

**NEW ZEALAND SPEECH-LANGUAGE THERAPY
CLINICAL PRACTICE GUIDELINE**
on
**Children's feeding and swallowing difficulties
(paediatric dysphagia)**

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As per NZSTA regulations, this guideline will be reviewed five (5) years after publication. The working group will take responsibility for this review.



New Zealand
Speech-language
Therapists' Association
Te Kāhui Kaiwhakatikatika Reo Kōrero o Aotearoa

Contents

Purpose of this document	3
Context and Use.....	3
Endorsements	Error! Bookmark not defined.
Methodology	4
Part 1. The NZ context	6
NZSTA Principles and Rules of Ethics.....	6
Scope of Practice.....	6
The Unique New Zealand Context.....	6
Definition of Dysphagia/ Feeding Problem	7
Causes of Dysphagia.....	8
Characteristics and Consequences of Dysphagia.....	8
Components of Service Delivery.....	9
Multi-agency SLT working.....	9
Organisation and legal responsibilities.....	9
Expectations of New Graduate (entry-level) clinicians	9
Education and training	11
On-going competence	11
Staff orientation	11
Continuing professional development.....	11
Clinical education.....	11
Staff Training.....	12
Leadership and supervision.....	12
Guidance for Employers.....	13
Part 2. Guidelines for clinical practice	14
IDDSI.....	14
References.....	16

Purpose of this document

The aim of this document is to provide clinicians and managers with consensus statements regarding current clinical best practice. This can assist in the clinical decision-making process by providing information on what is considered to be the minimum best practice. The focus of this is on the quality of the care provided. Expert opinion and professional consensus have also been considered within the evidence base.

Clinical guidelines are an important tool in supporting the delivery of high quality services that support the best possible outcomes for children and families. Although these guidelines are uni-professional and directed primarily at practising Speech-language Therapists, it is anticipated that they will contribute to multi-professional documents as appropriate. Throughout the document there is a strong emphasis on multi- and interdisciplinary team-working. The guidelines will also inform health, social and educational purchasers and other agencies that may become involved with individuals who have a communication or swallowing disorder.

This document provides broad clinical guidance on assessment and management for children with feeding and swallowing difficulties; also known as paediatric feeding disorders (Goday et al 2019). Each section is supported by evidence from the literature and the consensus of clinical experts.

Context and Use

These practices should be used within the prevailing context of the clinical governance agenda. The recommendations made should not be viewed as rules; rather, they should be taken as statements that assist in decision-making for both managers and clinicians. They are broad in their scope, but specific to childhood feeding and swallowing difficulties. They are empowering, providing guidance for the assessment and management of eating, drinking and swallowing difficulties in children across a range of ages, environments and with a diversity of presentations. They do not replace clinical guidelines, which have been devised for a narrow scope of work with a specific population of clients e.g. Videofluoroscopy Swallow Study, Tracheostomy guidelines. They are written from the viewpoint of minimum best practice as opposed to a perceived idealistic 'gold standard'.

This practices document should be read and interpreted in accordance with the Speech-language Therapist's clinical judgement. It is recognised that not everything will be clinically appropriate in every case, which is understandable. It is expected that the Speech-language Therapist will need to refer to one or more of the separate clinical guidelines for each individual. For example, Tracheostomy guidelines

Throughout this document "patient", "client" and "child/ren" is used interchangeably to refer to the person who is receiving support and their family/whānau and/or caregivers.

Methodology

Working Group

A working group was established from volunteers through the New Zealand Speech-language Therapists Association. Members varied in locality, service and experience. The group worked through email and teleconferences to establish the initial guideline. The group reviewed a number of existing guidelines from international organisations associated with speech-language therapy and with feeding and swallowing difficulties, relevant to children's services.

The group agreed that the New South Wales Ministry of Health - Feeding Difficulties in Children - A Guide for Allied Health Professionals Guideline (hereafter known as the NSW guideline) most closely met the need. In summary the NSW guideline provides direction to clinicians and is aimed at achieving the best possible children's care across services. The guideline reflects what is currently regarded as a safe and appropriate approach to the management of children with feeding difficulties. Amendments were required to adapt the guideline for use in New Zealand, and to include the most recent guidance on texture modification. A New Zealand Context document supports the NSW guideline.

"Feeding Difficulties in Children-A guide for Allied Health Professionals Title (GL2016_007)" republished with permission from NSW Ministry of Health, Australia, 20 August 2018.

Working Group Members

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Consultation Group

A range of specialists within relevant associated professions were asked to form a consultation group. The aim was to gain advice on the guideline and supporting document produced by the working group. The group included experienced professionals who worked with children with

eating, drinking and swallowing difficulties across the variety of different services as well as across the variety of contexts of New Zealand (e.g. rural, community-based).

Consultation Group

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Part 1. The New Zealand context

The New Zealand Speech-language Therapists' Association (NZSTA) is the national professional body of Speech-language Therapists in New Zealand. All NZSTA documents referenced in this guideline can be found on their website: <https://speechtherapy.org.nz/>

NZSTA Principles and Rules of Ethics

Speech-language therapists should have knowledge of, and practice within, the current NZSTA Principles and Rules of Ethics (2015). These state that a high standard of professional and ethical integrity is paramount in all speech-language therapy practice, including children's feeding and swallowing difficulties. All speech-language therapy practice should adhere to the five key principles and ethical rules of; beneficence and non-maleficence, professional competence, promotion and development of the profession, professional integrity and fairness.

Scope of Practice

It is the position of NZSTA that working in the field of childhood feeding and swallowing difficulties is within the scope of practice of speech-language therapists, including Entry-level SLTs graduating from New Zealand university programmes.

However, it is recognised that within childhood feeding and swallowing difficulties there are expanded, advanced and extended scopes of practice for speech-language therapists. For example;

- Children suffering burns (Rumbach, Clayton, Muller, & Maitz, 2016).
- Children suffering traumatic brain injury (Morgan, Ward, & Murdoch, 2004).
- In paediatric intensive care and neonatal intensive care units (American Speech-Language-Hearing Association, 2004).
- and in leading Videofluoroscopy Swallow Study (VFSS) and Flexible Endoscopic Evaluation of Swallowing (FEES) assessment and management.

The speech-language therapist will plan intervention for children within the context of the developmental sequence of eating and drinking skills. Of paramount consideration will be safety, nutrition and hydration, balanced against the desire for developmental progress. The speech-language therapist should at all times consider the priorities of the family/whānau, and prepare intervention to support them. Any discrepancy between caregiver priority and safety of the child/adolescent should be clearly documented.

NB: Children with feeding difficulties should be under the management of a registered medical practitioner, to oversee the child's care and act as a central point of coordination.

The Unique New Zealand Context

Ko te manu e kai i te miro

Ko te manu e kai ana i te miro, nōna te ngahere. Engari, ko te manu e kai ana i te mātauranga, nōna te ao.

The one who partakes of the flora and fauna that will be their domain. The one who engages in education, opportunities are boundless.

SLTs need to be aware of the importance of food in maintaining health, and in providing and sharing food with guests. For Māori there is a strong relationship between culture and kai (food). The preparation, choice and sharing of kai is a key aspect imbedded in Māori cultural practice. It is a significant aspect of manaakitanga; the hospitable welcoming of visitors (Brewer & Andrews, 2016).

Developing awareness of the importance of kai for cultural reasons (beyond nutrition) is critical. From a cultural perspective kai is not just a means for refuelling the body, rather it is part of a complex intertwining of kai and kōrero in order to ensure manaakitanga is upheld. Kai, in a Māori cultural context, is seen to remove the tapu from a situation, indicating a coming together (Durie, 1998), a strengthening of wairua (spirit) and spiritual and physical togetherness.

The act of preparing and presenting kai provides opportunity to facilitate social acceptance and engagement. Social and cultural significance attached to specific foods, eating and drinking behaviours and routines will affect not only social engagement but plans around safe eating, drinking and swallowing. For many cultural groups, food preferences and habits may act as markers of identity and group membership. Feeding practices and foods differ across cultures and are a reflection of beliefs about child nutrition and health needs (Kenny, 2015).

Support for children and whānau/families should reflect their cultural identity and food preferences in the preparation, sharing and consuming of kai and drink (Davis-McFarland, 2008). An SLT's obligations under Te Tiriti o Waitangi provides the foundation for the principles of partnership, participation and protection for Māori and non Māori in working together. These principles apply to supporting tamariki and whānau around eating and drinking. In brief, kai, kōrero and manaakitanga must be seen to influence outcomes that impact on safe eating, drinking and swallowing.

Definition of feeding and swallowing difficulties, including dysphagia

Childhood feeding and swallowing difficulties include motor, sensory and behavioural factors that negatively impact on a child's ability to safely and comfortably take the nutritional intake they require for growth and development. Dysphagia is the medical term for difficulty, or inability, to swallow. Dysphagia is listed by the World Health Organization in both the International Classification of Diseases (ICD-10) and the International Classification of Functioning Disability and Health. Dysphagia may present as difficulty with sucking, swallowing, drinking, chewing, eating, controlling saliva, taking medication, or protecting the airway. Dysphagia can occur at any time during a person's life and may be short or long term. The most common causes of childhood feeding and swallowing difficulties are related to underlying medical or physical conditions. However, it is recognised that childhood feeding and swallowing difficulties can also manifest in psychological or psychiatric conditions (Baheshree & Jonas, 2012; Suntrup et al., 2014). In addition, clinicians should be aware that symptoms of feeding and swallowing difficulties in children may manifest or be reported when the parent or caregiver is experiencing a psychological or psychiatric condition, such as depression, anxiety or psychosis.

Causes of Childhood feeding and swallowing difficulties

Childhood feeding and swallowing difficulties are symptoms secondary to something else. There are diverse potential causes of feeding and swallowing difficulties for children:

- Genetic (e.g. CHARGE syndrome, DiGeorge Syndrome).
- Developmental (e.g. consequence of prematurity of birth or global developmental delays).
- Acquired (e.g. brain injury, stroke, cancer).
- Functional (unknown cause).
- Iatrogenic (occurs during treatment, e.g. side effect of cardiac surgery or birth trauma).
- Structural impairment (e.g. cleft palate, hypertrophic tonsils).
- Physiological impairment (e.g. reflux, eosinophilic oesophagitis).
- Neurological impairment (e.g. epilepsy, lissencephaly).
- Psychosocial (e.g. a result of parental psychosis, such as Munchausen by Proxy, or lack of exposure to diverse foods due to poverty).

Characteristics and Consequences of feeding and swallowing difficulties

Feeding and swallowing difficulties are typically characterised by:

- Oral preparation, oral phase, pharyngeal phase or oesophageal phase dysfunction.
- Respiration-swallow incoordination.
- Limited ability to protect the airway.
- Mealtime behaviour disturbances.
- Learned fluid or food aversion.

The child will have impaired oral intake that is not age-appropriate and is associated with medical, nutritional, feeding skills and/ or psychosocial dysfunction (Goday et al, 2019).

Feeding and swallowing difficulties may result in:

- Failure to meet nutrition and hydration needs, including faltering growth (Arvedson, 2008; Prasse & Kikano, 2009).
- Depression, social isolation and negative impact on social well-being (Martino, Beaton, & Diamant, 2010; Thottam, Silva, McLevy, Simons, & Mehta, 2015) With children and adolescents, the depression and social isolation may be experienced by the adult caregivers and extended whānau (Didehbani, Kelly, Austin, & Wiechmann, 2011; Edwards et al., 2016; Swift & Scholten, 2010).
- Post-natal depression and trauma/grief processes experienced by parents and caregivers.
- Disrupted bonding and attachment in infancy with sequelae of psychological implications (Lee, 2008).
- Possible delayed or disordered development of oral skills (Barbosa et al., 2009).
- Pneumonia, in the presence of other risk factors such as recurrent respiratory illness, GORD, chronic aspiration, global developmental delay.
- Asphyxiation and death (Leslie, Crawford, & Wilkinson, 2009; Tutor & Gosa, 2012).

Components of Service Delivery

1. **Prioritisation of referrals:** Prioritisation systems will vary depending on the service provider. Documentation of prioritisation processes are strongly advocated. Prioritisation of new referrals against current caseload burden requires consideration. It is common practice for a benchmark to be set for speech-language therapy response time to feeding and swallowing referrals. All referrals for feeding and swallowing are important. Some factors make the feeding and swallowing referral both important and urgent. Prioritisation of referrals is based on risk to the child or infant's safety and/or wellbeing.
2. **Determination of need:** A decision on the most appropriate professional (speech-language therapist or another team member) to respond to a referral should be determined before the referral is accepted. If the determination of need is unclear from the referral information, the following questions from the New South Wales Health Feeding Guidelines for Allied Health Professionals may assist in structuring assessment:
 - a. Is oral feeding safe?
 - b. Is oral feeding adequate?
 - c. Is oral feeding efficient?
 - d. Is oral feeding developmentally appropriate?
 - e. Is oral feeding a positive experience for parent and child?
3. **Informed consent:** Informed consent is a fundamental concept in the provision of health care and education services. It is based on ethical obligations that are supported by legal provisions. The patient/client must be informed of the outcomes, benefits and risks associated with feeding and swallowing assessment and management services before these services commence. This discussion needs to be documented.

Multi-agency SLT working

At times, there may be simultaneous input from SLTs of more than one service, for example health and education service providers. Under these circumstances the speech-language therapists involved should ensure they have a clear understanding of their own, and others, roles and responsibilities when working with the child and their family/whānau. This information should be clearly communicated to the family and wider team involved. To foster these close multi-agency working relationships, strong communication pathways and local level service agreements between agencies must be established and maintained.

Organisation and legal responsibilities

Health and Safety policies, including infection control, must be followed where they exist. For this reason, therapists should be familiar with workplace occupational health and safety policies, workplace policies and procedures, relevant NZSTA Clinical Guidelines and other relevant legislation and guidelines. Speech-language therapists should be aware of the medico-legal implications and the responsibilities of working with clients who have feeding and swallowing difficulties.

Expectations of New Graduate (entry-level) clinicians

Competency-Based Occupational Standards (CBOS) (Speech Pathology Australia, 2011) have been chosen by the NZSTA as the tool to demonstrate attainment and subsequent maintenance

of entry-level competency during the first year of practice and beyond. CBOS 2011 is the minimum entry standard of practice for NZSTA & Speech Pathology Australia (SPA).

SLTs and employers can refer to the CBOS standards, the NZSTA New Graduate Framework (2015) and the NZSTA Mutual Recognition Agreement (2011) for details of minimum standards of competency for new graduate (entry-level) therapists and all practising speech-language therapists, including those trained overseas. It is important to recognise that speech-language therapy is not registered as a profession with the Health Practitioners Council, so individual organisations, employers and other stakeholders are required to follow their own due diligence process in ensuring that SLTs they employ are competent to carry out the role for which they are employed.

A new graduate (entry level) SLT trained in New Zealand or Australia must be able to demonstrate competence in all units of CBOS in childhood (and adult) SLT practice with both developmental and acquired disorders in the areas of: language, speech, swallowing, voice, fluency and multi-modal communication. In reference to swallowing, this includes (but is not limited to) competence in providing advocacy, education, assessment, management and undertaking life-long learning around oral, pharyngeal and oesophageal dysphagia, oral function for eating/drinking and meal time management. The CBOS 2011 document provides detailed exemplars of the level at which these competencies are demonstrated to be considered 'entry-level'.

CBOS 2011 states "It is unrealistic to expect that an entry-level speech therapist (SLT) will be competent in all areas of speech therapy (SLT) practice without access to supervision, guidance and support from a senior member of the profession."

As mentioned above, it is beyond the scope of entry-level (new graduate) practice to undertake unsupervised work with ventilator-dependent patients, to lead a VFSS assessment or to undertake a FEES assessment. In addition, feeding and swallowing-specific expectations have been compiled from documentation from the United Kingdom. This is complimentary to the CBOS standards. A summary of the competencies expected of entry-level clinicians include:

- Independent management of non-complex cases.
- Ability to conduct a clinical assessment and feeding/oral trial.
- Determine client safety with foods and liquids trialled.
- Make management decisions regarding:
 - Change of diet.
 - Strategies.
 - Intervention.
- Recognise the need for further assessment, for example:
 - Second opinion.
 - Modified barium swallow/VFSS.
 - FEES.
- Prioritise clients from defined criteria.
- Determine safety of oral feeding vs. alternative feeding (acute clients).
- Provide feedback to client and referral source regarding swallowing status and recommendations.
- Advise on risk management.
- Basic awareness training for client, family and other health professionals.
- Participation (not lead) in clinical audits or research.

(Based on 'Specialist dysphagia practitioner' (Boaden, Davies, Storey, & Watkins, 2006)

Education and training

On-going competence

SLTs must be eligible for practising membership of NZSTA. A SLT should recognise and acknowledge their skill base and work within their scope of professional competence and performance (Principle 2, NZSTA Principles and Rules of Ethics (2015); CBOS (Speech Pathology Australia, 2011).

Competency develops with experience, allowing a dynamic integration of knowledge, skills and processes and incorporating development of reasoning, communication, lifelong learning and professionalism (McAllister, Lincoln, Ferguson, & McAllister, 2006 2011). McAllister et al. reported that some competencies are harder to attain than others. For example, of 11 competencies, the five that have been reported to be most difficult to attain include (in order):

- Analysis and interpretation (CBOS, Unit 2).
- Assessment (CBOS, Unit 1).
- Professional, group and community education (CBOS, Unit 6).
- Clinical reasoning (General Competency, Unit 1).
- Planning of speech therapy intervention (CBOS, Unit 3).

NZSTA advises that competency attainment and maintenance should be shared between individuals and their employing organisations. Employers should not require a SLT with less than 12 months experience to provide services in areas of advanced clinical practice until competency attainment has been addressed.

Staff orientation

SLTs working with clients with feeding and swallowing difficulties should meet the skills and standards documented here and in the CBOS. SLTs should undertake any training required by their employer. For example: workplace health and safety training, infection control, manual handling, cardiopulmonary resuscitation (CPR) and child protection training. All national, organisational and local legislation must also be adhered to (e.g. police vetting for working with vulnerable people).

Continuing professional development

All practicing SLTs are:

- Encouraged to maintain, update and extend their knowledge through participation in on-going professional development activities.
- Jointly obligated with the service employer to identify individual's training needs and negotiate the most appropriate means of addressing these needs.
- Expected to undertake self-education activities as part of the commitment to professional development such as participation in the CPD recording as part of NZSTA membership.
- Encouraged to share their knowledge and expertise with their colleagues.
- Support others who are expanding the knowledge base of the profession.

Clinical education

All New Zealand and Australian university speech-language therapy/pathology courses equip students with basic skills and knowledge in dysphagia (McAllister et al., 2006). Practical skills in the area of childhood feeding and swallowing difficulties are, however, dependent upon the individual student's clinical placement. Whilst every effort is made to ensure students receive

sound practical skills, individual student's experiences will vary from setting to setting. Students should be provided with the opportunity to observe an experienced SLT conducting a childhood feeding and swallowing assessment and intervention where possible. Students should be provided with the opportunity to participate as much as their skill allows in the assessment, interpretation and management of clients with feeding and swallowing difficulties during their clinical training where possible. For this reason, we strongly encourage practising SLTs to offer student placement opportunities. The supervising SLT may provide the opportunity for students to become clinically competent in the assessment and treatment of feeding and swallowing difficulties, however, they ultimately maintain clinical responsibility for the clients care.

Staff training

SLTs have an important role in contributing to the training of other health professionals in; identifying symptoms of feeding and swallowing difficulties, preparation of appropriate food and drink, environmental adaptations, postural strategies, potential risks associated with unsafe feeding practices and non-compliance with recommendations.

SLTs may train, monitor and supervise others involved in supporting a client with feeding and swallowing difficulties. Training may include: provision of information, demonstration, and supervision or monitoring of practice of other staff about an individual or a group of people with feeding and swallowing difficulties. Training may enable other staff to carry out strategies recommended by the SLT, in order to affect a greater response to that intervention. The SLT has a responsibility to tailor the level of information to the needs and abilities of the person receiving the training. Training should be documented in the clinical notes or elsewhere in writing. SLTs maintain the responsibility for monitoring, supervising and altering the treatment programme.

Leadership and supervision

Experienced clinicians have a role in leadership and supervision. These clinicians will most often have undertaken additional training and may be responsible for specialist and complex caseloads. They may work in specialist clinics or locations across a range of settings. Roles associated with experienced clinicians include (Boaden et al., 2006);

- Teaching, training and supervising others in the identification of feeding/swallowing difficulties.
- Providing a resource for evidence-based practice and to offer consultative second opinions.
- Lead clinical quality improvement activities, audits and research.
- Develop local childhood feeding and swallowing policy and procedures.
- Assist in service delivery and budgeting.
- Lead and facilitate the development of effective interagency relationships to facilitate quality care for children and their families.

It is essential that at every level, throughout his or her entire career, the SLT working with infants and children with feeding and swallowing difficulties receive regular, dedicated, caseload specific supervision. This may take place in a number of different ways, for example; individual, 1:1 supervision with a more experienced colleague; peer supervision, either group or individual; or telephone supervision with a designated individual. Regardless of format, regular supervisory arrangements should be made as they are crucial for ensuring safe practice. Of particular importance is supervision during the development of competency to practise

autonomously. It is essential that a new graduate (entry level) SLT new to the clinical area of childhood feeding and swallowing is supervised by an appropriately qualified and experienced SLT in this clinical area.

Other issues for consideration include appropriate supervision for experienced SLTs and those in independent practice. These practitioners are vulnerable, should be provided with appropriate supervision arrangements, and should not undertake clinical work in feeding and swallowing without supervision. Members of the speech-language therapy workforce have a duty to understand the level at which they are working in childhood feeding and swallowing and to seek out appropriate supervision to support their on-going reflection and development, for the safety of the patient/client and themselves.

(Also see the RCSLT Interprofessional dysphagia framework
<https://www.rcslt.org/members/publications/publications2/Framework.pdf>)

Guidance for Employers

The employer is responsible for ensuring that the roles and responsibilities associated with patients/clients with feeding and swallowing difficulties are clearly detailed in the SLT's job description. Employers have a responsibility to ensure that the supervisor of SLTs undertaking childhood feeding and swallowing work has adequate skills to provide supervision and teaching in this area. Employers also have a responsibility to ensure that adequate time is given for supervision. It is recommended that new graduate (entry level) SLTs and SLTs new to practice in childhood feeding and swallowing receive a minimum of 2 hours supervision per month, although a higher level may be required as determined by the complexity of the clinical caseload and individual needs of the developing therapist. The supervisor should be appropriately qualified and experienced in this clinical area, maintaining their professional development beyond entry level specifically within childhood feeding and swallowing.

If there is no suitable supervisor within the employing organisation, employers may arrange for a supervisor from another organisation, but should ensure that this fits within a professional and clinical governance framework. Again, employers have a responsibility to ensure that the supervisor has adequate skills in this area.

Employers should ensure there are appropriate policy and guidance documents with regard to childhood feeding and swallowing difficulties within the employing organisation. *As with all clinical areas it is advised that employers ensure there is appropriate supervision in place for the supervisor.*

Employers have a responsibility to support SLTs engagement with continuing professional development activities. This is in order for SLTs to work within an evidence based and ethical framework (NZSTA Professional Development Policy).

Part 2. Guidelines for clinical practice

Please refer to the NSW guidelines document for guidelines for clinical practice. In reading the document please use common sense to apply the principles and practices to the NZ context, including amendments to relevant support services and agencies, government ministries and additional documents the guidance refers to.

The following amendments apply:

1. Local and national child protection policies for NZ apply.
2. A NZ Videofluoroscopy Swallow Study guideline is available from the NZSTA.
3. In NZ families are provided with a well-child book from Tamariki Ora (this replaces references to the 'blue book').
4. International Dysphagia Diet Standardisation Initiative replaces the previous Australian texture modification guidelines – more details are below.
5. Karitane and Tresillian services are not available in NZ. Plunket and other local child and parenting providers are available in NZ. PlunketLine can provide support and advice for families and professionals 0800 933 922.
6. Appendix 3, listing NSW services is not relevant and has not been replaced. SLTs are encouraged to identify their own local and national services.
7. SLTs are strongly encouraged to consult with dietitians or other professionals qualified to calculate energy and nutrition requirements. The details in the NSW document are for information only. Registered Dietitians will have access to specific and detailed energy and nutrition information.
8. In NZ, La Leche League is a provider of breastfeeding advice, support and advocacy.
9. <https://www.raisingchildren.org.nz/> is an NZ version of the Raising Children Australia website.

IDDSI

The following text replaces page 42 and 43 of the NSW guideline and any references to the Australian texture modification guidelines. Refer to www.iddsi.org

Thickening of liquids can be defined according to the IDDSI (Cichero et al., 2017);

0 Thin: Flows like water, fast flow, can drink through any type of teat/nipple, cup or straw as appropriate for age and skills.

1 Slightly thick: Thicker than water, requires a little more effort to drink than thin liquids, flows through a straw, syringe, teat/nipple, similar to the thickness of commercially available 'anti-regurgitation' (AR) formula.

2 Mildly thick: Flows off a spoon, sippable, pours quickly from a spoon, effort is required to drink this thickness through standard bore straw (standard bore straw = 0.209 inch or 5.3 mm diameter).

3 Moderately thick liquidised: Will not hold its shape on a spoon, sippable, pours slowly off a spoon, difficult to suck through a standard bore or wide bore straw (wide bore straw = 0.275 inch or 6.9 mm), cannot be piped, layered or moulded, cannot be eaten with a fork because it drops through the prongs.

4 Extremely thick pureed: Holds shape on spoon, flows very slowly under gravity, does not require chewing, could be piped, layered or moulded, no lumps, falls off spoon in a

single spoonful when tilted and continues to hold a shape on a plate, cannot be sucked through a straw, not sticky, liquid does not separate from solid.

More information on the Testing method, using the IDDSI flow test and rationale for specific levels can be found at www.iddsi.org

Solids

Textures of solids are also defined according to the IDDSI. A combination of tests may be required to determine which category a food fits into. Testing methods are; the fork drip test, spoon tilt test, fork and spoon pressure test, chopstick test and finger test. Please see www.iddsi.org for specific details of tests. The textures of solids are defined as follows.

3 *Liquidised*: Drips slowly or in dollops/strands through the tines/prongs of a fork (corresponds to level 3 moderately thick fluids).

4 *Pureed*: Sits in a mound or pile above the fork, a small amount may flow through and form a tail below the fork, does not flow or drip continuously through the fork prongs. The spoon tilt test can also be done to determine the stickiness of the food and the ability for it to hold together (corresponds to level 4 extremely thick fluids).

For soft, hard or firm food, the fork has been chosen to assess food texture as it can be used for assessment of hardness, shape and particle size:

5 *Minced & Moist*: Food should be able to be easily minced or mashed with a fork. It may be presented as a thick puree with obvious lumps in it. Food should be moist and should easily form into a ball in the mouth. For determining particle size safety for infants, samples that are smaller than the maximum width of the child's fifth fingernail should not cause a choking risk as this measurement is used to predict the internal diameter of an endotracheal tube in the paediatric population (Turkistani, Abdullah, Delvi, & Al-Mazroua, 2009). For adults, the slots/gaps between the fork prongs of a standard metal fork typically measure 4 mm and particles should be no larger.

6 *Soft & Bite-Sized*: A maximum of 1.5 x 1.5 cm particle size is recommended for adults which is the entire width of a standard fork and 8 mm for children to reduce risk of asphyxiation from choking on a food. To assess whether a food is soft or hard the fork pressure test can be done. See IDDSI for full details.

7 *Regular*: Can determine whether hard or soft by doing a fork pressure test.

Transitional food textures: minced & moist, soft & bite sized, and regular foods can be transitional food texture which means they start as one texture and change to another texture when moisture (e.g. water or saliva) is applied, or when a change of temperature occurs (e.g. heating). These foods are often called bite and dissolve (e.g. Baby mum-mum crackers, cruskits) or meltables (e.g. ice blocks, chocolate).

This texture is used in developmental teaching of chewing or rehabilitation of chewing skills (Gisel, 1991). Use a sample the size of the thumb nail (1.5 cm x 1.5 cm), place 1 ml of water on the sample and wait one minute. Apply fork pressure using the base of the fork until the thumbnail blanches to white. The sample should be squashed and disintegrated and no longer look like its original state when the fork has been lifted, the sample breaks apart completely by rubbing the sample between the thumb and index finger and does not return to its initial shape, or it has melted significantly and no longer looks like its original state (e.g. ice chips).

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Feeding Difficulties in Children - A Guide for Allied Health Professionals

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Summary Feeding Difficulties in Children, A Guide for Allied Health Professionals provides direction to clinicians and is aimed at achieving the best possible paediatric care in all parts of the state. The guideline reflects what is currently regarded as a safe and appropriate approach to the management of children with feeding difficulties.

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FEEDING DIFFICULTIES IN CHILDREN - A GUIDE FOR ALLIED HEALTH PROFESSIONALS

PURPOSE

Feeding Difficulties in Children - A Guide for Allied Health Professionals provides recommendations, information and guidance to support the clinical decision making of allied health professionals regarding the management of children with feeding difficulties. The guideline was prepared for the NSW Ministry of Health by an expert clinical reference group under the auspice of The Office of Kids and Families and is aimed at achieving the best possible paediatric care in all parts of the state.

KEY PRINCIPLES

The guideline reflects what is currently regarded as a safe and appropriate approach to the management of children with feeding difficulties. However, as in any clinical situation there may be factors which cannot be covered by a single set of guidelines. This document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. **It does not replace the need for the application of clinical judgement to each individual presentation.**

As in any clinical situation and due to the heterogeneous nature of feeding difficulties, there are factors that cannot be covered by a single guide. Clinicians and clients need to develop individual treatment plans that are tailored to the specific needs and circumstances of the client. This guideline should be read in conjunction with other relevant guidelines, position papers, codes of conduct, and policies and procedures, at professional, organisational and Local Health District levels.

USE OF THE GUIDE

Chief Executives must ensure:

- This guideline is adopted or local protocols are developed based on *Feeding Difficulties in Children - A Guide for Allied Health Professionals*
- Local protocols are in place in all hospitals and facilities likely to be required to care for children experiencing difficulties with feeding
- Ensure that all staff treating paediatric patients are educated and supported in the use of the locally developed paediatric protocols.

Directors of Clinical Governance are required to inform relevant clinical staff treating paediatric patients of this revised guideline.

REVISION HISTORY

Version	Approved by	Amendment notes
February 2016 (GL2016_007)	Deputy Secretary, Strategy and Resources	New guideline

ATTACHMENT

1. *Feeding Difficulties in Children - A Guide for Allied Health Professionals: Guideline.*

Office of Kids and Families

FEEDING DIFFICULTIES IN CHILDREN

A GUIDE FOR ALLIED HEALTH PROFESSIONALS



Health

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CONTENTS

1	Introduction	3
1.1	Background	3
1.2	Development of the guide	4
1.3	Objectives of the guide	4
1.4	Scope of the guide	5
1.5	Who should use the guide?	5
2	How to use the guide	7
2.1	Assessment, Management, Review Cycle	7
3	Key principles of practice	9
3.1	Child protection	9
3.2	Family-centred practice	9
3.3	Team approach	10
3.4	Cultural consideration	10
3.5	Supporting breastfeeding and provision of breast milk	10
4	Assessment	11
	Question 1: Is current method of feeding safe?	13
	Question 2: Is feeding adequate?	15
	Question 3: Is feeding efficient?	17
	Question 4: Is feeding developmentally appropriate?	18
	Question 5: Is feeding a positive experience for child and parent?	19
5	Feeding Assessment Summary	21
	Key Issues and Observations	22
	Goals and Strategies	25
6	Management	27
6.1	Feeding skill development	29
6.2	Facilitating safe swallowing	39
6.3	Dietary management to improve oral nutritional intake	48
6.4	Enteral feeding	57
6.5	Transition from tube to oral feeding	67
6.6	Oral hygiene and dental health	72
6.7	Seating and positioning	76
6.8	Feeding environments and routines	83
6.9	Sensory processing	88
7	References	93
8	Appendices	97
	Appendix 1: Paediatric Feeding Clinical Practice Guideline Working Party – Membership (2011-2014)	98
	Appendix 2: Paediatric feeding professional roles and agencies	99
	Appendix 3: NSW paediatric feeding teams and clinics	103
	Appendix 4: Energy supplements	104
	Appendix 5: Worked example for calculating a concentrated formula using formula alone	105
	Appendix 6: Worked example for calculating a formula using a carbohydrate supplement	107
	Appendix 7: Formula selection for enteral feeding	110
	Appendix 8: Tube feeding schedules/regimens for enteral feeding	113
	Appendix 9: Feeding equipment	115

1. INTRODUCTION

1.1 BACKGROUND

In addition to its primary role of providing nutrition to support growth and development, a positive feeding experience takes place in an environment of socialisation, communication, sharing and nurturing. Likewise, the mealtime comprises the family and child, in the context of the broader community and culture¹.

A feeding difficulty may present as difficulty at any level of the feeding process which encompasses all aspects of the child's developmental feeding skills, oral motor skills, nutritional requirements, environment, interaction with carers or sensory processes. Feeding difficulties commonly develop as a result of a variety of circumstances that occur early in a child's life. Examples of complex and non-complex paediatric cases are listed in Table 1.

TABLE 1: COMPLEX VS. NON-COMPLEX CASES²

Complex cases	Multisystem involvement (gut, respiratory, cardiac, renal, metabolic, neurological) Long-term tube dependency Tracheostomy Significant anatomical abnormalities High aspiration risk or known aspiration Oral feed refusal causing risk to adequate nutrition or hydration Medically unstable or acute Failure to thrive Social issues that pose risk to safety of child
Non-complex cases	Healthy neonate or infant with isolated feeding difficulty. For example: Bottle feeding or breast feeding or texture transition difficulty Fussy eater, sensory issues, mealtime management issues Isolated cleft lip or palate Faltering growth Oral feeding skills optimisation in children with disability or developmental delays

Dysphagia is the medical term for difficulty, or inability to move a substance from the mouth to the stomach. Dysphagia may present as difficulty with sucking, swallowing, drinking, chewing, eating, controlling saliva, taking medication, or protecting the airway. Dysphagia can occur at any time during the lifespan and may be short or long term. The most common causes of dysphagia are related to underlying medical or physical conditions. However, it is recognised that dysphagia can also manifest in psychological or psychiatric conditions³.

Managing feeding difficulties can be complicated and frustrating for health professionals and parents, with variable progression. Progress may depend on the timing of intervention, social background and cultural beliefs in addition to the underlying complexity of the child's health condition and/or presence of additional comorbidities such as developmental delay, failure to thrive or iron deficiency.

Clinical practice suggests that children with feeding difficulties are a rapidly expanding caseload amongst allied health professions across NSW. Increasing presentations of clients with feeding issues, the complexity of the caseload and expertise required for appropriate management places a burden of costs on the health service. The consequences of inaction and/or inappropriate management may include illness, hospital admission, malnutrition, prolonged tube feeding, developmental delay, psychosocial issues and family stress.

This guide covers assessment and management principles for children with a range of presenting problems and aetiologies, varying from non-complex cases (e.g. fussy eaters) to complex cases (e.g. children with feeding difficulties related to medical diagnoses across multiple body systems).

1.2 DEVELOPMENT OF THE GUIDE

The guide was initiated in response to survey results from NSW Health allied health professionals who work with children, requesting further education and guidance with regards to the assessment and management of children with feeding difficulties.

The Paediatric Feeding Clinical Practice Guideline Working Group was established to facilitate the development of an evidence-based paediatric feeding clinical practice guide, as an initiative of the NSW Child Health Network Allied Health Education and Clinical Support Program. Members of the working group were initially identified through an expression of interest process, with additional members invited to join the group as required. Group membership included speech pathologists, dietitians, occupational therapists and a psychologist from the NSW tertiary children's hospitals, non-tertiary hospitals and NSW Department of Ageing, Disability and Home Care. The working group was chaired and provided secretariat support by the Children's Healthcare Network, Allied Health Educators.

The scope of the guide was determined by the working group. Initially, a search was undertaken to identify any existing evidence-based guidelines which could be adapted for local use. In the absence of this, a list of clinical questions that would be addressed in a guide for the assessment and management of paediatric feeding difficulties was developed, and systematic searches were undertaken to identify answers. A broad review of both published and unpublished literature was completed from national and international sources. Where supporting literature was identified, the working group made recommendations based on the evidence, integrated with clinical expertise. Reference to supporting evidence is incorporated throughout the guide. Where evidence was not found the working group made a consensus recommendation based on clinical expertise. Research literature is supplemented by reference to published clinical guidelines and clinical consensus.


Critical review of the available research literature indicated that the majority were group or single subject design studies of Level III-V (American Academy of Cerebral Palsy and Developmental Medicine). An evidence classification scale was initially applied to the identified literature with consistent ratings at a moderate level. As a result, the working group decided that the classification scale added no value to the guide and it was not included.

It is intended that this guide is updated every five years in order to reflect any changes in evidence related to the assessment and management of children with feeding difficulties.

1.3 OBJECTIVES OF THE GUIDE

The guide provides recommendations, information and guidance to support the clinical decision making of allied health professionals in services provided by NSW Health regarding the management of children with feeding difficulties. The guide aims to:

- Optimise quality of care and health outcomes for children with feeding difficulties
- Optimise psychosocial outcomes in families
- Facilitate a consistent approach to management of children with feeding difficulties as close to home as possible
- Facilitate productive communication among professionals and with families
- Facilitate processes for quality improvement.

 **Appendix 1: Paediatric Feeding Clinical Practice Guideline Working Party Membership (2011-2015) (page 98)**

The guide will achieve this by:

- Providing recommendations that reflect best practice
- Providing an education and information resource for health professionals
- Outlining roles of the clinical disciplines within paediatric feeding
- Promoting a family-centred and multidisciplinary team approach to assessment and intervention.

As in any clinical situation and due to the heterogeneous nature of feeding difficulties, there are factors that cannot be covered by a single guide. Clinicians and clients need to develop individual treatment plans that are tailored to the specific needs and circumstances of the client. This guide should be read in conjunction with other relevant guidelines, position papers, codes of conduct, and policies and procedures, at professional, organisational and Local Health District levels.

1.4 SCOPE OF THE GUIDE

This guide applies to children with feeding difficulties from term at time of assessment to 12 years of age, with reference to feeding skills and anthropometric measures.

The guide will focus on providing a framework for the assessment and management of presenting issues, rather than specific diagnostic groups. Clinicians working with particular diagnostic groups should refer to other more specifically related documents together with specialists in these areas.

1.5 WHO SHOULD USE THE GUIDE?

This guide can be used by allied health professionals working individually or as part of a formal or informal feeding team. Allied health professionals who may utilise this guide include (but are not limited to):

- Dietitians
- Speech pathologists
- Occupational therapists
- Psychologists
- Physiotherapists
- Social workers.

The topics and content of the guide are relevant for allied health professionals across a variety of settings including: community, disability, acute and rehabilitation hospital settings in metropolitan, regional, rural, and remote areas of NSW.

Clinicians should recognise and acknowledge their limitations and not work beyond the scope of their competence. Where skill is lacking, appropriate training, supervision and mentoring should be sought.

Allied health professionals must meet the standard of a reasonably competent and experienced practitioner, as defined by their professional standards, providing allied health services for children with feeding difficulties. Accordingly, an allied health professional who is aware that they lack the required level of skill in the area of paediatric feeding should seek further advice and guidance. This may involve requesting support from a more experienced allied health professional within their discipline, their employing body or their service provider, or the advice of an established specialised paediatric feeding team.

Allied health professionals should be aware of recent literature in their field, current best practices, relevant clinical competencies and their professional Code of Ethics.



[Appendix 2: Paediatric feeding professional roles and agencies \(page 99\)](#)

The guide provides sufficient level of detail that clinicians may be clear as to the considerations required for effective clinical reasoning, decision making and provision of service in the area of feeding difficulties inclusive of enteral feeding. It is intended that where adequate resources are not available in the local setting, the guide may be used to identify the need for onward referral or collaboration with more specialised services.



[Appendix 3: NSW paediatric feeding teams and clinics \(page 103\)](#)

2. HOW TO USE THE GUIDE

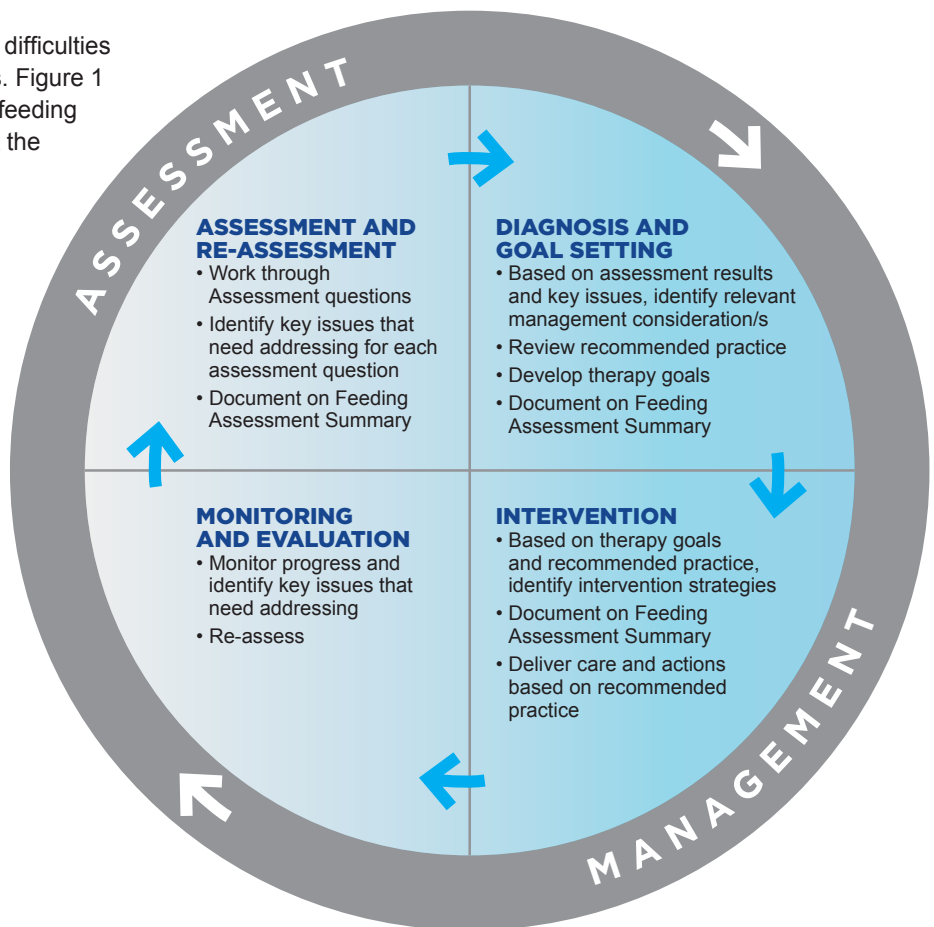
2.1 ASSESSMENT, MANAGEMENT, REVIEW CYCLE

Assessment and management of feeding difficulties in children is an ongoing, cyclical process. Figure 1 reflects the cyclical process of paediatric feeding management. The inner quadrants depict the four distinct, but interrelated steps in the paediatric feeding care cycle.

The dot points provide detail regarding the actions recommended in each quadrant. The outer ring identifies the components of the guide that relate to the steps, including:

- Assessment (page 11)
- Feeding Assessment Summary (page 21)
- Management (page 27)

FIGURE 1: PAEDIATRIC FEEDING CARE CYCLE⁴



3. KEY PRINCIPLES OF PRACTICE

A child's feeding may be influenced by a range of individual, physiological, social and environmental factors. Intervention should be child-focused, ensuring that feeding difficulties are not considered in isolation. Health service provision must be tailored according to the specific needs of each individual child, their family and environment.

It is agreed that the following key principles should underpin the practice of clinicians throughout the assessment and management of children with feeding difficulties.

3.1 CHILD PROTECTION

Child protection is a key issue for consideration when working with families that have complex needs⁵. The role of the professional is to ensure the service is child-focused, with the safety and wellbeing of the child being of paramount concern. Health workers are uniquely placed to support families and communities and promote the development of a safe and healthy environment for all children and young people. It is therefore, essential for allied health professionals to work collaboratively within multidisciplinary teams for the safety, welfare and wellbeing of children, young people and their carers.



NSW Government 'Keep Them Safe'
www.keepthemsafe.nsw.gov.au



NSW Health (2013). Child Wellbeing and Child Protection Policies and Procedures for NSW Health,
[www.kidsfamilies.health.nsw.gov.au/publications/fact-sheet-child-wellbeing-and-child-protection-policies-and-procedures-for-nsw-health-\(1\)/](http://www.kidsfamilies.health.nsw.gov.au/publications/fact-sheet-child-wellbeing-and-child-protection-policies-and-procedures-for-nsw-health-(1)/)



NSW Health (2006). New South Wales interagency guidelines for child protection intervention,
www.community.nsw.gov.au/kts/guidelines/info_exchange/introduction.htm

3.2 FAMILY-CENTRED PRACTICE

When working with children with feeding difficulties a family-centred approach plays an integral role in realising their goals. Families, carers and the client require support, information, reassurance and appreciation for their efforts⁶. The role of the professional team is to provide family members with this support, as well as adequate information and education, and then to work with them to achieve what they decide are their priorities⁷.

For the purposes of this guide, the term 'parent' will be used to refer to any individual who takes on the role of caring for a child.

3.3 TEAM APPROACH

A multidisciplinary team approach (whether in a format of multidisciplinary, interdisciplinary or transdisciplinary)⁸, is considered as best practice when working with individuals who have complex needs. The benefits of multidisciplinary team management include reductions in aspiration risk, feeding difficulties and mortality, and improvement in nutrition².

A multidisciplinary team approach may not be feasible in all settings, due to geographical, financial, organisational and time restraints. However, it is recommended that where possible, all disciplines involved with the individual work together in a family-centred model to meet the needs and goals of the individual and their family. Clinicians who do not work as part of a team are encouraged to seek support from other disciplines to facilitate the provision of as holistic a service as possible. This support may be from within their organisation, geographical area, specialist services or tertiary facility.

Children with feeding difficulties should be under the management of a relevant medical officer, to oversee the child's care and act as a central point of coordination.

3.4 CULTURAL CONSIDERATION

A culture incorporates the collection of beliefs and traditions associated with a specific group. It can guide the types of food that a family eats as well as the role of food and mealtimes. Many subcultures have their own values and influences as well as definitions of appropriate behaviour for children at mealtimes¹. Clinicians should respect individual family dynamics, child-rearing practices and community beliefs. It is vital to gain an understanding of these influences before attempting to initiate any change to feeding skills, routines or environments.

3.5 SUPPORTING BREASTFEEDING AND PROVISION OF BREAST MILK

Numerous studies have demonstrated the importance of breastfeeding for mothers and infants. In 2001 the report of a World Health Organisation Expert Consultation recommended exclusive breastfeeding for about six months, with introduction of complementary foods and continued breastfeeding after that⁹. In Australia the wording has been to recommend exclusive breastfeeding to 'around six months' of age¹⁰. Although infants should still be managed individually so that insufficient growth or other adverse outcomes are recognised and appropriate interventions are provided, the available evidence demonstrates no apparent risks in recommending, as a general policy, exclusive breastfeeding for the first six months of life. Breastfeeding has longstanding health benefits for the infant and brings health benefits to the mother. It also offers economic benefits to the family and to society¹⁰.

Breastfeeding is not achievable for some mothers and infants. In this situation, mothers should be supported in coming to terms with this and determining a feeding method that is both achievable and desirable to them. This may include expressing breast milk and then bottle feeding the infant.

4. ASSESSMENT

A thorough assessment provides the basis for the development of a comprehensive management plan to facilitate the best possible safety and function of feeding for the child¹¹.

Effective feeding assessments are very detailed and require the collection of all relevant information. Feeding assessments can often take more than one hour or continue over more than one appointment. A multidisciplinary team approach is considered best practice.

Information gathered about the individual may include medical history, social history, feeding history, medications taken, current dietary intake, a feeding observation and growth assessment.



SENSITIVE ASSESSMENT OF FEEDING ISSUES:

Parents of children with feeding difficulties may be experiencing high levels of emotional distress. It is essential that health professionals are mindful of parental feelings, thought patterns and behaviours, as well as the relationship with their child. An assessment process that is not empathic may contribute to parents feeling criticised and/or disengaging with the feeding service.



MEDICAL STABILITY FOR ORAL EXPERIENCES:

In children who have been medically unstable, or non-oral for a considerable period, a request or referral to initiate oral feed trials should come from a medical officer.

To be considered medically stable for oral experiences and feed trials, children need to be:

- Medically stable as per a medical officer
- At least 32 weeks gestation
- Off ventilation for at least 24 hours
- Able to maintain a resting respiratory rate of less than/equal to 80 with no respiratory distress cues
- Maintaining wakeful periods – quiet alert state
- Managing secretions (oral and pharyngeal).

Oral feeding progress can change from feed to feed and day to day and monitoring/ reassessment is crucial.

Feeding assessment – five questions

A thorough feeding assessment will involve finding answers to the following five questions:

1. Is the current method of feeding safe?
2. Is feeding adequate?
3. Is feeding efficient?
4. Is feeding developmentally appropriate?
5. Is feeding a positive experience for child and parent?

The questions included in this assessment are designed to be followed from top to bottom reflecting the priority order of identifying and addressing feeding problems. The questions and considerations included are aimed at supporting a thorough feeding assessment, rather than being used as a checklist. Clinicians should complete the assessment considering the client context and their individual scope of practice.

Clinicians need to identify areas for management based on the combined results of the feeding assessment framework, rather than isolated issues from individual questions.

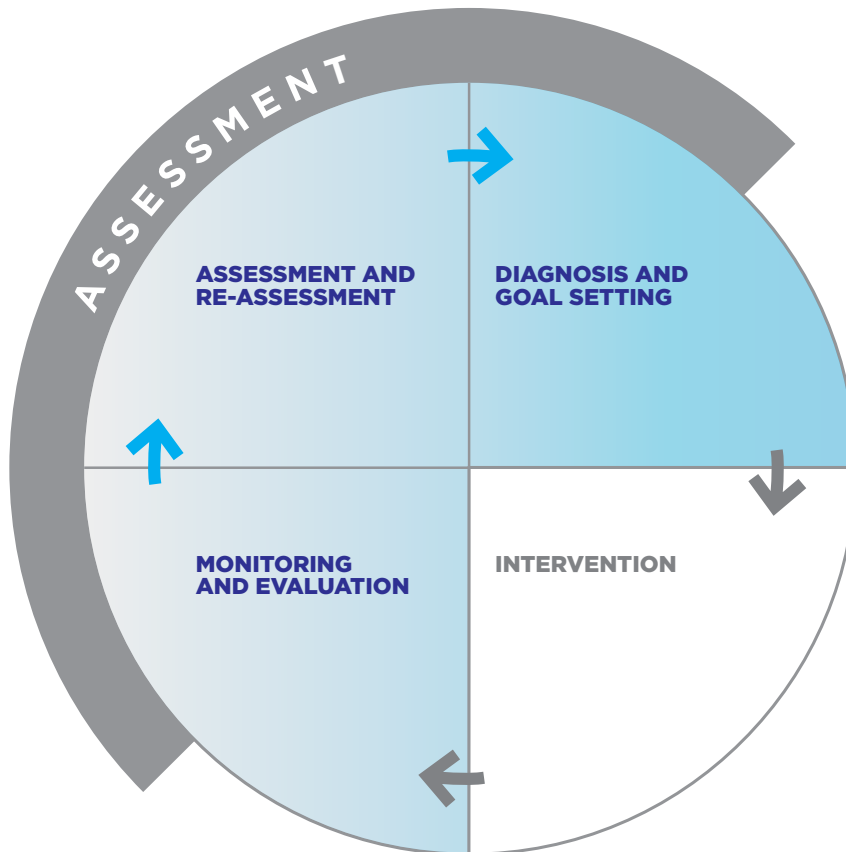
The Feeding Assessment Summary Proforma on page 22 may be used by clinicians to progressively record issues identified and management considerations for each of the five assessment questions.

In summary, as outlined in the paediatric feeding care cycle, assessment and reassessment involves:

- Working through assessment questions.
- Identifying key issues that need to be addressed for each assessment question.
- Documenting on Feeding Assessment Summary (page 21).



Refer to Assessment, Management, Review Cycle (page 7)



QUESTION 1: IS CURRENT METHOD OF FEEDING SAFE?

How to determine if feeding is safe?

KEY QUESTION:

Are there reported or observed indications of the child not tolerating the current method of (oral and/or tube) feeding?



INDICATORS THAT CHILD IS AT RISK OR MAY BE ASPIRATING:

Any observation of the following should be referred to a speech pathologist for further assessment.

Possible red flags (consider secretions, solids eaten and liquids taken orally or by tube):

- Overt signs: choking, gagging, coughing, refusing to feed, wet or gurgly voice during/after feeding, hoarse voice, drooling/pooling of secretions, apnoeas/desaturations with feeds, noisy breathing, physiological instability
- Subtle signs: watery eyes, nasal flaring, colour changes, sudden state or tone changes, ongoing need for supplemental oxygen or increased oxygen needs, frequent respiratory illness, poor weight gain, minimal oral intake/lengthy feed times, fatigue with feeding.



For an extensive list refer to Wolf LS & Glass RP (1992)¹².

CONSIDER:

- Information provided by the medical team and from your case history and feeding observation (where appropriate). Take into account underlying diagnosis, medications, current symptoms and how this may impact feeding:
 - Aspiration – chest status including frequency of chest infections, previous Video Fluoroscopic Swallow Study or VFSS (previously known as Modified Barium Study or MBS) results/recommendations
 - Level of alertness
 - Neurological status
 - Cardiac condition
 - Respiratory patterns (oxygen requirements, noisy breathing, colour, apnoea or desaturations, state or alertness, assess for changes during and after feeds)
 - Tone
 - Gestational age
 - Gastrointestinal functioning
 - Anatomical abnormality, e.g. cleft
 - Differences across feeding environments, e.g. home, childcare, school
 - Developmentally appropriate positioning of child during feeding
 - Modifications, equipment and techniques currently used for feeding, e.g. syringe feeding, dream feeding
 - Oral and dental hygiene.

Is current method of feeding safe?

YES	NO – Management considerations
<p>Go to Question 2: 'Is feeding adequate?'</p>	<p>Document assessment results on Feeding Assessment Summary form, including:</p> <ul style="list-style-type: none"> • Do you need to refer to an appropriate agency? <ul style="list-style-type: none"> ○ Document subtle or overt signs observed and medical status, then liaise with medical team regarding further appropriate assessment/referral ○ Primary referral to a speech pathologist with experience in paediatric dysphagia management ○ Need for Videofluoroscopic Swallow Study (in accordance with Speech Pathology Australia Videofluoroscopic Swallow Study Clinical Guideline, 2013). <p>Refer to Appendix 3: NSW paediatric feeding teams and clinics (page 103)</p> <ul style="list-style-type: none"> ○ Consider referral to dietetics and occupational therapy <p>Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)</p> <ul style="list-style-type: none"> • What are the key issues that need to be addressed? <p>Go to Question 2: 'Is feeding adequate?'</p>

RESOURCES

Arvedson JC, 'Assessment of Pediatric Dysphagia and Feeding Disorders: Clinical and Instrumental Approaches.' *Developmental Disabilities Research Reviews*, 2008;14:118-27.¹¹

This paper discusses the assessment of infants and children with dysphagia and feeding disorders addressing the status of feeding in the child, considerations including health status, broad environment, parent-child interactions, and parental concerns. An interdisciplinary team approach is presented to allow for coordinated global assessment and management decisions.

MIMS Online - Drug Interactions

www.mimsonline.com.au.acs.hcn.com.au/Search/Search.aspx

MIMS Online provides a wide range of Australian medicines information – full product information, abbreviated product information, drug/drug interaction module and pill identification.

Speech Pathology Australia, Dysphagia. Clinical Guideline, 2012.²

www.speechpathologyaustralia.org.au

This guideline reflects available evidence, issues and current clinical practice as it presents at time of release. It contains minimum standards of practice and provides a guideline for speech pathologists assessing, treating and managing clients with dysphagia.

Speech Pathology Australia, Clinical Guideline. Videofluoroscopic Swallow Study, 2013.

www.speechpathologyaustralia.org.au

This clinical guideline provides evidence based guidelines for the assessment and management of clients with dysphagia using the Videofluoroscopic Swallow Study (VFSS). The clinical guideline was developed to ensure comprehensive evidence based information on VFSS is available as a standard for all speech pathology services and practising clinicians.

Wolf LS, Glass RP, Feeding and Swallowing Disorders in Infancy, 1992.¹²

This book presents a comprehensive, multidimensional approach to feeding problems to assist the clinician in acquiring the knowledge and skills to take an active and effective part in the assessment and management of infant feeding. It contains detailed descriptions of feeding impairments and therapy examples of individual infants and well-detailed, problem-driven models and treatment strategies.

QUESTION 2: IS FEEDING ADEQUATE?

How to determine if feeding is adequate?

KEY QUESTION:

Is growth and nutritional intake appropriate for age and medical condition?




HYDRATION:

If there are acute concerns regarding hydration status, refer to a medical officer immediately. Signs or symptoms of dehydration may include reduced urine output, dry mucous membranes, abnormal respiratory pattern, lethargy, reduced skin turgor and sunken eyes¹³.

CONSIDER:

- Are linear and weight measurements indicative of optimal growth for age and clinical background using an appropriate tool for growth comparison (may need disease specific growth charts)?
- Medical factors that may require additional nutritional considerations, e.g. excessive losses of vomit, stool or urine; malabsorption; food allergies; increased work of breathing; seizures; drug-nutrient interaction; cardiac defects
- What is the child's level of fluid intake compared with requirements?
- Is urine and stool output – adequate, inadequate, excessive, e.g. diarrhoea, straining, constipation, dry nappies?
- Are biochemical parameters within normal range, e.g. iron deficiency?
- Is intake nutritionally adequate – energy, fluid, protein, iron, calcium, food groups?
- Oral, enteral and parenteral intake when determining adequacy
- Dietary restrictions (prescribed or parent initiated)
- Any differences between parent perceptions of adequacy and your professional opinion?

Is feeding adequate?

YES	NO – Management considerations
<p>Go to Question 3: 'Is feeding efficient?'</p>	<p>Document assessment results on Feeding Assessment Summary form, including:</p> <ul style="list-style-type: none"> • Do you need to refer to an appropriate agency? <ul style="list-style-type: none"> ○ Primary referral to a dietitian with experience in paediatric feeding management ○ Consider referral to: speech pathologist, specialist medical practitioner (e.g. gastroenterologist, immunologist, respiratory physician etc.), psychologist, social worker, paediatrician, occupational therapist, child and family health nurse, general practitioner, continence advisor, physiotherapist, lactation consultant. <p> Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)</p> <ul style="list-style-type: none"> • What are the key issues that need to be addressed? <p>Go to Question 3: 'Is feeding efficient?'</p>

RESOURCES

National Health & Medical Research Council (NHMRC), *Australian Guide to Healthy Eating*, 2013.

www.nhmrc.gov.au/guidelines/search

The Australian Guide to Healthy Eating is a food selection guide which visually represents the proportion of the five food groups recommended for consumption each day.

National Health & Medical Research Council (NHMRC), *Australian Dietary Guidelines*, 2013.¹⁴

www.nhmrc.gov.au/guidelines/search

The Australian Dietary Guidelines use the best available scientific evidence to provide information on the types and amounts of foods, food groups and dietary patterns that aim to:

- *promote health and wellbeing*
- *reduce the risk of diet-related conditions*
- *reduce the risk of chronic disease.*

National Health & Medical Research Council (NHMRC) & New Zealand Ministry of Health, *Nutrition Reference Values for Australia and New Zealand*.¹⁵

www.nrv.gov.au/

The Nutrient Reference Values outline the levels of intake of essential nutrients considered to be adequate to meet the known nutritional needs of practically all healthy people for prevention of deficiency states. The document can be used by health professionals to assess the likelihood of inadequate intake in individuals or groups of people.

NSW Health, *Personal Health Record (Blue Book)*.

[www.kidsfamilies.health.nsw.gov.au/publications/child-personal-health-record-\(blue-book\)/](http://www.kidsfamilies.health.nsw.gov.au/publications/child-personal-health-record-(blue-book)/)

The Personal Health Record (known as the 'Blue Book') is an important book for parents and children in NSW. It records a child's health, illnesses, injuries, and growth and development; and contains valuable health information that will remain useful throughout their life. This book provides a very useful reference for all allied health clinicians working with children within NSW. It provides a useful tool that allied health professionals can use to share contact details and progress with parents, doctors and specialist centres.

NSW Kids and Families, *Infants and Children: Management of Acute Gastroenteritis Clinical Practice Guideline*, 2014.¹³

This clinical practice guideline reflects what is currently regarded as a safe and appropriate approach to the acute management of gastroenteritis in infants and children. This includes details regarding clinical assessment of dehydration and initial treatment.

Shaw V, Lawson M, *Clinical Paediatric Dietetics*, 2007.¹⁶

This manual provides a practical approach to the nutritional management of a variety of paediatric nutritional disorders that may be ameliorated or resolved by dietary manipulation.

University of Washington, *Assessing Nutritional Status – Specialty Growth Charts. Assuring Pediatric Nutrition in the Community*.

www.depts.washington.edu/nutrpeds/fug/growth/specialty.htm

Growth data of children with specific conditions have been compiled into charts. These data are typically cross-sectional, and the charts are based on small groups of children. These charts are useful for comparing individual children to other children with similar diagnoses, but should not be used alone. Rather, data should be plotted on Centre for Disease Control (CDC) charts, then on specialty charts. Weight for length (or Body Mass Index – BMI) is not available on many of these specialty charts and must be plotted on CDC charts. It is important to remember that the children used to compile these charts may not have been adequately nourished. Thus, weights may be higher or lower than what is ideal.

QUESTION 3: IS FEEDING EFFICIENT?

How to determine if feeding is efficient?


KEY QUESTION:

Are nutrition requirements being provided in a reasonable, sustainable, achievable timeframe?

CONSIDER:

- Routine – including sleep patterns and other developmentally appropriate activities
- Timing, pacing and duration of meals/feeds
- Quantity of food offered vs. eaten – is there a mismatch between parent expectation and child's ability and/or requirements
- Impact of medications on feeding regimen (timing, frequency, alertness)
- Recurrent illness – interfering with meeting targets.
- Sensory/learned experiences, e.g. pain associated with feeding
- Enteral feeding methods – where and how administered (bolus, continuous)?
- Feeding in other settings, e.g. school.

Is feeding efficient?

YES	NO – Management considerations
<p>Go to Question 4: 'Is feeding developmentally appropriate?'</p> 	<p>Document assessment results on Feeding Assessment Summary form, including:</p> <ul style="list-style-type: none"> • Do you need to refer to an appropriate agency? <p>Dietitian, speech pathologist, psychologist, social worker, paediatrician, occupational therapist, child and family health nurse, general practitioner, continence advisor, physiotherapist, lactation consultant, Karitane, Tresillian</p> <p>Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)</p> <ul style="list-style-type: none"> • What are the key issues that need to be addressed? <p>Go to Question 4: 'Is feeding developmentally appropriate?'</p>

RESOURCES

Karitane

www.karitane.com.au/

Karitane provides support, guidance and information to families experiencing parenting difficulties right across NSW.

Tresillian

www.tresillian.org.au/

Tresillian is a Sydney based health service specifically designed to support parents in caring for their babies and young children. It is Australia's largest child and family health organisation providing expert parenting advice to families during the early years.

QUESTION 4: IS FEEDING DEVELOPMENTALLY APPROPRIATE?

How to determine if feeding is developmentally appropriate?


KEY QUESTIONS:

What is the child's developmental age?


Is the child's developmental age and ability taken into account during feeding?

CONSIDER:

- Exposure to feeding that is developmentally appropriate
- Gross and fine motor skills – tone, posture
- Communication development and cognitive skills
- Sleep patterns
- Behaviour at mealtimes and generally
- Flexibility of parents to respond to their child differently when child is less alert, tired or upset
- Cultural feeding practices
- Self-feeding ability – food and fluid
- Range of foods (including textures) and fluids offered vs eaten – is there a mismatch between skill and food/drinks offered
- Feeding environment – positioning, where seated (orally fed/tube fed), e.g. lap, stroller, high chair
- Time engaged with feeding
- Opportunity to get messy/explore food.

 Refer to Table 2: Developmental and oral motor skills associated with feeding progression (page 36)

Is feeding developmentally appropriate?

YES	NO – Management considerations
<p>Go to Question 5: 'Is feeding a positive experience for child and parent'</p> <p></p>	<p>Document assessment results on Feeding Assessment Summary form, including:</p> <ul style="list-style-type: none"> • Do you need to refer to an appropriate agency? Speech pathologist, occupational therapist, child and family health nurse, psychologist, social worker, paediatrician, dietitian, general practitioner, physiotherapist, lactation consultant, Karitane, Tresillian <p>Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)</p> <ul style="list-style-type: none"> • What are the key issues that need to be addressed? <p>Go to Question 5: 'Is feeding a positive experience for child and parent?'</p>

RESOURCES

NSW Health, Personal Health Record (Blue Book)

[www.kidsfamilies.health.nsw.gov.au/publications/child-personal-health-record-\(blue-book\)/](http://www.kidsfamilies.health.nsw.gov.au/publications/child-personal-health-record-(blue-book)/)

The Personal Health Record (known as the 'Blue Book') is an important book for parents and children in NSW. It records a child's health, illnesses, injuries, and growth and development; and contains valuable health information that will remain useful throughout their life.

This book provides a very useful reference for all allied health clinicians working with children within NSW. It provides a useful tool that allied health professionals can use to share contact details and progress with parents, doctors and specialist centres.

Raising Children Network, The Australian Parenting Website

www.raisingchildren.net.au/development/babies_development.html

This website provides evidence-informed information and resources for parenting. Raising Children Network's member organisations are the Parenting Research Centre and the Murdoch Children's Research Institute with The Royal Children's Hospital Centre for Community Child Health who work in partnership to provide information that can help parents with the day-to-day decisions of raising children.

QUESTION 5: IS FEEDING A POSITIVE EXPERIENCE FOR CHILD AND PARENT?

How to determine if feeding is a positive experience?

KEY QUESTIONS:

Are there issues in the relationship between child and parent that affect the mealtime experience?

Are there broader relationship issues between child and parent evident during non-mealtime interactions?

Can you identify the reason why feeding is difficult?

CONSIDER:

- Use open ended questions to explore mealtime
- Observe the child and parent during mealtime. Use home videos and observation to assist with gathering information around a 'usual meal'
- Obtain information about:
 - Where the child is fed
 - What's going on in the background
 - How the child is seated/positioned
 - Who is present and eating with the child
 - Mealtime communication
 - Child's reaction when given cues for mealtime and when food/feed is presented
 - Whether the child demonstrates hunger cues, shows interest in food, appears engaged, actively participates
 - Opportunity for self-feeding and messy play/food exploration
 - Length of meal times
 - Child's overall presentation, e.g. fussy, irritable, stressed, relaxed, drowsy, exhausted, early satiety
 - Signs of pain or discomfort during feeding
 - Behaviour changes with feeding
 - Parent's experience and presentation during meal time: is the parent stating or demonstrating feeling stressed, relaxed, engaged, overwhelmed, hopeless, exhausted by feeding/meal times? Are difficult feelings limited to mealtimes, or a broader experience?
 - Presence of problematic interactions during mealtime: evidence of coercion, excessive prompting, force feeding, excessive use of distraction with non-food objects, hiding food, 'faked' eating, mismatch between expectation and skill level and ability, developmentally inappropriate levels of help. When and how did this interaction start? Is the problematic interaction limited to mealtimes or indicative of a broader relationship difficulty?

- Differences in feeding environment, behaviour, situation, quantity eaten with other carers, at day care, when other children present
- For tube-fed children, determine how the child responds to being tube fed: before, during and after
- Whether the main feeder feels supported/criticised/blamed by their key relationships, e.g. their partner, parents, friends
- Ability of the parent to support child's independence and exploration; respond to child's cues in a consistent and sensitive manner



INDICATORS THAT A PARENT MAY BE EXPERIENCING ANXIETY OR DEPRESSION:

Any observation of the following should be referred to a psychologist for consultation/ advice on management:

- **High anxiety: excessive reassurance seeking (including seeking multiple professional opinions), asking the same questions repeatedly, disproportionate focus on one aspect of feeding (e.g. weight), overestimating cost/likelihood of a poor outcome, reports of feeling restless, anxious, worried. Anxious parents can come across as demanding and questioning of clinician's expertise**
- **Depression (including post-natal depression): presenting with flat affect/tearfulness, reports of feeling sad/empty/hopeless/excessive guilt, difficulties concentrating/making decisions/problem-solving, difficulties enjoying interactions with child.**

(Note: The conditions above are most common. However other serious mental health issues may present in parents, e.g. bipolar disorder, psychosis, eating disorders, factitious or fabricated illness.)

Any observation of the above should be referred to the referring doctor, psychologist and/or a social worker for consultation/advice on management.




Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)



Refer to Feeding environments and routines (page 83)

Is feeding a positive experience for child and parent?

YES	NO – Management considerations
<p>Feeding assessment complete</p> <p>Go to: Feeding Assessment Summary</p> 	<p>Document assessment results on Feeding Assessment Summary form, including:</p> <ul style="list-style-type: none"> • Do you need to refer to an appropriate agency? <ul style="list-style-type: none"> ○ Consider referral to psychology or social work, particularly if there are indicators that a parent may be experiencing anxiety or depression (see red flag above) ○ Consider referral to other appropriate agency: general practitioner, child and family health nurse, speech pathologist, Karitane, Tresillian, paediatrician, lactation consultant, occupational therapist, dietitian, physiotherapist, specialist medical practitioner (e.g. gastroenterologist, immunologist, respiratory physician etc.) <p>Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)</p> <ul style="list-style-type: none"> • What are the key issues that need to be addressed?

RESOURCES

Karitane

www.karitane.com.au/

Karitane provides support, guidance and information to families experiencing parenting difficulties right across NSW.

Tresillian

www.tresillian.org.au

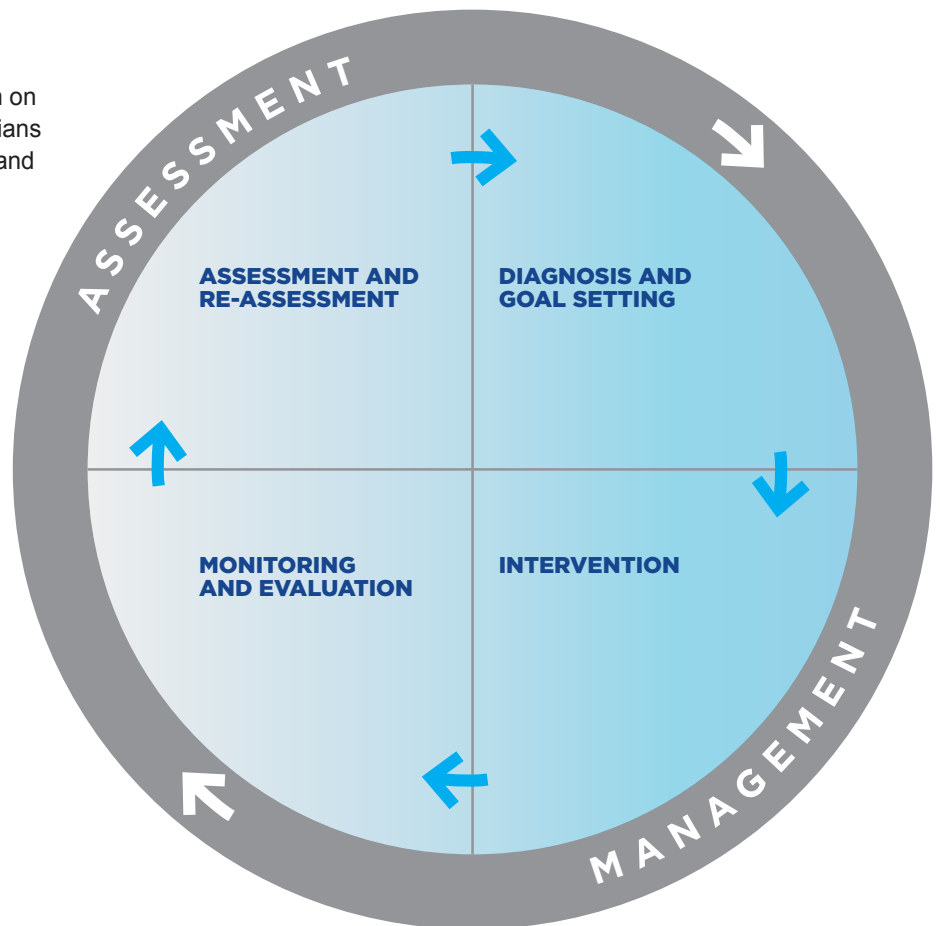
Tresillian is a Sydney based health service specifically designed to support parents in caring for their babies and young children. It is Australia's largest child and family health organisation providing expert parenting advice to families during the early years.

5. FEEDING ASSESSMENT SUMMARY

The *Feeding Assessment Summary* form on the following page may be used by clinicians to progressively record issues identified and management considerations for each of the five assessment questions. Consideration of the combined results and reference to the management chapter of the guide can then be undertaken to develop and prioritise key management goals.

The Feeding Assessment Summary can also be used for the ongoing reassessment of children's feeding throughout the paediatric feeding care cycle, resulting in the reprioritisation and review of management goals accordingly.

 **Refer to Assessment, Management, Review Cycle (page 7)**



KEY ISSUES AND OBSERVATIONS

1. Is current method of feeding safe?

<input type="checkbox"/> Yes	<input type="checkbox"/> No: What are the key issues identified that need addressing? <ul style="list-style-type: none"><input type="checkbox"/> Feeding skill development – Go to page 29<input type="checkbox"/> Facilitating safe swallowing – Go to page 39<input type="checkbox"/> Enteral feeding – Go to page 57<input type="checkbox"/> Transition from tube to oral feeding – Go to page 67<input type="checkbox"/> Oral hygiene and dental health – Go to page 72<input type="checkbox"/> Seating and positioning – Go to page 76
Assessment observations:	

2. Is feeding adequate?

<input type="checkbox"/> Yes	<input type="checkbox"/> No: What are the key issues identified that need addressing? <ul style="list-style-type: none"><input type="checkbox"/> Feeding skill development – Go to page 29<input type="checkbox"/> Facilitating safe swallowing – Go to page 39<input type="checkbox"/> Dietary management to improve oral nutritional intake – Go to page 48<input type="checkbox"/> Enteral feeding – Go to page 57<input type="checkbox"/> Transition from tube to oral feeding – Go to page 67<input type="checkbox"/> Oral hygiene and dental health – Go to page 72<input type="checkbox"/> Seating and positioning – Go to page 76<input type="checkbox"/> Feeding environments and routines – Go to page 83<input type="checkbox"/> Sensory processing – Go to page 88
Assessment observations:	

3. Is feeding efficient?

<input type="checkbox"/> Yes	<input type="checkbox"/> No: What are the key issues identified that need addressing? <ul style="list-style-type: none"><input type="checkbox"/> Feeding skill development – Go to page 29<input type="checkbox"/> Facilitating safe swallowing – Go to page 39<input type="checkbox"/> Dietary management to improve oral nutritional intake – Go to page 48<input type="checkbox"/> Enteral feeding – Go to page 57<input type="checkbox"/> Transition from tube to oral feeding – Go to page 67<input type="checkbox"/> Oral hygiene and dental health – Go to page 72<input type="checkbox"/> Seating and positioning – Go to page 76<input type="checkbox"/> Feeding environments and routines – Go to page 83<input type="checkbox"/> Sensory processing – Go to page 88
Assessment observations:	

4. Is feeding developmentally appropriate?

<input type="checkbox"/> Yes	<input type="checkbox"/> No: What are the key issues identified that need addressing? <ul style="list-style-type: none"><input type="checkbox"/> Feeding skill development – Go to page 29<input type="checkbox"/> Facilitating safe swallowing – Go to page 39<input type="checkbox"/> Dietary management to improve oral nutritional intake – Go to page 48<input type="checkbox"/> Transition from tube to oral feeding – Go to page 67<input type="checkbox"/> Oral hygiene and dental health – Go to page 72<input type="checkbox"/> Seating and positioning – Go to page 76<input type="checkbox"/> Feeding environments and routines – Go to page 83<input type="checkbox"/> Sensory processing – Go to page 88
Assessment observations:	

5. Is feeding a positive experience for child and parent?

Yes

No: What are the key issues identified that need addressing?

- Feeding skill development – Go to page 29
- Facilitating safe swallowing – Go to page 39
- Dietary management to improve oral nutritional intake – Go to page 48
- Enteral feeding – Go to page 57
- Transition from tube to oral feeding – Go to page 67
- Oral hygiene and dental health – Go to page 72
- Seating and positioning – Go to page 76
- Feeding environments and routines – Go to page 83
- Sensory processing – Go to page 88

Assessment observations:

Recommended referral/s:

GOALS AND STRATEGIES

Goal:

Strategies:

Goal:

Strategies:

Goal:

Strategies:

Goal:

Strategies:

6. MANAGEMENT

Consideration of the cyclical nature of paediatric feeding care continues in the planning and implementation of interventions to address issues identified through feeding assessment. Management of feeding difficulties includes goal setting, intervention, monitoring and evaluation as depicted in the paediatric feeding care cycle.

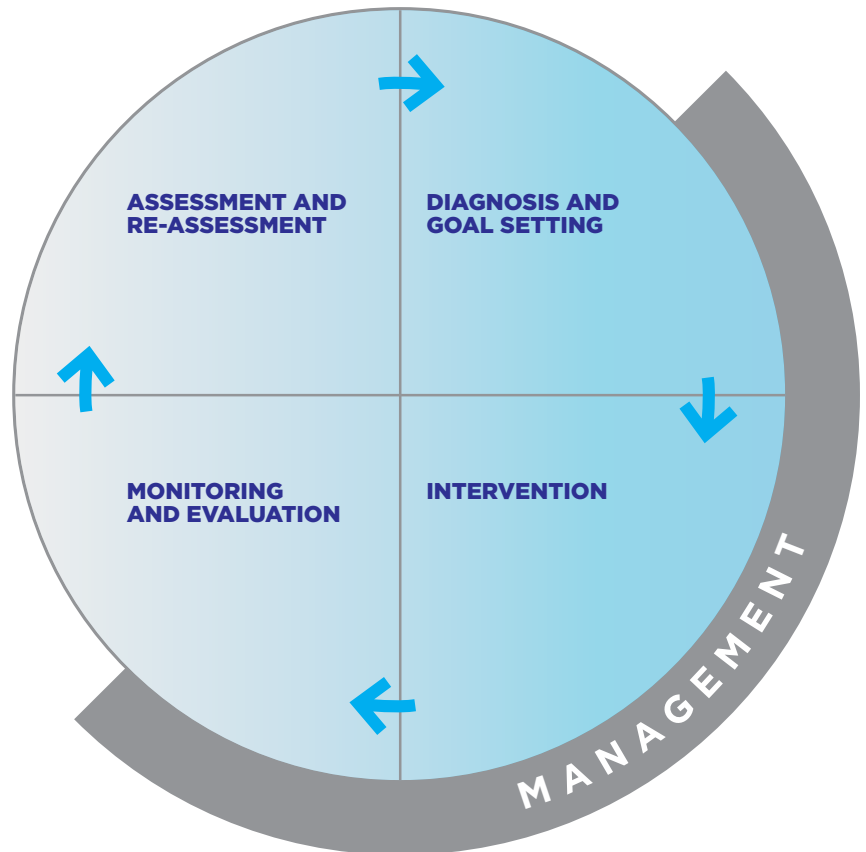
 **Refer to Assessment, Management, Review Cycle (page 7)**

This section of the guide includes management considerations relating to the following areas:

- Feeding skill development
- Facilitating safe swallowing
- Dietary management to improve nutritional intake
- Enteral feeding
- Transition from tube to oral feeding
- Oral hygiene and dental health
- Seating and positioning
- Feeding environments and routines
- Sensory processing.

The topics and content of the guide are relevant for allied health professionals across a variety of settings including: community, disability, acute and rehabilitation hospital settings in metropolitan, regional, rural, and remote areas of NSW.

Clinicians should recognise and acknowledge their limitations and not work beyond the scope of their competence and professional role. Where skill is lacking, appropriate referral, training, supervision and mentoring should be sought.





MEDICAL STABILITY FOR ORAL EXPERIENCES:

In children who have been medically unstable, or non-oral for a considerable period, a request or referral to initiate oral feed trials should come from a medical officer.

To be considered medically stable for oral experiences and feed trials, children need to be:

- Medically stable as per a medical officer
- At least 32 weeks gestation
- Off ventilation for at least 24 hours
- Able to maintain a resting respiratory rate of less than or equal to 80 with no respiratory distress cues
- Maintaining wakeful periods - quiet alert state
- Managing secretions (oral and pharyngeal)

Oral feeding progress can change from feed to feed and day-to-day and monitoring or reassessment is crucial.

6.1 FEEDING SKILL DEVELOPMENT

Facilitating the development of feeding skills in the infant or child who is non-oral or minimally oral may be considered as a management strategy in response to concerns regarding:

- Feeding safety
- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience.

Facilitating the development of feeding skills falls primarily within the scope of practice of:

- Speech Pathology

Additional support may be provided by:

- Occupational Therapy
- Dietetics
- Physiotherapy
- Other: Lactation Consultant, Child & Family Health Nurse, Medical Officer.

KEY MESSAGES

- **In children who have been medically unstable, or non-oral for a considerable period, a formal request or referral to initiate oral feed trials should come from a medical officer.**
- **Oral feeding progress can change from feed to feed and day to day. As a result, monitoring and reassessment is crucial.**
- **Feeding is a developmental skill and should be incorporated into the child's feeding management plan.**
- **When working with parents and children to facilitate feeding skills, it is important to consider the child's needs and responses.**
- **Parents should have a good understanding of the goals of the intervention so that they have realistic expectations for the initiation and progression of feeding. It may take time for skills to develop and achievements may be small.**
- **Hunger and satiation is the child's intrinsic motivation to feed. The development of normal hunger and satiation patterns is important, but not crucial in initiating first oral tastes.**
- **Children with delayed or disordered oral reflexes and/or motor skills may need specific treatment techniques to facilitate normal movements.**
- **Oral desensitisation aims to promote normal sensory responses when food or fluid is offered allowing the child to take food and drinks into their mouth. The frequency and type of desensitisation may change depending on the individual child's need.**
- **The goal of facilitating first tastes is for positive oral feeding experiences, not quantity or nutritional content of intake.**
- **Considerations for breast feeding, bottle feeding and solids will vary depending on the individual child's needs.**

Commencing oral experiences

In children who have been medically unstable, or non-oral for a considerable period, a formal request or referral to initiate oral feed trials should come from a medical officer.

• **To be considered medically stable for oral experiences and feed trials, children need to be:**

- **Medically stable as per a medical officer**
 - **At least 32 weeks gestation**
 - **Off ventilation for at least 24 hours**
 - **Able to maintain a resting respiratory rate of less than/equal to 80 with no respiratory distress cues**
 - **Maintaining wakeful periods – quiet alert state**
 - **Managing secretions (oral and pharyngeal).**
- Oral feeding progress can change from feed to feed and day to day. As a result, monitoring and reassessment is crucial.
 - Establish and maintain mother's milk supply if she wishes to offer breast milk while the child is non-oral. If breastfeeding, mother's milk supply can be negatively affected by prolonged non-oral feeding. Referral to a lactation consultant may be indicated if the mother has poor milk supply.



Refer to Enteral feeding (page 57)



Refer to Dietary management to improve oral nutritional intake (page 48)

- Children are not always able to communicate distress cues clearly. If strong disengagement cues are present oral feeding trials should be discontinued. Examples may include:
 - Significant changes in heart rate
 - Oxygen saturations outside normal limits for the child
 - Significant changes in respiratory status (e.g. rate, grunting, nasal flaring)
 - Loss of postural tone
 - Loss of state/alertness
- Ensure parents are trained to identify:
 - Engagement cues: may include eye contact, non-nutritive sucking
 - Disengagement cues: may include frowning, arching, pulling away from teat.

Facilitating feeding as a developmental skill

Feeding is a developmental skill and should be incorporated into the child's feeding management plan.



Table 2: Developmental and oral motor skills associated with feeding progression (page 36)

- When working with parents and children to facilitate feeding skills, it is important to consider the child's needs and responses:
 - Minimise distracting stimuli, such as excessive noise or light
 - Minimise care routines around feed times that may fatigue the child
 - Provide opportunities for the child to see, smell and touch food at a developmentally appropriate level.
- Aid/arouse child ready for feeding using strategies to facilitate meal time engagement. This may include putting prompts and supports into place to transition to meal time environment, for example unwrap the infant, change nappy or utilise visual cues.
- Intervene to prevent distress, physiological instability and disengagement of the child.
- Interventions should facilitate midline positioning and flexion which promotes hand to mouth experiences and is another example of feeding readiness.



Refer to Seating and positioning (page 76)

- Encourage parents to provide skin-to-skin care, hold and/or position their child to facilitate social interaction at tube feeding times.
- Whenever possible hide the tube/syringe during nasogastric feeds, so that the child makes associations between tastes, oral experiences and satiation rather than the tube and satiation.



Refer to Transition from tube to oral feeding (page 67)

- Encourage parents to provide positive experiences around the mouth as tolerated by the child, e.g. sustained touch, kisses.
- Provide developmentally appropriate opportunities for the child to participate in mealtimes and observe normal mealtime interaction, e.g. at home, school.

- Ensure that parents have realistic expectations for the initiation and progression of feeding. It may take time for skills to develop and achievements may be small.
- Some parents demonstrate poor attachment to the child, signs of post natal or situational depression or have a history of mental illness, which can impact on the parent child interaction during feeding. Social work and/or psychology input may be required.

Facilitating the development of hunger and satiation patterns

Hunger and satiation refers to the child's sense of hunger and fullness. This is important because hunger is the child's intrinsic motivation to feed. Some children who have been on continuous feeds or parenteral nutritional support may not have developed hunger and satiation patterns. The development of normal hunger and satiation patterns is important, but not crucial in initiating first oral tastes. When facilitating the development of normal hunger satiation patterns, consider the following:

- Ensure parents are trained to identify hunger cues and respond appropriately. Hunger cues demonstrated by the child may include mouthing, licking, suckling on hands, rooting reflex, non-nutritive sucking, eye contact
- Support parents to respond appropriately to disengagement cues or signs of discomfort during tube feeding, such as frowning, arching or pulling away
- If possible, the child should be progressed onto enteral feeds that mimic normal feeding patterns for the child's age
- Normalise the tube feeding environment as much as possible to mimic a normal oral feeding situation. For example:
 - If possible, hide the tube/syringe when feeding
 - Hold the child or seat the child so that social interaction is possible during the mealtime
 - Respond to signs of discomfort during tube feeding by giving the child a break or stopping the feed
 - Have foods present so that the child is exposed to the smell of food
 - If not distressing to the child, eat in front of them, so that they are able to observe normal eating function
 - If tolerated, offer a standard-shaped dummy to encourage non-nutritive sucking at feed times.

Facilitating normal oral reflexes and oral motor skills

Oral reflexes are evident in the foetus and emerge as the child matures. They usually occur in response to a specific sensory input, usually a tactile stimulus. Oral reflexes can be categorised as adaptive or protective¹²:

- Adaptive reflexes: assist in the acquisition of food e.g. rooting reflex, sucking reflex
- Protective reflexes: designed to protect the airway during feeding e.g. gag reflex, cough reflex.

It is important to establish positive oral responses to tactile stimuli before introducing oral intake, as this indicates an infant's neurological status and ability to integrate sensory integration.



Refer to Table 3: Normal Oral Reflexes (page 37)

Oral reflexes may be elicited using a number of specific stimuli.

The following strategies may be considered when working with parents and infants to facilitate normal oral reflexes:

- Aid/arouse the infant into a calm alert state
- If oral hypersensitivity is present, intervention should focus on facilitating normal sensory responses before focusing on oral motor patterns. Refer to the oral desensitisation strategies in the following section. Involvement of an occupational therapist may be indicated for management of these issues.



Refer to Sensory processing (page 88)

- In infants less than 4 months, facilitate the development of organised non-nutritive suck patterns using suck stimulation techniques.
- Position infants to support hand to mouth contact. This promotes licking, rooting and mouthing responses around feed times.



Refer to Seating and positioning (page 76)

- If breastfeeding, allow the infant to nuzzle at a partially expressed breast.
- If tolerated, offer a standard shaped dummy/pacifier or gloved finger to encourage non-nutritive sucking (NNS) at feed times.
- If a child demonstrates hypersensitivity, be mindful of eliciting the gag reflex.

- Children with delayed or disordered oral reflexes and/or motor skills may need specific treatment techniques to facilitate normal movements.



Refer to Table 3: Normal Oral Reflexes (page 37)

- Encourage parents to spend long blocks of time with children who are inpatients to facilitate cue-based oral experiences. In this way parents learn to respond appropriately to their child's cues.
- Ensure the experience is positive for the child and parent.



Refer to Feeding environments and routines (page 83)

Oral desensitisation strategies

Providing the opportunity for positive oral experiences is important in facilitating the transition between non-oral to minimal oral feeding. Oral desensitisation aims to promote normal sensory responses when food or fluid is offered allowing the child to take food and drinks into their mouth. The frequency and type of desensitization may change depending on the individual child's need.



Refer to Sensory processing (page 88)

The following strategies may be considered when undertaking oral desensitisation with children:

- Minimise unpleasant oral-tactile experiences, e.g. reflux, tube changes, suctioning. Particularly avoid these around meal times or when food offered
- Facilitate the acceptance of touch around and in the oral cavity with a gloved finger, dummy or empty feeding equipment (empty bottle with teat)
- When offering oral-tactile experiences, grade the input working from distal to proximal. Move slowly from shoulders towards the face, then lips, gums, tip of tongue, lateral tongue surfaces, anterior midline of tongue, middle of tongue and finally to the palate
- If the child shows a hypersensitive response, move back distally to an area of tolerance.
 - Some children who have been non oral for prolonged periods or who have had unpleasant or noxious oral experiences (e.g. reflux, suctioning, NG tube replacement) may demonstrate oral hypersensitivity. If reflux or vomiting is present and distressing for the child, medical review should be sought and the tube feed should not be commenced or running during the feeding intervention

- Use firm pressure, as tolerated, when offering oral-tactile experiences. Pressure should be consistent and firm, not light and feathery
- Promote oral exploration by positioning infants to support hand to mouth contact. This promotes licking, rooting and mouthing responses around feed times
- If breastfeeding, allow the infant to nuzzle at a partially expressed breast
- Promote pleasurable oral-tactile experiences and age appropriate oral exploration, e.g. offer toys to mouth, kissing and cuddling around face and mouth, songs and games involving touch around the face, e.g. "peek-a-boo"
- Encourage role playing with toy food and food utensils, e.g. tea parties, feeding puppets, picnics
- Encourage messy play with food and non-food items. Generally children will initially tolerate dry, hard objects, e.g. uncooked pasta, plastic balls. Gradually increase tolerance by introducing soft and wet items, e.g. play dough, shaving cream, jelly, sand
- Provide opportunities to see, smell and touch food
- Provide opportunities for the child to participate in mealtimes and observe normal mealtime interaction, e.g. at home, school.

Facilitating first tastes

At this stage, the goal of facilitating first tastes is for positive oral feeding experiences, not quantity or nutritional content of intake.

- Aid/arouse child into awake states before offering tastes
- Ensure that the child is able to maintain a quiet alert state before offering tastes
- Ensure child can coordinate non-nutritive sucking and breathing before initiating tastes.



Refer to Facilitating safe swallowing (page 39)

- Children may demonstrate readiness for oral feed trials at some feed times, but not necessarily all feed times.
- If possible, the child should be on bolus feeds on demand, or enteral feeds should replicate normal feeding patterns for child's age.
- If applicable, facilitate normal oral reflexes.
- Children with delayed or disordered oral motor skills may need specific treatment techniques to facilitate normal movements.

Refer to Table 3: Normal Oral Reflexes (page 37)

- Where dysphagia is suspected, a Video Fluoroscopic Swallow Study (VFSS) or Fiberoptic Endoscopic Evaluation of Swallowing (FEES) may assist in defining the anatomy and physiology of the child's swallowing and assist in developing a management plan for children who are minimally oral. Note: The child would have to be able to consume adequate amounts to proceed with VFSS/FEES assessment.

If feeding safely refer to Figure 2: Safe swallowing decision flow chart (page 35)

- Children with dysphagia may require texture modification, external pacing, specialised feeding equipment and/or specialised swallowing strategies.

Refer to Facilitating safe swallowing (page 39)

- Provide postural stability appropriate for the developmental level of the child.

Refer to Seating and positioning (page 76)

- If tube feeding is a pleasant experience for the child, commence the tube feed at the start of the intervention session to promote the association between satiation and positive oral experiences.
- Begin with 1-2 minutes of non-nutritive sucking or oral experiences to prime the child, before offering tastes.
- Oral feeding should not be pushed. At this stage, the goal is for positive oral feeding experiences, not quantity of intake.
- Parents should have a good understanding of the goals of the feeding intervention and intake so that they have realistic expectations.

Considerations for breast feeding

- This section assumes a lactation consultant or child & family health nurse (CFHN) is part of the managing team where ever possible.
- The following strategies may assist when first introducing the infant to breastfeeding:
 - Encourage skin to skin contact before and after feeding
 - If breastfeeding, consider having the mother partially express the breast to avoid strong let-down of milk whilst baby is nuzzling, licking or attached for short periods
 - Allow infant to nuzzle at a partially expressed breast
 - Allow infant to lick at the breast

- Facilitate attachment by stimulating the rooting reflex, appropriate breastfeeding position and providing external support as necessary.

Refer to Table 3: Normal Oral Reflexes (page 37)

Refer to Seating and positioning (page 76)

- Allow the infant to suck 3-4 times on nipple. If baby is demonstrating evidence of difficulty with suck-swallow-breathe, break the seal and give a rest from sucking. Allow the child to breathe, reorganise and cue for readiness
- Remove infant from the breast during let-down
- Referral to a lactation consultant may be indicated if:
 - Mother has poor milk supply
 - Poor latch evident
 - Poor milk transfer is suspected
 - Considering use of a nipple shield
- If a lactation consultant is not available a midwife, paediatric nurse or child and family health nurse may be able to offer support.

Considerations for bottle feeding

The following strategies may assist when first introducing the infant to bottle feeding:

- Offer a drop of warmed expressed breast milk or formula on the infant's lip to promote licking and sucking response during tube feeding to help the child organise for oral feeding
- Drop milk (from a 1mL syringe 0.1mL at a time) onto dummy, finger or lip
- Offer a slow flowing single hole teat and provide external pacing by allowing the infant to suck 3-4 times on a milk-filled teat and breaking the sucking or tilting the teat to remove milk. Allow the child to breathe, reorganise and cue for readiness.



A formal request or referral to initiate oral feed trials should come from a medical officer for children who have been medically unstable, or non-oral for a considerable period. Oral feeding progress can change rapidly, so ongoing monitoring and reassessment is crucial.



Refer to Pacing during mealtimes (page 41)

- Do not jiggle or turn the teat to stimulate nutritive sucking or oral responses.
- Some infants may benefit from cheek and chin support to facilitate lip seal and increase sensory input.

Considerations for solids

The following strategies may assist when first introducing the child to food:

- Allow food play during tube feeding
- Offer a small taste of very thin puree on the child's lip to promote licking and oral movements during tube feeding. This can be offered in a variety of ways, e.g. via a spoon, the parent's clean finger, on a washable toy.



Refer to Table 2: Developmental and oral motor skills associated with feeding progression (page 36)

- Always ensure that a child is supervised when attempting new textures.
- To assist a child to accept different textures later in childhood, exposure to a variety of food textures is recommended.
- Delaying a child's introduction to lumpier foods may contribute to fussy eating habits that may continue throughout their lives.
- Once a child is accepting smooth textures, they can be exposed to more complex textures under supervision of a speech pathologist as tolerated.

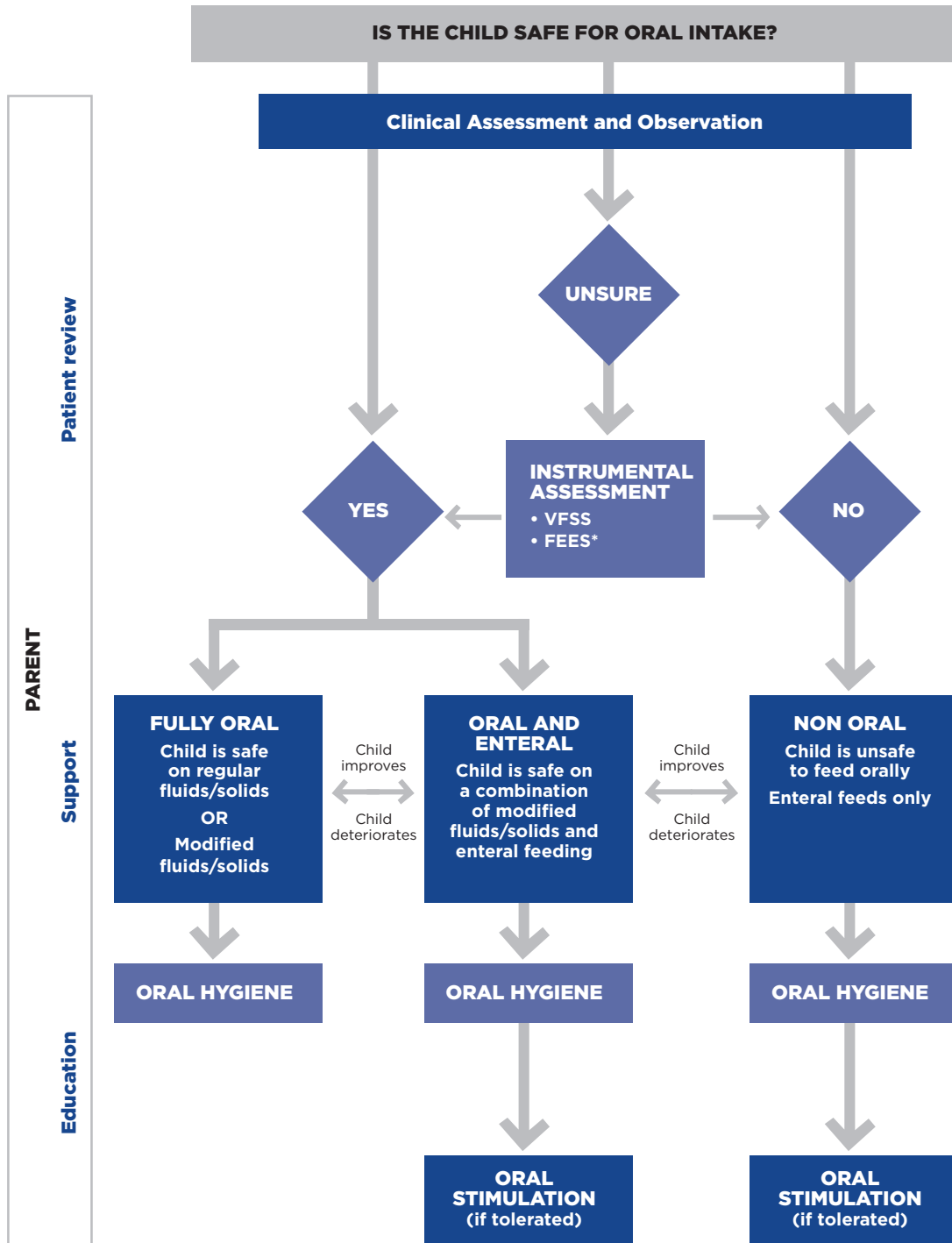
RESOURCES

Australian Breastfeeding Association (ABA)

www.breastfeeding.asn.au

The ABA are Australia's leading authority on breastfeeding. They provide support, education and advocacy for a breastfeeding inclusive society.

FIGURE 2: SAFE SWALLOWING DECISION FLOW CHART



*Fibreoptic Endoscopic Evaluation of Swallowing

TABLE 2: DEVELOPMENTAL AND ORAL MOTOR SKILLS ASSOCIATED WITH FEEDING PROGRESSION ^{17, 18}

The following provides a guide reflecting typical development. Not all children will progress systematically through each stage.

Age (months)	Progression of liquid and food	Oral-motor skills	Developmental skills
0 to 4 months	Thin liquid (e.g. breast milk, formula)	Suckle on nipple Forward-backward tongue movement Adaptive oral reflexes ie. rooting, sucking	Head control acquired
4 to 6 months	Thin purees (e.g. rice cereal, pureed fruits)	Suckle off spoon at first Separation of tongue and jaw movements Transition from reflexive suckle to suck (up-down) tongue pattern	Gross motor control of head and neck, trunk control Sitting balance Hands midline
7 to 8 months	Thick purees (e.g. pureed potato, rice cereal & fruit) Textured purees/soft mashed (e.g. mashed banana, potato or pasta)	Some protective oral reflexes desensitised Cup drinking Vertical munching	Hand-to-mouth play Reach, pincer grasp Assists with spoon Finger feeding begins Core stability developing
8 to 9 months	Bite & dissolve foods (e.g. Cruskit, Baby Mum-Mum biscuits) Soft finger foods – early chewing foods (e.g. pasta, soft fruit and vegetables, bread) Hard munchables for exploration (e.g. rusks)	Emerging lateral tongue movements Unsustained bite pattern	
9 to 12 months	Hard finger foods (e.g. biscuits, rusks, par-cooked vegetables, fresh fruit) Harder/chewy finger foods (breads, pasta, eggs, deli meats)	Cup drinking independent Emerging rotary chewing Graded bit through harder/chewy food	Refines pincer grasp Finger feeding Grasps spoon with whole hand
12 to 18 months	Complete range of textures with some modification, including mixed textures (e.g. lasagne, minestrone)	Lateral tongue action established Straw drinking	Increased independence for feeding Scoops food, bring to mouth
18 to 24 months	More chewable food (e.g. steak, raw vegetables, hard fruits – apple)	Mature rotary chewing Emerging/controlled sustained bite on hard foods	
24 months and above	Complete range of textures/family foods	Ongoing refinements of oral skills Controlled sustained bite	Total self-feeding, increased use of fork, cup drinking, open cup drinking and straw drinking, no spillage

TABLE 3: NORMAL ORAL REFLEXES ^{12, 19, 20}

Reflex	Stimulus	Behaviour	Presenting age range
Adaptive Oral Reflexes			
Rooting	Stroke cheek or near mouth	Senses stimuli & localises, opens mouth, extends & depresses tongue	From 32-37 weeks gestation to 3-6 months
Sucking	Touch to the lips and tongue	Reflexive suckle (forward-back wavelike tongue movement), coordinated with up-down jaw movement	From 18 weeks gestation to 4-5 months
Tongue protrusion	Touch tongue tip	Tongue protrudes from mouth	From 38-40 weeks gestation to 4-6 months
Transverse tongue	Stroke sides of tongue	Tongue lateralises to side of stimulus	From 28 weeks gestation to 6-9 months
Phasic bite	Stimulate gums	Rhythmic up-down jaw movement	From 28 weeks gestation to 9-12 months
Protective Oral Reflexes			
Gag	Touch back of tongue	Mouth opening, head extension, floor of mouth depresses	Commences 26-27 weeks gestation and persists through life
Cough	Fluid in larynx or bronchi	Upward movement of air to clear airway	Commences 35-40 weeks gestation and persists through life

TABLE 4: FACILITATING NORMAL ORAL MOTOR PATTERNS^{1, 12}

This list is not exhaustive and oral motor function should be assessed by a speech pathologist.

Presenting Problem	Possible Management Strategies
Poor jaw stability/low tone	<p>Provide supportive positioning with hip flexion and midline flexion.</p> <p>Provide firm, constant external facilitation/support of the jaw and cheek with fingers/hand while mouthing and feeding.</p>
Excessive jaw movement	<p>Provide supportive positioning with hip flexion and midline flexion.</p> <p>Provide external facilitation/support of the jaw and cheek to reduce/limit jaw movement with fingers/hand while mouthing and feeding.</p>
Poor lip seal/poor cheek stability	<p>Provide supportive postural positioning.</p> <p>Encourage lip closure by providing facilitative support of lower lip/cheek/jaw with thumb and index finger.</p>
Tongue retraction	<p>Provide supportive postural positioning with midline flexion of shoulders or try a well-supported side lying position with head elevation.</p> <p>Stimulate the rooting reflex prior to all mouthing/feeding activities.</p> <p>Once rooting reflex elicited practice non-nutritive sucking on finger gradually moving the contact deeper along the palate.</p> <p>Work finger on to the top of the tongue.</p> <p>Try jiggling, tapping or stroking the tongue to encourage forward and down placement of the tongue.</p> <p>Do not exceed the infant's threshold.</p>
Tongue thrust/protrusion	<p>Provide supportive postural support.</p> <p>Apply firm tapping or touch pressure to the midline of the tongue – start at the tip of the tongue and move to the midline.</p> <p>If spoon feeding, use a firm plastic spoon, apply downward pressure on the mid-tongue as the food is tipped off the spoon.</p> <p>Encourage lip closure by providing facilitative support of lower lip/cheek/jaw with thumb and index finger.</p> <p>Minimise feeding equipment that may exacerbate tongue thrusting patterns (eg. teats and spouts).</p>
Lack of central grooving in tongue	<p>Stimulate the rooting reflex prior to all mouthing/feeding activities.</p> <p>Once rooting reflex elicited practice non-nutritive sucking (NNS) on finger gradually moving the contact deeper along the palate.</p> <p>When NNS cycle complete, bend the finger so that the knuckle places pressure on the tongue.</p> <p>Slowly rotate finger so that the pad is now on top of the tongue, apply gentle downward pressure slowly removing finger from mouth.</p>
Nasopharyngeal regurgitation	<p>This is indicative of palatal dysfunction and should be further investigated by a speech pathologist, plastic surgeon or Ear, Nose & Throat (ENT) specialist.</p>

6.2 FACILITATING SAFE SWALLOWING

Consideration of strategies to support safe swallowing function are particularly in response to concerns regarding:

- Feeding safety.

Strategies may also be considered in response to concerns regarding:

- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience.

Facilitating safe swallowing falls primarily within the scope of practice of:

- Speech Pathology.

Additional support may also be provided by:

- Occupational Therapy
- Nutrition & Dietetics
- Pharmacy
- Physiotherapy
- Other: Medical Officer

KEY MESSAGES

- Management following identification of dysphagia should involve a team approach.
- The goal of dysphagia intervention is to facilitate oral intake whilst minimising risk of airway compromise. Any observation of indicators that a child is at risk or may be aspirating should be referred to a speech pathologist for further assessment.
- It is recommended that the child's current feeding skills are reviewed at the time of any significant change to their health or medical status to minimise the associated risk of aspiration.
- It is important to check that the medications a child is currently taking do not pose a risk of aspiration. A pharmacist must be consulted prior to making any recommendations that may affect the delivery of medication.
- Strategies to facilitate safe swallowing may include pacing during mealtimes, texture progression and alterations in feeding equipment.
- The aim of pacing is to increase safe oral intake by assisting the child to coordinate their suck-swallow-breathe (SSB) cycle.
- Viscosity/texture changes of liquid or food can influence both the efficiency and effectiveness of the child's feeding skills.
- Viscosity/texture modification can be used with children with dysphagia to minimise risk of aspiration.
- Progression through textures may support development of new oral motor skills.
- Equipment, including teats, cups and spoons may be used to facilitate normal feeding patterns and improve intake. Equipment selection should consider the child's general development, oral anatomy, oral motor and swallowing skills.

RECOMMENDED PRACTICE

Confirm readiness for oral intake in the management of dysphagia/swallowing

- Management following identification of dysphagia should involve a team approach. A medical officer should be involved in intervention planning and monitoring where aspiration is suspected to ensure the child's pulmonary health is monitored and to make decisions regarding safe nutritional routes for nutrition and hydration. The goal of dysphagia intervention is to facilitate oral intake whilst minimising risk of airway compromise.



INDICATORS THAT CHILD IS AT RISK OF OR MAY BE ASPIRATING:

Any observation of the following should be referred to a speech pathologist for further assessment. Possible red flags (consider secretions, solids eaten and liquids taken orally or by tube):

- **Overt signs:** choking, gagging, coughing, refusing to feed, wet or gurgly voice during/after feeding, hoarse voice, drooling/pooling of secretions, apnoeas/desaturations with feeds, noisy breathing, physiological instability
- **Subtle signs:** watery eyes, nasal flaring, colour changes, sudden state or tone changes, ongoing need for supplemental oxygen or increased oxygen needs, frequent illnesses, poor weight gain, minimal oral intake/lengthy feed times, fatigue with feeding.



For an extensive list refer to Wolf LS & Glass RP (1992)¹²

- If there is any indication that the child is at risk or may be aspirating on fluid or food, non-oral feeding will need to be considered by the speech pathologist.
- A speech pathologist, experienced in dysphagia should follow the Speech Pathology Australia Dysphagia Clinical Guideline² to recommend the most appropriate strategies to support safe swallowing function.



Speech Pathology Australia. Dysphagia. Clinical Guideline. 2012.²

www.speechpathologyaustralia.org.au/publications/clinical-guidelines

- Further instrumental assessment such as a Videofluoroscopy Swallow Study (VFSS) may be indicated. A VFSS is a gold standard assessment carried out by a speech pathologist in consultation with a radiologist to determine swallow function, level of aspiration risk and intervention planning.
- Although it is not recommended as the sole diagnostic procedure, a VFSS can provide information regarding²¹:
 - Aetiologies and symptoms of dysphagia, including risk of aspiration
 - Anatomy and physiology of the swallowing mechanism
 - The need for specific texture modification of oral intake (food and/or fluid)
 - The effectiveness of compensatory strategies and rehabilitation techniques.



Refer to Appendix 3: NSW paediatric feeding teams and clinics (page 103)

- Under all circumstances, if there is a risk of aspiration, any changes to the viscosity or texture of fluids or solids must be closely supervised by the managing medical team and speech pathologist.
- In children with dysphagia, good oral hygiene is important to minimise the risk of pneumonia associated with aspiration of bacteria in secretions, as well as other infections. This is flagged as necessary for both the non-oral and oral feeders.



Refer to Oral hygiene and dental health (page 72)



MEDICAL AND HEALTH CONSIDERATIONS¹

There are a number of factors that may influence risk of aspiration in children including alertness, positioning, rate of intake and general wellbeing.

A change in a child's health status may often have an impact on whether children are able to eat and drink and the associated risk of aspiration.

Be aware that a child's feeding regimen may need to be changed immediately if there is a significant change in their medical status.

It is recommended that the child's current feeding skills are reviewed at the time of any significant change to their health or medical status.

Medication modifications

- Not all medications are available in child-friendly dose forms like oral liquids or dispersible tablets or are pleasant to taste. It is therefore, often necessary to modify existing dosage forms to improve administration, e.g. crushing or dispersing solid dosage forms like tablets or capsules or to improve palatability by mixing the medicine with food or drinks.
- It is important to consult a pharmacist or a relevant resource, for example the *Australian Don't Rush to Crush Handbook* or the individual medicine monographs available on eMIMS prior to recommending alterations of medicines. It is important to check the medications a child is currently taking.
- Modifying a medicine may alter its effectiveness or stability, increase the risk of toxicity, or the taste or texture maybe be unacceptable²², e.g. modified-release tablets or capsules should not be crushed.
- Each medication should be administered separately to prevent chemical incompatibility between drugs²³.
- Altering solid oral dose forms of medicines or administration via an enteral feeding tube is an off-label use. It is important to document all alterations to medication outside of the product registration²².



The Society of Hospital Pharmacists of Australia. Australian Don't Rush To Crush Handbook. Therapeutic Options for People Unable To Swallow Solid Oral Medicines.

www.shpa.org.au/Publications/Do-Not-Rush-to-Crush

Strategies to facilitate safe swallowing

Pacing during mealtimes

The aim of pacing is to increase safe oral intake by assisting the child to coordinate their suck-swallow-breathe (SSB) cycle. Pacing also allows for re-establishment of normal respiration that underpins coordinated SSB patterns. This is often used as an interim management strategy until the child's system matures, for example in the premature population until their respiratory or cardiac function allows them to pace their SSB patterns independently. Pacing can assist in reducing pooling, oral spillage, pharyngeal spillage, laryngeal penetration and/or aspiration.

- Pacing is a technique that can be used across all feeding situations and age ranges i.e. breast, bottle, cup and solid feeding.
- The rate and frequency of pacing will be dependent on suck to swallow ratio, suck strength, age of the child and feeding method.
- Pacing should aim to replicate normal feeding cycles i.e. 1-3 sucks per swallow for infants¹².
- As an infant's own control mechanisms mature, the need for pacing may be reduced, e.g. only used towards the end of the feed as the child fatigues, or may become unnecessary if the child is able to pace themselves independently.

Common techniques include:

- When first trialling pacing, complete nipple/teat removal may be required initially, progressing gradually to partial nipple/teat removal until the infant can self-pace
 - Complete removal means the nipple/teat is fully removed from the mouth but should still make contact with the cheek, lips or chin
 - Partial removal means that attachment has been broken and the nipple/teat remains in the mouth
- Partial removal is less disruptive for the child who is trying to maintain a rhythm with feeding. However, if the child does not respond to this it may be necessary to completely remove the teat/nipple/cup
- There are many methods to partially remove a teat/nipple. These include:
 - Breaking the child's lip seal by inserting a finger gently between the tongue and nipple for breastfeeding
 - Moving the teat laterally in the mouth when bottle feeding
 - Tilting the bottle downwards to remove milk from the teat
 - Adjusting the child's position to remove milk from the teat
- Generally partial removal should occur after every 3-5 sucks, but the frequency will depend on the child's self-pacing skills and physiological stability
- If pacing with a spout cup or open cup, allow 1-3 continuous sips, put the cup down, wait for the swallow then re-offer the cup and repeat the process
- If pacing with solids, offer 1 mouthful, wait for swallow and for the mouth to be fully cleared before offering more food.

- If a child has delayed initiation of tongue movements or significant oral residue, offer an empty spoon with downward pressure on the midline of the tongue to prompt bolus propulsion and swallow
- If a child has dysphagia i.e. delayed swallow or swallowing disorder, they may require multiple swallows to clear the oral cavity and pharynx. In these cases, wait for the initial swallow(s) then, offer an empty spoon to encourage a dry swallow before offering more food. Pharyngeal pooling may occur after the first teaspoon or after multiple mouthfuls. A VFSS will assist in formulating a safe management plan with regards to frequency of pacing.



Refer to Appendix 3: NSW paediatric feeding teams and clinics (page 103)

Modification of texture

- Slowing the flow rate of liquid may reduce the frequency of swallowing allowing an infant more time to organise their suck-swallow-breathe pattern and produce more rhythmic and coordinated feeding.
- Increased oral control may reduce premature oral and pharyngeal spillage, reducing the risk of aspiration.
- Fluid and solid texture modification may be used in conjunction with pacing and equipment/teat modification to:
 - manage suck-swallow-breathe incoordination in infants
 - assist swallow safety in children with diagnosed dysphagia.

Progression through textures

- Texture changes of liquid or food can influence both the efficiency and effectiveness of the child's feeding skills.
- If a child is having difficulty managing a certain texture this may impact negatively on both mealtime duration and nutritional intake.
- Children with dysphagia may be at increased risk of aspiration and choking episodes as they transition to more challenging textures. Where a child is at increased risk of choking, parents should be trained by a medical professional in what to do if their child has a choking episode.



Factsheet – How to prevent children from choking on food. The Children's Hospital at Westmead & Sydney Children's Hospital, Randwick²⁴

- Alternatively, if the child has no difficulty with their oral skills they may be eating "easy" foods that are not challenging enough for them. They may stay at a certain developmental level longer than is necessary. This decreases the child's ability to develop new oral motor skills.
- Children should be assessed as to the safety of progressing onto more challenging food textures to ensure they are meeting their developmental potential. The child's oral motor skills, swallowing function and risk of choking should be taken into consideration when making management decisions regarding texture progression²⁵.

The following texture modifications can be made:

Liquids

- Most children will be able to manage normal/thin fluids, e.g. water, breast milk, formula, without difficulty. If a child has considerable oral motor and swallowing difficulties, they may require modified fluids
- Thickening of liquids may be of benefit when there are signs of aspiration, difficulty controlling fluids in the mouth and signs of delayed initiation of swallow. Children with dysphagia may benefit from thickening liquids to assist with oral control of fluids and to allow more time for swallowing to trigger and for airway closure
- Thickening of liquids can be defined in the following ways²⁶:
 - a. Mildly thick, Level 150 (nectar consistency): fluid runs freely off the spoon but leaves a mild coating on the spoon
 - b. Moderately thick, Level 400 (honey consistency): fluid slowly drips in dollops off the end of the spoon
 - c. Extremely thick, Level 900 (pudding consistency): the fluid sits on the spoon and does not flow off it
- The use of thickening agents or pre-thickened drinks are usually determined and prescribed by the speech pathologist in conjunction with a dietitian and/or medical team
- Any concerns regarding the type and the amount of fluid a child may or may not be taking should be discussed with a speech pathologist and a dietitian
- Cereal thickeners and gum thickeners are appropriate for different ages
 - Use of thickeners is NOT recommended for pre-term infants²⁷
 - Xanthan gum based thickeners are NOT recommended for children less than 3 years of age²⁷

- Starch based, locust bean (carob bean) gum and guar gum thickeners are recommended thickeners for children less than three years of age²⁷
- Check with the manufacturer and/or doctor/dietitian before prescribing a thickener for children less than three years of age
- Due to the effect of amylase (in human milk) the type of thickening agent used for expressed breast milk is important
 - Gum based thickeners do not respond to amylase and can be used as a thickening agent
 - Food and Standards Australia and New Zealand approves only carob bean gum and guar gum as thickening additives to infant formula products²⁸

Solids

- Thin puree – first stage in the introduction of solids for the transition from liquids to solids. Thin puree is considered to be a smooth, runny puree. This initially assists in swallowing solids safely without any chewing. It also prepares the child to begin to control solid food in their mouth with their tongue and lips
- Thick puree – progression from a runny to a thick puree consistency may mean that the child is more able to move the food with the tongue and handle more “bulk” in the oral cavity. Thicker puree may give the child more time to prepare for a swallow
- Textured puree/soft mashed – is graded up from smooth thick puree to assist with chewing and oral motor development. Textured puree can have more solid lumps within the puree and is sometimes likened to “fork-mashed” foods. Grainy textures (e.g. cous cous, rice, mashed pasta) can be mixed with pureed food to make a textured puree. The consistency is seen as a cohesive spoonful that requires only minimal chewing/munching
- Bite and dissolve foods – these foods will dissolve with saliva only. None or minimal intraoral pressure is required to dissolve (e.g. Baby Mum-Mum[®] biscuits, Potato Stix, prawn crackers, Cruskits[™], ice-blocks, chocolate)
- Soft finger food – these foods can be easily broken down in the mouth with minimal chewing/munching and are easily swallowed (e.g. grated soft cheese, banana, avocado, well-cooked cubed vegetables, tinned fruits, boiled egg, fish). This is the start of the child’s own exploration with food texture and developing independent eating
- Harder/chewy finger food – these are foods that require more chewing as they do not break down as easily as the soft finger foods (e.g. toast, chicken, lunch meats, pasta, ripe fresh fruit, such as pear, peach, melon)

- Hard finger foods – these foods require mature biting and rotary chewing (e.g. raw fruit or vegetables, meats and harder biscuits)
- Hard munchables – these foods will not break apart easily in the mouth and in the early stages are for exploration, not consumption (e.g. raw carrot sticks, celery sticks, hard dried fruit stick, beef jerky). At later stages they may be included as table food
- Table food – as a child reaches 12 months they are able to eat most foods offered at dinner time in small cut up pieces. They may still have difficulty eating foods that require a lot of chewing (e.g. steak) but can generally sit down with the family and eat a well-balanced and nutritionally complete meal.



Morris and Klein, Pre-Feeding Skills 2nd Edition, 2000.¹



Texture-modified foods and thickened fluids as used for individuals with dysphagia: Australian standardised labels and definitions²⁹

Making texture changes a more positive experience

- Children with feeding difficulties, including sensory defensiveness, may find changes to food textures and mealtimes a source of discomfort and distress¹. It is important to assist the child to explore at a level that is comfortable and safe for them
- Development of mealtime plans aid parents to understand what the child needs, to make mealtimes enjoyable and less stressful
- Small steps need to be taken to assist a child’s transition through the new texture experience. Gradually increasing texture i.e. thickness, lumpiness and grainy properties of food in small amounts may be necessary for children who are orally defensive or have sensory aversion
- Very small changes to a fluid or food can have a negative effect on children with sensory processing issues. Changes in temperature, shape, how the food or liquid is presented (spoon, bowl, cup, environment, or timing) may all be variables that upset a child’s mealtime routine and intake.



Refer to Feeding environments and routines (page 83)



Refer to Sensory processing (page 88)

Alterations in feeding equipment

Equipment, including teats, cups and spoons may be used to facilitate normal feeding patterns and improve intake. Equipment selection should consider the child's general development, oral anatomy, oral motor and swallowing skills.

Teats

- Changing the flow rate, size and/or shape of the feeding equipment may impact suck-swallow-breathe coordination and safe oral intake. Teat selection should be based on achieving the best possible attachment and flow rate for the infant
- Teat selection and pacing are frequently used in conjunction with each other to manage suck-swallow-breathe and fatigue issues. Teat selection should be based on the infant's presenting problem i.e. short sucking bursts, disorganised sucking, respiratory compromise, poor endurance, prolonged sucking
- An infant's suck efficiency needs to be fully assessed and understood before any teat selection can be made i.e. an infant who fatigues and has a weak suck but a safe swallow may need a faster flowing teat with pacing to assist safe oral intake. Whereas, an infant with a strong suck but uncoordinated swallow may need a slow teat with or without pacing or thickened fluids to assist safe oral intake
- There is an exhaustive range of teats available, including cross-cut, slow-fast flow, orthodontic, latex, rubber, wide-neck and standard neck. Choice selection should be based upon the above points.

Note: A standard-shaped teat is generally suitable for use with most infants.



Refer to **Table 5: Possible strategies to support safe swallowing function in infants (page 45)**



Refer to **Appendix 9: Feeding equipment (page 115)**

Cups

- Changing the flow rate, size and/or shape of a cup may impact suck/sip-swallow-breathe coordination and safe oral intake

- Thickened fluids are commonly used when introducing cup drinking in order to reduce the flow rate of the fluid and assist with oral control of fluid
 - Many infant training cups have a one way valve which require a competent attachment and suck to open. Children with respiratory compromise and poor endurance may have difficulty extracting fluid from spout cups with one way valves. Likewise, children with feeding difficulties may find transitioning from a teat or weaning from tube feeds straight to a cup too difficult. If this is the case, remove the one way valve and thicken the fluid (as necessary)
 - Some cups, such as pop-top containers, can exacerbate head extension which can increase the risk of aspiration. Cut-out cups and straws can assist in facilitating appropriate head positioning for drinking
- Encourage self-feeding or hand-over-hand feeding where possible. Encourage self-feeding by placing the child's hands on the cup handles or around the cup. The adult may then place their own hands over those of the child and assist the hand to mouth movement
- Encourage small sips if the child is impulsive or takes large mouthfuls and has poor bolus control. When introducing cup feeds, offer 1-2 sips then remove the cup completely or pace the feed by placing the spout or lip of the cup on the child's lips without allowing further intake.

Spoons

- There are a range of spoon types to suit individual feeding needs and oral motor skills. Spoon selection should change with the child's growth and/or presenting problem
- For infants under nine months, the head of the spoon should be small and shallow and made out of plastic with some flexibility
- Metal spoons are contraindicated for infants and for children with disability as their use may encourage the bite reflex.

Other specialised feeding equipment

- There is a broad range of specialised feeding equipment on the market including anti-colic teats, orthodontic teats and dummies, cleft palate teats and bottles, cut away cups, weighted cups, fresh food feeders, divided plates. The range is endless.
- Children with a specific diagnosis such as Cleft Palate, craniofacial abnormalities, Cerebral Palsy, Epidermolysis Bullosa, will need specialised feeding equipment. Selection should be based on individual need.
- In most other cases, children with feeding difficulties should be offered standard shaped teats, cups and spoons in the first instance.



Refer to Appendix 9: Feeding equipment (page 115)

Factors to consider for facilitating safe swallowing

Positioning during feeding

- The optimal feeding position emphasises flexion, midline orientation and neutral alignment of the head and neck¹².
- Referral to an occupational therapist or physiotherapist is indicated if children require specialised seating, positioning and handling around feeding.



Refer to Seating and positioning (page 76)

Manipulation of feeding schedules

- Feeding is a motor task. Feeding competency and endurance develops in line with oral motor skill development.
- Feeding efficiency can be improved by limiting the length of the feeding session, allowing for frequent breaks. Feeds may be as short as 5-10 minutes for some children but should not exceed 30 minutes.

TABLE 5: POSSIBLE STRATEGIES TO SUPPORT SAFE SWALLOWING FUNCTION IN INFANTS ^{1, 12}

Presenting Problem	Pacing	Equipment Selection	Texture Modification	Positioning & Handling
Fluid pooling and spilling from mouth	Yes – to modify sucking and swallowing rate and coordination	If strong suck – trial a slow flow or cross cut teat. If soft, weak suck – consider risk of aspiration and cease oral trials	+/- depending on suck strength and effect of pacing	Elevated, well supported midline position Lip, jaw and cheek support
Prolonged sucking – minimal intake	Yes – to establish nutritive SSB cycle	Standard shaped teat with slow to fast flow Consider other specialised feeding equipment	+/- depending on suck strength and effect of pacing	Elevated, well supported midline position Lip, jaw and cheek support
Short sucking bursts, ↑respiratory rate, ↑work of breathing	Yes – to establish suck rhythm and SSB coordination	Slow flow or cross-cut teat	+/- trial of thickened fluids depending on suck strength. Need to monitor infant endurance and fatigue	Elevated, well supported midline position Consider side lying Lip, jaw and cheek support
Respiratory compromise	Yes – to support optimal respiration	Slower flow or cross-cut teat	+/- thickened fluids depending on swallow safety and VFSS results	Elevated, well supported midline position Consider side lying to support respiration
Coughing or choking	Yes – to establish safe SSB cycle	Slow flow or cross cut teat; faster flow teat if using moderately thick fluids. Consider risk of aspiration and need to cease oral trials	Thickened fluids or modified diet (based on VFSS results)	Elevated, well supported, chin tuck (if able), midline flexion

Note: These strategies can be modified for older children demonstrating oral motor and/or swallow incoordination. The pacing and texture modification strategies can be applied in the same way for cup (sip and swallow) and solid (chew and swallow) feeding. Equipment selection should consider the child's general development, oral anatomy, oral motor and swallowing skills. Many of the oral-facilitative strategies can still be applied in addition to specialised seating and positioning.

- Where possible, offer short, frequent feeds or alternate feeds with tube feeds to reduce fatigue.
- If the child is tube fed, offer the oral feed before the tube feed when the child is most alert and hungry.
- Reduce the level of light and noise at feed times.
- Provide external rhythms by using rocking and/or music at feed times¹².



Refer to Feeding environments and routines (page 83)

Hydration and nutrition

- Children with dysphagia may be at increased risk of poor hydration and inadequate intake for nutrition. Their fluid intake, hydration and nutritional status should be monitored carefully.
- Children with respiratory compromise (or increased work of breathing) typically have poor feeding endurance and as such may not have the capacity to take full oral feeds to sustain nutrition. They may require additional nutritional support to promote adequate growth
 - Poor endurance can result in reduced oral intake and poor weight gain
 - Formula can be concentrated or supplements can be added to breast milk, formula and/or solids to increase the energy density of each feed under the care of a dietitian.
- It is important to consider the types of textures managed by the child and whether the food texture is impacting on the child's nutrition and hydration
 - Some children need to stay on less challenging food textures (e.g. thin smooth purees) for main meals due to delayed oral motor skills. They may manage more challenging textures, but are unable to consume adequate volumes efficiently to sustain nutrition. More challenging textures could be offered at snack times for skill development

- Children should be offered food textures at their developmental level. If children are offered foods beyond their oral motor skills level, it may impact on the volume of food consumed and subsequently on their nutritional intake. Modifying the texture, by making it less difficult, may result in an increase in caloric intake and weight gain³⁰
- When children are on thickened fluid it is important to be mindful of the amount of liquid a child is able to swallow as well as overall fluid in their diet
- Whilst understanding a child's oral motor skills and range of textures that they manage, it is important to provide a variety of tastes and nutrition from various food groups. This enables the child to explore and enhance the nutritional value of their oral intake.
- In children where, despite intervention, intake is not adequate to meet hydration or nutritional needs, non-oral feeds may be required.



Refer to Dietary management to improve oral nutritional intake (page 48)



Refer to Enteral feeding (page 57)

Oral hygiene

- Children with dysphagia or cognitive impairments are at a greater risk of having poor oral hygiene. Poor oral hygiene can lead to respiratory conditions such as aspiration pneumonia in these populations.

WARNINGS

- **Every management plan must be individualised.**
- **Any observation of indicators that a child is at risk or may be aspirating should be referred to a speech pathologist for further assessment.**
- **Poor correlation between viscosity with barium and viscosity to texture modified diets must be considered for safe clinical management³¹.**
- **Medications: if texture of medication is changed, (e.g. tablet to liquid or crushed tablet) the composition of the medication may also be changed. Check any medication changes with the managing medical team, dietitian and pharmacy.**
- **Variable medical presentations and level of alertness may affect how the child may handle various textures on any given day.**

RESOURCES

Dietitians Association of Australia & Speech Pathology Australia, *Texture-modified foods and thickened fluids as used for individuals with dysphagia: Australian standardised labels and definitions, 2007.*

www.speechpathologyaustralia.org.au/resources/terminology-for-modified-foods-and-fluids

A scale for modified fluids and a scale for texture-modified foods were developed and consensus was achieved between the Dietitians Association of Australia and Speech Pathology Australia. The standards are now recommended for use throughout Australia.

Evans Morris S, Dunn Klein, M, *Pre-feeding Skills: A comprehensive resource for mealtime development, 2000.*¹

The book includes a strong base of information about normal development in feeding as well as limiting factors that influence feeding. Assessment and treatment principles are thoroughly explored.

NSW Kids and Families, *Infants and Children: Management of Acute Gastroenteritis Clinical Practice Guideline, 2014.*¹³

This clinical practice guideline reflects what is currently regarded as a safe and appropriate approach to the acute management of gastroenteritis in infants and children. This includes details regarding clinical assessment of dehydration and initial treatment.

Speech Pathology Australia, *Dysphagia. Clinical Guideline, 2012.*²

This guideline reflects available evidence, issues and current clinical practice as it presents at time of release. It contains minimum standards of practice and provides a guideline for speech pathologists assessing, treating and managing clients with dysphagia.

The Children's Hospital at Westmead & Sydney Children's Hospital, Randwick, *How to prevent children from choking on food.*

www.schn.health.nsw.gov.au/parents-and-carers/fact-sheets

Fact sheet designed for education of parents.

The Society of Hospital Pharmacists of Australia, *Australian Don't Rush To Crush Handbook. Therapeutic Options for People Unable To Swallow Solid Oral Medicines, 2012.*²²

www.shpa.org.au/Publications/Do-Not-Rush-to-Crush

This handbook has monographs for over 500 Australian medicines listing generic names, brand names and available forms and strengths. There are separate recommendations for administering solid oral dose forms to patients with swallowing difficulties and patients with enteral feeding tubes.

Wolf LS, Glass RP, *Feeding and Swallowing Disorders in Infancy, 1992.*¹²

This book presents a comprehensive, multidimensional approach to feeding problems to assist the clinician in acquiring the knowledge and skills to take an active and effective part in the assessment and management of infant feeding. It contains detailed descriptions of feeding impairments and therapy examples of individual infants and well-detailed, problem-driven models and treatment strategies.

6.3 DIETARY MANAGEMENT TO IMPROVE ORAL NUTRITIONAL INTAKE

Dietary management to improve oral nutritional intake may be considered as a management strategy in response to concerns regarding:

- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience.

Dietary management to improve oral nutritional intake falls primarily within the scope of practice of:

- Nutrition and Dietetics.

Additional support may be provided by:

- Speech Pathology
- Occupational Therapy
- Psychology
- Other: Lactation Consultant, Child and Family Nurse, Medical Officer.

KEY MESSAGES

- **Children with feeding difficulties are at greater risk of nutritional deficiencies.**
- **Infants and children with feeding difficulties often require oral nutritional support in order to optimise their growth and nutritional intake. Several factors need to be considered in order to assist with meeting their nutritional requirements.**
- **There are numerous ways to increase the energy intake of infants and children. Strategies vary based on age, medical condition and current oral intake. In addition to energy, other aspects need to be considered including fluid, fibre, protein and micronutrient intake.**
- **Encouraging food variety can assist with meeting the requirements from the five food groups.**
- **If oral nutrition support is ineffective, enteral nutrition support may be considered as an additional or alternative therapeutic management strategy.**

RECOMMENDED PRACTICE

- Infants and children with feeding difficulties are at risk of inadequate nutritional intake, poor weight gain and growth delay or faltering.
- Oral nutrition support can be a useful first line therapeutic dietary management strategy to optimise growth and nutrition intake.

Estimating energy requirements

- A child's energy requirements can be estimated using an appropriate equation. Ideal body weight may be required for some calculations. Disease factors should be used for particular medical conditions and for infants who are failing to thrive.



The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant formula, Enteral and Supplementary Feeds from the Children's Hospital at Westmead³²

- Energy requirements should be re-calculated at subsequent review appointments, to accommodate for changing weights and clinical presentation.

Estimating protein requirements

- A child's protein requirements can be estimated using an appropriate equation.



The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant formula, Enteral and Supplementary Feeds from the Children's Hospital at Westmead³²

- Protein requirements should be increased for infants who are failing to thrive. For 'catch-up' growth to occur it is ideal to provide 9% energy from protein¹⁶. In practice, it is recommended that for infants less than six months of age, protein should not exceed 4g protein/kg/day.

Supporting oral nutrition for inadequate intake and/or growth faltering

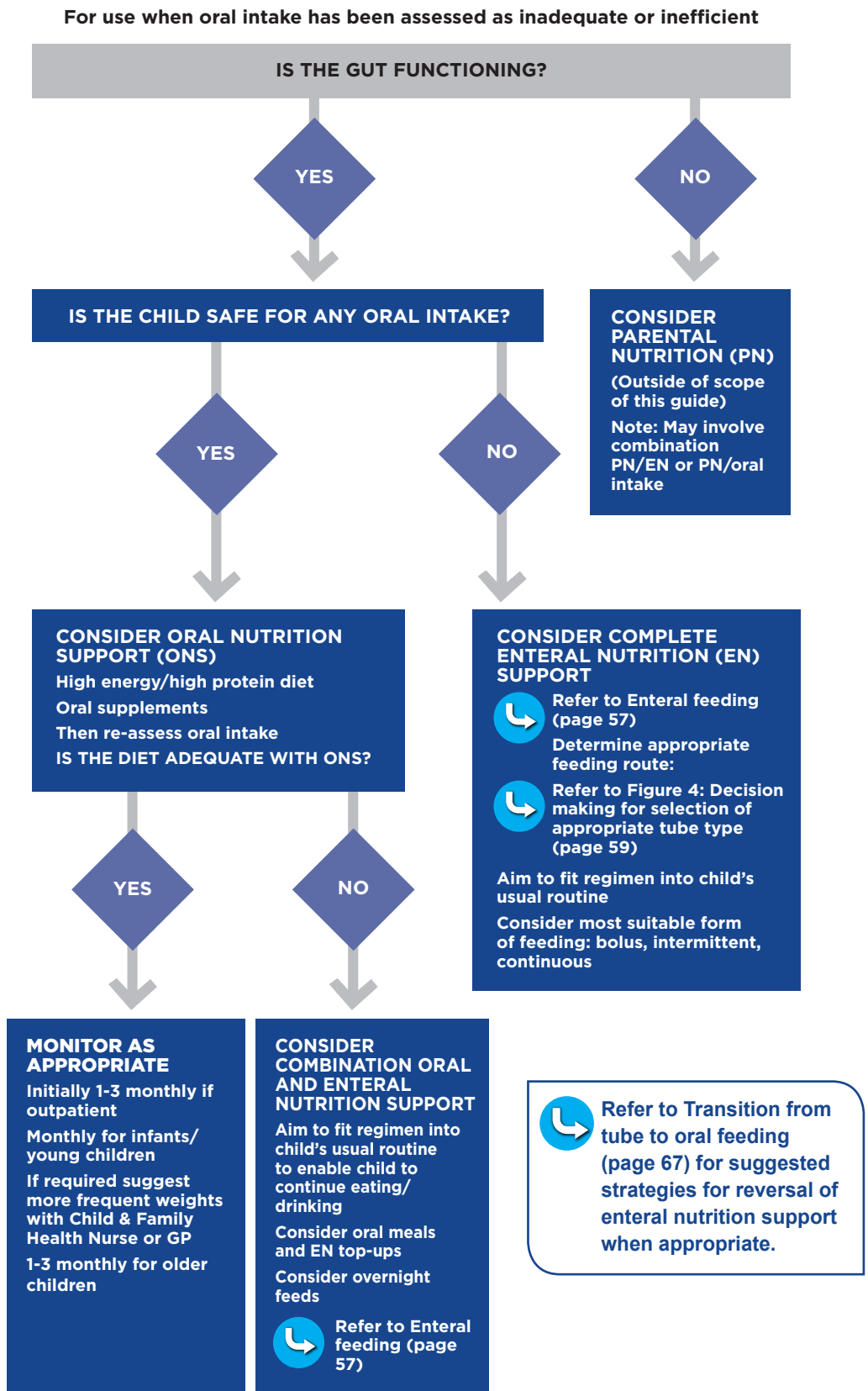
- If the dietary intake of the child is inadequate to meet their estimated requirements, food fortification and oral nutrition support should be considered as a management strategy. Strategies will vary depending on the child's age and clinical presentation.
- Care should be taken when considering whether the estimate of the child's energy needs is an accurate reflection of their actual energy requirements. On paper the calculations may suggest that the child's oral intake is not meeting the calculated estimated energy needs but in reality the child is maintaining adequate growth. It is therefore important to use estimated energy calculations as a guide only and to consider if a child is meeting their requirements, in light of their growth pattern.
- Consider referring to a speech pathologist for children with chewing and/or swallowing issues that are impacting on the types of foods consumed.
- If oral nutrition support does not assist with meeting nutritional requirements for adequate growth, taking into consideration what is appropriate for age and medical condition, consider referral to a medical officer for enteral feeding.



Refer to Enteral feeding (page 57)

- Considerations regarding the selection of nutrition support when oral intake has been assessed as inadequate or inefficient are detailed below in Figure 3.

FIGURE 3: NUTRITION SUPPORT DECISION MAKING TREE⁵⁵



Adapted from *Selection of Nutrition Support Regimens* by R.S. Dechicco and L.E. Matarese, 1992, *Nutrition in Clinical Practice*, 7(5), p239-45.

Supporting oral nutrition for exclusively breastfed infants

- For all infants, exclusive breastfeeding should be encouraged until around six months of age, unless contraindicated by their medical condition¹⁰.
- When conducting the assessment and considering a child's growth trend, it is worthy to note that breastfed infants grow differently to formula fed infants.
- Growth of breastfed infants should first be plotted on the Centre for Disease Control and Prevention (CDC) 2000 growth charts. For an additional guide on the child's growth, weight and length history can be plotted on the World Health Organisation (WHO) 2006 charts. Syndrome-specific growth charts are also available.



Centers for Disease Control and Prevention:
www.cdc.gov/growthcharts/

- If there is no known medical cause for poor weight gain in a breastfed infant, this may be due to other considerations relating to breastfeeding and milk supply. In these situations, the mother and infant should be referred to a lactation consultant, child and family health nurse or clinical nurse consultant.



Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)

- If oral nutrition support is needed to assist with growth, this can be given via:
 1. Expressed Breast Milk (EBM)
 2. EBM mixed with:
 - a. Infant formula powder, or
 - b. A carbohydrate (CHO) supplement, or
 - c. A fat emulsion (fat supplement), or
 - d. Mixed carbohydrate supplement and fat supplement
 3. Carbohydrate supplement syrup. A 50% solution (2kcal/mL) should be given after the feed to ensure intake of breast milk is not affected
- If milk supply remains inadequate or if the infant is tiring easily, it may be necessary to provide supplementation, known as 'top-up' feeds (that is, offering a breastfeed followed by a 'top-up') with either EBM or formula from a bottle or via a tube feed.



Refer to Enteral feeding (page 57)

- The preferred method of fortification is the addition of infant formula to EBM³⁴. This is to maintain the protein to energy ratio.
- Discuss the fortification plan with the parent, ensuring that informed consent is obtained and documented. If you are unable to speak with the mother or the infant has not yet been trialled with infant formula, consider fortifying with a carbohydrate polymer³⁴.
- It is recommended to gradually increase the energy density via slow introduction of these supplements to ensure gastrointestinal tolerance:
 - When using formula to fortify EBM, it is common practise to add 3-4% formula. If extra calories are needed above this, it is usually done with the addition of a fat emulsion or carbohydrate supplement, to avoid excessive protein and/or solute-load
 - For carbohydrate supplements, grade up in 2-4% increments as tolerated
 - For fat emulsions, grade up slowly in ½-1% increments³⁵.



Refer to Appendix 4: Energy supplements (page 104)

Supporting oral nutrition for formula fed infants

- Ensure that adequate volumes of formula are being consumed.
- The following can be used as a guide for the approximate amount of formula required by infants at different ages.

TABLE 6: INFANT FEEDING GUIDELINES¹⁰

Days 1 to 4	Start at 30-60 mL/kg/day and increase over the next few days
Day 5 to 3 months	150mL/kg/day Some infants, especially those who were preterm, will require up to 180-200mL/kg/day
3 to 6 months	120 mL/kg/day
6 to 12 months	100mL/kg/day Some infants may reduce to 90mL/kg/day Infants of this age also take solid foods

Note: Values given are a guide only.

- Once the feed volume has been optimised, the energy density of the formula can be increased.
- Formula can be concentrated using additional formula powder, extra carbohydrate or fat or a combination.



For advantage and disadvantages of each fortification method refer to Table 7: Advantages and disadvantages of different modification methods for increasing energy density of formula (page 53)

- For 'catch-up' growth to occur it is ideal to provide 9% energy from protein¹⁶.
- Contraindications to concentrating formula would include:
 - Protein intakes exceeding recommendations (for infants less than 6 months of age, protein should not exceed 4g protein/kg/day)
 - Where an anti-regurgitation (AR) formula is being used it is not recommended to concentrate the feed as it may become too thick. Instead a standard infant formula should be concentrated and then a thickener can be added separately. Alternatively, the AR formula can have carbohydrate or fat added.
- For details on the amount of calories provided by carbohydrate and fat supplements:



Refer to Appendix 4: Energy supplements (page 104)

- For additional details on adding calories:



Refer to Appendix 5: Worked example for calculating a concentrated formula using formula alone (page 105)



Refer to Appendix 6: Worked example for calculating a formula using a carbohydrate supplement (page 107)




The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant formula, Enteral and Supplementary Feeds from the Children's Hospital at Westmead³²

TABLE 7: ADVANTAGES AND DISADVANTAGES OF DIFFERENT MODIFICATION METHODS FOR INCREASING ENERGY DENSITY OF FORMULA^{35, 36}

Modification	Method	Advantage	Disadvantage
<p>Concentrated formula</p> <p>Recommend gradual increase in strength</p> <p>Concentrate formula to meet protein and nutrient needs</p> <p>Do not exceed the maximum recommended protein intake for infants</p>	<p>Add extra formula powder in the given volume water</p>	<p>Easy</p> <p>Maintains standard ratio of protein:fat:CHO</p>	<p>Possible constipation</p> <p>↑ osmolality and renal solute load</p> <p>May increase satiety</p> <p>May exceed recommended micronutrient intake</p>
<p>Extra CHO</p> <p>Increase by 2% increments/2kcal/30mL as tolerated</p>	<p>Add a carbohydrate supplement</p>	<p>Easy</p> <p>Inexpensive</p> <p>Minimal ↑ in osmolality and renal solute load</p>	<p>May cause osmotic diarrhoea</p> <p>Vitamin/mineral/protein content may be less than recommendations</p>
<p>Extra Fat</p> <p>Add in ½-1% increments each 24 hours</p> <p>Recommend not to increase by >2-3% fat in 24 hours</p> <p>Expected maximum tolerance as follows:</p> <ul style="list-style-type: none"> ○ 5-6% fat concentration in infants (ie. 5-6g total fat per 100mL feed) ○ up to 7% fat concentration in children over 1 year <p>Lower levels of tolerance will occur where there is reduced gut function or where MCT emulsion is used</p>	<p>Add a fat emulsion</p> <p>Unless clinically indicated long chain triglycerides (LCT) should be trialled first.</p>	<p>Easy</p> <p>For medium chain fatty acid (MCT) supplements, this provides an alternate route of digestion</p>	<p>LCT slows gastric emptying and increases satiety</p> <p>May aggravate reflux</p> <p>Expensive</p> <p>May cause gastrointestinal upset</p> <p>Vitamin/mineral/protein content may fall short of recommendations</p>
<p>Combinations</p> <p>Concentrate formula to meet protein and nutrient needs</p> <p>Add CHO and fat in increments as indicated above for additional energy</p> <p>Maximum total energy content of formula for infants should only go above 30kcal/30mL under close supervision</p>	<p>Add extra formula powder in the given water volume</p> <p>Add carbohydrate supplement</p> <p>Add fat emulsion</p>	<p>Minimises disadvantage of using only one method</p> <p>Combination of fat and carbohydrate</p>	<p>Expensive</p> <p>Many steps involved in preparation and increased chance of measurement error</p>

Supporting oral nutrition for infants between 6-12 months

- If oral nutrition support is needed to assist with growth for this age group, consider food and drink fortification and structured meal times (including high energy, protein mid meal snacks).
- Fortification of food and drinks can be used to optimise energy intake³⁷.
- For specific ideas on food and drink fortification for this age group, refer to relevant Australian tertiary children's hospital factsheets.
- If there is an over dependence on breastfeeding or formula, encourage age and developmentally appropriate feeding. Parents may require support regarding establishing a routine as well as sleep and settling.

 **Refer to Appendix 2: Paediatric feeding professional roles and agencies (page 99)**

- It should be noted that cow's milk should not be given as the main drink to infants under 12 months. Studies have found that feeding infants whole cow's milk before 12 months of age is connected to a higher incidence of iron deficiency¹⁰.

Supporting oral nutrition for infants from 12 months

- If oral nutrition support is needed to assist with growth for this age group, encourage a variety of food from all food groups, with particular emphasis on energy dense foods³⁷.
- Aim for a structured routine of three main meals and two to three high energy, protein snacks each day.
- Mix calorie-dense ingredients into usual family foods.
- Consider commercial oral nutrition supplements for children who are not meeting macronutrient and micronutrient needs.

Ensuring adequate fluid intake

- Ensure adequate fluid intake according to guideline for age³².
- For children who are experiencing dark, concentrated urine, try to optimise fluid intake.
- For children who do not like to drink or have difficulty with fluids, high water content foods can be encouraged, such as jelly, custard, yoghurt, ice cream, fruit, vegetables and soup. However, adequate fortification is important to ensure caloric density.



HYDRATION:

If there are acute concerns regarding hydration status, refer to a medical officer immediately. Signs or symptoms of dehydration may include reduced urine output, dry mucous membranes, abnormal respiratory pattern, lethargy, reduced skin turgor and sunken eyes¹³.

Supporting adequate food variety

Food variety can be defined in terms of foods that are biologically diverse or foods that are nutritionally distinct from each other¹⁴. Variety includes menu items both within and across food groups as well as a variety of tastes, textures and forms of food³⁸.

- Our food supply is commonly categorised into five core groups:
 1. Vegetables and legumes/beans
 2. Fruit
 3. Milk, yoghurt, cheese and alternatives
 4. Lean meats and poultry, fish, eggs, tofu, nuts, seeds and legumes or beans
 5. Grain (cereal) foods, mostly whole grain and/or high fibre cereal varieties
- Unless otherwise indicated children and adolescents should enjoy a wide variety of nutritious foods from each of the five food groups, to increase the potential for recommended macro and micronutrient needs to be met. Limited food variety can result in over or under nutrition of particular macro and/or micro nutrients.
- Limited food variety is often multifactorial in its aetiology however pinpointing key social, behavioural and economic concerns may assist in prevention and/or management.
- Early assessment and intervention has an increased capacity to rectify and overcome suboptimal food variety.
- The severity of a feeding related medical condition is likely to influence the severity of food restriction.

Key concepts for managing patients at risk of limited food variety

- Understand parental expectations: realistic expectations are key to achieving progress. Education for parents about age appropriate serving sizes and frequency of food types per day can help to establish realistic expectations of their child. The National Health and Medical Research Council Dietary Guidelines provide details regarding the minimum recommended number of serves per day for children aged 2-16 years.



NHMRC Infant Feeding Guidelines¹⁰

- In practice:
 - Comments from health professionals can be misinterpreted or misconstrued and may contribute to unrealistic parental expectations
 - For children up to the age of five, a practical guide for parents is one tablespoon of each food type at each meal per year of age (a one year old might get one tablespoon of meat/chicken or fish, one tablespoon of carbohydrate source and one tablespoon of peas in one meal)
 - Fluid intake before the meal is likely to suppress appetite.
- Parental anxiety: High levels of parental anxiety can lead to limited food variety for many reasons
 - Anxiety about lack of intake may lead to: force feeding; limited variety being offered as the parent prefers to offer what the child will eat; stressful environment around food which may lead to anxiety for the child around eating and trying new foods.
- Socio-economic factors: Consider parental cooking and food preparation skills, financial barriers, parental or sibling 'role modelling'
 - If a family does not have vegetables in the house, and do not know how to cook vegetables it is unlikely the child will be offered these, particularly in a few different textures such as some puree; some lumpy and soft finger items.
- Where insufficient nutrient intake is an ongoing concern, assessment of nutrient status may be beneficial. Blood tests with supplementation as indicated may be required. When requesting a blood test:
 - Ask for all nutrients at risk at once, so that the child only has one blood test
 - Be clear about why the test is being requested
 - Only request something that will change practice or outcome for the patient.
- Consequences of limited food variety, that will also contribute to further reduction in food intake to be mindful of include (but are not limited to):

- Limited fruit and vegetable intake may result in constipation which may perpetuate reduced appetite and/or vomiting
- Excess calcium intake coupled with poor iron intake may lead to iron deficiency which may contribute to a reduction in appetite
- Poor intake of animal sources (dairy and meats) may result in B12 deficiency.

Additional management strategies for improving food range

- Offer alternative food within core groups. For example:
 - Offer eggs, fish, legumes or tofu if meat and poultry is refused
 - Offer cooked, dried or tinned fruits and vegetables if raw varieties are refused or textures not well managed.
- Limit non-core food and beverage items to help with appetite.
- Encourage the use of refused core foods into standard recipes such as grated vegetables in sauces or patties and cheese or dairy in mashed vegetables or soups.
- Encourage a variety of offerings at both main meals and mid-meals. Mid-meals/snacks should be recognised as an important contribution to overall intake, including food variety.
- Include a variety of different coloured foods at each meal.
- Offer two small courses at each meal, e.g. cereal then toast at breakfast; hot meal then fruit or custard or yoghurt at dinner.

Management strategies for limited food textures

- Try a graded progression of food textures. For example:
 - Puree meat > minced > soft-cooked pieces > strips of meat/whole chop or cutlet
 - Puree fruit > mashed > naturally soft peeled pieces > whole fruit products



Refer to Progression through textures (page 42)

- Encourage palatable food preparation to assist with intake. For example: utilise soft cooking methods such as casserole or the use of moist meats such as mince

WARNINGS

- Any concerns regarding possible dehydration should be referred to a medical officer.
- Nutrition advice must be appropriate for the child's medical condition.
- Macronutrient and micronutrient recommendations must be appropriate for age and not exceed the upper limit. Supplementation of vitamins and minerals may be necessary until the dietary intake is adequate.

RESOURCES

Centers for Disease Control and Prevention, **Growth Charts.**

www.cdc.gov/growthcharts/

Growth charts consist of a series of percentile curves that illustrate the distribution of selected body measurements in children.

di Prima K, Cichero J, **More Peas Please. Solutions for feeding fussy eaters, 2009.**

This book provides a guide to helping children eat a variety of foods. It examines the importance of children eating a balanced diet and helping them overcome negative experiences to certain foods.

Griffiths G, Stapleton D. **Sense-ational Mealtimes, 2013.**

www.sense-ationalmealtimes.com.au/

Sense-ational Mealtimes is a book aimed at providing parents with strategies to manage tricky mealtime behaviours, fussy or picky eating, a fear of new food and feeding problems. The book focuses on the sensory preferences of children during mealtimes. Further details regarding the book and authors is available on the website.

National Health & Medical Research Centre, **Infant Feeding Guidelines, 2012.**¹⁰

www.nhmrc.gov.au/guidelines/publications/n56

The Infant Feeding Guidelines are aimed at health workers to assist them in providing consistent advice to the general public about breastfeeding and infant feeding. They support optimum infant nutrition by providing a review of the evidence, and clear evidence-based recommendations on infant feeding for health workers.

NSW Kids and Families, **Infants and Children: Management of Acute Gastroenteritis Clinical Practice Guideline, 2014**¹³

This clinical practice guideline reflects what is currently regarded as a safe and appropriate approach to the acute management of gastroenteritis in infants and children. This includes details regarding clinical assessment of dehydration and initial treatment.

Queensland Health, **Fun not Fuss with Food, 2013.**

www.health.qld.gov.au/health_professionals/food/funnotfusswithfood.asp

This is a tool for health staff to provide information to parents about nutrition for children. Information includes tips for child friendly meals, food activities and games, healthy snack and drink ideas, information about the amounts and kind of food for children.

The Children's Hospital at Westmead, **The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant formula, Enteral and Supplementary Feeds, 2010.**³²

This booklet provides a handy comparison of the nutritional composition of standard and specialised infant and paediatric formulas, as well as the enteral and supplementary feeds currently available in Australia.

Women's and Children's Hospital, **Clinical Nutrition Handbook, 2013.**³⁵

A pocket guide, written by paediatric dietitians, includes paediatric nutrition assessment guidelines; paediatric enteral feeding guidelines; comprehensive infant and paediatric formula composition tables; parenteral nutrition guidelines; infant, child and adult vitamin/mineral supplements; and nutrition support guidelines for premature infants.

Appendices

- **Appendix 4: Energy supplements (page 104)**
- **Appendix 5: Worked example for calculating a concentrated formula using formula alone (page 105)**
- **Appendix 6: Worked example for calculating a formula using a carbohydrate supplement (page 107)**

6.4 ENTERAL FEEDING

Enteral feeding may be considered as a management strategy in response to concerns regarding:

- Feeding safety
- Feeding adequacy
- Feeding efficiency.

Management of enteral feeding falls within the scope of practice of:

- Nutrition and Dietetics
- Speech Pathology.

Additional support may be provided by:

- Occupational Therapy
- Physiotherapy
- Psychology
- Child Life/Play Therapy
- Social Work
- Other: Nurse, Medical Officer.

KEY MESSAGES

- **When possible, enteral nutrition is preferred over parenteral nutrition as the method of feeding for patients who have a functioning gastrointestinal tract.**
- **The decision about enteral feeding route will be made by the medical team, where possible in consultation with the dietitian.**
- **Mother's breast milk is the optimal choice for infants. When breast milk is not available a standard infant formula is recommended until 12 months of age. In some situations specialised formula may be required to meet the clinical needs of the child.**
- **Enteral feeds can be administered by continuous, intermittent, gravity drip or bolus methods, or a combination of these based on the needs of the child and family.**
- **Enteral feeding is a process which requires ongoing assessment to determine starting rate and ongoing monitoring to ensure appropriate incremental increases.**
- **When safe and appropriate, a trial of oral feeding/ stimulation should be considered.**
- **Refeeding syndrome can arise as a result of implementing nutrition (oral, enteral or parenteral) in malnourished patients. Specific strategies for the implementation and monitoring of enteral nutrition support for children at risk of refeeding syndrome are essential.**
- **Home enteral nutrition (HEN) refers to the provision of enteral nutrition in the home setting. HEN allows enterally fed hospital patients, who are otherwise medically stable, to be discharged into the community.**

RECOMMENDED PRACTICE

For children who are unsafe or unable to meet their nutritional needs orally, additional nutrition support may be required to optimise nutritional intake for growth. This may be provided through one or a combination of methods including:

- **Enteral nutrition:** The delivery of a liquid nutrition formula directly into the gastrointestinal tract, via a feeding tube, inserted through the nose, stomach or jejunum^{39, 40}
- **Parenteral nutrition:** The method of supplying nutrients intravenously. This must be an appropriate mixture of carbohydrate, protein and fat with essential vitamins and trace elements and is beyond the scope of this document. Refer to guidelines on paediatric parenteral nutrition for more information if required⁴¹.

When possible, enteral nutrition is the preferred method of feeding for patients who have a functioning gastrointestinal tract. Although not without risk, enteral nutrition is preferred over parenteral nutrition as it has reduced risk of infectious complications; reduced bacterial translocation in the gastrointestinal (GI) tract; is more physiologically appropriate; and can be more economical.

 **Refer to Figure 3: Nutrition support decision making tree (page 50)**

Involving the multidisciplinary team

When managing children it is important to consider that enteral feeding not only requires knowledge from a dietitian but also support from the multidisciplinary team⁴². The multidisciplinary team may include (but not be limited to) the following:

- Nursing staff and the medical team: Involvement is imperative for the safe, hygienic administration of enteral feeds and the selection and maintenance of feeding equipment which is beyond the scope of this document
- Speech pathologist:

 **Refer to Feeding skill development (page 29)**

- Occupational therapist and physiotherapist:

 **Refer to Seating and positioning (page 76)**

- Occupational therapist:

 **Refer to Sensory processing (page 88)**

- Play/Child life therapist: May prepare the child and explain the enteral feeding process and related procedures in an age appropriate manner including the use of equipment and photographs to reduce anxiety by allowing the child/young person to feel prepared. In addition they can support children and young people during NG tube insertions, button changes and other feeding related procedures, through the use of coaching and diversion techniques
- Psychologist: May provide assessment of a patient and their caregiver's thoughts, feelings and behaviours related to enteral feeding and oral intake, as well as assessing adjustment to the underlying medical condition. They provide psychological interventions to assist in healthy adjustment to enteral feeding. Psychologists are involved in intervention to target prevention of oral aversion and tube dependence
- Social worker: May provide psychosocial assistance to the child and their family as they adjust to the feeding process. This includes generalised counselling and referral to relevant community agencies.

Considering enteral feeding route and tube types

The following need to be considered when choosing the most appropriate enteral feeding route:

- risk of aspiration
- considerations specific to the child's medical condition, gastric function or previous surgeries
- expected duration of enteral feeding.

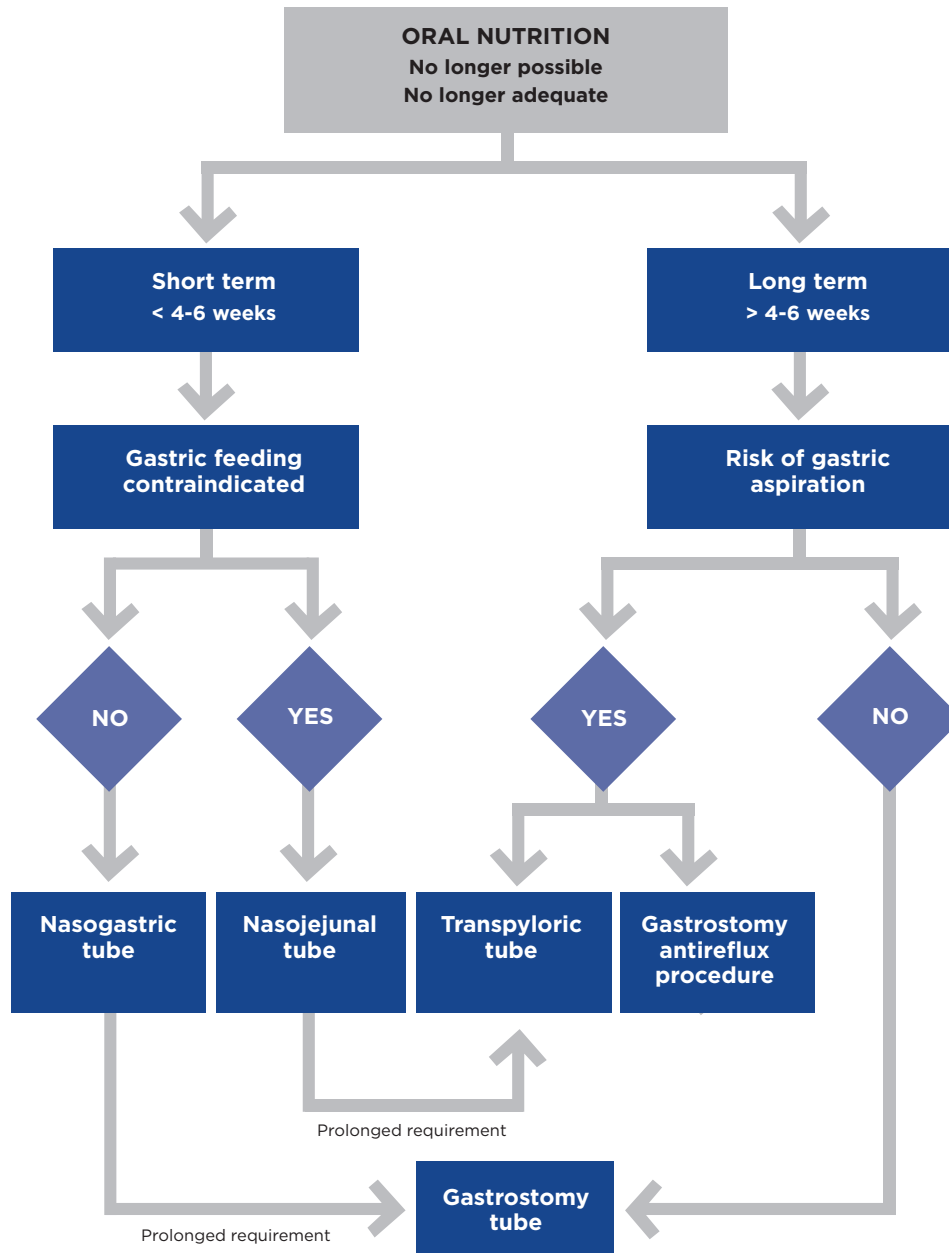
The decision about the most suitable enteral feeding route and tube type is generally made by the medical team. The dietitian can assist with the decision making process based on current tolerance of oral and/or enteral diet and nutritional goals.

Goals of nutrition support should be discussed within the multidisciplinary team prior to starting enteral nutrition support.

Recommendations have been made for gastrostomy insertion after four to six weeks of enteral feeding. However these timeframes are not always feasible or reflective of practises in health facilities at a local level⁴⁰.

Selection of the appropriate tube type for enteral nutrition can be guided by the decision tree in Figure 4.

FIGURE 4: DECISION MAKING FOR SELECTION OF APPROPRIATE TUBE TYPE ⁴³



Adapted from *ESPEN Guidelines on Artificial Enteral Nutrition*, p. 849.⁴³

Selecting formula

- There are a wide variety of formulas designed for infants as well as older children and adults. Mother's breast milk is the optimal choice for infants. Breast milk can be fortified to provide additional nutrition if required. If breast milk supply is insufficient or unavailable, formula may be used in conjunction with breast milk or as a substitute. In some situations specialised formula may be required to meet the clinical needs of the child^{10, 40, 44}.
- Feed selection should consider the following:
 - Age
 - Weight
 - Medical history, for example, food allergies, conditions that require specific formulations (based on fat, protein or carbohydrate type) and conditions impacting feed tolerance
 - Nutritional requirements
 - Accessibility for Home Enteral Nutrition patients and convenience of administration
 - Palatability (when relevant)
 - Osmolality (when relevant).



For more detailed guidelines regarding formula selection refer to Appendix 7: Formula selection for enteral feeding (page 110)

Considering regimens for enteral feeding

- Enteral feeds can be administered by continuous, intermittent, gravity drip or bolus methods, or a combination of these. Further information, including the advantages and disadvantages of each method:



Refer to Appendix 8: Tube feeding schedules/regimens for enteral feeding (page 113)

- When choosing an enteral feeding regimen consider the following^{45, 46}:
 - Clinical condition, for example: impacting medical conditions, potential tolerance issues, risk of reflux/aspiration
 - Age
 - Patient activity level, preferences, lifestyle, development and family routine
 - Cost effectiveness and/or implications (liaise with social work if concerns)
 - Ability and education level of the parent.

Starting and advancing enteral feeds

- Ideally, nutrition intervention goals should be determined in discussion with parents and the multidisciplinary team when starting enteral nutrition support.
- Children starting enteral nutrition support require an individual assessment for determining the most appropriate rate of delivery of nutrition support. Factors to consider when determining starting rates include:
 - Current medical condition
 - Tolerance to any previous enteral nutrition regimens
 - Formula type
 - Route of delivery
 - Nutritional status at time of starting feeds
 - Specific nutrient requirements
 - Goal of nutrition support (for example exclusive or supplemental nutrition)
 - Biochemistry status
 - Expected duration of nutrition support
 - Refeeding risk.
- Enteral feeding should only be started following medical confirmation of tube placement. In most cases feeds can be started at full strength with the volumes being gradually increased in stages either as an increased infusion rate or as a larger bolus¹⁶.
- Consideration of advancing feeding regimens should be undertaken upon review of the above mentioned factors. Progression toward goal rate should not undermine the acute medical condition of a patient.
- Time between reviews will be dependent on the individual patient, care setting and duration of nutrition support. In the initial stages, gastrointestinal functioning, nutrient intake and actual volume of feed delivered should be reviewed daily⁴⁷. Intervals for review may increase as the patient becomes stabilised on nutrition support.

Suggested starting rates and incremental increases for continuous nasogastric/gastrostomy tubes

Suggested starting rates and incremental increases for nasogastric/gastrostomy tubes are outlined in Table 8.

Note: The child's goal rate should be determined on an individual basis taking into consideration age and weight as well as energy, fluid and nutrient requirements. Tolerance of final feeding rates will vary between individuals and should be closely monitored and adjusted accordingly.

TABLE 8: SUGGESTED STARTING RATES & INCREMENTAL INCREASES FOR CONTINUOUS NASOGASTRIC/ GASTROSTOMY TUBES^{39,48}

Age	Initial hourly infusion	Advancing feeds*	Maximum goal rate
0 – 2 years	5 – 10mL/hour for 4 hours	5 – 10 mL/hour every 1 – 4 hours	6 mL/kg/hour
2 – 6 years	10 – 15 mL/hour Nasogastric for the first 4 hours Gastrostomy for the first 4-8 hours	10 mL/hour every 1 – 4 hours	4 – 5 mL/kg/hour
7 – 14 years	10 – 20 mL/hour Nasogastric for the first 4 hours Gastrostomy for the first 4-8 hours	10 mL/hour every 1 – 4 hours	3 – 4 mL/kg/hour
> 14 years	20 – 30mL/hour Nasogastric for the first 4 hours Gastrostomy for the first 4-8 hours	10 mL/hour every 1 – 4 hours	125 mL/hour

* The frequency of increasing rate may need to be slower for some children to ensure feeding tolerance.

Suggested starting rates and incremental increases for nasojejunal/jejunosomy tubes

In addition to the advice for nasogastric and gastrostomy tubes, when feeding into the jejunum:

- In practice, it is recommended to start continuous feeds at 1mL/kg/hr, e.g. 5mL/hr for a 5kg infant. The maximum starting rate for children >10kg is 10mL/hr
- Continuous pump feeding is required for jejunal feeding due to the lack of reservoir capacity in the small bowel⁴⁹. Bolus feeds are contraindicated⁵⁰. Intermittent pump feeding may be possible. However, particularly for infants, consultation with the medical team is recommended due to potential risk of hypoglycaemia when ceasing jejunal feeds.

Suggested starting rates and incremental increases for bolus feeding

Established suggested starting rates and incremental increases for bolus feeds are outlined in Table 9.

Note: The child's goal volume should be determined on an individual basis taking into consideration age and weight as well as energy, fluid and nutrient requirements. Tolerance of final feeding rates will vary between individuals and should be closely monitored and adjusted accordingly.



RISK OF REBOUND HYPOGLYCAEMIA

When transitioning from a continuous to intermittent jejunal feeding regimen there is a risk of rebound hypoglycaemia, particularly during the pause from feeding. Discuss with medical team regarding the frequency and duration of blood glucose monitoring specific to the child's age and condition.

TABLE 9: SUGGESTED STARTING RATES AND INCREMENTAL INCREASES FOR BOLUS FEEDING ^{46, 51}

Age	Initial hourly infusion	Advancing feeds*	Maximum Goal Volume
0 – 2 years	10 -30 mL hourly bolus	Double volume for 2nd hourly bolus Treble volume for 3rd hourly bolus	150 – 200 mL bolus feed every 4 hours * 120-130mL for children less than 5kg body weight.
2 – 6 years	10 – 30 mL hourly bolus	As for 0 – 2 years	150 – 250 mL bolus feed every 4 hours
7 – 14 years	10 – 30 mL hourly bolus	As for 0 – 2 years	150 – 250 mL bolus feed every 4 hours
> 14 years	20 – 40 mL hourly bolus	As for 0 – 2 years	150 – 300 mL bolus feed every 4 hours

* The rate at which feeds are increased will vary depending on the child, e.g. could be over 12 hours or 48 hours depending on feed tolerance.

Managing refeeding syndrome

- Refeeding syndrome is a term used to describe the various metabolic complications that can arise as a result of implementing nutrition (oral, enteral or parenteral) in malnourished patients.
- Clinical consequences of refeeding syndrome can include hypophosphatemia, hypokalemia, hypomagnesaemia, haemolytic anaemia, muscle weakness and impaired cardiac function leading to fluid overload, arrhythmia and possible death⁵².
- Children at risk of refeeding syndrome include those who have experienced⁵³:
 - Chronic malnutrition
 - < 80 % of Ideal-Body-Weight, BMI <5th percentile for age
 - Undesired weight loss of 10% or more within a three month period with physical signs of fat and/or muscle depletion
 - Minimal oral intake/ acute food refusal (less than ~ 50% estimated requirements) for more than 14 days
 - Little or no nutritional intake for 7-10 days
 - Hypophosphatemia, hypokalemia or hypomagnesaemia prior to refeeding
 - Prolonged severe vomiting and/or diarrhoea
 - Evidence of cardiac arrhythmia where pre-existing cardiac condition does not exist.

Enteral nutrition support for children at risk of refeeding syndrome

- Deranged electrolytes should be corrected prior to starting feeding⁴⁷.
- Start continuous nutrition support at no more than 50% of estimated energy requirements per day.
- Slowly advance nutrition support in increments to meet 100% of estimated energy requirements.
- It is preferable not to increase nutrition support in the presence of biochemical derangement. Supplementation may be required to correct biochemical derangements in order for feeding to advance.

Refeeding syndrome monitoring

- Medical monitoring during refeeding is essential amongst all patients recognised as being at risk of refeeding syndrome.
- The principle biochemical marker of refeeding syndrome is hypophosphatemia. This usually occurs within the first 1-4 days of refeeding, although can occur during the first two weeks.
- Hypophosphatemia may be associated with hypokalemia, hypomagnesaemia, hypoglycemia, sodium and fluid retention and/or thiamine deficiency.
- Monitoring for signs of refeeding should take place prior to the initiation of enteral feeding and periodically during enteral nutrition therapy. Guidelines for monitoring refeeding are detailed in Table 10.

TABLE 10: GUIDELINES FOR MONITORING REFEEDING ⁶

	Day 1	Day 2-5	Days 6-14
Electrolytes (including phosphate, magnesium, potassium)	Daily	Daily	Weekly
Blood glucose	Daily	Daily	Weekly

- Daily electrolyte supplementation as indicated until serum levels stable.
- Recommendations for starting potassium, thiamine and phosphate supplementation for at least the first five days of feeding should take place in discussion with the medical team and pharmacy.

Trouble shooting for enteral nutrition

It is important for health professionals and parents to be aware of potential signs that an enteral feeding review is required and methods for overcoming common issues (including methods for reporting these to members of the multidisciplinary team). Indicators that an enteral feeding review is required are detailed in Table 11.

TABLE 11: INDICATORS FOR AN ENTERAL REVIEW⁴⁷

Gastrointestinal signs	vomiting, diarrhoea, abdominal distension, constipation, dumping syndrome
Anthropometric signs	unintentional weight loss, excessive weight gains
Dermatological signs	Skin breakdown, skin irritation, infection, excessive moisture, hypergranulation, tight fitting tube surrounding administration site
Administration, environment or equipment signs	regular or frequent tube blockages, leaking through the tube, leaking around the tube, frequent tube dislodgement

- Strategies for the management of poor gastrointestinal tolerance should be undertaken on an individual basis and in the context of current medical status. Strategies may include, but are not limited to the consideration of:
 - Excessive or inadequate feed volumes
 - Gut dysmotility including potential influence of medications
 - Excessive or inadequate fibre and/or fluids
 - Excessive or inadequate concentration of formula
 - Less than optimal feed duration or rapid feed administration
 - Inappropriate storage of formula, feed contamination or misuse of consumable items
- Persistent poor feed tolerance should be reviewed by a medical officer to consider:
 - Underlying gastrointestinal disorder
 - Medications to improve gastric emptying or gut motility
 - Transpyloric feeding if persistent reflux resulting in excessive losses preventing appropriate weight gain
 - Medications to assist with regular stooling to prevent constipation
- Refer to professional resources for guidance regarding the prevention and management of common enteral nutrition related problems.



[Refer to Enteral Feeding Resources \(page 65\)](#)

Administering medication

When administering medications via enteral route consult with the pharmacist, medical or nursing staff to ensure safe and effective use of medications. The main aspects to consider when administering medications via enteral modes include:

- **Safety:** Not all medications may be given via enteral feeding tube, for example buccal or sublingual tablets and the absorption of some medicines may be altered depending on the location of the tube. Consult with a pharmacist or refer to the *Australian Don't Rush to Crush Handbook*²² prior to administering medication via enteral tube.
- **Oral administration:** If a child is safe to take medications by mouth this route should be used. However, therapists focusing on feeding should consider if medications have an unpleasant taste. This may cause distress or aversion and potentially limit progress with oral feeding.

- Preventing blockage of enteral tubes by²²:
 - Selecting the most appropriate dose form. Liquid medications should be used where possible
 - Ensuring solid oral medicines are crushed finely when this is the chosen option
 - Avoiding drug interactions with feeds. Feeds may affect medicine absorption
 - Avoiding acidic liquids
 - Considering the tube size
 - Giving each medication separately with water flushes, after stopping the feed, between each medication and before restarting a feed
- It is important to consult a pharmacist, refer to the *Australian Don't Rush to Crush Handbook* or the individual medicine monographs available on eMIMS prior to recommending alterations of medicines.



The Society of Hospital Pharmacists of Australia. Australian Don't Rush To Crush Handbook. Therapeutic Options for People Unable To Swallow Solid Oral Medicines²²

www.shpa.org.au/Publications/Do-Not-Rush-to-Crush

Enteral feeding should be considered a cyclical process which requires not only the initial assessment and implementation of a feeding regimen but also ongoing monitoring with adjustments made towards achieving both long and short term goals.



Refer to Assessment (page 11)

Establishing Home Enteral Nutrition (HEN)^{42, 55}

- The provision of enteral nutrition in the home setting is called Home Enteral Nutrition (HEN). HEN allows enterally fed hospital patients, who are otherwise medically stable, to be discharged into the community.
- The aims of HEN include provision of effective nutritional support, promotion of patient and family autonomy, ensuring safe maintenance of nutritional support, and maximising the potential for improved lifestyle and optimised disease management⁴⁰.



Paediatric Home Enteral Nutrition (HEN) Tube Feeding A Multidisciplinary Resource for Health Professionals.³⁹

Monitoring enteral nutrition

The main aims of monitoring enteral nutrition are to ensure patient safety, optimal growth and address any concerns with complications of feeding. There are no evidence based guidelines regarding biochemical, growth and clinical monitoring in the paediatric population⁵⁴. For this reason monitoring must be based on the individual patient and their specific needs. Avenues to consider when determining frequency of monitoring include gestational age, postnatal age, disease, severity of illness, degree of malnutrition and level of metabolic stress⁴⁴.

WARNINGS

- **Any observation that a child may be at risk or may be aspirating should be referred to a speech pathologist for further assessment.**
- **When transitioning from a continuous to intermittent jejunal feeding regimen there is a risk of rebound hypoglycaemia, particularly during the pause from feeding. Discuss with medical team regarding the frequency and duration of blood glucose monitoring specific to the child's age and condition.**
- **Refeeding Syndrome may occur in a child who is severely malnourished or who has adapted to a state of starvation but can occur in any child when nutrition is restarted after a period of decreased intake.**
- **Persistent poor feed tolerance should be reviewed by a medical officer.**
- **Specific formulas may be required for children with allergies or specific medical conditions.**

RESOURCES

Agency for Clinical Innovation (ACI), *A Clinician's Guide: Caring for people with gastrostomy tubes and devices*, 2014.⁵⁶

www.aci.health.nsw.gov.au

The guide provides health professionals with practical advice related to the different stages of the patient journey from deciding to initiate gastrostomy tube feeding to removing the tube or device, including transition or transfer of care.

American Society for Parenteral and Enteral Nutrition (ASPEN), *Clinical Guidelines for the Use of Parenteral and Enteral Nutrition in Adult and Pediatric Patients*, 2009.⁴⁶

www.unicap.br/pos/cursos_atualizacao/downloads/2002guidelines.pdf

These clinical guidelines, designed for use by health care professionals who provide nutrition support services and their patients, offer clinical advice for managing adult and pediatric (including adolescent) patients in inpatient and outpatient (ambulatory, home, and specialized care) settings.

Dietitians Association of Australia (DAA), *Enteral nutrition manual for adults in health care facilities*, 2011.⁴⁹

www.daa.asn.au/wp-content/uploads/2011/11/Enteral-nutrition-manual-Oct-2011.pdf

Note: adult feeding rates are not appropriate in infants and young children.

This manual was developed for dietitians and other health care professionals as a practical resource for managing enteral nutrition support. It should be used in consultation with an appropriately qualified dietitian.

National Institute for Health and Care Excellence (NICE), *Nutrition support in adults: Oral nutrition support, enteral tube feeding and parenteral nutrition*, 2006.⁴⁷

www.guidance.nice.org.uk/CG32/Guidance/pdf/English

These guidelines cover the of nutrition support in adult patients (>18 years) who are either malnourished or are at 'risk' of malnutrition.

National Health Service (NHS), *Caring for children and young people in the community receiving enteral tube feeding. Best practice statement*, 2007.⁵⁴

www.healthcareimprovementscotland.org/previous_resources/best_practice_statement/caring_for_children_and_young_.aspx

The aim of the statement is to offer guidance to nurses, allied health professionals, midwives, and health visitors on best practice relating to the care of children/young people in the community receiving enteral tube feeding.

The Society of Hospital Pharmacists of Australia, *Australian Don't Rush To Crush Handbook. Therapeutic Options for People Unable To Swallow Solid Oral Medicines*, 2012.²²

www.shpa.org.au/Publications/Do-Not-Rush-to-Crush

This handbook has monographs for over 500 Australian medicines listing generic names, brand names and available forms and strengths. There are separate recommendations for administering solid oral dose forms to patients with swallowing difficulties and patients with enteral feeding tubes.

Sydney Children's Hospital, *Refeeding Syndrome: Prevention And Management - Practice Guideline*, 2013.⁵³

www.chw.edu.au/about/policies/pdf/2013-7036.pdf

This is a practice guideline that reflects what is currently regarded as safe practice in refeeding syndrome at Sydney Children's Hospital.

Western Child Health Network, *A Multidisciplinary Approach to Paediatric Home Enteral Nutrition (HEN) A Resource Manual for Health Professionals*, 2013.³⁹

Developed as part of a project by the Western Child Health Network this manual provides information in the form of a resource, guidelines and education to guide practice and ensure consistency when working with paediatric home enteral nutrition.

RESOURCES

Wolf LS, Glass RP, *Feeding and Swallowing Disorders in Infancy*, 1992.¹²

This book presents a comprehensive, multidimensional approach to feeding problems to assist the clinician in acquiring the knowledge and skills to take an active and effective part in the assessment and management of infant feeding. It contains detailed descriptions of feeding impairments and therapy-examples of individual infants and well-detailed, problem-driven models and treatment strategies. This manual provides a practical approach to the nutritional management of a variety of paediatric nutritional disorders that may be ameliorated or resolved by dietary manipulation.

Appendices

- **Appendix 7: Formula selection for enteral feeding (page 110)**
- **Appendix 8: Tube feeding schedules/regimens for enteral feeding (page 113)**

6.5 TRANSITION FROM TUBE TO ORAL FEEDING

Transition from tube to oral feeding may be considered as a management strategy in response to concerns regarding:

- Feeding safety
- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience

Transition from tube to oral feeding falls primarily within scope of practice of:

- Nutrition and Dietetics.

Additional support may be provided by:

- Occupational Therapy
- Psychology
- Speech Pathology
- Other: Medical Officer, Specialist Nurse (Clinical Nurse Consultant/Stoma Nurse).

Note: this section should be consulted only after reading the following:



[Feeding skill development \(page 29\)](#)



[Feeding environments and routines \(page 83\)](#)

KEY MESSAGES

- **Transitioning from tube to oral feeding should be considered from the time tube feeds are initiated. Setting a clear platform from the outset avoids tubes being used for longer than required.**
- **Children who present with feeding difficulties are a heterogeneous group and therefore, it is possible that a variety of treatments will need to be developed or tailored to the unique needs of these subgroups of children⁵⁷.**
- **At each stage of the transition process it is important to identify the current goal and work toward it rather than trying to work on everything.**
- **Assess the safety and readiness of the child to begin or increase oral feeding and the readiness of families to work with their child and health professionals toward oral feeding.**
- **Feeling comfortable with tube feeding and/or being in a mealtime setting is essential before facilitating the development of feeding skills and working on oral desensitisation.**
- **The schedule for reducing tube feeds will be different for each child.**
- **Permanent removal of a feeding tube may be considered when the child is clinically stable and able to consume adequate oral intake in order to grow appropriately and meet other nutrition parameters.**

RECOMMENDED PRACTICE

There is a continuum from non-oral feeding to oral feeding. Some children are totally tube feed dependent, others progress to eating small amounts. Some children can eat solids but receive all liquids by tube. Some children eat by mouth but need extra calories via the tube to grow. Other children progress to oral feeding and are able to grow and thrive without the tube⁵⁵.

Set achievable goals

- Goal setting with the family and team of managing health professionals is essential to planning the tube to oral transition approach as each child is different. Only defining success as 'full oral feeding and tube removal' can be counterproductive as this may not be achievable depending on the child's underlying diagnosis and ongoing medical issues.
- Placing pressure on families and the child to increase oral volumes sometimes at the expense of pleasurable meal times can result in a sense of failure rather than focusing on each small success throughout the process.
- Sometimes despite a thorough assessment, it is not possible to identify the underlying feeding difficulty or issue impacting on oral intake until a child starts to reduce tube feeds and show interest in eating. Consider the following factors when setting goals with families and other health professionals to move from tube to oral feeding:
 - Adequacy of weight and growth
 - Volume, e.g. bites, spoons, millilitres taken at meals/ snacks and the length of time taken to consume food/ fluids
 - Skill and texture, e.g. coping with developmentally appropriate family foods, self-feeding
 - Food range/variety, e.g. range of food groups, range of foods within a food group
 - Pleasure and social participation, e.g. sitting with family or peers at school, sensory input, schedules or routines.
- At each stage of the transition process it is important to identify the current goal and work toward it rather than trying to work on everything. Support children and their families to facilitate autonomy, enabling the child to develop skills that will support oral intake.

Assess readiness

Assess the safety and readiness of the child to begin or increase oral feeding and the readiness of families to work with their child and health professionals toward oral feeding.

Child Readiness

Readiness is considered to be an internal phenomenon and therefore is difficult to objectively define. The adults involved in the child's care can provide the encouragement and opportunities for the child that support and seem to promote readiness however, readiness is essentially child led and directed. Therapists can support parents to look for and encourage cues and signs that the child is interested in food and in eating. Consideration of the child's medical status, behaviour and functional skills will determine the starting point for any programme.

Parent Readiness

Using a family centred practice model will ensure the parents have prioritised the need to move towards oral feeding for their child. Therapists can assist parents to identify all the issues involved and devise a plan that allows for a step wise transition to oral feeding that is child led. It is important to assist parents in their transition from being 'the (tube) feeder' to the provider of food.

Create a positive feeding environment

- Children who are tube fed may miss some of the physical and emotional closeness associated with a positive mealtime that supports a solid base of trust for the orally fed infant^{1, 58}. It is therefore essential to prepare infants and children for oral experiences when tube feeding is first initiated
 - Avoid creating a clinical or sterile tube feeding environment. Parents are often quieter as they focus their attention on the equipment rather than the child⁵⁸
 - Foster a supportive tube feeding environment that ideally mimics the oral experience e.g. seated at table, seated in highchair, infant held in parent's arms making eye contact (as per breast or bottle feeding).




Refer to Feeding skill development (page 29)

- Discomfort with tube feeding may be generalised to all encounters with food⁵⁸.
- For some children sighting tube feeding equipment may result in gagging/retching, vomiting, body tension, abdominal tightening and negatively impact gastric emptying.
- It is very important that a calming setting is created to relax and prepare the child. This may be done through choice of language, tone of voice, singing/music, touch, to help build positive associations with the tube feeding environment.

 **Refer to page Sensory processing (page 88)**

- If oral experiences are forced or the child was force fed prior to tube feeding, there may be ongoing negative associations. A stepwise/graded approach may be more suitable to enable the child to consolidate skills throughout the transition process.
- Encourage parents to be in touch with their child's cues to slow feed administration, take a break or reduce feed volume if child is not tolerating:
 - Should be discussed with dietitian to modify appropriately (change volume, concentration, delivery method) if this consistently occurs, particularly if child is losing weight due to consistently receiving lesser feed volumes
 - Parents who continue offering a prescribed volume without recognising child's signals of discomfort can exacerbate child's distrust of tube feeding/negative associations. This may override the child's ability to self-regulate hunger and satiation.


 **Refer to Feeding skill development (page 29)**

 **Refer to Feeding environments and routines (page 83)**

- Persistent poor feed tolerance should be reviewed by a medical officer to consider:
 - medications to improve gastric emptying or gut motility
 - transpyloric feeding if persistent reflux resulting in excessive losses preventing appropriate weight gain
 - medications to assist with regular stooling to prevent constipation.

Commence oral preparation

- Feeling comfortable with tube feeding and/or being in a mealtime setting is essential before facilitating the development of feeding skills and working on oral desensitisation.

 **Refer to Feeding skill development (page 29)**

Reduce tube feeds

- The schedule for reducing tube feeds will be different for each child.
 - For some children reducing tube feeds in a short period of time results in hunger provocation with subsequent improvements in oral intake. For others it results in rapid weight loss and dehydration
 - Some children have more success with a gradual reduction over many years as their oral skills and volume of food/fluid accepted improves whilst growing and gaining weight appropriately.
- There are few studies addressing tube weaning approaches. The approaches to weaning are varied, as are opinions:
 - If food is not accepted, the link between eating orally and satisfying hunger is not made. Thus stimulating appetite by reducing tube feeds will not in itself lead to oral intake⁵⁹
 - Hunger provocation via reductions in tube feeding volumes over a set period of time is a component of the Early Autonomy Training Program in Graz⁶⁰ (3 week inpatient program or outpatient web coaching) and it was also applied in both the Kindermann⁶¹ (inpatient admission ranging from 9-33 days) and McGrath Davis⁵⁷ (14 week outpatient protocol) studies.
- Opinions also vary regarding whether to use bolus feeding to mimic hunger and satiety sensations or continuous overnight feeding to enable the child opportunities to be exposed to a full oral diet during the day. The approach needs to be individualised to work for the child and their family:
 - There is no specific research that has compared the relative effectiveness of using an overnight or daytime bolus schedule to achieve the transition to oral feeding⁵⁹
 - Continuous tube feedings do not allow for development of normal biological rhythms⁶².

- Other authors advocate overnight feeding for weaning because the child is less aware of the artificial process of tube feeding, leaving the day clear for oral attempts^{18, 60}.
- As approaches to reducing tube feeds (weaning) are varied, there is opportunity for trialling what best suits the individual child within the context of their family setting. Factors to consider before reducing tube feeds include:
 - Inpatient or outpatient
 - Timeframe
 - Regular medical reviews – with whom, how often?
 - Hydration monitoring – may need to set a minimum acceptable fluid intake, consider water via tube to replace feeds
 - Growth – set an agreed goal for acceptable weight loss or time frame before building up again
 - Energy levels and/or alertness during the day – is this related to medication, do they need a top-up bolus?
 - Oral intake – are you happy to work only on volume/calories before range?

 **Refer to Dietary management to improve oral nutritional intake (page 48)**

- Family's ability to cope during the process and support available to them
- If a tube is removed, what is the action plan for re-insertion?



HYDRATION:

If there are acute concerns regarding hydration status, refer to a medical officer immediately. Signs or symptoms of dehydration may include reduced urine output, dry mucous membranes, abnormal respiratory pattern, lethargy, reduced skin turgor and sunken eyes¹³.

Plan permanent removal of a feeding tube

- Permanent removal of a feeding tube may be considered when the child is clinically stable and able to consume adequate oral intake in order to grow appropriately and meet other nutrition parameters. The time frame for removing the tube is variable and needs to be decided on an individual basis. Consideration should be given to the child's underlying condition, nutritional status and possible future needs for nutrition support⁶³.
- When considering permanent tube removal the following questions should be considered by all of the health professionals involved in the child's care⁶³:
 - Can the child eat and drink safely?
 - Can essential medications be taken orally?
 - Is the child consuming adequate oral intake in order to maintain:
 - Appropriate weight for age, length and height?
 - Appropriate growth trajectory?
 - Hydration?
 - Micronutrients (with or without supplementation)?
 - Is the child clinically stable?
 - What are the child's likely future health care needs that could impact their ability to meet nutritional requirements?
 - Does the child (where age appropriate) and their family understand the implications of tube removal and the process including risks of reinsertion if required?

WARNINGS

- Persistent poor feed tolerance should be reviewed by a medical officer.

RESOURCES

Agency for Clinical Innovation (ACI), *A Clinician's Guide: Caring for people with gastrostomy tubes and devices*, 2014.⁵⁶

www.aci.health.nsw.gov.au/

The guide provides health professionals with practical advice related to the different stages of the patient journey from deciding to initiate gastrostomy tube feeding to removing the tube or device, including transition or transfer of care.

Ellyn Satter Institute

www.ellynsatterinstitute.org/

*The Ellyn Satter Institute is named for Ellyn Satter, Registered Dietitian Nutritionist and Family Therapist. She is the author of the *Division of Responsibility in Feeding*. The website provides a range of related articles and resources.*

Feeding Matters

www.feedingmatters.org/

Feeding Matters aims to bring pediatric feeding struggles to the forefront so infants and children are identified early, families' voices are heard, and medical professionals are equipped to deliver collaborative care. The website provides a range of related articles and resources.

NSW Kids and Families, *Infants and Children: Management of Acute Gastroenteritis Clinical Practice Guideline*, 2014.¹³

This clinical practice guideline reflects what is currently regarded as a safe and appropriate approach to the acute management of gastroenteritis in infants and children. This includes details regarding clinical assessment of dehydration and initial treatment.

6.6 ORAL HYGIENE AND DENTAL HEALTH

Oral hygiene and dental care may be considered as a management strategy in response to concerns regarding:

- Feeding safety
- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience.

Oral care is the responsibility of all health care professionals. However it should be noted that some health professionals will have more reason to be observing oral hygiene practices. In particular, oral hygiene and dental health falls within scope of practice of:

- Nutrition and Dietetics
- Speech Pathology
- Occupational Therapy
- Other: Dentist, Child and Family Health Nurse, Medical Officer.

KEY MESSAGES

- **Oral health should be the responsibility of all health professionals involved in a child's care⁶⁴.**
- **Good oral hygiene is integral to good general health status.**
- **Children with dysphagia or cognitive impairments are at a greater risk of having poor oral hygiene.**
- **During feeding assessment and management all health professionals should take a role in promoting good oral hygiene as well as identifying and managing conditions such as oral candida and sialorrhoea.**

RECOMMENDED PRACTICE

Preventing poor oral hygiene (coating and debris) and early childhood caries (dental decay)⁶⁵

- Poor oral hygiene should be readily visible on visual examination; there may be visible damaged or diseased tissue, or foreign material in the oral cavity such as food particles.
- Early childhood caries (ECC) is a dental condition occurring in the preschool years; from eruption of the primary (baby teeth) dentition until secondary (adult teeth) dentition erupts. Treatment often requires hospitalisation and general anaesthesia.
- ECC can lead to poor eating and there can be adverse effects on the development of secondary teeth.
- ECC begins with white lesions or lines which become larger turning yellow/brown.

Children at risk:

- Lifestyle: Children with poor general hygiene; children whose parents do not regularly brush their teeth; children with poor diets (high incidence of sugary/acidic food and drinks)
- Skills: Children with poor oromotor skills; children with lingual ankyloglossia (tongue tie)
- Other: Children with disabilities or with oral sensory processing disorders may be at particular risk due to the challenging nature of performing tooth brushing/oral care; children with medical conditions e.g. gastro-oesophageal reflux (GOR), Eosinophilic esophagitis (EOE); children receiving medications e.g. inhaled corticosteroid.



Refer to Sensory processing (page 88)

Strategies:

- 'Lift the Lip/See My Smile': For children 0-5 years to examine the upper front teeth and look for early signs of tooth decay
- Discourage prolonged bottle feeding/prop feeding and introduce a cup around six months
- Avoid sugary foods and drinks (including bottle/sippy cup containing juice or carbonated beverage)
- Encourage regular tooth brushing twice a day with fluoride toothpaste. Parents need to help young children brush their teeth under the age of eight years.

- Infants: As soon as the first teeth appear, parents should clean the teeth using a soft moist cloth or a soft baby toothbrush if the baby accepts it
- 12 months: Use a small, soft toothbrush without toothpaste
- 18 months: Use a small, soft toothbrush with a small pea size amount of fluoride toothpaste.
- Children should spit out toothpaste after brushing but not rinse. If children are not able to spit then only use a smear of toothpaste.
- If tooth brushing can only occur once a day, encourage tooth brushing before bed after the last incidence of oral intake (including milk).
- Advise parents to avoid transfer of oral bacteria to their child by maintaining good oral health themselves and by not placing food, utensils, dummies or teats into their own mouths and then into their child's mouth.
- Encourage parents to take their child to the dentist by their first birthday.

Identifying and managing oral candida⁶⁶

- Oral candida is an overgrowth of the fungus *Candida albicans* in the oral cavity it can spread to all surfaces in the oral cavity, tonsils and into the pharynx.
- Symptoms include white lesions or coating, redness, pain, bleeding.

Children at risk:

- Children with poor oral hygiene, poor sterilisation practices for oral appliances/bottles/dummies
- Children receiving medications or with medical conditions known to lead to increased incidence of the growth of candida (e.g. inhaled corticosteroids, antibiotics, immunosuppression and nutritional deficiencies).

Strategies:

- Referral to medical officer for prescription of topical antifungal agent
- Brushing teeth with fluoride toothpaste and rinsing with water.

Identifying and managing sialorrhea

- Sialorrhea refers to excessive saliva production that appears beyond the lip margin. Commonly caused by neuromuscular dysfunction or hypersecretion of saliva or sensory dysfunction.
- Sialorrhea can result in perioral chapping, maceration of skin, dehydration, odour, social isolation.

Children at risk:

- Children with a disability
- Children with particular neurological conditions with associated low oral tone or poor sensation
- Children with dysphagia
- Children with upper airway obstruction such as enlarged adenoids
- Can also occur in the normally developing population (up until the age of 6 in some literature).

Strategies:

- Implement behavioural strategies to encourage regular swallowing and wiping of oral secretions with cognitively intact children
- Question parents regarding history of snoring/noisy breathing or poor sleep patterns
- Referral to Ear Nose and Throat surgeon for assessment of possible airway compromise which could be causing increased mouth breathing leading to drooling, e.g. enlarged adenoid tissue
- Referral to medical officer for pharmacological management, e.g. prescription of anti-cholinergic medication or other systemic drying agents
- Referral to medical officer for consideration of administration of botulinum toxin
- Referral to medical officer for consideration of surgical management of drooling, e.g. salivary duct redirection.

Managing oral health when nil by mouth⁶⁶

- Clients who are nil by mouth (NBM) are at risk of having poor oral health as the oral cavity becomes dry and unclean and there is an increased risk of infection and disease.
- Children on enteral feeds are at particular risk.

Strategies:

- Regular oral care practices – tooth brushing twice daily with fluoride toothpaste (see oral hygiene section)
- Rinse or swab the oral cavity with antiseptic mouthwash and water (suction equipment on hand)
- Apply lip moisturiser
- Referral to medical officer for consideration of saliva substitute/oral lubricant
- Referral to paediatric special needs dentist for regular check-ups/assistance with cleaning. A general dentist or dentist experienced in working with children would also be suitable if there are no special needs dentists available.

RESOURCES

Carman R, Davies L, Dziubek M, Sim N, Tensen N, Wilson C, et al, *Best Practice Guidelines for Oral Care and Secretion Management*, 2012.⁶⁶

www.health.vic.gov.au/older/toolkit/O6Nutrition/O1Swallowing/index.htm

The information in this manual is presented by Western Health, in conjunction with fourth year Bachelor of Speech Pathology students at La Trobe University. This manual was developed for the purpose of ascertaining and providing best practice guidelines for oral care with dysphagic patients for speech pathologists, nursing staff, and medical staff within the Western Health acute and sub-acute settings.

Centre for Oral Health Strategy, *Early Childhood Oral Health Guidelines for Child Health Professionals*, 2009.⁶⁴

www0.health.nsw.gov.au/policies/GL/2014/GL2014_020.html

The ECOH Program aims to improve the health and wellbeing of children in NSW by integrating oral health into general health interventions provided by child health professionals. The guidelines add value to the Personal Health Record, which includes basic oral health information for parents.

Centre for Oral Health Strategy, *Early Childhood Oral Health (ECOH) Program: The Role of Public Oral Health Services*, 2008.⁶⁵

www0.health.nsw.gov.au/policies/pd/2013/PD2013_037.html

The Early Childhood Oral Health (ECOH) Program encourages child health professionals to regularly check for signs of early childhood caries (ECC) by 'lifting the lip'. The policy describes responsibilities and procedures for implementing the ECOH Program in NSW.

NSW Health, *Resources: Publications and Fact Sheets, Oral Health*.

www.health.nsw.gov.au/oralhealth/Pages/default.aspx

A comprehensive list of resources is available and can be used by health professionals, students, families, care givers and their recipients as well as the general public. They have also been grouped by broad target groups including:

- *Pre-natal*
- *Preschoolers*
- *School Age Children*
- *Teens*
- *People with Special Needs*
- *Aboriginal and Torres Strait Islander people.*

Sydney Children's Hospitals Network, *A Clean Mouth is Crucial for Children with Special Needs*.

kidshealth.schn.health.nsw.gov.au/fact-sheets/

Factsheet available to be used by health professionals, families and parents. This addresses dental care and health.

kidshealth.schn.health.nsw.gov.au/fact-sheets/home-enternal-nutrition/clean-mouth-crucial-children-special-needs

6.7 SEATING AND POSITIONING

Consideration of seating and positioning may be relevant as a management strategy in response to concerns regarding:

- Feeding safety
- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience

Seating and positioning falls primarily within the scope of practice of:

- Occupational Therapy
- Physiotherapy

Additional support may be provided by:

- Speech Pathology

KEY MESSAGES

- **Stability-mobility patterns play an important role in the coordination of the suck-swallow-breathe synergy.**
- **Positioning of the feet, legs and pelvis influences the trunk which influences the head, neck and upper limb control and function.**
- **Appropriate positioning of the child is essential for effective, efficient and safe feeding. This may be facilitated by commercially available or specialised equipment.**

RECOMMENDED PRACTICE

Positioning of infants and young children for feeding

- Feeding a child who has poor trunk control in an unsupported, upright position can make it difficult for the child to develop a refined chewing pattern¹ and may place them at increased risk of aspiration. It is important that a child who has not yet achieved functional sitting and/or displays tonal issues (hypertonicity or hypotonicity) is well supported in their highchair or equivalent.
- Preliminary evidence suggests that positioning intervention can have a positive influence on feeding safety and efficiency for children with cerebral palsy⁶⁷.
- Midline positioning or alignment of head, trunk and limbs can enhance the safety and efficiency of feeding in conjunction with strategies looking at food consistency and swallowing skills⁶⁸.
- Infants need to be positioned age appropriately but with consideration for developmental level.
- Midline development can influence the development of hand, foot and oral control. Infants require a stable base from which to develop movement and functional skills. Without this stable base it is difficult to carry out controlled and functional movements¹. Positioning intervention will need to be provided to those infants who:
 - Are disorganised
 - Require support to maintain a midline position
 - Have not yet achieved functional sitting.
- Considerations in evaluating the child's position for feeding should include information on the following:
 - Location of the assessment
 - Position of the child for feeding, for example held by parent, seated in high chair or commercially available chair, or seated in specialised chair/equipment.
- Specific questions to be answered may include:
 - Is tilt required?
 - Is the child symmetrical?
 - Is head support required?
 - Is the pelvis stable?
 - Is trunk support required?
 - Are the feet and legs in stable supported position?
 - Is the head in a chin tuck position?
 - Does the carer have eye contact with the child?
 - Is the seat wipeable/washable?
 - Is there room for growth?
 - What is the required action or follow up?
- Appropriate postural support for feeding can be achieved by:
 - Modifying positioning in carer's arms
 - Modifying the infant's existing highchair or feeding seat by adding custom foam supports and a footrest
 - Providing specialised seating such as a chair with lateral support, headrest and tilt-in-space mechanism.
- Stability-mobility patterns play an important role in the coordination of the suck-swallow-breathe pattern required for safe/effective eating and drinking¹



Refer to Facilitating safe swallowing (page 39)

- Proximal support influences distal movement and control¹
- Positioning needs to consider the whole body¹
- Positioning of the feet, legs and pelvis influences the trunk which influences the head, neck and upper limb control and function⁶⁹.

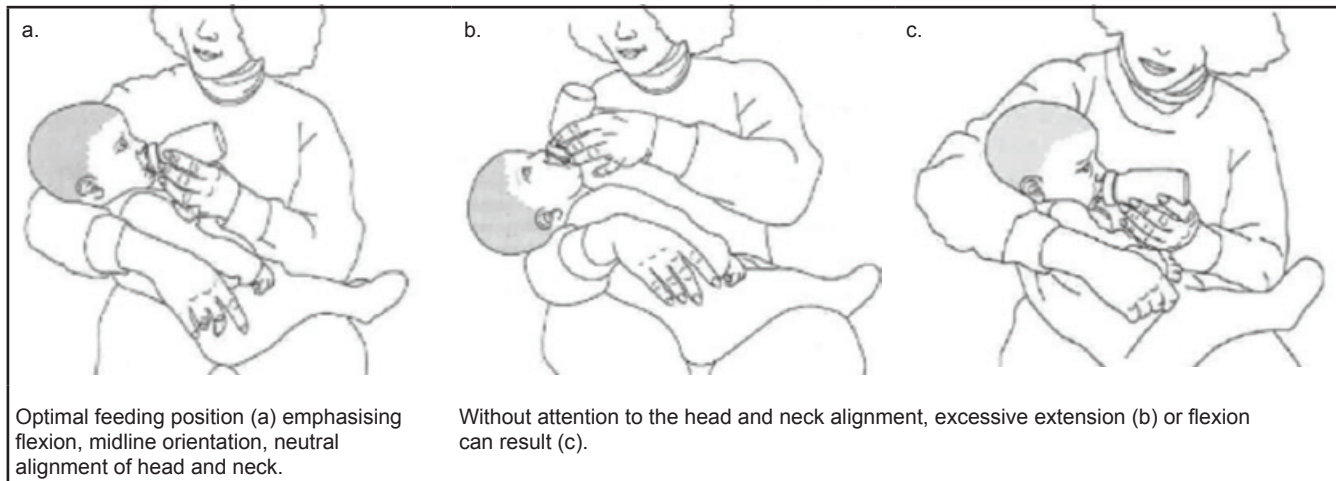
Positioning for breast, bottle, tube feed in infants and young children

- Midline positioning or alignment of head, trunk and limbs enhances safety and efficiency of feeding⁶⁸.
- In order to ensure that the environment is conducive for learning positive cues for eating, the infant should ideally be held by an adult carer in a secure hold that allows for eye contact when being breast, bottle or tube feed, as this is the most natural environment to be fed in at this age.
- There may be some situations however, where the infant requires more supportive positioning than can be achieved when being held. Specialised equipment such as a Tumble Form may be considered, however, it is still important that the infant is positioned face-to-face with the carer so that eye contact can be made.
- Wrapping vs non-wrapping:
 - Wrapping provides midline support however need to consider temperature, e.g. if infant is too warm they may become sleepy, and that wrapping is a strong cue for sleep time
 - Consider just wrapping the infant's top or bottom half if level of alertness is an issue
 - Side-lying for bottle feeds may assist with midline organisation, control of flow of fluid and control of potential pooling of fluid. See Figure 5.

FIGURE 5: EXAMPLE OF SIDE-LYING FOR BOTTLE FEEDING



FIGURE 6: POSITIONING FOR BOTTLE FEED¹²



Positioning when introducing solids

- Child to be positioned in highchair or equivalent, e.g. a booster seat. This allows eye contact with the feeder, facilitates communication and therefore makes feeding more pleasurable⁶⁸.
- Positioning should allow for the infant to be eating at the family table by 14-17 months of age, even if this is in the highchair next to the table.

Many parents initially feed their infants in a rocker chair. This is not appropriate for infants with developmental delay or tonal issues as they do not provide enough support and the movement of these chairs creates instability.

Using highchairs and boosters

- If recommending commercially available highchairs it is most appropriate if they have a high back, some padding, tilt-in-space and an accessible tray. See Figure 7.
- For children with low postural needs the use of towels or foam to modify their posture may be adequate, e.g. at lumbar and laterals. To modify seat height and depth some foam or flat cushions or pillows can be used but it is essential to ensure that stability is maintained.
- It is important for a child's feet to be supported during feeding. Ensure that the footrest is the correct height. If the highchair footrest is too low and cannot be adjusted consider using a block of high density foam to fill the gap. If the child is using a booster seat consider placing a box for a footrest under their feet.

FIGURE 7: EXAMPLE OF OPTIMAL COMMERCIALY AVAILABLE HIGH CHAIR



Positioning for infants and children with significant postural needs

- For children with moderate to severe postural needs it is recommended that a referral to an occupational therapist and/or physiotherapist be made for comprehensive evaluation, recommendations and assistance in arranging suitable and safe equipment.

Pelvic stability

- Pelvic stability provides the base foundation of support in a sitting position. Pelvis positioned at neutral or with slight anterior tilt, with 90 degrees hip flexion.

FIGURE 8: PELVIC STABILITY⁷⁰

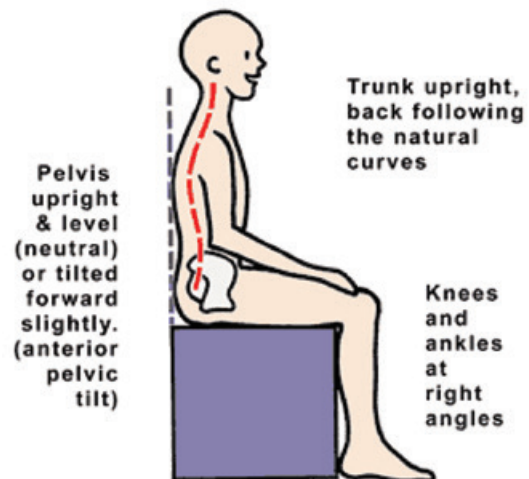
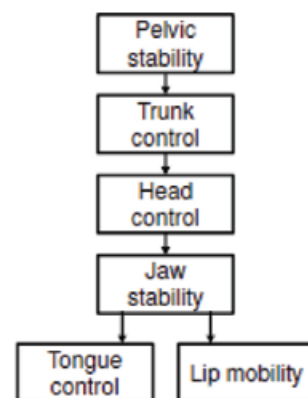


FIGURE 9: THE INFLUENCE OF PELVIC STABILITY ON ORAL CONTROL FOR FEEDING⁶⁸



Feet

- Ensure feet are supported on a stable surface as this will influence pelvis and hip stability.

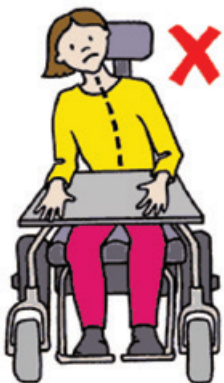
FIGURE 10: CORRECT FOOT POSITION⁷⁰



Trunk Control

- Poor trunk control can lead to poor head control. Lateral supports may assist with providing adequate trunk stability for those children that cannot independently maintain a midline position of the trunk.
- Monitor the effect of lateral supports on a child's respiration.

FIGURE 11: TRUNK CONTROL⁷⁰



Head Support

- Head support i.e. a chair with a high back or a head rest may be required if adequate head control has not yet been achieved.

FIGURE 12: HEAD SUPPORT⁷⁰



- The more upright the seated position the more the head and neck need to work therefore tilt or recline may reduce the amount of effort involved in keeping the head and neck in midline.
- Tilt is preferable as it does not change the position of the pelvis.

Tray access

Tray access – initially provides extra trunk support and stability, and later provides a place for forearms and elbows as the child begins to attempt to self-feed¹.

FIGURE 13: TRAY ACCESS⁷⁰



Using specialised seating equipment

- Feeder seats, e.g. Tumble Form, Special Tomato.
- Specialised supportive seating with hi-lo base
- Specialised seating may offer:
 - lateral support
 - head rest
 - tilt-in-space
 - recline
 - height adjustment
 - height and angle adjustable tray
 - adjustable footrest
 - growth
 - can be used in both a stroller base and hi-lo base.

FIGURE 14: EXAMPLE OF A FEEDER SEAT



FIGURE 15: EXAMPLE OF MANUAL WHEELCHAIR COMPONENTS⁷⁰

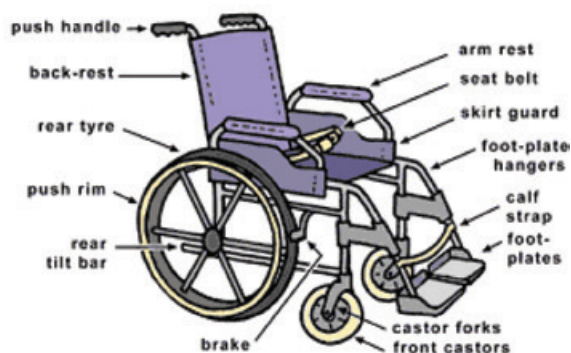
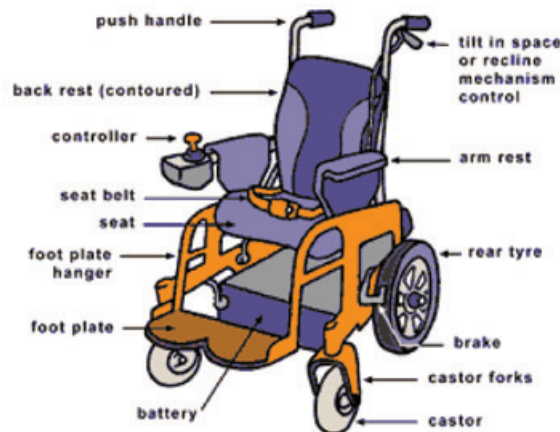


FIGURE 16: EXAMPLE OF POWER/ELECTRIC WHEELCHAIR COMPONENTS⁷⁰



- Consideration of accessories to assist feeding process (e.g. IV/feedbag attachments and pump holder for mobility devices such as strollers and wheelchairs).
- Positioning should ensure that the carer can be at eye level with the child in their chair.
- Seating options need to support the child's participation with their family and in other settings (e.g. family day care, preschool/school, extended family and respite).
- Comfort – a mechanically correct seat also needs to be comfortable for the child otherwise they will not be able to tolerate sitting in the seat or may try and arch and move out of the position¹.
- Safety – children need to be adequately secured and supervised in any equipment that is being used for feeding. For children at risk of choking or aspiration during feeding, the carer also needs to have a quick and effective means for removing the child from the equipment¹.
- Fatigue – the child needs to be monitored throughout the mealtime for signs of fatigue which will affect their ability to maintain their posture.
- Collaboration with families and carer's about their routines and providing support/education/information will assist them to make informed decisions about positioning and equipment.
- Consider pressure care in any seating/positioning options for children with compromised nutrition⁷¹.



National Pressure Ulcer Advisory Panel White Paper:

www.npuap.org/wp-content/uploads/2012/03/Nutrition-White-Paper-Website-Version.pdf

- If a child is transported in their wheelchair in a vehicle ensure components fitted for safe travel can be changed or modified easily for safe mealtime positioning.
- During trials for seating systems use temporary measures to simulate supports to assess the effect on seating, respiration and feeding/swallowing.
- Funding – there are services that can support the family to obtain funding for specialised equipment which will differ between states and geographical locations.

WARNINGS

- Any harness used during seating should follow the best practice guidelines to avoid injury or death from improperly fitted or used chest harnesses.



Best Practice Guidelines for Promoting Airway Safety when Prescribing Postural Supports⁷²

- Supervision required at all times when using equipment prescribed.
- Effective parent education and information provision (e.g. safe use of equipment, positioning for safe feeding), information accessible by all learning levels and cultures.
- A child's position should be reviewed prior to mealtimes to ensure they are supported for safe feeding and swallowing.

RESOURCES

Australian Breastfeeding Association (ABA)

www.breastfeeding.asn.au

The ABA are Australia's leading authority on breastfeeding. They provide support, education and advocacy for a breastfeeding inclusive society.

Cerebral Palsy Alliance

www.cerebralpalsy.org.au/services/all-programs-and-services/assistive-technology/technotalk/

Technotalk Newsletter (May 2011) A guide to Sitting Upright

Technotalk Newsletter (February 2011) Seating and Respiratory Function.

Technotalk Newsletter (March 2007) Seating and Positioning

Novak I, Farrelly C, Adderley M, **Best Practice Guidelines for Promoting Airway Safety when Prescribing Postural Supports, 2002.**⁷²

This document aims to provide an overview of the issues and safety considerations relating to the safe use of postural harnesses and other seating prescribers. The document outlines the risks associated with the use of harnesses and details how to best minimise these risks.

Novita Childrens Services, **Positioning at Mealtimes, 2011.**

www.novita.org.au/library/Factsheet-OED-5-positioning_at_mealtimes.pdf

Fact sheet designed to facilitate good posture while eating and drinking

Novita Children's Services, **Positioning Tips for Wheelchair Users, 2011.**

www.novita.org.au/library/Factsheet-Positioning_Tips_forWC_users_0.pdf

Fact sheet describing how children with disability must be well positioned in their wheelchair to be comfortable and for their seating to support them correctly.

6.8 FEEDING ENVIRONMENTS AND ROUTINES

Consideration of feeding environments and routines may be considered as a management strategy in response to concerns regarding:

- Feeding as a positive experience.

Consideration of feeding environments and routines falls within the scope of practice of:

- Psychology
- Occupational Therapy
- Speech Pathology
- Nutrition and Dietetics.

KEY MESSAGES

- **The mealtime routine is not just a time for eating but a time for relationship building, exploring food, learning mealtime manners and developing socialisation skills.**
- **A child's ability to participate fully in the mealtime routine can be influenced by a range of factors, including the physical and sensory environments¹.**
- **The communication, behaviours and reactions of parents and other family members, have a strong influence on the eating habits and behaviours of children⁷³.**
- **It is important to help parents learn to observe their child's behaviours, reactions and communicative attempts during a meal, and develop an understanding of what is happening for the child.**

RECOMMENDED PRACTICE

Supporting mealtime routines

- Communication, socialisation, a sense of family and belonging, sensory exploration, relaxation and celebration are all part of the mealtime routine, and vary from meal to meal, family to family. It is not just a time for eating but a time for relationship building, learning mealtime manners, exploring food and developing socialisation skills.
- Consistent routine helps the child to learn the difference between hunger and satiation. Children rely more on routine as they get older.
- A predictable mealtime routine can allow the child to feel more settled.
- It is important that a child can learn the difference between food time and play time, however, that does not mean that mealtime should not be fun.
- Different families and cultures have various social expectations, rules, and ideas on appropriate manners at mealtimes. It is important that the child's and family's normal mealtime routine is identified.

Setting up a mealtime routine

- Develop a mealtime structure of three meals with 1-2 small snacks for toddlers and 2-3 snacks for older children.
- Keep meals short (no longer than 30 minutes).
- By 14-17 months, the child should be eating with family at the table (even if in highchair right next to table)¹⁸.
- Designate a place by using a visual sign to indicate that it is meal time, e.g. table cloth, placemat.
- Create a routine:
 - Give a warning, e.g. ten minutes before the meal time
 - Encourage the child to help set the table and serve food
 - Transition activity, e.g. wash hands and face, sensory preparation for the child who has sensory processing difficulties⁷⁴

Refer to Sensory processing (page 88)

- Seating at the table should ensure good posture with use of a booster/cushion and footrest if required

Refer to Seating and positioning (page 76)

- Keep as calm and positive as possible and allow the meal time to be a relaxed time (e.g. start by singing a song, telling a story from the day, comment positively on desired mealtime behaviours)

- Encourage the child to stay at the table for the duration of the meal and have a clear finishing routine, e.g. wipe hands/face and/or help clear the table⁷³.

Supporting mealtime environments

- Each element of the environment contributes to the type of meal that is experienced and whether or not the meal is enjoyed by both the child and parent. The physical, sensory, cognitive and emotional needs of individual children and parents will influence the impact of environmental elements¹.
- Mealtimes can take place in a variety of environments, e.g. home, school, at a relative's home, in the park. For a child with feeding difficulties it is ideal to try and keep the environmental elements consistent; however this is not always possible.

Physical environment

- The physical environment includes the physical comfort and support received by the child and the parent¹.
- The child's feeding and oral motor skills are strongly influenced by their seating and positioning.



Refer to Seating and positioning (page 76)

- The comfort of the adult who is feeding the child is also important to the success of the meal. If a carer's body is poorly supported they may become fatigued which may contribute to physical and emotional stress. Children can sense this stress and often misinterpret it as their fault¹.
- Other aspects of the physical environment include:
 - Utensils – dishes, cups, cutlery, placemats, table cloths
 - Room – which room, décor, view from the chair, temperature
 - Furniture – arrangement of furniture in room, location of child's seat and other's at the table
 - Food – texture, consistency, temperature, colour, size, shape, odour
 - Distractors – presence of television and other toys or electronic devices.

These aspects can play an important role in the mealtime routine and also have an influence on the sensory environment.

Sensory environment

- The sensory environment incorporates all sensory areas that are involved in mealtime.
- The child's sensory preferences, along with the family's sensory preferences, often determine where food is eaten. However, there is often a mismatch between preferences which can be problematic, particularly if a child is more sensitive than the rest of the family¹.
- Some children learn to eat only in the presence of distractions, e.g. when the television is on, or while playing with a favourite toy. Using distractions to enable children to eat is not recommended as a long term solution for the following reasons:
 - The child lays down the brain pathways for the distractor
 - The child shifts into reflexive eating mode
 - The child does not lay down pathways for eating, so they do not know how to eat when not distracted
 - The parent is distracted from teaching about eating¹⁸.
- The sensory properties of the food also need to be taken into consideration for children with sensory processing difficulties, e.g. strong food odours, amount of food presented on the plate, colour of the food, taste and texture.
- Children with disordered sensory processing may require specific intervention techniques to facilitate mealtime routines.



[Refer to Sensory processing \(page 88\)](#)

Considering communication and behaviour

- It is important to help parents learn to observe the child's behaviours and reactions during a meal and develop an understanding of what the child may be attempting to communicate through this behaviour¹.
- Remember that communication can occur both verbally and non-verbally.
- Focusing on eliminating undesired behaviours may result in ignoring a child's communication attempt.
- Children who refuse to eat, engage in mealtime tantrums or show some undesired responses at mealtimes may be attempting to communicate that something is wrong¹.
- There are many factors that impact a parent's ability to observe their child's cues during mealtimes and to be responsive to these cues:
 - When parents are stressed by their child's weight or mealtime behaviours, or external factors (e.g. work, relationships), it is difficult to accurately read what their child is trying to communicate at a mealtime
 - When parents are anxious, they are less likely to be able to go at their child's pace and more likely to force feed, use distractors or engage in excessive prompting
 - When parents are depressed, it is difficult for them to be creative and problem-solve around mealtime difficulties, or to notice small steps of progress.
- It is important for a parent to learn to reflect on how they are responding to their child, and what this is communicating about food and mealtimes. In an attempt to encourage eating, parents often become trapped in cycles of behaviour that inadvertently reinforce undesired eating behaviours (e.g. paying excessive attention to delaying, food refusal or disruptive mealtime behaviours can result in an increase in this behaviour).
- How adults use language around mealtimes contributes to whether a child experiences this time as enjoyable or aversive.
- The communication environment includes the non-verbal communication of adult attitudes and expectations and communication of their emotional experience¹.

Providing reinforcement

- Give verbal praise for desired mealtime and eating behaviour in appropriate amounts, and in line with what the child is capable of. Some children struggle more with different aspects of mealtimes and require more positive praise for newly acquired behaviours.
- Reinforce verbally for interactions with food and use descriptive praise, e.g. 'you tried that vegetable', 'great munching', 'well done for tasting'.
- Reinforce sibling's eating behaviours also, but try not to make comparisons.
- Playing with the food is reinforcing in and of itself. Touching food can desensitise the child, as long as the pace of desensitisation is appropriate for the child.
- Use disappearing object reinforcers if an object reinforcer is the only option, e.g. blowing bubbles to reward desired eating behaviours.
- Avoid force feeding, scraping/wiping food from child's face during meal as this can be an unpleasant experience and function as punishment for eating behaviour.
- Avoid negative reinforcement of food refusal, such as offering numerous alternatives when child refuses to eat what was originally offered. Cleaning the table during a meal can also negatively reinforce (i.e. increase) food refusal.

Supporting mealtimes

Support the parent and child's role

- Remember it is the parent's responsibility to choose what, when and where to eat and the child's responsibility to decide whether to eat or not, and how much they will eat⁷⁵.
- Learn to trust the child's appetite and help them to understand their body signs for whether they are full or hungry.
- Let the child have a sense of control by giving them 'forced choices', e.g. the shape of the sandwich, what type of pasta etc⁷⁵.
- Invite the child to be involved in all aspects of the meal, e.g. preparing food, setting table, serving food, clearing up.

Make mealtimes a positive experience

- Help the child to have an enjoyable mealtime experience, e.g. by focusing on desired eating/mealtime behaviours, by having a predictable routine, and engaging in fun or relaxing activities to prepare for the mealtime.
- Enjoy the mealtime for the opportunity to sit together with no distractions. Balance talking about food and nutrition with talking about other areas of life. This can apply to all ages.
- Encourage parents to focus some of their attention on what they are noticing about what they are eating, and to comment on this, e.g. shapes, textures, tastes⁷³. Make the food fun!
- Do not punish the child during mealtime⁷³.
- Toddlers will be messy. Allow for mess and exploratory play, especially for those children who are hypersensitive with food, taste, touch and texture.



[Refer to Sensory processing \(page 88\)](#)

Establish expectations and model desired behaviours

- Set clear and attainable expectations, e.g. child needs to stay at the table, how much food the child should try.
- Model desired eating behaviours and enjoyment of food (e.g. comment on what you experience of the food's taste, texture, nutritional value).
- Reduce focus on undesired mealtime behaviours. Respond to these behaviours in a calm and neutral manner and state expectations (e.g. "food stays on the table"). Ignore undesired behaviours if safe to do so.
- Parent should be at eye level with the child while feeding, and eating at the same time if practical.

Provide education and support

- Educate child about the food and/or their body's experience of the food.
- Some children require prompting or encouragement to focus on their meal. Keep prompting minimal, as excessive prompting can reinforce delaying behaviour.
- Break down larger skills or behaviours into smaller steps or components.
- Go at the child's pace and do not force feed⁷³.
- If the child is struggling to eat, and the parent is struggling in their effort to encourage the child to eat, a good strategy is for the parent to stop what they are currently doing and to go at the child's pace (e.g. by commenting on or mimicking what the child is doing in their food exploration). It is important for parents to learn to reflect on how they are responding to their child at mealtimes and to consider whether any of their behaviours are inadvertently reinforcing undesirable mealtime behaviours.
- Provide utensils to keep the child interested and enhance skills, e.g. give them their own spoon or try a child sized fork even if they cannot yet use it properly.

RESOURCES

Raising Children Network website

www.raisingchildren.net.au/articles/eating_with_toddlers.html/context/223

This website provides evidence-informed information and resources for parenting. Raising Children Network's member organisations are the Parenting Research Centre and the Murdoch Childrens Research Institute with The Royal Children's Hospital Centre for Community Child Health who work in partnership to provide information that can help parents with the day-to-day decisions of raising children.

Cathey M, Gaylord N, Picky Eating: A Toddler's Approach to Mealtime. *Pediatric Nursing*, 2004;30(2):101-7, Table 1. Parental Handout.

This parental handout describes how to manage a picky eater including strategies to make meals and snack time more enjoyable for a toddler.

Table 3. Food rules applicable to children beyond infancy from: Bernard-Bonnin, A-C, (2006) *Feeding Problems of Infants and Toddlers. Canadian Family Physician*, Vol 52 Oct, p 1247-1251.

This table identifies food rules that are applicable to children beyond infancy including scheduling, environment and procedures.

6.9 SENSORY PROCESSING

Sensory processing may be a consideration in the management of concerns regarding:

- Feeding adequacy
- Feeding efficiency
- Feeding development
- Feeding as a positive experience.

Consideration of sensory processing falls primarily within the scope of practice of:

- Occupational Therapy.

Additional support may be provided by:

- Psychology
- Speech Pathology.

KEY MESSAGES

- **How a child responds to sensory information during mealtimes may impact on their feeding development and mealtime experiences.**
- **For mealtimes, a child needs to achieve and maintain a calm but alert state.**
- **Adjustments to the child's routine and environment that accommodates their sensory needs is more likely to result in a positive feeding experience.**

RECOMMENDED PRACTICE

Understanding sensory processing for feeding

- Everyone notices, takes in and uses sensory information from their bodies and their environment⁷⁶. This information provides the basis of how we interact and respond to day-to-day demands. If the way we process information fits with the demands and expectations of our environment there are generally no concerns.
- It is when our response to sensory information does not fit our environment and routine that it becomes an issue. We can all have difficulties sitting still or preferring to eat particular textures or tastes but still maintain feeding adequacy, efficiency and participation in mealtimes as a social experience. When feeding adequacy, efficiency, development or participation is detrimentally affected it is beneficial to review how a child or young person is processing sensory information.
- Our bodies receive information from the seven sensory systems:
 1. Touch (Tactile)
 - provides safety information, e.g. if something is too hot, cold, sharp and will cause us harm
 - how much food is in the mouth
 - or detail, e.g. the feel of the spoon in our hand; food on our face or textures in our mouth; someone handling you during mealtimes or providing hand over hand assistance
 2. Vision (Visual)
 - provides safety information, e.g. if something looks rotten/unusual; if we are sitting up; if something is rushing towards us we need to move out of the way
 - or detail, e.g. size/shape/texture of food; colour/consistency of food or drink; where our utensils are on the table
 3. Hearing (Auditory)
 - provides safety information, e.g. about activities happening in our environment that may affect us
 - or detail, e.g. the crunch or slosh of food; the sound of someone's voice providing directions
 4. Taste (Gustatory)
 - provides safety information, e.g. if something doesn't taste right
 - or detail, e.g. salty, bitter, sweet, sour
 5. Smell (Olfactory)
 - provides safety information, e.g. if something doesn't smell right
 - or detail, e.g. the smells of food and food cooking can start the preparation sequence for mealtimes for example salivation

6. Movement (Vestibular) Provides us with information on the position of our head in space which is important to let us know if we are upright and balanced:
 - Provides safety information, e.g. does it feel like I am falling over/tripping or
 - Detail, e.g. am I sitting calmly, able to move my body as I lift my arm to feed myself
 7. Body Position (Proprioception) Sends messages to and from our muscles/tendons and our brain on how our body is positioned:
 - Provides safety information to protect our muscles and joints
 - Detailed information on how to move our bodies to complete a movement successfully, e.g. chew, scoop food with a spoon and bring it to our mouth, manipulate finger foods.
- Difficulties can occur for children when they respond to non-dangerous sensations as something they need to protect themselves from, e.g. the look, smell and taste of the food.
 - All of us process sensory information differently and demonstrate sensory preferences. Comprehensive data gathering of how a child processes sensory information during their daily activities can provide useful information and suggestions to help them manage feeding adequacy, efficiency and most of all maintain feeding as a positive experience.

Preparing for mealtimes

- A child needs to achieve and maintain a state that matches the demands of the activity they are undertaking⁷⁷. For mealtimes a calm but alert state is required. If a child is outside this calm-alert state they may:
 - Miss critical sensory information that will help them manage feeding
 - Have difficulties engaging in the feeding process trying to avoid or seek certain sensations, e.g. sitting in the one spot, managing a non-preferred taste or texture, filling mouth with food.
- A child may be able to improve their ability to self-regulate and manage their responses to sensory information or require ongoing support from a carer to recognise and modify sensory input.
- Preparation includes:
 - Activities that help the child prepare their sensory systems for mealtimes, e.g. heavy work activities may be appropriate for many children experiencing mealtime difficulties



SENSE-ational 'Heavy Work' activities for being CALM-ALERT at mealtimes in Gillian Fowlers Mealtime Book⁷⁴

- Consideration of the sensory aspects when setting-up the environment such as decreasing background noise, turning the television down or off, being aware of low level noise in the environment such as the humming of a light or fridge, using natural light if possible and eliminating glare, room temperature so it's not too hot or cold.

Supporting mealtime routines and environments

- Intervention that focuses on a child's routine and environment is more likely to increase their participation as well as parent's feelings of competence in supporting the child.
- Accommodating for the child's sensory processing needs rather than fixing atypical patterns leads to better outcomes which are child and occupation focused within the context they have to function⁷⁸.
- Some general principles are:
 - Noticing distractions in the environment and minimising/eliminating these as much as possible
 - Using equipment that supports the child's sensory processing preferences. For example, plates with dividers if the child has an aversion to food touching; using a serviette to cover up part of the food if the child gets visually overwhelmed; supportive seating¹⁸.



Refer to Seating and positioning (page 76)

- Support provided by carers is important across all the settings in which the child spends time (home, extended family, preschool/school, respite). Carers can be encouraged to understand and be respectful of their child's sensory processing needs especially aversions to touch, sight, sound and movement by using strategies such as:
 - Pre-warning if they have to provide hands on assistance
 - Approaching from a place the child can see them and be able to prepare themselves
 - Using the tone/volume of voice the child is comfortable with and responds to
 - Reducing the amount of food offered at any one time to reduce visual overstimulation
 - Acknowledging their child's need to get their body ready before sitting for a meal.



Refer to Feeding environments and routines (page 83)

Supporting the child

- Analyse the steps needed for the child to eat or feed themselves. Steps of the task and the equipment can be modified to make it easier for the child to take part or to increase the challenge to help them engage, e.g. angled spoons, thicker handles, plate guards, non-slip matting:
 - Forward chaining can be used to gradually build the child's ability to complete the activity one step at a time⁷⁹
 - Backward chaining (where the child completes the last step initially) can give a feeling of accomplishment and success⁶⁹.
- Analyse the properties of the feeding utensils and equipment that will be used to help the child engage and be as independent as possible at mealtimes, e.g. bowls, plates, spoon, forks, seating.
- Use interest areas and fun and engaging ideas (such as singing, music) to help make the mealtime a positive experience which fosters learning and change.
- Modify the activity to give more or less sensory information⁷⁴.
- There is preliminary evidence that weighted products, including vests and lap-blankets, may have a positive effect on a child's sensory processing with appropriate evaluation by a trained health professional and structured implementation⁸⁰⁻⁸⁶.
- There is preliminary evidence that dynamic seating options can have a positive impact on a child's ability to sit and engage during tabletop tasks⁸⁷⁻⁸⁹. However, in children with significant or complex hypotonia, hypertonia or dystonia with poor postural control and sitting balance, dynamic seating options may not be effective.

RESOURCES

Ernsperger, L, Stegen-Hanson, T and Grandin, T, *Just Take a Bite: Easy, Effective Answers to Food Aversions and Eating Challenges!* 2004.

This book takes parents and professionals step by step through the myths about eating to the complexity of eating itself, through an understanding of physical, neurological and/or psychological reason why children may not be eating as they should.

Evans Morris S, Dunn Klein M, *Pre-feeding Skills: A comprehensive resource for mealtime development*, 2000.¹

The book includes a strong base of information about normal development in feeding as well as limiting factors that influence feeding. Assessment and treatment principles are thoroughly explored.

Griffith G, Stapleton D, *Sense-ational Mealtimes: Making sense of tricky mealtime behaviour, fussy/picky eating and feeding difficulties*, 2013.⁹⁰

The SENSE-ational Mealtimes book helps parents understand what they and their child are experiencing at tricky mealtimes. SENSE-ational Mealtimes explains that what sounds, smells, sights, touch, movement, temperatures, tastes and textures we avoid, are bothered by, tolerate, love and seek are based on our genetics, the sensory thresholds in our brain, our feelings and interactions, our surroundings and our previous experiences and memories.

Queensland Health Department, *Fun Not Fuss With Food. Facilitator's Manual*, 2010.

www.health.qld.gov.au/health_professionals/food/funnotfusswithfood.asp

This is a tool for health staff to provide information to parents about nutrition for children. Information includes tips for child friendly meals, food activities and games, healthy snack and drink ideas, information about the amounts and kind of food for children.

Toomy K, Ross E, *Picky Eaters vs Problem Feeders: The SOS Approach to Feeding*, 2011.¹⁸

The SOS Approach to Feeding is a Transdisciplinary Program for assessing and treating children with feeding difficulties. The program integrates sensory, motor, oral, behavioral/learning, medical and nutritional factors and approaches in order to comprehensively evaluate and manage children with feeding/growth problems. It is based on normal developmental steps, stages and skills of feeding found in typically developing children.

Appendices

Appendix 9: Feeding equipment (page 115)

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8. APPENDICES

Appendix 1: Paediatric Feeding Clinical Practice Guideline Working Party – Membership (2011-2014)

Appendix 2: Paediatric feeding professional roles and agencies

Appendix 3: NSW paediatric feeding teams and clinics

Appendix 4: Energy supplements

Appendix 5: Worked example for calculating a concentrated formula using formula alone

Appendix 6: Worked example for calculating a formula using a carbohydrate supplement

Appendix 7: Formula selection for enteral feeding

Appendix 8: Tube feeding schedules/regimens for enteral feeding

Appendix 9: Feeding equipment

APPENDIX 1: PAEDIATRIC FEEDING CLINICAL PRACTICE GUIDELINE WORKING PARTY – MEMBERSHIP (2011–2015)

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Clare Saunders	Clinical Psychology	Sydney Children’s Hospitals Network (Randwick)
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Kylie Wilson	Occupational Therapy	ADHC, Coffs Harbour
Lauren Gladman	Dietetics	St George Hospital
Marika Diamantes	Dietetics	Liverpool Hospital
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APPENDIX 2: PAEDIATRIC FEEDING PROFESSIONAL ROLES AND AGENCIES

Profession	Definition and scope of practice in paediatric feeding
Child and Family Health Nurse	<p>Child and family health nurses (CFHN) are registered nurses with further qualifications in the speciality of child and family health nursing. CFHN are recognised as practicing at an extended level of nursing, working within a primary health care model with families with infants and young children.</p> <p>Reference: www.health.nsw.gov.au/nursing/projects/Pages/child-and-family-health-practice-framework.aspx</p>
Child Life Therapist	<p>Child life therapists are employed in the paediatric tertiary hospitals in NSW as well as in a number of paediatric wards in adult tertiary and regional hospitals.</p> <p>Child life therapy involves evidence-based interventions, which aim to reduce the stress and anxiety that can be associated with hospitalisation by focusing on developmental, social and emotional wellbeing. Specifically, child life therapy services may include general 'medical play', which seeks to correct misconceptions and reduce anxiety around medical experiences.</p> <p>Reference: www.childlife.org.au/</p>
Dietitian	<p>Dietitians apply the art and science of human nutrition to help people understand the relationship between food and health and make dietary choices to attain and maintain health, to prevent and treat illness and disease.</p> <p>Dietitians have the necessary knowledge and skills to contribute to assessment and management of paediatric feeding to provide targeted nutrition interventions⁹¹. Common goals include:</p> <ul style="list-style-type: none"> • Optimised growth • Optimised weight for height • Optimised nutrient intake • Improved nutrient balance • Provision of adequate energy and micronutrients • Education for families to provide appropriate food choices and supplements for their child. <p>References: www.daa.asn.au/universities-recognition/dietetics-in-australia/definition-of-a-dietitian-for-migration-purposes/ British Dietetic Association (www.bda.uk.com/)</p>
Gastroenterologist	<p>The roles of the gastroenterologist in managing children with feeding difficulties, in conjunction with other members of the multidisciplinary team, are as follows:</p> <ul style="list-style-type: none"> • Assessing nutritional status along with the dietitian • Doing blood tests looking for deficiencies of protein, minerals and vitamins • Excluding organic causes for feeding difficulties and failure to thrive. Diseases/conditions that might result in feeding difficulties include Gastroesophageal reflux disease, Coeliac Disease, Eosinophilic Esophagitis, Inflammatory Bowel Disease as well as food allergies and intolerances. These conditions should be investigated with blood tests and where needed endoscopies and biopsies. If a disease is found, the gastroenterologist should treat it appropriately in order to improve the feeding and nutrition of the child • Utilising the services of a speech pathologist to assess the safety of the child's swallow and to look for and treat oral aversion • If the child's nutritional needs are not being met by oral intake alone the gastroenterologist, along with the other members of the feeding team, may recommend nasogastric feeds. If the requirement for the naso-gastric feeds is found to be prolonged (longer than 6-8 weeks) the gastroenterologist may assist in the placement of a gastrostomy. <p>Reference: www.gesa.org.au/</p>
General Practitioner	<p>A General Practitioner (GP) is a doctor who provides person centred, continuing, comprehensive and coordinated whole person health care to individuals and families in their communities.</p> <p>As a sector, general practice, its practice teams and their primary health care relationships comprise the foundations of an effective health care system. As a relationship based specialist medical discipline, general practice clinicians are defined by the characteristics of their discipline.</p> <p>Reference: www.racgp.org.au/becomingagp/what-is-a-gp/what-is-general-practice/</p>

Profession	Definition and scope of practice in paediatric feeding
Immunologist	<p>Specialist immunology and allergy physicians undergo general training in medicine, followed by postgraduate training in immunology and allergy. Specialist immunology and allergy physicians work in a range of settings, including hospitals, private practice, diagnostic immunology laboratories, research centres and universities.</p> <p>Referral may be appropriate for:</p> <ul style="list-style-type: none"> • Diagnosis and management of food allergies • Further education and ongoing management of immune system disorders • Severe, life threatening allergy (anaphylaxis) • Immunotherapy if treatment of allergic diseases is contemplated • In asthma, when there is evidence of continuing poor control, despite regular use of asthma medication • For investigation of unexplained inflammation (fevers of unknown origin, unexplained fevers, weight loss) • Investigation of recurrent or unusual (opportunistic) infections. <p>Reference: www.allergy.org.au/patients/allergy-and-clinical-immunology-services/clinical-immunologist-allergy-specialist</p>
Lactation Consultant	<p>Lactation consultants are the members of the health care team who have specialist knowledge of and primary focus on, breastfeeding. They are the experts whom mothers and other health professionals turn to when skilled assistance is required around breastfeeding.</p> <p>Reference: www.lcanz.org/about-us/lcanz.htm</p>
Occupational Therapy	<p>Occupational therapy is a client-centred health profession concerned with promoting health and wellbeing through occupation. The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. Occupational therapists achieve this outcome by working with people and communities to enhance their ability to engage in the occupations they want to, need to, or are expected to do, or by modifying the occupation or the environment to better support their occupational engagement.</p> <p>Occupational therapists have the necessary knowledge and skills to contribute to assessment and management of paediatric feeding in regards to the following areas:</p> <ul style="list-style-type: none"> • Seating and positioning during feeding, including providing carers/parents with support and information to carry out recommendations in the home and community environments • Promotion of independent feeding with use of task modification and adaptation • Mealtime management in regards to assessment and/or modification of the mealtime environment and routine • Assessment and management of sensory processing and regulation difficulties that contribute to difficulties with feeding • Developmental assessment and intervention. <p>Paediatric feeding is a specialty clinical area and therefore it is encouraged that occupational therapists working within this scope of practice seek additional training, specifically in the areas of seating and positioning, and sensory processing.</p> <p>Reference: www.otaus.com.au/about/what-is-occupational-therapy</p>
Paediatrician	<p>General paediatrics is a broad based multidisciplinary specialty which, on referral from primary care providers, provides expert diagnosis, treatment and care for infants, children and young people aged from 0 to 18 years. General paediatricians work in close collaboration with other medical professionals including general practitioners, subspecialists, paediatric nurses and allied health professionals. For those infants, children and young people requiring multiple subspecialty care, the general paediatric team is essential to provide a comprehensive coordination of services.</p> <p>Reference: www.racp.edu.au/trainees/advanced-training/advanced-training-programs/general-paediatrics</p>

Profession	Definition and scope of practice in paediatric feeding
Physiotherapist	<p>Physiotherapy involves a holistic approach to the prevention, diagnosis, and therapeutic management of disorders of movement or optimisation of function to enhance the health and welfare of the community from an individual or population perspective. The practice of physiotherapy encompasses a diversity of clinical specialties to meet the unique needs of different client groups. (Australian Standards for Physiotherapy. 2006, Canberra: Australian Physiotherapy Council.)</p> <p>Physiotherapists have the necessary knowledge and skills to contribute to assessment and management of paediatric feeding in regards to the following areas:</p> <ul style="list-style-type: none"> • Respiratory assessment of effective cough and airway clearance necessary for oral feeding. • Seating and positioning during and after feeding, including providing carers/parents with support and information to carry out recommendations in the home and community environments. • Developmental assessment and intervention. <p>Reference: Australian Standards for Physiotherapy. 2006, Canberra: Australian Physiotherapy Council www.physiocouncil.com.au/standards</p>
Psychologist	<p>Psychologists are experts in human behaviour. They use scientific methods to study the factors that influence the way that people think, feel, learn and behave, and evidence-based interventions to help people to overcome challenges and improve their emotional and physical wellbeing.</p> <p>Psychologists provide a multifaceted perspective on feeding difficulties that encompasses emotional, behavioural and relational aspects. Psychologists assess for comorbid emotional, behavioural or psychiatric conditions within the child or broader family systems and provide interventions or facilitate referrals as appropriate. The psychologist works with families to develop behaviour management strategies to make mealtime more successful by providing:</p> <ul style="list-style-type: none"> • Implementation of mealtime structure and a feeding schedule • Appetite manipulation • Parent training in understanding and reading a child's cues for hunger and satiety • Parent training for behaviour management. <p>References: www.psychology.org.au www.apadivisions.org/division-54/sigs/index.aspx</p>
Respiratory Physician	<p>The roles of the respiratory paediatrician are to assess if a child has significant respiratory disease, what the causes are, and what treatment, if any, is required. In the management of children with feeding difficulties, the role of the respiratory physician is to primarily look for evidence of aspiration causing lung disease such as bronchiectasis.</p> <p>Reference: www.adc.bmj.com/content/69/5/609.full.pdf</p>
Social Worker	<p>Social workers are trained health professionals who have experience supporting children and families in dealing with the impact of illness on family life. Social workers, as part of the multidisciplinary health team, provide crisis intervention, psychosocial assessment, counselling, advocacy, mediation, case management and complex discharge planning. They may also refer patients and their families to specialist services within the community to ensure the psychosocial issues continue to be managed after the child leaves hospital.</p> <p>Social workers work in partnership with other health professionals. They work collaboratively with patients and their families to ensure they are informed and actively able to participate in the child's treatment plan.</p> <p>Reference: www.aasw.asn.au/information-for-the-community/what-is-social-work</p>

Profession	Definition and scope of practice in paediatric feeding
Speech Pathologist	<p>A speech pathologist has been trained to assess and treat people who have a communication disability. Speech pathologists complete a degree at university which encompasses all aspects of communication including speech, writing, reading, signs, symbols and gestures.</p> <p>Speech pathologists are knowledgeable about normal and abnormal anatomy, physiology, and neurophysiology of the upper aerodigestive tract responsible for respiration, swallowing, and speech. Their educational and clinical background prepares speech-language pathologists to assume a variety of roles with expertise related to evaluation and treatment of individuals with swallowing and feeding disorders. Appropriate roles for speech pathologists include, but are not limited to:</p> <ul style="list-style-type: none"> • Performing clinical feeding and swallowing evaluations • Performing instrumental assessments that delineate structures and dynamic functions of swallowing • Defining the abnormal swallowing anatomy and physiology and diagnosing swallowing disorders • Identifying additional disorders in the upper aerodigestive tract and making referrals to appropriate medical personnel • Making recommendations and developing treatment plans about management of swallowing and feeding disorders • Providing treatment for swallowing and feeding disorders, documenting progress, and determining appropriate dismissal criteria. <p>References: www.speechpathologyaustralia.org.au/information-for-the-public/what-is-a-speech-pathologist www.asha.org/policy/TR2001-00150/</p>

Agency	Service
Karitane	<p>Karitane provides support, guidance and information to families experiencing parenting difficulties right across NSW.</p> <p>www.karitane.com.au/</p>
Tresillian Family Care Centres	<p>Tresillian is a Sydney based health service specifically designed to support parents in caring for their babies and young children. It is Australia's largest child and family health organisation providing expert parenting advice to families during the early years.</p> <p>www.tresillian.org.au/</p>

APPENDIX 3: NSW PAEDIATRIC FEEDING TEAMS AND CLINICS

Specialist clinics are available at a number of tertiary and non-tertiary facilities across NSW. It is recommended that clinicians make contact initially with local services and then proceed to specialist clinics and tertiary children's hospitals.

The below provides details of established paediatric feeding teams and clinics in NSW. This list is not exhaustive and additional services may be available at other sites.

Facility	Contact details	Tertiary children's hospital	Feeding team	VFSS service	Tongue tie clinic	Paediatric dental clinic
John Hunter Children's Hospital, Newcastle	Lookout Road NEW LAMBTON HEIGHTS NSW 2305 Ph: 02 4921 3727 Fax: 02 4921 3599 www.kaleidoscope.org.au	✓	✓	✓		
Sydney Children's Hospitals Network (Randwick)	High Street RANDWICK, NSW 2031 Ph: 02 9382 1021 Fax: 02 9382 1200 www.schn.health.nsw.gov.au	✓	✓	✓		
Sydney Children's Hospitals Network (Westmead)	Cnr Hawkesbury Rd & Hainsworth St WESTMEAD NSW 2145 Ph: 02 9845 0000 Fax: 02 9845 2078 www.schn.health.nsw.gov.au	✓	✓	✓		
Liverpool Hospital Speech Pathology	Cnr Elizabeth St & Goulburn St LIVERPOOL NSW 2170 Ph: 02 9828 4703 Fax: 02 9828 4744		✓	✓		
St George Hospital Speech Pathology	Belgrave St KOGARAH NSW 2217 Ph: 02 9113 1360 Fax: 02 9113 1382		✓	✓		
Westmead Centre for Oral Health Westmead Hospital	PO Box 533 WENTWORTHVILLE NSW 2145 Ph: 02 9845 7839 Fax: 02 9845 8306				✓	✓

APPENDIX 4: ENERGY SUPPLEMENTS

Addition to Formula (wt(g)/vol(100mL))	Additional Calories per 100mL	Additional Calories per 30mL
CARBOHYDRATE SUPPLEMENT	E.g. +1% CHO = 1g/100mL	
+1% CHO	3.9	1.1
+2% CHO	7.8	2.3
+3% CHO	11.7	3.5
+4% CHO	15.6	4.7
+5% CHO	19.5	5.9
FAT EMULSION	E.g. +1% FAT = 1g/100mL	
+0.5% FAT	2.3	0.7
+1% FAT	4.5	1.4
+2% FAT	9.0	2.7
+3% FAT	13.5	4.1
+4% FAT	18.0	5.4
+5% FAT	22.5	6.8

Note: When calculating ensure to factor in displacement of these additions:

- For every gram of carbohydrate supplement 0.625 mL is displaced
- For every mL of fat emulsions 1mL of water is displaced.

This will be most significant when making up larger volumes.

APPENDIX 5: WORKED EXAMPLE FOR CALCULATING A CONCENTRATED FORMULA USING FORMULA ALONE

Scenario

You are asked to see a baby that is not gaining weight. At three months she consumes 90mL x 6 bottles per day of standard infant formula and you calculate that this does not meet her energy requirements. She is not able to increase her energy intake by drinking greater volumes, so you decide to concentrate the formula to assist with weight gain.

Standard dilution of formula X (per litre)	133g powder + 900mL water (1 scoop per 50mL)
Energy (per litre) kJ (kcal)	2840 (679)
Scoop weight (g)	7.4
Energy density	20kcal/30mL
Energy per gram of powder kJ (kcal)	21.35 (5.11kcal)
Displacement	0.75mL per gram

Note: Information on standard dilution for formulas, energy provided per litre and scoop weight is available in *The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant Formula, Enteral and Supplementary Feeds*³². Energy density, energy per gram of powder and displacement factors can be calculated from the information available in *The Feeding Guide*.

Please note that the nutritional compositions of formulas frequently change.

For this reason it is best to always refer to the information available on the formula tin or manufacturer's instructions. Manufacturer's instructions can be obtained by contacting the company representative.

STEPS TO CALCULATE A RECIPE FOR A 24KCAL/30ML CONCENTRATED FORMULA FOR HOME

Note: For home, recipes are calculated in number of scoops rather than grams for ease of preparation. It is best to give the recipe in whole scoops, rather than half scoops.

Step 1: Work out how much energy you need in each bottle

Working on 90mL volume (current volume offered per feed), calculate the energy required per bottle.

$$\text{Energy per bottle} = \frac{90\text{mL}}{30} \times 24\text{kcal} = 72\text{kcal}$$

Alternatively you could calculate that each mL requires 0.8kcal (24 divided by 30 = 0.8kcal/mL), thus

$$\text{Energy per bottle} = 90\text{mL} \times 0.8\text{kcal} = 72\text{kcal/mL}$$

Step 2: Work out grams of powder

$$\text{Grams of powder} = \frac{\text{Energy required}}{\text{kcal/g of powder}} = \frac{72\text{kcal}}{5.11} = 14.1\text{g powder}$$

$$\text{Scoops of powder} = \frac{14.1\text{g}}{7.4\text{g per scoop}} = 1.9 \text{ scoops (round to 2 scoops)}$$

Note: Only round if you get an answer that is within 0.1 scoops i.e. 1.9-2.1 scoops for this answer. You will need to work out the answer again with another volume if the answer is a fraction of a scoop to obtain an answer that is as close to a whole scoop as possible.

Step 3: Work out the displacement

$$2 \text{ scoops} = 2 \times 7.4\text{g} = 14.8\text{g of powder}$$

1g of powder displaces 0.75mL

$$2 \text{ scoops displaces} = 0.75 \times 14.8\text{g} = 11.1\text{mL}$$

$$\begin{aligned} \text{Volume of water required} &= 90\text{mL} - 11.1\text{mL} \\ &= 79\text{mL (round to 80mL)} \end{aligned}$$

Final answer

To prepare a 90mL bottle requires 80mL of water and 2 scoops of Formula X. This is equivalent to 1 scoop per 40mL of water (this is equivalent to 0.8 times the usual amount of water required for standard concentrations).

Note: Terminology for increased strength formula varies across hospital and care facilities. Some facilities express concentrations using a percentage method (kcal/100ml). Should you require assistance interpreting recipes using a method with which you are not familiar, please contact the referring facility for clarification and advice.

APPENDIX 6: WORKED EXAMPLE FOR CALCULATING A FORMULA USING A CARBOHYDRATE SUPPLEMENT

Scenario

You are asked to see a baby that is not gaining weight. At one month he consumes 60mL x 8 bottles per day of standard infant formula and you calculate that this does not meet his energy requirements. He is not able to increase his energy intake by drinking greater volumes. He is receiving an adequate amount of protein from the formula so you decide to add a carbohydrate supplement instead of concentrating the formula to assist with weight gain.

Standard dilution of formula X (per litre)	133g powder + 900mL water (1 scoop per 50mL)
Energy (per litre) kJ (kcal)	2840 (679)
Scoop weight (g)	7.4
Energy density	20kcal/30mL
Energy per gram of powder kJ (kcal)	21.35 (5.11kcal)
Displacement	0.75mL per gram

Note: Information on standard dilution for formulas, energy provided per litre and scoop weight is available in *The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant Formula, Enteral and Supplementary Feeds*³² from the Children's Hospital at Westmead for energy equations and disease state factors. Energy density, energy per gram of powder and displacement factors can be calculated from the information available in *The Feeding Guide*.

Please note that the nutritional compositions of formulas frequently change.

For this reason it is best to always refer to the information available on the formula tin or manufacturer's instructions. Manufacturer's instructions can be obtained by contacting the company representative).

STEPS TO CALCULATE A HOME RECIPE FOR A 24KCAL/30ML FORMULA BY ADDING 4KCAL/30ML OF CARBOHYDRATE SUPPLEMENT

Note: For home, additives are usually given as metric teaspoons, tablespoons or millilitre measures.

Step 1: Work out how much energy you need in each bottle

Working on 60mL volume (current volume offered per feed), calculate the energy required per bottle.

$$\text{Energy per bottle} = \frac{60\text{mL}}{30} \times 24\text{kcal} = 48\text{kcal}$$

Alternatively you could calculate that each mL requires 0.8kcal (24 divided by 30 = 0.8kcal/mL), thus

$$\text{Energy per bottle} = 60\text{mL} \times 0.8\text{kcal/mL} = 48\text{kcal/mL}$$

Note: since we are using a standard infant formula i.e. 20kcal/30mL, the energy from powder will be:

$$\text{Energy from powder} = \frac{60\text{mL}}{30} \times 20\text{kcal} = 40\text{kcal}$$

AND remaining energy will be from the supplement:

$$\text{Energy from supplement} = \frac{60\text{mL}}{30} \times 4\text{kcal} = 8\text{kcal}$$

Step 2: Work out grams of formula powder

$$\text{Grams of powder} = \frac{\text{energy required}}{\text{kcal/g of powder}} = \frac{40\text{kcal}}{5.11} = 7.8\text{g powder}$$

$$\text{Scoops of powder} = \frac{7.8\text{g}}{7.4\text{g per scoop}} = 1.1 \text{ scoops (round to 1 scoop)}$$

Step 3: work out grams of carbohydrate supplement powder

$$\text{Grams of powder} = \frac{\text{energy required}}{\text{kcal/g of powder}} = \frac{8\text{kcal}}{3.9^*} = 2\text{g powder}$$

* (1 gram of carbohydrate supplement = 3.9kcal)

Note: Information on the nutrient profile of energy, fat and protein supplements are available in The Feeding Guide: A Paediatric Handbook on the Nutritional Composition of Infant Formula, Enteral and Supplementary Feeds³² from the Children's Hospital at Westmead for energy equations and disease state factors.

Step 4: Convert supplement to metric measures

$$\text{Amount of supplement required} = \frac{2\text{g}}{**2.5\text{g per teaspoon}} = \frac{3}{4} \text{ teaspoon}$$

** (1 teaspoon of carbohydrate supplement = 2.5 grams)

Note: Metric weights of supplements are determined using a level measure. These values are not available in *The Feeding Guide*. To work out these values you will need the supplement, metric measures (for example teaspoons and tablespoons) and a digital scale. Multiple measures should be taken to improve accuracy of the measurement.

Step 5: Work out the displacement

$$1 \text{ scoop} = 1 \times 7.4\text{g} = 7.4\text{g of powder}$$

1g of powder displaces 0.75mL

$$1 \text{ scoop displaces} = 0.75 \times 7.4\text{g} = 5.6\text{mL}$$

AND

$$\frac{3}{4} \text{ teaspoon} = 0.75 \times 2.5\text{g} = 1.9\text{g of powder}$$

1g of powder displaces 0.625mL

$$\frac{3}{4} \text{ teaspoon displaces} = 0.625 \times 1.9\text{g} = 1.2\text{mL}$$

$$\begin{aligned} \text{Therefore, volume of water required} &= 60\text{mL} - (5.6+1.2\text{mL}) \\ &= 53\text{mL (round down to 50mL as most baby bottles} \\ &\quad \text{do not have 5mL increments)} \end{aligned}$$

Note: In this example, the small quantity of carbohydrate supplement will not displace a significant amount of water. The displacement will be more significant when larger quantities of the additive are used.

Final answer:

Add $\frac{3}{4}$ of a teaspoon (3 x $\frac{1}{4}$ tsp) of carbohydrate supplement to a prepared bottle of Formula X (50mL of water and 1 scoop of powder)

Note: In this example, the exact concentration of the final solution is 23.8kcal/30mL

Note: Terminology for increased strength formula varies across hospital and care facilities. Some facilities express concentrations using a percentage method (kcal/100ml). Should you require assistance interpreting recipes using a method with which you are not familiar, please contact the referring facility for clarification and advice.

APPENDIX 7: FORMULA SELECTION FOR ENTERAL FEEDING

Disclaimer: This formula guide is not extensive and was designed for use as a starting point when selecting paediatric enteral formulas. Individual product specifications including indications and contraindications, suggested age for usage and the nutritional composition should be referred to before deciding which formula to use. This information is usually accessible online from product manufacturers. Paediatric handbooks such as Westmead Children’s Hospital “The Feeding Guide”³² also provide an overview of products. It should be noted that formula compositions may be changed by manufacturers without notice and individual product compositions should be reviewed before usage.

KEY MESSAGES

- Breast milk is the ideal choice when possible
- Standard formulas are not suitable in various medical conditions
- Check individual product specifications and contraindications prior to use. Formula names and compositions change frequently.
- Suggested uses are common examples and not an extensive list of indications and contraindications

Infant Products

Formula	Characteristics	General Uses/Warnings	Examples
Standard from birth	<ul style="list-style-type: none"> • Cow’s milk based • Nutritionally complete from 0-6 months 	<ul style="list-style-type: none"> • Cow’s milk-based formula is suitable for most healthy full-term infants when breast milk is not available • Recommended over formulas made from soybeans, goat’s milk or modified lactose formula unless appropriate to the infant’s medical condition¹⁰ 	<ul style="list-style-type: none"> Aptamil Gold Plus Pronutra 1 Nan Pro Gold 1 S26 Gold Newborn
High energy from birth	<ul style="list-style-type: none"> • High energy (1kcl/ml) 	<ul style="list-style-type: none"> • Suitable for infants 0-18months or less than 8kg • Contraindicated for Galactosaemia 	<ul style="list-style-type: none"> Infatrini
Follow on	<ul style="list-style-type: none"> • Cow’s milk based • Often higher in protein and minerals than ‘from birth’ formulas 	<ul style="list-style-type: none"> • Not suitable for infants <6 months of age • Infants >6 months do NOT require transition to follow on formulas if solids are able to be established 	<ul style="list-style-type: none"> S26 Progress Nan Pro Gold 2 Aptamil Gold Plus Pronutra 2
Toddler	<ul style="list-style-type: none"> • Milk drink 	<ul style="list-style-type: none"> • Marketed for age 1 to 3 years, not routinely recommended in the clinical setting • Not nutritionally complete • Can be used with dietetic supervision as a supplement to support children with marginal nutrient intakes. However over consumption can compromise oral intake and cause unnecessary weight gain in otherwise healthy children 	<ul style="list-style-type: none"> Heinz Nurture 3 Gold Toddler Aptamil Gold Plus Pronutra 3
Soy	<ul style="list-style-type: none"> • Soy based protein 	<ul style="list-style-type: none"> • Uses include those following a vegan diet, proven cow’s milk protein allergy (without soy protein allergy), permanent lactose intolerance, galactosemia • Should NOT be used for preterm infants • Concerns have been raised about the possible physiological effects of isoflavone compounds on the infant’s developing neuroendocrine system. There is no clear clinical or scientific evidence to support the position that these compounds are harmful, although no long-term studies have conclusively documented the product’s safety in infants¹⁰ 	<ul style="list-style-type: none"> Karicare Soya All Ages S26 Soy

Post discharge preterm formula	<ul style="list-style-type: none"> Provides a transitional formula for preterm infants following discharge Usually higher in energy, protein, iron, zinc, calcium, phosphorus and Vitamin E than standard formula 	<ul style="list-style-type: none"> For use under specialist medical and dietetic supervision for preterm infants < 33 weeks gestational age Continue use until 3-6 months corrected age and until growth parameters have reached 25th percentile 	S-26 Gold Prem Gro
Partially hydrolysed protein	<ul style="list-style-type: none"> Protein is broken into peptides 	<ul style="list-style-type: none"> Breast milk is the first choice for allergy prevention There is no evidence that partially hydrolysed infant formula prevents allergic disease when used for supplementary feeds in hospitals, and widespread use for this purpose may undermine breastfeeding¹⁰ NOT for treatment of proven allergy to cow's milk protein Recommended for children with a first degree family history of allergy⁹² 	Karicare HA Nan HA
Extensively hydrolysed protein (Semi-elemental)	<ul style="list-style-type: none"> Protein is broken into its constituents ie. protein is largely present as peptides but these are lower molecular weight (kDa) Often contains significant proportion of medium chain triglycerides (MCT) 	<ul style="list-style-type: none"> Used in cow's milk protein allergy, severe diarrhoea, intestinal malabsorption including short bowel syndrome 	Alfare Aptamil Gold Pepti Junior Allerpro
Amino acid (Elemental)	<ul style="list-style-type: none"> Amino acid synthetic formula. Some varieties are supplemented with long chain polyunsaturated fatty acids and varied proportions of MCT 	<ul style="list-style-type: none"> Used in cow's milk allergy, multiple food protein intolerance, children with gastrointestinal impairment requiring an amino acid based diet such as short bowel syndrome 	Elecare Neocate Gold / Neocate LCP (children <1year) Alfamino Neocate Advance (children >1year)
Fat modified formula	<ul style="list-style-type: none"> Lipid fraction is based on MCT 	<ul style="list-style-type: none"> Used in lipid and lymphatic disorders including: Chylolthorax, Intestinal Lymphangiectasia, Biliary Atresia, Alagille Syndrome Additional supplementation of essential fatty acids may be required in some patients 	Lipistart Monogen
Carbohydrate modified formula	<ul style="list-style-type: none"> Formula with altered amounts and/or type of carbohydrate depending on clinical indication 	<ul style="list-style-type: none"> Example conditions: <ul style="list-style-type: none"> Lactose intolerance 	Delact
		<ul style="list-style-type: none"> <ul style="list-style-type: none"> Sucrase-isomaltase deficiency 	Alfare Karicare Soya All Ages Aptamil Gold Pepti Junior Neocate
		<ul style="list-style-type: none"> <ul style="list-style-type: none"> Glucose-galactose intolerance: Not nutritionally complete, only used for disorders in CHO metabolism 	RCF (Ross CHO Free) Carbohydrate-free mix
		<ul style="list-style-type: none"> <ul style="list-style-type: none"> Galactosaemia: Not suitable for disaccharide intolerance 	Karicare Soya All Ages S26 Soy
		<ul style="list-style-type: none"> <ul style="list-style-type: none"> Combined lactose, sucrose and fructose intolerance 	Elecare Neocate Aptamil Gold Pepti Junior

Paediatric Products

Note: Energy density is based on the standard dilution recipe provided by the company. Product recipes are often modified to provide alternative caloric densities tailored specifically to the patient. For example, a product providing 1.5kcal/mL made at standard dilution may be modified to 1kcal/mL or 1.2kcal/mL to meet a specific patient's needs.

Caution must be applied when modifying recipes and providing feeding regimens to ensure the macronutrient and micronutrient provision is appropriate for the patient.

This guide is aimed at general and more common medical conditions. It does not include products designed for specialist medical conditions.

Characteristics	General Uses/Warnings	Examples
Standard formula	<ul style="list-style-type: none"> • 1kcal/mL at standard dilution • Cow's milk protein based • Can be used as the sole source of nutrition. However caution needs to be applied to ensure prescribed volumes meet age specific NRVs 	<p>From >1 year: Pediasure, Sustagen Kid Essentials, Nutrini</p> <p>For older children: Osmolite, Jevity, Ensure, Nutrison</p>
High energy/protein	<ul style="list-style-type: none"> • Usually 1.2-2kcal/mL at standard dilution • Used in patients who are fluid restricted, have elevated nutritional requirements or poor volume tolerance • Often high protein and should be used with caution in smaller children 	<p>From >1 year: Nutrini drink powder, Nutrini Energy, Pediasure Plus</p> <p>For older children: Jevity HiCal, Ensure Plus, Nutrison Energy, Two Cal, Resource 2.0</p>
Extensively hydrolysed (semi elemental)	Metabolically stressed patients, those susceptible to sepsis, burns, impaired digestion/absorption	Perative, Peptisorb
Amino acid	0.8-1kcal/mL at standard dilution Used in cow's milk allergy, multiple food protein intolerance, gastrointestinal impairment requiring an amino acid based diet such as short gut syndrome	Neocate Advance, Elecare, Vivonex Paediatric, Vivonex T.E.N

APPENDIX 8: TUBE FEEDING SCHEDULES/REGIMENS FOR ENTERAL FEEDING

Adapted from: Western Child Health Network. A Multidisciplinary approach to Paediatric Home Enteral Nutrition (HEN) A Resource Manual for Health Professionals. First ed: NSW Health; 2013.

There are different types of feeding schedules used. The choice of enteral feeding regimen is based on assessment of the child/infant's needs. Enteral feeds can be administered by continuous, intermittent, gravity drip or bolus methods, or a combination of these.

CONTINUOUS FEEDING

Defined as feeding for 24 hours continuously either by gravity drip or a feeding pump.

Allows for a slow and steady infusion.

Continuous feeding at low volume can be achieved by either gravity drip feeding or by use of an enteral pump.

Advantages:

- Fewer complications (e.g diarrhoea, reflux, nausea, abdominal distension, bloating)
- Enhanced tolerance to hyperosmolar enteral formula especially if fed into the small intestine
- Able to use a lower hourly rate compared with feeding for <24 hours
- Decreased risk of aspiration
- Preferred method when post pyloric feeding is required
- Preferred in patients with significant GOR and high risk aspiration, with jejunal tube to prevent aspiration and achieve maximum caloric intake
- Better tolerated in children with compromised gastrointestinal function or delayed gastric emptying.

Disadvantages:

- The psychosocial impact of 24 hour continuous feeding in the home setting on not only the parent or carer but also the family dynamic
- Reduced mobility due to physical attachment to the feeding apparatus
- Can be difficult managing and supervising overnight feeds
- Can be difficult with children who are mobile during the day
- Expense of equipment (pump, feeding containers/bags, giving sets etc)
- Can be more equipment to maintain and clean than bolus feeding
- Potential risk of formula contamination if feeds are left at room temperature longer than 4 hours
- For transpyloric feeds, the tube needs to be inserted under radiological conditions
- Cannot stimulate hunger.

INTERMITTENT FEEDING

Defined as a continuous infusion delivered over a shorter period or periods of time during the day and or night, usually ranging from 12-20 hours. Can be given by slow gravity drip or feeding pump.

Volume provided will vary, depending upon the child's requirements and the duration of infusion.

Advantages:

- Allows greater patient mobility
- Allows breaks:
 - for physical activity
 - for the administration of medications that are incompatible with feeds
 - to encourage oral intake if applicable
- Can be flexible to suit the child and/or parent's lifestyle and improve quality of life
- May be more psychologically acceptable
- Useful in the transition from continuous to bolus feeding, or from tube feeding to oral intake
- Beneficial compared to continuous feeding in children with smaller gastric capacity and increased risk of gastro oesophageal reflux.

Disadvantages:

- Expense of equipment (pump, feeding containers/bags, giving sets)
- More equipment to maintain and clean than bolus feeding
- Potential risk of formula contamination if feeds are left at room temperature longer than 4 hours
- Larger hourly volumes or higher infusion rate, when compared to continuous feeding may be poorly tolerated in some children
- May increase risk of reflux, aspiration, abdominal distension, diarrhoea and nausea due to higher infusion rate.

GRAVITY DRIP FEEDING

Can be given by intermittent or continuous drip

This method of feeding involves calculating the drip rate and adjusting it to administer the desired volume of feed in a set time

Estimated drip rates

mL/hr	Number of drips/minute
25	7
50	13
75	20
100	27
125	33
150	40
175	47
200	53

$$\frac{\text{Total volume (mL)}}{\text{Total time (min)}} \times \text{Drop factor (15)} = \text{drips/minute}$$

For example:

To calculate the drip rate to deliver 1200mL over 14 hours.

Infusions sets are calibrated for a drop factor of 15.

$$\frac{1200 \text{ mL}}{840 \text{ min}} \times 15 = 22 \text{ drips/minute}$$

Advantages:

- Useful if the child is not able to tolerate bolus feeding and pump feeding is not an option
- Power source is not required
- Feeding pump is not required.

Disadvantages:

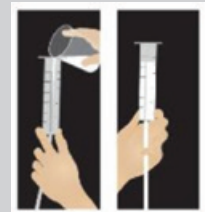
- Less accurate measurement and control of feeding rate
- Potential reduced mobility due to physical attachment to the formula bottle/container/bag
- Potential risk of formula contamination if feeds are left at room temperature for longer than four hours.

BOLUS FEEDING

Defined as rapid administration of a measured amount of feed/water by syringe (usually by gravity) or by feeding pump where slower and more consistent rate of delivery is required.

Bolus feeding is only ever administered via the stomach, which has the reservoir capacity to tolerate a large volume.

The child must have a competent oesophageal sphincter and be able to protect his/her airway adequately to minimise the aspiration risk associated with larger feed volumes and faster administration rates.



Advantages:

- More physiologically similar to a typical eating pattern
- Allows greater patient mobility
- Convenient for gastrostomy feeding
- Can be used to supplement oral intake
- Can be used in conjunction with other administration methods
- Can be flexible to suit the child's lifestyle
- May facilitate transition to oral intake
- Less expensive as a pump and giving sets are not required
- Lower risk of microbiological contamination
- Power source is not required.

Disadvantages:

- Not suitable for post-pyloric feeding
- More time intensive for parents/ carers compared to pump feeding
- Highest risk of aspiration, reflux, abdominal distension
- Contraindicated with any form of jejunal feeding.



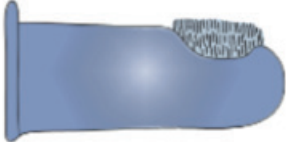

APPENDIX 9: FEEDING EQUIPMENT

There is a broad range of specialised feeding equipment on the market including anti-colic teats, orthodontic teats and dummies, cleft palate teats and bottles, cut away cups, weighted cups, fresh food feeders, divided plates. The range is extensive and products easily available vary according to market demand. Below is a list of the general feeding related equipment discussed within the document including features and examples of the identified items.

Teething and mouthing

Considerations when selecting teething and mouthing toys may include:

- Should stimulate a more active sucking pattern
- Reduce hypersensitivity in the mouth
- Reduced the strength of the tonic bite reflex
- Increase acceptance of objects coming towards the face/mouth
- Increase the amount of oral experience and exploration so the child will obtain better tongue, lip and jaw movements for feeding and sound play
- Increase oral organisation.

Features	Examples
<p>Sensory awareness toys Some toys build simple awareness of sensations in the mouth</p>	
<p>Sensory discrimination toys Other toys offer more complex sensory opportunities including smell, sound movement</p>	
<p>Sensory registration toys These toys can assist with oral stimulation or sensory registration/'waking up' the mouth</p>	
<p>Chewing practice Mesh food bag for chewing on foods safely and increasing food exploration</p>	

Pacifier/dummy

Considerations when selecting a pacifier or dummy may include:

- Has an outer shield that is moulded to the shape of the lips to provide sustained contact and stimulation for lip closure
- Fits the size and shape of the child's mouth
- Same or similar shape as the preferred teat/nipple (if infant has difficulty making sensory transitions)
- Non-latex and unable to be broken if the infant sucks or chews on it.



Teats

Considerations when selecting teats may include:

- Correct fit for the size and shape of the infant's mouth
- Flow rate needs to be appropriate for the consistency of the liquid, the infant's abilities and positioning.
- Holes are NOT artificially enlarged
- The nipple should NOT collapse with the infant's sucking. Softer teat for the infant with a weak suck, otherwise a strong stiffness/resistance in the material for the infant to suck adequately
- Teat provides a thin or narrowed area between the gums for the infant who has jaw thrust.



Bottles

Considerations when selecting bottles may include:





- The shape supports the infant's head-positioning needs
- Bottle holds the appropriate amount of fluid
- Easy and pleasing for the infant to hold
- Fits the size and the shape of the feeder's hand
- Sturdy and unbreakable
- The bottle can be coloured or decorated to attract and maintain the infant's visual attention.
- Free of bisphenol A (BPA).



Cups

When selecting, consider whether the cup:



- Can be tipped to get liquid at the lip without tipping the child's head back
- Does not shatter or break if the child bites the edge
- Gives the feeder a clear view of the child's mouth
- Provides a thick or rolled lip for extra stability if the child needs to hold the edge of the cup with the teeth
- Provides a graded control of liquid flow for the child whose ability to handle a larger volume of liquid is poor
- Is easy to hold and regulate liquid flow when held by an adult
- Provides an appropriate physical shape and an appropriate means of holding for the child who is a self-feeder
- Is coloured and decorated to visually interest the child.

Features	Examples
Cup and mug holders	
Cups with handles/grips	
Cut out rims	
Cups with spouts/lids	

Straws

Considerations when selecting straws may include:




- The amount of suction required to draw liquid up the straw increases as the diameter and length of the straw increases
- If you have reduced suction, a straw with a one-way valve will prevent the liquid from flowing back down the straw between sips
- Length and width dependent variable on the child's sucking skills
- Can it be cut, bent or adjusted to facilitate more mature straw-drinking skills
- Does not shatter or break if the child chews or bites on it
- Straws can be used with other adaptive equipment to provide support for the lips
- Provides a mechanism for graded control of the liquid flow for the child whose ability to handle larger volumes of liquid is poor
- Can be used when sitting at a table or when the child is in a car seat or a stroller.



Features	Examples
One way straws	 A clear glass filled with orange juice, with a standard yellow straw inserted into it. The straw is straight and reaches near the bottom of the glass.
Extendable straws	 A clear glass filled with pink juice, with an extendable straw inserted into it. The straw is pink and has a white, curved, extendable tip that is bent at a right angle.

Spoons

Considerations when selecting spoons may include:

- The spoon is relatively flat so the food can easily be removed by the upper lips
- The spoon fits the size of the child's mouth
- Metal spoons are covered, coated or have a plastic bowl for the child who is hypersensitive to the temperature or taste, or has a bite reflex
- The spoon does not shatter or break if the child bites it
- The length of the handle is appropriate for the feeder's hand for dependent feeding and appropriate for the child's hand for independent feeding
- Adaptive handle to facilitate child holding independently
- Appropriate weight and a pleasing texture for the infant to hold
- Colour and design to maintain the child's attention
- Moulded handles are shaped to fit the contours of a child's hand so that they can grip the handle more securely. Some include a ridge to prevent your child's hand slipping forward towards the spoon's head
- If maintaining a grip on the handle of the spoon is an issue, a hand strap with a slot to hold the handle may retain the cutlery in the hand
- Angled spoons have the head positioned at an angle to the handle so that less movement is required to bring the spoon up to the mouth. Some are set at a pre-fixed angle, others are mouldable and they are usually available for either left or right handed use.




Features	Examples
Shallow, flat or narrow bowls	
Handles which are textured, contoured, curved, built-up or looped	
Angled handles (left and right handed)	

Features	Examples
Soft tips	
Plastic coating	

Other cutlery

Considerations when selecting cutlery may include:


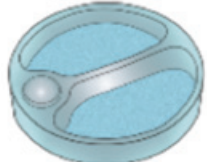
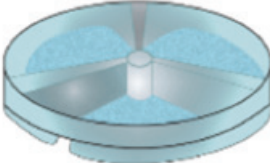


- Adaptive handles facilitate a child's grip. Some handles may include a ridge to prevent hand slipping forward towards the spoon's head
- If maintaining a grip on the handle is an issue, a hand strap with a slot to hold the handle
- The length of the handle is appropriate for the feeder's hand for dependent feeding and appropriate for the child's hand for independent feeding
- Appropriate weight and a pleasing texture for the infant to hold
- Colour and design to maintain the child's attention.

Features	Examples
Handles which are textured, contoured, curved, built-up or looped.	
Angled handles (left and right handed).	
Elastic straps (either integral to the design or as a separate item).	

Plates/bowls

Considerations when selecting plates/bowls toys may include:

- It is worth considering that careful selection of standard crockery can also make independent feeding easier
- A heavier plate is less likely to slip, a slip-resistant mat can help to stabilise a plate or bowl and a plate guard that clips onto a plate edge will give a vertical surface to push food up against when loading a fork or a spoon.

Feature	Examples
High sided plates and bowls	
Insulated plates and bowls	
Portioned plates	
Plate guards	
Slip resistant bowl	

RESOURCES

Independent Living Centres Australia

www.ilcaustralia.org.au/

Skillbuilders

www.skillbuilders.com.au/products

Evans Morris & Dunn Klein, *Pre-feeding Skills: A comprehensive resource for mealtime development*, 2000, pp. 497-502.¹