Childhood Diabetes Transcript

[Upbeat theme music plays]

Dr. Clancy

Welcome to Rounding at Iowa, a continuing medical education podcast developed by and for healthcare teams. I'm your host, Dr. Jerry Clancy, Senior Associate Dean of External Affairs for the Carver College of Medicine here at the University of Iowa. Today we will learn about the increased incidence of childhood diabetes, both Type 1 and Type 2, as well as standards of care and new monitoring and treatment interventions for diabetes in young people. Our objectives include: First, we want our participants to recognize the incidence trends for both Type 1 and Type 2 diabetes in children and adolescents. Second, we hope our participants can differentiate best-practice standards of care for Type 1 and Type 2 diabetes in children and adolescents. And third, we will identify early intervention options for pre-diabetes for children and adolescents. It's a big subject today, and we have the great advantage today to have three guest experts, Dr. Lisa Ejsmont, Dr. Uzma Rani, and Dr. Gabo Castano. They're going to help us sort through all of this. Dr. Lisa Ejsmont is an adjunct assistant professor and clinical pharmacy specialist here at the University of Iowa. She earned her PharmD from Midwestern University College of Pharmacy. Dr. Gabo Castagno is a clinical assistant professor of pediatrics here at the University of Iowa. He earned his MD from Tec de Monterey. He then completed pediatric residency at the University of Texas Health Science Center in San Antonio. This was followed by a pediatric endocrinology fellowship at Texas Children's Hospital from the Baylor College of Medicine in Houston. Dr. Uzma Rani is a clinical assistant professor of pediatrics here at the University of Iowa. She completed her medical degree training at Fatima Jina University in Lahore, Pakistan. She then completed pediatric residency and a Masters of Public Health at SUNY Upstate Medical University in Syracuse, New York. Dr. Ronnie, Dr. Ejsmont, and Dr. Castano, welcome to Rounding at Iowa.

Dr. Rani

Thank you for having us.

Dr. Clancy

All right, big subject today, lots to talk about. So I just provided our listeners A brief official description of your educational backgrounds and your current titles. First, could you just tell us what drew you to this work? And Gabo, let's start with you.

Dr. Castano-Heredia

so since I was in medical school, I was always driven towards what public health measurements could have most effect in our health. And when I realized that if we start with early intervention, like as in childhood, is when I decided I wanted to be a pediatric endocrinologist. So I knew this early on when I was in med school. And then as I dived more into like the actual residency training and then fellowship course, that was just like, yep, this is where I need to be. And at the moment, there's a high need for new ways of approaching these diseases that we're going to be talking through the podcast. So it's very much in my interest contributing to this.

Dr. Clancy

Great. Lisa, how about you?

Dr. Ejsmont

Sure. So before I came to UIHC, I was working as a clinical pharmacist in a community pharmacy and volunteering at a free medical clinic. And part of my role was providing diabetes education to our patients, which at that point was mainly Type 2 in adults. And what I consistently found was that if our patients knew more about how medications worked in their body and the effect on them, they were more likely to take their medications and achieve their goals. So I looked to transition to a role where I could focus mainly on patient education. And here at the university, they really rely heavily on pharmacists to be ingrained in our multidisciplinary teams to help with access and medication education. So I was lucky enough to find a position here in pediatric endocrinology.

Dr. Clancy

that's great. It's one of the great traditions at University of Iowa Healthcare is team-based care and pharmacy is very, very involved with all of our different teams. So that's great. Uzma, how about you? How did you get drawn to this work?

Dr. Rani

Yes, so preventive medicine has always been my inspiration, coming from Pakistan, where I saw a lot of preventable diseases. And it didn't change. Of course, when I was in the residency, I saw so many kids where diseases could be prevented. And that led me to my area of interest, childhood obesity. And type 2 diabetes is one of the complications of that. So I really got drawn to it.

Dr. Clancy

Great. Well, we have 3 like-minded people as far as the importance of this work. Isma, let's continue with you. What does a work week look like for you?

Dr. Rani

Yes, so I have a combination of clinical and research work. I do a day of clinic in my primary care practice where I see mix of patients, well visits, childhood obesity cases, headaches, a lot of mix, which I really love. My rest of the week is divided between my research work and again, it is related to childhood obesity. My project is focused on finding the barriers and facilitators for implementation of guidelines. that focus on childhood obesity management, and it's really close to my heart. My rest of the research time is basically on setting up a clinic, which is recently approved by the University of Iowa, so we are very excited about it, and we are going through the logistics of it.

Dr. Clancy

Lisa, how about you? I imagine you have a week with a lot of variety as well.

Dr. Ejsmont

Yeah, my typical week may have me working on something different every hour of the day. Generally, I work a lot on access to specialty endocrine medications and education on these medications. So I may be teaching our kiddos how to administer injections, learn how to swallow medications, or use other unique formulations of medications. For patients with specialty medications, I also follow up with them in clinic along with our providers to help with any administration concerns, adherence, or access issues. Our providers in clinic will consult with me to find out which medications are options for our patients as well, based on their medication history, their comorbidities, their insurance plans, etc. When insurance denies medication prior authorizations, then I'm involved with writing appeals, completing peer-to-peer discussions, providing alternative formulary recommendations, or working with patients to support improved adherence or minimized side effects with their current medications if we are not able to switch to something else. Also help with coordinating care to our patient medication assistance team here that helps patients obtain additional financial aid from drug manufacturers.

Dr. Clancy

Gabo, how about you? What does a work week look like for you?

Dr. Castano-Heredia

Mine's a bit more standard. I'm mostly clinical. I do hold a class at the Carver College of Medicine on Tuesdays for the medical students. And then what does vary during the week is the type of patients that I see. So mostly about 20% of my consult may be related to diabetes and obesity, Type 1 and Type 2. And the other about 80% is the all other endocrine conditions, which include bone, growth, puberty, thyroid, et cetera, et cetera. And I know, I

verify for Lisa that I do need her a lot for many of those patients. But yeah, so that's how my week kind of looks like. And I'm also helping with the new approved weight management clinic by the University of Iowa. So we are actually very excited that we're going to be able to provide more help for many more kids.

Dr. Clancy

We're going to definitely talk about that. But first, we need to do some foundational work. So let's begin really with just the waterfront of the types of diabetes you can see in children. Anybody feel comfortable describing just the different versions of diabetes that you might see?

Dr. Castano-Heredia

So I can jump in with that one. So classically, people will think Type 1 and Type 2. And there's actually trends that are trying to rename the Type 1 and Type 2, because we are now seeing patients who have, yes, antibodies, which that will define a Type 1, an antibody that attacks the pancreas, and therefore you don't make any more insulin, versus Type 2, which is they don't have antibodies, they do make insulin, but eventually the insulin stops functioning. But as our diets continue to not improve and our weight continues to trend up, we're actually seeing way more now Type 1 patients would actually present also with resistance, so kind of like a mixed Type 1 with Type 2. And on top of this, there's also the monogenic causes of diabetes, meaning that there's genes that happen to appear in a person, and that's another form of diabetes. And then to make it more rare, there's the atypical form of diabetes, meaning that you don't belong to the Type 1 or the Type 2 because you don't have the phenotype, you don't have the antibodies, and the genes are negative, so you're not modi, so we have the atypical form. And that's why there's a trend to try to re name Type 1, Type 2 to insulin dependent or insulin independent, antibody positive, antibody negative. And that's right now kind of what the current treatment and guidelines are going to be moving in the future. And it's getting more exciting that we have now many, many other medications that we can offer to these populations.

Dr. Rani

And I will just add that Type 2 diabetes was particularly considered an adult disease, but we are seeing a lot more cases, far more cases. than the type 1 diabetes in the children, which is very concerning. And there are certain age groups that are at highest risk, such as teenagers from 10 to 19 years of age.

Dr. Castano-Heredia

And to add to that, my youngest patient with Type 2 diabetes has four years old.

Dr. Clancy

Wow, it is changing rapidly. So Gaba, you touched on this, but what do we know about the causes of these different versions of diabetes? You talked a little bit about antibodies and you talked a little bit about insulin resistance. Anything else that is more on the forefront as far as us understanding?

Dr. Castano-Heredia

So I'm going to focus more on the Type 1 version on the monogenic for now. The monogenic form we know is inherited. So there's someone in your family that has the genes and you were to receive the genes so you're going to develop the condition. There are many of those that were diagnosed as a young adults, mislabeled as either Type 1 or Type 2. And as we have more knowledge on these genes, we're now finding that many of those were mis, like, diagnosed and we're seeing now more frequently in kids. The predisposition is just really pretty much genetics. And then opening like the window to Type 1, It's more on your autoimmunity predisposition, which we don't have the exact cause, but we do have some clues of what's going to have a higher impact for you to develop in Type 1 diabetes. Obviously, having parents with Type 1, it's an increased risk. Interestingly, if mom has diabetes, it's higher than if dad has diabetes Type 1, then percentage. Also for siblings, it's not the same as your twin versus your fraternal sibling has diabetes. Like fraternal siblings are around like 12% versus twins are closer to like 30%, which I also think is very interesting. If their twins are identical, why is it not 100%? And that's where the applotypes come in, which is called the HLA classes, which is how your antibody, your immune system reacts to pathogens. And depending which HLA you have present, which in this case HLA2, you may be more predisposed to have Type 1 diabetes. And there's these other theories, for example, if there's a virus that may have triggered it, kind of like the ecovirus, the most recent COVID pandemic, which we did see an increase, and the hygiene hypothesis. We do see this way more frequently in developed countries versus terrible countries. And we do see that the population, when they move, for example, from Latin America, from Africa to the United States to Europe, that population that migrates to those countries express the same risk factors as the population in the country they moved, not from the one that we're coming from, where there are very low risks for Type 1. So just a brief overview on that.

Dr. Rani

And I'll take on the Type 2 diabetes risk factor, and Gabo has very rightly already mentioned that there is a genetic component to that as well. With childhood obesity is the biggest modifiable risk factor for developing Type 2 diabetes. But then there are other things as well. And I would like to mention the social determinants of health where my, from primary

perspective, it is very, very important. We see a lot more Type 2 diabetes and childhood obesity in low socioeconomic groups, in certain underserved racial and ethnic groups such as American Indians and Alaskan Natives. Similarly, the lifestyle and environmental exposures, safety of your neighborhood, food insecurity, there are a lot more underlying risk factors for Type 2 diabetes as well as childhood obesity.

Dr. Clancy

Great answers. Great. All of you have touched on this a little bit, but let's just dig a little bit deeper into the trends as far as incidence for both insulin dependent and insulin resistant versions of diabetes.

Dr. Castano-Heredia

So for type 1, it has stayed pretty much stable across the last several decades. Like again, we did see a small bump, significant but small at the end when COVID hit, suggesting that the theory of COVID could have just predisposed to higher rates. We're also debating that if this was confounded by patients not seeking help in time because they were afraid of being exposed to COVID, and then we just found a massive amount of patients all at once. But there's about 0.3, 0.4 of children with Type 1 diabetes. And as adults, it's about like 0.5. The majority of them are diagnosed during teenage years. That's the biggest peak when we find them. And the second biggest peak is around like H5-7. That's when we have another peak. And I think what's interesting about now Type 1, knowing that this, like driven by the antibodies that you make against your pancreas, we do have a medication that as of today prolongs the onset of type 1 diabetes. And as of today, also we have several clinical trials that are looking at medications that may regress or revert the autoimmunity to the pancreas, hoping to actually cure Type 1. So that's why it's very important to now start more proactively screen these patients for antibodies for Type 1.

Dr. Rani

And for Type 2 diabetes, the hardest part is that you can have overt symptoms. You may not present with the symptoms for a long time when you compare it with Type 1, where there could be family history and you can present with symptoms early on in your life. So having a low threshold of screening for Type 2 diabetes with hemoglobin A1C, especially in kids who have obesity, is very, very important. As far as the trends are concerned, it is slowly rising. As I said that previously it was considered a disease for adulthood, but now about 45 to 50% of the new diabetes cases are Type 2 diabetes cases compared to type 1. And CDC says that there are 5,000 new cases per year in 10 to 19 years old children.

Dr. Clancy

So in our introduction, you 3 talked about your passion around prevention and early intervention. So let's talk about some of the risk factors of the precursor states of diabetes, particularly around childhood obesity and metabolic syndrome.

Dr. Rani

That's my passion. I'll go first on this one. Childhood obesity has been rising steadily, and we saw a big rise during and after the COVID pandemic. And There were, of course, multiple factors behind it, especially the social determinants, again, related to the food insecurity and physical activity. Our current estimates show that one in five children in the U.S. have overweight or obesity. In teenagers, this could be an even higher number. And the reason it is very important to screen for the childhood obesity, and it's very easy to screen for it, you just have to check the weight, check the height, and plot it on the growth charts. So based on those percentile of BMI, if anybody is between 85th to 95th percentile, that's considered overweight and 95th and above will be in obesity range. And then for obesity, there are different classes based on how swear the obesity is. So the reason I'm very passionate about it, one, it's preventable. Two, it can have really broad complications, starting from the mental health, physical health, such as Type 2 diabetes, joint problem, liver problem. So it's just a variety of complication that can have lifelong impact.

Dr. Castano-Heredia

Adding to that, like why does it happen or why is it happening? I am 100% sure that everyone now alive knows that they need to eat good and exercise. then why is it not happening? That's the actual intriguing part to me wanting to find kind of like solution and kind of like Usma mentioned this, the mental problem about it. So I think we're, that's personal opinion. We're in a society that is prioritizing easy solutions. Meaning that, yes, we are in a very busy environment. Parents both are working. They're no longer cooking at home. It's just easier to buy something that is packed open, easier to go to the fast food. And most of the times, these food options and food availability is what's not best for your body. If you actually want to plan a healthy meal, you have to go to the grocery store, buy food that is going to go bad in five, six days. You don't have time to cook it. it goes bad. And then, we couldn't cook it, we'll do something else, we'll order food. So you keep trying to do something without the best backup behind you. And I think that's what we're trying to do with in the future, I guess we'll talk again in the podcast. How can we keep these minds changed? There's the solution is out there. Why are you not getting it? How can we better help them do this? Rather than, yeah, they all they need to do is eat better and move more. It's not that simple.

Dr. Rani

I would totally agree with that. And for primary care physician, I would say that like many other chronic, complex problem, we should take childhood obesity as a chronic and a complex problem. I always like to think about this as a socioecological model with our patient in the center of that model. But most of the pediatric patients, they cannot take care of themselves. So we also need to include their family, both in the discussion of the causes of obesity as well as How can we prevent the obesity from going from class 1 less severe to more severe classification? It is also very important that we engage our community and we see what kind of resources are available. And as a primary care physician, we are unique in that sense that we are able to build that trust, not only with the families, but with the community as well. So just knowing what kind of resources are available in your school, in your park and rec center, your food pantries. And then definitely as a pediatrician, we are at a unique position to advocate for more resources in the community as well as the screening and management of the obesity.

Dr. Clancy

I agree. I work with a population in psychiatry that oftentimes is on disability. And being on disability, they are very stretched as far as their finances. So it's just very unfortunate. And then as well, particularly in those that live in rough neighborhoods, sometimes exercising is just not very simple. There's lots and lots of additional factors, as Gabo mentioned, other than just personal will, as far as, I just need to eat healthy and exercise more, but sometimes there's a lot of barriers.

Dr. Rani

And I would just add one more point to it, because it's very important the way we talk about weight with our teenage patients. It should not be revolved around the numbers, weight number. And I always start my conversation, first of all, we should ask permission if it's okay to talk about weight and height and how you are growing. They don't want to sometimes talk about it. And then I usually start with like, let's talk about what we can change in the lifestyle and how can we help you do that, rather than just saying that you should eat healthy or you should do more exercise.

Dr. Clancy

Great, great.

Dr. Castano-Heredia

And to add to that complexity, how many minutes do we get per patient? because we ideally will do this for every patient, but this takes time. Again, it's kind of like a broken system on something that everyone knows, quote unquote, what to do. So yeah.

Dr. Clancy

Absolutely.

Dr. Castano-Heredia

Let's keep going.

Dr. Clancy

Absolutely. The schedules are packed, the overflows and the double books and all that stuff. So I'm going to go against what Uzma just said and I'm going to ask about the numbers. But what are we seeing kind of as far as percent increases around childhood obesity and metabolic syndrome? What are the numbers telling us as far as where we were and where we are now?

Dr. Rani

Over the last couple of decades, the childhood obesity numbers have increased significantly. As I said that previously, it was one in 10, now we have one in five. And if you look at, this was a recent study from the global developmental goals where they forecast the obesity rates later in 2050. And you can see that they're going to double. So every other person could have obesity if we don't change what we are doing. And then I would re-emphasize that it cannot be changed just like at a personal level. It has to be at the society and policy level.

Dr. Clancy

All right, so now let us talk about what you guys are really excited about. I've heard about this for a little while because I got to work with Dr. Rani on some of this early on, but you've developed a new team and a clinic for early intervention. Tell us about how this works.

Dr. Rani

Yes, so we recently got a grant, and Dr. Castanio is with me on this one, where we are establishing A multidisciplinary clinic for the prevention as well as the management of childhood obesity. And as we are discussing in the past that this is a complex problem and it needs a very comprehensive, multidisciplinary care. And we are very happy that University of Iowa was able to give us this opportunity to establish a clinic. So in this clinic, we will have a general pediatrician, we will have pediatric endocrinologist, dietitian, psychologist, and pharmacist as well. So Dr. Ejsmont will be part of the team too, hopefully. And we will try to give the very comprehensive care. But another very important part to this clinic is that we are doing the community engagement as well as outreach as part of our expansion. We understand that these kind of clinic with comprehensive care are

not available, especially in Iowa. This is the first of the kind. And we want to make sure our community care providers are able to reach to us for referral as well as for education. The third part of this really comprehensive clinic is that we want to educate the clinician as well as the medical student who would be our future care providers. And as we said, that obesity rates are increasing. and complications related to it are also increasing. So it's really important to educate our trainees to make sure that they are able to take care of the patients. Nabo, you can add too, if you want.

Dr. Castano-Heredia

Yeah, I can add to that. So yeah, I think this is very neat, and I do think we need a different way of intervening how do we do weight management, because it's clearly not working as of today. And at least from the clinical trials, from all the obesity medications that we're going to talk soon, all of the trials include monthly interventions with dietician for healthy lifestyle interventions. And that's so far the only way that it's improving to patients for lose weight. All the real world data analysis, meaning that once the patient is not in a clinical environment, but is seen in a clinical trial environment, but is seen in like a clinical setting, when they don't incorporate the healthy lifestyle interventions, the success drops dramatically to the point that there's some real world interventions that don't show any benefit when you use even GLP-1s like Ozempic. Why? Because you're not treating the root cause. Yes, medications will help, but it will not be the solution. Kind of like to add to the increase in our current Type 2 and diabetes in our population. A number that I found very interesting in 2000, we had about 10 million US citizens with Type 2 diabetes. The projection for 250, what that was that number is going to be closer to like 26, 27 million. in 2024, we overpassed that projection. So all the projections that have been done in the past about how fast it's spreading, we are surpassing the projection. So we need to do something soon and better.

Dr. Rani

And I will just add one thing. We are very excited about this initiative, and it's a comprehensive program with three pillars. First pillar is clinical service. So we want to give a multidisciplinary care for our kids who have childhood obesity or overweight or related complications. So part of the team will be general pediatrician, obesity specialist, or pediatric endocrine, pharmacist, dietitian, as well as psychologists. So it takes a village to take care of the children who have overweight and obesity. Our second pillar is education. We want to train our future healthcare provider. As we have been discussing, childhood obesity is not going anywhere. And we want to make sure that our medical student as well as trainees are comfortable taking care of these patients. And our third pillar is our research. And we are talking about the new medication and surgical option for the kids who

have severe obesity with complications that are not treated with medication. So we want to make sure that part is also covered. And all of these pillars should have a strong base of community engagement and outreach. That's where we are going out. We will have a community care coordinator that can reach out to the patient as well as the community care resources to make sure that our patients are connected.

Dr. Clancy

So Lisa, what do you see your role is on this team?

Dr. Ejsmont

I know I'm going to get a whole bunch of questions about medication access. Absolutely, absolutely. And then working with families as well to make sure that they understand how to take their medications and why each of these medications is important. Like I said, that is really important for patients to understand in order to get their buy-in on taking these medications.

Dr. Clancy

So even though you're all young in my eyes, you are seasoned clinicians. What are you seeing as far as some of your success rates with some of the benefits of screening and early intervention for obesity and metabolic syndrome. I know the clinic isn't up and running, but when you intervene early, what does it look like?

Dr. Castano-Heredia

So I already manage several patients for obesity. Most of them have a few of the comorbidities. Otherwise, as of today, there's no place that we can just see all of them. So that's why we're going to like prioritize those that are having some comorbidities. But I have as young as like 19 month old. And I do see for those that are start to adhere to little by little changes to at least the weight velocity that they are gaining decreases in some of them plateaus. And in a few of them, because it would love to be more, starts to decline. And I do think that those are either plateau or start to decline. If we were able to get better access to better medications, it will be a more dramatic loss or a better response. But that's what I'm seeing right now with my current patients. There's always a few ones that just keep going up and it's harder to reach out to them. And that's when we need a more robust clinic. So it's just not me doing follow-ups, counseling, it's an entire team, which I do think once we have that, those numbers should be better.

Dr. Rani

And I'll answer this question in two parts. One is the prevention and other is screening. And from my perspective, I would say referral to the appropriate services. From prevention point of view, I would say primary care clinician can play a really important role because we start seeing the baby from day one. And there are so many risk factors, not only during the pregnancy, so intrauterine, but later on. So for example, we can advocate for the breastfeeding because that's protective against obesity and related complications. Similarly, complementary feeding timing, screen time during the childhood, sleep routine during childhood, soda or any sugary beverages avoidance. So all of this is part of our anticipatory guidance. And if we are able to start this conversation early on, we can definitely prevent the obesity later in childhood. The other part is early screening. So if we, based on our BMI percentile, if somebody is in overweight range and you start the conversation right there, that you are at a little higher risk of having obesity unless we make some changes in the lifestyle. And of course, just be very frank and very, I would say, personal in that sense. Again, as a primary care provider, we have this opportunity of trust with the family. Just go through the complication, just make sure that they understand that this is not about the weight. It's not also about bad parenting. It's just about so many different complex factors. And that we are trying to modify the factors that we can. And then if obesity has developed along with the complications, then making early referral to the proper specialist is very, very important. I do want to take a chance and talk about pre-diabetes in this. And that's, I usually take it as an opportunity rather than a complication that because it is With the right intervention around that time, we can definitely convert that to normal metabolic risk. And I will let Dr. Castano to talk about what we can do if somebody has pre-diabetes.

Dr. Castano-Heredia

Yeah, and that kind of goes along with like also Type 2 diabetes, because I'm now being more proactive in when to start offering medical treatment. And why do we care about this early if they're so young? So there was a study called the Today Study, and they follow kids diagnosed during their childhood. It takes about nine years for them to start developing microvascular complications. So literally, if you were diagnosed at age 15, by 25, you could have kidney damage. That's about 50% of the kids that were diagnosed. So the chances are, if you're a teenager or before teenagers, by the time that you're an adult, you're going to have chronic complications, that those are not reversible. So that's why acting on time is very important because it's already also proven that obesity without pre-diabetes or diabetes or any other complications will eventually progress to one of these complications. So that's why we're being more proactive and say, well, that this is the need. And that's why we're starting to offer these medications along with the lifestyle interventions alongside as early on as possible.

Dr. Rani

And for our listeners, I would definitely recommend them reading the AAP clinical practice guidelines. These are the first ever guidelines that are published for childhood obesity and overweight management. And they also recommend the screening labs. If a child has obesity, we have to screen for diabetes, liver injury, lipid problems, and depending on their symptoms, we may have to also do the other complication screening as well.

Dr. Clancy

I really like your approach as far as seeing metabolic syndrome and obesity as opportunities for intervention. Let's talk specifically about what medications you guys recommend. And then, you know, some of these are new, advanced, expensive medicines. Let's talk about how you deal with the payers and their willingness to actually prevent diabetes. So how does that all play out?

Dr. Ejsmont

So to start with kind of what we would go to first, and then I'll get to the hot topic. Metformin is going to be our first line. It's the standard of care. It's technically off-label for use in pre-diabetes, but it is for adults as well, and it still remains the standard of care. Metformin is associated with about a 3 to 5% body weight loss based on adult data. While we want a higher percent body weight loss, about 7% at least is associated with significant improvements in insulin sensitivity, A1C, HDL and C peptide levels, even that 5% could get you to a better metabolic function. Specifically extended release metformin would be my recommendation first line. It's associated with less side effects or less severe of the side effects. And so for our patients that can swallow tablets, that would be my recommendation as a first line treatment option for our patients. with pre-diabetes. There is a liquid formulation that's available for patients that can't swallow tablets. It's not extended release, so you might even need a slower titration for that, but it's still available. Some of these side effects that we are looking for in these pediatric patients that we want to titrate slowly for specifically include nausea, vomiting, upset stomach, and diarrhea. A lot of these go away with continued good adherence to the medication, and we can support good adherence by making sure we're titrating slow enough and starting at a low enough dose to prevent some of those in the 1st place. It's harder to convince somebody to try metformin again once they've had these negative side effects. So going in, knowing what to expect and how to prevent or minimize those side effects can be really important with getting our kids on these medications at an effective dose.

Dr. Clancy

So insurance companies have trouble with metformin.

Dr. Ejsmont

Metformin is generally pretty inexpensive and readily available. Most plans don't even require a prior authorization for metformin, with the liquid being an exception because it is much higher cost. I have not had trouble getting our patients with pre-diabetes on metformin, even the liquid, although sometimes it may take an appeal to get coverage for that liquid formulation. So easily, readily accessible. inexpensive option for patients that does have good efficacy.

Dr. Clancy

Great. Let's take it up a level and hit the major leagues as far as some of these meds.

Dr. Ejsmont

Sure. We have these glucagon-like peptide-1 receptor agonists, which are commonly called GLP-1s, and that's what I'll refer to them as here on out just for saving time here. We have a couple approved by the FDA for treatment of obesity in pediatric patients 12 and older. There are two products on the market currently with that FDA approval for pediatrics. We have a liraglutide, which is given daily, and then we have semaglutide, which is given once weekly. Semaglutide data is pretty impressive. We have about a 16% reduction in BMI in adolescents with obesity, with liraglutide having a little bit more modest of a reduction around 6%. But those are both great numbers. So we have great data. to support the use of these in our patients with obesity. And this is an on-label indication, which is pretty fantastic, given that pediatric providers are used to prescribing off-label, since most medications just haven't been formally studied or approved in pediatric patients. And normally, that is enough for us to get insurance access. However, for GLP-1s, the situation is markedly different, despite FDA approval and substantial clinical evidence demonstrating safety and efficacy. Insurance appeals for these agents are often denied or ignored simply as part of a cost containment strategy from insurance plans. Many plans just outright exclude coverage for any medications used for weight management and refuse to consider off-label use specifically for GLP-1s only, even when supported by evidence for conditions such as polycystic ovary syndrome or metabolic syndrome. We also see pediatric patients with moderate to severe obstructive sleep apnea and metabolic associated steatohepatitis, but the use of DLP-1s for these conditions is only FDA approved in adult patients at this point. And again, we can't get those insurance companies on board with coverage even when there's no other pharmacologic option available. It's incredibly frustrating to both patients and prescribers because we want to use these tools that we know help, but we're unable to access them for the vast majority of our patients. And the cost without insurance for these, even with these advertised manufacturer discount

programs, direct shipping, et cetera, tends to be unaffordable for the vast majority of families. So I mean, I personally feel kind of stuck waiting for these kids to meet diagnostic criteria for Type 2 instead of providing the best preventative care we know we have for disease states that increase the incidence of Type 2 diabetes. Very frustrating.

Dr. Clancy

Great answer and thank you for fighting the fight on this. And hopefully it'll get better, which kind of leads me into my next question of, you know, pay me now or pay me later kind of approach. So let's say, you know, that somebody has struggled with obesity and metabolic syndrome and they're just now able to get the treatment they probably could benefit from, and they flip over to diabetes. Particularly with children and adolescents, what do we see as far as the rate of progression of the illness when they present to you folks? I know that Gabo touched on it, that you can see a 25-year-old with microvascular disease, but what are you seeing clinically as far as some of the impacts of not being able to go forward with prevention that actually works?

Dr. Castano-Heredia

So pretty much are my numbers. It's if we did not treat the obesity or pre-diabetes, most all the time always progresses to diabetes. There's about a 50% progression from obesity in the next five years to diabetes, which I do think we're seeing that more sooner in children. When they compare adults with Type 2 versus children with Type 2 and obesity, it is more severe during childhood than adulthood. That's why they actually respond a little bit less to the medications compared when you compare it to the clinical trials of adults. They still respond, but less. So as, yes, you can revert it potentially faster because of the age, but if you don't treat it, progresses faster as well. So it's kind of like a double-edged sword being diagnosed when you're a teenager because you should be able to revert it fairly soon. If you act on time, I've seen pre-diabetes that in like three to six months with some metformin and minimal lifestyle interventions, they have a normal A1C versus those that were not seen or were missed because I do have those that we send a, they send a referral, I set a schedule, they don't show. And then one year later, the A1C went from like 5.9, 6.0 to like 8.7. So we do need to intervene, and they need to also be aware it is a real concern. And as Uzma mentioned earlier, it's a very delicate topic, so it's hard to not just bring up, but then how do I get you to do something about it?

Dr. Rani

I have seen some improvement in primary care office, provided all the barriers that we have discussed, less access to medication and a lot of insurance problem. I have seen some improvement with more frequent follow-up in the primary care office. I do understand that

this is also another barrier. We do not have much time or space in our clinic schedule to bring these patients, but intensive lifestyle therapy is one of the therapy where we will have more contact with the patient and go through the lifestyle a little bit more in detail and connect them with the community resources that has shown improvement in the BMI. I also want to touch upon another topic of medication as well, going back to Lisa again, that again, GLP-1s are in the news and, you know, everybody's talking about them and definitely they are the more effective treatment option. But then there are non-GLP-1 medication as well that are approved by FDA and maybe less of the expense than the GLP-1. So I sometimes use phentramine, which is stimulant medication that can help lose the weight in the children. So sometimes I have used it and have seen good effect with it. And the other one is Topiramade. Lisa, correct me if it's approved.

Dr. Ejsmont

Topiramade is technically off-label for weight management, but we do also frequently use that in clinic. There's not good data about what weight percentage we can see, weight reduction we can see. I think our biggest struggle with using topiramate in pediatric patients is that it has significant cognitive slowing. So sometimes we have to be really intentional about when we start that medication, when we escalate dosing, and whether it's worth keeping it on if it's potentially affecting somebody's school performance. So I think it can be great. I think for kids, it sometimes alters the flavor of soda. So it can be a really nice add-on for kids that are having a difficult time dropping that soda habit. So it can work well. And for some patients, unfortunately, those negative side effects to it can just be too limiting.

Dr. Clancy

So next, I'd like to kind of at least do some overviews of really the multidisciplinary approach to type 1 diabetes, to type 2 diabetes, you know, adolescents in children. and that special group that you mentioned, those that actually are showing both Type 1 and Type 2 in their clinical set of symptoms. So Gabo, let's start with you. Just what are some of your key clinical pearls for our listeners regarding the best practice as far as care of Type 1 diabetes from initial screening to monitoring to nutrition and then of course medications as well?

Dr. Castano-Heredia

So for a screening, I will say once you're diagnosed, knowing that you can have your siblings or your other kids screen for antibodies, we have now therapies that are going to be able to delay, hopefully, potentially soon cure, prevent the autoimmunity to progress. And then secondary, we do need a multidisciplinary team. They need to be seen by diabetes

educator because they're going to be having many needs because the main treatment continues to be insulin. And that's going to have its complications of overdosing, underdosing that needs constant monitoring. And that constant monitoring is what has led us to the use of technology, which has been amazing in the last five years. We've seen from one to two pumps to now 5 pumps available, all with automated system, meaning automated by the pump will give more insulin or less insulin depending on your glucose, which is made by the CGM. So that has made huge improvement on how we're managing diabetes. And I do think that also removes a lot of the burden of the insulin shot for many of our kids. And kind of like new areas, how does these medications for Type 2 diabetes could be beneficial for those with type 1 diabetes? There have been already several clinical trials trying to look decrease in total insulin dose, minimizing highs, minimizing lows. And the reason why we do want to reduce also insulin doses is patients with Type 1, classically, they already have a higher state of insulin resistance at about one to four more resistant than the average population, meaning that they are still going to need higher doses. And the issue with higher doses of insulin, it does promote weight gain. And if you have promote weight gain, then you're going to have, again, more insulin requirements. So it's a vicious cycle. And it's something that it's been studied. A very interesting study that I found, a new onset type 1, it's called the honeymoon phase, you still produce some insulin. They put them on a GLP-1, Sempix, semaglutide. There were several patients with Type 1 that were able to come off of insulin during the first year. So I think those are great advances, discoveries that these other medications could have potential benefits in these other populations when used properly. But that's kind of like a little comment on Type 1, we can move now to Type 2.

Dr. Clancy

Well, let's go with the in-between group, the group that is showing both type 1 and some resistance. Lisa, what pearls do you have for our clinicians?

Dr. Ejsmont

Yeah, so like Dr. Castano said, we have seen studies showing that the use of GLP-1s in these patients that have both the clinical features of Type 1 and Type 2 diabetes do benefit from a GLP-1. That is due to that weight loss that we can see with it as well as that reduced hepatic glucagon production. So we would ideally put some of these patients with that feature of Type 2 diabetes on a GLP-1. And that brings us back to the access problem. A few years ago, so I joined this clinic in 2020, there were not all of these prior authorizations and insurance barriers to GLP-1s. So we did actually have quite a few patients with Type 1 diabetes who were utilizing these GLP-1s. And we did see that exactly what Dr. Gabo had said. We see a reduction in the amount of insulin that's used. It helps promote weight loss.

Those patients were very satisfied. We have some patients that are on concentrated insulins in a pump and were able to reduce their dose. So now they don't even have to change their pump on a daily basis. They can extend it to like more normal wear of an insulin pump, really improved quality of life for some of these patients. And unfortunately, we lost access to these drugs once insurance barriers started to come down, including these patients that were already established on these medications had to come off. And we did see again that rebound in insulin needs, which again, quite frustrating.

Dr. Clancy

Great answers and really complex presentations here. Let's talk a little bit about kind of your key clinical pearls as far as the Type 2 childhood and adolescent patient. What would you recommend to our listeners?

Dr. Rani

Well, I would not go into the medication part of it because I have two experts who take care of the Type 2 diabetes. But what I want to say is that lifestyle modifications are part of all of these, not only diabetes, but obesity management. And sometimes when we talk about medication, it almost sounds like that medication could be just answer to all the problem, which it is not. Even if kids are losing weight, we want to make sure their nutrition is appropriate and they have a dietitian help to make that happen. Because sometimes When you are losing weight, you are not only losing your fat mass, you're also losing your muscle mass. You want to make sure that doesn't happen. Similarly, your physical activity is extremely important. Your resistance training, training is very important. And then definitely we need to take care of the mental health problem. We need to keep an eye, even if they are losing weight, even if they are on medication, if they are on insulin, these are all very stress-inducing situations. So as from the primary care perspective, we should keep an eye on that and make sure that, again, we are screening and referring the patient at appropriate time.

Dr. Clancy

All right, Lisa and Gabo, your advice as far as Type 2 diabetes in children and adolescents?

Dr. Castano-Heredia

So I want to comment on this because right now, per the ADA guidelines, the initiation for medication is metformin and insulin. I do think this will change, should change sooner to be GLP-1s as the initial first line of treatment. And the reason is those that I can get approved, it's not the best GLP-1, Trulicity, Lisa can comment more on that, but those that I'm able to start them on GLP-1 soon when they're like 6.7, 7.501c, I actually keep them off

of insulin. And as I mentioned before, if I am giving someone insulin, that's also promoting some weight gain, which it's also like a vicious cycle because they develop the diabetes because also they increase adiposity. And then I'm giving a medication that is also increasing the adiposity. So if I can avoid that, I think it's going to make controlling Type 2 diabetes much, much better. So I am very proactive and aggressive trying to get GLP-1s when the A1C is under 8 as my first treatment of choice, if not at least metformin. But that's what I try to get to as soon as possible.

Dr. Clancy

Lisa, your experiences and your clinical plurals.

Dr. Ejsmont

So metformin in that today's study, they actually found that a little bit less than half of the kids were able to maintain an A1C of less than 8% long-term on metformin monotherapy, which is drastically different than our adult population that only sees about a 15 to 20% failure rate per year. So having just over 50% failure rate in that one year timeframe is huge and tells us that there's a difference between pediatric onset and adult onset diabetes. So yes, we would want to start metformin. And ideally, we would like to escalate to GLP-1s as soon as available for that patient. Some of the insurance barriers that we have right now, based on the current clinical guidelines, not having them first line, mean that a patient has to fail metformin. So we have to see a worsening of their disease before we're able to access them, even for our patients with diagnosed Type 2 diabetes. So we would never tell someone to stop taking a medication to worsen their A1C so that we can get a GLP-1. It's an incredibly frustrating situation where you're like, okay, so I'm at 6.9% until I'm above 7, I can't get this patient this medication. What do you do? You're stuck. You're waiting for them to progress so that you can get them access to the medication that we know will work for them. In terms of the GLP-1s that are available, we're going to get a little bit confusing here. So we have two GLP-1s that are approved for pediatric patients with type 2 diabetes. And this is different than our pediatric approval for management of weight. For pediatric type 2 diabetes, the two that are available for ages 10 and over, which is different than the obesity approvals, is liraglutide, which is given daily, so it's the same drug. And then we have dulaglutide, which is that trulicity. Dulaglutide doesn't actually have good weight data, weight loss data. There was not a different scene. It does have A1C data, so it is helpful for pediatric patients. lowers A1C about a 1 percentile, whereas liraglutide, we can expect about like a 0.6% decrease in A1C. So both good options, but depending upon what your true outcome is for that patient, one may be a better choice than the other. Weekly therapy versus daily therapy may also be preferred for a family, but again, we just may not see that weight loss benefit with the dulaglutide that we may see with the daily liraglutide. We have

an additional other option. of an SGLT2 inhibitor or sodium glucose co-transporter 2 inhibitor. This is approved also for pediatric patients 10 and over with Type 2 diabetes. And these are pretty weight neutral, unfortunately, for our pediatric population. With the adult population, especially the older adult population, there is a weight loss benefit about 2 to 4%. But for pediatric patients, we just don't really see that. We do get good A1C reduction of about 0.8 to 0.9% for those patients, which is great. And there is some data showing that we may have some benefit on renal function and that we may have a slowing of the EGFR decline and a reduction in that 24-hour urine protein. Right now, there are longer-term studies kind of trying to show what benefit we may have on renal function for these patients. We just don't have that published yet. So be on the lookout for that in a few years. However, there are some common side effects with these SGLT2 inhibitors that make us pause and make sure that this is the right patient for this drug. Some of these side effects can include dehydration, which increases your risk of acute kidney injury, genital urinary infections, and euglycemic ketoacidosis. So we really have to make sure patients understand what they need to do to minimize the side effects of these and when to call us if they're concerned they're occurring. And after we maximize these non-insulin options, that's when we would consider moving to insulin. Again, like Dr. Castano mentioned, because those promote weight gain, we would want to try to maximize as best as possible these non-insulin agents first.

Dr. Clancy

Great answers. Boy, I love working with smart people. All right, so again, as I've mentioned and you've mentioned, you three are champions of prevention and early intervention. We've seen a consistent level of frustration as far as we know what works, but it's hard to get it improved as far as taking care of these pretty vulnerable patients as far as long-term outcomes. So if you were advising a health plan that was part of an employer-owned, self-insured health plan. What recommendations would we make for them as far as use of some of these medications for early intervention for metabolic syndrome, obesity, and Type 2 diabetes in children and adolescents?

Dr. Castano-Heredia

I'll just first say don't limit the use. On the contrary, support the use. And I will just say with the caveat of as long as these come with supported lifestyle interventions, because otherwise, yes, they're going to support the utilization and then they're going to be spending the complications and the medication without the actual result. So it needs to be comprehensive. So that will be my recommendation, that if they're approving, they should be asking for improvement. Like, yeah, every month I'm meeting in with my dietitian and my doctor at least every three months.

Dr. Ejsmont

I think along with that, I've seen some plans have certain inclusions already, which I think are fantastic, that include that the patient is seeing a dietitian, that the dietitian visit is covered as preventative care, meaning there's no cost to the patient, that gym memberships are included or reduced, or a patient has access to home exercise equipment, whether that's jump ropes, whether that's resistance bands, something that the insurance is giving to help support that healthy lifestyle management. If we just tell these insurers to cover these drugs, that's a lot of money on their end, and we don't necessarily have motivation for our patients to buy into these lifestyle changes. If the approval is conditional on, they're also actively engaged coming to these visits and we're seeing improvement, we can get buy-in and hopefully these insurance providers will see a payoff on their end in preventing these long-term complications of progression to Type 2 diabetes.

Dr. Rani

I would just say investing in employees' health is worth doing it. And happy employees will lead to more production, productive work, and just better health outcomes.

Dr. Clancy

All right, two more questions. So first is, as we look to the future, what do you see on the horizon? What do you see as far as better detection, better management, better screening, better treatment for diabetes in children and adolescents?

Dr. Castano-Heredia

In the near future, I think it's worse. I don't think they're working towards having this accessibility, but I think there's more and more of us advocating for this, wanting for this. There's enough proof that this works. So I do think in the next, hopefully five years, Maybe I'm wrong and it's less. We should start to see a change in how we are practicing weight management.

Dr. Rani

I'm a lot more hopeful. I think now that we are talking more about obesity, especially in the primary care space, I think we are more vigilant. And again, I would say we should not leave all of this to specialists. We are there. We are seeing those patients very frequently. We should take the lead. We should learn with training. I think we can have those skills such as motivational interviewing. And even with the newer advances, we will be in primary care practice, hopefully we'll be able to also prescribe medications. So I would say that I am seeing a lot of hope there, both in preventive aspect as well as the treatment.

Dr. Clancy

And how about you, Lisa?

Dr. Ejsmont

I don't know what I do with myself. If there's improved access to GLP ones, I would lose half of what I do all day. No, but really I do hope that we have improved access. I hope that these payers start to get information showing that early intervention helps them financially, because really that's the only way we're going to start seeing this early access for our patients for these medications.

Dr. Rani

What I wish is that there's a lot more work at the policy level because that's, although really hard to do, will have a broader impact both for prevention as well as management of the obesity as well as the diabetes.

Dr. Clancy

Well, I predict your clinic is actually going to be really a great demonstration of how this team-based care, early intervention really makes a difference. So that's my prediction as well. As we close, each one of you gets to give a few points as far as what you'd like to say as far as take-home points for our listeners. And Lisa, let's start with you.

Dr. Ejsmont

Sure. So I think I'm going to sound like I'm repeating myself here. GLP-1s are great tools, but our access is limited. So making sure that we are starting with metformin, extended release if possible, starting at a low dose, titrating up slowly as your patient needs to tolerate it, and always in combination with the whole family making lifestyle modifications to support healthy eating and physical activity.

Dr. Clancy

Great. Uzma, how about you?

Dr. Rani

Childhood obesity prevention and management works best when it starts early in primary care and is built around long-term family-centered support. And I would say the prevention doesn't start when you start seeing the changes in the BMI. It should start when a woman knows about that pregnancy. It should start from that. So it's really important.

Dr. Clancy

Great. Gabo, how about you? Some take on point.

Dr. Castano-Heredia

Obesity, as well as pre-diabetes and Type 2 diabetes in children, is more aggressive than adults, so that's why being very proactive early on should be our priority for our patients.

Dr. Clancy

Great point, great cautionary point. So as we close, I just want to say you guys have been fantastic. Dr. Ronnie, Dr. Ejsmont, Dr. Castano, thank you so much for joining us today and for your great work in prevention and early interventions, for your creativity, your innovation in putting together a new clinic, your attention to innovation. Just you've done a great job. So well done. To our listeners, thank you for joining us for this session of Rounding at Iowa, instructions for CPUs and CME credits and show notes. And we look forward to you joining us again on Rounding at Iowa.