Using the IDDSI Flow test in clinical practice: How thick is thick and does thickness really matter?

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Learning Intentions for Today

• Provide the skills to develop and measure liquids in healthcare settings;
• Help to fine tune skills using the IDDSI Flow Test to measure the above liquids;
• Learn how to help patients and caregivers independently map diet recommendations for the home setting;
• Learn about flow between contrast agents used for evaluation and thickened liquids used for dysphagia management.
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
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

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Development of International Terminology and Definitions for Texture-Modified Foods and Thickened Fluids Used in Dysphagia Management: The IDDSI Framework

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Systematic Review

• 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)
IDDSI Framework
Cichero et al. (2017) Dysphagia, 32: 293-314

Foods and liquids on a single continuum
Relevant across the age span
For all cultures and all care settings

www.iddsi.org
How do we traditionally measure flow?

**Low tech methods**
Low Technology Options for Liquid Flow Testing: Bostwick Consistometry

Similar to Posthumus Funnel used in dairy industry to measure liquid thickness

“Geometry allows for both shear and elongation that more closely matches flow conditions within the oral cavity”
How to start: Critical Elements
What specific syringe should I use?

10 ml slip tip syringe
**Product Description**

<table>
<thead>
<tr>
<th>Current Product Code</th>
<th>New Product Code</th>
<th>Current Quantity per Shelf Carton</th>
<th>New Quantity per Shelf Carton</th>
</tr>
</thead>
<tbody>
<tr>
<td>301604</td>
<td>303134</td>
<td>100 each</td>
<td>200 each</td>
</tr>
<tr>
<td>309604</td>
<td>302995</td>
<td>100 each</td>
<td>200 each</td>
</tr>
</tbody>
</table>

**Flow Test**

IDDSI level depends on liquid remaining after 10 seconds flow.

Level 4: Test with fork or spoon

Syringe length is critical: 61.5 mm from 0-10 ml
(suggested models: BD 303134 – slip tip, BD 302995 – Luer-Lok)

**Calibration:**

10 ml of water will exit the syringe completely in 7 seconds
And the syringe tip?

- **BD Luer-Lok™**
- **Luer Slip Tip**
- **Eccentric Luer Slip Tip**
- **Catheter Tip**
Mixing Tips & Tricks

• Pre-measurement helps for re-creation of liquids;
• Record small changes in thickener in order to recreate or adapt recipes;
• Use a scale, (consistency in hospital) if possible;
• Play with various liquid types you’re having to thicken
Troubleshooting

1. Bubbles
   - ensure you have enough sample
   - loading the sample

2. Chunks/Baby formula
   - move your liquid
   - always: powder into liquid

3. Barium
Loading with a 10ml BD™ Luer-Lok™ Syringe

Loading with a 10ml BD™ Slip Tip Syringe
Can I re-use a syringe?
FAQ’s

• Can I use a larger syringe?

• Can I re-use a syringe? ✓

• How many times should I run a liquid? 3-4

• What kind of timer should I use? Any sensitive touch timer (e.g., phone screen timers)

• How should I wash my syringes? Soapy warm water. 3x pump through and then 2x rinse with clean warm water.
Tips for using Contrast

• Always...
• add your barium to your medium (liquid) first
• add barium and thickener to moving water for ease of dilution (can combine)
• follow thickener instructions
• ensure there are no barium clumps when using powdered barium
• make sure to stir before IDDSI Flow Testing
Contrast and using Varibar®

<table>
<thead>
<tr>
<th>Varibar Product</th>
<th>IDDSI Syringe Flow Test Result (ml) Mean Standard Deviation</th>
<th>IDDSI Result (Level # and Name)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin 40%</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Nectar 40%</td>
<td>4.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Thin Honey 40%</td>
<td>9.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Honey 40%</td>
<td>9.9</td>
<td>0.1</td>
</tr>
</tbody>
</table>

![Bar chart showing residue fluid levels for different Varibar products]
Recipe for slightly-thick using Varibar®

50% Varibar® thin + 50% Varibar® Nectar
Recipes with Contrast

Dysphagia
https://doi.org/10.1007/s00455-018-9915-6

ORIGINAL ARTICLE

Characterizing the Flow of Thickened Barium and Non-barium Liquid Recipes Using the IDDSI Flow Test

Carly E. A. Barbon¹,² ✉ · Catriona M. Steele¹,²,³

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Recipes with Contrast

Table 1  Final recipes (g/100 ml) for all non-barium and barium liquids by IDDSI level

<table>
<thead>
<tr>
<th>IDDSI level</th>
<th>Non-barium</th>
<th>Barium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Xanthan gum</td>
<td>Starch</td>
</tr>
<tr>
<td>1</td>
<td>0.65</td>
<td>4.15</td>
</tr>
<tr>
<td>2</td>
<td>1.25</td>
<td>4.77</td>
</tr>
<tr>
<td>3</td>
<td>2.1</td>
<td>5.85</td>
</tr>
</tbody>
</table>
IDDSI Flow Test - Instructions

1. Remove plunger
2. Cover nozzle with finger and fill 10ml
   - Check the nozzle is completely clear before use
3. Release nozzle & start timer
4. Stop at 10 seconds
Fork Drip and Spoon Tilt Testing

**Fork Drip Test**

**Spoon Tilt Test**

- **Moderately Thick**
- **Extremely Thick**
Mapping to IDDSI - Drinks

**Current NDD 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

**0 Thin**

**1 Slightly Thick**

**2 Mildly Thick**

**3 Moderately Thick**

**4 Extremely Thick**
Mapping Texture Modification Recommendations

- **Hospital**
  - Create a kit with proper syringes
  - Practice in-house with demonstrations
  - Provide links
  - Provide recipes based on their outcomes on the IDDSI Framework

- **Home**
  - Encourage testing for familiarization
  - Provide *all* resources ahead of time (syringe, thickener)
  - Encourage check-ins
  - Visuals for comparison
Take Home Packages

YOU ARE HERE

FOODS
- REGULAR
- SOFT & BITE-SIZED
- MINCED & MOIST
- PUREED
- EXTREMELY THICK
- LIQUIDISED
- MODERATELY THICK
- MILDLY THICK
- SLIGHTLY THICK

DRINKS

- THIN
Benefits of the IDDSI Flow Test

- Repeatability
- Contrast medium preparation
- Technique
- Various levels of “stickiness”
- Small amount of stimuli required for testing
- Easy to teach and learn
- Cost-effective, inexpensive, accessible
IDDSI Testing, Evidence & FAQ’s
Get the APP!
IDDSI Print & Post Posters

What is IDDSI?

International Dysphagia Diet Standardisation Initiative (IDDSI)

The International Dysphagia Diet Standardisation Initiative (IDDSI) is a global standard for terminology and definitions to describe the texture-modified foods and thickened liquids used for individuals with dysphagia of all ages, in all care settings, and for all cultures.

The IDDSI framework consists of a continuum of 8 levels (0-7). Levels are identified by text labels, numbers, and color codes to improve safety and identification. The standardized descriptors and testing methods will allow for consistent production and easy testing of thickened liquids and texture-modified foods.

IDDSI flow test

The International Dysphagia Diet Standardisation Initiative (IDDSI) framework of terminology and definitions includes an objective measurement for liquid thickness.

The IDDSI flow test classifies IDDSI Levels 0-3 based on their rate of flow.

Use a syringe (following syringe dimensions as per image below) for correct results.

IDDSI flow test - instructions

Videos of IDDSI flow test can be found here: [http://iddsi.org/framework/drink-testing-methods/](http://iddsi.org/framework/drink-testing-methods/) or in the IDDSI App

1. Remove plunger
2. Cover nozzle with finger and fill 10ml
3. Release nozzle & start timer
4. Stop at 10 seconds

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A global initiative to improve the lives of over 590 million people worldwide living with dysphagia

IDDSI Framework
See the IDDSI Framework, testing methods and evidence statement.

Implementation
Learn about the process for implementing IDDSI in your home, setting or community.

Resources
Find resources developed by IDDSI related to dysphagia.
More on IDDSI Flow Tests


Question: Do you have any tips for clinicians who are planning to use the syringe test?

Lumps

One of the main challenges with syringe testing has been making sure there are no lumps within the stimulus. Even if there are very small lumps floating within the suspension, this can alter or impede the flow of the liquid through the syringe. When this occurs you do not get an accurate measurement of flow. There are a few ways to decrease the risk of having lumps in your stimulus:

1. Ensure that the liquid is moving at the time you pour the barium and/or thickener into the medium.
2. While the liquid is moving, either pour the pre-measured barium in, and then the thickener, or pour them into the moving water at the same time.
3. You can also mix together the pre-measured barium powder with the pre-measured thickener. After combining the two, you can pour this single mixture into the moving water.

Bubbles

Bubbles are also variables that can alter the flow, and the corresponding IDDSI flow test result. When you are using a syringe to draw up a sample of thickened liquids, bubbles can occur if air gets mixed in with the sample. Bubbles are also something that can occur when mixing in a thickener, particularly a gum thickener. In order to prevent bubbles in a test sample, you should make sure that there is enough liquid in the sample you are drawing up to prevent air from entering the syringe. When you then deliver the sample