

How much helps and how much is too much?

Understanding the new evidence base for
intervention recommendations for children
with autism

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Autism Intervention Meta-analysis

Common Intervention Recommendations



Early

Begin early in life (e.g., age 2), at or even before a diagnosis of autism is provided



Comprehensive

Targets broader learning and across domains, rather than focused on specific behaviors



Intensive

Provided for 25-40 hours per week



What are these recommendations based on?



The Lovaas¹ Study

Influential 1987 study that suggested children who received 40 hours of behavioral intervention per week for 2 years had greater gains in IQ than those who received 10 hours per week for the same amount of time.

Systematic Reviews of CTMs^{2,3,4}

Evaluations of "Comprehensive Treatment Models" that feature 25 hours per week of manualized interventions targeting broader development.

Moderator Analyses Across Effects from Early Studies^{5,6}

Some meta-analytic work that looks across studies suggests that larger effects were observed in studies of interventions with a greater number of hours.

What are the limitations of this evidence?



The Lovaas Study

1, 19, 24, 30

Although remarkable when it was published, the participants in this study were not randomly assigned, limiting our ability to conclude that it was the amount of intervention, and not some other factor, that caused the final difference between groups.

Systematic Reviews of CTMs

2,3,4,33

Some reviews have concluded that most CTMs are "weak in evidence of efficacy". These reviews also only evaluated high-intensity interventions rather than comparing them to low-intensity interventions. Umbrella reviews have concluded that most systematic reviews have "generally poor" methodological quality.

Moderator Analyses Across Effects from Early Studies

5,6

Analytic methods differed across meta-analyses, as did the nature of what studies were included. Some studies included pre-post single group studies, while others only included studies with comparison groups. This limits the interpretability of findings.

Is there evidence that does not support these recommendations?

Effective Low-intensity Intervention Studies^{7, 8, 9, 10}

Some studies have shown that low-intensity interventions (e.g., 1-5 hours per week) had significant effects on a range of important outcomes.

Primary Studies examining intervention hours^{11, 12, 13}

Some studies where participants received varied number of hours reported correlations or regression models examining the association between hours and outcomes, and did not find significant associations. Other studies compared groups receiving different intensities and found no group differences.

Moderator Analyses Across Effects from Meta-analyses^{14, 15, 16}

Some meta-analyses examining this question did not find that studies of high-intensity interventions had larger effects than studies of low-intensity interventions.

How has the evidence base recently changed?

Large increase in RCTs of autism-focused interventions³⁴

Number of Early Childhood Intervention RCTs in 2011: 2¹⁷

Number of Early Childhood Intervention RCTs in 2017: 48¹⁸



Project AIM: Autism Intervention Meta-analysis



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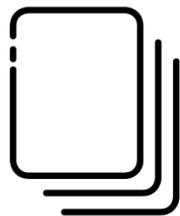


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Project AIM: Autism Intervention Meta-analysis



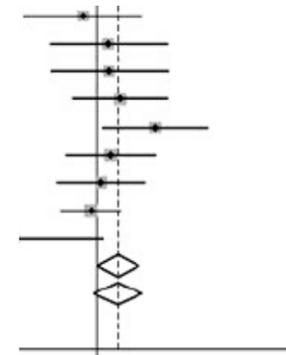
Comprehensive

Identified all group design studies of interventions for all outcomes for children with autism age 0-8 which featured an intervention and comparison group



Systematic

Systematically reviewed studies in terms of quality, and coded for participant, intervention, and outcome characteristics



Meta-analytic

Meta-analysis allowed us to estimate the overall effect of different intervention approaches for different types of outcomes in numbers.



Ongoing

Now that we have estimated overall effects, we are examining the participant and intervention characteristics that influence intervention effectiveness for different outcomes.



150 reports
130 studies
87 RCTs
6,240 participants
1,615 effect sizes

19

<http://dx.doi.org/10.26153/tsw/5683>

Intervention Intensity Recommendations

**What are the practical
consequences of
commonly recommending
high-intensity intervention
to young children?**

As a parent, and an early childhood professional, I have an ethical obligation to consider the impact that this recommendation has on families.





**The emphasis should
be on ensuring that
families live
normalized lives while
having positive
interactions between
themselves and their
children.**

20

Mark Wolery

What is the evidence?



Define the question



Does more intervention produce better outcomes for children with autism?

What does 'more' mean?

What kind of outcomes?

More?



Intervention Intensity

Dose: the number of teaching episodes that make up a teaching session²¹

Dose frequency: the number of times an intervention is provided per day per week (e.g., 30 hours per week)²¹

Total intervention duration: total amount of time that the intervention is provided (e.g., 2 years)²¹

Cumulative intervention intensity: Dose x dose frequency x total intervention duration²¹

Better?



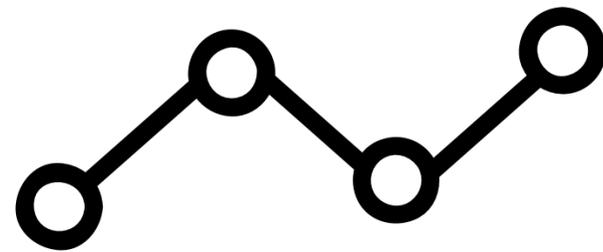
Outcomes

Specific learning or developmental change?

Specific learning: Observational measure of one or a few specific behaviors

Developmental change: broad learning across a domain, assessed with a validated, developmentally-scaled, standardized assessment

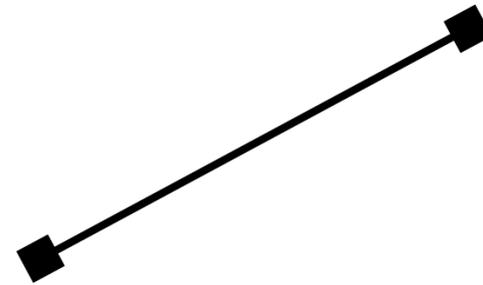
Study designs that cannot definitively answer this question



Single subject Design studies

Standardized assessments cannot be administered frequently enough to permit establishment of experimental control in SSD studies.

19,22



Within group pre-post studies

Children develop over time. Group design studies that have no control or comparison group prevent us from knowing whether change from pre to post was due to intervention

23, 30



Quasi-experimental studies

When groups are not randomly assigned, myriad other differences between groups may explain the differences in outcomes

19, 24, 30

So what kind of evidence do we need?

How can we ask this question so that we can
make recommendations with confidence?



Randomized Controlled Trials

In group design research, randomization is the best experimental control for alternative explanations of findings. Studies that randomly assign participants to high and low intensities of common interventions are needed.^{19, 24}

SMART Design Studies

Sequential multiple assignment randomized trials re-randomize non-responders to enhanced or intensified interventions in order to identify adapted interventions that might be more effective, at least for a subset of children²⁵

Cutting Edge Meta-regression analyses

Meta-analyses which use cutting edge methods (i.e., robust variance estimation) to examine whether dose frequency and cumulative intervention intensity are associated with larger effects, particularly across randomized controlled trials, and particularly on outcomes from developmentally-scaled assessments are needed.²⁶

Do we have new evidence that meets these criteria?

What does new methodologically rigorous research say about intervention intensity for children with autism?



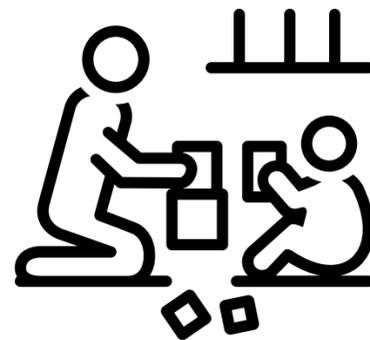
Findings from Project AIM

Cumulative Intervention Intensity does not significantly moderate intervention effects on:



Language

Children's ability to speak or understand language, or both. ²⁷



Play

Children's ability to engage in functional pretend play, or symbolic play. ²⁸



Adaptive Behavior

Children's ability to function independently in daily life (e.g., getting dressed, brushing teeth, toileting) ²⁹



Cognitive Scores

Children's performance on measures of intelligence and cognitive development. ²⁹

Findings from RCT of Dose Frequency

Participants were randomly assigned to one of two competing interventions, and then randomly assigned to one of two intensities (5 or 15 hours per week)

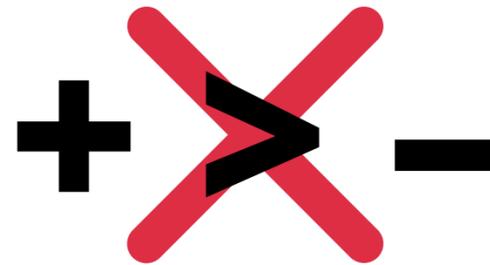
30,31



Equivalent Interventions

No significant differences between intervention groups at the end of the study

30,31



More is not unilaterally better.

No significant differences between participants who received 15 vs. 5 hours per week, across groups.

30,31



Autism Symptomatology Matters

Across intervention groups, preverbal children with *lower* autism symptomatology (i.e., fewer challenges related to their autism) benefited more from 15 hrs per week than from 5 hours per week. However, children with higher autism symptomatology (i.e., more challenges related to their autism) did not differentially improve with 15 vs. 5 hours per week. The outcomes were measures of language. Autism symptomatology was measured with the ADOS-2 CSS. ^{30,31}

How should we make dose frequency and intensity recommendations?



Stop making blanket recommendations.

The evidence is not strong enough to support recommendations for 40 or even 25 hours per week as unilaterally more effective than less.



Center the family.

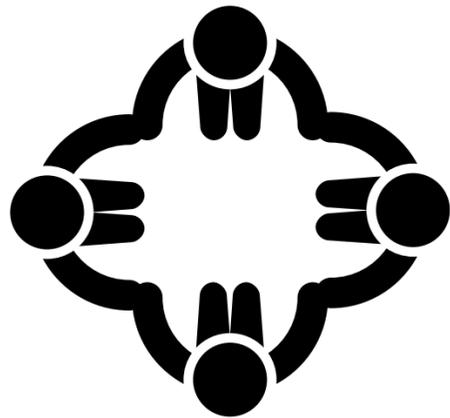
Provide natural supports that enhance family functioning in the context of daily routines rather than interrupting it. ²⁰



Center the child.

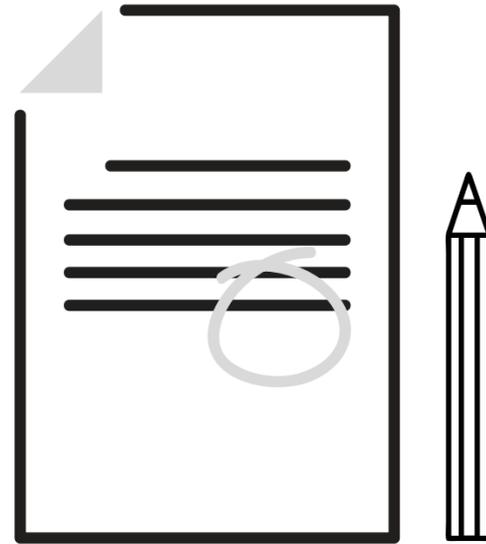
Consider the amount of time that it is developmentally appropriate for a young child to be engaged in a specific activity (even if it is fun) and base recommendations on this. ²⁰

How should we make dose frequency recommendations?



Collaborate with other providers.

When service providers are not collaborating, fragmented services are provided separately, and this is often a greater source of stress for families than the needs of their child. ²⁰



Keep up with the evidence.

The evidence base is rapidly changing. Make sure you're keeping up by reading studies across all disciplines, not just within your own.



Remember your ethical mandates.

Regardless of what studies say, you have an ethical obligation to consider the needs and desires of the family and the child. ²⁰

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