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## Improving Tolerance with Blenderized Whole Food Tube Feeding Formulas

### ReachMD Announcer:

Welcome to *Clinician's Roundtable* on ReachMD. This medical industry feature, titled "Improving Tolerance with Blenderized Whole Food Tube Feeding Formulas," is sponsored by Compleat®. Here's your host, Dr. Jennifer Caudle.

### Dr. Caudle:

This is *Clinician's Roundtable* on ReachMD, and I'm Dr. Jennifer Caudle. Joining me today to discuss the use of blenderized whole food tube feeding formulas for pediatric patients is Katherine Bennett, who's a registered dietitian at the Children's Hospital of Orange County in California. Katherine, welcome to the program.

### Katherine:

Thank you so much for having me.

### Dr. Caudle:

Oh, we're delighted that you're here. So if we start off with some background, you know, what kinds of challenges do caregivers and children face when trying to find a formula that's well tolerated?

### Katherine:

It can often be challenging finding a formula that is best tolerated, especially if a child has a diagnosis of any type of digestive disease, neurological issue, or if the child is malnourished. Underlying diagnoses, as well as complicated health issues like these can exacerbate intolerance as oftentimes these conditions can compromise gut function.

And, so, many times these children must go through multiple formula trials, changing from one formula to another to find one that is best tolerated. In my experience, I have worked with children who have gone through 5, 6, 7 plus formulas and not really tolerated any. In addition to the child's diagnoses, other factors contributing to this challenge includes the multitude of formulas available, combined with the potential lack of knowledge or experience by providers using all these formulas. One formula that works for one child may not work for another, so we really need to evaluate each child's overall health, their diagnoses, nutrition status, lifestyle, and be strategic about choosing a formula, especially when starting formula for the first time.

We really want to optimize tolerance as soon as we can, and this comes with having robust experience with children who are tube-fed, as well as the formula choices out there.

### Dr. Caudle:

And if we look at this on a broader scale, how does the financial burden of formula intolerance impact the healthcare system as a whole?

### Katherine:

Yeah, so besides the burden that we see on the child and the family, we do also see the burden of feeding intolerance on our healthcare system. In my own experience, I see the extra visits to clinic, the extra calls to the doctor to ask for what medication is next, or what formula is next. I see the admissions to the hospital for vomiting, diarrhea, poor weight gain, as well as the need for surgical procedures like a Nissen fundoplication or the placement of a jejunostomy feeding tube for the most severe cases.

A recent retrospective study used medical and pharmacy claims data and electronic health records to compare both clinical and health economic outcomes in children prescribed either commercial blenderized tube feeding formulas with whole food ingredients, or plant-

based standard tube feeding formula without whole food ingredients. Now, clinical outcomes included GI intolerant symptoms, while health economic outcomes included healthcare utilization and cost of healthcare provider visits in the outpatient setting.

Now, this was quite a large study, including over 1,000 children ages 1 to 14 years, and results showed that in addition to significantly decreased feeding intolerance associated with the use of the commercial blenderized tube feeding formula with whole food ingredients versus the standard plant-based formulas, there was also a decreased number of outpatient and inpatient visits, decreased number of ER visits with the use of this commercial blenderized tube feeding formula with whole food compared with the plant-based standard tube feeding formula.

Now, of course, we're happy for our patients that they don't need to come see us as much since they are doing well, but this also means less resources, like time and money being spent on their care because they are doing so well.

**Dr. Caudle:**

For those just tuning in, you're listening to *Clinician's Roundtable* on ReachMD. I'm Dr. Jennifer Caudle, and today I'm speaking with Katherine Bennett about feeding formulas with blenderized whole foods.

So, Katherine, let's talk more specifically about how blenderized whole food tube feeding formulas benefit our pediatric patients. First, can you tell us how a tube feeding formula with blenderized whole foods compares to other types of formulas on the market?

**Katherine:**

Of course. Now, this is a great question with a potentially very long answer but let me share with you how I explain it to my patients. Historically, formulas had 3 main categories based on the structure of their main protein source. The first and largest category of formulas are considered standard formulas, and these formulas contain an intact milk protein. The majority contain cow's milk as the protein, some may also contain soy protein. And these standard formulas may or may not contain fiber, and they may be flavored or unflavored. They also may be a standard calorie density, or 1.0 calorie/mL, or a high-calorie formulation like a 1.5 calorie/mL.

A second category is hydrolyzed, or semi-elemental formulas, and these types of formulas have the protein broken down, so it's considered pre-digested, or hydrolyzed into smaller parts for improved tolerance, digestion, and absorption. And they share many of the other similarities as the standard formula, including fiber content, flavors, and different calorie densities.

The third category of formulas is amino acid formula. Now these formulas contain protein in the form of amino acids only. These formulas I'd use for severe intolerance or GI dysfunction, and with food allergies. They typically don't have any fiber.

Now, historically, when a child has feeding intolerance, we would go down the line of formulas starting with standard, then moving to hydrolyzed, and if needed, amino acid-based to see if intolerance improves.

However, for many children with feeding intolerance, this traditional approach may not work. Now, this is where we have two newer categories of formula come in.

We still have the 3 categories of formula I just mentioned, but now have plant-based formulas and whole food-based formulas as 2 additional formula categories.

Plant-based formulas contain a plant protein as their protein source, no animal protein. And the popular plant protein being used currently is pea protein. We may also see different and/or more fiber types in these products as well. These products generally have no whole foods in them and are the consistency or viscosity of a standard formula. They're also available in different flavors and various calorie densities.

Now, whole food-based formulas are those formulas that contain whole foods in varying amounts. Some have more whole foods than others. These types of formulas contain animal and/or plant-based proteins.

Now, an important distinction between these whole food-based formulas and plant-based formulas is that whole food-based formulas may be plant-based, but not all plant-based formulas contain whole foods. These whole food-based formulas typically contain more fiber, and a larger variety of fiber types than any of the other categories of formulas, with many of these fibers coming naturally from whole foods. They often are thicker in viscosity than the other formulas because of whole food ingredients. This is also the category we are seeing the greatest expansion of product types in, especially as we are seeing the improvements in feeding tolerance with the use of these whole food-based products versus the traditional formulary categories.

**Dr. Caudle:**

And with that in mind, how can blenderized whole food tube feeding formulas benefit children?

**Katherine:**

Well, I'm really excited that the research is exploding with support for anecdotal experience showing that whole food tube feeding formulas are better tolerated than many of the formulas without whole food, and even plant-based formulas.

Another recent retrospective study again using medical and pharmacy claims data evaluated GI intolerance among children with specific chronic conditions who were changed from a non-whole food-based formula to a whole food-based formula during a hospital admission over about a 2-year period. This study included 469 children ages 1 to 14 years of age who had the main diagnoses of malnutrition, digestive system disorders, cerebral palsy, and seizure disorders. And across all these diagnoses, significantly fewer patients experienced GI intolerance systems symptoms with the whole food-based formula after discharge, than before their hospital admission when on a no – a non-whole food-based formula.

I think it's important to highlight these diagnoses of malnutrition, digestive system diseases, cerebral palsy, and seizures, as these conditions can place children at a higher risk for feeding intolerance. Many of my patients with feeding tubes and feeding intolerance have these diagnoses, and these conditions themselves, as well as the treatments and medication used to treat these conditions, can really affect gut motility.

Thus, it may be worth starting with a whole food-based formula in these populations to decrease their risk of feeding intolerance and really avoid the multiple-formula trials, and potentially failures, in the first place.

**Dr. Caudle:**

And based on your experience, why do you think caregivers are increasingly looking for natural and wholesome food options for their children's tube feeding formulas?

**Katherine:**

Now, that's another great question. Many of my families share with me that they want their tube-fed child to eat the way the rest of the family is eating. They also share that they want to have more control over what their child is eating. Also, many of them have heard how well children are doing on a whole food-based option and they really want to try it for their child. Another reason is that they want their child to be – their tube-fed child's diet to be consistent with the messages out there on what and how to eat. The dietary guidelines for Americans, for example, recommend for all of us to choose nutrient-dense foods from all food groups, including lots of fruits and vegetables, whole grains, as well as to limit foods high in added sugars. Families are concerned about the types of foods and ingredients in these foods that they eat by mouth, and they really share the same concern with what their tube-fed child is eating, specifically the formula ingredients. Families really want the opportunity to provide a healthy diet for their tube-fed child, and one that optimizes feeding tolerance, but also their health in general.

**Dr. Caudle:**

Now we've certainly covered a lot of ground today, Katherine, so before we close, what are some key messages you'd like learners to take away from our discussion?

**Katherine:**

We sure have, and I think there is still a lot more to uncover as this field advances. I'd really like learners to leave with 2 takeaways from our discussion today. Number 1, if you aren't already, become more familiar with tube feeding and feeding regimens for tube feeding, including all the possible formulas. I suggest throwing away the cookie-cutter approach. One size or one formula does not fit all in my opinion, and this includes reading the research, attending conferences and webinars, reaching out to experts in the field, but really also working with your patients, asking them questions, learning from them. Really try to acquire and maintain all the knowledge you can to set your tube-fed patient up for the most successful outcomes possible.

And number 2, what we eat matters, and this includes our tube-fed patients. What they eat matters. More research is supporting the benefits of whole food tube feeding. Not only as we're seeing improved clinical outcomes, but we're also seeing decreased healthcare utilization and costs. We are very aware that for the population that eats by mouth, how a healthy diet can reduce the risk of chronic disease, and decreased risk of chronic disease puts let's stress on our healthcare system. It's not surprising that we're seeing this in the tube-fed population as well. So, I'm really looking forward to seeing where the research continues to go and how it'll better help us support our tube-fed patients.

**Dr. Caudle:**

Well, those are some great points to take with us regarding blenderized whole food tube feeding formulas. And as that brings us to the end of today's program, I want to thank my guest, Katherine Bennett, for sharing her insights with us.

Katherine, it was great speaking with you.

**Katherine:**

You as well, Dr. Caudle. It was my pleasure.

**ReachMD Announcer:**

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