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

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**Abstract**

Thickened fluids and texture-modified foods are provided for the therapeutic treatment of dysphagia. Review of the literature indicated that numerous labels are applied to a small number of food textures and fluid thickness levels. The consequences of inconsistent terminology affect patient safety and the efficiency of communication. A joint project of the Dietitians Association of Australia and The Speech Pathology Association of Australia Limited (Speech Pathology Australia) was undertaken to develop consensus standards for number of levels, labels and definitions of thickened fluids and texture-modified foods within the Australian context. A project officer and multidisciplinary advisory committee were appointed by competitive process to carry out and oversee the project. The project determined that there were 39 different labels in use for thickened fluids and 95 different labels in use for texture-modified foods used in Australia. Dietitians and speech pathologists demonstrated overwhelming support for a standardised labelling and terminology system (99.2% of respondents). A national consultative process encompassing the views of more than 580 clinicians helped to formulate the final standards. A scale for modified fluids and a scale for texture-modified foods were developed and consensus was achieved between the Dietitians Association of Australia and Speech Pathology Australia. The standards are now recommended for use throughout Australia.

**Key words:** dysphagia diet, food and fluid standards, standardised diet, thickened fluid.

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**INTRODUCTION**

Texture modification of foods and thickening of fluid forms a routine part of the assessment and treatment of swallowing difficulties (dysphagia).<sup>1–6</sup> Dysphagia contributes to reduced dietary intake, and potentially malnutrition, aspiration and asphyxiation.<sup>7,8</sup> Regular fluids require excellent muscle control and accurate timing between the swallowing system and the breathing system. Thickened fluids slow the act of swallowing and by doing so, enhance safe swallowing.<sup>9</sup> Modified diets use alterations to food texture to reduce the need to chew or orally prepare food.<sup>10</sup> When an individual has dysphagia, there is a breakdown in the swallowing process that can result in food or fluids entering the lungs (aspiration). If enough food or fluid is aspirated, severe infections such as aspiration pneumonia may develop

leading to hospitalisation and even death. Consequently, thickened fluids and texture-modified foods is rarely a diet of choice, but a diet of necessity if an individual is to maintain their nutritional needs orally.

The provision of texture-modified foods and fluids is a prescription for individuals with dysphagia. By determining the cause and severity of the dysphagia, health professionals can determine the food texture and fluid thickness safest for an individual to swallow. If the prescription is not followed, the individual may face serious health consequences. Inconsistency in the labelling and definitions of foods and fluids adds an unnecessary and potentially dangerous layer of confusion. Confusion regarding food textures and labels was formally recorded as a contributing factor in the coroner's notes into the death of a South Australian nursing home resident.<sup>11</sup> To reduce the likelihood of adverse events,

professional consensus on language for texture-modified foods and fluids is needed.

A lack of standard labels and definitions has a number of implications aside from patient safety. Comparison of research studies is difficult because of the lack of a common language for texture-modified foods and fluids. Research into the role of texture-modified foods and fluids in dysphagia management is an area needing greater focus to promote evidence-based practice. It is anticipated that national consensus on standardised terminology will provide a direct benefit to research in this area.

Standardisation of food and fluid terminology will also facilitate product development from the commercial sector. In Australia, there are four commercial companies that currently supply pre-packaged thickened fluids. There is variability in the number of fluid thickness levels offered between the companies. Clear descriptions of different levels of fluid thickness and their labels will improve communication between commercial, consumer and professional sectors. Although there are some similarities in the names chosen for each level of thickness, there are also differences between companies. Companies who supply 'shelf ready' thick fluids will have greater confidence in developing product ranges if institutions across Australia are using a consistent language. A common language will also reduce errors in product selection in hospitals and at home. Standardisation will ensure that individuals with dysphagia have consistent access to the food and fluid textures that are safest for them.

Global variability in the names provided for texture-modified foods and thickened fluids is well noted in the literature.<sup>10</sup> An American task force identified 40 different names used to label solid food and 18 different names to describe thickened fluids.<sup>12</sup> An Australian study from the city of Brisbane (population 1.6 million) found there to be 12 different names for three different levels of fluid thickness sampled from only 10 major hospitals.<sup>13,14</sup>

Penman and Thomson conducted a detailed review of terminology, definitions and levels of dysphagia diets for the period 1981–1996.<sup>10</sup> They, and others, found there were wide variations in the degree of modification and numerous descriptions of textures.<sup>1,10</sup> Texture-modified diets typically ranged from two to five categories of altered food consistency.<sup>10,15</sup> There were typically three levels of fluid thickness. The most commonly described model of progression for food and fluid texture modification is noted in Tables 1 and 2.

The Australian Dysphagia Working Party was convened in 2003. It is a voluntary multidisciplinary leadership group with representation from speech pathology, dietetics, medicine, nursing, food services and industry. One of the aims of the group was to review current dysphagia management practices. Issues surrounding inconsistency in labelling and definitions for texture-modified foods and fluids in Australia were identified as a key area in need of resolution. The working party commenced work towards national standards but it became clear that the process would be better managed as a more formalised project by relevant Associations. The

**Table 1** Themes of thickened fluid classification based on Penman and Thomson's review of dysphagia diets<sup>10</sup>

<i>Fluid name and level</i>	<i>Description of fluid thickness</i>
Level 1—Nectar	Like nectar
Level 2—Honey	Like honey
Level 3—Pudding	Like pudding <sup>3,10</sup>
Thin	Water and all juices thinner than pineapple juice
Thick	All other liquid including milk and any juice not classified as thin
Thickened	Liquids thickened with starch to pureed consistency <sup>2,10</sup>
Watery	Water, tea, coffee
Milky	Milk and most fruit juices
Single cream	<i>Ensure Plus</i> and <i>Enterat</i> <sup>10</sup>
Double cream	Tomato juice, thinned pureed fruit, creamed soups
Custard	Cheese or custard sauce, smooth yoghurt
Semi-solid	Thick set yoghurt, blanchmange, mashed potato <sup>10</sup>

**Table 2** Model of progression of diets used for dysphagia (adapted from Penman and Thomson<sup>10</sup>)

<i>Food grading</i>	<i>Description of food texture</i>
Liquidised/thin puree	Homogenous consistency that does not hold its shape after serving
Thick puree/soft and smooth	Thickened, homogenous consistency that holds its shape after serving, and does not separate into liquid and solid component during swallowing, that is, cohesive
Finely minced	Soft diet of cohesive, consistent textures requiring some chewing (particle size most often described as 0.5 × 0.5 cm)
Modified normal	Normal foods of varied textures that require chewing, avoiding particulate foods that pose a choking hazard (particle size most often described as 1.5 × 1.5 cm)

Dietitians Association of Australia and Speech Pathology Australia agreed to manage the project and develop consensus standards. An initial project plan was proposed and funding was provided by a company with commercial interest in production of texture-modified fluids to support the process.

Time and resource limitations restricted the scope of this project. The project was not intended to address the nutritional adequacy nor patient acceptability of texture-modified foods or fluids. Objective measurement of thickened fluid is a complex and multifactorial task.<sup>5,16–23</sup> Thus, it was not considered within the scope of the study to address objective

measurement issues in relation to the definitions. Finally, the project was not intended to develop evidence-based practice guidelines.

The specific aims of the project were to, in an Australian context:

- 1 Determine the number of food texture levels to be used in a standardised scale.
- 2 Determine the number of fluid levels to be used in a standardised scale.
- 3 Determine standard names/identifiers for each food and fluid level.
- 4 Identify examples of foods appropriate for each food texture level.
- 5 Gain consensus from Dietitians Association of Australia and Speech Pathology Australia membership and other key stakeholders regarding points 1–4.
- 6 Commence communication of the new standards to stakeholders and commence education of speech pathologists and dietitians.

## METHODS

The project commenced with a development of a Memorandum of Understanding between the Dietitians Association of Australia and Speech Pathology Australia. The Associations jointly developed a final project plan. A project officer and advisory committee were appointed after calling for expression of interest. The project officer had a professional qualification in speech pathology, a doctoral degree in dysphagia and had published nationally and internationally in the area of viscosity and thickened fluids. The advisory committee comprised individuals with professional qualifications in dietetics (×2), speech pathology (×2), nursing (×1) and food services (×2). The project was overseen by professional officers from the Dietitians Association of Australia and Speech Pathology Australia, reporting to the Board of the Dietitians Association of Australia and the Speech Pathology Australia Council.

Ethical issues were considered by the professional officers. It was determined that participation in the project would be voluntary, the purpose of the project would be communicated at the time of requesting participation and individuals or organisations providing information for the use of the project would not be identifiable in reports arising from the project. The funding organisation was not to be involved in the design of the project, its conduct or the writing and interpretation of the results. A summary of the results of the project would be made easily accessible to participants in the project.

Communication between the officers of the Associations, the project officer and the advisory committee was via regular teleconferences. The project officer position was paid, while the advisory committee provided honorary support. The project commenced in June 2006, with a six-month time frame for completion.

Key project stakeholders were: Dietitians Association of Australia and Speech Pathology Australia, speech pathologists, dietitians, consumers, industry (i.e. commercial com-

panies that provide thickened fluids), non-government and community-based organisations, food service staff, food service professional bodies, and training institutions for speech pathology and dietetics. The training institutions were identified as stakeholders because they would provide an avenue for education of the new standards to new professionals. A dedicated website for the project was constructed as a conduit of information accessible by any person with an interest in the area.

A series of six steps were identified to meet the aims of the project. These steps are presented below.

### Step 1—Literature review

Step 1 involved collation of any existing Australian scales, investigation of current international scales and a review of the literature pertaining to texture-modified foods and thickened fluids. The literature review sought to identify any evidence for the number of levels of food modification or fluid thickness. In addition, evidence was sought for recommendations regarding food particle size and rationale for inclusion or exclusion of identified contentious food or fluid items (e.g. bread). An extensive literature search was conducted. The Medline, Cinahl, Web of Science and Cochrane Library databases were searched. The following search terms were used for food texture modification used with individuals with dysphagia: 'deglutition disorders + food', 'dysphagia diet and deglutition', 'dysphagia diet', 'dysphagia and foods' and 'texture modification'. The search terms for thickened fluids were: 'viscosity and deglutition disorders', 'viscosity and thick fluids', 'dysphagia and fluids', 'thick fluids' and 'dysphagia and viscosity'.

### Step 2—Survey of key stakeholders

A survey of key stakeholders, as identified earlier, was undertaken to determine support for national standardisation and to provide preliminary benchmarking for the number of food and fluid levels required for the final scales. Speech pathologists and dietitians were identified as one of the largest stakeholder groups for the project and a critical group to ensure the implementation of standards. A questionnaire was devised in consultation with the advisory committee. The questionnaire was available online via a dedicated website for the project for a three-week period. The online survey was publicised to members of both professional associations via email and print publications. In addition, facilities around the country were targeted for feedback. The targeted groups were included to increase the likelihood of capturing the full range of views. Telephone calls were placed to speech pathologists and dietitians working in the areas of acute, rehabilitation, community, extended care, disability and mental health for both adult and paediatric populations. Clinicians were asked whether they were aware of the project and whether they were interested in participating in the process by completing a questionnaire that was emailed, faxed or posted to them. Individuals who participated in Step 2 were asked

whether they consented to being contacted to participate in further stages of the project.

In addition to the professional groups, nine commercial manufacturers of thickened fluids or thickeners were approached. These were: Chef's Pride, Chipmonk, Flavour Creations, Janbak Industries, Novartis Medical Nutrition, Nutricia, Orfam, Orion and Swallowade. The commercial companies were asked to complete the same feedback form as the health professionals.

Teaching institutions with courses that were accredited by the Dietitians Association of Australia and Speech Pathology Australia were surveyed. The telephone surveys requested information regarding: (i) the terminology for texture-modified foods and fluids currently taught to students studying speech pathology or dietetics; (ii) perceived need for standardisation of terminology; and (iii) interest in an education package providing the final outcomes. Community-based organisations and independent groups including *Meals on Wheels*, and *Nutrition Australia* were informed of the project and invited to provide comment.

### Step 3—Development of the draft standards

Individuals who had consented to further participation were emailed, faxed or posted a copy of the draft document constructed from feedback from the stakeholder groups. The draft document contained a summary of information gathered from the questionnaires, definitions for each of the proposed levels and two labels for each level for consideration. Participants were asked whether they agreed with: (i) the number of levels proposed for each food and fluid scale; (ii) the definitions provided for each level; and (iii) a preference for one of the two labels provided. Some additional information was requested of participants regarding food inclusions and exclusions for the final document. Finally, participants were asked to indicate their area of expertise and their interest in participating in face-to-face or teleconference focus groups.

### Step 4—Focus groups

Following review of feedback from the draft document, four key questions were identified for discussion at face-to-face or teleconference focus groups of eight and 10 participants.<sup>24,25</sup> A two-hour time frame was set for each group. The advisory committee determined that the participants in the focus groups should be representatives from the following areas: (i) paediatrics; (ii) aged care; (iii) acute care (adult/paediatrics); (iv) rehabilitation; (v) disability; (vi) mental health; (vii) food services; and (viii) nursing homes.

A call for participants for the focus groups was placed via email with both Dietitians Association of Australia and Speech Pathology Australia. In addition, individuals who had reviewed the draft document from Step 3 and had consented to further contact were also included in the final list of focus group participants. Officers from the

Associations determined focus group membership to ensure a range of views were represented.

Eight focus groups were held within a two-week window. Five speech pathologists and five dietitians were formally invited to each focus group to allow an attrition rate of two per group. If individuals were unable to attend, alternative members were sought. Face-to-face focus groups were held in Queensland, New South Wales and Victoria. Two teleconferences were held to gather information from Western Australia, Tasmania, South Australia and rural and remote localities in Australia. The project officer attended and minuted each focus group. In addition, a member from the advisory committee was present at the focus groups wherever possible.

Four questions were posed to each focus group. The questions were determined by identifying themes in the feedback provided over the course of the project. The four focus group questions are included below:

- 1 It is proposed there be three official names for thickened fluids and texture-modified foods in accordance with the following example: (i) Level E—Smooth Pureed OR (ii) Smooth Pureed OR (iii) Level E. Participants were asked whether a descriptive or categorical label should be applied or both together. Participants were asked to discuss the impact of official naming, giving thought to the 'categorical label' for food textures.
- 2 The proposed terms 'slightly thick' and 'semi-thick' were considered to be too similar to show a point of difference for thickened fluids. Participants were asked to bring alternative names or concepts for the thickened fluid scale.
- 3 Feedback suggested that there was a need to clearly differentiate 'dental soft' from 'dysphagia soft'. Participants were asked whether it was acceptable for 'dental soft' to be explained by way of explanatory footnote and if there were other places that footnotes might be used.
- 4 Discussion regarding implementation of the scale and educational resources is required. Participants were asked to bring ideas regarding: (i) examples of menu category 'exclusions' for discussion; (ii) thoughts on the use of a colour coding system or use of icon coding to assist implementation; (iii) ideas for 'essential' and 'desirable' resources (e.g. DVD, wall chart, brochure); and (iv) ideas to promote uptake of the new system.

### Step 5—Final recommendations and final scale(s)

Review of all available information, including a further evidence-based review, lead to the development of a final scale. A dietitian was appointed by Dietitians Association of Australia to determine examples of food inclusions and exclusions for the final document. Consultation with the officers of the Associations, the advisory committee, the Speech Pathology Australia Council and the Dietitians Association of Australia Board was undertaken to produce the final scale.

## Step 6—Communication and education

The final step in the project was to commence communication of the new standards to stakeholders and education of Dietitians Associations of Australia and Speech Pathology Australia members. This publication marks the first formal communication of the standards and the process by which they were determined.

## RESULTS

### Step 1

#### Evidence

Two International scales for texture modification of foods and fluids for individuals with dysphagia were identified in the literature. These included the US Dysphagia Diet<sup>12</sup> and the UK National Descriptors for Texture Modification in Adults.<sup>26</sup> The terminology used in the US Dysphagia Diet<sup>12</sup> was not considered suitable for the Australian context. For example, 'Dysphagia Advanced' is the label applied to the *least* modified food texture. The word 'advanced' can also mean 'severe', as in 'severe dysphagia'. The label and the definition did not intuitively match. Also, many of the food inclusions and exclusions in the diet were viewed as culturally specific, making it difficult to adopt the whole package. The fluid scale used descriptors, and also provided objective measurement of fluid viscosity. The ability to adhere to objective measurement was an area that required further investigation in the Australian context. Thus, the ability to adopt even the fluid scale was questionable.

The UK National Descriptors for Texture Modification in Adults applied alphabetical labels to food textures, with a range of A–E, where A is the most modified (e.g. puree) and E is the least modified food (closest to regular textures).<sup>26</sup> However, without the description of the food texture, it would not be possible to work out which label to apply to the food, however. A descriptive title was considered to be an important part of the communication process in the Australian context. Similarly the fluid thickness levels were labelled numerically from one (thinnest) to three (thickest). Again, without an accompanying descriptor, there is room for miscommunication.

Two Australian state-based scales for texture-modified foods and fluids were identified. Both the Queensland and Victorian scales were endorsed by their state health authorities. The Queensland scale showed three levels of fluid thickness, while the Victorian scale showed four levels of fluid thickness in addition to regular fluids. A scale endorsed by the state health authority also existed for texture-modified foods in Victoria. This scale showed regular foods, with three levels of food texture modification.

The literature review revealed that the most common number of food texture modification levels reported in the literature was four.<sup>10</sup> The food scales showed liquidised or thin puree, at one end of the spectrum. The other end of the spectrum showed modified normal foods of various textures,

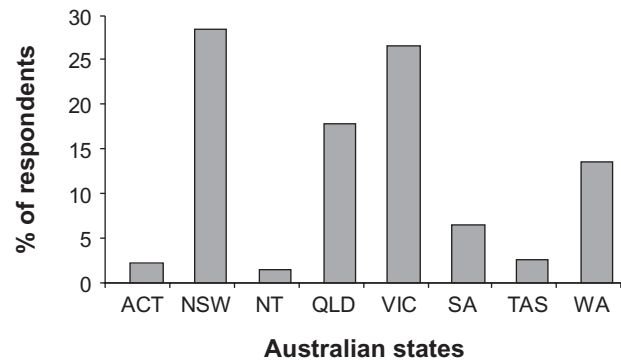


Figure 1 State of residence of survey respondents.

avoiding particulate foods that provided a choking hazard. The most common number of fluid thickness levels reported was three; however, some ventured to as many as six<sup>10</sup> (see Tables 1,2).

### Step 2

#### Reviews

*Review of training institutions.* Institutions accredited by Dietitians Association of Australia and Speech Pathology Australia were phone-surveyed as outlined in the 'Methods' section. Eleven institutions offering accredited dietetics courses were approached. Of these seven provided comment. For the speech pathology courses, eight institutions were approached and six provided comment. A common theme emerged from all teaching institutions. Students are often taught about modified texture foods and fluids by local acute care clinicians. Students are advised that there is a lack of standardisation of modified foods and fluid levels and labels between settings, and to seek further clarification from place of employment on local policies. All coordinators requested information about the new standards for inclusion in tertiary course material when available.

*Review of industry.* Of the nine commercial companies approached, four provided feedback. All companies who responded voiced support for standardisation of terminology and definitions. All companies who responded agreed with the proposed definitions as outlined in the survey.

*Review of professional feedback.* A total of 582 speech pathologists and dietitians responded to the questionnaire. Of these, 68.3% responded via the online survey system and 31.7% were the result of targeted surveys. Two hundred and twenty-two calls were placed to the targeted group; responses were received from 185, representing an 83% response rate. State of residence and locality of respondents are shown in Figures 1 and 2. A caseload summary for respondents is shown in Figure 3. Ninety-nine per cent of all respondents indicated their agreement with the need for an



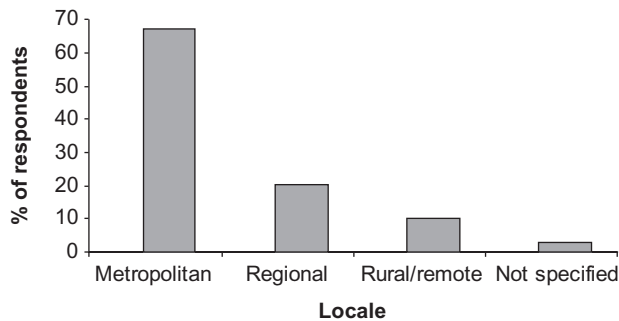


Figure 2 Survey respondents by locality.

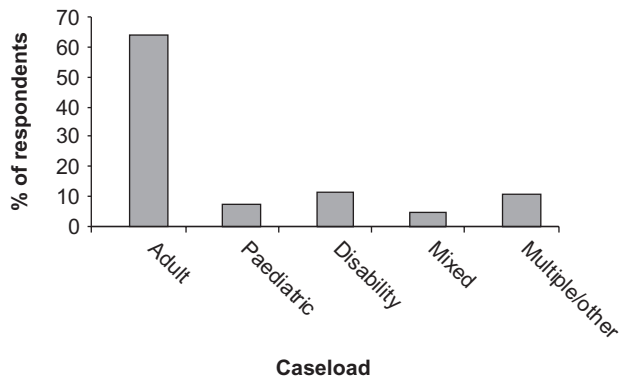


Figure 3 Survey respondents by predominant caseload.

Australian standardised terminology and definitions for texture-modified foods and fluids.

The number of different thickened fluid labels in current use was 39. Agreement with the proposed definitions for thickened fluids was 94% (SD 0.5). Support for four levels of fluid thickness, with normal being the 'least modified' category, was 89.4%. Three different fluid labelling practices emerged. One used a descriptive scale (nectar, honey, pudding). The other two were categorical. One used a straight grading system (Grades or Level 1–3), while the other used a comparative system (full thick, 1/2 thick, 1/4 thick). Respondents were asked to estimate the per cent prescription of three levels of fluid thickness at their facility. The response rate to this question was quite low at 43%. Those who responded indicated that 'nectar-like' thickness was most often prescribed, followed by 'honey-like' thickness, with 'pudding-like' thickness least often prescribed—see Figure 4.

The number of texture-modified food labels in current use was 95. For modified texture food, the agreement with the proposed definitions was greater than 90.2% (SD 4.4). Support for four levels of food texture, with normal being the 'least modified' category was 84.8%. There was a single descriptive labelling practice for food. However, there were many variations in the description of a single texture-modification level (e.g. minced, minced-mashed, minced-mashed-moist, mashed, texture-modified mashed,

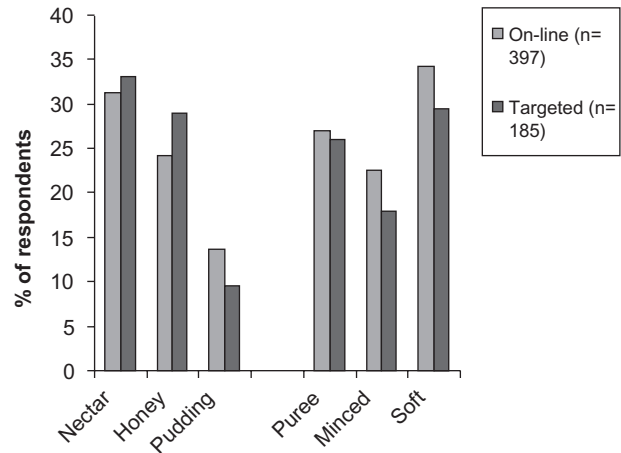


Figure 4 Average percentage of specific fluid thickness and specific food texture prescribed.

etc.). Respondents were asked to estimate the per cent prescription of three levels of texture modification at their facility. Those who responded indicated that a 'soft' textured diet was the most often prescribed followed by 'pureed' texture and then 'minced' texture—see Figure 4.

### Step 3

#### Feedback on draft documents

Draft documents from the first-phase survey were developed in consultation with the advisory committee. One hundred and forty-one respondents had indicated an ongoing interest in the project and had consented to contact following completion of their follow-up questionnaire. A one-week time frame was provided for comment in order to meet the project timelines. Sixty-four responses were received—a response rate of 45%. Two scales were initially produced to meet perceived differing needs of the adult and paediatric populations. An agreement level of 91% was found for the definitions proposed for the foods. Two food labels had been proposed for each level of food modification on the adult and paediatric scales. Respondents were asked to indicate their preference for either a descriptive title (e.g. 'soft') or a categorical label (e.g. 'medical food texture 20'). For the foods, respondents indicated a two-thirds majority preference for the descriptive label, with one-third indicating that a dual labelling system using both a categorical label and a descriptor would be useful. Less than 5% preferred the categorical label in isolation. The same trend was found for the paediatric food scale. Seventy-five per cent of respondents agreed with four levels of food texture modification, with the least modified being a 'soft bite-sized' and the most modified being 'runny pureed'. Seventy-five per cent of respondents also indicated they would like to see a seven-day food plan included in the final documents. Eighty-three per cent indicated that they would like to see examples of foods attributed to specific food categories (e.g. breads and cereals, fruit, etc.).

Ninety-seven per cent of respondents agreed with the definitions proposed for the thickened fluids. Again two labels had been proposed for the fluids for comment. One was a descriptive label (e.g. 'slightly thick') and one was a categorical label (e.g. 'medithick 150'). Equal numbers of respondents preferred the descriptive label or a combination of the descriptive label with a categorical label. Ten per cent of responders preferred the categorical label in isolation. There was an agreement level of 87.5% for three levels of thickened fluid, in addition to regular fluids for the adult scale. There was a 95.9% level of agreement with four levels of thickened fluids for the paediatric fluid scale, in addition to regular fluids.

Based on these results, the project officer devised the list of focus group questions that were refined in consultation with the advisory group. Debate occurred surrounding the need for a single or dual labelling system. Use of a categorical label lent weight to a 'formal scale' as opposed to 'adjectives' used to describe foods and fluids. Use of a dual labelling system was recommended to meet the needs of improved communication via description, while retaining the concept of a 'formalised scale' used in the clinical management of dysphagia.

## Step 4

### *Focus groups*

Of 117 applications received by the Associations, a total of 53 people participated in the focus groups. There were no nominations from individuals with expertise in mental health. Although an equal number of dietitians and speech pathologists were invited to participate in the focus groups, final numbers showed 22 representatives from dietetics, 30 from speech pathology and one from food services. A member of the advisory committee was present at five of the eight focus groups. The project officer attended and minuted each focus group.

In relation to Statement One concerning the food and fluid labelling system, the consensus of the groups was that if a descriptive label and a categorical label were to be used for the fluid scale, the same convention should be used with food scale. For clarity, both labels should be used in tandem at all times (e.g. Texture A—Soft). All groups agreed that if numbers were to be used in the fluid scale, then letters should be used in the food scale.

Statement Two related to the labelling system for thickened fluids. Opinion was split on the use of the term 'medithick'. Some liked the idea because it denoted the importance of thickening of fluids as a prescription for a medical condition (dysphagia). Other participants felt that the term would take away from the speech pathology and dietetic component and confuse people who might think they needed to approach medical staff for fluid changes. A numerical label was agreed upon with varying opinions as to whether it should be a 1-2-3-4 system, or one showing greater differences between the gradations of thick fluids, for example 80-150-400-900. There was considerable

discussion around the 'nectar-honey-pudding' and the '1/4 thick-1/2 thick-full thick' themes. A scale where the description focused on fluid 'thickness' was deemed the most appropriate.

Statement Three related to the use of postscripts. It also addressed the inclusions and exclusions of 'soft' food items suitable for individuals with dysphagia. An anomaly became clear. There were a large number of exclusions for individuals on a 'soft' dysphagia diet. The use of explanatory footnotes was not considered to be clear enough to safely communicate the difference between 'soft options' from the regular diet and a 'dysphagia soft' diet. Participants felt that the dysphagia soft diet should restrict all potential choking hazards while the 'soft diet' from the regular diet was based on individual choice. Clear specifications/postscripts regarding bread items were considered essential. Dual consistencies (e.g. minestrone soup, or fruit punch), soup, jelly and ice-cream, medications and nutritional supplements were also deemed to require specific comment.

Statement Four provided discussion surrounding implementation of the scales and resources required to assist implementation. Colour coding of the different levels of fluid thickness was considered an important adjunct. It was noted that a significant number of individuals working in food services may have English as a second language and that institutional kitchens are generally busy environments, so the use of a colour system was seen to assist clear communication. Participants advised against the use of a traffic light colour scheme or a colour scheme including red, as these schemes are already in use in some hospitals for allergies or other communications. In terms of resources required to assist implementation, an instructional DVD, wall chart and website were the most popular suggestions.

Other discussion from the focus groups related to whether there was a need for a single unified scale or one suitable for adults and another for paediatrics. A single scale was deemed less confusing, particularly for hospitals that provided services to both adult and paediatric clients. The benefit of separate scales was seen from a safety perspective with regard to particle size of foods that posed a choking hazard.

## Step 5

### *The final scale*

Feedback from the focus group was discussed at length by the project officer, advisory committee and the officers of the Associations and the Dietitians Association of Australia Board and Speech Pathology Australia Council. The outcome was the development of a single scale for food and a single scale for fluids. Applicability to both adult and paediatric populations was accomplished in the final documents. The final scale is shown in Appendix I. A comparison of the Australian scale with the US Dysphagia Diet<sup>12</sup> and the UK Texture Modification scale<sup>26</sup> is also included for international reference (see Tables 3,4).

**Table 3** Comparison between Australia clinical food texture scale, National Dysphagia Diet (US) and the UK food texture classification systems for individuals with dysphagia<sup>23,26</sup>

<i>Australian food texture scale</i>	<i>USA food texture scale</i>	<i>UK food texture scale</i>
Regular	Regular	Normal
Texture A—Soft (1.5 cm)	Dysphagia Advanced ('bite-sized'), <1 inch or 2.5 cm	Texture E (1.5 cm)
Texture B—Minced and Moist (0.5 cm)	Dysphagia Mechanically altered (0.6 cm)	Texture D
Texture C—Smooth Pureed	Dysphagia Puree	Texture C
		Texture B
		Texture A

**Table 4** Comparison between the Australian fluid texture modification scale, the National Dysphagia Diet (US) and the UK (adult) texture classification systems for individuals with dysphagia<sup>23,26</sup>

<i>Australian fluid viscosity scale</i>	<i>USA fluid viscosity scale</i>	<i>UK fluid viscosity scale</i>
Regular	Thin 1–50 cP	Thin fluid
Level 150—Mildly thick	Nectar-like thick fluids 51–350 cP	Naturally thick fluid
Level 400—Moderately thick	Honey-like thick fluids 351–1750 cP	Thickened fluid—Stage 1
Level 900—Extremely thick	Spoon-thick fluids >1750 cP	Thickened fluid—Stage 2
		Thickened fluid—Stage 3

## DISCUSSION

The current project has resulted in consensus for an Australian clinical scale of texture modification for foods and fluids for use with individuals with dysphagia. Consensus has been reached between the Dietitians Association of Australia and Speech Pathology Australia acting as representatives of these professions. A broad process of consultation with practitioners and review of the available scientific literature provided the platform for the final scales. The intention is that facilities should use only the levels that they determine to be appropriate for their specific situation. There is *no* requirement for facilities to use all levels of food/fluid texture modification. It is however, expected that facilities will find the standards useful and implement the labelling system and definitions developed. The consultation process for the Australian project was thorough. It incorporated comment from motivated practitioners and 'targeted' practitioners to ensure a broad cross-section of responses. There were many opportunities and many formats for practitioners and other stakeholders to contribute to the development of the Australian scales within the short timeframe allowed for the project. It is acknowledged, however, that consumers of thickened fluids and texture-modified diets were not included in the process. Given the task of attaining consensus with practitioners, it was determined during the project that consultation with consumers would form another project in its own right.

### Australian food textures

The Australian Clinical Food Texture Grading Scale shows 'regular foods' as the beginning of the continuum, with three levels of texture modification. The labels given to the foods

are 'Texture A—Soft', 'Texture B—Minced and Moist' and 'Texture C—Smooth Pureed'. Given that fluids were denoted with a numerical value, an alphabetical system for foods was adopted. The descriptive labels adopted reflected consensus opinion of stakeholders and are not evidence-based. However, they are similar to many of the labels reported by Penman and Thomson in their review of dysphagia diets.<sup>10</sup> The number of levels adopted for the Australian context is the same as the US Dysphagia Diet scale,<sup>12</sup> but less than the UK Texture Modification scale.<sup>26</sup>

Two food levels provoked discussion. 'Dental soft' and 'runny pureed' textures were both reported to have clinical utility. It was reported that these textures were used for specific demographics; however, as they were not commonly used in workplaces as separate levels for dysphagia management these two levels were not included in the final scale. Clinicians are encouraged to use their clinical judgement to prescribe any additional textures on a case-by-case basis. Where institutions wish to include these texture levels, they are encouraged to reference them to their place on the standard scale.

This project uses literature regarding asphyxiation to consider particle size and food exclusions. Food particle size is mentioned in some of the literature, but without empirical support. Common food particle sizes include: 1.0 cm cubes or less; 1.5 cm pieces broken with the flat edge of a fork suitable for a 'soft', 'bite-sized' diet, and particle sizes of 0.5 cm for 'easy chew' or 'minced food'.<sup>12</sup> The relationship between particle size and risk of asphyxiation is formally noted in only one journal article.<sup>27</sup> In order to avoid choking hazards, particle sizes must be small enough to pass through the trachea if accidentally aspirated without lodging in it and occluding it. It is for this reason that a 1.5 × 1.5 cm bolus has been noted as a target for the Texture A—Soft, with



smaller particle sizes of 0.5 cm recommended for the Texture B—Minced and Moist category.<sup>10,27–30</sup> Because of individual variation noted in body morphology, these sizes are suggested targets only, and are included for use in institutional quality assurance activities.

## Australian fluid thickness

The Australian Clinical Fluid Texture Grading Scale shows 'regular fluids' as the beginning of the continuum, with three levels of thickened fluids. The labels given to the thickened fluids are 'Level 150—Mildly Thick'; 'Level 400—Moderately Thick' and 'Level 900—Extremely Thick'. The numerical system for thickened fluids was chosen as a contrast with the alphabetical food texture levels. The descriptive labels applied are quite different to the labels currently used within Australia. They were derived from a desire to describe fluid *thickness* rather than fluid *types* (e.g. nectar-honey-pudding).

The terms *nectar* and *honey* were discussed at length. Commercially available nectar from the supermarket was considered not sufficiently thicker than a thin fluid for individuals who require thickened fluids. Attempting to describe this first level of fluid thickness as 'nectar', therefore posed problems. The term 'honey' already describes a known substance that is susceptible to changes in consistency with changes in temperature. The other most commonly used labelling theme related thickness back to 'full thick', that is, 1/4 thick and 1/2 thick. However, subjectively fluids were not always 'a quarter of the thickness' or 'half of the thickness' of full thick. There was a need to first agree on what 'full thick' was in order to be able to distinguish half of and a quarter of its thickness level. To enhance communication of fluid thicknesses a different terminology was required.

The inclusion of meaningful numbers in the scale was considered. Although a scale of 1–3 could have been used, some Australian facilities have used 1 to denote the thinnest fluid, while others had used 1 to denote the most thickened. A scale that uses a large number tied to a simple descriptor was perceived to promote better communication. The sun-screen SPF (sun protection factor) system provides a good analogy. The Anti-Cancer Council has worked hard to ensure a consistent and simple public message: the higher the SPF value, the more sun protection afforded.<sup>31</sup> The numeric value of SPF15 relates to a measurement of sun protection factor. The larger the number, for example SPF30, the greater the sun protection factor. The numbers chosen for the Australian fluid scale similarly have a meaning: the larger the number, the thicker the fluid. The US Dysphagia Diet<sup>12</sup> has prescribed specific viscosity levels for their thin, nectar-like, honey-like and spoon-thick consistencies. Note that the viscosities are to be measured at room temperature and with a shear rate of 50<sup>s<sup>-1</sup></sup>. The details relating to temperature and shear rate are essential to replication of correct consistencies. The research literature, however, demonstrates considerable variability in the viscosity range for thickened fluids.<sup>13,19,20,22,32–34</sup> It is not possible at this time to recommend specific viscosity levels as measured in centipoise (cP) for manufacturers. However, it is

possible to use the trends generated from the literature to provide a broad numerical scale where thin fluids are denoted by a smaller value and thicker fluids by increasingly larger values. The numbers chosen for the scale broadly correspond to viscosity measures (see Table 3). The numerical scale system proposed for the Australian nomenclature is sympathetic to the measured viscosity levels of existing commercial products at high shear rates. It is anticipated that with future research, formal viscosity levels will be developed according to an evidence base and form part of the label of thickened fluids.

The number of fluid thickness levels is equivalent to those noted in Penman and Thomson's review.<sup>10</sup> They are also the same in number as the US Dysphagia scale.<sup>12</sup> The Australian scale is fewer in number than the UK scale. The UK scale differentiates thin fluids from naturally thick fluids, then follows with three levels of thickened fluid. Naturally thickened fluids, and indeed thin fluids such as water, may have a use in the management of dysphagia in the transition to thin fluids, however, they do not require addition of a thickening agent. As such, it was decided that naturally thick fluids should not be considered as part of the continuum of regular fluids for the Australian context. In the treatment of infant dysphagia, there is a fluid thickness that is very similar to naturally thick fluids. It is thicker than breast milk or regular infant formula, yet it is still able to pass through a fast flow teat. The place of this therapeutic (infant dysphagia) 'naturally thick' level of thickness is indicated as a note in the scales; however, it is not defined as a level in its own right.

## Future directions

Consensus between practitioner groups has been achieved on the new standards and Speech Pathology Australia and Dietitians Association of Australia encourage their use throughout Australia. As with any new standards the challenge now becomes dissemination and implementation. Focus group attendees provided insight into the type of resources to be developed and ways to enhance broad dissemination. A short instructional DVD was considered important. This format would allow demonstration of particle size, ease of fork mashing and movement associated with pouring a thick fluid. A poster and downloadable images of food and fluid textures were also seen as useful. Focus groups felt that the website developed for the project should be retained as a point of reference for professionals as well as the community. Presentation of the final scale at professional associations conferences, preparation of a standard package to provide to tertiary training institutions and consistent and timely communication of the standards to industry are vital steps for implementation of the new descriptions.

Future projects should address a consultation process with consumers. Consumers should be consulted regarding their understanding of the new terminology and labelling system to determine the amount of education required for clarity. Other future work should be undertaken in the areas that were out of scope for this project. This includes

the nutritional adequacy and palatability/acceptability of texture-modified foods and fluids, development of objective measures of fluid viscosity and standard recipes for texture-modified fluids and, most importantly, the development of evidence-based guidelines to inform clinical practice.

Facilities are encouraged to use the labels and definitions provided to enhance consistency and thereby safety for individuals with dysphagia, improve communication between health professionals, increase the efficacy of research in this area and to stimulate growth in the range of products from the commercial sector. It is anticipated that facilities will use those levels that best suit their needs and if adding new levels will reference them against the scales provided. These scales are provided as a guide and it is expected that institutions will apply them within the policy and procedures of their individual institution. Speech Pathology Australia and Dietitians Association of Australia are committed to the broad communication and uptake of these consensus standards.

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## APPENDIX I

### Australian standardised definitions and terminology for texture-modified foods and fluids

The following fluid thickness and food texture grading scales provide terms for and descriptions of fluid and food texture modification for individuals with dysphagia (disordered swallowing).

The scales have been developed by a consultation process with dietitians and speech pathologists across Australia. The scales are a consensus standard agreed to by Speech Pathology Australia and the Dietitians Association of Australia and are encouraged for use around Australia. It is hoped that these standards will facilitate the development of the limited evidence base in this area of practice.

This project did not address:

- Nutritional or hydration adequacy of texture-modified diets, for example whether supplementary fluids may be required for individuals on thickened fluids
- Development of guidelines for clinical application or outcomes
- Client acceptability of modified foods/fluids
- Reliability of the consistency of thickened fluids

The scales have been developed to encourage standardisation of definitions and terminology across Australia. The standards are intended to be applied within the policies, procedures and capacities of individual institutions under the direction of dietitians and speech pathologists.

In Australia, speech pathologists establish dysphagia severity and determine the level of food and fluid texture modification required. Dietitians ensure that individuals who require texture-modified diets are able to meet their nutrition and hydration needs.

Four levels of texture modification have been identified for fluids and foods—unmodified plus three modified levels. Each modified level has a dual label, for example Texture A—Soft or Level 150—Mildly Thick. It is strongly encouraged that both labels be used.

The Fluid Scale has three different colours to denote the three different modified levels. These colours are a recommendation and may be used at the discretion of individual institutions or commercial companies to help identify more clearly the different levels of fluid thickness.

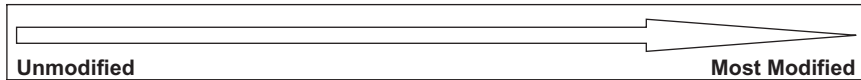
The levels noted in these scales occur on a continuum from unmodified to most modified. The scales do not relate to a scale across which an individual should travel or progress, but rather a scale across which a fluid or food item might travel as it becomes more modified.

It is important to note that speech pathologists and dietitians and the institutions in which they work should only use the levels they deem appropriate for their setting and client demographic. There is no requirement for facilities to use all of the levels and conversely there are some clinicians who will choose to add extra levels to the scales. To ensure consistency, it would be appropriate that any extra levels be referenced against the standard scale presented.

The following scales provide:

- The number of levels of food texture modification and fluid thicknesses
- The names of the levels (and for fluids a corresponding suggested colour to facilitate communication)
- A description of the levels
- Characteristics of the food or fluids that would be appropriate for that level
- Testing information—this is provided as a guide only. It is included for use in food service quality assurance activities
- Examples of *recommended foods* and *foods to avoid* for each food texture level. This list is not exhaustive and simply provides general direction

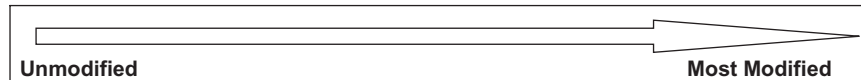
## Food texture modification grading scale for the clinical management of dysphagia



Unmodified - Regular Foods	Texture A – Soft	Texture B – Minced and Moist	Texture C – Smooth Pureed
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NAME	UNMODIFIED – REGULAR
<b>Description</b>	<ul style="list-style-type: none"> <li>• These are everyday foods</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• There are various textures of regular foods. Some are hard and crunchy, others are naturally soft</li> </ul>
<b>Food inclusions and exclusions</b>	<ul style="list-style-type: none"> <li>• By definition all food and textures can be included</li> </ul>





Unmodified - Regular Foods	Texture A – Soft	Texture B – Minced and Moist	Texture C – Smooth Pureed
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NAME	TEXTURE A – SOFT
<b>Description</b>	<ul style="list-style-type: none"> <li>• Food in this category may be naturally soft (eg ripe banana), or may be cooked or cut to alter its texture</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Soft foods can be chewed but not necessarily bitten</li> <li>• Minimal cutting required – easily broken up with a fork</li> <li>• Food should be moist or served with a sauce or gravy to increase moisture content (NB: Sauces and gravies should be served at the required thickness level)</li> <li>• Refer to <i>Special Notes (page S72)</i></li> </ul>
<b>Testing Information</b>	<ul style="list-style-type: none"> <li>• Targeted particle size for infants and children = less than half that for adults and children over 5 years or equal to 0.8 cm (based on tracheal size)<sup>28</sup></li> <li>• Targeted particle size for children over 5 years and adults = 1.5 × 1.5 cm<sup>10,27,30</sup></li> </ul>

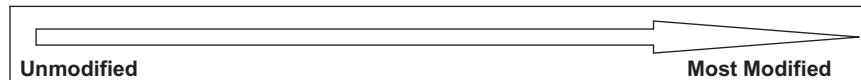
## Texture A—Soft

Recommended foods and those to avoid (examples only)

	<i>Recommended foods</i>	<i>Avoid</i>
Bread, cereals, rice, pasta, noodles	<ul style="list-style-type: none"> <li>• Soft sandwiches<sup>(a)</sup> with very moist fillings, for example egg and mayonnaise, hummus (remove crusts and avoid breads with seeds and grains)</li> <li>• Breakfast cereals well moistened with milk<sup>(b)</sup></li> <li>• Soft pasta<sup>(a)</sup> and noodles</li> <li>• Rice (well cooked)</li> <li>• Soft pastry, for example quiche with a pastry base</li> <li>• Other, soft, cooked grains</li> </ul>	<ul style="list-style-type: none"> <li>• Dry or crusty breads, breads with hard seeds or grains, hard pasty, pizza</li> <li>• Sandwiches that are not thoroughly moist</li> <li>• Course or hard breakfast cereals that do not moisten easily, for example toasted muesli, bran cereals</li> <li>• Cereals with nuts, seeds and dried fruit</li> </ul>
Vegetables, legumes	<ul style="list-style-type: none"> <li>• Well cooked vegetables<sup>(a)</sup> served in small pieces or soft enough to be mashed or broken up with a fork</li> <li>• Soft canned vegetables, for example peas</li> <li>• Well cooked legumes (the outer skin must be soft), for example baked beans</li> </ul>	<ul style="list-style-type: none"> <li>• All raw vegetables (including chopped and shredded)</li> <li>• Hard, fibrous or stringy vegetables and legumes, for example sweet corn, broccoli stalks</li> </ul>
Fruit	<ul style="list-style-type: none"> <li>• Fresh fruit pieces that are naturally soft, for example banana, well-ripened pawpaw</li> <li>• Stewed and canned fruits in small pieces</li> <li>• Pureed fruit</li> <li>• Fruit juice<sup>(b)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Large/round fruit pieces that pose a choking risk, for example whole grapes, cherries</li> <li>• Dried fruit, seeds and fruit peel</li> <li>• Fibrous fruits, for example pineapple</li> </ul>
Milk, yoghurt, cheese	<ul style="list-style-type: none"> <li>• Milk, milkshakes, smoothies<sup>(b)</sup></li> <li>• Yoghurt (may contain soft fruit)<sup>(b)</sup></li> <li>• Soft cheeses,<sup>(a)</sup> for example Camembert, ricotta</li> </ul>	<ul style="list-style-type: none"> <li>• Yoghurt with seeds, nuts, muesli or hard pieces of fruit</li> <li>• Hard cheeses, for example cheddar and hardened/crispy cooked cheese</li> </ul>
Meat, fish, poultry, eggs, nuts, legumes	<ul style="list-style-type: none"> <li>• Casseroles with small pieces of tender meat<sup>(a)</sup></li> <li>• Moist fish (easily broken up with the edge of a fork)</li> <li>• Eggs<sup>(a)</sup> (all types except fried)</li> <li>• Well cooked legumes (the outer skin must be soft), for example baked beans</li> <li>• Soft tofu, for example small pieces, crumbled</li> </ul>	<ul style="list-style-type: none"> <li>• Dry, tough, chewy, or crispy meats</li> <li>• Meat with gristle</li> <li>• Fried eggs</li> <li>• Hard or fibrous legumes</li> <li>• Pizza</li> </ul>
Desserts	<ul style="list-style-type: none"> <li>• Puddings, dairy desserts,<sup>(b)</sup> custards,<sup>(b)</sup> yoghurt<sup>(b)</sup> and ice-cream<sup>(b)</sup> (may have pieces of soft fruit)</li> <li>• Moist cakes (extra moisture, e.g. custard may be required)</li> <li>• Soft fruit-based desserts without hard bases, crumbly or flaky pastry or coconut, for example apple crumble</li> <li>• Creamed rice, moist bread and butter pudding</li> </ul>	<ul style="list-style-type: none"> <li>• Dry cakes, pastry, nuts, seeds, coconut, dried fruit, pineapple</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>• Soup<sup>(b)</sup>—(may contain small soft lumps, e.g. pasta)</li> <li>• Soft fruit jellies or non-chewy lollies<sup>(a)</sup></li> <li>• Soft, smooth, chocolate</li> <li>• Jams and condiments without seeds or dried fruit</li> </ul>	<ul style="list-style-type: none"> <li>• Soups with large pieces of meats or vegetables, corn, or rice</li> <li>• Sticky or chewy foods, for example toffee</li> <li>• Popcorn, chips, biscuits, crackers, nuts, edible seeds</li> </ul>

<sup>(a)</sup> These foods require case-by-case consideration.

<sup>(b)</sup> These foods may need modification for individuals requiring thickened fluids.



<b>Unmodified - Regular Foods</b>	<b>Texture A – Soft</b>	<b>Texture B – Minced and Moist</b>	<b>Texture C – Smooth Pureed</b>
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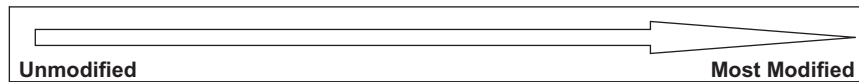
<b>NAME</b>	<b>TEXTURE B – MINCED AND MOIST</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Food in this category is soft and moist and should easily form into a ball</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Individual uses tongue rather than teeth to break the small lumps in this texture</li> <li>• Food is soft and moist and should easily form into a ball</li> <li>• Food should be easily mashed with a fork</li> <li>• May be presented as a thick puree with obvious lumps in it</li> <li>• Lumps are soft and rounded (no hard or sharp lumps)</li> <li>• Refer to <i>Special Notes</i> (page S72)</li> </ul>
<b>Testing Information</b>	<ul style="list-style-type: none"> <li>• Recommended particle size for infants and children = 0.2–0.5 cm (based on tracheal size)<sup>28</sup></li> <li>• Recommended particle size for children over 5 years and adults = 0.5 cm<sup>10,29</sup></li> </ul>

**Texture B—Minced and moist**

Recommended foods and those to avoid (examples only)

	<i>Recommended foods</i>	<i>Avoid (in addition to the Foods to Avoid listed for Texture A—Soft)</i>
Bread, cereals, rice, pasta, noodles	<ul style="list-style-type: none"> <li>• Breakfast cereal with small moist lumps, for example porridge or wheat flake biscuits soaked in milk</li> <li>• Gelled bread</li> <li>• Small, moist pieces of soft pasta, for example moist macaroni cheese (some pasta dishes may require blending or mashing)</li> </ul>	<ul style="list-style-type: none"> <li>• All breads, sandwiches, pastries, crackers, and dry biscuits</li> <li>• Gelled breads that are not soaked through the entire food portion</li> <li>• Rice that does not hold together, for example parboiled, long-grain, basmati</li> <li>• Crispy or dry pasta, for example edges of a pasta bake or lasagne</li> </ul>
Vegetables, legumes	<ul style="list-style-type: none"> <li>• Tender cooked vegetables that are easily mashed with a fork</li> <li>• Well cooked legumes (partially mashed or blended)</li> </ul>	<ul style="list-style-type: none"> <li>• Vegetable pieces larger than 0.5 cm or too hard to be mashed with a fork</li> <li>• Fibrous vegetables that require chewing, for example peas</li> </ul>
Fruit	<ul style="list-style-type: none"> <li>• Mashed soft fresh fruits, for example banana, mango</li> <li>• Finely diced soft pieces of canned or stewed fruit</li> <li>• Pureed fruit</li> <li>• Fruit juice<sup>(a)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Fruit pieces larger than 0.5 cm</li> <li>• Fruit that is too hard to be mashed with a fork</li> </ul>
Milk, yoghurt, cheese	<ul style="list-style-type: none"> <li>• Milk, milkshakes, smoothies<sup>(a)</sup></li> <li>• Yoghurt<sup>(a)</sup> (may have small soft fruit pieces)</li> <li>• Very soft cheeses with small lumps, for example cottage cheese</li> </ul>	<ul style="list-style-type: none"> <li>• Soft cheese that is sticky or chewy, for example Camembert</li> </ul>
Meat, fish, poultry, eggs, nuts, legumes	<ul style="list-style-type: none"> <li>• Coarsely minced, tender, meats with a sauce. Casseroles dishes may be blended to reduce the particle size</li> <li>• Coarsely blended or mashed fish with a sauce</li> <li>• Very soft and moist egg dishes, for example scrambled eggs, soft quiches</li> <li>• Well cooked legumes (partially mashed or blended)</li> <li>• Soft tofu, for example small soft pieces or crumbled</li> </ul>	<ul style="list-style-type: none"> <li>• Casserole or mince dishes with hard or fibrous particles, for example peas, onion</li> <li>• Dry, tough, chewy, or crispy egg dishes or those that cannot be easily mashed</li> </ul>
Desserts	<ul style="list-style-type: none"> <li>• Smooth puddings, dairy desserts,<sup>(a)</sup> custards,<sup>(a)</sup> yoghurt<sup>(a)</sup> and ice-cream<sup>(a)</sup> (may have small pieces of soft fruit)</li> <li>• Soft moist sponge cake desserts with lots of custard, cream or ice-cream, for example trifle, tiramisu</li> <li>• Soft fruit-based desserts <i>without</i> hard bases, crumbly or flaky pastry or coconut, for example apple crumble with custard</li> <li>• Creamed rice</li> </ul>	<ul style="list-style-type: none"> <li>• Desserts with large, hard or fibrous fruit particles (e.g. sultanas), seeds or coconut</li> <li>• Pastry and hard crumble</li> <li>• Bread-based puddings</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>• Soup<sup>(a)</sup>—(may contain small soft lumps, e.g. pasta)</li> <li>• Plain biscuits dunked in hot tea or coffee and completely saturated</li> <li>• Salsa's, sauces and dips with small soft lumps</li> <li>• Very soft, smooth, chocolate</li> <li>• Jams and condiments without seeds or dried fruit</li> </ul>	<ul style="list-style-type: none"> <li>• Soups with large pieces of meats or vegetables, corn, or rice</li> <li>• Lollies including fruit jellies and marshmallow</li> </ul>

<sup>(a)</sup> These foods may require modification for individuals requiring thickened fluids.



Unmodified - Regular Foods	Texture A – Soft	Texture B – Minced and Moist	Texture C – Smooth Pureed
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NAME	TEXTURE C – SMOOTH PUREED
<b>Description</b>	<ul style="list-style-type: none"> <li>• Food in this category is smooth and lump free. It is similar to the consistency of commercial pudding. At times, smooth pureed food may have a grainy quality, but should not contain lumps.</li> <li>• Refer to <i>Special Notes</i> (page S72)</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Smooth and lump free but may have a grainy quality</li> <li>• Moist and cohesive enough to hold its shape on a spoon (i.e. when placed side by side on a plate these consistencies would maintain their position without 'bleeding' into one another)</li> <li>• Food could be moulded, layered or piped</li> </ul>
<b>Testing information</b>	<ul style="list-style-type: none"> <li>• Cohesive enough to hold its shape on a spoon (i.e. when placed side by side on a plate these consistencies would maintain their position <i>without</i> 'bleeding' into one another)</li> </ul>
<b>Special Note</b>	<ul style="list-style-type: none"> <li>• Some individuals may benefit from the use of a <i>runny pureed</i> texture. This texture would be prescribed on a case by case basis. (Runny pureed textures do not hold their shape; they bleed into one another when placed side by side on a plate).</li> </ul>



**Texture C—Smooth pureed**

Recommended foods and those to avoid (examples only)

	<i>Recommended foods</i>	<i>Avoid (in addition to the Foods to Avoid listed for Texture B—Minced and Moist)</i>
Bread, cereals, rice, pasta, noodles	<ul style="list-style-type: none"> <li>• Smooth lump-free breakfast cereals, for example semolina, pureed porridge</li> <li>• Gelled bread</li> <li>• Pureed pasta or noodles</li> <li>• Pureed rice</li> </ul>	<ul style="list-style-type: none"> <li>• Cereals with course lumps or fibrous particles, for example all dry cereals, porridge</li> <li>• Gelled breads that are not soaked through the entire food portion</li> </ul>
Vegetables, legumes	<ul style="list-style-type: none"> <li>• Pureed vegetables</li> <li>• Mashed potato</li> <li>• Pureed legumes, for example baked beans (ensuring no husks in final puree)</li> <li>• Vegetable soups that have been blended or strained to remove lumps<sup>(a)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Coarsely mashed vegetables</li> <li>• Particles of vegetable fibre or hard skin</li> </ul>
Fruit	<ul style="list-style-type: none"> <li>• Pureed fruits, for example commercial pureed fruits, vitamised fresh fruits</li> <li>• Well mashed banana</li> <li>• Fruit Juice<sup>(a)</sup> without pulp</li> </ul>	<ul style="list-style-type: none"> <li>• Pureed fruit with visible lumps</li> </ul>
Milk, yoghurt, cheese	<ul style="list-style-type: none"> <li>• Milk, milkshakes, smoothies<sup>(a)</sup></li> <li>• Yoghurt<sup>(a)</sup> (lump-free), for example plain or vanilla</li> <li>• Smooth cheese pastes, for example smooth ricotta</li> <li>• Cheese and milk-based sauces<sup>(a)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• All solid and semi-solid cheese including cottage cheese</li> </ul>
Meat, fish, poultry, eggs, nuts, legumes	<ul style="list-style-type: none"> <li>• Pureed meat/fish (pureed with sauce/gravy to achieve a thick moist texture)</li> <li>• Soufflés and mousses, for example salmon mousse</li> <li>• Pureed legumes, hummus</li> <li>• Soft silken tofu</li> <li>• Pureed scrambled eggs</li> </ul>	<ul style="list-style-type: none"> <li>• Minced or partially pureed meats</li> <li>• Scrambled eggs that have not been pureed</li> <li>• Sticky or very cohesive foods, for example peanut butter</li> </ul>
Desserts	<ul style="list-style-type: none"> <li>• Smooth puddings, dairy desserts,<sup>(a)</sup> custards,<sup>(a)</sup> yoghurt<sup>(a)</sup> and ice-cream<sup>(a)</sup></li> <li>• Gelled cakes or cake slurry, for example fine sponge cake saturated with jelly</li> <li>• Soft meringue</li> <li>• Cream<sup>(a)</sup>, syrup dessert toppings<sup>(a)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Desserts with fruit pieces, seeds, nuts, crumble, pastry or non-pureed garnishes</li> <li>• Gelled cakes or cake slurries that are not soaked through the entire food portion</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>• Soup<sup>(a)</sup>—vitamised or strained to remove lumps</li> <li>• Smooth jams, condiments and sauces</li> </ul>	<ul style="list-style-type: none"> <li>• Soup with lumps</li> <li>• Jams and condiments with seeds, pulps or lumps</li> </ul>

<sup>(a)</sup> These foods may require modification for individuals requiring thickened fluids.

## SPECIAL NOTES

### Foods and other items requiring special consideration for individuals with dysphagia

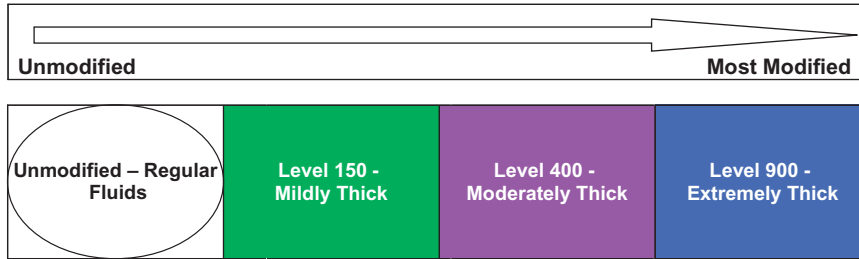
The following foods were identified as requiring emphasis.

Bread	<ul style="list-style-type: none"> <li>Bread requires an ability to both bite and chew. Chewing stress required for bread is similar to that of raw apple. The muscle activity required for each chew of bread is similar to that required to chew peanuts.<sup>35</sup> For this reason, individuals who fatigue easily may find bread difficult to chew</li> <li>Bread requires moistening with saliva for effective mastication. Bread does not dissolve when wet; it clumps. It poses a choking risk if it adheres to the roof of the mouth, pockets in the cheeks or if swallowed in a large clump. This is similar to the noted choking effect of 'chunks' of peanut butter<sup>36</sup></li> </ul>
Ice-cream	<ul style="list-style-type: none"> <li>Ice-cream is often excluded on diets for individuals who require thickened fluids. This is because ice-cream melts and becomes like a thin liquid at room temperature or within the oral cavity</li> </ul>
Jelly	<ul style="list-style-type: none"> <li>Jelly may be excluded from diets for individuals who require thickened fluids. This is because jelly particulates in the mouth if not swallowed promptly</li> </ul>
Soup	<ul style="list-style-type: none"> <li>Individuals who require thickened fluids will require their soups thickened to the same consistency as their fluids unless otherwise advised by a speech pathologist</li> </ul>
'Mixed' or 'dual' consistencies	<ul style="list-style-type: none"> <li>These textures are difficult for people with poor oral control to safely contain and manipulate within the mouth</li> <li>These are consistencies where there is a solid as well as a liquid present in the same mouthful</li> <li>Examples include individual cereal pieces in milk (e.g. cornflakes in milk), fruit punch, minestrone soup, commercial diced fruit in juice, watermelon</li> </ul>
Special occasion foods or fluids	<ul style="list-style-type: none"> <li>Special occasion foods (e.g. chocolates, birthday cake) should be well planned to ensure that they are appropriate for individuals requiring texture-modified foods and/or thickened fluids</li> </ul>
Nutritional supplements	<ul style="list-style-type: none"> <li>For individuals who also required thickened fluids, nutritional supplements may require thickening to the same level of thickness</li> </ul>
Medication	<ul style="list-style-type: none"> <li>Individuals on Texture C—Smooth Pureed are unsuitable for oral administration of whole tablets or capsules. Consult with medical and pharmaceutical staff</li> <li>Individuals requiring any form of texture-modified food or fluids may have difficulty swallowing medications. Seek advice if in doubt</li> </ul>

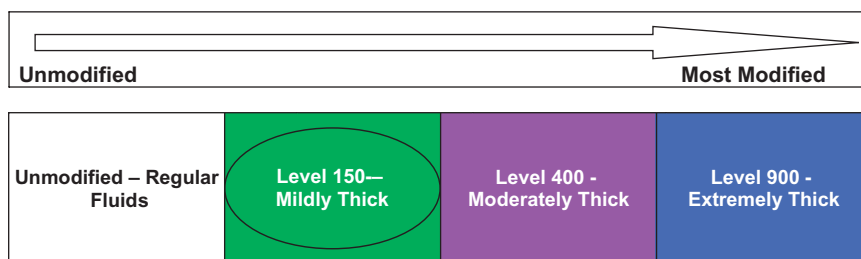
#### Characteristics of foods that pose a choking risk

Stringy	Rhubarb, beans
Crunchy	Celery is considered a choking risk until three years of age <sup>37,38</sup>
Crumbly	Popcorn, toast, dry biscuits, chips/crisps <sup>39</sup>
Hard or dry foods	Dry cakes or biscuits <sup>39</sup>
Floppy textures	Nuts, raw broccoli, raw cauliflower, apple, crackling, hard crusted rolls/breads, seeds
Fibrous or 'tough' foods	Raw carrots are considered a choking risk until three years of age <sup>37–41</sup>
Skins and outer shells	Lettuce, cucumber, uncooked baby spinach leaves (adheres to mucosa when moist—conforming material) <sup>42</sup>
Round or long shaped	Steak, pineapple <sup>39</sup>
Chewy or sticky	Corn, peas, apple with peel, grapes <sup>38,40,41</sup>
Husks	Whole grapes, whole cherries, raisins, hot dogs, sausages <sup>40,41</sup>
'Mixed' or 'dual' consistencies	Lollies (adhere to mucosa); cheese chunks, fruit roll-ups, gummy lollies, marshmallows, chewing gum, sticky mashed potato, dried fruits <sup>36,41–43</sup>
	Corn, bread with grains, shredded wheat, bran <sup>38,41</sup>
	Foods that retain solids within a liquid base (e.g. minestrone soup, breakfast cereal, e.g. cornflakes with milk); watermelon <sup>44</sup>

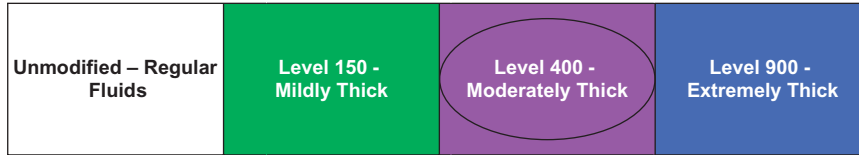
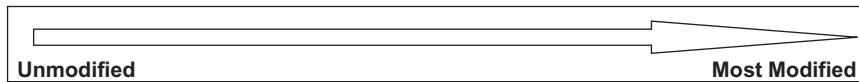
## Fluid thickness grading scale for the clinical management of dysphagia



NAME	UNMODIFIED – REGULAR FLUIDS
	<ul style="list-style-type: none"> <li>• There are various thickness levels in unmodified fluids. Some are thinner (eg water, and breast milk) and some are thicker (eg fruit nectar)</li> <li>• Unmodified - Regular fluids do not have thickening agents added to them</li> </ul>
Flow rate	<ul style="list-style-type: none"> <li>• ‘Very fast - fast flow’</li> </ul>
Characteristics	<ul style="list-style-type: none"> <li>• Drink through any type of teat, cup or straw as appropriate for age and skills</li> </ul>
Testing information	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

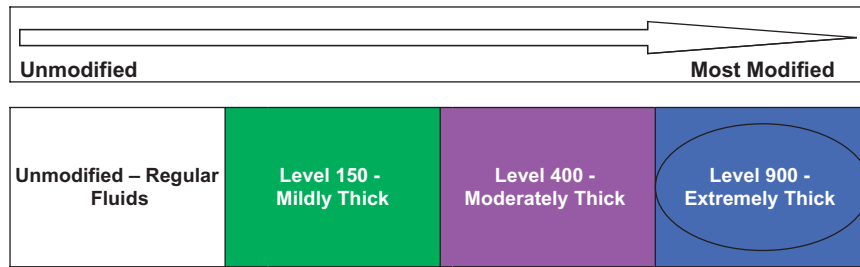


<b>NAME</b>	<b>LEVEL 150 – MILDLY THICK</b>  Level 150 – Mildly Thick is <i>thicker than</i> naturally thick fluids such as fruit nectars, but for example, not as thick as a thickshake
<b>Flow rate</b>	<ul style="list-style-type: none"> <li>Steady, fast flow</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>Pours quickly from a cup but slower than regular, unmodified fluids</li> <li>May leave a coating film of residue in the cup after being poured</li> <li>Drink this fluid thickness from a cup</li> <li>Effort required to take this thickness via a standard bore straw</li> </ul>
<b>Testing information</b>	<ul style="list-style-type: none"> <li>Subjectively, fluids at this thickness run fast through the prongs of a fork, but leave a mild coating on the prongs</li> <li>Testing scales for viscosity exist but are not formalised or standardised, and therefore are not included</li> </ul>
<b>Special Note</b>	<ul style="list-style-type: none"> <li>Breast milk or infant formula may be thickened for the therapeutic treatment of dysphagia in infants. This fluid thickness is <i>thinner</i> than <b>Level 150 – Mildly Thick</b>. However, it is thicker than unmodified breast milk or infant formula. It is the same thickness as commercially available ‘Anti-regurgitation’ (AR) formula.</li> <li>Consideration should be given to flow through a teat as determined on a case-by-case basis</li> </ul>



<b>NAME</b>	<b>LEVEL 400 – MODERATELY THICK</b>  Level 400 – Moderately Thick is similar to the thickness of room temperature honey or a thickshake
<b>Flow rate</b>	<ul style="list-style-type: none"> <li>• ‘Slow flow’</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Cohesive and pours slowly</li> <li>• Possible to drink directly from a cup although fluid flows very slowly</li> <li>• Difficult to drink using a straw, even if using a wide bore straw</li> <li>• Spooning this fluid into the mouth may be the best way of taking this fluid</li> </ul>
<b>Testing information</b>	<ul style="list-style-type: none"> <li>• Subjectively, fluids at this thickness slowly drip in dollops through the prongs of a fork</li> <li>• Testing scales for viscosity exist but are not formalised or standardised, and therefore are not included</li> </ul>





<b>NAME</b>	<b>LEVEL 900 – EXTREMELY THICK</b>  Level 900 – Extremely Thick is similar to the thickness of pudding or mousse
<b>Flow rate</b>	<ul style="list-style-type: none"> <li>• ‘No flow’</li> </ul>
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Cohesive and holds its shape on a spoon</li> <li>• It is <i>not</i> possible to pour this type of fluid from a cup into the mouth</li> <li>• It is <i>not</i> possible to drink this thickness using a straw.</li> <li>• Spoon is the optimal method for taking this type of fluid.</li> <li>• This fluid is <i>too thick</i> if the spoon is able to stand upright in it unsupported</li> </ul>
<b>Testing information</b>	<ul style="list-style-type: none"> <li>• Subjectively, fluids at this thickness sit on and do not flow through the prongs of a fork</li> <li>• Testing scales for viscosity exist but are not formalised or standardised, and therefore are not included</li> </ul>

Reference numbers throughout the Appendix refer to references contained in The Australian Standardized Terminology and Definitions for Texture Modified Foods and Fluids. *Nutrition & Dietetics* 2007; 64 (Suppl. 2): S53–S76.