

All right, to get us started, we're going to give you a scenario that might sound familiar to you. I've chosen the name Larson as a good Nordic name for this wintry day. But imagine that John and Jane Larson come to your office with their daughter Gina, who's aged 10. And they're concerned because she's gained weight much faster than her peers in her class.

They're concerned because they themselves have struggled with their weight through most of their lives and are also having some medical complications from their weight. They don't want this to happen to Gina. They're also concerned about their younger daughter, Josie, because they're concerned that she may also become overweight even though she's not overweight currently. So you do a medical evaluation, you take her height and weight, you determine that she is obese based on her BMI percentile, and you recommend changes in eating and physical activity.

The learning objectives today, I hope, will help you with these types of situations. What I hope to impart on you today is an understanding of how children learn their eating and physical activity habits. What are some of the social influences on their lifestyle that affect their weight management? I want to also give you a flavor of how behavioral interventions seek to make modifications to that lifestyle in an effort to treat pediatric obesity. And I also want you become familiar with the services currently offered and being developed here at Mayo that may help you serve these families better.

Well, sadly we know from statistics and studies of rates of obesity here in the United States and elsewhere in the world, that Gina's not alone. Her family is certainly not alone. Obesity rates have grown in the adult population over the last few decades, and have also grown in the pediatric population, as well. Such that nearly one in three children are currently overweight based on their BMI percentile at or above 85th percentile.

About nearly 17% are estimated to be obese, and what's disturbing, too, is this increase in those that are about the 97th percentile. So a very high rate of obesity. Certainly, the higher the degree of obesity, the greater likelihood that they will be obese adults later on with medical complications. Also disturbing, is that nearly 10% of infants and toddlers were at or above the 95th percentile too. So this is happening, also, at younger ages as well.

So what is making Gina overweight? Could it be our society's reliance on automobiles and going to and from activities? Could it be our busy lifestyle and reliance on fast food? Could it be her genetics? Overweight runs in the family. Maybe genetics might play a role in affecting her metabolism or the rate at which she feels satiety. Maybe it's her diet.

Maybe it's that she's spending less time at the park and more time in front of the TV and computer. Maybe it's that family is not eating meals. There's really not one clear answer for why the rates of obesity have increased over the last several decades. Very likely, it's probably not very strong biological causes. They just can't change that fast over time. There is certainly a lot of changes in our society's lifestyle. And when it comes down to it, regardless of her metabolism, well, metabolism does play a role but we can kind of boil it down simply.

And that if Gina takes in more energy than her body needs, and does this repeatedly over time, as a habit, she will continue to gain weight. If we modify that, and she begins to eat a little bit less than her body needs, she will then lose weight. This points to some of the modifiable aspects of weight is eating habits and physical activity habits as well as our sedentary behavior habits. So that's the role of lifestyle. There's a strong learning influence on the kind of lifestyle habits that we have. And that's what I would like you to learn today is how it is that we learn to overeat and become less physically active.

All right, one way that we can learn-- we're going to do a little bit of behavioral instruction today, take you back to the classics. We can learn by association. How many of you have heard of Pavlov's dog? OK, so you kind of know the story. All right, so the dog would be called in to eat at the same time that everybody else was going to be sitting down and eat dinner. So night after night, they'd ring the dinner bell, all the people would come in, the dog comes in, the dog gets his bowl of food. Of course, he's very hungry, he salivates, and so that he's ready to digest his food and eats his meal.

This happens night after night. Dinner bell rings, comes in, and he's hungry, salivates, eats his food. Well, Pavlov noticed that he was salivating even before he saw his food. Kind of well, that's kind of strange normally bells don't make dog salivate. So he put it together that well, yes, the food makes sense that it would make the dog salivate. But that with that pairing over time, the dog began to associate that bell with the food, and thus now, only needs the bell to associate or just to start to salivate.

All right, where does this come in with Gina? Well, maybe it will take some examples, maybe, from your life? What do you associate with this word?

AUDIENCE: Football.

[LAUGHTER] I hear football. Maybe it's into turkey? I think hot wings. Lots of parties. Foods at parties. Popcorn, OK. In fact, we could do an experiment and we could come up with all sorts of random associations that would train you to be hungry or crave food in certain circumstances.

Let's say we painted this chair yellow, here in the front. And every time you sat down there, I gave you a bag of M&Ms. OK? Eventually every time you come here to Grand Rounds, you'd sit in that chair. It says, mm, M&Ms sound good. Sound really good. Eventually, you might even start any time you see the color yellow. Mm, I have a craving for M&Ms. So you see how this can happen?

OK, so imagine you sit down for movie night, and every time you sit down for movie night you have a bowl of chips. Every time you sit on the couch, the couch becomes associated with eating. There could also be some emotional associations here as well, right? Think about these social events that we have up here. We kind of associate those sorts of things with belonging, with having fun, excitement, comfort. We can associate food with comfort.

And so that when we're having some negative emotions, or wanting to seek comfort, or we're bored and we're wanting excitement, we may turn to food in that meeting those needs because those have been paired throughout our lives. I had one parent say recently, in our family we learned to feed the boo-boo. So when somebody was hurting, you give them something to eat and make it all better.

We can also learn from the effects of our actions. If something that we do has a desirable outcome, we're more likely to do that again. If there is an undesirable outcome, we're less likely to do that again. Think about the child who is praised for cleaning his plate. That's positive reinforcement. He's likely to clean his plate next time and, perhaps, override his natural sense of satiety. Say in kind of a similar thing, too, with learning that getting scolded for turning down seconds because it offends grandma. Oh, I guess I better not do that again. I'll go ahead and have seconds so grandma's happy, OK? We can actually then learn to override our natural sense of how much our bodies need.

Here's an example of an undesirable outcome kind of extinguishing a behavior, or making behavior less likely. What about going to the gym every day. Dedicated. Wanting to lose weight, and then not seeing the pounds come off. How likely is that going-- that behavior going to be sustained of going to the gym if the goal is to lose weight and that doesn't happen. So you can kind of see how these habits can be learned.

Finally, we also know from Albert Bandura, and many studies subsequent that have supported social learning theory that we can not only learn from our own experiences and what happens directly to us, but also learn vicariously from watching others, and also through how we think and make sense of what we see and what we experience. This explains why my friend's daughter, the other day, asked for Dora treats.

My friend was mystified. She's never seen Dora treats. How'd this happen? Then she started realizing that Dora treats were being advertised on her daughter's favorite TV shows. And of course, the kids are having a great time, so it's a very salient model for eating Dora treats. And Dora is also a very nice model there too-- a very strong model for young girls.

So parents also matter too. What kids see what their parents do, what kids see their friends do, also has an influence on their lifestyle. Right. And somewhere we can learn our lifestyle habits through association, through the outcomes of actions, and through observations. We're influenced by all of these environmental-- all these environmental forces can play a role in kids' lifestyle and affects their weight.

All right, so how does this relate to Gina? What do we do? She's in your office. You're a good pediatrician and you want to help her. And you know the health risks. So you may turn to the Expert Committee Recommendations for treating overweight in children. This set of recommendations lines out four stages of intervention with increasing levels of support and intensity of services based on, in part, how heavy the child is based on their BMI-- how overweight they are-- but also whether they've succeeded at previous levels.

So you may start at Level 1 and make some specific recommendations. This article in the *Journal of Pediatrics* has a very nice list of some recommendations. I provided some here. You may give some specific recommendations for diet and physical activity. They recommend-- and if you're doing this well, you would personalize that based on what you know about the child's trouble spots. Are they overeating over lunch? Are they not eating enough fruits and vegetables? Are they drinking a lot of sugary soda? And try to change that.

And then work collaboratively with the family to come up with what goals seem reasonable to work on. How many of you have done this and seen families make change? Whoa, I'm seeing-- OK, some families will make change. How many of you have done this, and the families don't make change? They really struggle.

OK. I hear this a lot, and that's why I want to talk to you today because Stage 2 and Stage 3 have increasing levels of support, not only in terms of more frequent follow up with families, but also with specialist input from diet, from physical activity or exercise experts, but they're also very strongly behavioral in their recommendations. Level 2 has some behavioral types of approaches that might work in an office setting. Whereas, Stage 3 looks a lot like some of our classic components of multidisciplinary interventions with a strong behavioral component. These behavioral interventions are a key part to helping kids who fail, or don't do well enough, or don't make the gains that you want to see at Stage 1.

So what do we mean by behavioral interventions? Well, when we boil it down, we really are trying to identify patterns around the habits. All right, we want to understand the habits that we get into so that we can learn some skills to modify those in a gradual way, and in a sustainable way. A way that feels good and says, you know what, I can live my life like this.

We're going to start with some of the-- I really want to give you a flavor for what I might do in my practice so you have an idea of that especially as you're talking to families about, perhaps, taking this type of approach. I'm going to start with the types of skills we're going to give to children. One of the stronger predictors of weight loss when we look at weight management programs for children and adults, are doing recording. Actually recording things. Recording what we're eat tracking. So I use food and activity logs quite a bit.

This is an example. Can you guys see it OK? OK. So we can teach kids how to identify their patterns. Can you see where Gina might be overeating? Where she will be taking in more than what her body needs. Afternoon? As she's getting home. She might be. Maybe I should have made that a little bit more--

[CHUCKLES]

Well, she's actually eating pretty well, but what tells us that she's eating, she's feeling quite full. We can also then look at the patterns that might affect that. You kind of see where she may be feeling overly hungry later on in the afternoon. Why she might be? She's Yeah, she ate lunch very early in the day, and she didn't eat a whole lot. So might be setting herself up to come home and just start grazing throughout the day.

You can also notice that she is eating in the living room. So she may have set up a habit of well, when I sit down and watch TV or sit down in front of my computer, that's where I tend to stack and I may not be noticing what I'm eating. OK. Then help kids take what they've learned from looking at their patterns, and help them start to make some goals and then record their progress.

Here at Mayo, we talk about SMART goals. Our goals, in order to be really effective and helpful to us, need to be specific, meaningful, have some action tied to them-- what am I actually going to do? They need to be reasonable. If I'm maybe getting five minutes of physical activity a day, I'm not going to aim for getting the full hour every day. That's just setting myself up for frustration. They also need to be timely, meaning that they need to be tied to a specific end point-- by when am I going to do this?

So this note card gives an example of a goal that would be considered a SMART goal. This is an example of a type of form I may use for helping kids track their progress. So we can write the goals down below about what they're working on. I usually tend to stick to three or fewer. But if they have a goal that they're making some pretty good success on, we make go up to four.

And then they can track every day. They write down the day of the week there to the left. And make notes on each line and do a check mark or put a star in that. There are also some really nice forms available through Patient Education for physical activity for kids that kind of look like game boards. They can track, you know, in units of physical activity, and color in these little squares and shapes to track what they're doing.

mypyramid.gov also has a for-kids site as well that has some nice tracking forms as well that are kid friendly. All right, so they have their goals, but remember, they're still trying to fight this environment where there's a lot of reminders to eat or overeat. So we want to try to set them up for success. So if Gina's downfall, if she really finds it hard to kind of limit how much she's eating brownies-- not that brownies are bad-- but if she's having trouble not overeating her brownies, we may just say, all right, mom, dad, can we just have the brownies out of the house for now. And we'll have those be there for special occasions. Let's help her out.

I do that with ice cream for myself in my home. I love ice cream. I go to Dairy Queen or go out for ice cream and it's a nice treat for me, but if I have it at home, it's just not a good thing for me. We may also, if the TV is also a trigger, we may set a rule of like, OK, well, we're going to have a planned snack in the kitchen, and maybe we end up doing an activity before sitting down in front of the TV.

So it might be-- let's just change up that activity a little bit, and have you work on kind of a crafts project, or something, before you go watch TV. Or go for a walk, even better. If you may have noticed that-- I want to go back here-- there at the bottom, they have a line to say what my reward will be. Healthy lifestyle habits are rewarding but kind of in the long term.

When we start an exercise program, how many of us feel great the very first time? Maybe, but you might feel a little sore. Same thing with changing our eating habits. It might be difficult at first, but it's kind of rewarding in the long term. Well, it's kind of hard as a child to say, oh, I know this is going to feel great in the long term. So giving some rewards in the short term can be helpful, such as I'll have a friend over when I meet my goal. Or maybe my family can play a game or watch a movie or go for a walk or do something-- go bowling together, something like that when we make our goals.

Also, with many behavioral programs also have a cognitive component as well. We can fall into thinking traps such as oh, this is never going to work for me. All or nothing thinking like I have to lose X number of pounds in order for me to be considered successful. Or I need to have 30 minutes of exercise for it to count and having some firm rules about that. So we work mostly with older kids is more successful than younger kids. But we work to address some of those thinking traps when they end up getting in the way.

We also teach children how to utilize social support. How can you ask your parents what you need? How can you ask them for help? What's a way that they can help and that will feel good to you? How can you ask your friends for help? Can you get your friend to go shoot hoops with you, for example.

Evidence suggests that programs-- behavioral programs-- work best for children when parents are involved. And parents have a great influence on the child's environment. And we can also think about the parents influencing on those various pathways of learning that we've already talked about. So when it comes to observational learning, what parents do, and model for their kids, has a powerful influence.

There's research that suggests that when parents are targeted for weight loss along with their children, that actually children tend to lose weight. And the more that their parents lose, the more that the children lose. We also teach parents the concept of stimulus control, and helping set children up for success. So can you make fruits and vegetables more easily accessible? And make more calorie-dense foods more available on special occasions or harder to see.

Can you put the bike out where it can be more easily seen and used? All of those things are setting up the environment for success for kids. And then, of course, parents are involved with helping make this a rewarding experience. So teaching parents to use praise and reward effectively. The one question I get asked is do these treatments work?

In 1999, there was a review-- I think it needs to be updated-- but there was a review that looked at 26 randomized controlled trials for children ages 13 and younger for behavioral interventions, seven randomized controlled trials for adolescents, and nine that were mixed groups. And determined, that there really is well-established behavioral treatments for intervening with pediatric obesity, and they're probably promising interventions. These are based on the Chambless criteria. The big part because the adolescents just haven't been studied as well.

A more recent meta-analysis showed large effect sizes for family-based behavioral interventions for children. This looked at elementary school-age children-- studies with elementary school-age children, and looked at 44 treatment groups over 16 studies. This meta-analysis also found that when there's a family component, those programs are much stronger than those without a family component.

Are effects sustained? These are some results from Leonard Epstein, who has studied behavioral interventions for pediatric obesity for over 25 years. Looking at the data that he has on several hundred students-- or several hundred children-- you can see that there were changes in zBMI scores, initially, with children largely regaining weight, with greater regain among boys.

At the 10-year follow-up for his follow-up, 30% had achieved non-obese status. But it's also important to know that when he started over 25 years ago, children were less overweight than they are today. So we're starting at kind of a different set point. But his study also showed that the degree of change is just as strong in the more recent studies that he's done than those done before. It's just that you have fewer children-- they're moving about the same amount, but then fewer children than going underneath that threshold of obese status.

This isn't a panacea. There are some problems with these behavioral interventions. Most notably, high dropout rates. One study that reviewed studies that actually reported attrition, found that attrition was about 27 to 73%. So it's really hard to get kids and families to stay with it. Those studies looked at reasons why families dropped out of treatment. Families cited scheduling problems, insurance coverage problems. It said, you know, this program didn't seem to meet my needs or expectations.

And we don't really know what that is. I really wish I knew what they were saying there. And also that well, my child just didn't want to participate. So there are some challenges and barriers to doing these. Well, those kids who do complete it, do see some change. I mean what's important is that there's some data coming out, more recently, that even modest degrees of change in overweight status can have some important health effects for children. So even if we're not bringing them all the way down into to non-obese status, we may be having some positive effect on their health.

So what can you do that might be kind of quick and relatively easy at a Stage 2 where you're seeing the child in your office? You can start by making very specific goals and making sure that those are SMART goals. That they're realistic for where the child's at right now. You could consider linking a reward too. Working with the child to figure out-- child and family-- to identify a reward that might be motivating to them.

Giving activity rewards and privileges are best. And have some means of tracking and accountability. As I mentioned, Patient Education has some really nice resources as does mypyramid.gov for kids. And if you're still not making progress, still frustrated-- the family's frustrated-- we may consider a referral to our behavioral weight management services here at Mayo. I'll tell you a little bit about those.

So I've been developing consultation and intervention services for-- the common indications are obesity or medically complicated obesity. These services are aimed at helping children, adolescents, and their families make changes in their lifestyle to improve their health. Now notice, the focus here is on health change. I tend to emphasize that over weight change. We like to see some weight change. I really want to see changes in the overall health, and changes in their behavior.

So the services that we currently provide are evaluation and consultation. We also have a Teen Healthy Lifestyles Group that I'll be telling you a little bit more about on the next slide. And for those that are too young for that group or for some other reason just don't seem to fit well with that group, then we do intervention on an individual family basis.

Also part of my practice-- I'll just mention too-- is working with our adolescent bariatric surgery services as well. Doing some of the similar services, although we keep those services separate. So the teen group, we piloted a group this summer, and it was a lot of fun. We learned a lot. We had five kids start out, and we had 2 and 1/2 finish.

[LAUGHTER]

The half really wanted to come. We heard from her each week, but for various things that were happening, wasn't able to make it. We saw one of those make some really dramatic changes in her weight that ended up having some very positive effects on her health, and noticeable effects on her health. I feel very encouraged by that. The others were also just feeling good about the habits that they made and especially the habits that the families made.

But we learned from that experience, and restarted up the group, this time on a continuously running basis. We just started this Tuesday. So now we are accepting teens into this group on a rolling basis. They can join the group any time. It's for ages 13 to 17. We'll take 18-year-olds if they're still in high school and living at home. The group meets on Tuesdays from 3:30 to 4:30.

There's a team group as well as a parent group. My screen went out. There's a 14-session course. Most of the sessions are behavioral in nature. So learning the types of skills that we just went over. We also have two sessions that are specifically devoted to time with a dietitian, and two sessions that are specifically devoted to time with a physical fitness expert from the Dan Abraham Center, and we're very happy to have his time.

So we're very excited about this. I'm very fortunate To work with a lot of very good people, both in psychology and psychiatry, as well as in dietetics. Dan Abraham-- we have a few Fellows that are helping with the development and shaping the curriculum for our group as well.