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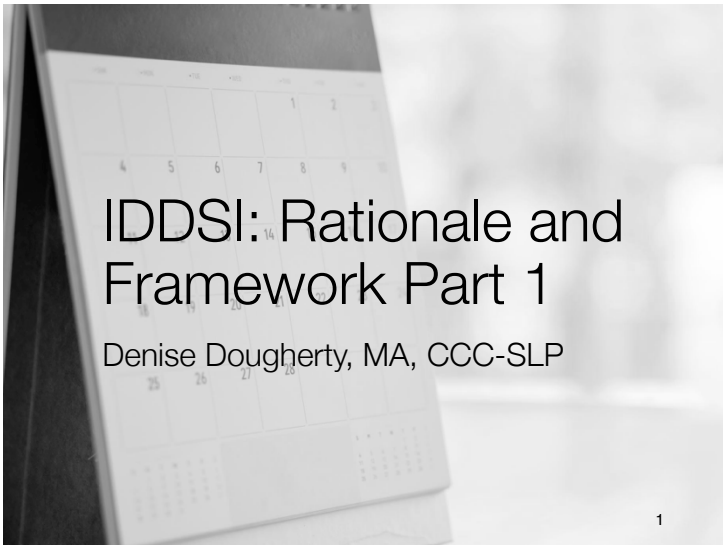

IDDSI: Rationale and Framework Part 1

Denise Dougherty, MA, CCC-SLP

1

- **Presenter Disclosure:** Financial: Denise Dougherty was paid an honorarium by OccupationalTherapy.com for this presentation. She owns/operates a private practice in Pennsylvania. Non-financial: Denise has no relevant nonfinancial relationships to disclose.
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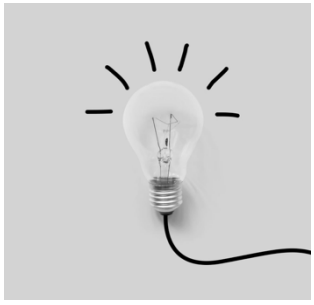
CONTINUED

Learning Outcomes

After this course, participants will be able to:

- define the levels in the National Dysphagia Diet.
- discuss the rationale for developing of a new system of standardization.
- identify three findings of the systematic literature review.



3

CONTINUED

Course Description

IDDSI framework was finalized in 2015 and provides more comprehensive guidelines for diet selection. This seminar will discuss the rationale behind developing new terminology and criteria for diet selections.

4

Citation for IDDSI

The International Dysphagia Diet Standardisation Initiative 2016 @http:// iddsi.org/framework/.Attribution is NOT PERMITTED for derivative works incorporating any alterations to the IDDSI Framework that extend beyond language translation. Supplementary **Notice:** Modification of the diagrams or descriptors within the IDDSI Framework is DISCOURAGED and NOT RECOMMENDED. Alterations to elements of the IDDSI framework may lead to confusion and errors in diet texture or drink selection for patients with dysphagia. Such errors have previously been associated with adverse events including choking and death.

5

OT and SLP Connection!

- Collaborate to provide patient care
- MUST be on same page w diets and bite size
- BUT ……..
  - What ***are*** they?!

6

Where *did* diet standardization start?

7

Growing frustration!

Lack of standardization for
- solid food textures
- liquid consistencies
- nomenclature

8

National Dysphagia Diet (1)

Project conceived by Dietetics in Physical Medicine and Rehabilitation dietetic practice group in 1996

Task force:

- Studied issue & formulated new diet
- Based on scientific food properties & clinical swallowing problems
- Food scientists, clinical & consulting dietitians, speech- language pathologists & food industry representatives, all w/ an interest, experience in dysphagia

9

National Dysphagia Diet Task Force Goal (1)

- Standardize all dysphagia diets on national basis to enhance communication among professionals, institutional food preparers, & food industry leaders to provide better & more consistent care for dysphagic patients
- Resulted in multilevel dysphagia diet

10

National Dysphagia Diet (2)

Published by American Dietetic Assoc. in 2002

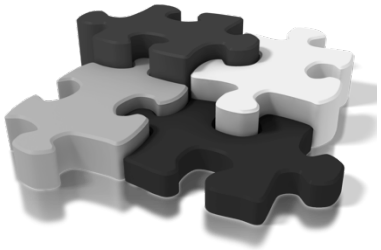
Proposed NDD

- Food classification
- 8 textural properties & anchor foods to represent points along continua for each property
- Diet level hierarchy
- Inclusion/exclusion of foods at each level based on subjective comparison with anchor foods

Q1 11

National Dysphagia Diet – 4 levels for semisolid/solid foods: (2)

- NDD Level 1:
- Dysphagia-Pureed requires very little chewing ability
- homogenous, very cohesive, pudding-like
- NDD Level 2:
- Dysphagia-Mechanical Altered requires some chewing
- cohesive, moist, semisolid foods
- NDD Level 3:
- Dysphagia-Advanced requires more chewing ability
- soft foods
- Regular
- All foods allowed



Q2 12

NDD Task Force

- Labels for liquid viscosity levels (thickness or resistance-to-flow)
- 4 frequently used terms identified
- Ranges are “commonsense approach” & need more research (2)
  - Thin 1-50 centiPoise (cP)
  - Nectar-like 51-350 cP
  - Honey-like 351-1,750 cP
  - Spoon-thick >1,750 cP

Q3 13

Confusion!

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CONTINUED

Confusion! (3)

- Global community increasing!
- Greater opportunities for confusion!!
- Overabundance of dysphagia diet labels, terminology, numbers & levels of food texture & thickened drinks
- Inconsistencies & errors in labeling of texture modified foods
- Deaths d/t inappropriate food textures delivered to pts. w/ dysphagia

15

CONTINUED

IDDSI

- Founded in 2012 & incorporated in 2013
- Independent not for profit association
- Registered & operates under regulatory guidelines of Australia
- All **voluntary** positions

10 countries represented by these groups

- Nutrition and Dietetics
- Food Service and Catering
- Speech Pathology
- Occupational Therapy
- Physiotherapy
- Gastroenterology
- Nursing
- Mechanical Engineering
- Food science (3)

16

Where to start!?!

How about a Survey!!!

- 33 countries w/ 2050 responses
- Common use of 3-4 levels of food texture
- 54 different names!
- More than 3 levels of liquid thickness
- 27 different names! (3)

Q4 17

Variation of Terminology Liquids. (23)

Thin
- Regular
- Less Mildly thick
- Regular/Thin/Clear
- Normal

Naturally thick fluid
- Grade 1 – very mildly thick
- Mildly thick
- Thickened liquids

18

Variation of Terminology Liquids. (23)

Nectar Like

- Thickened Fluid stage 1
- Level 150 mildly thick
- Grade 2 mildly thick
- Moderately thick
- Nectar/stage 1/ level 2
- Syrup
- Thickened

Honey like

- Thickened fluid stage 2
- Level 400 moderately thick
- Grade 3 moderately thick
- Extremely thick
- Honey/Stage 2/ Level 2/Default Thick
- Jelly
- Medium

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Variation of Terminology Liquids (23)

- Pudding like
- Spoon thick
- Thickened fluid – Stage 3
- Level 900 extremely thick
- Grade 4 extremely thick
- Pudding/spoon thick
- Full protection/thick/pudding
- Paste or creamy
- Pudding like

20

Variation of Terminology – Food (23)

- Regular
- Level 5 Normal Diet
- Easy to chew or Regular/ General/Dysphagia General
- Normal
- Solid
- Regular or Cut

21

Variation of Terminology – Food (23)

- Dysphagia Advanced
- Texture E –fork mashable, dysphagia diet 1.5 cm
- Texture A soft 1.5 cm
- Level 4 soft food
- Chopped or diced/dysphagia soft/dysphagia soft + minced/Stage 3/Level 3/Dental soft/Easy to chew with minced meat
- Cut up
- Soft
- Easy mastication
- Normal with soft meat/fish/chicken – no particulates
- Coarse Pate'

22

Variation of Terminology – Food (23)

- Dysphagia mechanically altered 0.6cm
- Texture D pre-mashed dysphagia diet 0.2cm
- Texture B minced + moist 0.5 cm
- Texture B minced and moist
- Level 3 dysphagia Diet
- Paste containing meat/fish
- Advanced minced/minced with finger foods/diced/chopped/soft minced
- Mashed
- Timbales

23

Variation of Terminology – Food (23)

- Dysphagia pureed
- Texture C thick puree dysphagia diet
- Texture C smooth pureed
- Level 2 dysphagia diet
- Jelly food with protein
- Minced/mashed/modified minced/ dysphagia fully totally minced/Level 2 mechanical/minced moist/minced meat modified vegetables
- Puree
- Jellied products

24

Variation of Terminology – Food (23)

- Texture B thin puree dysphagia diet
- Texture D liquidized
- Level 1 dysphagia diet/smooth jelly food with protein except for meat and fish
- Pureed/

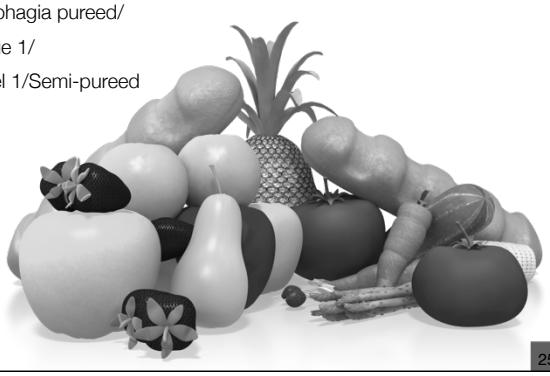
Thin pureed/

Dysphagia pureed/

Stage 1/

Level 1/Semi-pureed

- Level 0/smooth jelly food without protein
- Blenderized/liquid-ized
- Soft solid or puree
- Low viscosity fluids



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IDDSI (3)

Concerns Identified!

Need standardized terminology

- Reduce misunderstanding & ambiguity w improved communication efficiency

Pts. & caregivers

- Can't assume thickness across brands of thickeners & ready to use products are the same

Lack of standardized nomenclature for food texture & drink thickness

- major barrier to dysphagia research

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CONTINUED

International Dysphagia Diet Standardisation Committee or IDDSI (4)

3 yr. effort w/ Final Framework Nov. 2015 Identified

- 8 level continuum
- Drinks - Levels 0-4
- Foods - Levels 3-7
- Common terminology to describe food textures & drink thickness
- Confirm flow or textural characteristics of particular products w/ IDDSI testing
- **Test** foods/drinks **under intended serving conditions – especially temperature**

Q5 27

CONTINUED

Sponsors for Development

- Nestle Nutrition Institute
- Nutricia Advanced Medical Nutrition
- Hormel Thick & Easy
- Campbell's Food Service
- Apetito
- Trisco
- Food Care. Co. Ltd.
- Flavour Creations
- Simply Thick
- Lyons (IDDSI) (4)

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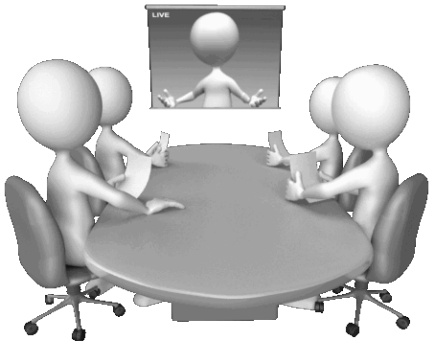
Sponsors Role

- Provided financial support
- Costs assoc. w administration, research, & data analysis (research assistant support for systematic review)

- NEVER involved w/ design or development of IDDSI framework
- Progress briefings at key milestones over course of project
- IDDSI reached out to professional associations & organizations re: project & invite participation & support (3)

29



IDDSI Committee

Monthly teleconference w 2 in-person meetings (2013-2015)

Systematic literature review regarding influence of food texture & liquid consistency on swallowing physiology conducted in 2014 & published in 2015 (3)

30

2013 – 5 stakeholder specific surveys developed

- Individuals w/ dysphagia, their caregivers or organizations providing support to people w dysphagia
- Healthcare professionals & food service professionals
- Dysphagia research scholars
- Industry representatives from companies manufacturing texture modified foods
- Industry representatives from companies manufacturing thickeners or thickened drinks for people w dysphagia (3)

31

More Surveys (21)

Between April/June 2015

- 3100 individuals in 57 countries completed survey
- 79% or 2478
  - health professionals working w people w dysphagia
- 10% or 319
  - food service professionals

Slightly thick

- 6.5% - lacked familiarity w/ level & distinction from level 2 mildly thick

Level 2 commonly used by pediatric clinicians to describe thickened infant milk

Level 7 – meltable/ dissolvable

- 6% - found level confusing, felt it required new name, additional info, examples
- Revised as transitional foods
- No assigned # as it crosses levels of the pyramid

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CONTINUED

Systematic Literature Review Key Findings -Evidence

- Thicker liquids reduce risk of penetration, aspiration but increase risk of post swallow residue in pharynx
- Existing literature insufficient to support delineation of specific viscosity boundaries or other quantifiable material properties related to clinical outcomes
- Best available evidence for selecting optimal food consistency comes from **careful exploration of tolerance for different foods as part of comprehensive swallowing assessment**
- Solid food & thick consistencies require greater effort in oral processing & swallowing [3]

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CONTINUED

Systematic Literature Review Key Findings -Evidence

- Solid, hard & adhesive/sticky foods require increased chewing rate, longer chewing & muscle effort (4)
- W/ normal chewing, tongue & jaw move in coordinated way to avoid injury from biting tongue during chewing
- No posterior tongue to palate seal during chewing & oral processing of foods - in contrast to pattern expected w liquids
- Not uncommon for particles of masticated food to collect in pharynx, usually in vallecular space, during oral preparation

Q6 34

Systematic Literature Review Key Findings -Evidence

- Very few studies provided objective measures of viscosity or density
- Authors described viscosity as "similar to water" but no adequate evidence to support description
- Shear rate – rate of deformation of non-Newtonian stimuli as fluid layers slide over each other when bolus placed under stress/force
- Examples - butter, corn starch mixed with water, cheese, jam, ketchup, mayonnaise, soup, yogurt, honey
- Bolus shear rates, tongue movement and pharyngeal shortening/constriction may alter bolus shear rates in swallow
- No clear guidelines for reporting apparent viscosities of food/ fluids studied
- Causes confusion & limits generalizability across studies (22)

35

Bias - Systematic literature review (22)

- Participant selection, missing data, performance of study tasks by participants, measurement of behaviors of interest
- ***ALL*** 36 studies reviewed identified risks w bias
- Most common risk of bias
  - failure to report whether or not raters were blind to bolus consistency during analysis
- Very small sample
- Blinding to bolus type
- Incomplete protocol
- Single trial per bolus type
- Insufficient detail, data
- Measurement of sEMG from tongue surface not validated
- Unbalanced samples – males vs. females, females only

Q7 36

Systematic Literature Review Key Findings –Evidence (22)

- Very little evidence to guide practice re: different degrees of modifying solid foods for pts. w/ dysphagia
- Strongly suggests relevant properties of food texture for swallowing, including cohesiveness, hardness, & slipperiness
- Exceptionally limited information available for objective measurement of texture-modified foods. Collaboration w/ experts in sensory aspects of food oral processing an important direction for future research

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Systematic Literature Review Key Findings –Evidence (22)

- Adopt sensory terms & scaling methods that are standard in food oral processing world to capture characteristics of foods used in dysphagia management
  - very worthwhile pursuit both for research & clinical food production
- identified major gaps in understanding impact of liquid consistency/food texture on swallowing physiology in healthy & disordered populations
- classifications of these properties should consider physiological behaviors observed when ingesting different stimuli

38

Systematic Literature Review Key Findings –Evidence (22)

- Differentiate liquids - flow easily w/ minimally applied tongue pressures in mouth vs. those requiring more active tongue movement to initiate flow
- Bolus behavior (containment, active tongue movement, chewing) may be useful to capture clinically relevant food texture properties for swallowing & choking risk
- May need different boundaries of bolus texture & flow for different subpopulations within larger clinical group of people w/ dysphagia, depending on physiological capabilities

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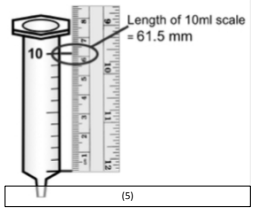


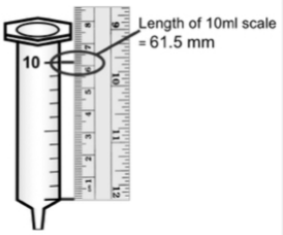
Syringe based liquid flow test

- 13 powder, gel, liquid thickening agents & 4 brands (commercially pre-prepared thickened liquids – starch, gums, combo of starch & gums)
- Mixed w/ Ocean Spray cranberry juice
- Recognize need for level for thickened infant milk

Ability to evaluate liquids not typically considered drinks

- condiments (sauces)
- liquids foods (soups)
- nutritional supplements or liquid medications (3)

Q8 40



Standardization of IDDSI Flow test

- Standardized volume
- Standardized flow time
- Standardized syringe dimensions to give categorization of liquid thickness that is internationally comparable
- Allows for valid comparisons between studies (18)

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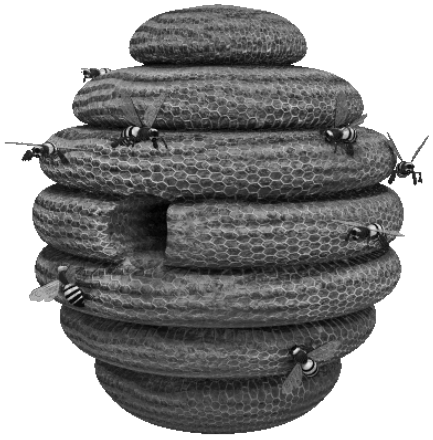


Nectar & Honey Terminology?

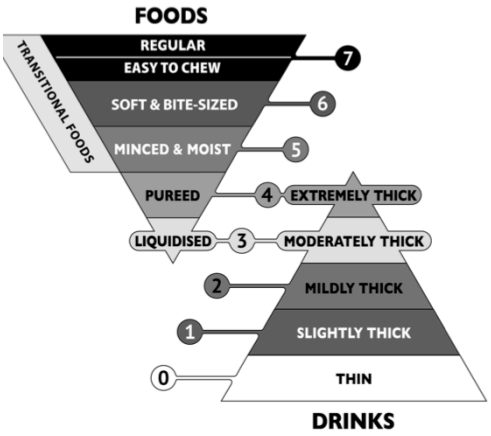
(5) (16)

- Terms not understood in parts of world, particularly Asia
- Widely understood in some parts of the world
- "Food" honey is botulism risk for infants under 12 months of age
- Decision made that terms describing variations of drink thickness would be more appropriate

Q9 42

Foods

- Proposed labels & descriptors for 5 different levels
- Assessed samples of ready to use texture modified foods using spoons, forks & oral appraisal providing opportunity to consider mouthfeel & behavior of sample in mouth
- Developed definitions of thickened liquids & texture modified foods, w physiologic rationale for each level (3) (5)



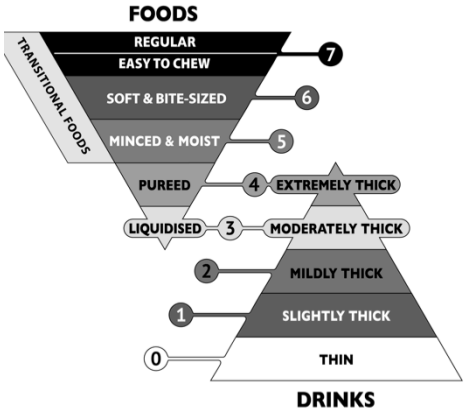
43

Additional survey in 2015 & final framework

Diagram of framework including labels & colors

- Detailed definitions & liquid testing methods
- Detailed definitions & food testing methods

- Survey indicated most common method of testing was visual inspection or observation (3) (5)



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- Twin pyramid design w foods on top, inverted pyramid & liquids on bottom
- Decision to use pyramid
  - already used nationally in Japan for dysphagia diets
- Color scheme aimed to make each color as distinguishable as possible
- Avoid color red
  - frequently used as color to denote alarm & danger in medical contexts
  - may also have other symbolism in some cultures (3)(5)

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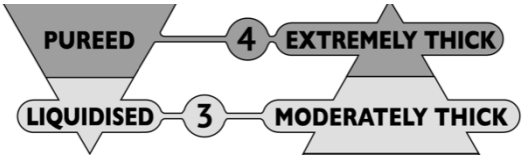

Novel feature of framework

- recognize certain food textures share flow properties w/ thickened liquids
- creates overlap zone in the middle of the framework
- use same #'s to refer to both food & drink items at these levels, recognized shared flow properties of these textures (3) (5)

46

Warning after level 6 to clarify physiological skills

- Required to both bite & chew food to safely transition to level 7 regular foods

Physiological contraindications for advancing to level 7:

- xerostomia
- requirement for dentures
- difficulty managing mixed textures
- impulsive behavior
- cognitive impairment
- delayed oral skills (dentition, chewing development, fatigue)
- impaired strength or stamina (3)

Q10 47

- Developed practical quantitative methods for testing food size and texture
- Available around the world (3)

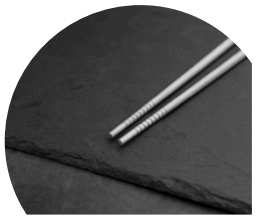

Photo by Andraz

48

Final framework included transitional foods side bar category

- Reflects transitional foods are regular foods – level 7
- Special textural properties
  - with application of moisture (saliva) or temperature change, food rapidly changes texture crossing boundaries between levels (3) (5)

49

Chewing = breaking down of food determined by # of factors

- toughness
- moisture content of food
- ability to adsorb (not absorbed but forms on surface) or absorb saliva
- fibrous nature of food (3)

50

CONTINUED

Level of moisture content singled out as most important variable to determine food readiness for swallow

Salivation moistens food bolus & assists w softening, disintegration & dilution

Reduced salivation hinders even full dentate individuals from adequate bolus preparation for swallowing (3)

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CONTINUED

During particle size reduction while chewing, normal bolus is ***not*** lump free

- Moist & cohesive
- Spoon tilt test assesses cohesiveness & adhesiveness
- Sample holds shape on spoon & falls easily when spoon tilted or turned sideways
- Little residue left on spoon
- These characteristics provide bolus that is **moist & cohesive** but **not** sticky or adhesive (3)

52

Food hardness is complex

- Practical test w fork or spoon recommended
- Pressure varies w level of force applied by individual
- Press just hard enough to cause blanching of thumbnail

Blanching

- pressure overcomes mean arterial blood pressure
- approximately 17kPa – measure w IOPI
- corresponds closely to typical tongue pressure used during swallowing (3)

53

Testing methods for chopsticks & finger pressure

- Level 6
  - food should squash w/ application of pressure & not return to its original shape when pressure released
- Transitional foods also be identified w fork pressure test
  - Sample of 1.5 x 1.5 cm soaked in 1 mL of water for 1 min.
  - Qualifies as transitional food if sample squashes, disintegrates & no longer resembles original shape ***or*** has melted significantly & no longer looks like its original shape (3)


Photo by Andraz Lazic on Unsplash

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FAQ addresses foods specifically identified in multiple autopsy reviews to increase choking risk

- IDDSI systematic review found evidence suggesting some extremely thick liquids may promote pharyngeal residue buildup
- Important development in dysphagia
  - recognize some foods may promote residue by being too thick
- Framework based on understanding that increasing thickness has demonstrated therapeutic benefit for reducing likelihood of penetration, aspiration (3) (5)

55

- Children younger than 3 yrs., adults 65+ yrs., individuals w poor dentition & those w neurological conditions are at high risk of death from food asphyxiation
- Healthy individuals – regardless of initial state of food – bolus is cohesive mass after oral processing & at swallow initiation
- Texture modification mechanically alters food prior to ingestion to level required to promote safe swallowing of bolus
- Recommendations for food texture based on altering food texture has demonstrated therapeutic benefit for reducing choking risk (3)

56

- Why alter foods?
  - Choking risk reduced by altered size (chopped, diced) & texture (soft puree)
- Consistent w evidence in literature specific to choking & asphyxiation risk
- Food textures posing most risk categorized by texture, shape & size

Foods w high choking risk

- hard or dry
- chewy or sticky
- crunch or crumbly
- floppy
- fibrous or tough
- have husks, are stringy
- round or long in dimension
- multiple or dual textures (3)

57

Framework promotes strict adherence to both **particle size & food texture** requirements

- Level 6 – soft and bite sized
  - 1.5 x 1.5 cm recommended
  - width of standard dinner fork from left to right running perpendicular to prongs corresponds approx. to this dimension
- Not possible to guarantee person w/ dysphagia will be able to cut food to this size or care staff/family will be available to precut food (3)

58

- Individuals w/ cognitive impairment at increased risk of choking d/t poor self monitoring of food size, rate of ingestion
- Some elderly without formal dysphagia dx & fewer than 20 teeth/ with dentures may benefit from soft food for ease of mastication
  - Don't strictly require stringent particle size requirement but may not strictly require dysphagia diet
- Level 7 soft to chew! (3)

59

Loss of occlusal units affects bite force

▪Those with greater than 20 teeth (10 paired occlusal units) have normal bite force values of ~~ 555N

Exponential decline in bite force observed with reduced # of teeth

▪10-19 teeth remaining – 383N

▪1-9 teeth remaining – 180N

▪Edentulous 155N

Reduced bite force & poor masticatory efficiency increases choking risk regardless of formal dysphagia dx

▪Flow rates in swallow expected to differ based on age & level of impairment of swallowing function (3)

60

CONTINUED

Liquids

Examine impact of drink thickness & food texture on swallow behavior across age spectrum

- General framework – thin drinks plus 3 levels of increasing thickness

Pediatric stakeholders reported common use of drink thicker than water but thinner than point of thickened liquids for adults

- Slightly thick = IDDSI Level 1
- Verified as distinct from other thickness levels in literature but level lacks data to determine exact thickness required for therapeutic benefit (3)

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CONTINUED

Remember!

- Weaknesses of National Dysphagia Diet
- Systematic Literature Review Findings
- IDDSI Rationale
- Food and Liquid Pyramid

62

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4. https://iddsi.org/Documents/IDDSIFramework-EvidenceStatement.pdf This work is licensed under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International License October 10, 2016
5. The International Dysphagia Diet Standardisation Initiative 2016 @http://iddsi.org/framework/.Attribution is NOT PERMITTED for derivative works incorporating any alterations to the IDDSI Framework that extend beyond language translation. **Supplementary Notice:** Modification of the diagrams or descriptors within the IDDSI Framework is DISCOURAGED and NOT RECOMMENDED. Alterations to elements of the IDDSI framework may lead to confusion and errors in diet texture or drink selection for patients with dysphagia. Such errors have previously been associated with adverse events including choking and death.

63

6. November-2019-e-bite--Back-to-the-beginning--important-reminders-about-the-IDDSI-framework--Level-5-clarifications--Food-Testing.html?soid=1124597382375&aid=lgmiaQwl3E8
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Questions?

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