



## Autism Early Intervention: Best Practice - Recent research

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(This fact sheet is a brief summary of my Master Class lecture<sup>14<sup>th</sup></sup> July 2009 that presented the evidence for a wide range of currently available treatments such as those described in Factsheet 18).

It is widely accepted that:

*ASDs need to be identified as early as possible;*

*children and their families need to be referred to appropriate services as soon as possible;*

*early intervention in autism is necessary and beneficial and*

*- the earlier the better.*

However, as yet there is no aetiology-based intervention for autism; in other words we do not know the exact cause of autism therefore we do not have a specific treatment for it. Despite this parents and professionals need to make informed decisions about intervention options for children. Some researchers have expressed concern over the large, and possibly growing, gap between what science can show is effective, on the one hand, and what treatments parents actually pursue.

The field has been plagued by differences of opinion and controversies over treatment methods (CMHO, 2003). To date many widely promoted new approaches have no empirical support and some new treatments may be unhelpful or in fact be harmful. Francis (2005) stated: (as there is) "...no cure for autism at present, the word "treatment" should only be used in a very limited sense, reflecting interventions aimed at helping people with ASDs to adjust more effectively to their environment." The issue of evidence-based treatments for young children with autism remains topical.

There is no doubt that early intervention for children with autism is a politically and scientifically complex topic. Why politically and scientifically sensitive? Today there is an emphasis on evidence-based practice but there is still debate about what types of research methods produce credible evidence. Because studies use different methods it is difficult to compare results. There is also the issue of where resources should be directed and how much evidence needs to be produced before a particular treatment or practice is supported and endorsed. There have been a number of papers published

over the past 12 months that are noteworthy. The interventions receiving most attention are early intensive behavioural interventions (EIBI) and sensory integration therapies. Both are widely practiced here in Victoria so information about them including recent research findings is timely and important.

### **Early Intensive Behavioural Intervention (EIBI)**

Narrative reviews of evidence based comprehensive treatments for young children with autism such as that by Rogers and Vismara (2008) have found that some randomized controlled trials have demonstrated positive effects in both short-term and longer term studies. The evidence suggests that early intervention programs are beneficial for children with autism, often improving developmental functioning, and decreasing maladaptive behaviors and symptom severity. A limitation of these studies is that we do not know whether improvements in developmental functioning might lead to significant improvements in vocational and social functioning in adulthood.

“Given the few randomized controlled treatment trials that have been carried out, the few models that have been tested, and the large differences in interventions that are being published, it is clear that the field is still very early in the process of determining what kinds of interventions are most efficacious in early autism; what variables moderate and mediate treatment gains and improved outcomes following intervention and the degree of both short-term and long-term improvements that can reasonably be expected” (Rogers and Vismara, 2008).

Lovaas (1987) described the first major study applying an intensive behavioural intervention (EIBI) program for young children with autism. The program involved 40 hours a week of direct intensive instruction by the therapist for at least two years. The goals in the first year were to reduced self-stimulatory and aggressive behaviours, improve compliance, teach imitation and extend intervention into the family. The goals in the second year emphasize teaching expressive and abstract language, interactive play with peers and extension of intervention into the community. This original research was criticised for a number of reasons including the claims of cure, improvement in IQ, high financial cost and level of expertise needed, the use of aversives and the inability to replicate the degree of improvements initially claimed.

Two papers have recently been published that systematically reviewed outcome research on EIBI and another two have used the meta analysis technique to assess outcome. Howlin, Magiati & Charman (2009) reviewed eleven studies that met inclusion criteria (including two randomized controlled trials). At group level, EIBI resulted in improved outcomes (primarily measured by IQ) compared to comparison groups. However, at an individual level, there was considerable variability in outcome, with some evidence that initial IQ (but not age) was related to progress. They also reported that the immediate impact of EIBI reduces over time. They concluded: “This review provides evidence for the effectiveness of EIBI for some, but not all, preschool children with autism” (p 23).

A second paper by Reichow and Wolery (2009) also systematically reviewed EIBI research and drew similar conclusions:

“The finding suggests EIBI is an effective treatment, on average, for children with autism. The conditions under which this finding applies and the limitations and cautions that must be taken when interpreting the results are discussed ...” “EIBI is not an intervention that suits the needs of all children with autism”. “It is imperative children not responding to intervention are identified early so additional and/or different treatments can begin” (p39).

This study also included a meta-analysis. (The meta analysis is another approach to integrating a body of research on a clinical practice – see footnote). Their meta analysis examined change in intelligence scores and included studies that were not controlled in order to have enough studies to include in the meta analysis. Reichow and Wolery discuss the limitations of their study and acknowledge that the validity of their conclusions is affected by the small sample size of the meta analysis, interpretation of the mean magnitude of effect based solely on the mean effect size may be misleading and finally, the standardized mean change effect size was calculated without reference to a comparison or control group (p 38).

The other meta-analysis recently published (Spreckley and Boyd, 2009) concluded that: “Currently there is inadequate evidence that ABI has better outcomes than standard care for children with autism. Appropriately powered clinical trials with broader outcomes are required”. A limitation of this paper is that only 4 studies were included in the analysis.

More recently, Eledevik et al, (2009) attempted to replicate and extend the Reichow and Wolery meta analysis “with a focus on methodological improvements” (p 441). In summary, they report that the result of their meta-analysis supports the implication that at present, and in the absence of other interventions with established efficacy, EIBI should be the intervention of choice for young children with autism. However, once again, there are serious limitations and the authors state that “any conclusions need to be drawn with caution and to be considered tentative” (p 448).

Importantly all the meta analysis studies conclude with the statement that large, randomized controlled trials comparing EIBI to other interventions are still needed. The decision of Howlin et al, (2009) to not include a meta analysis in their review of EIBIs is justified. The only variable consistently reported across the 11 studies included in that paper was IQ although this was assessed using different tests between and within the studies. It remains important for researchers to include a wide range of outcome measures when evaluating and establishing principal goals of an intervention. Howlin et al, remind us that broader variables such as “parental coping ability, family relationships, and stress and support networks” (p 35) have not been systematically investigated and will provide a “methodological challenge” to future researchers.

### **Sensory integration therapy (SIT)**

Sensory Integration (SI) is a popular and widely used therapy for children with autism. About 40% of children with autism currently or in the past have received SI therapy (Green et al, 2006). SIT is based on the theory that functional performance deficits are due to problems with processing sensory information. Therapy is directed at altering underlying neurological processing (Ottenbacher, 1982; Schaaf and Miller, 2005). Treatment sessions (OT delivered) involve provision of controlled sensory stimuli e.g. brushing & rubbing the body; deep pressure and compression of joints; stimulation with

use of scooter boards and hammocks (Ayers, 1972, Smith et al., 2005). More recently “sensory diets” have been introduced that provide the child with activities and environmental adjustments to suit the child’s individual needs. Sensory integration therapy (SIT), does not currently have sufficient evidence to allow recommendations as a primary intervention method for children with autism. However, many children with autism have significant sensory and motor impairments and therefore aspects of these therapies may be incorporated to develop a specific treatment plan.

There has been increasing interest in finding an evidence base for SIT. A recent SI treatment is the wearing of weighted vests (usually the vest has 10% of a person’s weight evenly distributed around the vest). The rationale for this treatment is that inattentiveness and stereotypic behaviours may be due to under/over sensitivity to sensory input. The weighted vest is believed to provide sensory input to alleviate these difficulties (Olson and Moulton, 2004b). It is hypothesized that vests provide deep pressure which has a calming and organising effect on the central nervous system. Stephenson and Carter (2009) reviewed seven studies examining the use of weighted vests. They concluded:

“ While there is only a limited body of research and a number of methodological weaknesses, on balance, indications are that weighted vests are ineffective. There may be an arguable case for continued research on this intervention but weighted vests cannot be recommended for clinical application at this point” (p 105).

Cox et al., (2009) evaluated the effect of weighted vests on appropriate in-seat behaviour for participants. There was no treatment effect for any of the participants. They then conducted a second experiment. Non-contingent reinforcement (NCR) was assessed within the context of a withdrawal design. NCR had an optimal effect on the participants’ in-seat behaviour. They stated:

“Though costs cannot be used to determine free, appropriate public education, schools must wisely spend taxpayer money and therefore should use their limited financial resources on empirically based interventions. It is incumbent upon occupational therapists and other applied researchers to evaluate the effectiveness of SI-based therapies for children with ASD if this is to be an option for students. This is the responsibility of advocates for SI therapies to either establish a research base for their practices or abandon their use with populations for which the research base has not been established” (p. 26).

Francis (2005) concluded that there is inadequate scientific evidence and SIT should be used in conjunction with proven therapies; with careful evaluation and only if they do not interfere with proven therapies.

### **Future challenges for researchers include:**

Assessing what treatment works for which children

Identifying the individual characteristics that predict responsiveness to specific programmes and approaches (Howlin et al, 2009)

Initial testing and replication of existing models.

Footnote: "Meta-analysis was created out of the need to summarize results from a number of studies in a quantitative but user-friendly way. Compared to the more traditional narrative research review, a good meta-analysis is more transparent about how studies were selected for the review, and applies more objective quantitative criteria to evaluate the findings of those studies. Originally meta-analytic methods were developed to review studies using between-groups research designs, but recently they have been adapted for reviewing findings from single-case experimental design studies. The results of a meta-analysis are typically reported in terms of effect sizes (ES). There are a number of ways to compute effect size. For instance, one type of effect size is computed from studies with a treatment and a control group, and another type is computed from studies reporting results from changes in a single group between pre- and post-testing. The first is considered more sound because of the controlled nature of the design. Effect sizes are often evaluated using a rule-of-thumb scale where 0.2 to 0.3 might be considered a "small" effect, around 0.5 a "medium" effect, and over 0.8 a "large" effect." Sigmund Eldevik, Richard Hastings, and Carl Hughes, 2009. "Meta-analyses of research findings can help guide practice and policy" *Professional Behaviour Analysts, Issue 9*, August, 2009

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