
Guideline Supplementary Paper

New Zealand Autism Spectrum Disorder Guideline
Supplementary Evidence on Applied Behaviour Analysis



With the support of the ASD Guideline Living Guideline Group

May 2010

FINAL

SUPPLEMENTARY PAPER ON APPLIED BEHAVIOUR ANALYSIS FOR THE NEW ZEALAND AUTISM SPECTRUM DISORDER GUIDELINE

1. PREAMBLE

1.1 Background

The Ministry of Health and Ministry of Education ('the Ministries') jointly funded the development of a New Zealand Autism Spectrum Disorder Guideline (NZ ASD Guideline) which was released in April 2008 (1).

As a result of feedback received during consultation, the Ministries sought additional review work on published research on interventions and strategies based on applied behaviour analysis (ABA) in relation to outcomes for people with ASD. Following an open tendering process, two groups were funded by the Ministry of Education to critically appraise the relevant literature:

- (i) the New Zealand Guidelines Group (NZGG) (2), and
- (ii) a consortium of New Zealand academics with expertise in ABA, led by Dr Oliver Mudford at the University of Auckland (3).

These reviews, conducted independently and in parallel, were peer reviewed, subsequently revised, and presented to the ASD cross government Senior Officials Group in February 2009.

1.2 Living Guideline Group process

A living guideline process was set up to keep the NZ ASD Guideline current and a Living Guideline Group (LGG) was convened by the New Zealand Guidelines Group to carry out this process. The goal of the LGG is to ensure that the NZ ASD Guideline remains up-to-date and relevant as evidence changes. It focuses on areas where new evidence has emerged that may warrant a re-examination or change in a NZ ASD Guideline recommendation. The LGG membership is presented in Appendix A.

The first topic considered by the Living Guideline Group was ABA. As the two parallel reviews were based on research published to December 2007, a review update of additional high level secondary evidence (systematic reviews), published from December 2007 to August 2009, was undertaken by NZGG (4) for consideration by the LGG. This review update and the two parallel technical reviews were considered by an independent technical expert, Professor Margot Prior (University of Melbourne), who provided the

LGG with a report noting divergences and convergences in the findings and summary comments of all three reviews.

A 2-day meeting of the LGG was held in November 2009 to consider the first topic, ABA. The LGG considered evidence from the two literature reviews on ABA conducted by NZGG and by Dr Mudford's team, the update of more recently published ABA reviews, and Professor Prior's summary comments.

On day one of the meeting, Professor Margot Prior and representatives of the two review teams presented summaries of their reports, and in addition a workshop on study design, quality and development of recommendations was delivered.

On day two of the meeting, the LGG considered the body of evidence. Ex-officio LGG members and representatives of the review teams (Oliver Mudford, Marita Broadstock, Anne Lethaby) attended as observers only.

The evidence on ABA was considered in terms of potential impact on the wording and evidence grading of current recommendations in the NZ ASD Guideline that could be considered as related to ABA. The development of new recommendations was also considered. Revised and new recommendations were graded using the NZGG Grading System, also used for the NZ ASD Guideline, detailed in Table 1. Grading decisions are made on the quality, quantity, consistency, applicability and clinical impact of all the studies forming the relevant body of evidence.

Table 1. Evidence grading system used

Grade	Meaning of Grade
A	The recommendation is supported by GOOD evidence (where there is a number of studies that are valid, applicable and clinically relevant)
B	The recommendation is supported by FAIR evidence (based on studies that are mostly valid, but there are some concerns about the volume, consistency, applicability and/or clinical relevance of the evidence that may cause some uncertainty, but are not likely to be overturned by other evidence).
C	The recommendation is supported by EXPERT OPINION only (from external opinion, published or unpublished, e.g., consensus guidelines).
I	No recommendation can be made. The evidence is insufficient (either lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined).

GOOD PRACTICE POINT

✓	Where a recommendation is based on the clinical and educational experiences of members of the guideline development teams, this is referred to as a good practice point.
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1.3 Definition of key terms

This report presents the decisions of the LGG from its November meeting relevant to existing or newly proposed ABA-related recommendations for the NZ ASD Guideline.

Key terms used in the research considered by the LGG include applied behaviour analysis (ABA), and early intensive behavioural intervention (EIBI). As there are varying understandings of what these terms mean in the literature, in practice and by the lay community, the LGG offer the following guidance to what these terms are understood to broadly mean.

Applied Behaviour Analysis (ABA)

The NZ ASD Guideline defines ABA in its glossary as “the process of systematically applying interventions based on the principles of learning theory to improve socially significant behaviours to a meaningful degree and to demonstrate that the interventions employed are responsible for the improvement in behaviour”. (p. 242).

To supplement this definition, the LGG draws from both review teams’ definitions (2, 3) to illustrate the features and techniques of ABA, as follows.

The experimental analysis of behaviour is a scientific approach to the discovery of environmental variables that reliably influence behaviour; applied behaviour analysis is the systematic application of these principles in socially significant contexts. In practice, applied behaviour analysis is not a single method or type of therapy; it refers to a collection of methods and techniques designed to increase positive behaviours and decrease negative ones. Common techniques include (a) reinforcement (contingency management, including extinction), (b) shaping and chaining (teaching components of more complex skills); (c) establishing stimulus control (discrimination training); (d) fading of prompts, cues, and physical assistance. Behavioural interventions designed to decrease negative (excess) behaviours require careful assessment of the function of the behaviour of interest (how it is being controlled by antecedents and consequences, or in other words, what function is it serving for the individual). Interventions designed to increase positive behaviours (e.g., teaching new skills) require assessment of the components of the skill (task analysis), the social validity or importance for the individual’s development, its acceptability to the individual and his or her social network (e.g., family, culture), and the likelihood that the new behaviour will result in positive natural consequences. Good assessment ensures that the behaviour change resulting from the intervention programme will ideally be maintained once the programme is no longer in effect, and that the behaviour will generalise to new settings other than the training context. For interventions to meet the definition of ABA, the behaviour change (outcomes for the individual) should be systematically monitored. Professionals trained in delivering ABA do not follow a rigid formula or protocol, but will individually design and modify procedures according to well-established behavioural principles. Further

discussion of how interventions are judged to meet these characteristics were provided in the two literature reviews, which also cited additional references that help to define these terms.

It has become quite common for highly structured, intensive early intervention programmes to be called “ABA” however this is not correct, since ABA refers to a wide variety of techniques and principles.

Early Intensive Behavioural Intervention (EIBI)

When early, intensive interventions are based on behavioural principles they can be correctly identified as EIBI. The NZ ASD Guideline defines EIBI in its glossary as “another term for the Lovaas Method of applied behaviour analysis”. (p. 247). However there have been many developments in early behavioural intervention since Lovaas first described his protocol in 1987. A more comprehensive and specific description was proposed by Eldevik et al. (5) in their meta analysis of EIBI studies, which was appraised in Broadstock’s (4) review of secondary literature considered by the LGG. The LGG agreed that this description be presented in the supplementary paper as a broad guide to interventions referred to as early behavioural interventions. The common elements of EIBI programmes, paraphrased from Eldevik et al. (5), are as follows (note that these are characteristics of programmes that would qualify as being EIBI programmes in formal outcome studies):

- (a) *intervention is individualised and comprehensive, addressing a range of skills;*
- (b) *a variety of ABA techniques are used to build new repertoires and reduce interfering behaviour. These are commonly delivered as discrete trial instruction, but may also involve incidental teaching and activity-embedded trials;*
- (c) *one or more individuals with advanced training in applied behaviour analysis and experience with young children with developmental disabilities (especially ASD) directs (supervises) the programme;*
- (d) *the selection of intervention goals and short-term objectives is usually guided by understanding of typical developmental sequences;*
- (e) *parents are encouraged to serve as active co-therapists for their children, and may be trained to do so;*
- (f) *intervention is delivered in one-to-one fashion initially, with gradual transitions to small-group and large-group formats when warranted;*
- (g) *intervention typically begins in the home and is carried over into other environments (e.g., community settings), with gradual, systematic transitions*

to preschool, kindergarten, and elementary school classrooms when children develop the skills they are required to learn in those settings;

- (h) programming is intensive, is year round, and includes 20 or more hours of structured sessions per week plus additional informal instruction and practice;*
- (i) in those programmes that have been formally evaluated, the duration of intervention is usually 2 or more years; and*
- (j) the intervention programme is usually commenced in the preschool years, when the children are 3 to 4 years of age.*

The description above is suggested by the LGG as a useful framework for defining early intensive behavioural intervention, although the LGG recognise that there may be some varying views on details that might be recommended for individual children.

1.4 Additional notes

The LGG would like the reader of this Supplementary Paper on ABA to take particular note of the following recommendations in the NZ ASD Guideline which are particularly relevant to interventions based on ABA:

Recommendation 3.1.5 (p. 87):

“Interventions should be monitored and evaluated on an ongoing basis. Where there is lack of progress over a three-month period, changes should be made to the curriculum or intervention goals, the time set aside for instruction, the intensity of instruction (such as lower teacher-child ratios) or increasing consultation and support from staff.” (Grade A)

Recommendation 4.3.03 (p. 139)

“Professionals, people with ASD, family, whānau and carers should evaluate treatment approaches before and during implementation.” (Grade C)

Recommendation 3.2.5.3 (p. 119)

“Physically aversive procedures should not be used” (Grade A).

Further, it should be noted that legislation, standards and policies highlighted on pages 31-32 of the NZ ASD Guideline are also relevant to this Supplementary Paper, including the United Nations Convention for the Rights of Persons with Disabilities (2008).

2. REVIEW OF ABA EVIDENCE AND IMPACT ON RECOMMENDATIONS FROM THE NZ ASD GUIDELINE

Assessment of the recent evidence on ABA by the LGG resulted in a number of revised or modified recommendations from the NZ ASD Guideline and newly developed recommendations. They are described in the tables that follow. The model table below describes how to read the actual tables.

Model Table

Original recommendation	Grade	Revised recommendation	Grade
<i>X.X.X.X – the number refers to the guideline recommendation number in the NZ ASD Guideline. The text is the recommendation itself.</i>	<i>X – Refer to p.3 of this paper</i>	<i>X.X.X.X – the number is the same as the current number in the NZ ASD Guideline, but the text is the new recommendation</i>	<i>X – Refer to p.3 of this paper</i>
<p>Additional text: <i>This section of the table provides text which should be read in conjunction with the revised recommendation. It provides information that either clarifies the meaning of a term in the original recommendation or provides further explanatory text to a new recommendation to help in its interpretation.</i></p>			
<p>Rationale: <i>This section of the table describes why the LGG made the change.</i></p>			

For new recommendations, no new number has been assigned.

2.1 Revised and modified recommendations

Original recommendation	Grade	Revised recommendation	Grade
<p>3.2.5.2 Educational interventions should incorporate principles of positive behaviour support, particularly a focus on understanding the function of the child's behaviour.</p>	A	not changed	not changed
<p>Additional text: The use of the term positive behaviour support in the NZ ASD guideline has caused confusion due to the implication that it might refer to a different, specific intervention package in ASD called "Positive Behaviour Support." For an understanding of positive behaviour support as a general set of professional standards and values, see discussion on pages 119 – 124 of the NZ ASD guideline.</p>			
<p>Rationale: General agreement that Recommendation 3.2.5.2 and its grade are accurate and should remain unchanged, but supporting text is needed to define what is meant by positive behaviour support to avoid any ambiguity.</p>			

Original recommendation	Grade	Revised recommendation	Grade
<p>4.3.4 Behaviour management techniques should be used to intervene with problem behaviours.</p>	A	<p>4.3.4. Behaviour management techniques should be used to intervene with problem behaviours following functional behaviour assessment.</p>	A
<p>Rationale: The addition of the phrase “following functional behaviour assessment” at the end of the recommendation is supported by evidence relating to functional behaviour assessment both in the current NZ ASD Guideline (section 4.3.a, page 141, and Recommendation 4.3.5) and by the new evidence presented to the LGG. The importance of conducting a functional analysis prior to conducting interventions with challenging behaviour was implied in the original recommendation but needed to be made explicit. There was agreement that the grade of A does not need to change.</p>			

Original recommendation	Grade	Revised recommendation	Grade
<p>4.3.6 Consumers of behavioural interventions should refer to recently published guidelines for identifying, selecting and evaluating behaviour analysts with people with ASD.</p>	C	<p>4.3.6 Consumers of applied behaviour analysis interventions should refer to recently published guidelines for identifying, selecting and evaluating behaviour analyst services for people with ASD.</p>	C
<p>Rationale: Changed behavioural to applied behaviour analysis to be more explicit about the recommendation being linked with considered ABA evidence.</p> <p>Note that the guidelines are those referred to in reference 284 (pg. 233) of the NZ ASD guideline.</p> <p>Decided no further supporting text is needed as the NZ ASD guideline provides a rationale on page 142 and outlines qualifications and training issues relevant to ABA.</p> <p>It was also decided to reword for clarity with the addition of “services for”.</p>			

2.2 New recommendations

New recommendation	Grade
Interventions and strategies based on applied behaviour analysis (ABA) principles should be considered for all children with ASD.	A
<p>Additional text: ABA does not refer to one programme or technique. In the evidence considered by the LGG, there was little or no New Zealand-based research showing the appropriateness of ABA to the New Zealand context and population.</p> <p>There is a lack of knowledge about the suitability of ABA for persons with an Asperger Syndrome diagnosis, and for participants aged 15 years or above.</p>	
<p>Rationale: The LGG decided to use “based on ABA principles” to make connection with research evidence around ABA explicit as many interventions include behavioural components.</p> <p>It was also decided to use the term ASD as consistent with terminology used in NZ ASD Guideline.</p> <p>Agreed that the phrase “interventions and strategies” encompasses a range of approaches, as explained in the definition offered in Section 1.3.</p>	

New recommendation	Grade
<p>Early intensive behavioural intervention (EIBI) should be considered as a treatment of value for young children with ASD to improve outcomes such as cognitive ability, language skills, and adaptive behaviour.</p>	B
<p>Additional text: There is substantial individual variability in outcomes ranging from very positive improvements, through minor or minimal improvements, to no effects. Families need to be advised of this conditional evidence about treatment outcomes.</p> <p>We still cannot specify which attributes of participants, families, treatment methods etc., are critical to outcome, apart from findings that higher IQ and language competence in individuals at the pre-treatment stage are predictive to some extent of greater gains post treatment, and at longer follow up.</p> <p>There is as yet insufficient research comparing high quality intensive ‘other’ treatment with EIBI to allow comparative judgements of treatment effectiveness.</p> <p>There is a lack of knowledge about the suitability of EIBI for the diverse ethnic and cultural groups of New Zealand and for people with a diagnosis of Asperger Syndrome.</p> <p>Individual trajectories in progress are the norm. Research suggests substantial individual variability in outcomes, ranging from very positive improvements, through minor or minimal improvements, to no effects found. Regular monitoring and evaluation of intervention effectiveness is therefore crucial (refer to NZ ASD recommendation 3.1.5 and recommendation 4.3.03).</p>	
<p>Rationale: Uncertainty about the optimal intensity of hours, and whom it benefits, is reflected in the grade allocated to this recommendation.</p> <p>As evidence relating to spontaneous, social communication competencies is equivocal, the recommendation refers to language skills.</p>	

New good practice point	Grade
ABA interventions and strategies should be relevant to the child's context and culture	✓
<p>Rationale: The need to weave cultural sensitivity throughout the NZ ASD guideline was agreed as important at the first LGG meeting.</p>	

New good practice point	Grade
Interventions based on the principles of ABA can be introduced before the diagnosis of ASD is confirmed in a child displaying some of the symptoms of ASD.	✓
<p>Rationale: There was a concern about issues relating to diagnosis as some people have a delay in diagnosis which could delay effective treatment.</p> <p>NZ ASD Guideline Recommendation 3.1.1 (p. 87) supports this good practice point:</p> <p><i>“Services should not wait for the diagnostic process to be completed but should be available as soon as a significant developmental need is identified.” (Grade C)</i></p>	

3. ACKNOWLEDGEMENTS

This report is based on the work of the Living Guideline Group (LGG), a multidisciplinary team convened by the New Zealand Guidelines Group and funded by the New Zealand Ministries of Health and Education. The Living Guideline Group is chaired by **Professor Ian Evans** and **Matt Frost** is Deputy Chair, and full membership and affiliations are listed in Appendix A.

Ex-officio LGG members include **Joanna Curzon** (Ministry of Education) and **Pamela Henry** (Ministry of Health).

Marita Broadstock (NZGG Senior Researcher) is the LGG Project Manager and assisted the LGG in drafting this report based on its deliberations.

The Living Guideline Group would like to thank **Professor Margot Prior** (Department of Psychology, University of Melbourne) who acted as technical advisor and provided summary comments to the LGG on the evidence considered, and presented these at the November meeting where applied behaviour analysis was discussed. Representatives of the review teams presenting summaries of their findings at the November meeting included: **Dr Oliver Mudford** (Director Applied Behaviour Analysis Programme, Department of Psychology, Tamaki Campus, University of Auckland) and **Associate Professor Neville Blampied** (Head of Department, Department of Psychology, University of Canterbury) from Uniservices, and **Marita Broadstock** (Senior Researcher, NZGG). **Anne Lethaby** (Research Services Interim Manager) provided project oversight, and also provided training for the LGG on development and grading of recommendations at its meeting on ABA.

Thanks also to NZGG staff including **Dr Jessica Berentson-Shaw** and **Stuart McCaw** for project development and terms of reference, particularly in the early stages, and to **Stephanie Dixon** and **Paula Bell** for assistance in providing administrative support to the LGG.

4. REFERENCES

1. Ministries of Health and Education. New Zealand autism spectrum disorder guideline. Wellington, NZ: Ministry of Health; 2008; Available from: <http://www.moh.govt.nz/moh.nsf/indexmh/nz-asd-guideline-apr08>
2. New Zealand Guidelines Group. The effectiveness of applied behavioural analysis interventions for people with autism spectrum disorder. Wellington, NZ: New Zealand Guidelines Group; 2008. Available from: http://www.educationcounts.govt.nz/publications/special_education/61791/1
3. Mudford O, Blampied N, Phillips K, Harper D, Foster M, Church J, et al. Technical review of published research on applied behaviour analysis interventions for people with autism spectrum disorders. Wellington, NZ: Ministry of Education; 2009. Available from: http://www.educationcounts.govt.nz/publications/special_education/61210/1
4. New Zealand Guidelines Group. Synthesis of recently published secondary literature on applied behaviour analysis. Wellington, NZ: New Zealand Guidelines Group; 2009. Available from: <http://www.nzgg.org.nz/download/files/Synthesisofrecentlypublishedsecondaryliteratureonappliedbehaviouranalysisaspublished.pdf>
5. Eldevik S, Hastings RP, Hughes JC, Jahr E, Eikeseth S, Cross S. Meta-analysis of early intensive behavioral Intervention for children with autism. *Journal of Clinical Child & Adolescent Psychology*. 2009 May; 38(3):439-50.

APPENDIX A

Membership of Living Guideline Group (as at December 2009)

Professor Ian Evans (Chair), School of Psychology, Massey University

Matt Frost (Deputy-Chair), Chair of Implementation Advisory Group for NZ ASD guideline

Dr Justin Barry-Walsh, Consultant Psychiatrist Forensic & Intellectual Disability Services, Clinical Leader Te Korowai Whariki. (Note: did not attend Nov meeting),

Associate Professor Jill Bevan-Brown, Director, Inclusive Education Research Centre, College of Education, Massey University

Dr Elizabeth Doell, Practice Leader, Communication, Special Education I Southern Regional Office, Ministry of Education

Dr Matt Eggleston, Child and Adolescent Psychiatrist, Clinical Head, Child and Family Specialty Service, Canterbury DHB. (Note: did not attend Nov meeting)

Dr Debbie Fewtrell, General Practitioner (special interest in autism spectrum disorder), Kerikeri

Dr Andrew Marshall, Developmental Paediatrician, Child Development Team at Puketiro Centre, Porirua

Ex-officio LGG members:

Joanna Curzon, Team Leader: Research, Professional Practice, Ministry of Education

Pamela Henry, Development Manager, Family and Community Support Team, Disability Support Services, Health & Disability National Services Directorate, Ministry of Health