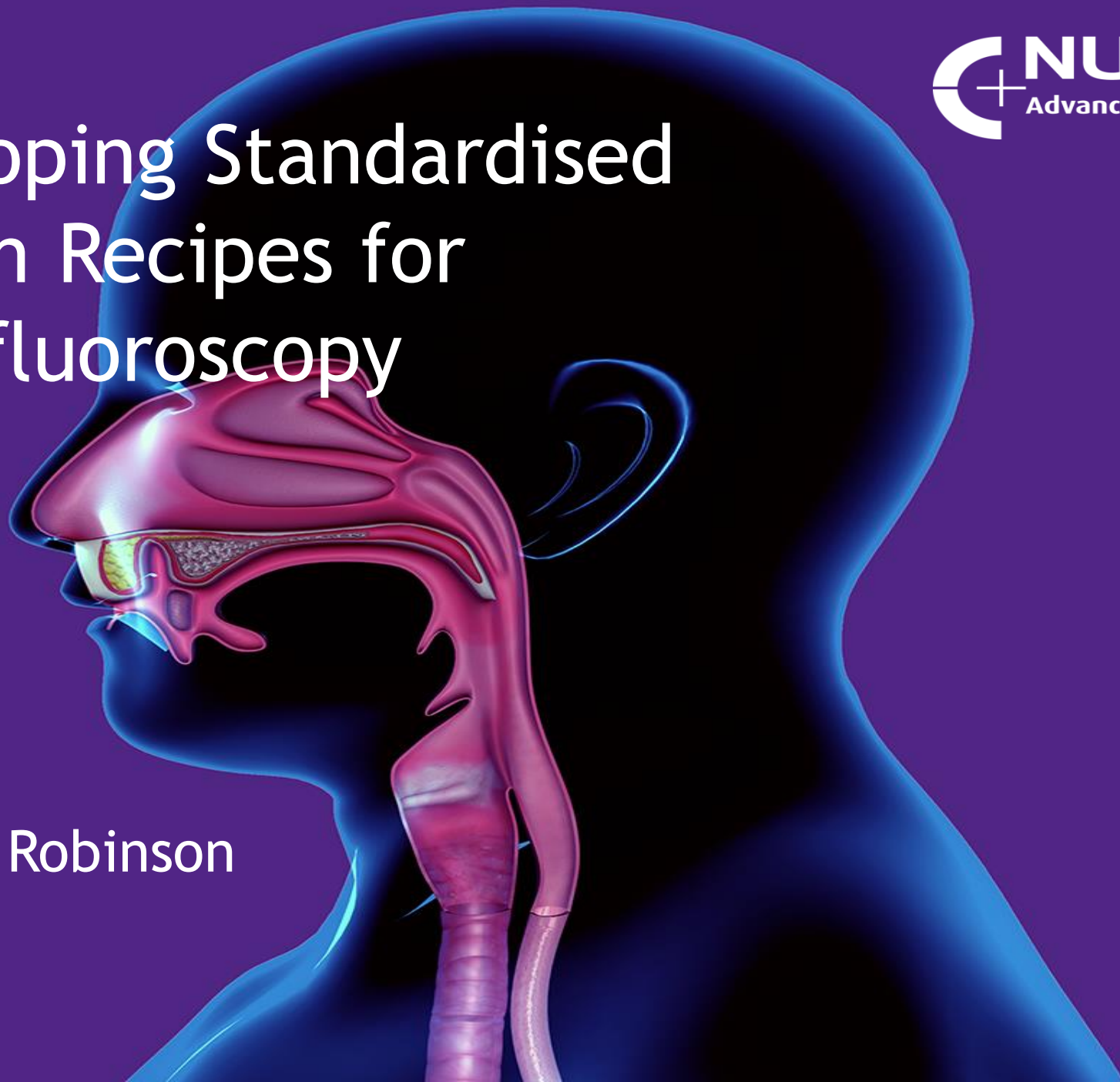


# Developing Standardised Barium Recipes for Videofluoroscopy

Jennifer Robinson

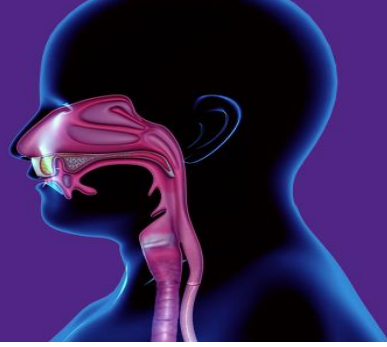


# Standardisation of Videofluoroscopy



- Allows for consistent interpretation between patients and different therapists
- Allows for comparison before and after a course of therapy
- Standardisation is important in many aspects of videofluoroscopy:
  - **The contrast (e.g. barium)**
  - **How it is prepared**
  - The order of presentation
  - The volumes to be tested
  - Technical aspects such as frames/second

Goal:



To establish standardised recipes for contrasts used in videofluoroscopy

# What we used to do



Normal fluid	roughly 1 part baritop to 2 parts water
Syrup-thick	straight baritop (or gastromiro diluted with water 50/50, then thickened)
Custard-thick	custard + baritop, thickened slightly
Puree	custard + baritop, but more thickener
Premashed	mix mashed banana with baritop
Fork mashable	custard + baritop paste spread on slice banana
Normal	custard + baritop paste, spread on biscuit

- *No measuring*
- *Everything was “eyeballed”*

# Contrast Recipes: Things to Consider



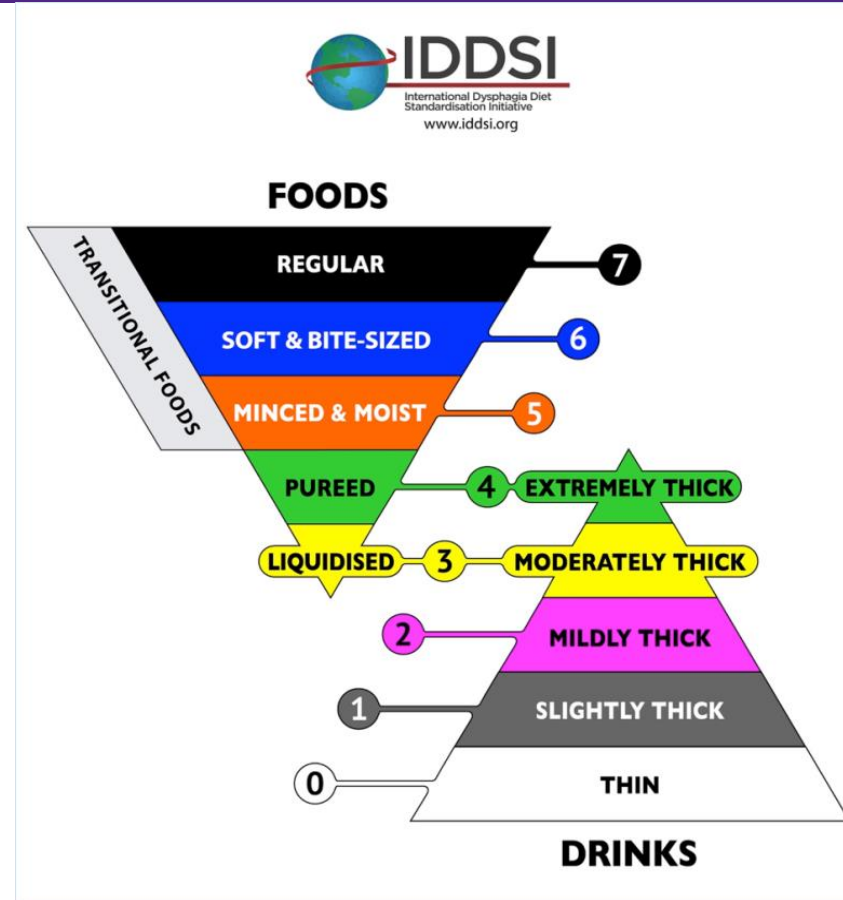
- **IDDSI** - Recipes should be IDDSI-compliant
- **Concentration** - Contrast materials should be a consistent concentration (weight/volume)
- **Contrast Agent** - Baritop vs EZ-HD vs gastromiro?
- **Dairy** - To use dairy or not to use dairy?

# Recipes are IDDSI compliant



## International Dysphagia Diet Standardisation Initiative

*Fluid levels can be objectively measured using syringe test and spoon tilt test.*



# Standardising Concentration



- [Catriona Steele on Barium Concentration](#)
- Concentration of 40% weight/volume recommended for barium
  - (Baritop is 100% w/v)
- Weight/volume = grams/millilitres
- Inconsistent concentrations of barium mean you can't accurately judge levels of oral/pharyngeal residue because higher concentrations tend to *stick* more.
- Suggested ratios of barium contrast to thickener to fluids in order to achieve desired concentration level:

<http://stealeswallowinglab.ca/srrl/best-practice/barium-recipes/iddsi-barium-calculator/>



*Non-disordered swallow with residue from 100% weight/volume barium*

**NUTRICIA**  
**Nutlis**  
Clear



NUTRICIA  
**Nutilis**  
Clear





# Swallowing Rehabilitation Research Lab

[www.steeleswallowinglab.ca](http://www.steeleswallowinglab.ca)



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## Barium Calculator

### Barium Calculator

This barium calculator will guide you in determining the amounts of barium, water and thickener required to achieve specific barium concentrations and liquid consistencies. Begin by selecting the desired consistency below:

1. Select desired fluid thickness:\*

- IDDSI Level 0: Thin
- IDDSI Level 1: Slightly Thick
- IDDSI Level 2: Mildly Thick (National Dysphagia Diet [NDD] Nectar)
- IDDSI Level 3: Moderately Thick (NDD Honey)
- IDDSI Level 4: Extremely Thick (NDD Pudding or Spoon-thick)

**FOODS**

3. Select desired barium product and barium concentration.

Select a brand of barium:

EZPaque powder (96%w/w) ▼

4. Enter desired barium concentration (w/v%):

20

5. Enter desired mixture volume (in mL):

250

Combine recommended amounts of liquid, barium product and/or thickener to obtain the desired mixture.

Amount of liquid to add:

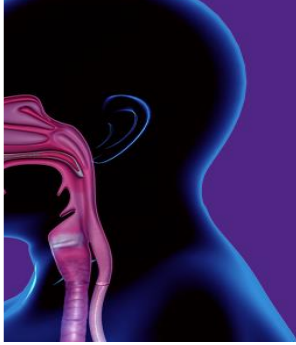
238mL

Amount of barium product to add:

52g

Amount of thickener to add:

none



# Which contrast to use?



# Baritop vs EZ-HD



- Baritop (liquid suspension) recipes attempted initially but we found E-Z-HD powder mixed with pre-thickened fluids resulted in a smoother, less lumpy bolus.

# Gastromiro (iopamidol)



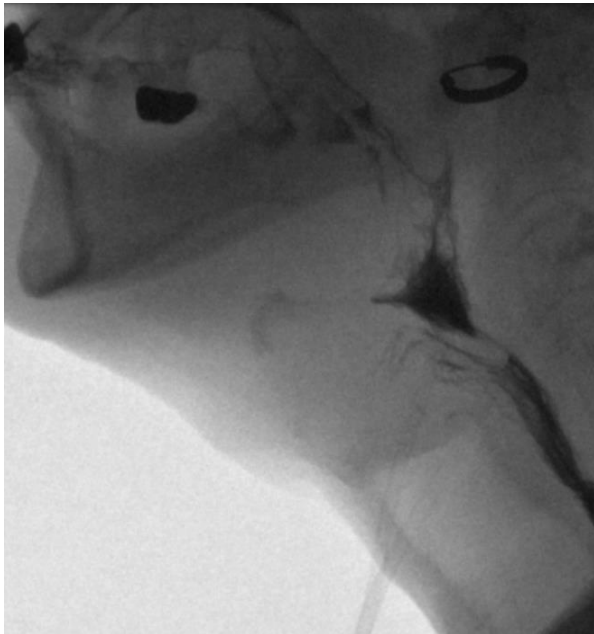
- Iopamidol (a non-ionic water-soluble contrast) is supposed to be less harmful to the lungs when aspirated.
- Usually used in cases where a high risk of aspiration is suspected.
- However, there is little to no evidence to support this. Some authorities do not recommend its use except in cases of suspected fistula.

M. P Federle et al, 2016. Contrast Media for Fluoroscopic Examinations of the GI and GU tracts; current challenges and recommendations. *Abdominal Radiology* (2017), (42) pp.90-100

# Gastromiro (iopamidol)



- Disadvantages:
  - Reduced visibility even at full concentration.
  - Thickens poorly—must be diluted to thicken.



*barium*



*gastromiro*

# Barium vs Gastromiro/iopamidol



- The only reported incidents related to aspiration of barium have been in huge doses, much more than we usually administer in videofluoroscopy.
- **Is using gastromiro worth it?**
- *Exception:* Starting with a teaspoon of gastromiro is recommended in case of suspected fistula.

# Aspiration of Dairy



“Milk fat generally consists of animal fat; when aspirated, it is hydrolyzed by lung lipases, and the release of fatty acids induce a severe hemorrhagic and necrotizing reaction.”

“Vegetable oils act as inert substances that induce a foreign-body reaction and are cleared by macrophages and expectoration of the lipid.”

Takıl, A., Umuroğlu, T., Göğüş, Y.F., Etı, Z., Yildizeli, B. and Ahiskali, R., 2003. Histopathologic effects of lipid content of enteral solutions after pulmonary aspiration in rats. *Nutrition*, 19(7), pp.666-669.



# Project Group: Developing Recipes



- Supplies needed:
  - Score sheets
  - Plates, forks, spoons
  - Plastic cups
  - 10-ml syringes
  - Shakers
  - Kitchen scale with tare function
  - EZ-HD
  - Nutilis Clear thickener
  - Bananas
- Recipes to develop:
  - Thin fluid
  - IDDSI level 1
  - IDDSI level 2
  - IDDSI level 3
  - IDDSI level 4
  - IDDSI level 5 minced & moist
  - IDDSI level 6 soft & bite sized

# Flow test recording form



## Record form for flow-testing recipes using EZ-HD powder

Recipe			Trial 1		Trial 2		Trial 3 (if first two don't agree)	
			ml left in syringe	IDDSI level	ml left in syringe	IDDSI level	ml left in syringe	IDDSI level
Normal fluid (for 40% w/v, mix 102g powder and add water to reach 250ml. For 20% w/v, mix 51g powder and add water to reach 250ml.)	Grams water:	Grams contrast:						
Naturally-thick – IDDSI level 1	Grams water:	Grams contrast:						
Stage 1 – IDDSI level 2	Grams water:	Grams contrast:						
Stage 2 – IDDSI level 3	Grams water:	Grams contrast:						
Stage 3 – IDDSI level 4	Grams water:	Grams contrast:						

*(Recipes flow-tested at 10, 30, and 60 minutes to ensure no change in flow rates over time.)*

# Recipes for videofluoroscopy

East Sussex Healthcare NHS Trust

last edited July 2018

The following recipes result in contrasts that are 40% weight/volume. Ensuring a consistent concentration of barium improves diagnostic accuracy by reducing variability in residue.

## General tips:

- Make sure to stir thin fluids before presenting as barium will settle.
- 1/4 teaspoon is equal to a 1/2 scoop Nutilis Clear.
- 41g of EZ-HD barium powder is equal to about 2 level tablespoons.

## Fluids and puree (IDDSI levels 0-4)

Mix fluid with thickener, stirring whilst adding and for at least 30 seconds. Let sit for at least 10 minutes.

Gradually stir in EZ-HD barium powder after thickening fluid using a fork to prevent lumpiness.

	Level 0	Level 1	Level 2	Level 3	Level 4
<i>IDDSI descriptor</i>	Thin	Slightly-thick	Mildly-thick	Liquidised Moderately-thick	Pureed Extremely-thick
<i>Previous descriptor</i>	Normal	Naturally-thick	Syrup-thick	Custard-thick Thin puree	Pudding-thick Thick puree
<i>Fluid</i>	100ml	100ml	100ml	100ml	100ml
<i>Nutilis Clear</i>	n/a	0.62g ½ scoop	1.25g 1 scoop	1.87g 1½ scoops	4.37g 3½ scoops
<i>EZ-HD barium</i>	41g	41g	41g	41g	41g

## Solid Consistencies (IDDSI levels 5-7)

For solid consistencies, 3-4ml of level 4 puree should be added to a 1-inch square solid bolus. For IDDSI level 5 minced & moist, add a small amount of barium powder.

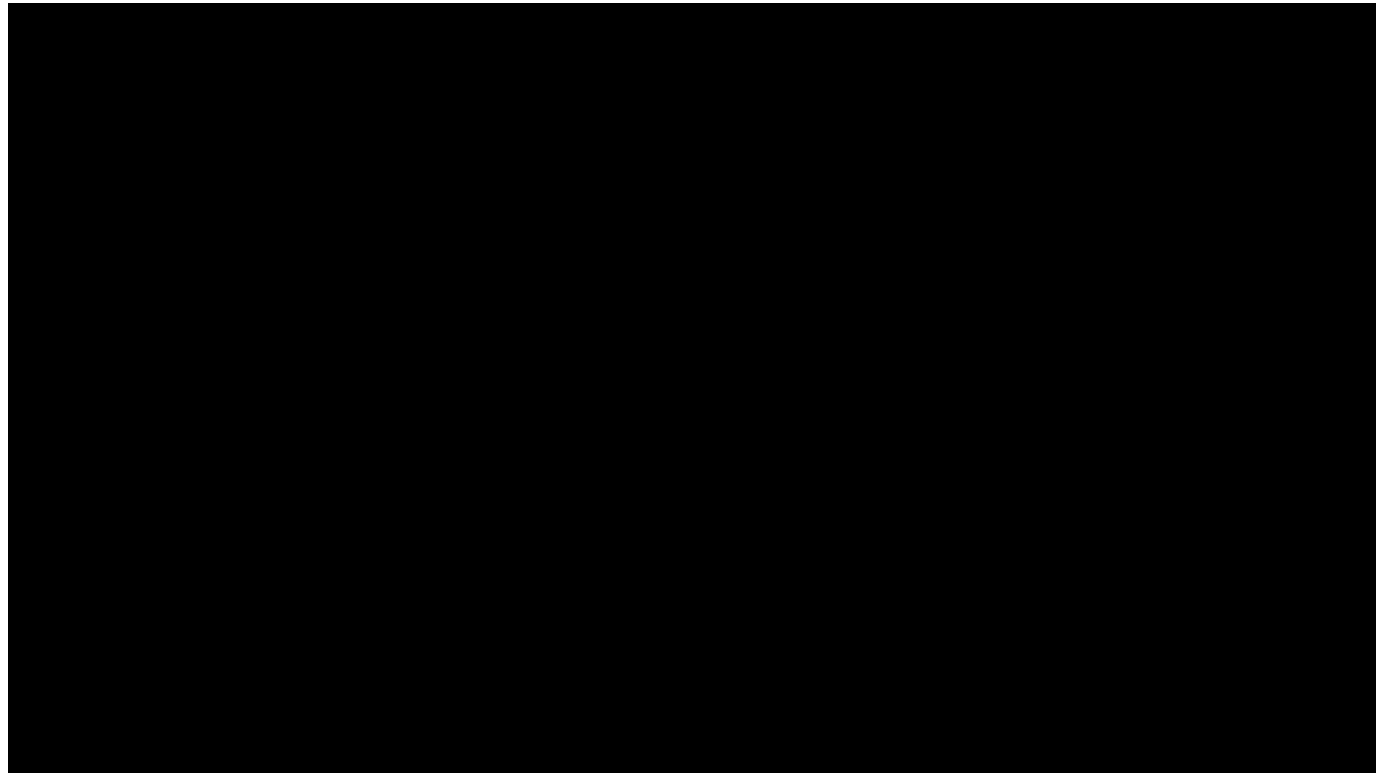


(Sheet laminated and kept in videofluoroscopy suite)

# Equipment used in clinic



# The Process



Thankyou!



*Questions and Ideas Welcome*

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 **NUTRICIA**  
**Nutilis**  
Clear

