The International Dysphagia Diet Standardisation Initiative

www.iddsi.org
**IDDSI Disclosure**

- The International Dysphagia Diet Standardisation Initiative receives funding from a variety of industry sources.

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**Sponsors and Supporters**

<table>
<thead>
<tr>
<th>Professional Associations:</th>
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</thead>
<tbody>
<tr>
<td>• Academy of Nutrition and Dietetics</td>
</tr>
<tr>
<td>• Africa Alzheimer’s Congress</td>
</tr>
<tr>
<td>• American Speech-Language-Hearing Association</td>
</tr>
<tr>
<td>• British Dietetic Association</td>
</tr>
<tr>
<td>• Canadian Association of Occupational Therapists</td>
</tr>
<tr>
<td>• Canadian Association of Speech-Language Pathologists and Audiologists</td>
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<tr>
<td>• Dietitians Association of Australia</td>
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<tr>
<td>• Dietitians of Canada</td>
</tr>
<tr>
<td>• Lung Association Australia</td>
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<tr>
<td>• Speech-Language and Hearing Association Singapore</td>
</tr>
<tr>
<td>• Speech Pathology Australia</td>
</tr>
<tr>
<td>• World Congress on Healthy Ageing</td>
</tr>
</tbody>
</table>

**International Societies:**

- Dysphagia Research Society
- National Foundation of Swallowing Disorders
“Thickening liquids has been and continues to be one of the most frequently used compensatory interventions [for dysphagia] in hospitals and long-term care facilities.”

Robbins, Nicosia, Hind, Gill, Blanco & Logemann, 2002
Development and Dissemination of an Aspiration Risk Reduction Diet

Jean Curran, MS, RD and Michael E. Groher, PhD
Department of Veterans Affairs Medical Center New York, New York

Abstract. Patients with oropharyngeal swallowing disorders secondary to neurologic impairments benefit from diets that minimize the risk of aspiration. An aspiration risk reduction diet was developed from our hospital's regular menu cycle. Examples of the diet's preparation, dissemination, and use in a 600-bed acute medical/surgical teaching hospital are discussed.

Key words: Swallowing, rehabilitation — Diet, therapeutic — Aspiration, risk reduction — Deglutition — Deglutition disorders
Which One of These Is Not Like the Others? An Inter-Hospital Study of the Viscosity of Thickened Fluids

This investigation examined the rheological (viscosity and yield stress) and material property (density) characteristics of the thickened meal-time and videofluoroscopy fluids provided by 10 major metropolitan hospitals. Differences in the thickness of thickened fluids were considered as a source of variability and potential hazard for inter-hospital transfers of dysphagia patients. The results indicated considerable differences in the viscosity, density, and yield stress of both meal-time and videofluoroscopy fluids. In theory, the results suggest that dysphagia patients transferred between hospitals could be placed on inappropriate levels of fluid thickness because of inherent differences in the rheology and material property characteristics of the fluids provided by different hospitals. Slowed improvement or medical complications are potential worst-case scenarios for dysphagia patients if the difference between the thick fluids offered by 2 hospitals are extreme. The investigation outlines the most appropriate way to assess the rheological and material property characteristics of thickened fluids. In addition, it suggests a plan of quality improvement to reduce the variability of the thickness of fluids offered at different hospitals.

KEY WORDS: dysphagia, rheology, viscosity, quality improvement, thickened fluids
What’s in a name?

In Australia...
39 different names for 4 levels of liquid thickness
95 different labels for 4 different levels of texture modified food

Atherton et al. (2007) Nutrition & Dietetics, 64 Suppl 2: S53-S76
Describe this food texture...
CORONERS ACT, 1975 AS AMENDED

SOUTH AUSTRALIA

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady
the Queen at Adelaide in the State of South
Australia, on the 7th day of April, and 8th day of
May, 1997, before W C Chivell, a Coroner for the
said State, concerning the death of G M.

Vitamized (Pureed)

Soft

Soft (minced meats)
and Normal
(soft vegetables)
Clinical Questions (examples)

• How thick is nectar?
• Are nutritional supplements (already) nectar-thick?
• Is barium (already) a nectar-thick liquid?
• How much thickener do I need to add to make a nectar-thick liquid?
• Is ice-cream a thin liquid when it melts?
• How do I know if a liquid is TOO thick for my patient?
Why do we need a standardised system?

• Safety
  – Multiple labels and definitions cause confusion
  – Staff within and between institutions
    • Dietitians
    • Speech pathologists
    • Food services
    • Nurses
    • Family/Care providers
    • Individuals with swallowing difficulties
Why do we need a standardised system?

• **Clinical efficiency**
  – Avoids re-assessment to determine safe fluid and diet levels

• **Development of clinical evidence and conducting research**
  – Lack of consistency

• **Commercial implications**
  – ‘ready to use/off-the-shelf’ items that are consistent from manufacturer/supplier to manufacturer/supplier and similar to those produced in hospitals/care facilities/at home
What did IDDSI set out to do?

- Number of food texture and fluid thickness levels for international standardized use (adult + paediatric)
- Standard names/identifiers for each food and fluid level AND measurement guidelines
- Examples of foods appropriate for each level, including culturally specific foods
- Input + consensus from international key stakeholders
- Publish + communicate the international standards
### Four stage plan... 2013-2015

| Stage 1 | Collaboration + consolidation of existing data  
(Completed August 2013) |
|---------|--------------------------------------------------------------------------------------------------|
| Stage 2 | Gather the evidence  
Stakeholder Surveys (completed, 2013)  
Systematic Review (completed Nov., 2014) |
| Stage 3 | Interlace technical + research evidence with clinical and cultural needs  
Task force meeting to develop framework (Jan, 2015)  
Feedback survey on draft framework (May, 2015) |
| Stage 4 | Consolidation + dissemination  
(July-December, 2015)  
Publication planned for 2016 |
What Do We Know So Far?

The Need for International Terminology and Definitions for Texture-Modified Foods and Thickened Liquids Used in Dysphagia Management: Foundations of a Global Initiative

Julie A. Y. Cichero · Catriona Steele · Janice Duivestein · Pere Clavé · Jianshe Chen · Jun Kayashita · Roberto Dantas · Caroline Lecko · Renee Speyer · Peter Lam · Joseph Murray
National Standards

USA, UK, Australia, New Zealand, Ireland, Sweden, Denmark, Japan
### Published International terminology for Texture Modified Food

<table>
<thead>
<tr>
<th>Country</th>
<th>Regular food</th>
<th>Dysphagia Advanced (bite sized, &lt; 2.5cm)</th>
<th>Dysphagia mechanically altered (0.6cm)</th>
<th>Extensively texture modified food</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA (NDD)</td>
<td>Regular</td>
<td>Texture E - Fork mashable dysphagia diet (1.5cm)</td>
<td>Texture D - Pre-meshed dysphagia diet (0.2cm)</td>
<td>Texture C - Thick Puree dysphagia Diet</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Texture A - Soft (1.5cm)</td>
<td>Texture B - Minced + Moist (0.5cm)</td>
<td>Texture C - Smooth pureed</td>
<td>Texture B - Thin Puree dysphagia diet</td>
</tr>
<tr>
<td>Australia</td>
<td>Regular</td>
<td>Texture A - Soft (1.5cm)</td>
<td>Texture B - Minced + Moist (0.5cm)</td>
<td>Texture C - Smooth pureed</td>
</tr>
<tr>
<td>Ireland</td>
<td>Texture A - Soft</td>
<td>Texture B - Minced and Moist</td>
<td>Texture C - Smooth pureed</td>
<td>Texture D - Liquidised</td>
</tr>
<tr>
<td>Japan</td>
<td>Level 5 Normal diet</td>
<td>Level 4 Soft food</td>
<td>Level 3 (Dysphagia Diet) Paste containing meat/fish</td>
<td>Level 2 (Dysphagia Diet) Jelly food with protein (Rough jelly surface)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Level 1 (Dysphagia Diet) Smooth jelly food with protein, except for meat and fish</td>
<td>Level 0 (Test Food) Smooth jelly food without protein</td>
</tr>
<tr>
<td>Canada</td>
<td>Easy to chew or Regular / General / Dysphagia General</td>
<td>Chopped or diced / Dysphagia Soft / Dysphagia soft + minced / stage 3 / Level 3 / Dental soft / Easy to chew with minced meat / cut up</td>
<td>Advanced Minced / Minced with finger foods / Diced / Chopped / Soft minced</td>
<td>Mincing / Mashed / Modified minced / Dysphagia Fully totally minced / Level 2 mechanical / minced moist / minced meat modified vegetables</td>
</tr>
<tr>
<td>Spain</td>
<td>Normal</td>
<td>Soft</td>
<td>Puree</td>
<td>Blenderized / liquidized</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Normal</td>
<td>Normal with soft meat/fish/chicken - no particulates (e.g., peas, rice)</td>
<td>Mashed</td>
<td>Puree</td>
</tr>
<tr>
<td>Brazil</td>
<td>Regular or Cut</td>
<td>Coarsa Raté</td>
<td>Timbales</td>
<td>Jellied products</td>
</tr>
<tr>
<td>Sweden</td>
<td>Regular or Cut</td>
<td>Coarsa Raté</td>
<td>Timbales</td>
<td>Jellied products</td>
</tr>
</tbody>
</table>
# Liquids

## Published International Terminology for Thickened Liquids

<table>
<thead>
<tr>
<th>Country</th>
<th>&lt; “Water-like”</th>
<th>Nectar-like (51-350 cP&lt;sup&gt;a&lt;/sup&gt;)</th>
<th>Honey-like (351-1750 cP&lt;sup&gt;a&lt;/sup&gt;)</th>
<th>“Pudding-like” &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA (NDD)</td>
<td>Thin (1-50 cP&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>Naturally thick fluid</td>
<td>Thickened fluid – stage 1</td>
<td>Spoon-thick (&gt;1750 cP&lt;sup&gt;a&lt;/sup&gt;)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Thin</td>
<td>Naturally thick fluid</td>
<td>Thickened fluid – stage 1</td>
<td>Thickened fluid – Stage 3</td>
</tr>
<tr>
<td>Australia</td>
<td>Regular</td>
<td>Grade 1 – Very mildly thick</td>
<td>Level 150 – Moderately thick</td>
<td>Level 900 – Extremely thick</td>
</tr>
<tr>
<td>Ireland</td>
<td>Regular</td>
<td>Grade 2 – Mildly thick</td>
<td>Level 400 – Moderately thick</td>
<td>Grade 4 – Extremely thick</td>
</tr>
<tr>
<td>Japan</td>
<td>Less mildly thick (&lt; 50 mPa.s&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>Mildly thick (50-150 mPa.s&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>Moderately thick (150-300 mPa.s&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>Extremely thick (300-500 mPa.s&lt;sup&gt;a&lt;/sup&gt;)</td>
</tr>
<tr>
<td>(JSER scheme)</td>
<td></td>
<td>Over Extremely thick (&gt; 500 mPa.s&lt;sup&gt;a&lt;/sup&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>Normal</td>
<td>Chocolate milk</td>
<td>Syrup</td>
<td>Jelly</td>
</tr>
<tr>
<td>Spain</td>
<td>Thin</td>
<td>‘Thickened’</td>
<td>Medium</td>
<td>Full protection/thick/pudding</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Thin</td>
<td>‘Thickened’</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>Normal or thin</td>
<td>Thicker liquid</td>
<td>Nectar or Honey</td>
<td>Pudding-like</td>
</tr>
<tr>
<td>Sweden</td>
<td>Liquids</td>
<td>Thickened liquids</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Shear rate 50 sec<sup>-1</sup>. Both cP and mPa.s are used in literature as the unit of viscosity; 1 cP = 1 mPa.s.
Global implications

• Robbins et al. (2008) Protocol 201
  – Conclusion: “individuals on honey-thick liquids had poorer outcomes than individuals on nectar-thick liquids”.
  – Quoted viscosity of their ‘nectar-thick’ was 300cP and ‘honey-thick’ was 3,000cP
  – Current recommended terminology in USA for ‘honey-thick’ liquids is between 351 and 1750 cP

• Potential for research findings to be misinterpreted due to terminology confusion

‘honey’?
Are we all talking the same language?
Current Practice Survey

August 2013 – January 2014

- Health Professionals & Food Services
- Persons with Dysphagia, Carer & Care Organisations
- Researchers
- Industry Partners – Texture Modified Foods & Thickened Liquids
Health Professionals & Food Service Survey

Most commonly 4-5 levels food textures reported

1 2 3 4 5

16% use a colour, number [1,II] or scheme to identify TM foods
# Names of Texture Modified Foods

54 different terms for regular + 5 levels of texture modified foods

<table>
<thead>
<tr>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular/Normal/Full/standard/solid</td>
</tr>
<tr>
<td>Soft (dental soft/mechanical soft/chopped/diced/cut up)</td>
</tr>
<tr>
<td>Mashed (fork mashed, pre-mashed)</td>
</tr>
<tr>
<td>Minced/mechanically altered/ Ground/shredded</td>
</tr>
<tr>
<td>Puree</td>
</tr>
<tr>
<td>Liquidised</td>
</tr>
</tbody>
</table>
Health Professionals & Food Service Survey

Most commonly 3-4 levels of liquid thicknesses most often reported

25% use a colour, number [1,II] or scheme to identify Thickened liquids
# Names of thickened liquids

27 different terms for regular + 4 levels of thickened liquids

<table>
<thead>
<tr>
<th>Thin/Normal/Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syrup/Slightly thick/Naturally thick</td>
</tr>
<tr>
<td>Nectar/Mildly thick/Grade 1/stage 1/Level 150</td>
</tr>
<tr>
<td>Honey/moderately thick/custard/Grade 2/Stage 3/Level 400</td>
</tr>
<tr>
<td>Pudding/ Level 3/Level 4/ Extremely thick/ Level 900/Spoon thick</td>
</tr>
</tbody>
</table>
Are we all talking the same language?
The Influence of Food Texture and Liquid Consistency Modification on Swallowing Physiology and Function: A Systematic Review

Catriona M. Steele · Woroud Abdulrahman Alsanei · Sona Ayanikalath · Carly E. A. Barbon · Jianshe Chen · Julie A. Y. Cichero · Kim Coutts · Roberto O. Dantas · Janice Duivestein · Lidia Giosa · Ben Hanson · Peter Lam · Caroline Lecko · Chelsea Leigh · Ahmed Nagy · Ashwini M. Namasivayam · Weslania V. Nascimento · Inge Odendaal · Christina H. Smith · Helen Wang

Received: 24 July 2014 / Accepted: 10 September 2014
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There **IS** evidence that thickening helps those who aspirate thin liquids

There **is ALSO** evidence that there is such a thing as “too thick”, where residue begins to accumulate

There is **NO specific evidence** to point to particular rheological values that define the boundaries of effective thickening (either just thick enough or too thick)
Putting all together...

Developing a culturally-sensitive, age-span relevant framework for classifying food and liquid consistency.
IDDSI Framework (September, 2015)
What are Transitional Foods?

• Foods that start as one texture and change into another with moisture or temperature
• Minimal chewing required
• Tongue pressure may be sufficient to break food down after alteration in moisture or temperature
Comments on visual appraisal

Study by Mills et al. cited in NDD, 2002

- 20 dietary technicians prepared barium materials (barium plus a base liquid) until stimuli “looked and poured like the dietary liquid it was supposed to mimic”

- “Using this method, the resultant viscosities of the thin and thick liquid test materials were vastly more viscous than real dietary liquids, and varied widely across the DMTs”

- Conclusion: “there is significant opportunity for false negative errors when test stimuli are prepared in this manner”
**Line-Spread Procedure:**

1. Place glass plate or clear plastic over concentric circles. The surface must be level and even.
2. Place cylinder over center circle and fill with liquid to be used in test. Level off and ensure the temperature is recorded.
3. Lift the cylinder and allow liquid to spread for 1 minute. (Note: Paste-consistency liquids will appear to stop spreading by ~ 15 seconds)
4. Take readings on limits of flow at four points at each time interval.
5. Obtain the final average reading by calculating the average of the four point readings. Temperature, time of spread and average should all be recorded.
Bostwick Consistometry
Viscosity Measurement Challenges

• All of these low-tech measures are considered “crude”
• None of them controls for variations in viscosity according to shear rate
• We have no evidence to really tell us what shear rates are operational in the mouth
The Measurement Dilemma

• Shear-rate dependent viscosity is TOO complicated to use in kitchens as the basis for classifying consistency
• We need a simpler, but valid and reliable method for measuring consistency at the point-of-use
Example videos of the IDDSI flow test can be found on Youtube and accessed through the resources page on the IDDSI website: www.iddsi.org

**IDDSI Level classifications based on liquid remaining after 10 seconds:**

- **Level 0:** All liquid has flowed through syringe.
- **Level 1:** There is between 1 and 4ml remaining.
- **Level 2:** There is between 4 and 8ml remaining.
- **Level 3:** There is more than 8ml remaining, but some liquid still flows through.
- **Level 4:** If no liquid flows at all, the category is Level 4 or above.

*Level 4 can also be easily identified without a syringe test: Material holds its own shape; small peaks remain on the surface. Too thick to be drunk from a cup or a straw, should be taken with a spoon. A full spoonful must drop off a spoon if turned sideways; a very gentle flick may be necessary but the material should not be firm, nor sticky.*
IDDSI Flow Test Videos

http://iddsi.org/resources/framework/
| Description/Characteristics | Flows off a spoon  
|                            | Sippable, pours quickly from a spoon, but slower than thin drinks  
|                            | Effort is required to drink this thickness through standard bore straw (standard bore straw = 0.209 inch or 5.3 mm diameter) |
| Physiological rationale for this level of thickness | If thin drinks flow too fast to be controlled safely, these Mildly Thick liquids will flow at a slightly slower rate  
|                                                   | May be suitable if tongue control is slightly reduced. |
| Testing method IDDSI Flow Test* | Test liquid flows through a 10 mL slip tip syringe leaving 4 to 8 ml in the syringe after 10 seconds (see IDDSI Flow Test instructions*) |
Measurement for Foods

**Particle Size:**

For hard and soft solid foods, a maximum food sample size of ~1.5 x 1.5 cm is recommended, which is the approximate size of the adult human thumb nail (Murdan, 2011).

For minced and moist foods, a maximum particle size of 4 mm is recommended.
Measurement for Foods

IDDSI Fork Pressure Test:

• The slots/gaps between the tines/prongs of a standard metal fork typically measure 4 mm.

• This provides a useful compliance measure for particle size of foods at Level 5 - Minced & Moist.
Measurement for Foods

**IDDSI Fork Pressure Test:**

- A fork can be applied to the food sample to observe its behavior when pressure is applied.
- Pressure applied to the food sample has been quantified by assessment of the pressure needed to make the thumb nail blanch noticeably to white.
FAQs: Drinks

Q: My facility only uses two levels of drink thickness; do we have to use all of the IDDSI drink thickness levels?

A: No, although the IDDSI framework includes five different levels of increasing drink thickness, there is no expectation that every facility will use all five levels. For example, some aged care facilities may only use Level 0 - Thin, Level 3 - Moderately Thick/Liquidised and Level 4 - Extremely Thick/Pureed. By labeling the drinks in this way, when a patient/client moves from a facility with fewer drink levels to a hospital with more drink levels, it will be faster, safer and more accurate for health professionals and care staff to provide the appropriate drink thickness level.

Q: I’ve not heard of Level 1 – Slightly Thick before, what is this level?

A: Level 1 – Slightly Thick is predominantly used by paediatric clinicians and refers to the thickness level similar to commercially prepared anti-regurgitation infant formula. It is noticeably thicker than regular Level 0 - thin drinks, but thinner than Level 2 – Mildly Thick drinks. It is thick enough to slow the flow rate through a teat/nipple, whereas Level 2 – Mildly thick fluids are too thick to flow through a teat/ nipple. Clinicians working with adult caseloads may find that some products that they have previously described as “naturally thick” fall in this Level 1 – Slightly Thick category.

Q: My facility has used the terms ‘nectar’ and ‘honey’ for decades; why weren’t these terms used in the IDDSI framework?

A: Two international stakeholder surveys were conducted encompassing more than 5000 responses. Although the terms ‘nectar’ and ‘honey’ were widely understood in some parts of the world, they had no meaning in other parts of the world, particularly Asia. Other considerations included the natural variability of ‘honey’ in its crystalline and liquid states, and that that the food honey is a botulism risk for infants under the age of 12 months. As an international framework suitable for use across the age spectrum, it was decided that terms that described variations of drink thickness would be most appropriate.
Monitor-Aware-Prepare-Adopt
Model for Implementation

**Monitor**

**Aware**
- Build awareness across facilities/sectors to all impacted clinicians, professional associations and their boards, industry, administrators, government, supply chain and support staff
- Communicate who, what, where, when, why & how impacted

**Prepare**
- Assess processes and protocols that may need to change
- Approve product changes, prepare materials/inventory/computer management
- Train clinicians, staff involved (e.g. IDDSI Flow test etc.)

**Adopt**
- Introduce new IDDSI system to pre-packaged goods and at facility level in food service chain
- Transition and integration
Currency Converter - Drinks

Current US Standards

- **Thin**
  - (Naturally thick liquids, e.g. infant formula, supplements)

- **Nectar-thick**
  - 51-350 mPa.s @50/s ✔

- **Honey-thick**
  - 351-1750 mPa.s @50/s ✔

- **Spoon-thick**
  - >1750 mPa.s @50/s ✔

IDDSI

0 Thin
1 Slightly Thick
2 Mildly Thick
3 Moderately Thick
4 Extremely Thick

Current US Standards
Currency Converter - Foods

National Dysphagia Diet (US)

- Regular
- Dysphagia advanced ✔
- Mechanically altered ✔
- Pureed ✔
- ? Pureed (or spoon-thick liquid)

Transitional Foods

- 7 Regular
- 6 Soft
- 5 Minced & Moist
- 4 Pureed
- 5 Liquidised
Helping Patients with Dysphagia Around the World

LATEST NEWS

September 2015

The detailed descriptors, testing methods and evidence for drink thickness levels is now published, and available here. Find the descriptors, labels descriptions, and the final IDDSI framework on the Framework page.

We're also happy to announce our new Silver Sponsor, Food Care Co. Ltd (Japan). Thank you to all of our sponsors for their support and their assistance in the development of our Framework.

Find out about the framework, the staggered launch, and where around the world we'll be featuring the framework. Did you miss the latest edition of the E-Bite? Check it out here, under E-Bites.

August 2015

At our last committee meeting, IDDSI discussed the feedback and responses collected in regards to our draft framework, fervent discussion over levels, the colours, and texture assessment resulted in a number of conclusions that will be published soon. Until then, please view the draft framework, and subscribe to us.

We wish to extend our sincere appreciation to all those who took the time to complete the survey, and to everyone who has supported IDDSI. Follow us on Twitter for updates on our work.