



CENTRE FOR  
Community  
Child Health

# Eating Behaviour Problems

*Practice Resource*

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# Practice Resource: Eating Behaviour Problems

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## Introduction

There is now a large amount of research evidence about the importance of the early years. Many professionals are unsure about how this evidence impacts on the services they provide for families and their professional practice.

The Centre for Community Child Health has therefore developed eleven “*Practice Resources*”. Each *Practice Resource* provides professionals with:

- an introduction to the topic
- a summary of the latest research, and
- practical strategies to support their daily work with young children and their families.

These *Practice Resources* will help professionals consider and understand the issues and the range of researched options and strategies available to discuss with parents and carers in addressing their concerns and increasing their confidence. They will also support management to make sensible decisions about the use of resources and directions for services to address important issues for children.

The project to develop these eleven *Practice Resources* has been made possible through funding from the Telstra Foundation.

See Appendix 1 and 2 for more details about the Centre for Community Child Health and the Telstra Foundation respectively.

## Why were *Practice Resources* developed?

The *Practice Resources* have been designed to bridge the gap between research and practice. Most professionals do not have the time to sift through and interpret the relevant research that can inform how they work with children and families, nor do they have access or opportunity to attend relevant professional development.

The aim of the *Practice Resources* is to broadly translate the research evidence on a number of important topics into easily understood practical information that can be readily used by a range of professionals, assisting their daily work with young children and their families.

While each resource is written for professionals working with children and families, the information will also be useful to managers of services.

## What is the structure of each Practice Resource?

These resources are designed to be easy to use and inform professional practice. The structure of the *Practice Resources* enables access to information at different levels of detail depending on the user's needs.

Each resource has the following structure:

- **Glossary**  
Definitions of key terms.
- **Section 1: Introduction**  
This includes definitions, how frequently problems occur, information about normal development (where relevant), effects of the problem, and whether the focus should be on promotion, prevention, or early intervention.
- **Section 2: What works?**  
This includes a simple summary of the research and outlines what works and therefore the strategies that should be implemented. Whilst this section is brief, strategies are sufficiently detailed and specific for action. To support the professional there is also:
  - **Parent information:** Pointers to existing web based parent information are provided. This information has been reviewed to ensure the messages are consistent with those in the resource.
  - **Key messages:** A single page summary is provided outlining the most important messages for professionals and managers.
- **Section 3: What the research shows**  
Annotated summary tables of the research evidence and intervention studies is included, with information provided about the level of evidence, see Appendix 4. Also included are the more detailed key research principles that are fully referenced.
- **References**  
All references used to inform the resource are listed.

To make these *Practice Resources* easy for professionals to access and use, references are not included within "Section 1: Introduction" and "Section 2: What Works". In "Section 3: What the research shows" references are included in the text. A full list of the references relevant to each topic can be found separately in the References section.

# Overview

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## What topics are covered?

### Promotion

- Breastfeeding
- Literacy

### Prevention

- Injury
- Overweight and obesity
- Smoking during pregnancy
- Passive smoking effects on children
- Child and adolescent smoking

### Early Intervention

- Language
- Settling and sleep
- Behaviour
- Eating behaviour

## How were the topics selected?

A number of criteria were used to select topics. These included:

- The importance of the issue in relation to children's health and development
- Requests from professionals
- Expression of need from communities
- Parental needs and concerns
- Perceived gap between evidence and practice
- Ease of including in daily professional practice
- Lack of information from other sources

See Appendix 3 for more detail about the selection criteria.

## How were the Practice Resources developed?

The content of the resources were drawn from the published research, expert advice, and information about innovative and promising practices. An expert committee oversaw the development of the content, and an expert in the field reviewed the content of each resource.

The format and design of the resources was focus tested and modified accordingly.

## Are there limitations to these Practice Resources?

For a number of topics there were limited numbers of well researched interventions and strategies available in the literature. Therefore it is important to note the following:

- Where possible National Health and Medical Research Council principles of assessing evidence were applied to research reviewed. For some topics there was very little evidence of high quality.
- Interventions and strategies included in the resources were based on a combination of research-based principles and expert advice.
- It is highly likely that the evidence for most topics will change over the next few years; suggested strategies may require ongoing review.

# Glossary

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<b>Associative learning</b>	A new behaviour that results from pairing something in the environment with something else. For example, when a child is required to eat a food in order to get another food as a reward, the likely result is a decreased preference for the initial food. Food aversions and preferences are acquired in this way.
<b>Division of responsibility</b>	A philosophy aimed at teaching parents to base feeding on the developmental readiness of the child and information coming from the child. Parents are responsible for providing food to children in a safe and supportive environment and children are responsible for how much they will eat, or even if they will eat at all.
<b>Modelling behaviour</b>	Teaching by example, by demonstrating a preferred or desirable behaviour for a child to copy or learn from.
<b>Neophobia</b>	Fear of new or novel foods, which is considered a normal part of children's eating development.
<b>Oral – motor problems</b>	Physical difficulty with coordinating the lips, tongue or pharynx that may cause problems with oral control and swallowing of food and fluids. These problems may be major and obvious as in children with severe cerebral palsy or more slight and subtle.
<b>Social context of meals</b>	The environmental setting and presentation context in which food is presented.

Refer to Appendix 5 for a glossary of terms related to research methodology terminology.

# Section 1: Introduction

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## Setting the scene

Focus:	Early Intervention
Topic inclusion:	Everyday difficulties in eating behaviours
Topic exclusion:	Non-behavioural eating difficulties
Age group:	One to six years

Eating is a fundamental human need and activity. Children's eating patterns develop from earliest infancy and lay the foundation for later eating patterns. Many factors shape eating patterns, including the following:

- Family factors such as parental food preferences
- Interactions between parents and children
- Exposure to a variety of foods
- Role modeling by parents of desired eating behaviours and foods
- The social context of meals and eating
- The cost, taste and availability of foods
- The child's developmental stage, temperament, and emotional state
- Health and developmental issues
- Genetic predispositions, including preferences for sweet or salty tastes
- Recognition of a child's feeding, hunger and satiety cues

Appropriate and successful eating in children also demands a division of responsibility. **Parents choose food that is safe and appropriate for the child, offer it in a positive and supportive fashion and allow the child to determine how much and even if he or she will eat at all.**

Children who do not have their eating cues recognised may come to associate hunger with anxiety rather than pleasure and may not learn to interpret and trust their own internal cues or regulate their intake. If children are forced to eat, it may result in long term problems with over eating and overweight due to poor appetite control.



# Section 1: Introduction

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In general the development of healthy eating patterns and behaviours in children require:

- Commencement of solid foods at a developmentally appropriate time.
- Repeated exposure to a variety of healthy foods. Neophobia, which is fear of new or novel foods, is common and decreases with age. Repeated exposure gives children the opportunity to increase their familiarity with foods. Foods may need to be offered up to ten times before they are accepted.
- A supportive and relaxed environment for (first) feeding experiences which encourages a positive association with food.
- Watching the context in which foods are either presented or withheld, for example rewarding a child for eating a particular food with another food will increase the preference for the reward food.
- Respecting the child's ability to regulate intake.

## Stages of development in eating and feeding behaviour

### Early feeding readiness cues

An infant's motor development occurs rapidly in the first few months of life and is partly dependent on physical growth. A child who is ready to begin the transition to eating solid foods will show both developmental and physical readiness and increased sensory awareness cues. For example, the child shows interest in exploring new textures and sensations by bringing hands and other objects to the mouth.

Feeding cues begin during the first weeks of life, when the infant signals hunger, satiety and discomfort with facial expressions, body movements and vocalisations. These cues expand further with the introduction of solid foods to include behaviours such as:

- Leaning toward food
- Opening the mouth in anticipation of food
- Reaching out for food
- Making sounds indicating pleasure

# Section 1: Introduction

Feeding cues indicating disinterest or displeasure with feeding include:

- Closing the mouth
- Turning away from food or the feeder
- Pushing the spoon or bottle away
- Crying

## Feeding skills and important milestones in the introduction of solid foods

- Present knowledge suggests that there is no nutritional advantage in introducing solids prior to four to six months of age.
- The physical development of the child should determine the texture and quality of the diet offered to infants; however a critical period for learning to accept solid foods is between six and seven months.
- When the pincer grip develops at around eight months of age children can pick up food and feed themselves and are excited by this. If the opportunity to do this is limited, children may refuse to eat.
- Eight to ten months is the critical period for introducing lumpy, solid foods so that children begin to get used to textures. Delayed introduction of textured foods may lead to difficulties in accepting increased textures throughout the weaning period.
- During the second year of life, a toddler's growth rate slows and that, along with a small stomach capacity, means that frequent opportunities to eat small quantities are necessary. Toddlers' eating behaviours are affected by other developmental characteristics including:
  - Increased mobility (leading to not sitting still long enough to eat)
  - Increasing desire for independence
  - Feeding skills (powerful desires to feed themselves even if not proficient)
  - Awareness of their environment (easily distracted from eating)
  - Increasing assertiveness and decision-making capacity (demands and refusals)
  - Ability to understand and use language ('no' often a favourite!)

The transition from milk to a varied diet and independent eating occurs in the first two years of life and must be assisted by parents. This involves moving from a single food to multiple foods, experiencing increased opportunity for self-regulation and having a new social context for eating. The success of this transition depends on the variety in the child's diet, the quality of the child's early learning experiences related to eating and parents' ability to adjust to their child's new independence.

# Section 1: Introduction

## Eating skills development

Age	Feeding skill and behaviour
Newborn	<ul style="list-style-type: none"><li>• Sucks and swallows safely</li></ul>
3 months	<ul style="list-style-type: none"><li>• Increased range of movements</li><li>• Sucking objects</li></ul>
6 months	<ul style="list-style-type: none"><li>• Jaw and lip control</li><li>• Developing chewing</li><li>• Takes food from a spoon</li><li>• Good head and trunk control</li></ul>
9 months	<ul style="list-style-type: none"><li>• Reaches for spoon</li><li>• Bites and chews</li><li>• Sits without support</li><li>• Can self feed with hands</li></ul>
12 months – 18months	<ul style="list-style-type: none"><li>• Independent</li></ul>

## About eating behaviours

### Eating behaviour concerns

*Eating behaviour concerns* other than overweight are likely to present in the first few years of life.

The crucial times when feeding or eating problems may occur include:

1. Infant feeding establishment: such as when an infant's early feeding cues such as hunger and satiety are misinterpreted or ignored. For example, persisting in feeding an infant who is showing signs of being disinterested, or scheduling feeds to fit a routine, and delaying feeds when an infant is showing signs of hunger.
2. The development of eating autonomy and feeding independence which typically peaks between one and three years of age. This is a time when children may become more fussy or reduce their food intake as growth slows.

It is common for parents of young children to express concerns about their children's nutritional intake and eating behaviour. These include worry about:

- Inadequate appetite: 'My child doesn't eat enough.'
- 'Finicky' behaviour: 'My child doesn't get enough variety.'
- Neophobia: 'My child won't eat new foods.'

# Section 1: Introduction

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These behaviours are common in toddlers and preschoolers and are considered a normal stage of eating development. They have the potential to become more problematic if parents become overly concerned and this results in forced feeding or in providing children with a limited range of foods that are preferred.

When assessing potential eating problems, if the child is growing appropriately and examination results are normal, it is likely that this is behaviourally based.

When parents report eating behaviour concerns about their child it is common to find:

- Normal growth
- Adequate energy intake
- Variable nutrient intake due to food fads
- Supplement use due to anxiety about appetite or nutritional deficiency
- Disrupted mealtime routines
- Ineffective feeding practices such as force feeding, lengthy mealtimes, endless choices, provision of favourite foods, bribery, mealtime distractions, and extended baby-bottle use
- Reliance on sweet drinks or milk to provide energy

## Feeding and eating disorders

*Feeding and eating disorders* may affect normal children as well as those with medical or developmental problems. Estimated prevalence of feeding or eating disorders ranges from 25 to 35 percent in normally developing children to 33 to 90 per cent in children with development delays. Physical causes for eating disorders in well children are unusual. Except for difficulties with chewing, sucking or swallowing, most eating problems in well children come about because of behavioural problems and represent difficulties in developing appropriate eating patterns and behaviours.

Poor feeding that occurs suddenly often indicates illness in young infants. Common childhood illnesses that should be excluded include respiratory infections, urinary tract infections, septicaemia (blood infection) and other gastrointestinal problems including constipation and diarrhoea.

Poor feeding in infants or young children that persists for longer periods of time may indicate more chronic childhood illnesses that require further investigation.

# Section 1: Introduction

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Specialist nutritional assessment and opinion should be sought for poor feeding over a long period of time, as behavioural strategies may not be sufficient to manage the problem.

For some children problem eating may have become entrenched, and support may be needed over an extended period of time. The change in behaviours expected in this instance will be much slower than for shorter term or less complex issues. Parents will need ongoing encouragement and reassurance about small positive shifts in behaviour and the time taken to achieve them.

If there is concern about severe eating problems such as food aversion that may have resulted from early trauma, then a comprehensive assessment or advice from other health professionals may be required.

The consequences of disturbed eating behaviours may be significant and long lasting. Both short-term and long-term problems can result in either slowed or accelerated growth. More serious consequences of this in the long term include failure to thrive, obesity, being excessively 'finicky' and nutritional deficiencies.

**Appropriate and successful eating in children also demands a division of responsibility. Parents choose food that is safe and appropriate for the child, offer it in a positive and supportive fashion and allow the child to determine how much and even if he or she will eat at all.**

*Practice resource:*

**EATING BEHAVIOUR PROBLEMS**

## Section 2: What works?

### Asking about eating behaviour concerns

Asking parents about concerns about their child's eating behaviour is important.

The Parents' Evaluation of Developmental Status (PEDS) instrument assists professionals to elicit and address in an informal way parental concerns about behavioural development. The questionnaire, which takes only a few minutes for parents to complete, focuses on children from birth to eight years.

The following link gives access to further information on PEDS: <http://www.rch.org.au/ccch/peds>

### Assessment of eating behaviour problems

Even when it is clear that there is no medical cause for disrupted eating behaviours, it is still important to determine if the degree of eating behaviour disruption is of major concern before a management plan can be initiated. Situations or behaviours that may indicate a more significant challenge include:

- A change in growth rate or weight gain rate
- Failure to thrive associated with food refusal
- Long-term food group restrictions resulting in nutritional inadequacies, such as restricting meat resulting in anaemia
- Significant texture restrictions
- Oral-motor problems such as chewing delay
- Delayed feeding skills, such as poor self feeding in an older infant or child
- Bizarre food habits – such as a compulsive craving for particular foods or behaviour such as eating large amounts of frozen food
- Pica – commonly regarded as eating substances not usually considered edible in a particular culture such as dirt
- Prolonged or short mealtimes
- Inadequate or excessive meals and snacks
- Tantrums at mealtimes
- Gagging or vomiting at meals
- Inappropriate mood around food or mealtimes, including significant anxiety or distress
- Dental decay
- Significant parental concern, distress or anxiety about the feeding or eating behaviour

## Section 2: What works?

A comprehensive assessment should be able to answer the following questions:

- Is there a medical or psychological reason for problem eating?
- Who is most concerned by the eating problem eg. the parent, child, others?
- Is growth an issue?
- Are there likely to be nutritional deficiencies? (Does food therefore need to be fortified?)
- Are there any oral-motor problems limiting the ability to eat, or are there any significant food aversions?
- Are behavioural strategies appropriate?

To help determine whether children are displaying problems with growth, professionals can refer to the following links for the Centre of Disease Control growth charts (adapted by the Victorian Department of Human Services) used to monitor growth, and the National Health and Medical Research Council's guidelines for assessing growth:

- [www.health.vic.gov.au/childhealthrecord/growth\\_details/index.htm](http://www.health.vic.gov.au/childhealthrecord/growth_details/index.htm)
- [www.nhmrc.gov.au/publications/files/n34.pdf](http://www.nhmrc.gov.au/publications/files/n34.pdf)

### Introduction to eating behaviour strategies

Most research on eating behaviour has focused on understanding normal and abnormal eating behaviour patterns. There are few studies that have actually trialled specific interventions for eating behaviour problems. Many interventions are based on understanding and reinforcing children's normal developmental eating patterns.

**Behavioural interventions are the most successful in addressing eating behaviour problems.** Research evidence has shown that the behavioural interventions most likely to be effective include:

- Repeated exposure to novel foods
- Modelling behaviours by parents, carers and peers
- Parents' responsiveness to the child's eating cues, including hunger and satiety

## Section 2: What works?

### Understanding behaviour interventions

The primary aim of any feeding intervention is to increase parental awareness of a child's eating cues.

The parental role should be to provide appropriate food in a supportive environment and the child's role should be to determine his or her own intake. However, parental concern about their child not eating well often creates an environment of anxiety. Parents may then persist in ineffective or counterproductive strategies and a battle for control can develop.

Research suggests that the three factors that have the greatest impact on shaping food acceptance patterns in children are:

1. **Repeated exposure to new foods.** It is normal for a child to reject a food on first exposure, but pleasure and acceptance can be increased by offering the food repeatedly in a supportive way. Sometimes five to ten exposures are necessary.
2. **The social context of meals.** Family mealtimes teach children about the culture of eating in the family and the wider environment. Parental influence, such as sharing their own food likes and dislikes can make a difference.
3. **Associative learning.** This can result in either a food preference or aversion. For example, the association of a food with illness can decrease the preference for that food.



## Section 2: What works?

### What you can do

Working with children and families in ways that prevent problems from arising, or managing problems in a calm and supportive way will encourage parents to develop strategies to support healthy eating practices.

There are key principles in supporting parents so they develop healthy eating patterns in their toddlers and preschoolers:

1. The parent takes the role of providing appropriate foods and the child selects what and how much he or she wants to eat (division of responsibility).
2. Fear of new foods (neophobia) and diet fads tend to worry parents but are a normal part of development.
3. Encouraging children to experience new foods is assisted by familiarity and lack of pressure to eat.
4. Bribery is counterproductive.
5. Allowing the child to maintain control of intake may have important long-term positive health implications.

Management strategies should include:

- Relieving parental anxiety
- Reassuring about growth and normal age- and developmentally appropriate behaviour
- Providing realistic expectations of age-appropriate quantities of food for children
- Encouraging a division of responsibility, that is, that parents provide the food in a supportive environment and the child decides how much to eat or whether to eat at all

#### **Practical strategies**

Practical strategies for managing challenging eating behaviours have emerged from research on eating behaviour that identifies key features of children's eating. These include:

- *Exposure.* Familiarity increases food acceptance and willingness to try new foods.
- *Modeling.* Adults, siblings, and peers provide direct and indirect examples of eating behaviour.
- *Positive reinforcement.* A happy, safe, relaxed feeding atmosphere combined with recognition, praise, and approval reinforces appropriate behaviour.

## Section 2: What works?

- *Discipline.* Consistent, appropriate limit setting; and routine and consistency around meals
- *Support.* Emotional support, encouragement and affection around eating are crucial.
- *Caretaker responsiveness.* Appropriate sensitive responses to developmental readiness and emotional issues involving feeding help to promote healthy eating behaviours.

**Parental behaviours at mealtime that support healthy eating in children include the following:**

**Sit with the child during meals or snacks.** This allows the adult to model appropriate behaviours and establishes a social atmosphere.

**Eat the same food as the child.** This promotes positive role modelling and allows neophobic children to learn that foods are safe.

**Allow the child to serve her- or himself.** Children have the ability to regulate their intake to meet requirements by increasing or decreasing their intake at subsequent meals. This also gives the child more power at mealtimes.

**Offer a variety of foods even if they may be refused initially.** Neophobia is the most frequent nutritional problem in toddlers and can be managed by repeated exposure and modelling.

**Encourage children to taste all food offered.** Children will learn to like a variety of foods if given the opportunity. Exposure to foods is likely to increase the preference for them and ensure a diet adequate in nutrients through increased food variety.

**Avoid hurrying the child to eat.** Children need to have the opportunity to register hunger and satiety and enjoy the social aspect of mealtimes.

**Allow the child to decide how much food will be eaten.** Children's ability to regulate their own food and energy intake should be respected. This allows hunger satiety cues to be well developed.

## Section 2: What works?

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**Try to avoid using food as a reward, punishment or pacifier.** This is likely to be counterproductive, particularly if it occurs in relation to concerns that the child has an inadequate diet. It is likely to lead to undesirable or unhealthy food preferences.

**Talk pleasantly to the child at meals, but not just about food.** The social context in which food is presented is an important component of positive feeding experiences.

**Avoid distractions such as the television or talking on the phone at mealtimes.** This decreases the value of the mealtime and does not allow the child to learn normal eating behaviour. Opportunities to learn manners and to become sensitive to feelings of satiety and therefore learn to control appetites are lost.

For further ideas on promoting relaxed mealtime strategies the booklet *Relaxed and Social: a Positive Approach to Your Child's Healthy Eating* can be found at the following link:

[www.rch.org.au/emplibrary/ecconnections/Relaxed\\_Social\\_1-5yrs.pdf](http://www.rch.org.au/emplibrary/ecconnections/Relaxed_Social_1-5yrs.pdf)

## Section 2: What works?

### Information for parents

Helpful eating and mealtime tips for parents can be obtained from the following sources:

- Raising Children Network (each age group has a section on nutrition):  
<http://raisingchildren.net.au/>
- Nutrition tip sheets, Victorian Department of Human Services:  
[www.goforyourlife.vic.gov.au/hav/articles.nsf/web1/families?open](http://www.goforyourlife.vic.gov.au/hav/articles.nsf/web1/families?open)
- Ellyn Satter and the Division of Responsibility in Feeding:  
[www.ellynsatter.com/index.htm](http://www.ellynsatter.com/index.htm)
- US Child Health site:  
[www.keepkidshealthy.com](http://www.keepkidshealthy.com)
- Nutrition Australia:  
[www.nutritionaustralia.org/Nutrition\\_for\\_all\\_ages/Children/panicky\\_parents\\_guide\\_to\\_fussy\\_eaters\\_fs.asp](http://www.nutritionaustralia.org/Nutrition_for_all_ages/Children/panicky_parents_guide_to_fussy_eaters_fs.asp)
- Canadian Best Start from Ontario (focused on early childhood):  
[www.beststart.org/resources/nutrition/index.html](http://www.beststart.org/resources/nutrition/index.html)
- Victoria's Better Health Channel Food facts:  
[www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/foodfacts?openview&count=500](http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/foodfacts?openview&count=500)

## Section 2: What works?

### Key Messages for Professionals

Children's eating patterns develop from earliest infancy and are shaped by many experiences. The success of eating behaviour is based on:

- Parents' ability to read their child's feeding cues
- The quality of the child's early learning experiences related to eating
- The variety of foods offered to the child
- The ability of parents to adjust to their child's growing independence
- Parents' recognition that children are capable of regulating their food intake
- Parents' acknowledgement that children have few innate preferences for or aversions to particular foods

Additional factors that have great impact on shaping food acceptance patterns are:

- Repeated exposure to new foods
- The social context of meals
- Associative learning experiences, that is, situations in which the child has learned food preferences or aversions through associations with pleasant or unpleasant experiences

Successful feeding also requires a division of responsibility: **Parents choose the food they serve to their children and when and where they serve it, and children are responsible for how much of what food they eat and whether they eat at all.**

Common concerns by parents of toddlers and preschoolers include:

- Inadequate appetite: 'My child doesn't eat enough.'
- 'Finicky' eating behaviour: 'My child doesn't get enough variety.'
- Neophobia: 'My child won't eat new foods.'

These behaviours are common in toddlers and preschoolers and are considered a normal stage of eating development. They have the potential to become more problematic and may result in forced feeding or in children having a limited range of foods that are preferred. This may lead to eating behaviour problems.

## Section 2: What works?

### **Research-based strategies for addressing eating behaviour problems**

There are a number of practical strategies for managing challenging eating behaviours that have been developed from research. These include:

- Broaden food exposures to increase familiarity with food and help acceptance and willingness to try new foods.
- Ensure adults, siblings, and peers provide direct and indirect examples of eating behaviour.
- Provide positive reinforcement as a happy, safe, relaxed feeding atmosphere combined with recognition, praise, and approval reinforces appropriate behaviour.
- Consistent, appropriate limit setting; and routine and consistency around meals
- Emotional support, encouragement and affection around eating.

## Section 2: What works?

### Key Messages for Managers

Children's eating patterns develop from earliest infancy and are shaped by many experiences. The success of eating behaviour is based on:

- Parents' ability to read their child's feeding cues
- The quality of the child's early learning experiences related to eating
- The variety of foods offered to the child
- The ability of parents to adjust to their child's growing independence
- Parents' recognition that children are capable of regulating their food intake
- Parents' acknowledgement that children have few innate preferences for or aversions to particular foods

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These behaviours are common in toddlers and preschoolers and are considered a normal stage of eating development. They have the potential to become more problematic if parents become overly concerned and this results in forced feeding or in providing children with a limited range of foods that are preferred.

## Section 2: What works?

### **Research-based strategies for addressing eating behaviour problems**

Professionals who work with families and young children are well placed to address common eating behaviour problems. Management strategies for raising healthy eaters should:

- Relieve parental anxiety
- Reassure parents about growth and normal age- and developmentally appropriate behaviour
- Enable parents to provide realistic quantities of food appropriate to the age of the child
- Encourage a division of responsibility where the parent provides the food in a supportive environment and the child decides how much he or she will eat or whether to eat at all



## Section 3: What the research shows

### Summary of the evidence

There have been very few systematic trials that have tested the effectiveness of interventions for eating problems in children.

Intervention focus	Recommended intervention	Effectiveness*
Eating difficulties	Allow children to self select an adequate energy intake from a selected menu without assistance	**
	Repeated exposure to foods (up to ten times)	**
	Role modelling by parents and peers (that is, eating the same food together in a pleasant environment)	**

#### Guide to recommendation of effectiveness category

Level of evidence	Effectiveness	Key
Strong to good evidence	Beneficial	***
	Not beneficial	xxx
Fair level of evidence	May be beneficial	**
	May not be beneficial	xx
Requires more studies	May be beneficial (promising)	*
	May not be beneficial (not likely)	x
	Unknown benefits	?

Refer to Appendix 5 for a glossary of terms related to research methodology terminology.

## Section 3: What the research shows

### Key research findings on eating behaviour

- **Minor feeding problems are very common in early childhood.**

Twenty-five to forty per cent of toddlers and early school-aged children exhibit some eating or mealtime behaviour problems.<sup>1</sup>

- **Some problem behaviours are more common than others.**

Parents report that 33 per cent of infants and 52 per cent of toddlers are 'not always hungry at mealtimes', 42 per cent of toddlers 'try to end meal after a few bites', 35 per cent are 'picky eaters' and 33 per cent have 'strong food preferences'.<sup>1</sup> Only a small proportion of children suffer from severe eating problems.

Estimates of the degree to which infants and children suffer severe and prolonged eating problems have ranged from one to two per cent<sup>6</sup> to three to ten per cent.<sup>1</sup> The prevalence of non-organic failure to thrive (poor growth for which there is no clear medical cause) in particular has been estimated to range from 1.4 to 3 per cent.<sup>6</sup>

- **The desire and ability to eat are natural in children.**

It would typically take a great deal of disruption in a child's life to interrupt the natural tendency to accept and regulate food intake.<sup>2</sup>

- **Factors that contribute to successful eating behaviour vary according to the developmental level of the child.**

During the first few months of life, attachment between mother and child and an infant's regulation of internal states are important factors in the developing feeding relationship.<sup>2</sup> As the child gets older temperament begins to increasingly affect eating behaviours. As a child's mobility and independence increase in the second year of life, fussiness and negative eating behaviours may become more likely.<sup>3</sup>

There are key sensitive periods in an infant's development when exposure to different tastes and textures is essential to prevent developmental or behavioural feeding difficulties.<sup>15</sup>

## Section 3: What the research shows

- **Eating behaviour is also strongly influenced by parental characteristics.**

Maternal insensitivity, parents who are too rigid or controlling or parents who show excessive concern about their child's weight and growth may contribute to problem eating behaviours in their child.<sup>2, 14</sup> A longitudinal study of children's food preferences over time showed that mothers' and children's food preferences were significantly although moderately related. Foods disliked by mothers tended not to be offered to children.<sup>13</sup>

Parental feeding styles may promote overeating or overweight in children.<sup>16</sup>

If mothers have a previous or recent history of eating behaviour disorders, there is a greater risk that their children will have eating problems and that they will interfere more with their children at mealtimes.<sup>4</sup>

- **The family environment is paramount in influencing children's eating behaviours.**

The factors in the family that appear to be most important in influencing children's eating behaviours include the following:

- Parental food preferences and beliefs
- Children's exposure to food
- Role modelling
- Media exposure
- Child-parent interactions around food<sup>17</sup>

- **Role modelling is essential to promote desirable eating behaviours in children.**

Young children are known to prefer the foods consumed by their parents and peers. In one study, preschool children were shown to self-select their 'least preferred' foods after observing a group of peers consume these foods on several occasions.<sup>18</sup>

A study of 24 child care programs found a positive correlation between knowledge about nutrition, behaviour at mealtimes, attitudes and caregiver behaviour.<sup>9</sup>

## Section 3: What the research shows

- **Fear of new foods (neophobia) is a common and normal developmental feeding problem for young children, and one that can be overcome.**

Repeated exposure to new foods in a safe and supportive environment will increase the likelihood of children trying and accepting new foods.<sup>21</sup> Directives such as ‘Try it – you’ll like it’ have been shown to influence young children positively to overcome their fear of novel foods.<sup>10</sup>

- **The optimal environment for children’s development of self control of energy intake for health and growth is one in which parents provide healthy choices but allow children to have control of how much they consume.**<sup>2, 19, 20, 22</sup>

A very controlling and authoritarian parenting style impedes a child’s ability to develop self control, and these strategies may in fact be counter-productive.

Seventy seven children three to five years old in a preschool setting were given juice with varying energy densities and allowed to choose their lunch afterwards from a set but varied menu. The energy density of lunch as well as that of the juice drunk previously were measured. All children had height and weight measured and parents completed comprehensive questionnaires to examine the degree of control children exercised over their intake. Results showed that children with greater fat stores were less able to regulate energy intake. The best predictor of regulation was parental control. More controlling mothers had children who showed less ability to self-regulate energy intake.<sup>11</sup>

- **Severe eating problems are more prevalent in children with physical or intellectual disabilities.**

The prevalence of severe eating problems ranges from 26-90 per cent for children with physical disabilities, 23-43 per cent for children with intellectual disabilities and 10-49 per cent for children with a medical illness, born prematurely or with low birthweight.<sup>1</sup> Children with cystic fibrosis typically fall well below their level of recommended daily allowance for food intake.<sup>7</sup>

- **Children have an innate ability to regulate appetite.**

Three infants seven to nine months old allowed to self select from a limited range of foods showed meal-by-meal variation; however energy intake remained relatively constant. All children appeared to grow well over time without adult attempts to control the infants’ intake.<sup>8</sup> Fifteen children aged two to five years had their intake assessed and measured over six 24-hour periods. Children were able to choose freely the quantity and type of foods they preferred from a standard menu. Food intake

## Section 3: What the research shows

showed great variability at individual meals; however daily energy intake remained relatively constant.<sup>11</sup>

- **Positive family and parental feeding behaviours are important to help prevent overweight in children.**<sup>14</sup>

Parental feeding styles may promote overeating or overweight in children. In a systematic literature review, parental feeding restriction was associated with increased child eating and increased total energy intake. This has important implications for determining the best and most appropriate level of control for parents to help bring children's diets into line with public health recommendations and to manage the increasing rates of overweight and obesity in children and adolescents.<sup>16</sup>

### Interventions for eating behaviour problems

While there have been very few systematic trials that have tested the effectiveness of interventions for eating problems in children, there is a body of evidence suggesting practical strategies for use by the parent and carer that support the development of healthy eating in children. This includes studies that illustrate the ability of children to regulate their own appetite and intake, the negative consequences of over-control of children's food intake, the positive influence of peers and family role modelling, and the importance of repeated exposures of foods to improve acceptance of novel foods and the social influences on children's preferences for foods.

Interventions that have been most successful in promoting healthy eating behaviours in children include:

- Repeating the exposure of a new or novel food to improve acceptance through increased familiarity<sup>21</sup>
- Modelling behaviours, that is, parental and peer consumption of a food increases consumption and preference of it by the child<sup>9, 17, 18, 23, 26</sup>
- Allowing the child to determine (control) how much food is eaten from a selected menu, which results in consistent and adequate energy intake despite meal-to-meal variation in intake<sup>2, 8, 11</sup>
- Ensuring that the social context in which food is offered is one that is likely to increase preferences for a variety of foods, including new foods<sup>16, 23, 25</sup>
- Making positive statements to encourage the child to taste novel or new foods.<sup>9, 10</sup>

## Section 3: What the research shows

### Annotated summary of intervention studies

Following is:

- A summary of the intervention studies that were used to inform this resource
- Annotated summary of eating behaviour studies

#### Summary of intervention studies

Focus of study	Author
Appetite regulation in children	Birch, L. and Fisher, J. (1993) (1995) (1991) Davis, C. (1928) Satter, E. (1996)
Impact of repeated exposure on acceptance of novel foods	Birch, L. (1982)
Effect of carer behaviour and family environment on eating behaviour in children	Birch, L., Fisher, J. and Davidson, K. (2003) Birch, L. and Davidson, K. (2001) Nahikian-Nelms, M. (1997) Birch, L., Zimmerman, S. and Hind, H. (1980) Campbell, K. and Crawford, D. (2001)
Cognitive behavioural interventions in children with eating difficulties	Blissett, J. and Harris, G. (2002)
Division of responsibility in eating	Satter, E. (1986) (1996) (1990)(2000)
Eating practices associated with increased risk of overweight and obesity in children	Birch, L. and Fisher, J.O. (1995) (2000) Faith, M.S., Scanlon, S., Birch, L., Francis, L. and Sherry, B. (2004) Spruijt-Metz D., Lindquist C., Birch L., Fisher J. and Goran, M. (2002) Johnson, S. and Birch, L. (1994) Birch, L., Marlin, D. and Rotter J. (1984)
Factors affecting children's food preferences	Skinner J. et al. (2002) Addessi, E., Galloway A., Visalberghi, E. and Birch, L. (2005) Pelchat, M. and Pliner, P. (1995)
Factors associated with eating development and problems in young children	Pelchat, M. and Pliner, P. (1986) Skuse, D. (1993) Lipsitt, L., Crook, C. and Booth, C. (1985)

Practice resource:

EATING BEHAVIOUR PROBLEMS

Annotated summary of eating behaviour interventions

Study	Participants	Focus of study	Intervention	Results	Comments
Birch et al. (1980) <sup>23</sup>	64 children (age range 3-10yrs)	Influence of four social-affective contexts on the food preferences of children	A food determined to be neutral to the child (neither highly preferred or not preferred) was presented to children as: 1. a reward 2. non-contingently – paired with adult attention 3. in a non-social context 4. at a snack time	Presenting foods as a reward or non-contingently paired with adult attention produced significant increases in preference.	Social-affective context in which foods are presented is extremely important in the formation of young children’s food preferences. Care needs to be taken when offering foods as a reward, however positive parental attention can increase the preference for foods and provides an opportunity to broaden children’s food intake.
Pelchat and Pliner (1995) <sup>10</sup>	41 children with mean age of four years	Effect of information about taste on young children’s willingness to try novel foods	Children were presented with foods previously determined to be novel but within a food group eaten frequently. Foods were offered with an adult saying either ‘Would you like to try it?’ or ‘Would you like to try it? It tastes good.’	Increased willingness to try some foods was associated with provision of the information ‘it tastes good’.	Supportive mealtime practices by adult can help deal with food neophobia in young children.

Practice resource:

# EATING BEHAVIOUR PROBLEMS

Study	Participants	Focus of study	Intervention	Results	Comments
Birch, L. and Johnson, S. (1994) <sup>12</sup>	77 children three to five years old attending a university preschool and their parents	Children's ability to self-regulate energy intake and to determine whether individual differences in the precision of food intake regulation are related to children's anthropometric measures (growth measurements)	Children completed controlled, two-part meals used to estimate their ability to adjust food intake in response to changes in caloric density of the diet.  An eating index reflecting children's precision in the ability to regulate energy intake was correlated with children's anthropometric measurements.	Children with greater body fat stores were less able to regulate their energy intake accurately.  The best predictor of children's ability to regulate energy intake was parental control of feeding: more controlling mothers had children with less ability to self-regulate energy intake.	Optimal environment for children's development of self-control of energy intake is that in which parents provide healthy food choices but allow children to assume control of how much they consume.
Davis, C. (1928) <sup>8</sup>	Three infants in institutionalised care aged seven to nine months	Infants' self selection of a diet from a limited range of 'natural' foods	Over a six-month period, children were given three meals per day. Infants indicated their choice from a selection of food and drinks without carer intervention except for assistance with feeding the indicated food. Children were allowed to eat to appetite.	Children were observed to eat in waves, that is, small to large quantities of particular foods. Energy intake remained quite constant despite mealtime variation in quantity and food choice. Children grew well.	Children have an innate ability to regulate energy intake without interference from carers. Children can self select a nutritious diet given access to a range of healthy foods.

Practice resource:

# EATING BEHAVIOUR PROBLEMS



Study	Participants	Focus of study	Intervention	Results	Comments
Birch, L., Johnson, S. and Andersen, G. (1991) <sup>11</sup>	15 children aged two to five years	Children's regulation of energy intake	Study conducted over six 24-hour periods during which children were fed from a standard menu, choosing foods they preferred in the quantities they desired	Children's intake at individual mealtimes was highly variable – that is, a low energy meal may have been eaten in response to a previous high energy meal. However daily energy intake remained relatively constant over the day.	Children have the ability to regulate energy intake without interference by parents. Coercive strategies, such as threats or bribes, to encourage children to eat more may be counterproductive and interfere with this balance.
Levin-Pelchat, M. and Pliner, P. (1986) <sup>24</sup>	Mothers of 79 children ages two to seven years	Examine variables associated with young children's eating	Questionnaire with items pertaining to children's feeding history and past and current eating behaviour	Children whose eating behaviour was relatively problematic differed from other children in that they had: <ol style="list-style-type: none"> <li>1. had less exposure to novel foods</li> <li>2. were more likely to be rewarded and coaxed to eat and punished if not eating</li> <li>3. had higher scores for behavioural or psychological problems</li> <li>4. were more likely to have developed a conditioned taste aversion</li> </ol>	Social influence, early experience with diverse foods, conditioned taste aversions and general maladjustment may be related to food acceptance and rejection in children.

Practice resource:

# EATING BEHAVIOUR PROBLEMS

Study	Participants	Focus of study	Intervention	Results	Comments
Adessi, E., Galloway, A., Visalberrghi, E. and Birch, L. (2005) <sup>25</sup>	27 children aged two to five years recruited from day care facilities	Specific social influences on children's ability to accept novel foods and overcome food neophobia	Children's behaviour related to novel foods was assessed under different conditions when an adult model: 1. was not eating 2. was eating a food of a different colour 3. was eating a food of the same colour	Children accepted their novel food more when an adult model ate a food of the same colour than when they ate food of a different colour or where the adult was just present.	Food acceptance in young children is promoted by specific social conditions such as when others are eating the same type of food.
Birch, L., Fisher, J. and Davidson, K. (2003) <sup>26</sup>	Longitudinal data for girls at ages five, seven and nine years	Whether restrictive eating practices foster girls' eating in the absence of hunger (EAH) and whether girls' weight status moderates the effects of restrictive feeding practices	Study design created to feature: <ul style="list-style-type: none"> <li>two maternal restriction factors: low and high</li> <li>two weight status factors: not overweight and overweight</li> <li>three age factors: five, seven and nine years</li> </ul>	Mean EAH increased significantly from five to nine years of age. Higher levels of restriction at five years of age predicted higher EAH at seven and nine years.  Girls who were overweight at five years and who received higher levels of restriction had the highest EAH scores at nine years and the greatest increases in EAH from five to nine years of age.	Maternal restriction can promote overeating. Girls who are already overweight at five years may be genetically predisposed to be especially responsive to environmental cues. The developmental increase in EAH between five and nine years may be especially problematic in environments that support obesity.

Practice resource:

# EATING BEHAVIOUR PROBLEMS

Study	Participants	Focus of study	Intervention	Results	Comments
Blissett, J. and Harris, G. (2002) <sup>27</sup>	Case study of a child with growth problems and moderately severe feeding difficulties	Eating behaviours, growth, parental anxiety.	Intervention based on cognitive behavioural principles and psychological techniques focusing on reducing parental anxiety and returning control of eating back to the child	Eating behaviours improved considerably over a six-month period.  Growth and weight increased.	

*Practice resource:*

# EATING BEHAVIOUR PROBLEMS

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# Appendix 1

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## Centre for Community Child Health

The Centre for Community Child Health's mission is to improve the health and wellbeing of all children.

At the forefront of Australian research into early childhood development and behaviour, the Centre has a particular interest in children's mental health; obesity; language, learning and literacy; hearing; and the development of quality early childhood services.

The Centre is committed to disseminating its research findings to inform public policy, service delivery, clinical care and professional practice.

Professor Frank Oberklaid, an internationally renowned researcher, author, lecturer and consultant, leads a team of over 90 staff from a range of disciplines including paediatrics, psychology, education, early childhood, public health and communications.

Located at The Royal Children's Hospital, Melbourne, the Centre is a key research centre of the Murdoch Childrens Research Institute and an academic centre of the University of Melbourne.

Further information about the Centre for Community Child Health can be found at [www.rch.org.au/ccch](http://www.rch.org.au/ccch)



## Appendix 2

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### Telstra Foundation

In 2002, as part of its strong tradition of community involvement, Telstra established the Telstra Foundation, a program devoted to enriching the lives of Australian children and young people and the communities in which they live.

The Telstra Foundation supports projects that develop innovative solutions and new approaches to issues affecting children and young people aged 18 years and under, are based on sound research, and develop practical applications of new knowledge and have an emphasis on early intervention.

The Telstra Foundation has two main programs, with the *Community Development Fund* providing the funding for the practice resource. The Community Development Fund provides grants to charitable organisations for projects that have wide impact and intervene early to address causal factors affecting the health, well-being and life chances of Australia's children and young people.

Further information about the Telstra Foundation can be found at:

<http://202.12.135.148/dir148/tfweb.nsf/webdocs/home~home?opendocument>

## Criteria for selecting topics

There were a number of criteria used for selecting the topic for each practice resource. These included:

- *Importance of the issue in relation to children's health and development*  
There are a number of issues that are very prevalent and impact both on the immediate health and development of the child as well as the impact over the life course.
- *Provider need*  
Through various forums providers have requested easier access to research based information that will assist directly in their daily interactions with children and families.
- *Community need*  
Around Australia there is increasing community activity focusing on early childhood. A number of these communities have begun to articulate the desire to support families more effectively through providing services that engage in family centred practice and use research based strategies to address issues that concern parents.
- *Parent need and concern*  
National consultations have highlighted the issues that parents want more information about. In addition, Australian research has shown that there are a small number of issues that cause parents the most concern about their children.
- *Perceived gap between evidence and practice*  
There are a number of areas of practice which in general do not reflect research evidence in spite of sound evidence from that research.
- *Can be readily incorporated into routine practice*  
The primary aim of each resource is to assist professionals in their interactions with children and families. Priority was given to issues about which strategies could be relatively easily incorporated into practice.
- *No duplicating of effort*  
Consideration was given to whether issues had been addressed elsewhere in similar ways for the same audience.

## Appendix 4

### NHMRC Guidelines for Levels of Evidence

- |       |  |
|-------|--|
| I     | Evidence obtained from a systematic review of all relevant randomised controlled trials.   |
| II    | Evidence obtained from at least one properly designed randomised controlled trial.   |
| III-1 | Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation of some other method).  |
| III-2 | Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group. |
| III-3 | Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group.                           |
| IV    | Evidence obtained from case series, either post-test or pre-test and post-test.  |

# Appendix 5

## Glossary of Terms – Research Methodology

Note: Wherever possible these definitions are taken from the *Glossary of Terms in the Cochrane Collaboration, Version 4.2.5, updated May 2005*.

<b>Case-control study</b>	A study that compares people with a disease or outcome of interest (cases) with people from the same population without that disease or outcome (controls), and which seeks to find associations between the outcome and exposure to particular risk factors
<b>Cochrane Review</b>	Systematic summaries of evidence of the effects of health care interventions, intended to help people make practical decisions. For a review to be called a Cochrane Review it must be in the Cochrane Database of Systematic Reviews or the Cochrane Review Methodology Database. These are administered by the Cochrane Collaboration, an international organisation that aims to help people make well-informed decisions about health care.
<b>Control</b>	A participant in a randomised controlled trial who is in a group that acts as a comparator for the experimental intervention(s); alternatively, a participant in a case-control study who is in a group that does not have the disease or outcome of interest.
<b>Control trials</b>	Studies in which participants are assigned to an intervention or control group using specific criteria.
<b>Effectiveness</b>	The extent to which a specific intervention, when used under ordinary circumstances, does what it is intended to do.
<b>Evidence</b>	Up-to-date, accurate information about the effects of interventions.
<b>Randomised controlled trial (RCT)</b>	An experiment in which two or more interventions are compared by being randomly (like tossing a coin) allocated to participants.