



Dr. Stukus: Hello and welcome to "Conversations from the World of Allergy," a podcast produced by the American Academy of Allergy, Asthma & Immunology. I'm your host, Dave Stukus. I'm a board certified allergist and immunologist and serve as the social media medical editor for the Academy. Our podcast series will use different formats to interview thought leaders from the world of allergy and immunology. This podcast is not intended to provide any individual medical advice to our listeners. We do hope that our conversations provide evidence-based information. Any questions pertaining to one's own health should always be discussed with their personal physician. The Find An Allergist search engine <http://allergist.aaaai.org/find/> on the Academy website is a useful tool to locate a listing of board certified allergists in your area. Finally, use of this audio program is subject to the American Academy of Allergy, Asthma & Immunology Terms Of Use agreement which you can find at www.aaaai.org.

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Dr. Davis: Thank you, David. I'm really glad to be here.

Dr. Stukus: Wow. I'm excited to have a conversation with you regarding this and I know our listeners are going to learn so much from today. But before we get into the content, we're recording this in August of 2020. We all know this is a time in our world marked by a global pandemic due to COVID-19 and also tremendous societal unrest sparked by the murder of George Floyd and I've been asking a lot of our guests the same question lately-- how are you doing?

Dr. Davis: Thank you for that question. It is really an unprecedented time and kind of surreal as we have had to navigate the changes in our social interactions as well as this unroofing of the health disparities

that are really evident during this time of COVID-19. I've been doing really well, actually, because the issues that have been unroofed currently are not necessarily new issues. They're just issues that now have come to the awareness of everyone. So, I really think this is a time of great opportunity and so, I'm really optimistic and excited about what's going to happen because of the heightened awareness surrounding these issues.

Dr. Stukus: Excellent. I love that-- opportunity, excited, things like that. That's why you're the perfect guest for today. So, as a follow-up to that, have the events of the last several months changed anything for you regarding your approach to caring for patients or some of your research interests?

Dr. Davis: It has and I think I have really realized we have a lot to do and we are all in a unique situation, especially those of us who are allergists, to make a difference during this pandemic, to be able to expand the access to healthcare services as well as educational efforts to those people who have been disproportionately affected by this disease. So, I have actually been inspired to engage in conversations with the leaders at my institution to talk about how or what we can do and how we can put things in place in order to make sure that people who are underserved at this time medically don't get left behind because the pandemic will continue on and there may be more people who are employed who then move to become unemployed. So, we want to make absolutely sure that a large segment of our population in the US don't have to suffer needlessly. So, I've been thinking about this and then I've also been inspired to try and figure out how the pandemic has affected our patients here at Texas Children's with food allergies. So, we've started a research project to really find out what's happening.

Dr. Stukus: That's amazing. I heard you say inspired twice in your reply, which I'm hopeful that-- I'm already inspired just by the introduction here and hopefully our listeners will be as well. That's fantastic. Thank you for sharing that. Okay. So, to get into today's topic, let's just start with the basics and if you may, can you just orient our listeners regarding how you're going to be defining food allergy for the purpose of today's conversation?

Dr. Davis: Yeah. So, food allergy, really, from an allergist's perspective and how we're going to be talking about it really refers to the conditions in people that are triggered by food but really moderated by the immune system. So, when there's an immune system response to food, this is what I would call a food allergy. So, this doesn't refer to food intolerances that might be mediated by lactase deficiency, lactose ingested foods and then we will encompass IgE-mediated and non-IgE-mediated diseases in those food allergies.

Dr. Stukus: Okay. Yeah. As you know and our listeners know, there are millions of people affected by these hypersensitivity disorders. So, that's good to focus on that and then also, how are you going to be defining or how would you define disparities and how does that relate to food allergies? For instance, is it purely dealing with social or economic differences or racial or ethnic? If you could explain some of that at the outset, that would be great.

Dr. Davis: Well, disparities just means difference and then health disparities really refers to disproportionate burden on a particular group of people with an illness. So, in the context of food allergies, disparities could mean-- it could apply to any group and as we know, actually, male children

tend to be affected more with the food allergies. So, it could be sex-related. It can also be socioeconomic. So, when we look at urban versus rural populations, there are differences and then it could also be racial and ethnic. So, it encompasses all of these things and it really encompasses any characteristic in a group that is disproportionately affected by food allergies. So, that's what I would say.

Dr. Stukus: Okay. I think that's a great introduction. Now, I'd like to kind of tease out some of those different key areas that you touched upon and discuss how they impact various aspects related to food allergies. So, you mentioned that boys tend to have a higher prevalence of food allergy, but how do socioeconomic and racial or ethnic disparities impact the prevalence of food allergies? Are some populations at higher risk to develop food allergies in the first place?

Dr. Davis: Yeah. We do think so. Prevalence studies do show that there are more food allergies predominately seen in minority and lower income populations in the US. These populations also have higher rates of food allergy-related anaphylaxis and emergency department visits. So, we also know that black, Hispanic, and Asian children can have some disparate specific food allergies. So, black children have higher odds of wheat, soy, corn, and fish/shellfish allergy. Hispanic children have higher odds of corn, fish/shellfish allergy. Indian children have higher odds of tree nut allergy. So, really, it can disproportionately affect different populations based on the actual food allergen.

Dr. Stukus: So, they're at higher risk to develop food allergies in general and then among the different food allergens, there are also disparities there as well, correct?

Dr. Davis: Yes. That's right.

Dr. Stukus: Can you orient our listeners as well-- you already defined food allergy. But really, what are the most common types of food allergens in regard to these hypersensitivity disorders?

Dr. Davis: So, there are eight very common-- most common food allergens with a ninth that has joined. So, that includes milk, egg, wheat, and soy allergies as allergens that are typically outgrown and tend to affect children and then there are tree nut, peanut, fish, and shellfish allergens. Those really develop-- they can occur in children and adults, but are kind of characteristically or seen as later-developing food allergens that are in most patients lifelong. Then the one that has been also pulling up the rear as the ninth is the sesame allergy.

Dr. Stukus: Okay. So, with IgE-mediated food allergies you mentioned before, can you just describe what's the typical presentation or what's the range of symptoms as well as timing of onset to some of these foods that you just mentioned?

Dr. Davis: So, for IgE-mediated food allergy, which is the food allergy that is typically thought of when people have hives or swelling or respiratory difficulty, this is the kind of allergy that can happen immediately after eating a food and doesn't really need a lot of food ingestion or exposure in order to cause a significant reaction. We are very concerned about this kind of food allergy because it can lead to the life-threatening severe allergic reaction called anaphylaxis. So, all systems can be involved in anaphylaxis reactions. We know that the skin is a major organ that's involved. So, hives, swelling, itching

can happen and eczema can be flared in an IgE-mediated hypersensitivity reaction. You can have swelling of the conjunctiva. You can have nasal congestion and rhinorrhea. There can be really a swelling in the throat as well as respiratory symptoms like cough difficulty breathing, shortness of breath, wheezing, all of those respiratory symptoms are really red flags for anaphylaxis, the gastrointestinal tract can be involved with nausea, vomiting, diarrhea, and just pain and so, interestingly, the bladder can be-- rarely is the bladder involved. Neurologic symptoms can occur and of course, the cardiovascular system can be involved, causing hypotension, fainting, blue and pale skin and these are really these neurovascular-- neurologic and cardiovascular symptoms are really the ones that are very concerning and should be taken seriously, treated immediately.

Dr. Stukus: Okay. Yeah. You touched upon eczema as part of an IgE-mediated reaction, but what about in regard to prevalence of eczema? Do we see differences among these populations you mentioned in regard to increased prevalence of food allergy among black and Hispanic and Asian children and if we see those differences in regard to prevalence of eczema, how does that actually relate to food allergies?

Dr. Davis: Well, in atopic dermatitis, about a third of patients have food allergies and so, we know that they run very closely together and there's a higher prevalence and persistence of atopic dermatitis in female and black children in urban areas. We also know that there's a higher prevalence as well as severity and impaired quality of life among these patients. Black and Asian children are seen for office encounters and allergists for atopic dermatitis at a higher frequency than white children and there is some role of the, of course, health insurance status, a smaller family size, and single mother household, which all actually correlate with an increased risk of childhood atopic dermatitis. So, we know that there are disparities there and there are a lot of opportunities, I think, to really treat and care for those patients.

Dr. Stukus: Yeah. So, it's just-- I'm hearing you describe just an increased burden overall across many levels. We're going to talk more about that in a second. I want to touch upon something you just mentioned because I'm interested in this. you mentioned the insurance code. When we look at these disparities, how are they identified? Are these like large-scale population epidemiologic studies? Can you give us a very brief background about what some of these studies use as far as methodology to identify these disparities?

Dr. Davis: Yeah. So, some of the studies that are large-scale use Medicaid or Medicare databases or also health insurance databases of very large health systems to determine what the diagnosis and the frequency of diagnosis that's physician-led in those populations and the proportionality of the diagnoses among the different health insurance groups is compared. So, that's typically how these studies have been conducted and there was a recent study, actually, out of Northwestern where the prevalence of food allergy among Medicaid-enrolled children was found to be about 0.6% and there were differences in race and ethnic groups so that Asian, black, and Pacific Islander or Native Hawaiian children had higher odds of food allergy, while Hispanic and Native American children had 15% and 24% lower odds compared to white children. So, there are definitely differences, but it's interesting that the prevalence of food allergy in this Medicaid population was quite-- was much lower than what other studies have noted, which is typically 6% to 8% of children. So, I do think that there is in some instances a lack of diagnosis in many of these underserved populations and Mount Sinai looked at differences in their Medicaid or underserved clinic versus their tertiary care clinic. Julie Wang did this study and really did see that there were

differences in the diagnosis of food allergy in those two populations. So, it definitely is a concern, but we know that these claims-based prevalence data show us that there may be really a group of people who have not been diagnosed. We saw the same thing, actually, in our studies of the Houston Independent School District, the fourth-largest school district in the nation, when we queried the schools, the nurses “How many children do you have in your school with food allergy?” and so, we found that really, 90% of the food allergic diagnosed and identified children were in schools that were in areas of higher socioeconomic status. So, we think that really, there is a need to actually identify and diagnose patients who are underserved.

Dr. Stukus: Oh, boy. What an interesting little sidebar there. All right. Well, thank you for sharing that. As a note to our listeners, for the medical professionals among you all, the ICD-10 codes that you use matter. So, make sure that you put the diagnosis on the chart so it can be captured by our outstanding epidemiologists and researchers like Dr. Davis. Okay. So, let’s go back to our topic. Can you define morbidity? I think you mentioned this a little bit briefly earlier, but what does that term morbidity mean and how does it relate to food allergies? Are we just talking about emergency room visits for reactions or are there other things as well?

Dr. Davis: There are other things that really affect the quality of life of a food allergic patient and I think I have over the years really have come to respect the daily burden of food allergy. It’s kind of like an invisible disease because our patients with food allergies, they look fine to other people, but because of the risk of the life-threatening anaphylaxis and the potential for death, every single moment, food allergy patients have to try and prevent themselves from dying, right? So, we’d know that through quality of life studies, some studies show that children with food allergies have a lower quality of life than children with, for instance, type 1 diabetes and so, I think we-- many people can tend to underestimate the impact and morbidity of food avoidance in food allergic patients’ lives. It’s is incredibly life-changing. This is what patients tell me all the time. They had no idea before they were diagnosed how much effort it would take in order to stay away from certain foods. So, it’s really a huge burden and that is really, I think, the goal of these treatments. That’s what we’re really trying to impact, the hidden morbidity of food allergy.

Dr. Stukus: What about in regard to the disparities related to morbidity and quality of life that you mentioned, do we see the same differences among various populations and if so, what kinds of metrics have been used to demonstrate these differences? Are we talking about quality of life surveys or are there other objective assessments that have been done?

Dr. Davis: Yeah. So, there are several surveys that are out there for food allergy quality of life. There’s the Food Allergy Quality of Life Questionnaire, the FAQLQ. There’s the Food Allergy Independent Measure, FAIM. So, then there’s the PedsQL, the Peds Quality of Life survey that’s used in eosinophilic esophagitis and so, there are several surveys that have been used and these are the ones that typically are used in oral immunotherapy trials or other food allergy quality of life assessments and typically, the higher the score, the lower the quality of life. The lower the score, the higher the quality of life. There have not been many comparisons with regard to quality of life in food allergy populations. Typically, the studies of quality of life as well as immunotherapy have typically been in white and Asian children in our population that we see in our tertiary care centers are typically skewed in that there are very few minority patients and so, really, I think these are studies that should be done and we’ll learn more. I think that as

we-- so, we have looked to see what the burden for food allergy associated disease like eosinophilic esophagitis, we've looked at kind of the burden in our own population and it did show us that patients that have Medicaid or are underserved, an inability to really pay for their food, specialized foods typically tend to have a lower quality of life. I think the field is ripe to have these studies in food allergy patients.

Dr. Stukus: Absolutely. Does it cost more for families who have to live with children who have food allergies? I mean, they have to find alternative sources of food and things like that?

Dr. Davis: Absolutely. There have been plenty of studies that show there are billions of dollars just when you look in aggregate of the food allergy community that have to be spent on specialized foods and so, we know that that is a huge burden and we know that government programs really do not provide foods for food allergic patients. We know that food banks typically don't provide foods for those who need their services and have food allergy. Here in Houston, we, through our Food Allergy Family Network, have had some parent leaders whose families are collecting food allergen safe foods to give to the Houston Food Bank so that those foods will be available. This is really a huge burden on patients who can't afford to buy these foods online, don't have online access. It's getting better, I do believe, because of places that have large amounts of food products have started having a few selections, but it's still quite limited compared to those who have access online as well as to grocery stores that are typically in higher socioeconomic areas.

Dr. Stukus: Oh, boy, just another layer to all of this. I'd like to go back to something that you mentioned as a major source of the decreased quality of life for a lot of families who have children with food allergies, even adult patients who have food allergies and that surrounds the fact that accidental ingestion of their allergen could lead to a life-threatening or potentially fatal reaction. We know that thankfully, fatal reactions to food allergens are rare among the entire population of the millions of children and adults who have food allergy diagnosis. But is there any evidence demonstrating that certain populations are at higher risk for this tragic outcome?

Dr. Davis: Yes. We did a study of children with fatality from food-induced anaphylaxis and the mortality was 1% in the population that was from the intensive care unit across the nation and we did find that actually, Asian, Indian, and Pacific Islander were more likely to experience these really life-threatening anaphylactic events in the intensive care unit. We didn't really see much difference with regard to mortality, but I think more studies need to be done that are comprehensively looking at fatalities. There really have been just a few registries, but we need really more comprehensive, unbiased data looking at mortality from food-induced anaphylaxis.

Dr. Stukus: Another area of need, it sounds like. Now, sort of going back to the quality of life aspect, but just in general, food allergy self-management requires a lot of education, understanding of risk from various exposures, development of effective communication skills, access to epinephrin in case of accidental ingestion, and so on. It's really a lot of skills that need to be taught and developed and practiced and it can be really challenging for anybody who has a food allergy or a child with food allergy. What do we know about the specific challenges impacting populations at risk and how that negatively impacts their ability to self-manage or avoid their food allergens.

Dr. Davis: Yeah. Well, we do know that disparities in food allergy management have been documented with black and Hispanic patients really less likely to correctly identify signs of food allergic reactions or food triggers and, again, this is directly related to adequate food allergy education. So, we know that the education for this population really needs a lot of attention and improvement. We also know that food insecurity has been established as a risk factor in milk and egg allergy and is associated with a lower health literacy. So, I do think that it would be really good for allergists to actually ensure that every patient they're seeing has access to enough food because food insecurity, we would know that that person is at increased risk of potentially not being able to one, access food allergen-free foods and may also need an extra measure of education. I do think that there are a lot of areas for improvement. So, there actually have been some disparities recognized in the administration of action plans and such. So, action plans and epinephrin auto injectors really should be supplied to all food allergy patients. This may not so much apply to the allergist who would give it to everyone, but in the setting of an emergency medicine department, making absolutely sure that every single patient actually gets these interventions. It would be helpful.

Dr. Stukus: Now, going back to something you mentioned before about treatment of food allergy, can you just orient our listeners? What are you talking about when you say treatment of food allergy? Is there a cure out there? Are you referring to oral immunotherapy or can you expand upon that a little bit as well as what that actually entails for a family who pursues that option?

Dr. Davis: Well, there's no cure for food allergy. We all know that and whenever a family is diagnosed with food allergy, there are certain things that have to be done in order to make sure they have everything they need in order to have a good quality of life. One of those, of course, is understanding the implications of the food allergy and the impact that it could have on their life. So, they have to understand how to avoid food allergens. They have to understand the food allergy symptoms and signs of a severe reaction versus a mild reaction. Then they have to understand how they can, in the moment, treat mild and severe allergic reactions. They have to-- because they have to treat a severe reaction and be ready to treat a severe reaction, they have to know when epinephrin auto injection should be appropriate and when they need to give themselves their EpiPen or when the parent needs to give the child the EpiPen or the AUVI-Q, the generic epinephrine. So, it is really incumbent upon us as physicians and providers to supply them with that education and it has to be done in a manner that is culturally sensitive that they can understand. So, if I have a patient that doesn't have English as a primary language and I tell them everything about food allergy very quickly, have medical words and don't have a translator or somebody to make sure that they understand, then that can impair the treatment of food allergy for that patient. So, I think all of these things have to be taken into consideration and there are, through the Academy, materials that are in many languages that can be accessed so that patients who have these allergies can get written information asking about food insecurities and then asking about comfort level in reading materials would be also an important thing to address.

Dr. Stukus: That's a lot to go over when a diagnosis of food allergy is established and it needs to be revisited every time they come in for follow-up visits and anticipatory guidance. It changes based upon age. It's going to be very different for younger children compared to adolescents and so on and so forth.

Now, what about oral immunotherapy? What does that look like for a family who decides to pursue that treatment option? What would some challenges be for some of these at-risk populations?

Dr. Davis: Thank you for bringing that up because oral immunotherapy is an important treatment for food allergy and it has been shown to decrease the threshold dose for severe reaction in patients and right now, it is FDA-approved for peanut allergy. It is also available for other foods in different practices across the US. So, I do think it's something that should be considered and offered to all patients that are appropriate for that treatment with an adequate assessment of the efficacy for that particular treatment as well as balancing the risks and benefits for that. I did look to see if anyone has actually done studies to determine if there are disparities in the administration of oral immunotherapy. I think we're just so young in this field that we just don't have that information yet. But I would say that in thinking about health disparities and the populations affected, I would encourage every researcher who is doing oral immunotherapy work just to report the gender and ethnic, racial composition of the populations they're working with. That alone will, I think, at least allow us to assess what's happening in those populations. Over the past decade or two, I think we've gotten away from identifying ethnic and racial identity in our research studies. It's not always there and so, that would actually help just determine what we may be missing just because we don't have the information.

Dr. Stukus: Thinking through it on a practical level, what would some challenges be in regard to some of these populations in lower socioeconomic areas or those at higher risk? Do they have less access to some of these services? Would there be more perceived challenges on a day to day basis inside the home as far administering and monitoring for adverse reactions? Do you have any thoughts along those lines?

Dr. Davis: Oh, yes. There are a large amount of barriers to utilizing oral immunotherapy in lower socioeconomic populations. We know that referrals to allergists don't always happen as early in those populations. So, one thing that would actually help reduce the barriers is for allergists who really want to make a difference for populations that are underserved to designate a portion of their time or a portion of their patient population to those that are underserved. It is somewhat of a sacrifice, I think, to do that, but increasing access to allergy care is one of the barriers that's very large for Medicaid populations or populations that are underserved. Another issue, of course, is the coverage and cost, concerns about cost in these populations. Because there are competing financial interests in the home, in many cases, these treatments would fall to the bottom of the list behind food and rent and so, addressing that early on is an important factor and making absolutely sure that the family really understands the commitment that they need to make and also working with their primary care provider to be a partner, I think that one of the things that has been really successful in decreasing health disparities is the partnership of a physician with the community stakeholders. So, the folks that are in that patient's community that can help. Social workers can help. Different lay organizations can help. But definitely their pediatrician where they're getting primary care can be a huge partner and if that provider understands this treatment and can really encourage that patient or patient family to engage and be a resource, that, I think, will really make a big difference.

Dr. Stukus: Dr. Davis, are you suggesting active coordination of care among all medical professionals involved in a family's life with bidirectional communication as well as enrollment of community service to help support that family? What a novel concept.

Dr. Davis: Wow. Yeah. Fantastic, right?

Dr. Stukus: Yeah. A little easier said than done, unfortunately, as you know better than most.

Dr. Davis: That's right.

Dr. Stukus: Oh, my goodness. As we kind of wrap up here, we have listeners from all over the United States and other countries as well. You sort of mentioned some of the tangible things we can do earlier, but can you summarize or do you have a call to action for all of us who are working with families who have food allergies themselves or with their children? Are there any tangible things that we can do for individual patients who may be at risk?

Dr. Davis: Yes. I would say that we allergists should be really curious and ask questions. We should find out-- really be very patient-focused and find out from the patient really what their understanding is of the disease, what their needs are and as we share with them, do it in a culturally competent fashion. I would say don't be afraid to ask the families what barriers they see to the treatments and listen and then work with them to solve the problem. I think that for allergy practices, we can be proactive in looking at our practices and the ways in which there may be systemic barriers to care and asking our office staff about those barriers that might be able to be eliminated in an easier way than you might think. So, I think really taking a look at "Could I offer my services to patients in underserved populations?" would be something really good to consider and implement. I also think-- I have a lot of things that I think would be really helpful-- but another would be to engage younger trainees who are in these groups in order to share with them about the wonderful world of allergy and immunology and encourage people to study allergy and immunology. I also would encourage everyone to read the literature with regard to health disparities and there's a work group report that will be coming out from the Committee on the unserved in the Academy that will talk about the health disparities in allergy and immunology practices. So, thank you, Dave, for having me on.

Dr. Stukus: Yeah. That's great advice. Before I let you go, if I can ask one more follow-up-- are there any community or school-based programs designed to address food allergies specifically? I know that there's lots of great programs with asthma and asthma mobiles that go out in the community and things like that. But has anything been established along those lines for food allergy?

Dr. Davis: Yeah. So, along with the SAMPRO™ program, there is a food allergy school management piece there. I do know that the CDC has guidelines also for the care management of food allergy in schools that can be accessed by all allergists, anyone who would like, and I would say that in order to implement these kinds of programs, just as you talked about a comprehensive community-based program, this is really what makes these programs effective and successful. So, if you want to implement that, if a school wants to implement that, it will take a village.

Dr. Stukus: I think that's a great way to round things out. Dr. Davis, this has been extremely informative, very helpful. I can't thank you enough for your time. Is there anything else you'd like add before we say goodbye?

Dr. Davis: I just want to say thank you for highlighting this topic and I'm excited to see what's going to happen in the future.

Dr. Stukus: All right. Well, thank you for the inspiration for all of us. We hope you enjoyed listening to today's episode. We hope you enjoyed listening to today's episode. Information about credit claiming for this and other episodes can be found at <https://education.aaaai.org/podcasts/podcasts>. Credit claiming will be available for one year from the episode's original release date. Please visit www.aaaai.org for show notes and any pertinent links from today's conversation. If you like the show, please take a moment to subscribe to our podcast through iTunes, Spotify or Google Play so you can receive new episodes in the future. Thank you all for listening.