



## Clinical Guideline

# Dysphagia

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## **Summary**

- It is the position of Speech Pathology Australia that working in the field of Dysphagia is within the scope of practice of speech pathologists (Speech Pathology Australia, 2003).
- It is essential that speech pathologists work collaboratively as part of a team using a person centred approach in the field of Dysphagia.
- The Association supports an evidence based practice approach to the assessment, intervention, and outcome measurement in the area of Dysphagia.
- The Association strongly supports speech pathologists providing education and consultancy services to professionals, the broader community, clients and carers to improve the understanding of people with Dysphagia.
- Speech pathologists have a pivotal role in the assessment and management of dysphagia (swallowing disorders). The speech pathologist may act as clinician, consultant, team manager, educator, and/or researcher. The extent of involvement depends on the nature of the clinical setting and population.
- Safety guidelines should be followed where they exist. For this reason, clinicians should be familiar with workplace occupational health and safety policies, workplace policies and procedures, relevant Speech Pathology Australia Clinical Guidelines and other relevant legislation and guidelines.
- Speech pathologists should be aware of the medico-legal implications and the responsibilities of working with clients who have dysphagia.
- Speech pathologists should have knowledge of the current Speech Pathology Australia Code of Ethics (2010) and the Principles of Practice (2001) that state that decision-making in dysphagia should incorporate awareness of the ethical principles of autonomy, non-maleficence, beneficence and justice.
- Speech pathologists should work within their scope of practice. Where experience or skills are limited, appropriate advice, mentoring and peer support should be sought.
- Consistent, full and accurate recording and documentation of all areas of client assessment and management should occur.
- Projects on feeding / swallowing / dysphagia should be incorporated into general departmental Quality Assurance or Total Quality Management Procedures as appropriate.
- Where possible, speech pathologists should manage clients with dysphagia as part of a team to achieve the best possible outcomes.
- This paper reflects available evidence, issues and current clinical practice as it presents at this point in time.
- This paper contains minimum standards of practice. It is a guideline for speech pathologists assessing, treating and managing clients with dysphagia, not an exhaustive examination of the topic.
- This Clinical Guideline should be reviewed every five years.

## 1.0 Evidence-based Recommendations

Speech pathology is a scientific and evidence-based profession (Evidence-Based Practice in Speech Pathology, 2010). In order to promote evidence-based practice, grading of the available evidence for foundation areas such as: dysphagia screening, assessment, treatment, treatment strategies, safety (medications and oral hygiene) and model of care have been provided in the table below.

In 2009 the National Health and Medical Research Council recognised that there was a need to review the literature for: (a) a hierarchy of evidence according to the parameters of research question and research design, *and* (b) the quality of the study, consistency of the findings across studies, clinical impact of the results, generalisability of the results to the population, and how applicable the results are to the Australian health care setting. Clinicians may be familiar with Levels of Evidence grading I-IV, where I represents systematic reviews of randomised control trials and IV represents case series with post-test or pre-test/post-test outcomes. The Levels of Evidence address the need for a hierarchy of evidence as outlined above and identified as "(a)". The system that incorporates quality of research "(a)" together with clinical impact "(b)" is described on an A-D grading scale. Under this scale A represents evidence that can be trusted to guide practice whereas D represents evidence where the recommendations are weak and the evidence needs to be applied with caution. The definitions of A-D are provided under the table below.

Current research in speech pathology is limited by few randomized control studies and small subject numbers. These factors limit the ability to provide Level I-II evidence, and consequently reduce the number of 'A' level recommendations. Where there is insufficient research evidence, but a large body of clinical experience or expert opinion that provides support for the statement, this has been shown as a grading of GP, or Good Practice.

The inclusion of evidence-based recommendations in this document also serves to highlight to researchers where further investigations are required to continue the promotion of high levels of evidence-based practice in dysphagia management.

Recommendation	Grading
1 Clients should be screened for feeding/swallowing safety before being given food, drink or oral medications. Swallow screening should only be undertaken by individuals who have been trained, and using a validated tool	B  (Martino et al., 2009; Cichero et al., 2009)
2 Clients who fail a swallow screen should be referred to a speech pathologist for a clinical assessment +/- oral/feeding trial. The speech pathologist will determine whether an instrumental assessment is indicated to support appropriate management	GP  (Smith Hammond & Golstein, 2006)
3 Where it is unsafe for a client to swallow oral medication, referral to a Pharmacist and the client's treating doctor is required	GP  (Griffith, 2008; Society of Hospital Pharmacists of Australia)
4 Compensatory strategies such as: food and liquid texture modification, alterations to face, head or body positioning, therapeutic techniques and alterations to the environment may assist in the management of dysphagia.	B  (Berzlanovich et al., 2005; Robbins et al., 2008)

5	Teaching of new skills (infants and children) or rehabilitation of function can facilitate improvement in swallowing function. Clinician's should demonstrate competence in using the techniques before application.	C  (Bogaardt, et al. 2009; Shaker et al., 2007; Ludlow et al., 2007; Logeman, 1998; Arvedson, 1998)
6	Improvement and maintenance of oral hygiene is an appropriate and effective intervention for clients with dysphagia	B  (Carlaw, et al. 2011; Brady et al., 2006; Langmore, et al., 1998)
7	Multidisciplinary management of the clients with dysphagia is highly recommended due to the complexity of the condition	GP  (Smith Hammond & Goldstein, 2006)

Grading scale (NHMRC, 2009); National Stroke Foundation (2010):

- A Body of evidence can be trusted to guide practice
- B Body of evidence can be trusted to guide practice in most situations
- C Body of evidence provides some support for recommendation(s) but care should be taken in its application
- D Body of evidence is weak and recommendation must be applied with caution
- GP Good practice based on clinical experience and expert opinion

## **2.0 Origins of the dysphagia clinical guideline**

Australian speech pathology involvement in dysphagia has increased steadily since the mid 1980's. Speech Pathology Australia published the "Dysphagia Position Paper: General" in 2004. Since that time, Speech Pathology Australia has published specialist dysphagia position papers in the areas of: Modified Barium Swallow (2005), Tracheostomy (2005), and the advanced practice paper, "Fibreoptic endoscopic evaluation of swallowing (FEES)" (2007). In 2007, Speech Pathology Australia, in conjunction with the Dietitians Association of Australia, jointly published the Australian Standardised terminology and Definitions for Texture Modified Foods and Fluids. The role of the speech pathologist in the area of dysphagia continues to evolve and expand.

This guideline is intended to provide information and guidance for speech pathologists on clinical and workplace issues as relevant to the area of dysphagia. These guidelines are intended to be applied across the lifespan. They are, therefore, relevant to speech pathologists working with paediatric and/or adult clients who present with dysphagia. The topics and content of the guidelines address dysphagia clinical practice across a variety of settings including: community, education, disability, domiciliary, acute and rehabilitation hospital settings, and aged care.

These guidelines should be read in conjunction with other relevant clinical guidelines and positions papers, policies and procedures. Support for key messages are shown as per National Health and Medical Research Council levels of evidence guidelines (NHMRC 2009). This document may be used to monitor that the requisite standards in the general area of dysphagia are being met at both an individual and organizational level.

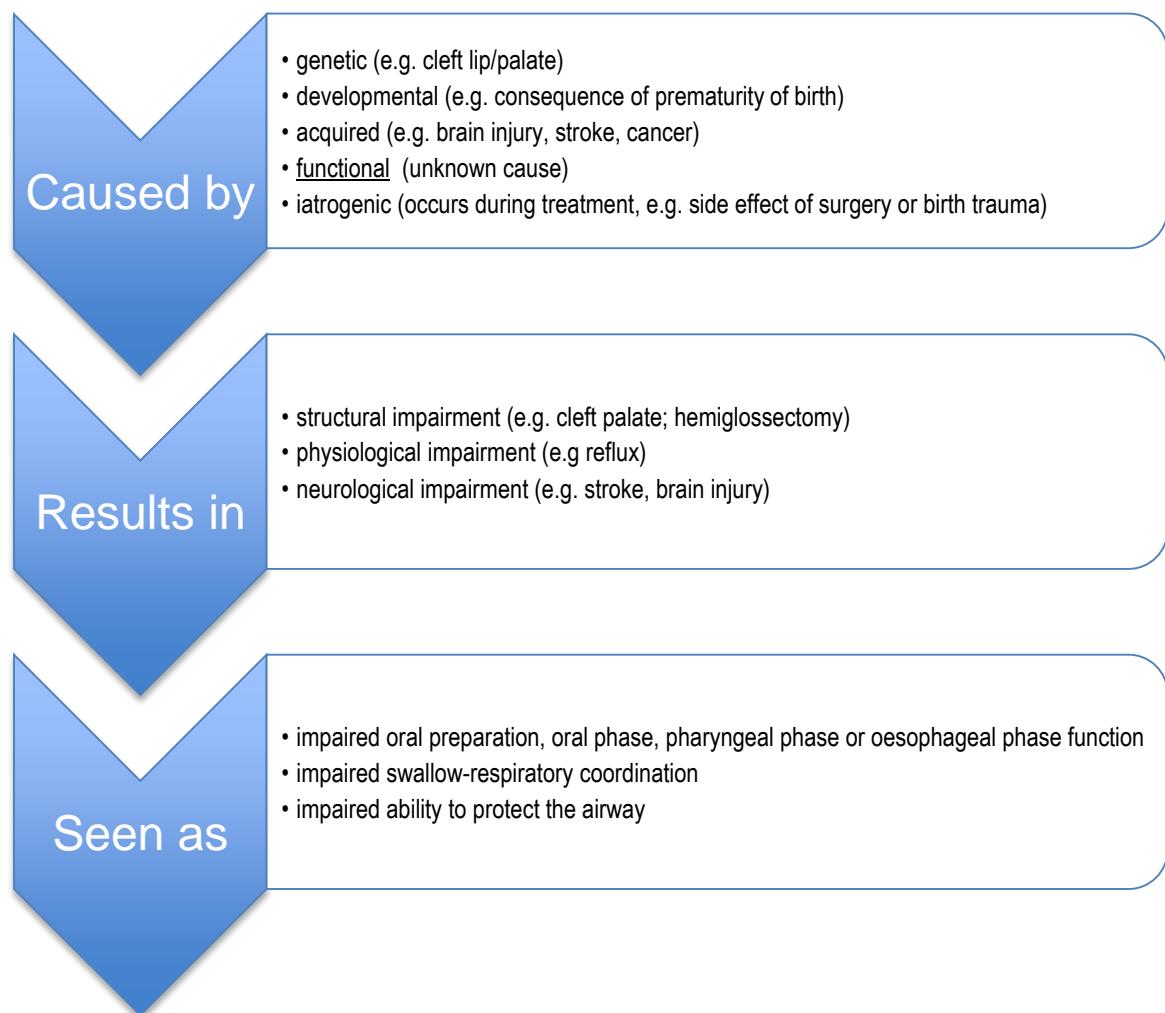
## 3.0 Background

### 3.1 Definitions

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 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 conditions (Vaiman, Shoval & Gavriel, 2008).

The causes, consequences and presentations of dysphagia are shown in Box 1 below.



Consequences of dysphagia include:

- Failure to meet nutrition and hydration needs, including failure to thrive in infants (Vivanti, Campbell, Suiter, Hannen-Jones, Hulcombe, 2009; Hays & Roberts, 2006)
- Asphyxiation and death (Berzlanovich, Fazeny-Dorner, Waldhoer, Fasching, & Keil, 2005).
- Depression, social isolation and negative impact on social well-being (Ekberg, Hamdy, Woisard, Wuttge-Hannig & Ortega, 2002).
- Possible delayed or disordered development of oral and communication skills (Barbosa, Vasquez, Parada, Carlos, Gonzalez, Jackson, 2009; Morris & Klein, 2000).
- Pneumonia, in the presence of other risk factors such as (Langmore, Terpenning, Schork, Chen, Murray, Lopatin et al., 1998) :
  - dependence for feeding
  - dependence for oral care
  - number of decayed teeth
  - tube feeding
  - more than one medical diagnosis
  - number of medications
  - smoking.

## 4.0 Dysphagia prevalence

The true prevalence of dysphagia is difficult to estimate as it is reported as a function of: dysphagia type (oropharyngeal vs. oesophageal), disease state (infant prematurity, stroke, head injury), investigative setting (hospital, community), and country of investigation. A summary of dysphagia prevalence statistics using these categories is shown in the table below. There are many conditions that result in dysphagia, consequently the table is not exhaustive.

Dysphagia prevalence		
Dysphagia type		
Oropharyngeal	See below under investigative setting and country and disease/disorder type	
Oesophageal	10-20% (GESA, 2011)	
Investigative setting and country		
Acute hospital:	0.35% USA (Altman, Yu & Schaeffer, 2010) 25% Australia (Cichero, Heaton & Bassett, 2009) 55% Spain (Cabre, Serra-Prat, Palomera, 2010)	
Aged Care:	55% USA (Kayser-Jones & Pengilly, 1999) 68% Canada (Steele, Greenwood, Ens et al., 1997)	
Community:	11% UK (Holland, Jayasersekeran, Pendleton et al., 2011) 13%, Japan (Kawashima, Motohashi, Fujishima, 2004) 16% Netherlands (Bloem, Lagaay, van Beek et al., 1990)	
Disease/Disorder type		
ADULTS		
Stroke	14-94% (Langdon, Lee & Binns, 2007)	
Brain Injury	61% (Cook, Peppard, Magnuson, 2008)	
Dementia	84% (Horner, Alberts, Dawson, Cook, 1994)	
Motor Neurone Disease	81% at time of death (Hardiman, 2000)	
Chronic Obstructive Pulmonary Disease	27-84% (McKinstry, Tranter & Sweeney, 2010; Good-Fratirelli, Curlee, Hollee 2000)	
Parkinson's Disease	32% (Walker, Dunn & Gray, 2011)	
Cancer of head and neck	50% (Brodsky, McFarland, Dozier, Blair, Ayers, Michel et al., 2010)	
Age (> 65 yrs)	10-30% (Barczi, Sullivan & Robbins, 2000)	
INFANTS and CHILDREN		
Prematurity	25-55% (Mercado-Deane, Burton, Harlow, Glover, Deanne, Guill, et al. 2001)	
Cleft lip/palate	25-73% (Glenny, Hooper, Shaw, Reilly, Kasem & Reid, 2004)	
Infant reflux	50% in infants < 3 months (NASPGHAN + ESPGHAN, 2009)	
Developmental disability	60% (Giudice, Staino, Capano, Romano, Florimonte, Miele et al., 1999)	
General population	13% (Mercado-Deane, Burton, Harlow, Glover, Deanne, Guill, et al. 2001)	

## **5.0 Changes and trends**

The knowledge base and competencies in the speech pathology profession continue to evolve. These changes have resulted in alterations to: scope of practice and responsibilities of the profession, the contexts and conditions in which dysphagia clinical work is performed, and the expectations of other professionals and members of the public. These changes and influencing factors are described below:

### **5.1 Evidence-based practice**

- Research providing support for improved dysphagia outcomes using multidisciplinary teams that include speech pathologists (Morgan & Skeat, 2011; Frank, Mader & Sticher, 2007).
- Promotion of specific interventions to improve swallowing outcomes (e.g. Logemann, Rademaker, Roa Pauloski, Kelly, Stangl-McBreen, Antinoja et al., 2009) or quality of life (e.g. Carlaw, Finlayson, Beggs, Visser, Marcoux, Coney et al., 2011) supported by research.
- Standardisation of terminology and definitions for texture modified foods and fluids used for individuals with dysphagia (Atherton, Bellis-Smith, Cichero & Suter, 2007).
- Association advocacy of evidence based practice as demonstrated by:
  - Evidence Based Practice in Speech Pathology (Speech Pathology Australia, 2010) and
  - Development of SPEECH-BITE™ accessible via the Speech Pathology Australia website to provide a database of speech pathology interventions and treatment efficacy

### **5.2 Consumer awareness and involvement in health care**

- Medicare funded allied health services under the federal government initiative for individuals with “Complex and chronic conditions” initiative (chronic disease management items, previously known as ‘enhanced primary care plan’ items)
- Early intervention services under the “Helping children with autism” federal government initiative
- Allied health services under the “Better start for children with disabilities” federal government initiative

### **5.3 Advances in medicine and technology**

- Better healthcare has resulted in increased longevity for older individuals with forecasts that by 2050 one third of the population of the developed world will be older than 60 years of age (United Nations, 2001).
- Better healthcare for neonates has resulted in improved survival rates of premature infants, often with complex medical needs (Stephens & Vohr, 2009).
- Improved access and technological advances to techniques such as modified barium swallow, and fibroscopic endoscopic evaluation of swallowing.
- Development of new medical technologies e.g. transcranial stimulation (Kumar, Wagner, Frayne, Zhu, Selim, Feng et al., 2011).
- Development of remote services e.g. telemedicine (Sharma, Ward, Burns, Theodoros, Russell, 2011).

### **5.4 Quantification of costs associated with dysphagia**

- Three-fold increased risk of death within 30 days following diagnosis of aspiration pneumonia (Cabre, Serra-Orat, Palomera, 2010).
- Annual economic impact of dysphagia reported at \$547 million in the acute hospital setting (Altman, Yu and Schaeffer, 2010).

- Mean cost of \$17,000 per episode of treatment for aspiration pneumonia with increasing costs associated with higher numbers of co-morbidities (Sutherland, Hamm and Hatcher, 2010).
- Decrease in annual cost for treatment of chest infection in hospital (£48.2M reduced to £26.1M) and in the community (£3M reduced to £1.6M) when speech pathologists were involved in patient care (Marsh, Bertanou, Souminen, Ventankachalam, 2010).

## **5.5 Expanded, advanced and extended scope of practice**

- Speech pathology service allocation to specialist acute hospital units. For example:
  - burns (McKinnon DuBose, Groher, Carnaby-Mann & Mozingo, 2005),
  - paediatric traumatic brain injury (Morgan & Skeat, 2011),
  - head and neck cancer (Feng, Kym, Liden, Haxer, Feng et al., 2007)
  - spinal injury (Cameron, McKinstry, Burt, Howard, Bellomo, Brown, Ross et al., 2009) and
  - intensive care and neonatal intensive care units (Baumgartner, Bewyer, Bruner, 2008).
- Emergence of speech pathology service allocation to emergency medicine wards and weekend cover/on-call rostering as evidenced in job descriptions for speech pathologists across Australia.

## 6.0 Scope of Practice

### 6.1 General principles

Dysphagia management may be complex and is often multi-factorial in nature. The speech pathologist's understanding of human physiology is critical. The swallowing system works with the respiratory system. The respiratory system is in turn influenced by the cardiac system, and the cardiac system is affected by the renal system. Due to the physiological complexities of the human body, few clients present with dysphagia in isolation.

### 6.2 Complex vs. non-complex cases

Broadly the differentiation between complex and non-complex cases relates to an appreciation of client safety and reduction in risk of harm. The following table provides clinicians with examples to differentiate complex from non-complex cases. All clinicians, including new graduates, should have sufficient skills to appropriately assess and manage non-complex cases. Where a complex client presents, the skills of an advanced clinician are required. Supervision and mentoring should be sought from newly graduated clinicians or those with insufficient experience to manage complex cases. Refer also to the Services Management section (Section 8.0) of this document.

Examples of Complex vs. non-complex cases	
Complex adult cases	Multi-system involvement (gut, respiratory, cardiac, metabolic, neurological etc.); medically unstable clients; multi-stroke; palliative care, head and neck surgery, tracheostomy, ventilator dependency, high or known aspiration risk; long-term tube dependency; social issues that pose a safety risk to the client
Non-complex adult cases	Uncomplicated stroke without multiple system involvement (e.g. first stroke), dementia, Parkinson's Disease, uncomplicated or basal state Chronic Obstructive Pulmonary Disease, medically stable head injury or traumatic brain injury
Complex paediatric cases	Multi-system involvement (gut, respiratory, cardiac, renal, metabolic, neurological etc); long-term tube dependency; tracheostomy; significant anatomical abnormalities; high aspiration risk / known aspiration; oral feed refusal causing risk to adequate nutrition/hydration; medically unstable / acute; failure to thrive; social issues that pose risk to safety of child
Non-complex paediatric cases	Healthy neonate or infant with isolated feeding difficulty: e.g. bottle feeding / breastfeeding / texture transition difficulty, fussy eater, mealtime management; isolated cleft lip / palate; oral / feeding skill optimisation in children with disability or developmental delays. Neonates, infants or children who doesn't explicitly require multi-disciplinary input or monitoring for safe assessment and management.

### 6.3 Screening

Screening procedures are designed to identify *risk* of dysphagia. They often rely on the presentation of dysphagia *symptoms*. In contrast, assessment often refers to a *diagnostic* procedure where *anatomical or physiological abnormality* can be ascertained (Logemann, Veis and Colangelo, 1999). Often patients are screened to determine aspiration risk first and then to determine whether physiological assessment is required (e.g. modified barium swallow or fibrooptic endoscopic evaluation of swallowing [FEES]).

Speech pathologists or other health professionals can conduct dysphagia screening. With the development of best practice care plans, there has been an increased need for dysphagia screening tools, administered by a range of health professionals. For example, the National Stroke Foundation mandates that stroke patients be screened for dysphagia in the first 24 hours post stroke, and prior to oral intake (Clinical guidelines for stroke management, 2010). Stroke patients who 'fail' the screen are referred to speech pathology for formal dysphagia evaluation. The use of screening tools has support from the research literature. There is a three-fold reduction of dysphagia risk in hospitals where

dysphagia screening programs are used (Hinchey et al., 2005; Weinhardt, Hazelett, Barrett, Lada, Enos, Keleman et al. 2008).

In the adult population, the majority of screening tools have been developed specifically for the stroke population (Martino, Silver, Teasell, Nicholson, Bayley, Streiner et al., 2009). However, an Australian dysphagia screening that is suitable for a generic population has been developed and validated (Cichero, Heaton & Bassett, 2009). The RWH Dysphagia Swallow Screening Tool has received widespread international approval (Altman, 2011). Both the Martino et al. (2009) tool and the RWH Swallow screening tool have been developed for nurse administration. Both tools have stringent requirements for knowledge and skills prior to eligibility to screen for dysphagia.

There do not appear to be any validated and published pediatric dysphagia screening tools. Sirmet-Gaudelus, Poisson-Salomon, Colomb, Brusset, Mosser, Berrier et al., (2000) have published documentation to help identify children at risk of malnutrition. Although there were infants with dysphagia within their sample population, there were insufficient numbers for dysphagia to be identified within the tool. However, questions relating to diet consumption and number of vomiting episodes per day were seen to 'catch and identify' patients with dysphagia who are also at risk of malnutrition.

A screening tool has been developed for individuals with dysphagia and disability. Nutrition and swallowing are key factors in the Nutrition and Swallowing Checklist developed by the New South Wales Department of Community Services (Stewart, 2003). Identification of any risk factor from the 24-question checklist prompts the screener to refer to the *Nutrition in Practice Manual* and determine which health professionals may require referral to best manage the client's needs.

Screening tools are not used to measure dysphagia severity, or to guide dysphagia management. Therefore, screening tools do not replace speech pathology assessment.

## 6.4 Assessment

Swallowing assessments are conducted using clinical (non-instrumental) and instrumental procedures (e.g. modified barium swallow, FEES etc.). Some, but not all patients will undergo both clinical and instrumental assessments. Like screening assessments clinical assessments may also identify symptoms of dysphagia. However, clinical assessments provide information regarding the anatomy and physiology of the oral phase of swallowing and hypothesis formation of pharyngeal phase functioning. Instrumental assessments provide information about oral, pharyngeal and in some cases oesophageal phase functioning.

The aims of any assessment of dysphagia are to (Carnaby-Mann & Lenius, 2008; Logemann, 1998; Groher & Miller, 1992):

- Determine the presence or absence of a feeding/swallowing difficulty.
- Collect information on the current medical diagnosis, patient's medical history, history of the feeding/swallowing disorder, client or carer's understanding and awareness of the feeding/swallowing disorder.
- Describe a client's feeding/swallowing abilities, including severity and level of impairment.
- Determine the client's nutritional and respiratory status, including ability to protect the airway.
- Determine ability to coordinate swallowing with respiration.
- Determine the likelihood for safe oral intake
- Best consistencies of food or liquid to consume
- Best conditions for feeding/swallowing
- Recommend alternative nutritional management if required.
- Determine the need for further diagnostic studies.

- Determine possible causes of dysphagia.
- Establish baseline clinical data.
- Plan treatment or compensatory strategies appropriate to the feeding/swallowing disorder.
- Determine requirement for referral to other health professionals.

#### **6.4.1 Clinical Assessment**

The value of a clinical assessment should not be underestimated. It is the platform upon which further clinical decision-making is based. The clinical assessment involves assessment of motor and sensory function, and observation of client swallowing ability. It is a core element of speech pathology training in the assessment of clients with swallowing disorders (CBOS, 2011).

Details regarding the method of conducting a clinical assessment are specified in a number of textbooks (Adult and paediatric dysphagia: Leonard & Kendall, 2008; Cichero & Murdoch, 2006; Adult dysphagia: Logemann, 1998; Huckabee, M.L. & Pelletier, 1998; Paediatric feeding/dysphagia: Watson Genna, 2008; Arvedson & Brodsky, 2002; Evans Morris & Dunn Klein, 2000; Wolff & Glass, 1992)

Clinical assessments of dysphagia can be divided into eight phases. These are described in the table below.

<b>Clinical assessment of dysphagia</b>	
<b>1. BACKGROUND</b>	<p>Medical diagnosis including medical status</p> <p>Complexity of medical condition (e.g. more than one body system involved: cardiac + respiratory diagnosis)</p> <p>Current nutritional status and immediate nutritional needs (food allergies or intolerances; breast or bottle feeding; nutritional supplements)</p> <p>Cultural, educational, religious and vocational background</p> <p>Level of stress or concern of client/carer regarding the feeding/swallowing difficulty</p>
<b>2. IMMEDIATE OBSERVATIONS</b>	<p>Client awareness of their environment</p> <p>Client level of alertness</p> <p>Client ability to participate in feeding/swallowing assessment</p> <p>Presence of tubes: intravenous line, nasogastric tube, gastrostomy tube, tracheostomy tube</p> <p>Client state (e.g. agitation or fussiness)</p> <p>Ability to manage oral secretions</p> <p>Respiratory status (e.g. oxygen assistance; depth and rate of respirations)</p> <p>Posture and positioning</p>
<b>3. COMMUNICATION, COGNITION AND BEHAVIOUR</b>	<p>Ability to follow instructions</p> <p>Visual and auditory skills (e.g. need for glasses, hearing aids)</p> <p>Need for communication device</p>

Pediatric age appropriate developmental motor, communicative and cognitive milestones

Psychological variables (e.g. depression in adult clients or adult carers)

Insight into their condition

#### 4. OROPHARYNGEAL ASSESSMENT

Structure and presentation of the oral anatomy, oral mucosa, posterior pharyngeal anatomy and mucosa (e.g. soft palate, posterior pharyngeal wall)

Oral hygiene and dental status (blisters, oral candida, dry mucosa)

Cranial nerve assessment, specifically:

CN V – Trigeminal (motor + sensory)

CN VII – Facial (motor + special sensory)

CN IX – Glossopharyngeal (sensory + special sensory + secretomotor + motor)

CN X – Vagus (sensory + special sensory + motor)

CN XII – Hypoglossal (motor)

In addition, for paediatrics, presence or absence of age appropriate oral reflexes (e.g. rooting, sucking, swallowing, tongue extrusion and lateralisation, phasic bite, gag, cough reflexes)

Presence or absence of spontaneous swallows of saliva

Ability to protect the airway (e.g. presence or absence of spontaneous cough reflex)

#### 5. ORAL TRIAL/FEEDING ASSESSMENT

Client suitability to participate in oral trial (e.g. contraindication includes decreased level of alertness, extreme agitation, extreme fatigue, inability to protect the airway)

Appropriate positioning for feeding/swallowing trial

Appropriate range of regular and texture modified liquids and/or solids to determine current level of function regarding swallow safety (including infant formula)

Appropriate feeding or adaptive equipment to make a sound clinical judgment (e.g. teat types, plate guards)

Ability to coordinate breathing and swallowing (e.g. presence of deglutition apnoea)

Promptness of swallow reflex initiation

Presence of laryngeal excursion

Alterations to client state during or after feeding/swallow trials (e.g. change in rate or depth of respiration; regurgitation; distress)

Evidence of oral residue post swallow trials

Stamina and fatigue levels

#### 6. REFERRAL FOR OTHER ASSESSMENTS

Need for further information regarding the pharyngeal or oesophageal phases of swallowing

What additional information will the instrumental assessment provide?

Will the additional information change client management?

#### 7. OVERALL IMPRESSION AND DIAGNOSIS

Integration of all information gathered to determine dysphagia severity and prognosis

	Swallowing safety Degree of risk for choking or aspiration Ability to consume sufficient food/liquid orally to meet nutritional needs
	Determination of primary location of dysphagia Oral preparation Oral Pharyngeal Oesophageal
	Dysphagia severity: Mild, moderate, severe dysphagia Normal, possible impairment, probable impairment, definite swallowing impairment
<b>8. MANAGEMENT PLAN</b>	
Food and/or liquid prescription (e.g. need for texture modified foods or liquids; adaptive equipment)	
Requirement for assistance or supervision with feeding (including posture and positioning) and training for staff of same	
Safety to swallow oral medications	
Referrals to other health professionals	
Circumstances that will prompt staff/carer to request speech pathology review	
Oral hygiene plan	
Suitability for rehabilitation or treatment (consider client new learning ability; client/carer motivation to comply with treatment; stamina to participate in treatment; overlying psychological issues such as depression in client or carer)	
Referral for instrumental assessment of swallowing	
Frequency of speech pathology review	

#### 6.4.2 Oral medication

Individuals with dysphagia may not be able to safely manipulate or swallow oral medications (e.g. tablets, capsules or liquid medicines) resulting in a choking or aspiration risk. Many medications are unsuitable for cutting and crushing due to such alterations causing an insufficient dose to treat the condition, or toxic dose-dumping (Nissen, Haywood & Steadman, 2009). Where the speech pathologist identifies that the client may not be able to safely manipulate or swallow oral medications, the medical officer should be informed and the pharmacist consulted to determine an appropriate alternative formulation or management plan. This is supported by publications such as *Australian Don't Rush to Crush Handbook: Therapeutic Options for People Unable to Swallow Solid Oral Medicines* (2012) and Griffith's (2008) paper providing best-practice guidelines for medication-related dysphagia.

Medications can also induce dysphagia. For example, central nervous system depressants (tranquillisers, opioids and barbiturates) have side effects that suppress the protective cough and swallow reflexes, resulting in airway risk (Staniland & Taylor, 2000). Psychoactive medications (e.g. haloperidol) can produce a sedative effect in addition to a reduction in muscle coordination. Dyskinetic movement patterns can affect the oral, pharyngeal or oesophageal phases of swallowing, however, the effect is most often dose dependent. A number of medications induce oesophageal disorders. For example, there can be direct oesophageal injury and medication induced oesophagitis, or a reduction in lower oesophageal sphincter tone, thereby promoting conditions for reflux (Kikawada, Iwamoo, Masaru, 2005). Finally there are many medications that affect saliva production and have xerostomia as a side effect (Sokoloff & Pavlakovic, 1997). Saliva is required to form a cohesive bolus and as a lubricant to assist swallowing efficiency. Medications associated with xerostomia include, but are not

limited to: antidepressants, antihistamines, antimuscarinic medicines, and certain antipsychotics, beta-blockers and diuretics.

#### 6.4.3 Adjunct assessment

In addition to the clinical swallowing assessment, adjunct procedures may be included as required. Two common adjunct procedures are cervical auscultation and pulse oximetry as described below.

Adjunct clinical assessments	Populations	
Cervical auscultation	Sensitivity 84-94% (Borr, Hielscher-Fastabend, Phil, & Lucking, 2007; Stroud, Lawrie & Wiles 2002; Eicher, Mano, Fox & Kerwin, 1994) Specificity: 56% (Stroud et al., 2002) 70-78% (Borr et al., 2007; Eicher et al., 1994). Clinician reliability for cervical auscultation is variable, however, this is no different to variabilities noted in clinician interpretation of modified barium swallow (Stoeckli, Huisman, Burkhardt & Martin-Harris, 2003).	Adult and paediatric
Pulse Oximetry	Normal scores 95-100% Baseline measurement should be taken before swallow trials commence (Higo, Tayama, Watanabe & Nito, 2003). Drop of at least 4% is a conservative figure to show meaningful change in oxygen saturation levels (takes calibration of equipment and true change into account) (Sellars, Dunnet & Carter, 1999; Zaidi, Smith, King, Park, O'Neil & Connolly, 1995). Maximum fall in saturation noted on average 5.3 sec <i>following</i> the aspiration event (range 5-120 s; Zaidi et al., 1995). Physiologically a drop in oxygen saturation will not co-occur with aspiration, but after the event (Colodny, 2001). Pulse oximetry is best used to record respiratory system status.(Colodny, 2001; Tamura, Shishikura, Mukai & Kaneko, 1999).	Adult and paediatric

#### 6.4.4 Instrumental assessment

Instrumental examination is an adjunct to the clinical assessment and oral trial. It is used to more thoroughly evaluate the oral, pharyngeal and oesophageal phases of swallowing. It may also be used to evaluate the effect of compensatory and treatment strategies on swallow efficiency and function (Logemann, 1998). The clinician can surmise information about pharyngeal function from the clinical examination, however, there is a reliance on dysphagia symptoms, rather than physiology.

Instrumental examinations are especially useful for diagnosis and management of pharyngeal phase disorders (Daniels & Huckabee, 2008).

Before requesting an instrumental assessment, the clinician needs to be aware of:

- What additional information the instrumental assessment will provide?
- Will this additional information change the course of management?
- Will the procedure provide a reliable indication of function at usual meal-times?

For example, an adult with agitation and dementia is a poor candidate for an instrumental assessment. It is not appropriate to trial rehabilitation techniques as the client is unlikely to remember them.

Agitation limits the ability of the instrumental assessment to provide reliable information about function at usual meal-times. For paediatric clients, if clinical assessment reveals that the child is drowsy, has low oral tone, and is unable to trial any food/liquid consistency in the clinic, the likelihood of these factors changing in an instrumental examination are limited. There is limited additional information the instrumental assessment is likely to provide and there is increased stress for the child and carer as a result of the procedure.

At times instrumental examination may be unavailable or not suitable, as indicated in the examples above. Consequently, the speech pathologist may rely on the results of the clinical examination and oral trial/feeding assessment. Although this may limit the trial and implementation of specific compensatory and rehabilitative techniques, recommendations based on the clinical examination and oral trials is considered acceptable practice.

The two most common and readily available instrumental assessments are the modified barium swallow (MBS) and fibreoptic endoscopic evaluation of swallowing (FEES). Speech Pathology Australia has clinical guidelines for both MBS (2005) and FEES (2007). The skills and experience required to perform an MBS are documented in the Modified barium Swallow Clinical Guideline (2005). Clinicians, including new graduates, should work within their scope of competence, and seek assistance as required (CBOS, 2011). FEES is considered an advanced competency. Further details regarding the FEES procedure and competencies can be found in the FEES Clinical Guideline (2007).

Other instrumental assessments include: manometry, high resolution impedance manometry, ultrasound, nuclear scintigraphy, manofluorography, radionuclide milk scanning, and 24-hr pH monitoring. Some of these procedures are used by medical staff and can provide the speech pathologist with valuable additional information.

#### **6.4.5 Assessment of Activity and Participation**

Whilst it is important to determine the underlying structural and physiological reasons for dysphagia, other factors must also be considered (Threats, 2007). The World Health Organization ICF Body Structure and Body Function Codes directly describe aspects of swallowing that speech pathologists are most familiar with. For example: structures of the mouth, pharynx, larynx etc. Body function influences eating and drinking behavior and includes: consciousness, appetite, attention and motivation, etc. However, Threats (2007) astutely points out that swallowing is a social behaviour. The impact of dysphagia on social activities and participation also need to be addressed. Environmental factors such as food, lighting, sound, support of family and carers can either assist or hinder the person with dysphagia. However, assessment of activities and participation are not as frequently assessed as body structures and functions. Assessment of other factors includes but is not to:

Activity and Participation factors	Environmental factors	Personal factors
Successfully transporting food to mouth	Lighting in the room	Food preferences
Consumption of food in culturally acceptable ways	Pleasantness of eating partners	Personality
Drinking running water (e.g. fountain)	Attitude and support of family members	Religion (e.g. ability to take Holy communion)
Feeding from breast or bottle	Attitude and support of health professionals	Pre-morbid rate of eating
	Attitude and support of carers	Avoidance of social gatherings
	Restrictions to social life	
	Change to work or leisure	
	Carer state and ability to facilitate infant feeding (e.g. postnatal depression; full-time work commitments)	
	Availability of appropriate feeding equipment (e.g. teats, bottles, adaptive equipment, plate guards)	

Evaluations such as the Australian Therapy Outcome Measurement Scale (Skeat & Perry, 2005) and SWAL-QOL (McHorney, Bricker, Robins, Kramer , Rosenbek, Chignell, 2000) may assist with identifying these factors.

#### **6.5 Diagnosis**

Dysphagia diagnosis, including cause, severity and likely progression is necessary for the development of client treatment and management plans. Further details regarding diagnosis are listed in the table above under "Overall impression and Diagnosis".

## 6.6 Intervention

Where dysphagia has been diagnosed, speech pathologists should develop a management plan to meet the needs of the individual client. The aims of dysphagia treatment and management are to:

- Maximise safety, efficiency and effectiveness of swallowing function
- This is particularly important for the paediatric population for whom growth and cognitive development are reliant upon adequate nutrition and hydration
- Determine safety for oral intake; and if not appropriate advise medical, nursing and allied health staff of the need for non-oral nutrition and hydration
- Where oral intake is indicated, the speech pathologist will determine the most appropriate food and liquid consistency using terminology from the Australian Standardised terminology and definitions for texture modified foods and fluids (Atherton et al., 2007)
- Where there is transition from enteral to oral nutrition, the speech pathologist will facilitate the process in conjunction with medical, nursing and allied health staff
- Mitigate risks associated with dysphagia (e.g. client positioning, infant swaddling, need for client supervision or assistance)
- Optimise quality of life aspects associated with eating/drinking/feeding (social, cultural)
- Determine whether compensation (food/liquid modification) +/- rehabilitation will be used to optimize outcomes
- Continue to evaluate additional service needs (e.g. referral to other health care professionals, or referral for follow-up instrumental assessment).

The treating speech pathologist must be able to determine and describe the presenting symptoms, the aspect/s of swallowing function that are impaired, and the likely cause of dysfunction to enable appropriate treatment planning. Treatment that is undertaken without identifying the underlying cause and mechanism of dysphagia may be less effective and has the potential for increased harm.

Treatment of dysphagia involves specific, targeted intervention of impaired functions (Logemann, 1998). Treatment can involve compensation or rehabilitation for lost function, teaching of new skills (particularly to infants/children), or a combination of these.

### 6.6.1 Compensation

Compensatory techniques are those aimed at altering bolus flow in a way that compensates for compromised oropharyngeal function, without changing the underlying physiology. The following are examples of compensatory techniques:

Compensatory technique	Paediatric examples	Adult examples
Liquid modification (Robbins, Gensler, Hinds, et al., 2008; Diniz, Vanin Xavier et al., 2009; Cichero et al., 2011)	Thickened breastmilk or infant formula (viscosity < Level 150- mildly thick); thickened liquids for infants and children (as per adult examples)	Thickened liquids (Level 150- mildly thick; level 400 moderately thick; Level 900- extremely thick) as determined by assessment
Food texture modification (Berzlanovich, Fazeny-Dorner, Walhoer et al., 2005; Gisel, 2008)	Use of texture modified foods (e.g. Texture A- Soft, Texture B- minced and moist, Texture C Smooth Pureed) as determined by assessment. In addition, use transitional food textures e.g. lumpy puree, runny puree and dissolvable food textures.	Use of texture modified foods (e.g. Texture A- Soft, Texture B- minced and moist, Texture C Smooth Pureed) as determined by assessment.
Food/liquid sensory adjustments (Bulow, Olsson & Ekberg, 2003; Logemann, Pauloski, Colangelo, 1995 : e.g. Temperature	Warm or cool bolus Flavour of infant formula; use of food	Cold bolus Sour bolus

Flavour	flavourings to encourage acceptance of different food types and textures	Carbonated bolus
Tactile		
Dose modification for medication administration (Griffith, 2008; Society of Hospital Pharmacists of Australia, 2012)	Example: Provision of liquid medicine	Example: Provision of suppositories, patches, injectable medicine in accordance with the Pharmacist's recommendations
Bolus volume modification (Arvedson & Brodsky, 2002)	Cross-cut teat; teats with different flow rates; bottle with small volume dispensing capacity	Smaller cup size or supervised ingestion
Method of bolus delivery (Arvedson & Brodsky, 2002)	Breastfeeding, supply line, bottle feeding, teaspoon, cup, straw, other special feeding equipment	Open cup, spoon, straw, spout cup, sports bottle
Body posture (Newman, 2000)	Football hold, prone position; swaddling of infant	Supported upright with or without pillows
Head or facial posture (Fucile & Gisel, 2002; Logemann, 1998)	Jaw, lip or cheek support	Jaw or lip support Head turn Head rotation/tilt Chin tuck Head extension Effortful swallow Mendelsohn manoeuvre Supraglottic swallow Super-Supraglottic swallow
Pacing of food or liquid rate of ingestion (Newman, 2000)	Recommendations of client specific rate of liquid or solid ingestion to assist carers	
Environmental adjustments (Newman, 2000)	Optimal lighting, limit distractions, recommendations for frequency of feeds/meals, timing of feeds/meals, volume or size of feeds/meals	
Prosthetic devices (Logemann, 1998)	Obturator or palatal augmentation prosthesis	

## 6.6.2 Rehabilitation

Rehabilitation techniques aim to promote safe and efficient swallowing function due to changes achieved in improvement of underlying anatomy and physiology. For example, improvement in strength, speed, rate and coordination of the muscles required for safe and efficient swallowing. Examples of rehabilitation techniques are included below:

Rehabilitation technique	Used for	Population appropriate for
Masako manoeuvre	Proposed to exercise the glossopharyngeus muscle (a portion of the superior pharyngeal constrictor) and thereby improve tongue base to pharyngeal wall valving. (Fujiu & Logemann, 1996)	Validated on adults; may be appropriate for older children with adequate cognitive and communicative abilities to follow instructions
Shaker or Head lift manoeuvre	Proposed to strengthen the suprhyoid complex to improve hyolaryngeal excursion (Shaker, Kern, Bardan, Taylor, Stewart, Hoffman et al., 1997).	Validated on adults; may be appropriate for older children with adequate cognitive and communicative abilities to follow instructions
Electrical stimulation	The application of low voltage electrical currents to muscle tissue, causing contraction of the muscle fibres (Ludlow, Humbert, Saxon, Poletto, Sonies, Crujido, 2007).	Suitable for some adults
Biofeedback	Visual display, such as that offered by sEMG (e.g. wave amplitude and timing of contraction); visual display offered from modified barium swallow or FEES; acoustic feedback offered	Validated on adults; may be appropriate for older children with adequate cognitive and

	from swallow-respiratory amplification (Bogaardt, Grolman, Fokkens, 2009).	communicative abilities to follow instructions
Surface electromyography (sEMG)	A means of measuring the myoelectric impulses generated by the muscle just before it contracts (Abernethy, Hanrahan, Kippers, McKinnon, Pandy, 2005).	Validated on adults; may be appropriate for older children with adequate cognitive and communicative abilities to follow instructions
Strengthening exercises	Exercises need to be functional. For example, tongue lateralization practice assists with development of chewing skills; tongue protrusion is not a functional skill for efficient and safe swallowing (Logemann, 1998; Arvedson, 1998).	Adults and children > 6 months
Jaw		
Lips		
Cheek		
Tongue		
Swallowing practice	The best exercise for swallowing is swallowing (Logemann, 1998).	All individuals

### 6.6.3 Teaching of new feeding/eating skills to infants and children

The term 'rehabilitation' infers that skills that have already been learned will be restored through treatment. Whilst this term is appropriate for use with adults, it does not sufficiently describe what is required in the field of paediatrics. In paediatric dysphagia treatment infants may be learning skills for the first time, rather than building on a platform of already acquired skills. For example, tongue lateralization may need to be overtly taught for children who gag on lumps and solids and where these foods pose a choking risk. Thickened liquids may be offered therapeutically to help a child learn oral control and manipulation skills, rather than specifically to compensate for aspiration risk.

### 6.6.4 Oral hygiene

Improving and maintaining oral hygiene is an appropriate and effective therapeutic intervention for clients with dysphagia (Brady, Furlanetto, Hunter, Lewis, Milne, 2006). Dependence for oral care, and number of decayed teeth were identified as second and third items importance on a list of seven items correlated with the development of aspiration pneumonia (Langmore et al., 1998). Oral hygiene protocols should be a routine part of dysphagia intervention plans regardless of age, dentition status and method of nutrition (i.e. including oral, non-oral feeding or nil by mouth status). Refer to dental health professionals for guidance on the most appropriate frequency and method of oral care. In 2009, the Department of Health and Ageing released the "Better oral health in residential aged care" plan providing an assessment toolkit, oral health care planning guidelines and dental referral protocol. Supporting documents are available from the Department of Health and Aging web-site.

### 6.6.5 Free Water Protocols

Oral hygiene is a key tenet of free water protocols. Free water protocols have been researched and implemented to address hydration and compliance issues associated with the provision of thickened liquids. Free water protocols allow for specially selected individuals with dysphagia, who would typically be prescribed only thickened liquids, to also have access to un-thickened water. There are specific inclusion and exclusion criteria that are applied to determine whether an individual is safe to participate in a free water protocol. In addition, water is the only thin fluid allowed on such a protocol; other thin fluids such as coffee, tea, juice etc. are strictly prohibited. The body is made up of 60% water. Water is pH neutral and thought to be the safest fluid managed by the body in the event of aspiration. Water is not permitted at meal-times or for taking oral medications. As noted above, strict oral hygiene policies are key requirements for application of free water protocols (Langdon, 2009). Researchers using randomized controlled trial methodology have reported: (a) improved fluid intake (increases of 10% of calculated fluid requirements); (b) significantly improved quality of life scores as measured by the SWAL-QOL, and (c) no adverse effects (aspiration or pneumonia) over an average of 54 days with judicious use of the free water protocol in conjunction with stringent oral hygiene

(Carlaw, et al., 2011). Australian studies in a stroke population have been undertaken, but require larger numbers (Murray & Correll, 2009).

### **6.6.6 Non-oral feeding and hydration**

For some clients, swallowing function is profoundly impaired. The speech pathologist has a role in recommending non-oral status, requiring the clinician to have a clear understanding of the client's presenting dysphagia, risks to the client's health through compromised swallowing function (pulmonary, nutrition, hydration), and prognosis.

Alternative routes of providing nutrition/hydration include but are not limited to: nasogastric tube feeding (NGT), gastrostomy feeding (percutaneous endoscopic gastrostomy PEG), jejunostomy, or total parenteral nutrition (TPN). Fluids can be delivered intravenously, subcutaneously or enterally. The team will decide the most appropriate form of alternative nutrition. The provision of alternative routes of feeding does not remove risk of aspiration, as individuals have been noted to aspirate refluxed enteral feeds (Siddique, Neslusan, Crown et al., 2000).

### **6.6.7 Management of activity and participation factors**

Most dysphagia therapy focuses on the medical aspects of dysphagia and specifically body structures and function (Threats, 2007). Threats (2007) makes a compelling case showing that management plans that also address client activity, participation, personal and environmental factors are also required. It may be these latter variables that affect cognitive skills such as compliance, or conditions such as depression, so necessary to successful dysphagia management.

### **6.6.8 Counselling**

As part of routine dysphagia management, speech pathologists are often required to provide client counseling to help clients better understand their dysphagia, the implications of dysphagia, and treatment and management options. With management plans that include texture modified foods and liquids, or supplemental/alternative feeding, the speech pathologist should provide clear information about the rationale for the recommendations and any potential risks associated with the plans. Information should be balanced, ideally support by evidence and presented in a manner that uses plain English (layperson's) terminology. Visual presentation to support verbal information (diagrams text, video and computer images and anatomical models) may assist and should be used as appropriate.

### **6.6.9 Palliative care**

The goals of palliative care are to improve the quality of life of client and their families who present with dysphagia as a consequence of a life-limiting illness. Clients have a right to be informed of their condition and treatment options. They also have the right to refuse life-prolonging treatment. The speech pathologist has a role in symptom management and enhancing quality of life when addressing swallowing and communication at the end of life (Roe & Leslie, 2010). Individuals may choose to continue oral intake despite risks associated with this. The clinician needs to be observant of ethical issues around the provision of artificial nutrition and hydration. Advanced care directives may explicitly state that the individual does not wish to be kept alive by artificial means, including nutrition and hydration. There is scientific evidence to support the decision to forgo artificial nutrition and hydration. Cessation of oral intake (food and liquids) is a normal part of the dying process. The resulting ketosis from lack of food and endorphin release from dehydration are thought to have an anaesthetic effect that diminishes pain and provides a sense of calm and well being (Ferris, 2004). Parenteral and enteral feeding does not improve symptom control; in fact it may increase discomfort (Ferris, 2004). Parenteral fluids at the end of life can result in pulmonary oedema, exacerbating the dying process. Anticholinergic medications may be started to minimize the accumulation of secretions. Clear documentation of client wishes and medical team recommendations is required.

Decisions regarding treatment are best made as part of a consultative and collaborative approach in which the best possible management under the circumstances is provided. This may include goals such as comfort and dignity, and eventually the withholding or withdrawing of treatment (Roe & Leslie, 2010; NSW Department of Health, 2005). Support for clinicians is also indicated. The primary focus of dysphagia teaching is on 'cure', however, this is not possible in palliative care (Roe & Leslie, 2010)

### **6.6.10 Ceasing intervention and discharge planning**

Following intervention, speech pathologists must also consider circumstances that necessitate the cessation of services. Once a client is discharged from Speech Pathology care, documentation regarding the rationale for discharge and need for an ongoing treatment program should be specified in the client's files. Reasons for ceasing intervention or discharge from speech pathology services include, but are not limited to:

- Goals achievement
- Client reached optimal level of functioning
- Intervention inappropriate (e.g. due to medical deterioration, lack of client/carer cooperation)
- Client discharged from hospital or education facility
- Client/carer fails to attend
- Client transferred to another facility/speech pathology service
- Client's level of function plateaued
- Client deceased

People to be informed of client's discharge status:

- Appropriate team members (e.g. Medical team, educational team, early intervention team and/or caring practitioner),
- Client/family/carer and
- Relevant health professionals involved in client's care.

Should the client require ongoing care, with the client's permission, a written care plan including the following information should be forwarded to the client /carer and all health professionals involved:

- Client background information,
- Speech pathology intervention and progress to date (including current recommendations, outcomes of any instrumental assessment and management plan) and
- As indicated, recommendations for follow up by health professionals (e.g. private speech pathologist, dietitian).

In addition, the speech pathologists should ensure that (a) the management plan is understood by all parties involved, (b) strategies are in place to support the plan and (c) that client/carer is aware of signs/symptoms associated with a deterioration in swallowing function and aspiration-related complications with information on what to do and who to contact in this event.

The managing speech pathologist should ensure that where training is required for the client or carer to implement a management plan that they are provided with an optimal method to maximise understanding of what is required. This may include use of interpreters, visual and written aids.

## **7.0 Services Management**

### **7.1 Principles of practice**

To facilitate quality service provision to clients beyond competency requirements please refer to the Principles of Practice (Speech Pathology Australia, 2001). The document includes principles related to: Ethics, client services, service management, the education of others and research.

### **7.2 Referral**

Referrals may originate from a wide range of sources. Within the hospital system there are often guidelines and procedures, while these elements may be less structured in community settings or private practice. It is recommended that each service provider have a referral procedure.

Health or teaching professionals may initiate referrals following screening or assessment, as a consequence of a clinical pathway or due to parent or carer concerns. Individuals who may raise a referral include:

Medical staff, including specialists and general practitioners

Nursing staff

Allied health professionals (Physiotherapist, Dietitian, Occupational Therapist and others)

Clients, their family members or carers

Teachers

Examples of reasons for referral are included in the table below. These are also known as 'dysphagia symptoms'.

<b>Reasons for referral</b>
<b>General</b> (Holland, Jaysekaran, Pendleton, Horan, Jones & Hamdy, 2011)
Any swallowing difficulty
Difficulty with saliva management
Coughing or choking when swallowing liquids
Coughing or choking when swallowing solids
Difficulty coordinating swallowing and breathing
<b>Paediatric specific</b> (Morgan & Reilly, 2006; Arvedson & Brodsky 2002)
Sucking and swallowing incoordination
Weak suck
Difficulty coordinating breathing and swallowing
Irritability or sleepiness during feeding
Excessive gagging or recurrent coughing during or after feeds
Growth faltering or failure to thrive or weight loss
Feeding periods longer than 30-40 minutes
Unexplained food refusal

Drooling beyond 5 years of age
Delay in developmental feeding milestones (e.g. food texture transitions)
Craniofacial anomalies
Frequent unexplained chest infections
<b>Adult specific</b>
(Australian & New Zealand Society for Geriatric Medicine, 2010; Kawashima et al., 2004)
Previous diagnosis of pneumonia
Feeling of food getting 'stuck in the throat'
Coughing during or after eating or drinking
Food remaining in the mouth after swallowing
Frequent throat clearing
Prolonged meal-time
Unintentional weight loss
Change to food texture preferences or eating patterns
Too much or not enough saliva
Dyspnoea, crepitations, sudden deterioration in oxygen saturation

### 7.3 Prioritisation

Dysphagia has been implicated in the development of dehydration, malnutrition, chest infection and pneumonia (Langmore et al., 1998; Altman, 2011). Early identification and management of dysphagia is critical to prevent or minimize complications.

Prioritisation systems will vary depending on the service provider. Factors that will affect prioritization include: local policy and procedure manuals, available resources, and geographic location. Documentation of prioritisation processes are strongly advocated. Prioritisation of new referrals against current caseload burden requires consideration. Prioritisation policies should be in accordance with the *Code of Ethics* (2010).

It is common practice for a benchmark to be set for speech pathology response time to dysphagia referrals. All referrals for dysphagia are important. Some factors make the dysphagia referral both important *and* urgent. Factors to consider when determining prioritization of referrals includes, but is not limited to:

Suggests high urgency	Suggests moderate urgency	Suggests lower urgency
New referrals with underlying respiratory problem or aspiration risk	Dysphagia management not impacting on respiratory function	Client tolerating current diet/fluids - monitoring of status
New acute stroke referral OR New acute paediatric feeding/swallowing referral	Assessment of client with existing enteral or intravenous fluid support	Stable chronic dysphagia
Client classified nil by mouth without enteral or intravenous fluid support	Review assessments for alterations to clients already managing a fluid/diet texture	
Infants with failure to thrive or weight loss		
Complex presentation with multiple co-morbidities		
Concern for ability to manage current diet		

/fluids due to medical fluctuation

Impact on administration of oral medications

Dysphagia management impacting on discharge planning

Prioritisation information summarized from: National Patient Safety Agency, UK (2007); electronic personal communications from speech pathology departments of Australian hospitals. Refer also to Principles of Practice (2001, Speech Pathology Australia).

In settings where client intake/admission occurs out of regular working hours, consideration should be given to after-hours management of dysphagia (e.g evenings, weekends, public holidays). It is recommended that services have resources or contingency plans to meet urgent after hours needs. This may include having procedures in place that determine the management of a client who is admitted after hours with dysphagia. For example, clients at potential risk of dysphagia may be kept Nil By Mouth overnight with hydration until seen by a speech pathologist, or provision of an on-call speech pathologist on weekends or public holidays. Other team members such as medical, nursing, and dietetics staff involved in the care of the client with dysphagia need to be consulted in planning these procedures. In a community/out-patient setting consideration should also be given to the availability of urgent appointment slots.

Documentation of the prioritisation process as part of a policies and procedures manual enables the speech pathology service to provide clients and referring agencies with a rationale for caseload management decisions

#### **7.4 Documentation**

Documentation should ensure all medico-legal and accreditation requirements are met. As in other areas of practice, all documentation must be signed, dated and if required, the time should also be recorded. Thorough documentation is important and should include but not be limited to:

- A baseline of the client's condition
- Assessment results and management plan
- Progress or decline
- Changes in the client's condition which may impact on progress
- Advice to staff and/or carers
- Precautions
- Recommendations for further investigation
- Reasons for ceasing treatment/intervention

Speech pathologists need to ensure that advice is recorded in writing. Verbal information, advice or management changes should be followed up by written confirmation in a timely manner. The speech pathologist should also refer to their employer's departmental policy, relevant legislation and guidelines.

Documentation may be in the form of medical or educational reports, clinical notes, management plans, or correspondence to the referring agent. The service is expected to establish an appropriate system for the preparation and storage of written documentation. Reference should be made to local policy.

#### **7.5 Team work**

Dysphagia management may be complex and multi-factorial in nature. Speech pathologists often work as part of a multidisciplinary team. The benefit of multidisciplinary team management includes: reductions in aspiration risk, feeding difficulties and mortality (Smith Hammond & Goldstein, 2006) and

improvement in nutrition (Heiss, Goldberg & Dzarnoski, 2010). Furthermore, there are health economic benefits to a multidisciplinary approach to dysphagia management (Smith Hammond & Goldstein, 2006). A multidisciplinary team also provides an important source of support for clients and carers.

The client, or carer/s (including paediatric clients) are essential members of any dysphagia team. Other members of the dysphagia team may include:

- Family members
- Speech pathologists
- Medical practitioners (including but not limited to the disciplines of: radiology, otorhinolaryngology, gastroenterology, paediatrics, geriatrics, neurology, respiratory medicine, rehabilitation medicine, general practice, maxillofacial surgery and palliative care)
- Nurses
- Dietitians
- Dentists, orthodontists, dental hygienists/therapists
- Physiotherapists
- Occupational therapists
- Social workers
- Pharmacists
- Catering/hospitality staff
- Teachers
- Psychologists
- Radiographers

## **7.6 Models of practice**

Speech pathologists working with clients with dysphagia utilize a range of service delivery models. Speech pathologists assist clients in metropolitan, regional, rural and remote settings.

The speech pathology service provided will depend on the needs of the client, the location, prioritisation policies and available resources. Models of service delivery include but are not limited to:

- Individual,
- Group,
- General and specialist feeding and/ or swallowing clinics,
- Consultation,
- Education and training of client, carer, families and health professionals,
- Resource development and provision,
- Telehealth,
- Multidisciplinary and transdisciplinary team management and
- Family centred care and developmental care.

Speech pathologists may work concurrently in a range of different service delivery models. Services may be offered through government health or education facilities, private health or education facilities or through private practice.

## **7.7 Issues and risk management**

Speech pathology involvement in dysphagia is the most medical of the fields of speech pathology practice, in that management has the potential to cause significant harm, including death (Threats, 2007).

Speech pathologists are advised to work within a risk management framework that includes:

- Identifying risks,
- Analysis of the impact of identified risks in terms of prevalence and consequences,
- Development of strategies to minimize the likelihood of the events occurring and consequences associated with the risks,
- Implementation of risk reduction strategies and
- Ongoing evaluation of the effectiveness of the risk reduction plan.

Many of these features can be addressed using quality improvement planning. Development of quality procedures should be governed by best evidence based ‘best practice’. Risk management may include, but is not limited to: Commonwealth, State, Local and facility regulations for building, fire, safety, and occupational health and safety. Facilities should ensure adequate guidelines are in place for the provision of texture modified foods and liquids; monitoring to ensure the texture modified foods and liquids meet the requirements of the National standards (Atherton et al., 2007) and policies are in place for the management of foreign body obstruction. Clinicians should be mindful that texture modified foods, including semi-solids still pose a choking risk (Berzlanovich, Fazeny-Dorner, Waldhoer, Fasching & Keil, 2005), and policies may need to be updated to address this. Potential risks to the client should be evaluated throughout the assessment and management process.

## **8.0 Credentialing**

Speech pathologists must be eligible for practicing membership of Speech Pathology Australia. A speech pathologist should recognize and acknowledge their skill base and not work beyond their scope of knowledge and competence (Code of Ethics- Section 5.3, 2000; CBOS, 2011, Speech Pathology Australia).

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, 2011). McAllister et al. (2011) 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 pathology intervention (CBOS, Unit 3)

Speech Pathology Australia advises that competency attainment and credentialing should be shared between individuals and their employing organizations (Credentialing Position Statement, 2009, Speech Pathology Australia). Employers should not require a speech pathologist with less than 12 months experience to provide services in areas of advanced clinical practice until competency attainment has been addressed.

The Credentialing Position Statement (2009, Speech Pathology Australia) provides further details regarding a hierarchy of new skills recognition. These are outlined lined in brief below:

- Theoretical knowledge
- Contextual application
- Guided observation
- Supervised practice
- Independent practice
- Maintenance of practice
- Advanced practice

Speech pathologists working in areas where advanced competencies are required should ensure that local credentialing procedures have been satisfied prior to involvement in advanced practices (Credentialling Position Statement, 2009, Speech Pathology Australia). Credentialing procedures may include: additional training, and assessment of competencies in the local workplace. Where such procedures do not exist, speech pathologists are strongly advised to develop such procedures to ensure they have approval and support from their employer to perform advanced practice procedures.

### **8.1 Expectations of entry-level clinicians**

Entry-level clinicians are required to meet the Speech Pathology Australia CBOS standards (2011). These standards set out the minimum skills, knowledge base and professional standards speech pathologists are required to meet to practice within Australia. They represent expectations of the public, employers and the profession. Competence must be demonstrated in the areas of language, speech, swallowing, voice, fluency and multi-modal communication. This document is intended to be read in conjunction with the Speech Pathology Australia CBOS standards (2011).

In addition, dysphagia-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 based on "Sheffield Level 4" (Pownall, Sheffield Consortium) and 'Specialist dysphagia practitioner' (Boaden, Davies, Storey & Watkins, 2006) include:

Expectations of entry-level clinicians
Independent management of non-complex cases
Ability to conduct a clinical assessment and feeding/oral trial
Determine client safety with foods and liquids trialed
Make management decisions regarding: (a) Change of diet (b) Strategies (c) Intervention
Recognise the need for further assessment, for example: (a) Second opinion (b) Modified barium swallow (c) 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 in clinical audits or research

## 8.2 Leadership and supervision

Senior clinicians have a role in leadership and supervision. Senior clinicians will most often have undertaken additional training and may be responsible for specialist and complex caseloads. Senior clinicians may work in specialist clinics or locations across a range of settings. Roles associated with senior level clinicians include (Consultant Dysphagia Practitioner, 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 dysphagia policy and procedures
- Assist in service delivery and budgeting

## **9.0 Education and training**

### **9.1 Staff orientation**

Speech pathologists working with clients with dysphagia should meet the skills and standards documented in this clinical guideline and the CBOS (2011). Speech pathologists 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 Commonwealth, State and local legislation must also be adhered to (e.g. Blue Card for working with children; police check for working with aged care residents).

### **9.2 Continuing professional development**

All practicing speech pathologists are:

- Encouraged to maintain, update and extend their knowledge through participation in ongoing professional development activities
- Jointly obligated with the service employer to identify individuals 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 voluntary Professional Self-Regulation program conducted by Speech Pathology Australia
- Encouraged to share their knowledge and expertise with their colleagues
- Support others who are expanding the knowledge base of the profession

These points are supported by the following Speech Pathology Australia documents: Code of Ethics (2010), Principles of Practice (2001) Professional Self-Regulation (2010).

### **9.3 Clinical education**

All Australian university speech pathology courses equip students with basic skills in dysphagia (CBOS, 2011, Speech Pathology Australia). Practical skills in the area of dysphagia 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. Speech pathology students should be provided with the opportunity to observe an experienced speech pathologist conducting a dysphagia assessment and intervention where possible. Speech pathology students should be provided with the opportunity to participate as much as their skill allows in the assessment, interpretation and management of clients with dysphagia during their clinical training where possible. The supervising speech pathologist may provide the opportunity for students to become clinically competent in the assessment and treatment of dysphagia, however, they ultimately maintain clinical responsibility for the clients' care.

### **9.4 Staff Training**

Speech pathologists have an important role in contributing to the training of other health professionals in: identifying symptoms of dysphagia, preparation of thickened liquids and texture modified diet; environmental adaptations; postural strategies; and potential risks associated with unsafe feeding practices and non-compliance with recommendations. Speech pathologists may train, monitor and supervise other health professionals involved in supporting a client with dysphagia. Training may include: provision of information, demonstration, supervision or monitoring of practice of other staff about an individual or a group of people with dysphagia. Training may enable other staff to carry out strategies recommended by the speech pathologist, in order to affect a greater response to that intervention. The speech pathologist has a responsibility to tailor the level of information to the needs and abilities of the person receiving the training. Documentation detailing the information

provided in such training sessions is required. Any variations to these instructions must be given in writing. Speech pathologists maintain the responsibility for monitoring, supervising and altering the treatment program.

## 10.0 The Clinical-Research Interface

### 10.1 Evidence based practice

Evidence based practice refers to the “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.... evidence-based [practice] means integrating individual clinical expertise with the best available external clinical evidence from systematic research” (Sackett et al., 1996, p. 71). For example, the concept behind the chin tuck technique is to protect the airway through the postural change of neck flexion to protect the airway. The technique is logical and the hypothesis is sound, however, the technique is not suitable for all clients. Extreme flexion can make the airway prone to collapse (Wolf & Glass, 1992). Using a small number of research clients, Bulow, Olsson & Ekberg (2001) demonstrated that the chin tuck is contraindicated for clients with weak pharyngeal constrictors. The technique loosens the constrictors and increases aspiration risk in this population. Making ‘best practice’ clinical decisions depends upon remembering the evidence correctly at the right time and place, defining the patient’s unique circumstances, asking the client’s preferences and respecting the client’s values and rights (Haynes & Haines, 1998).

Due to the vulnerable nature of the population under study, much of the dysphagia literature is based on small sample sizes. This makes generalization of results for best practice difficult. Studies also tend to be population specific (e.g. stroke, cerebral palsy). It is not possible to assume that evidence that works for one population is transferrable to other populations. Clinicians are encouraged to keep abreast of rapidly evolving dysphagia research by reading journal articles and attendance at conferences.

### 10.2 Outcome measures

In order to demonstrate that: (a) treatment or compensations prescribed are valid, (b) feeding, eating and drinking skills are functional and (c) the client has better quality of life with treatment than without, measurement of outcome is a necessary part of dysphagia management. Historically outcome measurement has focused on quantifiable biomechanical changes, often assessed via modified barium swallow (Huckabee & Pelletier, 1999). However, improvement of biomechanics is only one of the goals of dysphagia management. The main goals for dysphagia management are safe, adequate, independent (as appropriate), and satisfying nutrition and hydration (Rosenbek & Donovan, 2006). Outcome measurement is increasingly important to demonstrate the value of services to health and education authorities, to private health insurers and to private paying clients. As noted in previous sections of this document, The World Health Organization provides guidance around consideration of biomechanical factors in addition to personal, environmental, client activity and participation factors (Threats, 2007).

Published outcome measures and their major focus		
Impairment	<i>Penetration-Aspiration scale</i> (Rosenbek, Robbins & Roecker, 1996)	Suitable for adults and children
Client function	<i>Australian Therapy Outcome Measurement Scale [AUSTOMS]</i> (Skeat & Perry, 2005)	Suitable for adults and children
	<i>Functional scale of feeding status</i> (Huckabee & Cannito, 1999)	Designed for use with adults, but could also be applicable for children
	<i>Dysphagia Outcome Severity Scale [DOSS]</i> (O’Neil, Purdy, Falk et al. 1999)	Designed for adults
	<i>McGill Ingestive Skills Assessment [MISA]</i> (Lambert, Gisel, Groher et al. 2003)	Designed for use with the elderly

Client Disability	<i>Royal Brisbane Hospital Outcome Measure for Swallowing [RBHOMS]</i> (Ward & Conroy, 1999)	Designed for use with adults but could also be applicable for children
Quality of Life	<i>SWAL-QOL</i> (McHorney, Bricker, Robbins, Kramer et al., 2000)	Designed for use with adults
Client Satisfaction	<i>SWAL-CARE</i> (McHorney, Robbins, Lomax et al. 2002)	Designed for use with adults

## **11.0 Ethical considerations**

There are a number of occasions in dysphagia assessment and management where decisions are made regarding client care. Decisions should be based on the ethical principles that underpin all aspects of speech pathology clinical practice (Code of Ethics, 2010). These include the principles of: (a) beneficence and non-maleficence, (b) truth, (c) fairness, (d) autonomy, and (e) professional integrity. Each of these principles are clearly described in the Speech Pathology Australia Code of Ethics (2010). In addition, speech pathologists are referred to the definitions of 'consent' and 'informed consent' that are included in the Code of Ethics (2010) document.

Particular occasions in the assessment and management of a client's dysphagia that require active consideration of ethical principles include determination of whether:

- It is appropriate to proceed with a clinical swallowing assessment or feeding/oral trial
- It is appropriate to proceed with an instrumental assessment
- Compensatory or rehabilitation techniques are appropriate
- Or when to terminate speech pathology intervention

## **12.0 Legal issues**

### **12.1 Code of Ethics**

Speech pathologists should adhere to the Speech Pathology Australia *Code of Ethics* (2010) and to any codes, policy and procedures relevant to their employing body.

### **12.2 Legislation**

It is recommended speech pathologists be conversant with the legislation that applies in the state or territory in which they practise.

### **12.3 Duty of care**

*Duty of care* is a legal term describing the relationship, in this case, between the individual and parent/caregiver and the speech pathologist. The speech pathologist owes a duty of care to his/her client and caregiver. A breach of duty of care leaves one liable to civil action for a claim of damages (compensation) if legal action is taken by the individual under your care or parent/caregiver(s) or carer. A breach of duty of care may result from one or several specific actions whilst under the care of the speech pathologist. For example, a failure to act when action was required, or a statement made that in the eyes of the law amounts to a “negligent misstatement.” The duty involves using the same degree of care that a “reasonable” speech pathologist would exercise in the circumstances. Whether or not there has been a breach would be determined by what other speech pathologists working in the same field would have done in the circumstances. Consequently, it is the duty of the speech pathologist to be aware of recent literature in their field, current practices carried out by peers, adhering to workplace policies and procedures and being conversant with the Speech Pathology Australia Association documents.

### **12.4 “Proxy” Interventions**

Where a speech pathologist does not carry out the intervention but has instructed and supervises someone else i.e., student speech pathologist carrying out the intervention, the law would hold the advising/supervising speech pathologist liable just as if they were carrying out the intervention themselves. The law refers to this as “vicarious liability.” In other words, the same standard of care would be required if the speech pathologist was holding him/herself out as the person with the knowledge and skills. The fact that he/she did not actually carry out the intervention would be irrelevant in the eyes of the law. Therefore it is necessary for “proxies” to exercise the same standard of care as that required of the speech pathologist instructing or supervising them, and for all documentation (i.e. Individual Education Plans, progress notes, negotiated contracts) regarding “proxy” interventions to be maintained. In addition, the service plans must include adequate time and resources to train “proxies” and monitor programs.

### **12.5 Standard of Care**

‘Standard of care’ is synonymous with ‘duty of care’ (Moffet & Moore, 2011). The prevailing standards of the relevant profession are taken into account when determining duty and standards of care, providing these standards are themselves reasonable (Legal Services, Victorian Government Department of Human Services, 2000). Situations should also be examined to determine whether it would be reasonable for a person to do more than just comply with the professional standards.

New graduates, individuals re-entering the workforce or speech pathologists trained outside of Australia should ensure they meet Competency Based Occupational Standards of practice (2011) and other requirements deemed necessary by Speech Pathology Australia. Accordingly they should be competent to manage non-complex clients as outlined earlier in this document. Ability to manage complex clients will necessarily require additional guidance, supervision and/or training. Speech pathologists should advise their employing body or the service provider if they require additional training to meet the duties outlined in their work contract.

## **12.6 Consent for speech pathology involvement**

*Informed consent* refers to the client and/or parent(s)/caregiver(s) being fully informed and aware regarding the service, assessment, interventions, treatments and role of the speech pathologist in mental health. For young people who are at an age of being able to consent, if there is the presence of an intellectual disability or a mental health problem that in the opinion of the speech pathologist does not allow for the ability to consent to services this needs to be resolved in line with organisational policy/procedure. In such circumstances, the parent(s) /caregiver(s) may be required to consent. Service provision should not commence without consent being formally clarified.

Consent requirements vary in different states and territories. A young person may provide consent depending on the particular state's laws of age of consent. In some states and territories the attendance at an appointment is implied as consent.

Situations may arise during the treatment process where verbal consent is requested of the client or parent(s)/caregiver(s). For example, a case being handed over to another clinician for a one-off session or a young person's request that the clinician make contact with their educational setting without written consent being initially arranged. Ideally, written consent should be obtained in these instances but where verbal consent has occurred then this should be documented by the speech pathologist in the individual's file.

Informed consent for speech pathologists undertaking research in mental health requires that the speech pathologist make contact with the appropriate governing Ethics Committee of the service. Research should not be undertaken without full ethics approval.

## **12.7 Privacy and freedom of information legislation**

Speech pathologists are required to comply with all relevant Commonwealth and State laws regarding client privacy and freedom of information legislation. The storage, duration and appropriate means of disposal of client information should be as specified by organisational and state/territory requirements.

## **12.8 Indemnity cover and insurance**

It is the responsibility of each speech pathologist to ensure they have appropriate professional indemnity cover and public liability.

It is the responsibility of the speech pathologists to ensure they have appropriate professional indemnity cover and public liability. Professionals should be aware that there may be instances where the employing body will not necessarily indemnify them for their actions. It is recommended that all practicing Speech Pathology Australia members have professional indemnity insurance.

Speech pathologists should clarify the insurance situation for accidental loss, theft or damage to resources during transport with their insurer.

## **12.9 Service guidelines**

It is recommended that speech pathologists adhere to the approved guidelines of the employing body in terms of clinical and service management.

## **13.0 Conclusions**

The field of dysphagia is relatively young and continues to evolve. Early research focused on dysphagia as an impairment of a specific aetiology, and protocols for radiological assessment of swallowing. The last 30 years has seen the emergence of screening and assessment techniques and importantly, intervention strategies. The dysphagia clinical guideline provides updated information on the areas of dysphagia prevalence, scope of practice, service management, credentialing, education and training, evidence-based practice, ethical and legal issues. Clinicians are encouraged to view dysphagia holistically, beyond impairment, to include its effects on activity and participation in society.

Documentation of the effectiveness and efficiency of speech pathology intervention for dysphagia is a fundamental part of demonstrating that the speech pathologist is an essential member of the team (Threats, 2007). Quality improvement and research in the field needs to be fostered. The evidence-based recommendations at the beginning of this document provide a platform for researchers to identify areas requiring further investigation.

## **14.0 Future Directions**

By 2050 one third of the population of the developed world is expected to be over the age of 60 yrs. Prevalence data reported earlier show that 10-30% of adults are likely to have dysphagia. Medical advances also mean that premature babies are surviving at younger gestational ages, but often with more complications. The demand for dysphagia services can be expected to rise. In light of this and other developments, three broad areas require further consideration for our future directions. These include: the increasing demands of dysphagia and diminishing time to provide communication intervention for patients in need of both services; the requirement to provide evidence for efficacy of dysphagia rehabilitation; and the impact of the aging population on service delivery.

Firstly, referrals for dysphagia have climbed exponentially over the last 25 years. Speech pathologists need to advocate strongly for communication as well as dysphagia to ensure that patients requiring both of these services receive optimum care (Enderby, 2002; Petheram & Enderby, 2001). Quality improvement studies can help to provide evidence to show the requirements for speech pathology time and funding for both communication and dysphagia (Marsh et al., 2010).

Secondly, whilst research to date has focused heavily on dysphagia assessment, more work needs to be done to demonstrate effectiveness of treatment. Identifying and monitoring of dysphagia is insufficient to effect change. New research is emerging in the field of strength and resistance training for rehabilitation of swallowing function (Logemann, Rademaker, Pauloski et al., 2009; Robbins, Kays, Gangnon, et al., 2007). Treatment impacts on the ability to actively participate in society and importantly on quality of life.

Thirdly, population demographics, technological developments and the demands of the growing aging population are likely to see changes to service-delivery models. Although the evidence strongly supports a multi-disciplinary framework for dysphagia, the global financial crisis has stretched resource allocation. Collaborative work with other health professionals (Dietitians Association of Australia) has brought achievements such as the Australian Standardised Terminology and Definitions for Texture Modified Foods and Fluids. Models such as the Inter-Professional Dysphagia Framework (Boaden, Davies, Storey & Watkins, 2006) provide a scaffold showing a continuum of dysphagia knowledge from Assistant Dysphagia Practitioner to Consultant Dysphagia Practitioner. This model allows exploration of a framework for inter-disciplinary service delivery, with a clear delineation of knowledge, skills and scope of practice. The framework also provides the opportunity for the profession to clearly map advanced, expanded and extended scopes of practice.

Clarity of roles in the field of dysphagia, both within the profession through recognition of advanced competencies, and outside of the profession is required (McAllister et al., 2011). The speech pathology profession will need forward planning to ensure it continues to guide the field of dysphagia.

## 15.0 Glossary of terms

Activity	Execution of a task or action by an individual (as used in the World Health Organization Model of Disability)
Anticholinergic medication	Medication used to block acetylcholine receptors resulting in inhibition of transmission of parasympathetic nerve impulses. Most obvious side effects are dry mouth and dry eyes.
Cervical auscultation	Acoustic information provided by the sounds of swallowing or swallow-related respirations. Clinician may use a stethoscope to listen to sounds. Alternatively a microphone or accelerometer and amplifier +/- computer software program can be used to record acoustic samples for analysis.
Clinical assessment	Use of dysphagia symptoms in addition to formal assessment of the anatomy and physiology of swallowing (e.g. cranial nerve assessment) allowing information about the oral phase and hypothesis formation regarding the pharyngeal phase of swallowing. Includes observation of client feeding and swallowing abilities (as appropriate).
Co-morbidities	Disease or other pathological process occurring simultaneously with another
Craniofacial anomalies	Marked abnormalities of the cranial or facial region
Crepitations	Dry crackling or rattling sounds, like that created by rubbing the ends of fractured bone
Compensatory strategies	Strategies used to alter bolus flow so that it compensates for impaired function, without changing the underlying physiology (e.g. provision of texture modified food or thickened liquids, change to teat flow rate etc.)
Developmental care	Structuring of the environment and providing care in response to the behavioural cues and states of the preterm infant
Dyspnoea	Laboured or difficult breathing
Electrical stimulation	Application of low voltage electrical currents to muscle tissue causing contraction of the muscle fibres
Endorphins	Any of three neuropeptides that bind to opiate receptors in various parts of the brain producing a potent analgesic effect
Family centred care	Primary health care that includes assessment of the entire health of the family. Seeks to identify actual or potential factors that could influence the health of family members and strategies to maintain or improve the health of the family unit
Fibreoptic Endoscopic Evaluation of Swallowing (FEES)	Fibreoptic Endoscopic Evaluation of Swallowing uses flexible laryngoscopy passed transnasally to provide evaluation of oropharyngeal swallowing and a unique view of the pharynx and larynx
Free Water Protocol	Free Water Protocols allow the administration of water only as a thin liquid in conjunction with prescribed thickened liquids to improve hydration in individuals with dysphagia. An oral hygiene protocol is central to use of the Free Water Protocol. There are specific inclusion and exclusion criteria for patient selection.
High resolution impedance manometry	Comprehensive test of both oesophageal pressure and bolus transit dynamics
Impairment	Problems in body structure or function such as a significant deviation or loss (as used in the World Health Organization Model of Disability)
Interdisciplinary model	Group of health care professionals from diverse fields who work in a coordinated fashion for a common goal for the patient

Instrumental assessment	Use of instrumental devices (e.g. radiological, endoscopic or other technology) to provide information regarding anatomy and physiology of the swallowing mechanism (oral, pharyngeal and in some cases oesophageal function is assessed)
Infant swaddling	To wrap, restrain or restrict with cloth
Ketosis	Accumulation of excess ketone bodies in body tissues and fluid when fatty acids are incompletely metabolized
Manofluorography	Combination of manometry and simultaneous fluoroscopy
Manometry	Measurement of pressure by means of a manometer. In dysphagia most often refers to pharyngeal and oesophageal pressures. Transnasal catheter used to collect information regarding pressure from microtransducers along the catheter. Provides information on tongue driving force pharyngeal contraction, pharyngeal shortening, upper oesophageal sphincter relaxation.
Modified Barium Swallow	Radiologic assessment of the oral, pharyngeal and/or oesophageal regions while the person swallows barium-coated substances (liquids or foods). Also known as a 'videofluoroscopy'.
Multidisciplinary model	Professionals representing different disciplines coordinating the contributions of each profession, where the professions are not considered to overlap to provide best patient care
Nasogastric tube	Flexible tube passed transnally through oesophagus to stomach to provide liquid nutrition bypassing the oral, pharyngeal and oesophageal phases of swallowing
Nuclear scintigraphy	Nuclear scintigraphy uses radionuclide scanning during the ingestion of a radioactive bolus (often Technetium-99) to track the bolus as it passes from the oropharynx to the stomach. Expensive, dynamic assessment of swallowing. Conducted by medical officer trained in nuclear medicine imaging.
Oesophagitis	Inflammation of the oesophagus
Oral medications	Tablets, capsules, lozenges or liquid medication taken by mouth
Participation	Involvement in a life situation (as used in the World Health Organization Model of Disability)
Percutaneous Endoscopic Gastrostomy (PEG)	Surgical procedure for placing a feeding tube directly into the stomach without need for an open laparotomy. Nutritionally complete enteral feeding formula is provided through the tube directly to the stomach. Used to provide long term nutrition. Bypasses oral, pharyngeal and oesophageal phases of swallowing.
Psychoactive medication	Drugs that affect the mind or behaviour. Five main classes: opiates and opioids (heroin, methadone); stimulants (cocaine, nicotine); depressants (tranquillisers, antipsychotics, alcohol); hallucinogens (LSD); and marijuana, hashish.
Pulmonary oedema	Fluid accumulation in the lungs (often associated with left ventricular failure)
Pulse oximetry	Non-invasive continuous measure of arterial oxygenation. Uses a probe attached to a pulsating vascular bed (finger, toe, ear lobe) to measure arterial oxygenation. Normal SpO <sub>2</sub> levels are in the region of 95-100%. Need a drop of 4% from baseline for meaningful results.
Quality improvement studies	A model focusing on improvement in a key aspect. For example: Define and verify the process to be improved; collect data to establish baselines; develop action plans for improvement including communication and methods of monitoring; implement the action plans (if needed as pilot first); evaluate outcomes against original goal; provide ways to monitor the final system. Also known as: Continuous Quality Improvement (CQI); Total Quality Management (TQM); Plan, do, study, act (PDSA); FADE; Six Sigma
Radionuclide milk scanning	See Nuclear Scintigraphy
Randomised control trial	Study design where participants are allocated at random (chance alone) to receive one of several interventions. RCT's are quantitative, controlled, comparative experiments. Powerful research

	design.
Rehabilitation strategies	Rehabilitation strategies promote safe and efficient swallowing function through targeted treatments aimed at improving underlying anatomy or physiology (e.g. Shaker manoeuvre to improve strength of hyolaryngeal excursion).
Screening	Relies on the identification of dysphagia symptoms. Designed to identify risk of dysphagia. Screening tools do not identify dysphagia severity or guide management.
Surface electromyography (sEMG)	Electrodes are placed on the skin overlying the muscle to record electrical activity of the muscle. Not invasive. Most often used in dysphagia externally on floor of mouth muscles (under chin). Not possible to differentiate individual muscles due to small size of muscle and muscle overlap in this region.
Telehealth/Telemedicine	Medical information is exchanged from one site to another via electronic communications. Can be used for consultation, diagnosis, treatment
Texture modified foods	Foods altered in texture (degree of hardness, adhesion, cohesion, consistency, crunchiness, chewiness or gumminess, particle size or rate at which food breaks down in the mouth)
Thickened liquids	Liquids that are thicker than regular liquids such as water, milk, juice). They may be naturally thick (e.g. fruit nectar, fruit smoothie), or have a thickening agent dispersed to increase viscosity.
Toxic dose-dumping	A premature and exaggerated release of a drug due to environmental factors changing the drug metabolism. It can markedly increase the concentration of the drug and cause adverse effects or toxicity (poisoning).
Total Parenteral Nutrition (TPN)	Intravenous feeding providing the patient with all fluids and essential nutrients needed. Bypasses oral, pharyngeal, oesophageal and gastric phases of deglutition.
Transcranial magnetic stimulation (TMS)	Used to modulate cortical excitability. A painless, non-invasive stimulating coil is used to upregulate or downregulate neural structures under the coil to produce change in motor function coordination. Repetitive transcranial magnetic stimulation (rTMS) is a variant of transcranial magnetic stimulation and is under investigation for rehabilitation of swallowing function post stroke
24 hour pH monitoring	Used in studies of the oesophagus to determine presence of acid in the oesophagus over a 24 hr period. Current gold standard for diagnosis of gastroesophageal reflux disease. Apart from diagnosis, can be used to track impact of medication or surgery to treat the condition.
Transdisciplinary model	Team composed of members from a number of different professions cooperating across disciplines to improve patient care through practice or research
Ultrasound	Imaging of deep structures of the body by recording echoes of high frequency sound waves bounced off tissues. Resulting signals are converted to a sonogram. A non-invasive assessment of soft tissues and body cavities. Most often used in dysphagia for assessment of the oral preparatory phase and oral phase of swallowing. Can be used to assess oral function in breastfeeding infants.
Xerostomia	Dryness of the mouth due to salivary gland dysfunction

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