International Dysphagia Diet Standardisation Initiative (IDDSI) Framework and Rationale, Part 1

Recorded April 16, 2020

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OccupationalTherapy.com Course #4717

- [Fawn] Today's course is on International Dysphagia Diet Standardization Initiative or IDDSI, Rationale and Framework part one. Our presenter today is Denise Daugherty. She owns and operates a private practice in Indiana, Pennsylvania where she conducts therapy with children and adults. She received her bachelor's in communication disorders from Marywood University and her master's from St. Louis University. Since 2007, Denise has served on the expert workgroup of the physician's office, measure project for quality insights of Pennsylvania working on initiating quality measures for CMS to improve effectiveness, efficiency, economy and quality of service delivered to Medicare beneficiaries, specifically medication review. She's a past president of the American Academy of private practice and speech pathology and audiology. A past member of ASHA's Health Care Economics Committee and co-editor of the "Private Practice Essentials: "A Practical Guide for Speech-Language Pathologists." Denise works as a forensic speech pathologist and expert witness in litigation involving dysphagia, choking deaths and surgical errors. Welcome, Denise, so happy to have you.

- [Denise] All right, I believe I'm coming through on the microphone now. So we will go ahead and get started. As far as the disclosures, I do need to inform you I am receiving an honorarium from occupationaltherapy.com, and I am involved in private practice so we can move on from this slide. As far as our learning outcome is for the presentation, after this course, you will be able to define the levels in the National Dysphagia Diet. You'll also be able to discuss the rationale for developing the new system of standardization and identify three findings of the systematic literature review.

When we're looking at the IDDSI framework, it was finalized in 2015, and it provides a much more comprehensive guideline for diet selection. So this seminar is going to discuss the rationale behind developing the new terminology and the criteria for diet selections. When we are talking about the IDDSI, the International Dysphagia Diet Standardization Initiative, they are very strict about citations, so I wanted to make sure

that we have this information on a slide of its own, and it's also in the bibliography. So when we're looking at the International Dysphagia Diet Initiative, there's a lot of information on their website that you can download and duplicate. Again, they just want to make sure that you're providing the citations. All right, so when we're looking at the occupational therapy, speech-language pathologists connection, excuse me, we work very closely in the facilities that I've been in all based on my experience, so we are collaborating to provide patient care. And it's very important that we're all on the same page as far as diets that are recommended for this individual, what they should look like, what the bite size should be.

The problem is exactly what are they? In some facilities depending on staffing, the occupational therapist may be the individual who is there more at mealtime than the speech-language pathologist, especially if you have a contract company, the speech pathologist may not be there on a regular basis, so you tend to be the one in interacting with staff, interacting with the kitchen, the patient and the family. So it's very important that you know what the meals look like. You need to know what the bite size that that diet level recommends. And bite size is really important because when we're talking about choking deaths, if there is an autopsy, they will measure the food that is in the airway, and if it doesn't match up with the bite size for the patient's diet, we've got some issues as far as legal concerns. It's also the occupational therapists that then will provide the education to the staff at mealtime when you're working with that individual. So it's very important that both the speech pathologist and the occupational therapist are presenting the same message to the staff. And there's a lot of times where I'm in a facility and I hear this staff saying, "Well OT is saying this but speech is saying this." So it's really important that we are coordinating our message to the staff.

So again, that bite size, what the diet should look like, how the patient should eat or be fed. Those are critical messages, and it's also important from a documentation

standpoint that you identify that there was education. Who did you educate? Who did you talk to? What exactly did you say? So that notes if you were just saying educated staff, that's better than nothing, but it's important that you elaborate on that, just so that we're clear what exactly you told the staff because that's often in question when we talk about lawsuits. So where did this diet standardization start? Why did we get to modify diets in the first place? And why was there a need to change? We already had the National Dysphagia Diet. So there was a lot of frustration in the professions that work with patients who have dysphagia. We have problems with the standardization for solid food textures, what exactly are they? What should they look like? How do you prepare them? The same thing for liquid consistencies, how do we know that the liquid is thickened appropriately for this individual?

So that terminology became a real sticking point. We started with the National Dysphagia Diet, and this project was conceived by the Dietetics in Physical Medicine and Rehabilitation dietetic practice group. They started this in 1996. And they put together a task force. The responsibility of this task force was to study the issues about diets and to formulate new diet protocols. So they looked at clinical swallowing problems, they looked at food properties, and they had a number of individuals who all had either an interest in dysphagia, experiencing dysphagia that were part of this committee. So we're looking at food scientists. We have clinical and consulting dieticians, the speech-language pathologists, food industry representatives, the companies that formulate the thickeners and the different pre-processed foods that your dysphagia patients may be consuming.

So out of all of this collaboration, we ended up with a standardized dysphagia diet, and this was on a national level. So when we're talking about National Dysphagia Diet, these are levels that have been documented, put together by this particular committee. So we have multiple Level dysphagia diets that came out of this whole project. This National Dysphagia Diet ended up being published by the American Dietetic

Association in 2002. And what we have are food classifications. There are different levels of foods looking at textural properties, and we have points along the continuum for what each level should have as far as foods that you're allowed, foods that you should not be allowed. So there is a hierarchy and it was very clear at that point, what you can and cannot have. They were also looking at bite sizes, but it's not as comprehensive as what we have with the IDDSI, but it was a great start. And unfortunately, my experience has been with the National Dysphagia Diet in facilities I've worked at, everybody puts their own spin on it. So depending on what facility you're working in, their National Dysphagia Diet level one may not look exactly like it does in another facility. So it's really important we know again, what diets look like, what you can have, what you can't have, and the rationale behind that.

So we were looking at National Dysphagia Diet level one, and with this one, we have the purees. And the puree does not require a lot of chewing ability. It doesn't require the processing that the higher levels do, so it's more of a pudding like consistency. Now, when we're looking at the purees, the diet level one, as I said, every facility tends to have their own spin on this, but what I've seen in some facilities on that diet level one, we have mashed potatoes that are very, very sticky. They're one big lump. And that's hard for some of our patients to process even though it's technically a puree, it was just too difficult for the patient to handle. So in a lot of facilities that I've worked at, the staff and myself, we would have to modify that mashed potato before we've had the patient. So we had to add some milk, thinned it out, make it a much more creamy texture, because it didn't require as much processing if it was creamy, so kind of thinking about is Swiss Miss pudding, very creaming rather than a big lump. And we found the same thing when we were looking at macaroni and cheese or pastas or noodles. Those food items, again, technically a puree, but these were so sticky. We could probably throw it on the wall and come back next week and it would still be there. It is just very difficult to process. So even though it is a puree, and it's what our patient should have, a lot of patients can't tolerate that, they don't have the skills, they

don't have the chewing ability, they don't have the strength and that puts them at risk. Plus they fatigue very, very quickly. So that became a choking hazard in a lot of facilities.

The other thing that we would find that comes out on that diet level is the pureed cake. Now, in some facilities pureed cake looks like a pudding or a cake butter, but in some facilities what comes out as puree cake is a piece of cake floating in a bowl of milk. That is not pureed cake, that's a piece of cake floating in a bowl of milk. And dietitians that I worked with would explain, yes, it is puree because we smash the cake into the milk before we feed the patient. And I hate to burst your bubble, but I need to tell her I've never seen anybody smash the cake into the milk before they fed it to the individual or the individual would self feed. So that's problem number one. Number two, if that individual was on thickened liquids, the liquid in that bowl is not thickened. So we have a thin liquid consistency that puts our patients at risk. And then number three, when you smash the cake into the milk, you get a mixed consistency. That is not puree, you have particles of cake floating in the milk, and that's a choking hazard for a lot of our individuals. And you'll see on the IDDSI, they talk about next or dual consistencies, and that's what the cake is when you smash it into the milk. It's not puree, it's not smooth. We have the particulate matter floating in the milk. So purees, how can you screw that up? In a lot of facilities, we have different versions or purees, the sticky, the adhesive or we have something that really is a mix consistency rather than a puree.

We have diet level two. And this is mechanically altered, so it does require some chewing, you're going to have moist semi-solid foods that form a cohesive bolus, one that is easy to form, process and swallow. Now, in this diet level two, depending on the food item, they are looking at the bite sizes or the pieces of that food being anywhere from one quarter inch to one half inch, so they give you a range of diameters for that bite size. In a lot of facilities, that's not how it comes out. So that becomes a concern.

But you do have to do a little chewing and then we get to the advanced, and this is level three. So when we're looking at bite size pieces for this level, we're looking at about one inch pieces. So with this advanced dysphagia diet level, it does require more chewing. You have soft foods, it's not gonna be the tough foods like you would have on a regular diet, but it does require some processing. And then we move to the regular foods.

Now, in a lot of facilities, they don't do all of those levels. They may have puree, they'll have mechanical or the level two, and then they jump right to regular. So there's a huge jump from having everything ground to getting a piece of steak and that put our patients at risk as well. So you need to think about what foods should look like and what risks it poses to your patients. In some facilities when you're having the pureed diet come out, it's ice cream scoops. It's a very solid lump versus other facilities where that puree is basically a puddle that you need a compartment plate to corral before it runs all over the tray. Well, which one is it? So puree it needs to be that smooth consistency kind of like the Swiss Miss pudding. The problem with the puddles in that plate, if that individual is on thickened liquids, that puddle of puree may actually be too thin and pose a choking hazard for our patient, so it's really important everybody's on the same page with what this individual should have. So even though we have some guidelines, every facility that I've ever worked at took some liberties with those diet levels.

We also had labels for the liquid viscosity. So what we're talking about with viscosity is the resistance to flow or the thickness of the liquid. So when we do modified barium swallows, we're looking at how fast the patient is able to swallow and control the liquids. And if they don't do well with regular liquids or the thin, we need to slow down the liquid to match the speed of the swallow, so there we get into the labels of nectar, honey and spoon or pudding thick. So we tend to have those four terms, thin, nectar honey and pudding or a spoon-thick. Now, when you take a look at the centipoise, this

is a measurement of the viscosity or the thickness. And we have different values. So there's a range when we're looking at what is considered to be a nectar-thick liquid, and this gets us into some trouble. So when they measured thin liquids with centipoise, one way that you could test a liquid is called a line spread test. And you have circles on a piece of paper. You put a, basically a PVC pipe on the middle circle, fill it with your liquid, lift up that PVC pipe and watch how far the liquid spreads over a course of about a minute. And depending on how far it's spread, that is either a thin, nectar, honey and if it didn't move, really you have that wallpaper paste pudding spoon-thick liquids. Well, nobody really has the time to test this, so we end up kind of eyeballing what the liquid looks like and that gets us into trouble because again there is a range.

So thin goes from one to 50 centipoise. This would spread the most on the line spread test. Then we have nectar, and this is from 51 to 350. So this is your tomato juice consistency. We move to honey which is 351 to 1,750. That is a huge range. So if somebody stopped you in the hall and asked you to look at a liquid and said, "Does this look like nectar to you or honey?" Again, very difficult to eyeball because there's such a range. And then we have the spoon-thick or the pudding. This is your thickest liquid. And this is basically you're eating your liquids, there's no way you're gonna be able to drink this or suck it through a straw. So we have the viscosity. Now, when we thicken our liquids, this is problematic for many of our facilities because they don't know how to mix. So we end up giving our patients something that's the wrong thickness. And if you are in a facility that uses the starch base thickeners, those are notorious for thickening over time. So you might have mixed it correctly, and it is nectar, but the longer it sits, it turns into more of a honey consistency. So again, it's not the liquid our patients should be receiving. And we hear this all the time, gosh, the spoon stood up on my liquids today. Well, there are nectar. That is not the consistency, so we need to fix that.

When we're thickening, if we haven't educated our staff on how to mix, many times what they will do is put the spoonful of powder in the liquid, stir it and give it to the patient who promptly chugs it. Well, technically that individual is still getting a thin liquid with powder swirling because we didn't give that liquid and the powder or the thickener the time required to bind and make it thick, so technically it's still thin. On the other hand, you'll have those staff individuals that put that powder in, they look at it and say it doesn't look thick enough to me and they just keep adding powder and all of a sudden there's that fine line between thin and wallpaper paste. So you have to really follow the directions that are on that can, and sometimes those are really sketchy. It will tell you, oh, one to two tablespoons give or take. Well, depending on the liquid, if it has pulp or vitamins or minerals or fats, it thickens differently, so there is a little bit of a variation in the amount of teaspoons or tablespoons that you put into that liquid to come up with nectar, honey or a spoon. But many times we haven't educated the staff, and if we have, they oftentimes don't follow our educational guidelines, so the viscosity becomes a real issue for our patients.

So all of this created some confusion. Everybody is doing their own spin on the National Dysphagia Diet, we don't really know how to mix the liquids appropriately, so our patients are in danger of an aspiration event, choking or a death. Well, what confused everything even more is the world is a much smaller place than it used to be, so we now have people that are traveling and we have different dysphagia diet labels, different terminology we're referring to, different liquids and solids with different names, so it puts our patients at risk. There are deaths with our patients because they were given inappropriate food textures. So we needed to do something different, we needed to do something better than what we had already in place. So as a result, there was a committee that formed and it was called the IDDSI, the International Dysphagia Diet Standardization Initiative. This is a group that was formed in 2012, and it was incorporated in 2013. So this is an independent organization, not for profit, and it is registered and operates under the guidelines of Australia. Every position on this

committee is voluntary. There were 10 countries that were on this committee and we have a number of different groups that were represented. So there were individuals who came from the nutrition and dietetics background, food service in catering, speech pathology, occupational therapy, and so on. So all of these individuals were coming together on this committee to see what we could do differently, what we could do better for our patients.

So the problem was, where do we start? They felt that a survey was a good place. So we need to know what we were doing now so we could figure out what our starting point was, what problems there were, and then tackle those. So the survey went out to 33 different countries, there were 2,050 responses, and what they found was, there was a common use of three to four levels of food textures, but there were 54 different names that refer to those different textures. And we saw the same problem with liquids. There are more than three different levels of liquid thicknesses, and they had 27 different names, so it became very confusing if you traveled or moved around from country to country or relocated, what you were used to calling something in Germany did not equate to the same diet in the United States and so on, so it really created some real issues and put our patients at risk.

To give you an idea of the terminology, if we were looking at thin liquids, we tend to talk about thin or regular liquids. Well, we have less mildly thick, we have clear, we have normal, we have grade one, very mildly thick, thickened liquids as we continue down through the different consistencies. When we get to what we would consider a nectar, we have level 150, mildly thick or grade two, moderately thick syrup, thickened, we're all talking about nectar here. When we move into the next level, which is your honey thick, we're looking at level 400, moderately thick or grade three extremely thick, jelly, medium. And then when we get to the pudding or the spoon-like, we have stage three, level 900, grade four, pudding-like, paste or creamy, so it became a real issue when they started getting all of these surveys in, so many names, what are we gonna

do? And they saw the same thing with foods. What we would consider to be a regular diet, we have easy to chew, general, normal, regular or cut and then we continue to move through what we would call normally the dysphagia advanced. And some of these names, we have a diameter, we have 0.5 or 1.5 centimeters depending on the levels that we're talking about. Of course, pate was a name for some of these. When we get into the mechanically altered, now you're looking at 0.2 centimeters, 0.5 centimeters paste, mashed. And then when we get to the puree, we have additional names for that, so it became extremely difficult for us to figure out what a patient should have when they were moving around. Really put our patients at risk. So it gives you an idea of the problems we were having with terms.

So now that we have the concerns identified with those surveys, it became very clear there needs to be standardized terminology, and again, this is a global effort. Well, we have a lot of problems with facilities trying to deal with the National Dysphagia Diet, let alone now we have the international. So we need to deal with the misunderstanding, we need to deal with the vagueness or the ambiguity. And it became very clear that patients and caregivers really couldn't assume that all the different products out there on the market were actually the same consistency, the same viscosity, so it became clear that in looking at research, the terminology made it very difficult to take a study that was done in Germany, and how does that work in the United States. So it became very clear we had to change something. So they ended up doing this three year effort, putting this standardization, the framework together, and they finalized the framework in 2015.

So we have a continuum. We have drinks that go from levels zero through four, we have foods that go from levels three through seven, so you see an overlap between the liquids and the solids. But now we have common terminology to talk about the food textures and the thickness of the drinks. We're looking at the ability to test, so for the first time, we really have a great way of testing our foods, the textures, and the bite

sizes at bedside. It's very easy, doesn't take a lot of training for our staff, so we should be able to eyeball that tray, that plate and identify this is not done correctly, we need to reprocess it, it needs to go back to the kitchen. But what they also found was you need to be sure that when you are testing the foods or the liquids, you're testing them under the intended serving conditions, especially temperature. What they found was that as liquids that we would normally drink hot as they cooled off, it changed the thickness of the liquid. So if you were supposed to drink this liquid hot and you tested it when it was lukewarm, it tested completely different. So you always need to test that food or that drink under the intended temperature it's supposed to be consumed. Now, when the IDDSI Committee started, they realized that this was going to require some financial support, so they reached out to companies that were already working with dysphagia products and putting those out on the market.

They wanted sponsors. So they came up with the role of the sponsors. These are some of the companies that you may recognize and if you go to the IDDSI website, you'll be able to pull up an even larger list. The amount of sponsors behind the IDDSI has grown over time. So you'll be able to identify companies that I'm sure you've seen products in your facilities. Their role was to provide financial support, and the committee was very clear on what the sponsors role should be. They were to pick up the costs for the research, the administration, the data analysis or the systematic review of the literature that was already out there. And it was very clear from the very beginning, these sponsors were never involved in the design or the development of the framework. That was not their job. They were there as a financial sponsor. These companies were briefed at various stages within this developing framework, so as they reached milestones, they would talk to the sponsors about the progress to date.

And IDDSI also reached out to professional organizations and associations, letting them know about the project and inviting them to participate or provide support for the project. When the committee was working, they did a lot of this with teleconference,

and they had several in-person meetings, so we're looking at the timeframe between 2013 and 2015 for developing the framework. They did a systematic literature review. They wanted to look at what was out there regarding food texture, liquid consistency, and how that influenced the physiology of the swallow. So they did this literature review in 2014, and they published the results in 2015. And we'll talk a little bit about what they found. In addition to looking at the research, they also put together different surveys for the stakeholders, and this was done in 2013. So we had our initial survey that went out looking at what do we call these different diets and what do we call these different liquids. Now, they targeted very specific groups. They wanted to do one survey for individuals who had dysphagia diagnosis, their caregivers, or organizations that provided support to individuals who had the diagnosis of dysphagia, so that was one survey. Another one went out to healthcare professionals and food service professionals. A third survey went out to the dysphagia research scholars, and then other surveys went out to the industry representatives who were manufacturing the textured modified foods, and another one went out to the companies that were manufacturing the thickeners or the thickened drinks.

So all of that information went out, came back, and they acted on those results of the survey. So between putting all this framework together, there were additional surveys that went out. This was done in 2015. They looked at 3100 individuals, 57 countries. Those are the surveys that were completed, and they found that the individuals that completed them were either healthcare professionals or food service professionals as far as the breakdown. What they found was the term slightly thick had been put out there as a term. What they found was 6.5% of those who were surveyed weren't familiar with that level. And they weren't sure how that was distinct from level two which was your moderately thick or the nectar. And what they found was, we needed to have something that described the thickened infant's milk or the formulas. So that was a level that was added to the IDDSI framework. They also looked at level seven, which is your highest level, and there was some concern about foods that were

considered to be meltable or dissolvable. And there were a number of individuals that found that was confusing. So they came up with a new name and they call this particular level transitional foods.

So it does not have a number and as I show you the framework, you're going to see transitional foods cover several different levels. This is food that starts out as one consistency and then dissolves or melts, so it would be appropriate for individuals who were on like a mechanical-altered diet all the way through regular. When we're looking at the systematic literature review, some of the results and I'm sure some of these aren't a surprise to you. Thicker liquids did reduce the penetration and aspiration, but it also increase the risk of residue that we found in the pharyngeal area after the swallow was completed, and that would put our patients at risk. They found that the existing literature was insufficient to support the use of viscosities. Those levels that we talked about with the centipoise, thin, nectar, honey and spoon-like or pudding, so we needed something different there.

They also felt that we needed to look at the evaluation. We need to do a really thorough evaluation with our patients to determine what they can tolerate, what they can safely handle as far as the foods, and we do that in our evaluation. So that is our best evidence for making a recommendation. In addition to the modified barium swallow or the VFSE, the first time we have contact with a patient is at bedside. So we're doing trials, we're looking at how they handle the diet they're on, do we need to upgrade or do we need to downgrade based on how they perform, how they tolerate, how they handle those different textures. We know that solid foods and thicker consistencies require more effort in processing and swallowing. So when we go back to some of the things we talked about earlier with those sticky foods that would come out on the pureed diet that put our patients at risk because it was so thick, they didn't have the skills necessary to process it safely. We found that the adhesive sticky foods required more processing, it took longer to chew, required more muscle efforts, and a

lot of our individuals who were placed on that pureed diet didn't have that strength. They didn't have the chewing ability. They fatigue very, very quickly. So that particular food item put them at risk. We're looking at shear rate and this is difficult to define. But it's how the layers of the food kind of slide over each other. Did I advance too quickly? Yeah, okay.

All right, so we're looking at the viscosity, we're looking at the different levels that our patients would consume. When we're looking at that palatal seal, there's a different process in a palatal seal when we're looking at foods versus liquids, does the tongue move up or does it stay down? We also need to be careful because if we're not chewing efficiently, we tend to have what we would call premature spillage or containment, and that would mean that the food or the particles that were chewing can often fall over the back of the tongue before we'd actually decided to trigger that swallow, so it can get our patients into trouble as that residue builds up. Alright, so this is the shear rate. I ended up talking about this on the previous slide, but the shear rate is the layers of the fluids or the foods sliding over each other whenever we're doing that chewing, and some of the examples that came out when we're looking at shear rates, the ketchup, mayonnaise, yogurt and honey, that created some challenges for individuals, and we don't normally think of them condiments whenever we're evaluating our patients.

There were also problems with the literature review as far as bias, and what they found was there were problems when they selected participants for the studies. There was a data that was missing. They found bias in every one of the studies that they looked at. How many times have you read a study and you found that they only looked at three patients versus thousands? So the sample of patients made or skewed the results of those studies. The other thing they found was many times in the study the patients were only given one trial with the bolus, and that is something that can give us a false sense of security when we're doing a diet recommendation or liquid recommendation

for our patients. If we give them one bite or one sip and it doesn't look bad, it's okay, we may move on. However, if you gave them a second sip of that same liquid or a second bite of that same food, you might see a completely different ability to handle. So that's when they would aspirate or that's when it would fall out of the mouth and create some problems. So you need to provide more than one trial, and that's really important when you're looking at a modified barium swallow that it's just not one sip or one bite before you make the recommendation.

They also felt that we need to look at the food properties, cohesiveness, hardness, how slippy the food is. We're going to kind of zip through the systematic literature review. But they felt we needed to adopt some of the sensory terms that we see in the food processing world, the food scientists if you've ever read any of their studies, the terminology they use is just mind boggling, but we needed to use some of their terms when we're talking about our diet and liquid consistencies and the rationale. We know that fluids require tongue strength, they require tongue pressure and the same thing we see with foods. So when we're looking at some of these diet levels, you should be able to just use the pressure of your tongue to break up that food, you really don't need to chew it. The tongue pressure is sufficient to break that food into particles. So they looked at that. It's lot of different findings. Now, let's go on to the testing. We mentioned that with the IDDSI, you're going to be able to test the liquids and the foods.

So for the liquids, they used a syringe-based flow test, and what they looked at originally was powders and the gel thickeners. They mixed those with Ocean Spray cranberry juice, and then they watched how it flowed through the syringe. They were also able to evaluate the condiments, things that we don't normally consider to be a liquid. But that would be your condiments. We know soups, we have to thick in those if our patients require thickened liquids, and then there's always a problem with nutritional supplements or liquid medications. So, how many times have you been approached? Do we need to thicken the inshore? That's just a bear to thicken because

of every ingredient that's in that, it tends to get really lumpy. So they wanted to use a syringe, which would be easy for everyone to have in the facility rather than the line spread test. So they put together the flow tests, and we're looking at a standardized volume. We're looking at a standardized flow time and a standardized syringe. So we're looking at a 10 milliliter syringe. So you're going to fill the liquids to that line, and as you're filling this syringe, you are closing off the bottom with your thumb or your index finger. Once you fill this syringe to the 10, you let the liquid flow and you're going to let it flow for 10 seconds. So we have a standard flow time, we have a standard volume, and we have a standard syringe. So that would allow us to compare the liquids and come up with what is the consistency of those liquids? So it's very easy to test is this liquid nectar? Is it honey? Is it thin, is it slightly thick by the amount of liquid that is still left in that syringe after the 10 seconds.

So we'll explain this in a little bit more detail as we go through today and part two. The other thing that we found with terminology is the nectar and honey that we tend to use all the time and don't think twice about it. Well, those terms weren't really understood in parts of the world, particularly Asia. So we had to play around with the terminology. They also found that when we use the term honey in some parts of the world, they translated that into the food, and that's a botulism risk for infants under the age of 12 months. So they felt we needed to stay away from nectar and honey terminology because of the misunderstandings. Now, when we get into the framework, this is what it looks like. So if you go to the IDDSI website, you'll be able to see this framework and all of the rationale behind it, what foods you can and cannot have. So as you see we have the overlap. Okay, get our pointer here. Okay, I'm losing the pointer.

So we see the overlap between puree and extremely thick, liquidized, and moderately thick. So we have the labels for food, there's the pointer. Alright, so here we have the overlap. They're basically the same. All right, so there's definitions for each one of those. There's specific ways to test what would fall under each one of these

categories. So if we take a look at the levels, okay, that pointer again. There we are. Alright, so we have regular, we have easy to chew, which is a subset of regular, soft and bite size, minced and moist, and then we get into the overlap. We continue through the liquids to mildly thick, slightly thick, which would be your infant anti-regurgitation formulas and then you're thin. So with the syringe, you're able to test is it moderately thick all the way through thin, you're not going to use the syringe for the extremely thick because it won't go through the syringe. It's way too thick. Now, because this is a global standardization, they wanted to make sure that everybody was on the same page with how to test, what are the definitions? So this framework came out in 2015. They did add the easy to chew a little bit later. So we have different colors, very specific colors because they wanted to make sure that if an individual was colorblind, they would be able to differentiate between those colors.

And you see the gray block on the side, right here, that is your transitional foods. So we'll go from minced and moist all the way to regular, so these are the foods that would dissolve or melt. So an example of a transitional food would be Pringles potato chips, or the Gerber Puffs or Cheetos. They are a regular food, but as they melt and you add saliva or the temperature changes, it would be perfectly appropriate for an individual who was on a minced and moist diet. So it gives them the ability to crunch and bite, but the food is going to dissolve. They also felt that the way that we decide if a food is appropriate, it's using visual inspection and we see this with our families all the time, they'll look at a food and say, "Ooh, that's disgusting," and if they don't believe it looks like the food we say it is, they may not eat it. So many facilities have gone to the pre-molded purees so it looks exactly like the food, and we have less resistance if we can go that route. So we have the twin pyramid. This model was used in Japan and they kept this model for the framework.

Okay, they wanted to avoid the color red because that tends to be seen as alarmist. It denotes that there is danger, and in some cultures it had some additional symbolism,

so they stayed away from the color red. We do have that overlap that we talked about between the purees and the extremely thick, moderately thick and liquidized or the blenderized, so they share the same numbers and the same colors on the framework. Now, when we get into the warnings, there are certain criteria that prevent you from advancing to level seven which is regular diet. So when we're looking at the framework, we have level six. For you to go past level six, you really shouldn't have dry mouth. So these are all contraindications for you advancing to level seven. We don't want to advance you if you have dry mouth because you're missing the saliva that's really important to form a cohesive bolus. If you have dentures, probably not a good idea to put you on a regular diet, and the reason is, if you have dentures, we tend to have a more coarse bolus when we're chewing than we do with our natural teeth.

What happens when you chew is with your natural teeth, that tooth moves ever so slightly in its socket, and it activates something called a periodontal ligament, and as that tooth wiggles, that periodontal ligament sends information to the brain and you're brain tells you how to modify your chewing based on what's going on with that periodontal ligament and how it's moving. So if you have dentures, you can activate that periodontal ligament and adapt your chewing based on the food. So with dentures, we tend to form work coarser bolus, and we don't have the chewing strength with dentures that we do if we have our own teeth. We would not want to advance a person to level seven if they can't manage the mixed textures. The IDDSI also calls it dual consistencies.

So when we're talking about mixed or dual consistencies, this would be your cereal and milk, your soup that has vegetable or meats, and it's also watermelon, or grapefruit because you have the liquid portion as well as the solid. You need to be able to handle both to advance to level seven. These are really critical. If this is an individual who is impulsive or has a cognitive impairment, they are not going to be safe with regular diets where we can't modify the bite size. Any delay in oral skills, the fatigue or

impaired strength and stamina, these would all be reasons to keep this person on a level six, rather than advance them to regular. So it gives you the rationale to explain why you're not taking that individual up to the next level of diet. We also are looking at how to test the foods. Now, because this is global, not every culture uses a fork or a spoon, so there are testing methods for chopsticks. Can you break up the food with the chopstick and the same thing with your fingers? What happens when you put that food between your thumb and your index finger? Can use squish it? Does it leave a residue? Is it smooth as it moves between the index finger and the thumb? So there's ways we can test it without having a utensil. We talked about the transitional foods very briefly and we'll enhance that discussion as we go into part two.

So in this framework, we have the regular easy to chew, soft and bite size which is level six and minced and moist. So if you're on minced and moist, you may be able to handle a transitional food such as the Pringles potato chip, a waffle cone, Gerber Puffs, Cheetos. Again, you always want to keep in mind that everything we do is patient specific, so as much as you might like to try a transitional food with an individual, it may not work very well for them. So some it will, some it won't. But transitional foods are technically a level seven, but because they melt, or they dissolve when you add saliva or the temperature changes, it becomes easy for a person who is on minced and moist to handle it, so it's not going to put them at risk. So these transitional foods may allow you to work on increasing chewing skills, biting skills, without putting the patient at risk. Chewing is really important when we're breaking down the food. So we're looking at words like toughness, we're looking at moisture of the foods. The ability to adsorb versus absorb saliva.

So when we're looking at the adsorb, the ad, we're not absorbing but the saliva forms on the surface or the moisture forms on the surface and then we also have the fibrous nature of food. So something that would be fibrous, when you peel an orange and you have the white fibers, those would put our patients at risk. So we need to be able to

work on breaking down this bolus. Now, when we're looking at chewing, a lot of our individuals complain that the food is really, really tough, and what we don't realize or what the patient doesn't realize is the food isn't any tougher than it was years earlier, it's just their muscles are much more weaker. They don't have the bite force, they don't have the strength so the food didn't change, it's their muscle strength that did, so that's very hard for them to realize. We need to also talk about the moisture of the food. That determines if the food is ready for us to swallow. When we're chewing, the tongue is really able to differentiate if that particle is ready to swallow or not. So the particles that it deems ready to swallow, will move on back, that anterior posterior propulsion, and then the tongue will move the particles that need to be chewed more, have more saliva introduced, you'll move those particles more towards the front of the mouth.

So if we have dry mouth, we can't moisten the food and it's very hard to form a cohesive bolus. On the other hand, we can have too much saliva. If you have an individual that has to chew a lot and we see this with some diagnosis, you'll have that individual that just has that prolong chew, they chew and chew and chew. And there are some theories that the reason why they do this is they can't build up the positive pressure to do a swallow, so they just chew. Well, the problem with prolong chew is that activates the parotid saliva glands so it produces more saliva. So now we have a bite or a bolus that is flooded. They just can't form a cohesive bolus. There's nothing that they can kind of grab on to, it's just this pool of saliva with food in it. So you'll see both ends, too much saliva versus the reduced saliva. Even if an individual has their own teeth and reduced saliva, that can create problems with preparing the bolus for swallow. So it's not just the individual that has a dysphagia diagnosis, it's also those who don't. So when we're looking at the ways to test a bolus, we're looking at a spoon and fork testing, we can also do the chopstick or we can do the finger. Now, we recognize that when we, healthy individuals are chewing, our bolus is not lump free,

and each particle is a different dimension, so they're not all uniform. We need to be able to test our food. So we're looking at how much moist and cohesive the bolus is.

So with the spoon tilt test, that is going to tell us if this food is too sticky, too adhesive. So when you put that food on the spoon and tilt it, easy, tilting of that spoon, not tilting the spoon and shaking it and using your shoulder and your elbow, that bolus should fall off that spoon and you shouldn't have very much residue left. So those are all characteristic of being moist and cohesive. If you tilt that spoon and you're having to shake it violently with your elbow and your shoulder getting into this, it is to adhesive, so it won't pass the test for a particular diet level. And that's where we found the issues that we've been talking about what the puree, the sticky macaroni and cheese and the mashed potatoes. Those would fail the test so they need to be reprocessed.

We're also looking at the food hardness, and this is a practical test with the fork or spoon, so you're going to put pressure on that food. Now, they talk about thumbnail blanching. When you're testing, and this would be for level six, you're going to press that fork down or the spoon down, and you have to put pressure with your thumb on that utensil. Your thumbnail should blanch white. That equates to a kilopascal of about 17, and that is measured on a tool called the EOB. And when you have that thumbnail blanched, that corresponds to the pressure that your tongue would put on that food. So it's a way to test level six. Your thumbnail blanches white when you push down. When we're looking at other ways to test your food, we mentioned the chopsticks, we can do the finger pressure. So with level six, you should be able to push down with that fork or that spoon, your thumbnail blanch is white. When you remove the utensil or you're not pushing with your fork or your thumb or the chopstick, that food should not bounce back to its original shape, it should be squished. That would be meeting the test for level six. And then we have our transitional foods.

So again, when we're looking at the testing procedure, they are very, very specific with the bite size and with the amount of water that you're going to put on that transitional food to see if it meets the test. Does it dissolve? When we're looking at the systematic review, we know that there is residue that builds up in the pharyngeal area. So again, we wanna make sure that our patients are safe on that diet, that they can clear the residue that may collect in the molecular in the pure form of sinus. So we know our patients need the skills to process that food and handle it safely. So the rationale for all those diet levels and the framework are very clear, when you would recommend and when you would not. We know that children younger than three and adults over the age of 65, who have poor dentition as well as those who have neurological conditions, those individuals are at a very high risk of death from food asphyxiation. Healthy individuals, they need to be able to process the food and swallow it regardless of the bite size, regardless of the texture. The individuals who can't, again children under three, adults over 65, poor dentition, neurological conditions, we have to modify the foods so that they can handle that safely and it doesn't pose a choking risk or an aspiration risk.

So that's where we get into the evaluation at bedside, looking at trials and then determining the appropriate level on the IDDSI. Very important that we make sure this is the safest diet for individuals, we have to remove the choking risk. There are a number of food items that they've identified internationally looking at autopsy results, and we'll talk about those in part two, but this gives you a quick rundown of foods that have a high choking risk, foods that are hard or dry, chewy or sticky, crunchy or crumbly, floppy would be the lettuce leaf. And what would happen with the lettuce, when you swallow that, if it goes the wrong direction and covers the vocal cords, you may be able to try to cough, but what will happen is that lettuce leaf kind of flies up then flops back down again and covers the vocal cords. So very important that we're looking at that. We talked about the fibrous, the orange and the white fibers that are on the orange after you peel it, and then we go into the multiple or dual textures. When

we're looking at the bite size, one way that we can identify is correct is the use of the fork. We're looking at the width of the standard fork. That's an indication if that food particle is the width of a standard fork, we're in the ballpark for inappropriate bite size. So we'll talk more about testing, again, when we get into part two.

We have that cognitive impairment, there's certainly much more at risk. Even if an adult does not have a formal diagnosis of dysphagia, if they have fewer than 20 teeth, or dentures, they may need a softer food. So that's where they came up with the level seven, soft to chew. If you have fewer than 20 teeth, that impairs your ability to break down the food appropriately, so it gives you an idea of the bite force that is identified as Newtonian values. So if you have your own teeth, you're at 555 Newtons, edentulous, you're at 155, so again, we can't break down the food, therefore, we need the modified diet. So it gives us some rationale for that individual who is a edentulous or who has poor dentition that we can justify the recommendations and explain the rationale. When we're looking at liquids, we have the framework and they did come up with the slightly thick, which is IDDSI level one, versus the thin, which is IDDSI level zero, so we'll talk about those again when we get into part two.

So some things to just recap, the National Dysphagia Diet, it served us for a while that we know there are weaknesses with that. We've identified some of those, that came out of the IDDSI surveys and the IDDSI committee's systematic literature review. We have the rationale for the different levels on the IDDSI for the liquids and the solids, and we came up with the food and liquid pyramid. So what we're going to do in part two, is take a closer look at those IDDSI levels. What would be included? Why would it be included? What's the rationale for making that recommendation and further discussion about how we can test. So I will pass it back on to occupationaltherapy.com.

- [Fawn] Thank you so much Denise for a great talk today. I hope everyone has a great rest of the day. You join us again on Continued and occupationaltherapy.com. Thanks, everyone.