI suggest that higher child social-communication and lower sensory-ritualistic behaviors at service entry indicate better potential outcomes (Smith et al., 2015). Adaptive research designs, such as SMART designs, are making strides toward identifying how to adjust dose mid-treatment and use more naturalistic treatment strategies to maximize outcomes (Kasari et al., 2014). Finally, advances from the field of implementation science demonstrate the importance of accounting for socio-cultural barriers and how social determinants of health may contribute to intervention uptake, engagement, and efficacy—particularly as disenfranchised populations are severely under-represented in research.

How is this research translated into practice?

The treatment dose recommended in many policies and guidelines may not be based in evidence and may not consider the broader implications of high intensity for many families. For example, the Behavior Analyst Certification Board (BACB), which governs the credentialing of behavior analysts, released practice guidelines for interventionists and policy makers to consider when developing treatment programs for individuals with ASD (BACB, 2019). These recommendations include the use of a tiered approach to service delivery, with two levels of support: focused applied behavior analysis (ABA) treatment (10–25 h per week for individuals needing treatment for a limited number of behavioral targets) and comprehensive ABA treatment (30–40 h per week for treatment of children with needs across multiple developmental domains, such as cognition, social, communication, emotional, and adaptive functioning). The guidelines note that treatment hours

should not include the number of hours a child spends in school or in other therapies, which is in direct contrast with prior recommendations that include school, other treatment and activities in “treatment hours” (National Research Council, 2001). In fact, recent EIBI studies found that community programs (considering all the hours of services) had similar results to high quality EIBI (Rogers et al., 2019). Although the BACB guidelines indicate that individuals’ needs should be considered when recommending treatment hours, the minimum number of recommended ABA treatment hours in these guidelines is 10 h each week, with a strong recommendation for a higher dose.

In response to these new guidelines, some ABA providers have enacted policies that require families to commit to a minimum of 15 h per week of therapy to be eligible for treatment. These kinds of sweeping requirements fail to account for the wide-range of behavioral, academic, social, and communication treatment needs individuals on the autism spectrum have, or the need for developmentally appropriate treatment intensity depending on a child’s age. Policy recommendations for a minimum number of hours also fail to consider the broader implications for the child’s family. Whether the family is able to sustain high-intensity treatment hours may vary based on parents’ income, job requirements, family support, number of children in the family, and so on. Requiring families to commit to an arbitrarily set minimum number of hours may lead to increased burden and stress for parents who already experience considerable stress, which can in turn jeopardize child outcomes. Furthermore, guidelines for a minimum number of hours of ABA treatment fail to consider the other treatments most children with ASD receive. Comprehensive treatment may include speech and language therapy, occupational therapy, social skills groups, and cognitive behavior therapy among other treatments, in addition to ABA. For school-aged children, some of these interventions often occur outside of the school day. How can a family reasonably fit all of these therapies into any given week if they are required to commit to a minimum number of hours of treatment? In addition, this leaves little time for recreation and family activities. Overall, prescriptive guidelines such as these may not be developmentally appropriate for young children, may reduce access to EIBI by unnecessarily filling providers’ caseloads and by limiting access to families who cannot commit to minimum hours, increase the cost of intervention services unnecessarily, and limit family choice regarding intensity of services.

Conclusion

Overall, current research does not provide conclusive data regarding the most appropriate EIBI dose for children with ASD. Although some argue that “more is better,” many factors should be taken into account when prescribing treatment, including service access, family functioning, cultural

and developmental appropriateness of intervention, and the role of other treatment modalities. Our intention is not to recommend for or against moderate-to-high intensity services but rather to challenge sweeping recommendations for all children, without consideration of child and family factors that should influence intensity. For example, slavishly adhering to a minimum number of hours may perpetuate service disparities for families who, for myriad reasons, cannot access the recommended dose (Magaña, Parish, Rose, Timberlake, & Swaine, 2012; Pickard & Ingersoll, 2015). Data on how to individualize dosage for this group of children who present with varied skills, needs, ages, and family contexts is nonexistent. Advances in research that emphasize identifying mediators and moderators of treatment and designs that systematically account for dose adjustments are promising means to better understanding the relationship between child, family, and service characteristics and optimal treatment intensity. As policy and practice guidelines are heavily influenced by research, the time is ripe for rigorous evaluations of treatment intensity to ensure that the continuing evolution of these policies and practices are data-driven. Efforts should also focus on improved access to high quality, evidence-based treatment across populations, with particular emphasis placed on efforts to improve access to care for under-served and under-resourced populations who often have very limited or no access to high quality treatment. Finally, as a broad community of providers, researchers, and advocates, it is our collective responsibility to ensure that guidelines and policies are fully informed by evidence.

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