SPEAKER 1: Thanks for having me. I'm going to try to talk a little bit about the non-pharmacological, or also known as the behavioral, treatments for ADHD. And I was talking to a former colleague from Nebraska. And, yes, there are effective behavioral treatments out there for ADHD. I'm going to try and review the current affairs with ADHD, where it stands now, and how we got there, review some of these behavioral approaches, and try to give you a sense of what they look like, and then actually provide some evidence to support the use of behavioral treatments.

So ADHD is probably the most commonly presenting behavioral disorder that we see in children. About 20% of all children will meet diagnostic criteria for a DSM 4, DSM 5 diagnosis. And I work in primary care. And that's probably the most common issue that we see for referrals. So about a quarter of the referrals to us as a psychologist in a primary care setting are for ADHD. And you see that about 11% of children are diagnosed in about one in five boys. So it's very commonly presenting behavioral disorder.

So there's a long history of the treatment of ADHD and a lot of it stems back to the MTA study conducted in 1999-- so large, multi-treatment assessment, randomized clinical trial, looking at the behavioral treatment of ADHD versus the pharmacological treatment. And there were some problems with that study in 1999, mainly-- just to touch on a couple of them-- the intensity of the behavioral treatments was never really allowed to be varied within that. And pharmacological treatment was varied even outside of recommended doses.

When they assessed the outcomes, they only looked at the behavioral treatments a month or so-- several months, actually-- after the behavioral treat was discontinued, whereas they evaluated the pharmacological side at the peak of the pharmacological dosage. And maybe most importantly, when they introduced the sequencing, when they looked at behavioral and pharmacological treatments combined, they only introduced medication first and then the behavioral treatment. They never did behavioral treatments first and then introduced medication. And I think that's a really important piece. And now I'll come back to that a couple of times during the talk.

So after that time, from that study, when it was released right around 2000, a lot of individuals, clinicians interpreted that as medication was the primary and only necessary treatment for ADHD. And this really influenced the number of stimulants being prescribed. You can see here, from 2002 to 2012, sales and stimulants quadruples. And at that time, at around 2012, there was data to suggest that one in five children before the age of 18 would go on a stimulant medication, which a prevalence rate of 11%, which is very high as well.

I think everyone was kind of getting the sense that we're using too many stimulant medications, maybe overprescribing. And the American Academy of Pediatrics responded to this in 2011 by putting out guidelines essentially saying that we should be using both behavioral and pharmacological treatments simultaneously. And that's probably the best strategy for treating ADHD. And that was done in 2011 after about 10 years of primarily the pharmacological treatments being used.

But there were a lot of people working diligently on trying to demonstrate that behavioral treatments were effective during those 10 years and eventually got those guidelines out. Currently, the state of affairs are not that encouraging in terms of access to behavioral treatment. Only about 13% who are diagnosed with ADHD are receiving effective behavioral therapy. 93% of children with ADHD are on stimulant medications.

It is the most expensive disorder in child health care next to the birth of a child. So because of the prevalence and the expense associated with the medications, it is the most expensive childhood disorder at $20.6 a year and increasing. And there are some really concerning things that are happening, such as, in 2013, CDC saw that about 10,000 children that were two years old were on stimulant medications.

Why is this? Why are these things happening? Because I don't think people are aware of the efficacy of behavioral treatments, the fact that they're out there, and that they can be effective. So of children who need behavioral health services, only about 20% of those kids actually ever get any. And of them, maybe 10% to 15% are getting high quality services. So very little access.

And that's what we try and do in primary care as a psychologist is to increase that access. And I think that, when we do that, it's kind of interesting-- what is it that we're actually doing? And so I wanted to give you a little bit of a taste of what do these behavioral treatments look like when we provide them in primary care. And I think that it would be very generalizable to the cardiac clinics that you are working as well.

So this is a Buffalo model, and it's essentially also referred to as a safety first model because of some of the side effects associated with stimulant medications. I think Stewart highlighted that for us all. I'm not sure that I'm clear on whether it's good or bad. But I think that necessarily you would want to be conservative. And that goes regardless if there's a cardiac issue in the equation for that child or not. There are side effects with sleep. There are side effects with eating. And it can exacerbate other problems like anxiety or ticks and things of that nature.

So a safety first model, a Buffalo model, essentially was developed by this individual William Pelham who's been quite active in this area. And the idea is to do a very thorough assessment of the ADHD upfront. The American Academy of Pediatrics says we want at least a Vanderbilt at home in school. The NIH, the American Psychological Association and the Michigan Psychological Association, all would recommend a little bit more than that, maybe some multiple measures for multiple individuals in multiple settings-- so something maybe a couple of measures beyond the Vanderbilt.

The Vanderbilt is nice, but it's essentially a checklist. And it's really not norm-based. So we don't have a sense of is this child varying outside of normal limits on any of these dimensions of ADHD. So it just kind of gives you a sense of is the child experiencing symptoms. It doesn't give you a sense of how far those symptoms are varying outside of the norm. So it's a good start.

And then putting behavioral treatment in place after the assessment-- and the assessment is nice because it gives you a sense of, are there other things going on, such as anxiety and depression, which can really make a child look distracted or look inattentive. It also might be helpful in pointing out a specific learning issue.

If a child doesn't understand how to read, then a stimulant medication is not going to be effective in treating that issue. You will need to pull that child out and go back and work on some reading skills that they didn't learn through the regular ed curriculum in the mainstream curriculum.

And then the treatment that Pelham would recommend through the Buffalo model would be, first, sort of a parent training model and, generally speaking, he would recommend about four to eight sessions of parent training. And then, usually what's called a daily report card, a school behavior program, a behavior program for the school as well, and see how that works. And if that is not getting you sort of traction over the course of four or six weeks, then introduce medication.

So these are some of the measures that we use. This is kind of a checklist that we use that's similar to the Vanderbilt just to give you kind of a sense of some of the things that we use as a DSM 5 ADHD checklist. This is an Eyberg behavior inventory. This is norm reference. So it's nice. It gives you a sense of, does the child you know just have kind of externalizing behavioral problems, or are the issues more ADHD related. It helps provide a little bit of differential diagnosis between behavioral and ADHD.

This is a broadband measure called the BASC. This is an older version, Behavior Asessment Scale for Children. Some people might be familiar with this. But it's basically giving you what I would call like a 20,000 foot view of a child's psychological functioning, their overall functioning. And it's helpful in identifying things like anxiety or depression or externalizing behavior problems, maybe even some social problems at home that might be influencing a child's ADHD or inattention. And it helps to separate those things out from ADHD.

And then this is a Conor's, which is a nice sort of narrow band. It looks very closely at ADHD, but gives you a sense of maybe are there some academic issues and things of that nature. So we'll use a variety of those measures-- so usually two or three of those measures-- to try and get a sense of, is it ADHD or are there other psychological issues that might be explained and need to get attention.

And another thing that we'll do is actually go in and directly observe the child because all of those measures are filled out by the parents and the teachers. There's always going to be a little bit of subjectivity to their views, even though they are norm referenced tests. So going into the classroom and getting a direct view, laying your eyes actually on the child and getting a direct assessment. This

The way we do this, the direct observation, is we'll take 10, 15 minutes and we'll just watch the target child. And every 20 seconds or so, we'll mark down whether or not they're on task or not for that period of time. And then we'll take two randomly selected same gendered peers within the classroom and do the same thing. And we get a sense of the on task behavior versus the other kids in that classroom.

And it's a nice way to get a sense of, OK, each class has sort of its own equilibrium or level of activity and attention. Like, some classes are very active and loud. Other classes are quiet and everybody's sitting in their chairs, and it gives you a sense of where the target child is relative to the norm within that classroom. And it's a nice way to look at everything through the lens of a direct observation, to make a differential diagnosis.

So when we score these all up, what we'll do is we'll put him in a measure of spreadsheet like this, and we'll put all the home ratings over here, and we'll put little asterisks in the areas where they elevated. And then visit the school ratings. And we'll put them side by side like this. And by doing this, it gives us a good sense of what else might be going on here. And though there are some attention issues that are consistent between home and school, there's also a lot of concerns about academic problems. And those might be even more of a concern.

So if nothing else, you're going to want to make sure that we initiate an academic evaluation at the school and work on reading in specific academic issues as a first line approach and maybe in addition to the ADHD treatment. And this is just another example of that where you can see kind of how this child may be more of a behavioral flavor. This is the inattention stuff in here. And it's not really super consistent. But the behavioral stuff is pretty consistent across the different home and school settings. So maybe more of a behavior problem than it is an ADHD focus inattention issue.

So what do the behavior treatments actually look like? So I want to try and give you a little bit of a sense of what these programs look like, what the parent training looks like. It's usually referred to as behavior parent training. It's delivered in four to eight sessions. Usually, what we're trying to do is teach parents the role of attention. And one recommendation that you'll see in almost all of these is that they take 10, 15 minutes of one on one time with your child, every single night, and really shower them with attention, pull away from trying to control that period with questions or demands. We don't want it to look like an academic situation. And we're not trying to teach during the situation. We're trying to teach the child through showing them that, if you do pro-social behavior, you'll get a lot of reinforcement from parental attention for doing that.

And we really try and teach them strategies to do that, to use their attention as a tool. And we also try and teach them reinforcement and motivation based strategies, which are kind of hard to learn because they're a consequence-based strategy. So you have to be very good at finding the behaviors that you're trying to shape and then reinforcing them consistently. And that's not something that you can just do one time. And it's also something where you can't sort of dangle a reward at the end of the month and say, well, you they didn't change their behavior. Therefore, reinforcement didn't work. Reinforce will only work if they actually engage and actually experience that reward consistently in the short term.

And then we'll also shape up some consequences, refine their timeout abilities, their timeout strategies for the home as well. So we'll do that on the home level, try and give parents some basic parenting skills, evidence based proven methods for managing behavior, getting homework done-- things of that nature. they're very associated with ADHD.

So this is probably the hallmark feature of an ADHD behavior program. It's called the daily behavior report card. And so what we try to do is target a couple behaviors-- so for this child we target on task behavior and following directions. And we'll have the teacher just rate the child every day on a scale of 1 to 10. This is just for example. This is kind of the elementary version, and this is the high school version. The middle school version is a little bit different.

But for the elementary school kids, which are most of them, we want to get what we call a baseline. So at first, we'll say, just have a teacher send this note home for a couple of weeks and reinforce the child to talk about the reinforcement that we use in the second, deliver the incentives at home as soon as they walk in the door for just bringing the note home. And then get a sense of where the child's at on these targeted behaviors.

And each child can have different targets. Some kids, you're are going to target in-seat behavior. Other kids, you're going to be targeting completing work, following directions, hands to self, things of this nature. Each kid's operationalizing their ADHD. You want to do that individually. And each kids is a little bit Different

So this is a scale of 1 to 40 total. So after, let's say, a couple weeks, the kid's average score was 23.5. We would actually set a goal of OK, Johnny your goal now is to get a 24. So you want to set the goal right at where they're coming in at basically. And then at home you have something like this, where immediately when they walk in the door, you're going to have usually all those things that I remember as a child that were sort of the right after school routine, which was kind of like watching a little bit of screen time, having a special snack, and some one on one attention from parents.

And so we usually kind of do a combination of those to make it really look salient and impactful. So all of that is delivered contingent upon meeting your goal, bringing your note home. And then as a consequence to start out with-- and this is what I would call kind of a light behavioral intervention, somewhere where you want to start-- as a consequence for not meeting your goal, all we would do is withdraw that. There wouldn't be any sort of punishment procedure. It would just be like, you don't get it on those days.

And the idea is that you're showing these kids, you're teaching them by showing them, when you behave in a particular way and receive a certain score for that behavior, that translates to home. It's not like Las Vegas. What do you do at school does not stay at school. It comes home, and there's a consequence. Things will look different for you on the days that you meet your goal versus days that you don't. And if you're consistent with that, over time, usually you'll see the child gravitate towards meeting this goal.

As they meet the goal, you can raise the bar. And you can connect it to two weekly incentives as well for consistently meeting your daily goals. And you're trying to teach them through showing them, teach them through these consequences. And about 70% of kids will respond favorably with ADHD. You can manage according to the Pelham's data-- you can manage ADHD symptoms effectively with about 70% of kids using a strategy similar to this, which is light.

And then intense behavioral intervention would be to do something like this but also in the school where you're actually delivering feedback at an hour interval or a half hour interval at school and then delivering actual incentives, privilege based, incentives-- being the line leader, the special helper, taking a note to the office, things like that-- contingent upon meeting those goals in school. And that would be a more intensive intervention.

So let's look at the data. So we looked at, here at U of M, in our primary care clinics, we looked at two clinics-- one clinic with a psychologist who was providing what we call integrated behavioral health strategies, and we had standard medical care, which was Vanderbilt and medication. Integrated behavioral health was that thorough assessment of behavior treatment package, a little bit of parent training, and then introduced medication if needed.

So you can see that these are ADHD symptoms. So we want these to reduce. We measured it over the course of 12 weeks. The dark line is the integrated behavioral health group. The dash line is medication only. We had 68 kids, 35 in the standard medical care group and 33 in the integrated behavioral health group.

So you could see a reduction was a little bit more significant. These were statistically significantly different at 12 weeks-- more reduction. And with ADHD, only treatment was medication. You see the kind of reduction maybe kind of tailing off over the course of 12 weeks. This is according to the parents. And teachers agreed, maybe a little bit more dramatic.

The kids in the integrative behavioral health group started out a little bit more severe, but ended up having better outcomes, whereas the medication only group, standard medical care, did not have quite the impact. By the end of it, we're almost back to baseline. So one of the things that we looked at when we did this-- one of the things I was always concerned about this is that parents wouldn't want to do this, that they would not want to do the parent training aspect of it. They would just kind of want to use medication to treat it quickly and efficiently from their perspective.

But when we assessed their acceptability, they actually found the behavioral treatments to be more acceptable. This was on a scale of 1 to 6. And you can see a lot of fives for the behavioral treatments from both parents and teachers, and standard medical care kind of more in the 4 range in terms of finding the treatment to be acceptable.

So this was not randomized. And that's kind of one of the main flaws of this study. But one of the most interesting aspects was standard mental health care, about 66% of the kids went on the medication, integrated behavioral health group, about 22% went on. So that was one of the big findings, even though we had sort of maybe better clinical outcomes in the behavioral side.

Some more sort of refined studies looking at this-- this is a Dose-range crossover study conducted by Pelham. He had 44 kids, and they all received every level of behavioral treatment-- no behavioral treatment, low behavioral treatment, and high behavioral treatment. And they received the placebo point 15 different dosages on the x-axis down here. So this is the dosage.

So every kid went through the different dosage. All 44 kids age six to 12 went through the different dosages and the different intensities in terms of the behavioral treatment. They varied the dosages about three or four days. And they varied the behavioral treatments every three weeks.

And the main thing you can see here is that there's a big gap in terms of the reduction, which is that we want-- reduction of ADHD symptoms on the y-axis here. The big gap when there there's no behavioral treatment in place that you don't get as big of an effect and that you do kind of still get a pretty big effect even without the medication in place.

But the sequencing is really important. And in the most recent release of-- this is a randomized control trial with 150 kids-- 75 into behavior treatment, 75 into medication treatment. And after that, after they were randomized into behavioral or medication, they randomized them again to see-- they wanted every kid to be on both of those treatments, to be behavioral and medication. They randomized again to put them in to a group after that.

So what we found in this when he sequenced it was that-- and this is on the x here. You've got medication first-- it's a little bit hard to read-- versus behavior first. And these are, on the y-axis you basically have behavioral symptoms in Class You can see a greater reduction in the behavior only groups on both of these. These are both in-class behavioral problems and behavioral problems that are significant enough to get you kicked out of class.

So you had more reduction with the behavior first versus med only first. But the key was that, if you went from med first to behavior, the outcome was very poor. Med first to behavior has very poor outcomes. Behavior first med is still pretty good. But med first to be-- that's the main finding that he found, is that behavior alone does a pretty good job, especially compared to medication. But if you want to have them both involved, if you go medication first to behavior second, the outcome is the worst outcome in the study.

And he also found that it had really big impact on parental involvement. And I talked a little bit previously about how parents-- they found it quite acceptable to do behavioral therapy. But they don't show up if you do the behavior second. So when you do behavior first, your attendance rate for one session versus the whole parent training of six to eight sessions, you see 70% follow through roughly if you do behavior first. If you do behavior second, the follow through is 20% or so or lower for the whole thing.

And then more people show up for booster sessions, follow up behavioral booster sessions, when they need it-- sort of an ADHD sick visit, if you will. More people show up for those as well if you do the behavior first.

So I would recommend the treatment of choice would be good, thorough evaluation, a few measures at home in school, introduce some parent training-- in particular, get the daily report card in place. And if that is not effective, then introduce the medication. The daily report card becomes a really nice way to evaluate medication efficacy. You can blind the school to the medication manipulation and use that as a fairly objective report of how effective that medication is in addressing the ADHD symptoms. And that's a very nice way to use it.

I think this is proven. We see this to be fairly effective. I don't think it's overly challenging to do. I think you can do this. I don't think it's overly involved. And I'm happy to take any questions anyone has, although I think we're going to save that for the end. I really appreciate you having me, and thank you.