Event ID: 2334499

Event Started: 4/11/2014 12:48:38 PM ET

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And one of the side effects, of that particular antipsychotic is that when you get above a certain dosage level, seizures are a possible side effect. And prophylactically, we were giving anticonvulsants to the study participants. People whose moods might've been a little wild or moderately movable within the range of acceptable changes, the moods tended to be more stable. So after a few months, they gave us the idea of doing research on using anticonvulsants simply as a mood stabilizer. So that is where we're at now. Not all anticonvulsants will do that. We will cover specifically which ones do. Several of the anticonvulsants are very useful for a -- reducing aggressive symptomatology. If somebody is verbally aggressive, which happens much more come -- much more often, and lesser cases, physically aggressive, can be treated quite competently with an anticonvulsant. And a mood stabilizer, aggression the dresser. Page meant -- pain management, we have one or two anticonvulsants that can be used as a pain management education. We will talk about the details. The very specific kind of May -- pain management under migraine treatment. So the classes and individual medications of anticonvulsants, I wanted to throw them up here. It's a very common problem with people who have developmental disabilities if they can have seizure disorders. So a lot of people are on anticonvulsants. So you know about them and you know the different kinds of anticonvulsants that are out there, but these are the general classes. And benzodiazepines. Technically benzodiazepine is not an anticonvulsant. But clonazepam and clorazepate do have -- we generally refer to those particularly. Gabapentin, all in a similar class. The new warnings about anticonvulsants include some common sense clinical aspects that we have known about for quite a long time. Forever, we've known that you cannot make abrupt changes in an anticonvulsant. You want to make sure that any change you make, dosage is done gradually. So you start the person had what might be a reasonable dose. You don't want to overwhelm them. You don't want to overwhelm their -- overwhelm their systems. You are calculating a reasonable dose and then you change your dose is very slowly. You have to give the body a chance to adjust to what's going on with that kind of stimulation and lack of stimulation in the brain. Blockage of stimulation. So any change that we make needs to be done in a gradual, careful manner. The problem with that, we know for a fact that anticonvulsants do not slip around easily within the human body. It needs to be done very slowly. The problem is that what if the person refuses medication at the time it should be given? The timing is extremely important with anticonvulsants. If you are supposed to take it, let's say at 8:00 in the morning and then 5:00 in the afternoon and the person does not get up at 8:00, several days during the week, do we change the dosage to noon and then move the 5:00 p.m. dosage later in the evening? Let's say 8:00 p.m., it cannot be done spontaneously. So you have to know your clients very well and no, what are their propensities? I have somebody who routinely sleeps through breakfast. She does not like to get up early. And the resident lets her do that. And she stays up kind of late, so she has a normal awakening during the day. The anticonvulsant, when first prescribed; it was put at a very early hour, during breakfast time. And that wasn't going to work for her. So right away, we changed the time that it was going to be given and made those adjustments so that we wouldn't have to make an abrupt change later or make any change whatsoever later. This important information that you can share with the prescriber for when medication is going to be given, and what happens with them after they take their anticonvulsants? In general, anticonvulsants have either sedating side effects, or more of an activating side effect. More likely, they are going to be sedating side effects. And you don't want to be giving them their anticonvulsants just before they go to programs. And the program staff or sheltered workshop staff had mentioned that they're sleeping or just so tired that they're not really involving themselves in groups or in activities. So that's something you need to tell the prescriber so that the prescriber can start out at a very reasonable timeframe for the medication. So no abrupt changes. Something else on the abrupt change category, which is a new warning for us, is that anticonvulsants, whether used as a mood stabilizer, a pain management medication, or an actual anticonvulsant has that anticonvulsant feature to it. Its calm down, slowing down, some of the firing that's happening in the brain. So that can destabilize somebody's mood. If their mood was stable and all of a sudden they are put on an anticonvulsant forever -- for whatever reason, that can disrupt somebody's mood. Especially someone who has fragile syndrome, autism spectrum, fairly significant and notable social features to their diagnostics. Those people tend to be a little bit more disruptive -- disrupted by the mood changes that can happen with anticonvulsants. So you don't want to put somebody on an anticonvulsant or you don't want change what's going on with them. When they are going to have a lot going on, sister is getting married, or they're going to a new program or moving to a new residence because one of their group homes is closing, these disrupt -- these disruptions don't need to be layered on with more changes. Tapered dose reduction is extremely important, regardless of what the purpose is of the medication, the diagnostic frame is for it. We want to have the dose changed in such a way that stimulation blockage in the brain -- that the medication does, is slowly adapted to, over time. So when you have somebody on a particular anticonvulsant -- let's say they're having sedating side effects and it's interfering with their functioning and they're not having the diagnostic framework for which you are giving the anticonvulsant, mood stabilization, pain management or for actual feature disorder, you want to bring that dose down very slowly. Bring it down too quickly; the person can have an overstimulation in their brain. Whatever you were giving that medication for, will happen. Even though it might be a small dosage change. You have to be much tapered for this population, very sensitive. Regular checkups. Things like gastrointestinal problems, urinary tract problems, mononucleosis, somebody who recently was diagnosed with liver cirrhosis, he is only 17. But it is a result of all of the medications that he's been on. And his liver was already not in tip top shape, which is not unusual for somebody on the autism spectrum. So I want to know how well that liver is functioning. So I need liver tests. Most of our medications are metabolized through the liver. The liver's got to be working very well in order for us to give the medication and know that it's being absorbed, metabolized, it's going where it needs to go, it's doing what it needs to do, and it's being excreted from the body properly. So either checkup is important. Not easy to do with some people, they refuse regular blood work and regular physical exams. But make it as easy as possible for the individual. If you can't do everything at once because it's uncomfortable for the individual, then do it in pieces. One day they will give a urine sample. Several weeks later, they might have their blood drawn for some reason. Or they will have some support around difficult testing for them so they can get through it as comfortably as possible. Key information that we need to keep them safe and healthy. When you take an anticonvulsant, regardless of the region you're taking it, -- reason you're taking it, it can affect other results. It's good to tell people who are drawing the blood to write on the lab slip or lab results so that the clinician who is prescribing can tell what's going on. Have they had breakfast? Lunch? Dinner? What other medications are they on? Because it makes a difference. Have they recently received a pain medication? That can very much change the liver function test. People don't often think about that. They are happy the pain is being managed. On an ongoing basis, I need the liver function test to be as accurate as possible. There are drug interactions with anticonvulsants, regardless of the reason you are giving it. Other central nervous system medications can interact with an anticonvulsant. So you might have -- doubling up on sedating side effects. Something to know about ahead of time. You don't want to do that unless you really need that side effect to help that person get sufficient rest. You also need to keep in mind if they're on any dental medications, postsurgical medications, any emergency medications, these things can all interact and it can be a problem. That's something that depends on the person's metabolism. For example if they just had surgery, and they have had anesthesia but they are also on pain medication, that can slow down the metabolism of their body in general. It's certainly going to slow down their got. So -- their got -- gut. If the metabolism slows down either because gastrointestinal system has been modified or mitigated in some way, not metabolizing things as well, things are not being absorbed as well through the wall of the bowel, or because there is what we call P 450 issue, cytochrome P 450 is a liver enzyme. And it can be activated by certain medications, which means that the liver is going to clean up that medication and get it out of that person's system very quickly. Sometimes it can do it too quickly if the medications are interacting. So you are giving medication for pain, and you're giving an anticonvulsant that accelerates the cytochrome P 450 that's used to met -- metabolized that pain medication. And the anticonvulsant is ripping out of their system as fast as you can give it. And it seems like the pain medication is not effective. When really, what you have is a drug interaction. And for the most part, pharmacies are right on top of that and they will tell you, these medications do not mix well. You're going to have a dosage change that needs to take place because of these co-administered medications. But people who have developmental disabilities are different. They're build different, they're wired a different, they're more sensitive here their lab results might not be as unusual as you would see in people who don't have a developmental disability. But it could still affect what's going on. The gastrointestinal and liver problems are really right out there in terms of how is this medication going to be metabolized? Something to pay attention to. Some recent warnings that have come out from the FDA, and research in general, is that some anticonvulsants -- it varies with the individual -- can increase suicidal ideations. And suicidal behaviors. We have to be careful about these new warnings because these warnings, if any of you are harkening back to the late 1980s or early 1990s, these warnings came out about selective serotonin reuptake inhibitors, the new antidepressants. The first one was Prozac. Next one was Paxil, Zoloft, medications that you cannot overdose on. You take too much, and it will be uncomfortable, but you're not going to kill yourself. And at the time in the late '80s, the only antidepressants we had were tricyclic antidepressants that you can overdose and kill yourself extremely easily. Now, you have to be on a very special diet. And if you don't adhere to the special diet, you can shoot your blood pressure up in what's called a hypertensive crisis. And you will stroke and die or stroke and disabled. So those two situations were difficult antidepressants to put somebody in who was lethal. So you would only give them two or three days of medication. You would have them come back and give them more because you did not want to overdose. And you did not want people to be having a piece of pizza or macaroni and cheese, things you cannot have on this special diet. So in 1998 when Prozac came out, everybody we had, every therapist I know, we had legally depressed people, put those people on Prozac. The interpretation by the lay community was, these people became suicidal because they were on these medications. No. It was the other way around. We put them on those medications because they were lethal and they can't hurt themselves with these medications. If they were prone to overdosing. But it took nine FDA hearings to clear that up. And about five years. So it was misrepresented by people who are not scientists, people who are not clinicians. It was misunderstood. This is a recent new warning. And I don't know whether it's a misunderstanding or whether it's clinically very relevant. I haven't had any issues in my practice. And my colleagues have not reported any suicidal ideation increases or certainly suicidal behaviors from the use of anticonvulsant. But it's out there, and I wanted to let you know about it. Because of the use of anticonvulsants is so common in this population. Let's talk about the anticonvulsants side effects. By law in the United States, the FDA requires that when the research is being done on a new medication, phase two human research trials before it gets put on the market, you're very careful when you're doing research with medication about documenting all of the side effects that somebody has. And by law, if 1% of those people in those phase three trials have any side effects, it must be listed in the side effects of the medication. But these anticonvulsants have been around for a very long time. And they have not been in phase three trials for a long time. So we know that these side effects are legitimate. They're just not blips from the research environment. There are behavior changes. Sometimes that can be because of slight mood stabilization. It can be because of the sedation or the activation side effects. So you know that there are going to be some behavior changes. You have to watch for it and measure it to make sure it's not extreme. There are some oral impacts. The anticonvulsant can try out the mucous membrane and caused gingivitis or exacerbate delicate oral situation. The other -- Dr. Trigoboff and I have a number of people who have had very painful dental experiences. And it is the pain receptors in their mouth have been very much challenged over the years with the different dental problems. And when they go on certain anticonvulsants and there are these dry features to them, we can anticipate that there's going to be an oral impact and try to head it off. There are some facial changes that happen with some anticonvulsants. The most notable -- I'm sure you've seen this a number of times is that the features tend to get a little larger. The facial features. So you're going to see their expression is going to be slightly different. And just in general, they are going to look a little different. There might be some weight gain or some water retention. That might be more around the facial area. So you're going to see enlarged facial features. Hair issues, especially with people losing their hair. And if somebody has an immune problem, if they have an autoimmune disease, if they have lupus or antiphospholipid anti--- antibody syndrome, 30% of people can become allergic to their own hair follicles. Sometimes hair loss, it is a perfect circle of alopecia of a bald spot. Where is it coming from? It grows back. But if the person is on anticonvulsants, there can be a general thinning of the hair that can -- has nothing to do with autoimmune disease. It can be treated in a number of different ways. It can be quite distressing to somebody who is really aware of how they look and how much hair they are losing. It can be distressing. There are some age-related changes. Older people, especially people who have developmental disabilities who are older, are very sensitive to all of the side effects in general. They are going to be much more accentuated with people who are over 50. Although as disturbing as that is to me, that would be considered an older person, so be it.

There's going to be more sensitivity to all of these side effects for people who are over 50. The gastrointestinal changes, side effects that can happen is that they can be constipated or have diarrhea or have nausea. These things can happen with people who have developmental disabilities anyways because their GI systems are just not build the same and they have a lot of challenges in that regard. So you need to keep an eye on what's going on with their gastrointestinal systems, know whether they have a predisposition towards constipation or a predisposition towards diarrhea. And focus on any changes that are going on when they are put on an anticonvulsant or when the dose is changed. There are changes that usually go along with whether it is sedating or activating anticonvulsant. As you can imagine, sedating makes them sleep a little longer and they might sleep during the day. You might take more naps than usual. Pain is different on certain anticonvulsants. Actual side effects of one anticonvulsant is called Neurontin, it changes the perception of pain. The person actually has the pain but the perception of the pain has changed such that it's not as distressing, not as intrusive into their lives, and that's one of the reasons why we give Neurontin has a pain management -- management medication. Common with a lot of medications, there are going to be more sensitive, they are going to get more sunburns. Some people will get almost like a rash, blotchy red dots rash. And itches. Or some people have very purple, red sunburns. Always good to keep long sleeves, big hats, on people, even in warm weather. Needs to be covered up as much as possible. And you need to be aware of -- the common misperception that when it is cloudy, you can't get a sunburn. Because many of the filtering that's going on with the clouds themselves are not doing any f avors. So it's only sensitivity, regular problem, people need to cover up. Muscle twitching can be a side effect. Because remember, the major feature of it is to change the electrical current activity of what's going on in the brain. It does have some impact on motor neurons, what is going to make your muscles work. Sometimes muscles might just jump, they might not be in full spasm but they can fire in such an unusual way that it makes the person move in a certain, abrupt way, which can be a problem for other things going on in their lives. So these are the general side effects of anticonvulsants, not hugely problematic, but something we need to keep track on because so many people who do have developmental disabilities are taking anticonvulsants. These are the side effects that need intervention. Prescriber needs to know right away if any of these are happening. If the person becomes clumsy -- clumsy that is not typical for them, where it is generating from as a side effect is that module -- muscle twitching feature is being more homogenized across their nervous system. So it is interfering with their large muscle groups, like their legs and back and their arms. And so they're going to be bumping into things because their mother -- their muscles are not moving the way they normally should. I need to know about that. So clumsy is a good observation that can be communicated to the prescriber. Slurred speech is also a very important one because it can indicate the problem with the Tonga, which is an enormous muscle, not just what you see when people stick out their tongue, it widens and flattens and goes way deeper into the throat. And it is attached in very sensitive neurological way. When somebody is having a reaction, their tongue can feel like it is swollen, when really what's happening is the tongue is going into spasms. If it is not real pliable, the speech is not going to be very distinct, because the tongue is not moving the way it should around all of -- so slurred speech can mean there's a problem with the tongue, which indicates an allergic reaction or a spastic response of some kind. It also can indicate there might be some cranial impact to what's going on, that the person is having some firing in a portion of the brain that's controlling some of their speech. And they might even sound like they are drunk. So if you have somebody who is slurring her speech like they are drunk, they might be drunk, we know that alcohol abuse is rampant in this population. In any population, but especially with anybody who has developmental disabilities, self-medicating with alcohol, topic for another day, but slurred speech, if they are not imbibing alcohol, could be a pretty serious side effect. And the prescriber needs to know about it immediately. Trembling, because what's happening is not just a muscle twitch, and not an allergic -- allergic reaction but muscles are being affected in a regular kind of way, a trembling is an indication that their motor neurons are being affected and motor skills are going to be affected. People who have a lot of motor challenges do not need something else on top of it. There can be vision and eye problems, more uncontrolled eye movements where the eye will go up into the head or they roll off to the side or the person really can't focus. They have blurred vision, double vision, these are important features to keep in mind. Important side effects. Vision and eye problems. Also sometimes, the vitreous in our eyeballs, can actually be affected by some of the medication. Many medications will have to certain anti-cholinergic side effects where they dry up a little bit. If you dry out some of the fluids in the high ball, you're going to have a tougher time focusing. You're going to have blurred vision as a side effect. Not as damaging but very frustrating to the individuals, and frightening. You need to take care of that. There can be mood changes like I mentioned before. There can be a destabilization of the mood in such a way that the person is crabby all of a sudden and then usually -- or they are talking a little too fast and a little too loud. Might be a little hyper elevated mood, a little hypomania. Those mood changes need to be paid attention to. And of course, depression. I don't see it all that often, but I do have colleagues who told me that when people have bins -- been destabilized, because DC dating side effects are usually -- because the sedating side effects are a relief. Trouble sleeping from pain or adjustment disorder sometimes, so the sleep has been welcomed. But after a wild, you notice that the other mood experiences they are having are also in the depressive mode and sleep changes actually reflect a depressive symptomatology. So that's a problem that needs to be addressed. Bone mass. Most of the anticonvulsants have as an unusual side effect that they will promote osteoporosis. So people who are on anticonvulsants really need to have their bone mass checked annually. It needs to be part of their physical. With females, it's not that difficult. They usually have it done at OB/GYN appointments. If they attend their OB/GYN appointments, they will check bone mass right there. In general, people need to have bone mass checked. There's a couple easy ways to do i t. The easiest is a machine where you put your heel of your foot in the machine and it reads the bone mass, the percentage of density that's going on with your bones. There's also one that looks like an x-ray machine. You lay on a table and it has a large overlay, and it slides over you, down your body, and it reads your bone density and gives you an idea of what's going on. I had somebody who was on -- for pain management, put on Neurontin. And she just had gone to her OB/GYN appointment before we put her on Neurontin. And she had her bone mass checked and it was fine. She was on Neurontin for 13 months when she happened to have her next OB/GYN appointment. And they checked her bone mass again and it was down by 13%. Her bone mass had been decreased 13% in 13 months. Unusual side effect, but something that has to be tracked, because it's dangerous. And people who have developmental disabilities are more prone to osteoporosis because of their own physiology. And many of the meds do challenge them further, like an anticonvulsant can accelerate that process. Once you get into late stage osteoporosis, the only stage at which you could feel something, it's too late. It's very difficult and very painful. That's why we want to have bone mass checked on a regular basis. I'd rather check -- catch osteoporosis early then to have late stage when I'm trying to do more pain management around it. Many people, like 12% of people, will get a rash from certain anticonvulsants. I know this has driven a lot of residential staff, really into some busy activities because they see this rash and it's like, detergent, what they ate, trying so hard to look for and environmental or medical feature, which is very important to do. But when they come right down to i t, it's a side effect of the meditation -- side effect of the medication. The other ones, slightly less. Enlarged glands, especially the glands. On the throat, what happens with the enlarged glands is that once they are swollen, if the person has a chronic sore throat or sinusitis, those glands will swell and they become pendulous. And they're always swollen. So you don't know anymore. Are those recent swelling or just the same old swelling that it has had? It's important to pay attention to people when they have swollen glands. Muscle weakness, because the firing of the neurons in the brain have been adjusted by the anticonvulsant. So there might be some muscle weakness when there is a blockage of the firing or an over firing as the muscle -- not doing any more of that. So the muscle weakness, especially if it is on one side or another, needs to be tracked. And fever. Not just a low-grade fever. It can be a fairly substantial theater. Needs to be kept in close monitoring for needed intervention. Really need to pay attention to that. There are newer preparations. And it's called the technology. And we have had to have a number of different technologies. We've had tablets for a very long time where they condense the actual active substance in with the substrate. So some powdery substance that can be crunched in and holds the medication. And then release it in a tablets, once the tablet has been adjusted. And release it at a regular pace. So tablets and capsules for a very long time. We do have an interesting new capsule that some of the anticonvulsant can be taken with. It's like a slow release. It's a capsule that has layers. And the inner layer has -- there's medication and then a layer of a capsule around it. And in that layer are drilled, microscopic holes with a laser. And they plug those holes with a substance that dissolves slowly over time. Then there's more medicine and then another layer of a capsule that has those laser drilled holes that are plugged with a temporary substance that the body dissolves and the medicine slowly extracts. And the outer layer, more medication -- it's a regular sized capsule, but there's a lot going on in it. Not a problem in terms of biometrics. Actually better because you can gradually give a medication over a 24 hour period without having to administer it over and over and over again throughout the day. The problem is that you have to be very sure of the dose that that person is going to do well. And they can't be in a state of flux with their condition, with their seizure disorder, with pain disorder, with their migraines, it has to be very stable. We know they respond to this particular -- throughout the day and then you can give these special capsules. You also have to let people know that that capsule, the one that has the laser drilled holes doesn't dissolve. The plugging of the laser drill dissolves, but the capsule layers themselves don't so it comes out in the stool. If people don't know that, they can be quite frightened by it. What is it doing that? It looks a little different. The colors are changed when it comes out in the store. Liquids are a big boon especially for people who have swallowing problems. But sometimes they are revolting, really difficult to eat. They taste terrible. Sometimes they fill it up with so much serum and so much flavor that it's really over the top and it is revolting to people who are sensitive to those sensory experiences. There are sprinkles. Sprinkles are fairly new with anticonvulsant. It doesn't have a flavor whatsoever. And you can sprinkle it on putting or apple sauce or whatever they are needing, whatever food they have. You have to make sure that they are ingesting the entire substance. If they have it smooshed around on the plate, you have to make sure the sprinkles were totally ingested. So there's a number of ways to handle that. I'm sure most of you have figured that out already. Sometimes putting something in a smaller container that you could really monitor that they have adjusted the whole thing. Then there's a parent Carol -- a parenteral prodrug. Enteral means gastrointestinal tract. So it would be metabolized -- anything you're going to swallow or anything you are going to use, a suppository is used. Gastrointestinal tract. Parenteral means outside of the gastrointestinal tract. That means usually an injection. So that is one of the newer preparations. Most of the brand-new research on this, it's called a prodrug because it's a precursor drug. It's not the endpoint that people might have been taking -- or maybe they've had very difficult responses to that particular form of Dilantin. So they give this prodrug ahead of time. It's a precursor. And sometimes it can be easier to metabolize. Put it in the muscle, the muscle doesn't react to it the way the gastrointestinal tract does. And it can be much more easily controlled and useful for people. So that's the whole anticonvulsant story. Certainly if you have any questions about that, please ask me at the end when we have questions and answers. Let's talk about antihypertensives. The fact that people who have high blood pressure means that they can have it as a primary hypertensive state where their body is built in such a way that they have a higher tensile aspect to their vascular system, and blood pressure goes up. Primary hypertension is very common in certain groups. And people will tend to become more hypertensive as they age. Because you are talking about, what's the flexibility? What's the tensile strength of the walls of your vascularity? What are your veins and arteries doing? As you get older, they can become more brittle. People who have developmental disabilities tend to age a little faster than the rest of us. They might have that brutal aspect to their veins and arteries and capillaries earlier in their lives. So you might see a primary hypertension in their 20s and 30s. Then if you add a high level of cholesterol, especially low density lipoprotein, LDL, low density means that they are the key and they are spongy and they glob onto the wall of your vessels. And if you have that kind of LDL that is too hiding your system and whatever anti-hyperlipidemia queue are taking to bring it down isn't effective in doing that, that means that the walls of your veins and arteries have this sticky stuff along the side of it. In order to get the blood through that sticky interference, there has to be more pressure behind it. So that raises your blood pressure. The problems that happens when you do have high blood pressure is imagining the pressure going through a hose, pushing the water through a hose. And the hose walls, over time, become more brittle, or they become more clogged up with low density lipoprotein, or both. And if the pressure is higher through that hose, it's going to be pushing harder on the walls as it goes through. So if it pushes harder against the low density lipoprotein, it can break off a clump of it and send it someplace dangerous, like your head. You have a stroke. Or it can tear through the brittle wall of the veins and arteries, and you bleed out. You may have an aneurysm. It weakens the wall of the vessel and you have an aneurysm and the person can bleed. That's what happens in the head, abdomen, it really just depends. The other issue about having high blood pressure is that you usually don't get symptoms of high blood pressure. Usually someone takes -- if it is only high when somebody -- a medical professional is taking the blood pressure instead of you taking yourself at home, that's called whitecoat hypertension. And usually we don't treat that. Take off the white coat, take off their blood pressure. If the hypertension is really durable and there all the time, what that means is that the pounding hype up -- high-pressure blood, which you do not feel, very seldom will people get a headache. Usually when their blood pressure is super high or they are starting to bleed or they have had something moved into the pathway of the blood so that it is blocking it a little bit or causing a vascular spasm of some kind, that doesn't happen that often. What mostly happens is that you have the constant pounding of blood through very delicate tissues, like your kidneys. And like your liver. And like your eyes. And like your nerve endings. And so those organs and the vessels going through those organs are going to be damaged. And by the time you pick up on it, when the person is actually having a symptom of high blood pressure, the damage has already been done. And it's very hard to repair it if you can repair it at all. So that's a long way of saying, hypertension is really bad. And he needs to be addressed. And it needs to be on all the time, need to track it and make sure it's effective. And some people, hypertension is not responsive to one antihypertensive. So sometimes we give ones that have different pathways of action. And we are trying to get to them in a number of different ways. Let's talk about some of the mechanisms of actions. That can really save somebody's life in the long run. What we're trying to do mainly with anti-hypertension medication is to bring down the blood pressure. There's lots of ways to do that. Many ways around that particular problem. One way is to reduce the volume of the blood. And harken back -- the first time I did this explanation to somebody, they went, you mean like when barbers used to bleed people in the Middle Ages? That's probably one way to reduce the volume of the blood, but there's more effective chemical ways to do it without making the person hypovolemic and lowering the volume of the body. You are trying to reduce the blood volume at any particular pace. So you want it to be paged differently and you want it to be all over the body in the same pace. So you don't want certain areas of the body to have these pressured areas. So that's one mechanism of action of reducing the blood pressure. Another is to take a look at the vascular distance. The walls of your veins and arteries provide a certain structure. That's what you're blood goes through, like the wall of a hose. And if that wall is very rigid or giving a lot of resistance or in spasm a lot, a lot of the time, people could have spasms along their vascular systems. And what that's going to do is increase the resistance against the blood that's going through the system. And one way to reduce people's blood pressure is to reduce that systemic vascular resistance, to calm it down. , the vascular spasm, lower the tension that's going on in that system. That's another way to do it. Totally different mechanism of action. Another way to do it is to reduce the cardiac output. What is coming out of your heart, into your aorta and then a shock to your system and right there at where your heart is, if you're cardiac output is very over the t op, then that needs to be reduced, because that increased pressure is going to we can the vessels, closest to the heart, which can cause an aneurysm, abdominal aneurysm. Any weakness that's going on in those vessels will be exploited by very high cardiac output. You want to minimize that as much as possible. And there's another pathway to do that. Then there's parts of our brain that -- I'm sure you all know this, that control different parts of our bodies. There's the sympathetic nervous system, and there's the parasympathetic nervous system. And sympathetic nervous system is kind of in charge of the autonomic outflow. What comes out of these areas automatically. Autonomically. And if you control what's happening in the brain, the message that that nervous system gives all of the vascular systems on how it's going to pump out that blood and how it's going to go, and even to some extent, the spasticity of the vascular wall. So many different ways to accomplish the same thing. The action on the brain regions that controls the sympathetic automatic outflow, basically what that means is slow the flow so that you're not having things rushed and hurried and pressured through the system. So whenever you hear sympathetic automatic outflow, that's what they are really talking about. So there are some new uses for the antihypertensives that we've had around for a very long time. One of them is stroke prevention. Many people have higher risk of stroke because of cigarette smoking, because of alcohol use, because of other substance use, because of familial propensities. Stroke prevention is a very important part of what we do. But people who have hypertension are at a much higher risk for stroke. When you smoke cigarettes, that increases your blood pressure and heart rate for the time that you are smoking. But up and down, up and down, is a way to make the walls of the vessels rigid and even a little spastic in some cases. So stroke prevention is quit smoking, but it's very difficult to smoking cessation with anybody. And you add the features of psychiatric symptomatology, where people don't think as clearly, or they can process data as effectively, nicotine, combustible nicotine actually helps them do that. For about seven minutes. So it makes it very hard to give it up. Should I think more clearly or should I quit smoking? So stroke prevention takes into account that you really should remove as many of the risk factors as you can. But some antihypertensives can be given to people to prevent that first stroke. And they might not even have a very durable and dangerously high level of blood pressure, but because they have other risk factors for stroke, people have been given antihypertensives. It's not a convenience. It actually has some problems for people. It can make people go to the bathroom much more often because some of them work by decreasing -- increasing, I should say, the kidney activity. So you're going to produce more you're in. And you're going to have to go to the bathroom more often. It is a diuretic; it pulls the water out of the system, which is one way to decrease the blood volume. Go up a little bit. That was the first mechanism of action that I mentioned, reducing the blood volume. The way to do that is to pull some of the fluid out of the system, which is what some -- some hypertensives do, but it makes the person go to the bathroom more often. So you don't want somebody to have an event like they are wetting the bed. That makes them feel bad. You don't want them to have an incontinence issue because then it becomes a placement issue, it becomes a workplace issue, a program issue, and of course how they feel about themselves, no one feels good when they are dribbling urine or they don't realize they have to go to the bathroom or they have to go so urgently that it interferes with their functioning. So giving the antihypertensives if it happens to have a diuretic action is -- it's focus is to reduce the blood volume. For stroke prevention, that's one of those things you have to weigh in the balance. Is it really worth it? Is the person going to have difficulty with that process? That's one of the new uses of antihypertensives. Another is to reduce the incidence of myocardial infarction. Again, people have an increased risk if they are still smoking, drinking, to access, with this population doesn't really take a whole lot. Kind of sensitive to alcohol use. So again, you're going to have to balance, what is the risk for MIA -- MI? There's been some use -- very robust studies done on using antihypertensives to minimize the onset of a new heart failure episode. So let's say somebody didn't have heart failure or a heart block. And it was minor, but it's expected to happen again because the risk factors have not changed. As a matter of fact, they've been accelerated because they had this first event. Sometimes it is able to delay or at least minimize the next event so the program -- so the purpose -- so the person is not as challenged by the cardiac symptom. There is a way of -- people who have developmental disabilities frequently will have kidney problems. And that problem is a gradual degradation of their the glomerular of until attrition -- glomerular filtration rate. And how does it filter? How fast does it filter? If you slow down the rate of degradation that the person has through their kidneys, through using an antihypertensive, you will be able to keep their kidneys healthy a lot longer. They might not have high blood pressure or any issues in that regard. They don't have vocational hypertension. Only hypertension -- they might be put on an antihypertensive to try to keep kidneys healthy as much as possible. What that does is it changes how hard the kidney has to work. If somebody has a risk factor for some kidney decline, that's the way to go with it. It is very robust, good results. Shaking legs syndrome is a side effect of a number of different medications, but it also can happen spontaneously, especially people who have spasticity issues. And the leg is moving and they can't stop. Not so much an issue during the d ay, but shaking and moving when they are trying to sleep and it interrupts their rest, deep sleep, so they could be destroyed by shaking legs syndrome. It burns off a lot of calories. If you have somebody who is very spastic to begin with, they are burning off a lot of calories from muscle spasms. So they might become dangerously thin. So some antihypertensives have been very useful in treating shaking legs syndrome. Right from the very beginning, we've done this for many years. Inderal has diuretic features to it has been very useful in treating shaking legs syndrome. So people have been on Inderal who don't have blood pressure issues, but they've had the shaking legs syndrome -- let's talk about -- that's the story with antihypertensives. Totally lost my voice there. Let me try to fix this. Let's talk about antacids. We know that people who have developmental disabilities have a lot more gastrointestinal problems than people who don't. And I wanted to raise the point that there are different categories of antacids. And to define them, talk about what the differences are -- they're very important differences. A lot of this is over-the-counter, it can interfere with other treatments that we have. So as a pharmacological perspective, it needs to be paid attention to. So these are the four main categories of antacids. There are prescription medications, and there are a number of them. They have become far more common. Commercials on TV and people who have certain side effects from other medication that caused them to have gastric problems, but also people who have developmental disabilities -- I might have mentioned this in the pane module if you attended those -- I will reiterate for those that haven't -- people who have developmental disabilities, a variety of different developmental disabilities, have a problem that happens more than he does in the general population, where the cardiac sphincter -- and it is called the cardiac sphincter because it is on the same level as your heart, the sphincter that happens at the top of your stomach. And your stomach of course has acid in it, but your esophagus, the tube that goes from your mouth down to your stomach does not have acid in it. It is actually in the other direction. The acid is supposed to be contained in the stomach. Usually what keeps it there is it's a low level of acid, not like a tremendous amount, but also the sphincter at the top of your stomach closes and keeps it all inside. If you have gastric stomach, esophageal tube that goes from your mouth down to your stomach, reflux disease or gastric reflux disease, the amount of acid in your stomach is too much. It's more than usual. And the sphincter at the top of your stomach is not very effective. It does not seal it off nicely. So you have this extra acid that's being generated. And it ejects through this floppy sphincter into the base of the esophagus. Gastroesophageal reflux disease. Where it just reflux is out there. The base of your esophagus does not want acid in it. It hurts. It burns. That tissue is not supposed to have that. And a lot of people who have developmental disabilities have developmental disabilities 11. They have access acid buildup in their stomach if they have floppy sphincter's. It causes pain. You might see somebody doing what is called a parentheses movement. They are trying to get things positioned in such a way so it's not so uncomfortable. So you don't have that acid pooling at the top of the sphincter and eating away and also rating in some cases those tissues. There are a number of prescription medications that have been available the past 15 years for GERD that were never available before. So that is one way of antacids be effective. There's also antacids available over-the-counter. And those are chewable or gum or liquid. Things that are not prescription strength. And they handle things that are much lower intensity level. Chewable antacids can be prescription or over-the-counter. TUMS is very common. And a lot of times chewable antacids will have calcium carbonate in them, basically chewing up a version of chalk. And that calcium is what calms down and absorbed the acid. So it makes it less problematic. And there's also antacids in pills and in capsules. So let's see. Basically what we're trying to do with antacids is to decrease the total load of acid that an individual will have in their body at any one time. So it also decreases the amount of acid that can splash up and cause the pain. So this is what you use antacids for. They call it heartburn, because it's this painful feeling you have on the level of your heart because it's happening in the top of the stomach and the bottom of the esophagus at the cardiac sphincter. The PPI, the proton inhibitors, they acknowledge this predisposition to osteoporosis. We, as the people who give PPI to those who have heartburn, know that they're going to encourage osteoporosis. So you have to be real careful about that. Let's see. Anything out about -- anything else about Poe -- proton pump inhibitors? Histamine is a normal part of our reactive system. Hit -- histamine comes into effect when the body is challenged by something. Sometimes, the heartburn can be treated by giving something that blocks the histamine or in other words, is an antihistamine. There are only particular kinds of antihistamines that work. The more proper term is histamine blocker. You don't want to have Sudafed for heartburn. Most likely won't. That you have to make a differential diagnosis. If there's no relief after days of treatment, or using an antacids for heartburn, then you need to get it checked. Really three or four days, if the person is not feeling better, there's something else going on, either more dire, there might be an actual ulceration at the bottom of the esophagus or you can get something called Barrett's esophagus. It can be very dangerous. And it's treated very differently. Or they might actually have a heart problem, a cardiac problem. People who have very different responses to what's going on with cardiac problems. And we know now after years of research that women in general -- especially women who have developmental disabilities, have very different side effects or very different symptoms of cardiac problems. And they can just show up as heartburn. So the caution. We tend to be cautious about these things. Select the right medication for the problem. The person taking antacids for heartburn, for a problem like GERD, in a few days, not feeling better, that's not right medication. It's not working or there's something else going on. Has to be differentially diagnosed. Assure the quality. When you buy something over-the-counter, it's not going to be regulated like a pharmaceutical is. A pharmaceutical is very closely regulated by the FDA and by the pharmaceutical company's own quality management. They don't want to have a problem with a quality management lawsuit. They make sure things are really in good shape. But over-the-counter alternatives and complementary, not a regulated industry. Or minimally regulated. So you could be buying some over-the-counter thing that does not have an active ingredient that's of any use to you. Or it might have mold or mildew or algae or dirt from somebody -- they put it in a beautiful box and it looks lovely but it's not very effective. So go with a source that's very reliable. Go with a source that has more to lose, that's a that -- let's say that. More focused on the quality of the product because that is their entire business. They are not going to pick up and go someplace else and design a different box for their product. So quality by source. Exercise a great deal of care because there are similar names for products that are very different. And that has caused some problems with gastrointestinal medications that you can buy over-the-counter. A couple of examples here. Examples of prescription medications, Prevacid, Prilosec, AcipHex, Zantac, but keep in mind that you can buy Zantac over-the-counter. But the prescription Zantac is pharmaceutical grade as opposed to being over-the-counter grade. So you can't just interchange them. They have to be pretty careful about them. There are some higher concentrations, lower concentrations, really have to read the label. How much is going to be in a tablespoon? And you have to track and see if you are a person who has developmental disabilities, is able to read those directions and is taking the proper amount. I can't even count the number of times I've gone to talk to s omebody, the resident -- they're taking their antacid by appending the bottle over their mouth, not measuring anything. But they think they have the proper amount. You have to look and see what is the action? What is the intensity of the dose that they are taking? So it is not being used -- misused for the purpose. They have to acknowledge that there is medication interactions. More difficult to track when people are buying over-the-counter for themselves, but a general rule of thumb with antacids is that if you are taking something that coats the lining of the stomach, that means that as the stomach binding is coated, anything that you're taking by prescription, it needs to be absorbed through the lining of the stomach, that's not going to happen. So you either take the medication that is absorbed in the lining of the stomach first, and wait a half hour, 40 minutes, and then take the medication that coats the lining of the stomach, or don't take the medication that coats the lining of the stomach. Because it's just going to interfere with reception medication. Having said that, there's also some non-antacids, non-gastrointestinal medication that people take for health purposes. So there are some oily substances that you take that go through the stomach just fine, but they line the bowel, and some medication gets absorbed through the bowel lining. So there has to be some awareness of what people are using, what are they buying over-the-counter, what are their family and friends giving them? Just trying to self medicate? So that's a physical end of it. Let's talk about antipsychotic medication. Antipsychotic medication is called that imaginatively enough because it is trying to address psychotic symptoms. The psychotic symptoms that people have are in three main areas. It could be psychotic in three main areas. You could have hallucinations. A solution -- a hallucination is a sensory experience that is not real. It can happen in any of the five senses. You can hear something that's not there, which is the most common in the Western Hemisphere. You can see something that's not there. Or much less common, smell, taste, or touch something that's not there. Those last three, smelling, tasting, and touching are called proprioceptive hallucinations. The first place to go when somebody has one of those is to get them a physical. They either have an infection or a mass that is laying on the cranial nerve causing this experience. But hallucination in those five areas is much more likely to be auditory or visual. Usually individual, it's associated with the dispensing process, we call it a cognitive impairment. So cognitive disability, so you're going to probably have as an antipsychotic feature that is a hallucination, something auditory that's not there. In frequently, voices. More -- more likely, phones ringing, crackling paper, mechanical taking, animals growling, insects sounds, things like that. So that's hallucinations. The second psychotic symptom is a delusion. A delusion is a thought that's not real. It can't be validated. The most common delusion where somebody believes that -- they're paranoid because they believe somebody is going to take something away from them that is important to them. Their reputation, a relationship with somebody, a position that's important to them, and it's not a pharmacological process. There might be a kernel of reality in there, but everything else is not real. You want to really medicate hallucinations and delusions. And the third psychotic symptom, which is disorganization. I'm not talking about a messy desk disorganization. If it was, I would be on meds. But you have to keep in mind that disorganization can be extended to the point where the person is not able to converse, not able to put a sentence together, not able to communicate needs. It is because of a psychotic symptom, not because they are mute or you have another disability that interferes with communication. Also disorganized behavior with touching things and not really getting things done. Those are the main three psychotic symptoms that would give antipsychotic medications for. There are a group of medications called traditional or conventional antipsychotic medications. Keep in mind that before 1958, in over 2500 years of there being descriptions of psychotic symptoms, and things that we now call schizophrenia, in the literature and in people's diaries, of course they did not call it schizophrenia, but these symptoms have been described for a very long time. We did not have medication until 1958. So these were the first antipsychotic medications. There was Thorazine. The very first one. And actually nobody was looking for let's make an antipsychotic. That was not a priority. The priority was in the early 1 950s, a surgeon in France was looking for a better Benadryl. If any of you have ever had surgery, you know they usually give you an injection of atropine or Benadryl before you go in for surgery. It's like, why do you get that? Those things dry you out. Surgeons are annoyed by moisture. And you do not want an annoyed surgeon. You want a very happy surgeon. Moisture makes things slippery, more difficult to manage. It makes things glisten, so you don't think -- you don't see things as well. And it's not convenient to do some of those procedures with a lot of fluid on board. So they give you something to dry you out. It's for the surgeon's convenience. Doesn't really help you at all. It makes your recovery for -- from anesthesia a little more difficult. But happy surgeon. So this guy tinkered together this chlorpromazine. These are the days before we had institutional review boards and ethics boards that would monitor these things. And he noticed that the people he was doing surgery on who happened to have psychotic symptoms were a little clearer after he gave them chlorpromazine. So research was done for a couple of years on this as an antipsychotic medication. And thus Thorazine was born. That was our first antipsychotic. We got it here in the United States in 1958. Haldol, 1960. And medications thereafter. These medications are okay. Not great. As antidepressants. And there's more. These are medications you may have heard of. Some of these are not using anymore -- we are hardly using at all anymore because of the cardiac effect of it. But you might know that people have been on these medications for sustained periods of time. We also had crossed diagnostic uses. When people are bipolar, where their mood goes high or low or -- but they can have psychotic symptoms when they are bipolar. And we give an antipsychotic for those features. Any major mental illness you can have psychotic features with. You can be psychotic with depression, you can be psychotic with bipolar illness. You can be psychotic with any major stressors, posttraumatic stress disorder, generalized anxiety disorder, not as often, but you may have had people who have been on a number of different psychiatric medications. And these older antipsychotics were the ones being used. The newer antipsychotics are called atypical antipsychotics; the very first one was Clozaril. It is new for us. December of 1989. In the United States, it was developed in 1960, and it was used for 18 years in Europe until they had a major problem with it. And they took it off the market. We did research here in the 1980s on Clozaril use. And it came off the market -- it came on the market in 1990. It is still considered the gold standard for treatments. If your body can manage it -- some people's bodies cannot metabolize it well and they have difficulties with blood components, it is the best. You have to have your blood drawn to monitor some of the side effects of it. Whispered all came out next. Then a long-acting injectable -- Risperdal came out next. People who had antipsychotic medication, that they refused to take the pill or they could not swallow the pill, it was a problem, Haldol and pro-lipid, the conventional and -- Antiochus -- antipsychotic group, you could inject it into a muscle and then the muscle would generally gradually extract and put it into the system and the person would have use of that antipsychotic. It's simpler to a train depot where you would store things and then gradually pull it out into the train station. We store the medication in the muscle, but Haldol and Prolixin needed to be suspended in a liquid in order to be ingested into the stem so it could be metabolized. And Haldol and Prolixin have a lot of side effects. So when you inject it, it is there. And the side effects are there until they are worn off, which can take weeks. Some people get those injections once a month. But the liquid put into is the f oil. -- it is actually sesame oil. You can't cook with the stuff, pharmaceutical grade sesame oil. Very sick. And when you gave those injections, you've really got to push on the syringe to get it in there. Over time, that heavy oil and medication put into those muscles -- usually given through the vastness latter Alice, big muscle that can be metabolized. If somebody does not walk well or they have a lot of spasticity or they are in a wheelchair, then we have to give it in the deltoid. And the deltoid is not a very good point. Vastness latter Alice or the buttocks muscles or the deltoid, you would form these sterile cysts, not muscle fiber. It would not metabolize the medication well. Plus you have those side effects in the body. For as long as that medication is in the system. Sometimes it would get trapped by fat globules depending on the fat content of the person’s body. That is not muscle fiber. So fat is not going to metabolize the medication like a muscle fiber would. It kind of slides it off to the side. When those fat cells are exposed or exploded in some way, the medication might flood into the muscle fibers close to those fat cells. And then the person might have a tremendous amount of side effects from that injection. So those depot medications were all we had from 1962 until about 2002. And then Risperdal came up with their long-acting medication, which is in water. So you have to give the injection every two weeks with Haldol and Prolixin, the choices could be every two, three, or once a month. But it is in water. It's a much easier injection to give. Had a number of people who had to have a deltoid injection. And they don't form the same sterile cysts. And the Haldol and Prolixin can't always do. They are metabolizing well with the deltoid muscle. Seroquel's claim to fame is that it is sedating as a side effect. Zyprexa's claim to fame is that it is a very good antipsychotic. Chemically, it is the closest to Clozaril. So if people can't take Clozaril because of their metabolic, then Zyprexa and -- Zyprexa might be a good option. But Zyprexa's major side effect is weight gain. Not so much with Risperdal, but Zyprexa's weight gain is quite notable to the point where we usually -- before we put somebody on Zyprexa, we teach them about dietary changes that they have to make. And volume is the biggest help for minimizing the weight gain. But you are still going to gain weight on Zyprexa. Zyprexa has a long-acting medication and injection depot. It's not used very often, because it just came out on the market. It hasn't been used much in the past several months since it came out because you must monitor the person for four hours after you give the injection. Not very convenient. For the person who just got the injection. And for the clinician, because they're hanging out with each other for four hours. That takes up a lot of time. Geodon is an atypical antipsychotic specifically designed to be an antidepressant and antipsychotic. Energizing medication. I don't know whether I'd go into details about that but I will go back to it if I didn't. And Abilify is another atypical antipsychotic. Invega is a metabolite of the risperidone molecule called haloperidol. They have the same three levels of capsules with the laser drilled holes that have a plug-in them. So you could take the pill and very slowly, over a 24 hour period, you are routinely getting an insertion of medication into your system. And they have a long-acting sustenance. Saphris is fairly new. Only available in the sublingual cachet. It doesn't instantly evaporate in the mouth like you would a nitroglycerin tablet or something like that. And you cannot eat or drink for 20 minutes after you put that in because it will interfere with your absorption. Fanapt came out at the same time as Saphris and Latuda is fairly new. So these are all atypical antipsychotics. And they all have special features to them to make them -- why would I use that? The newly approved drug I have here as Saphris, Fanapt, Latuda, Invega, these are all fairly new ones. And it is unusual for us to have fairly new antipsychotic medications because many, many medications never make it out of the phases of exploration and research. Then there's some adjunct therapy that's very new. If you hear people talking about an AC, acetyl cysteine. And the jury is still out -- some research on small groups of subjects have indicated that if you add NAC to an antipsychotic, then the person would be able to resolve their symptoms more effectively. It's not cheap, because you need a fair amount of it in order for it to work. And it is not covered by Medicaid or most insurance plans don't cover it. But people have found it to be helpful. And when the research comes out and is finalized, I will certainly let you know what they say about it. And Lamictal lamotrigine is a mood stabilizer, but it has been found that if you add it to an antipsychotic medication, that it is very helpful in stabilizing symptomatology. They don't have the same fragility of psychotic symptoms that some other combinations would have. And they mix very well with all of the antipsychotic medications. And the other adjunctive therapy is as our cuisine. People are still doing research on. What has come out looks fairly good. So before I get into more details about the laser drills, let's take a break for 10 minutes. I know I have a break -- a great slide on here, but I have not reached it yet. We're going to move that break slide up so that I'm not overwhelming you. So let's take a break now for about 10 minutes.

Okay. We're back. We did have a very good question about the side effects that need attention for anticonvulsants. Excellent question. And I will make sure that I discuss this later the next time I do this particular formula. The anticonvulsants can have side effects because of their metabolic features, you can have those side effects right away initially when they are put on the medication. They could have them when there's any dosage change. What I mean by dosage change is go up or down on your does. But also it could be given at a different time of the day. You could have any of those side effects. And it can happen to to three years later. So you always need to be on the alert -- on the alert for the list of side effects that says needing attention. Because it could happen at any time. One of the things that happens in our bodies is our bodies change. Sometimes it is the whole aging process. But as we changed just a little b it, how we metabolize our medications are going to be changed a fair bit as well. Excellent question. Watch for those things all the time. Actually, the technology that is here on this particular slide, we've talked about the laser drilled multiple compartment nonbiodegradable capsule. For example, Invega is an example of that. There's also what are called flash tabs or cachet delivery systems. Exactly the same thing. Cachet and flash tabs. Saphris is a cachet, goes under the tongue, dissolves, not into the -- not instantaneously, the way nitroglycerin does. It gives a person a real jolt. Long-acting injectables we talked about, the ones that are oil-based, the more old-fashioned ones, and then there's something called sub labels. Put it -- sublingual. It takes quite a while to dissolve. And it takes much longer than like a nitroglycerin where it's going to dissolve immediately. Cross diagnostic uses. We've talked about this a little bit, but let's explore it in more detail. So the antipsychotic is called an antipsychotic because it's researched was based on treating people who have psychotic symptoms. Delusions, hallucinations, disorganization. It does clarify thinking. So you don't have to be psychotic to have your thinking be distorted. You can have a mood disorder that is very disruptive, like bipolarity, major depressive disorder, posttraumatic stress disorder, you can have some real problems with your thinking with those. You can have pain to the point that it is interfering with your processing of information. And they can clarify the same thing. Of a person who was dealing with a pain problem, either acute pain or chronic pain problem. So clarifying same thing can happen in many different diagnoses, not just psychotic symptomatology. We use it in dementia, whatever the phrase is, use it for education, for people who have overwhelming physical problems and they are just not handling it very well at the time. So clarifying thinking is an extremely useful aspect of the antipsychotic medication. Reducing or eliminating hallucinations of course, that's how it was originally developed. The reduction in hallucinations is fairly reliable with antipsychotic medication. The elimination of hallucinations doesn't happy with -- does not happen with very many of them. Clozaril is reliably 12 eliminate. Reducing delusions, reduction of delusions, imitating delusions, we are talking -- we are talking Clozaril. Because they help people process information and they remove some of the distractions that people might have, might be exposed to, can actually decrease aggression. And make people less likely to lash out in an illogical or impulsive way. And some people who have developmental disabilities have a major issue with impulsivity and with aggression, lashing out when they are feeling overwhelmed. Just had it happen last week, where a young woman was finally able to go from her residence to make a visit at her mother's house. Had not been there in a couple years. And when it was time to go home, she just became very agitated. And this is a family who is lovely and caring and very understanding. There are some professionals in the family as well. They knew what they were doing. And they managed her aggression, her verbal agitation, very well from what they said. But she just got violent all of a sudden. She's through a stapler at her sister's head and caught her face and she needed three stitches. Grabbed her mother's hair and was trying to pull her mother around by her hair. Very aggressive behavior that was out of pretend. She didn't usually behave like t hat. This happened last week. And one more episode of aggression has happened since last week, not to that extent, but she broke a mirror in the bathroom. And then tried to use the shard to hurt herself. So that's a level of aggression that starting to get to be problematic. And we will probably consider using an antipsychotic medication to treat this. Stabilizing moods. This was a fairly new concept in antipsychotic medication. But we know that there are -- for example, Geodon was developed to stabilize depressive effect. And with schizophrenia, depression, you are going to have these mood problems in addition to the psychosis. And just loading on more medication. So Geodon was developed specifically to address both of those symptoms. And we found out in general, that these antipsychotics can stabilize the mood. Frequently see people who are bipolar also taking an antipsychotic Mike -- medication in addition to a mood stabilizer or antipsychotic medication might perform all of the features of a mood stabilizer. They don't even need anything extra, unlikely, but it has happened with a few people. So the issue for us is antipsychotic medication. And when you explain to him -- family members or clients, it's an antipsychotic medication. What's going on with that? I don't want to take that. It's not in antipsychotic -- an antipsychotic medication only. It was just approved, but the cross diagnostic uses for these compounds is a very common aspect of pharmacology these days. Since probably 2000, a good 14 years, chemical compounds address a number of different issues. Because we are complex as individuals, we need that kind of flexibility. Even though as the slide says, cross diagnostic use. It will elevate a depressive mood. Certainly Geodon will do that, but also you're going to see that with some other substances. You're not likely to see Clozaril used for a lot of cross diagnostic uses because it uses because of the blood work that's required. People don't want to do that. Someone who is bipolar and fairly well functioning, someone who has asked -- obsessive-compulsive disorder, they're not going to want to come in every two weeks for blood draws. So that's why it would not be seen, although it would be very effective. Most of the time you're going to see things like Risperdal, Zyprexa, Seroquel, much more likely Geodon and Abilify. It decreases overstimulation for people who have diagnosis on the autism spectrum because overstimulation is quite distracting and disturbing. It interferes with people's clear thinking. That's what the medication was built for. It does help decrease overstimulation, which can lead to agitation. And it improves behavior because it helps people to think more clearly and to organize their thoughts and to take a step or two into their thought process about what's going on regardless of their disability. They will be able to think a little bit more clearly and their behavior will be better managed if they take one of these medications. Of course, the diagnostic category for antipsychotic medication is schizophrenia. Schizoaffective behavior disorder can be bipolar or the symptoms of schizophrenia and symptoms of some mood disorders, some affective disorder. That can be bipolar disorder or depression. So it is called schizoaffective disorder. Bipolar illness, a personality disorder or a personality trait, strong personality trait, where the symptoms must be managed. One of the major criteria that we're using international standards around pharmacology where people who have personality disorders is especially borderline personality disorder, is that there has to be -- and there is, a structure to how the pharmacology of pharmacology proceeds in giving people relief from micro-psychotic episodes, from behavioral problems, from feeling overwhelmed, from having emotional problems that are contributing a great deal of distress and quality of life. So the antipsychotic medications -- usually very low doses, has been very helpful with people who are very distressed from the symptoms, not from a major mental illness but from a personality disorder or the strong traits of a personality disorder. And of course depression. The diagnostic category for an antipsychotic medication, autism, is like I mentioned before, can decrease the overwhelming sensory experience that can help people think more clearly, it can affect in a positive way, affect their thinking, their clarity of thought, and it can decrease some of the anxiety that people have frequently. Because these are major tranquilizers. That's the category that they were originally labeled. They hail -- help to calm and clear thinking. So people who have autism who are very agitated or they get upset very easily by disruptions in their schedule, and behavioral interventions, which are required, never something that you are going to get rid of it because you are giving a medication, really -- the behavioral interventions are not sufficient. There is a sufficient amount of distress over and above what is acceptable but that's when you would employ an antipsychotic medication. Asperger's, same thing. Very distressed, social context that are interfering with abilities to function well. Obsessive-compulsive disorder, which is an anxiety disorder, you need to have some type, something that will calm and clarify the thinking. That's what antipsychotic medications are made for. Other anxiety disorders like generalized anxiety disorders, posttraumatic stress disorders, phobias, true phobias are actually quite rare, but you have these anxiety disorders, panic attacks, where sometimes you need something as much -- that has much more potency to it than just a minor tranquilizer. Seizure disorders, recent research shows that antipsychotic medication can be helpful in decreasing some of the overstimulation of certain parts of the brain. So partial seizures and generalized seizures, the overstimulation in certain parts of the brain can be caused by an antipsychotic medication. That's one of the major diagnostic categories. Behavioral tics as well as verbal tics like Tourette's, most commonly treated with antipsychotic medication. We used to give Haldol to people who had Tourette's. There was a problem where a baseball player had Tourette's and it really sedated him and interfered with his swing. Made him stiff, not so much sedation. He wouldn't take it so he was having all these verbal tics. But now with the new medication, new since 1990, there are more options and the treatment is better without having a lot of coadministration issues and Tourette's. So that was the break. We took it. I hope you enjoyed it. I will have to move this slide. Understanding the treatment options for autism. We are going to take a look at how autism is treated pharmacologically. And non-pharmacologically. And I will mention some of the new research. And we are going to discuss treating a symptom versus treating the syndrome. And you might find this hard to believe, but I have strong opinions about these things. Common problems and common medications. Interactional difficulties that are random in people who have autism or anything on the autism spectrum. They can have over excitation, overreaction, aggression, hyperactivity, they are uncooperative, especially if something is different. So you know these things better than I do, I'm sure. Symptoms include impulsivity, tantrums, picture earlier speech, Spiegel -- people might not understand. It can be varied to help communication. So the interactional difficulties of over excitation, overreaction, aggression, hyperactivity and uncooperative mess, they all fall in a similar category. They will take similar medications. Over excitation and overreaction, probably going to go more with an anticonvulsant medication. Aggression and antipsychotic. Not always Clozaril because we don't always have that option, especially if they are on certain anticonvulsant. The have to take Tegretol. Can't take Tegretol and Clozaril. They don't mix well. They don't play well with each other. So we don't usually go there although it can be very helpful. So other antipsychotics, newer ones we would like to use. Hyperactivity, uncooperativeness, anticonvulsant, both of these things will calm down over excitation of the brain and help develop more pro-social behavior situations. The symptoms of impulsivity, usually responded to with antipsychotic medication, and anticonvulsant, again because they calm the over excitation of the brain. Tantrums, same thing. You are talking about impulsivity and some aggression.

Even though this is a new aspect of pharmacological interactions of people with disabilities, the treatment for autism need to be put into the forefront. The whole purpose with what we are doing with people with autism is to help them relate to others. To help them feel more comfortable and for them to have good relationships. We have to teach people who have autism how we build a meaningful social interaction. If they don't have that ability, we have to teach them. If we do have the ability, all the better. It's unusual with autism. There are strategies that we need to teach people and how to increase eye contact. You don't want them staring, you don't want them not blinking. You don't want them looking away all the time so that they aren't really accessing. And it is a very sophisticated concept. How much I contact is appropriate? How much is over-the-top? How much is too little? It's a delicate communicative process but we are very sensitive to it. We're teaching people how to competently communicate, that has to be part of the program. Encouraging sincere affection and sincere expressions of joy and caring on an ongoing basis. Where it does not come blurting out as an afterthought. And, that is something that you routinely teach people. And when you have a lot of these three bullet things in place, meaningful social interactions, appropriate eye contact, sincere expression of feeling, when they have feelings about people, those actually developed neural pathways in the brain that will decrease over time their need for some psychiatric medication. Because they are malleable, to a certain extent. There is some eccentricity in the brain. Motivating and teaching because sometimes people have a motivational syndrome, and they're not learning at the same pace that they previously learned that or that would be expected from their apartment. So, you can teach people. How do you say what you want? How do you express love? How do you express good, positive feelings? And, how to take care of yourself. How to find clients’ motivations and interests. So, you're going to be talking to somebody about discovering what they are good at, what they enjoy. Today like drawing? I see somebody right now, a young woman who drew absolutely beautiful detailed, colorful and highly accurate drawings of animals and did an absolutely beautiful job. And, all of a sudden, she just stopped. And it was very potent to have that drop out of her life. And, so, we talked about what was going on and gradually got her back to it. And, there was difficulty for her not being able to perform that expression of drawing. And she's getting back. Not all the way back to it but it was a communication to us because she stopped doing something she was very interested in.

You want to motivate people to be dynamic and to have a learning experience that really does change how they are changing. Because like I mentioned, there are neural pathways will be reestablished, there are changes that we can make to the brain. Once damages Artie there, we can get around it to a certain extent but you want to learning experiences to morph and change and be dynamic with that individual situation. Anyone the individual to gain some skills that they need to be successful in life. How to remember, how to pay attention for a significant period of time, not just a few seconds and then they are off someplace. Just learning how to stay in focus and how to cooperate with other people. That there are other people in the room if they need to be acknowledged and that there is nothing bad that is going to happen to the individual because they're interacting with others. And a lot of people who have developmental disabilities have been traumatized to a significant extent, and there might be some catastrophic thinking at whatever logic level they are at that needs to be taken into account. They need to be brought along slowly, for exploring these new experiences.

Speech and language development. Always very important to increase communication skills. I need to increase my communication skills. I can't go a single day without thinking, I probably could have said that clearer, better, or everybody needs to be working on their communication all the time because human communication is incredibly complex. It is very demanding and there are some variables that make a mess out of what we are trying to do. We are trying to say something to somebody or do something for somebody and there are hundreds of ways to misunderstand people and to misunderstand what people are -- you are not clear to other people and you clearly are not getting the message that other people are getting you. So, all people need this, not just people with autism but it might be a little bit more important for people who have autism to be able to improve their communication skills. Has they might have deficits that really interfere with their having a more standard sideline.

More functional strategies for increasing verbal communication. How can they get better down talking in a way that really works for them and what they're doing in their life? Having somebody memorize, because they're very good at memorizing. I have somebody who almost has an eidetic memory. He sees the facial expressions, he knows the name of the feeling underneath it and then relay that is the only way that he can know how somebody else is feeling. To memorize those facial expressions. That's a functional strategy for him and then he can say the word. Hey, it looks like you are worried. Are you worried? He can't carry a conversation on very far but he does feel very much better that he was able to nail that definition. Yeah, I'm really worried, I have to go to the doctor and, I got it, for it. Yes, that one.

Okay, interact, make requests, express, these are things that are important. I know I have the male gender in some of these. Interacting and making requests, not demands, and being able to handle things. If somebody says, no, you can't go out right now, or I cannot take you to the dollar store or I can't talk to you right now we’re have to leave, those request, not being met, can be quite distressing. So, there has to be a way to interact about being disappointed without it having a catastrophe. They need options for how to communicate. And, it's never too late for anybody to learn how to communicate.

In general, and I'm sure you all know this very well, continual education, continual training and continual community support is very important in autism treatment. You are creating an optimal environment for people to learn what they need to learn in this world. It's not an easy process but we have a lot of experts in this particular process and we are -- how am I doing on time? Good. We are continually trying to improve what is going on in the environment. It has to be comfortable, it has to be safe and it has to be free from overstimulation to reasonable degree. If somebody is overstimulated because the walls are based, that has to be accommodated to pick you can't just go repainting everything because the person feels overstimulated. Her has to be an affect nation that is functional in the world. Filter out nearly all of the most common distractions for the individual, learn how to eliminate the push and pull control battle that happens. Push and pull. Very common in family interactions and sometimes in residences. Where one person wants to do, let's say the person with autism wants to do one thing and the mother wants to do something else. You know, yes, no, yes, no, give me, give me, no. And it's all push and pull as opposed to saying, I hear what you want to do. This is what happens first. And it takes the whole push and pull out of it. Sometimes we are teaching the individual with a disability but also teaching the family members, caregivers and residential aides, whoever we can get access to. People need to know how to extract themselves from a control battle. Decisive and useful handling of challenging behaviors. Some people who have autism, they have behavioral problems. We have to find a way to have different behaviors and more competent ways of communicating what is going on with them and the reason why they have their behavioral issues. And there has to be a practical technique for preventing the behaviors and the practical techniques can come from staff observing what is going on with the individual. They usually do this. They have somebody who homes, just before she is going to lose her temper. It's a little bit of a hum, does not last very long, but knowing that it is there so that people can intervene and try to lower the distress level for her.

I want to talk about generic compounds first. The FDA, the number of years old, but, it comes up in different ways since then. Generic compounds are the chemical name for a compound. We usually have a trade name and a chemical name. And, the chemical name, the generic name for any compound is formed from its chemical basis. So, you have a whole group of medications that belong to this chemical class so they are going to have similar generic names. And then we have the trade names. The trade names are established by marketing research. If you've ever gotten one of these in the mail. They send you a list of things. Here are five names of medications for something, I'm going to send you a check for $20 or something, please return the survey to us and they will send it to a cross-section in the country, the age and genders, and, they just organize it into a marketplace. And so, you'll pick the name of the medication that makes the most sense for you, that you remember, that were kind of fit with what is going on with that and then they have the trade name. That is the five. The science is marketing the trade name. The trade names are into compounds when they first put on the market and women have been tested. So, the FDA gave the approval after the human research has been done and they say okay, this is your launch date, when you can put it on the market. What is the name? What are you going to give it? So, like Haloperidol, the trade name is Haldol, and they allow them to make that drug under the name of Haldol for X number of years. Based on the research that they tested. If they did nine years on adults or 11 years or 13 years and children. And the reason that they are doing that is to reinforce companies, for doing research and development, because I got to pay researchers, they have to pay for all of the lab equipment, four years. And, they have to pay for the manufacturer and the company, the factory, the distribution, all of that stuff is very expensive. And, it takes years and years to put something on the market and at the very last day, the FDA could say to them, no, we are not going to market this. And they just spent 14 years of money and investment in a medication that the FDA will not allow to be marketed. So zero money comes back to them.-

So, one out of 1000 medications will make it to market. And so they want to, by patent, say okay, you have the right to make this medication. Nobody else has the right to make this medication. It is patented and they give that patent a little bit of extra length if you do a little extra research on it, like with children or special groups. Very difficult research to do. Then when it goes off patent, then anybody can make it. And when anybody makes it, it's called the generic compounds. So, when it comes off patent, when and why is the medication offered in generic form over the patent expiring? The US rules about generic compounds are very strict. You must have a pattern for a certain link of time. And you know, keeping in mind that patents for a device are much shorter, usually only five years. And they want you to improve your devices. So, he can't just say, have a patent on this device and want to improve for freedom by patent five years as they're going to charge you a lot of that money to get that patent put through. They wanted to improve on this device. But, you're still only going to get a five-year patent. But it was medication, you really can't get much more than 13 years, typically it is nine years. So, all of the years that you put into developing that medication, you're not going to get all of your money back for it. Or if you do, it is lost. So those are the US rules about generic compounds. But there's also a rule about how much of the active cross-section, the active compound can be in the generic compound. For example, if you make Risperdal and Resperidol is the generic name, but the Risperdal has a certain color, and I can tell, and the user certain substrate on the what holds it together and it special, they did the research. It comes off patent, now it's generic and anybody can make that chemical compound of Risperidol, the bit of how the same dyes and substrates. So, what the FDA says to him, okay, you can make that, but you cannot call it Risperdal, you have to call it something else. You could have ethereal amount of the active medication in there which was alarming to a lot of people when they first found out that is how the FDA works, but that is how the FDA works. And, there is an amount of variability in there and will go over that in a minute. And, if you know that a generic compound has some variability in how much active medication is in that till, as compared to the one that is still made by Hansen pharmaceuticals called Risperdal, which now you have somebody who has taken risperidone, if people say it's exactly the same stuff. Well, it's exactly the same medicine but it's not the same substrate, dye, and sometimes not even the same amount of active medication. So when people say I'm taking a generic and is not the same, believe them. Especially people who are very sensitive like people with schizophrenia, schizoaffective disorders, people who have bipolar autism or any other developmental disability that can be sensitive to generics. If they took trade before in the got changed to generics, they very likely will see a difference.

So, we talked about research and development. Country of origin is an interesting process. And that is involved with this generic as well. When we make drugs in the United States, we have a lot of control over the factory in the Clemens -- cleanliness, distribution and transportation system but other countries are very different. Denmark is different, Japan is different, what is happening is that Sweden, Norway, Finland area, Italy, all of these countries have very different rules about things. The United States has the longest research period of any country on the face of the earth. You want to put a drug on the market, you're going to put it on the market early in Europe, maybe 24 months of research. In United States, nine years of research. So, a lot of companies to to make their products in another country because it's much easier to do that. And FDA has to take that into account. How is this drug made? How competent was the research? How long-term are the implications of it? That is why the country of origin becomes important.

Patent longevity we party talked about in pharmaceutical compound production, what is the substrate, what holds it together, what is the tie and the dye lots change frequent, do they make their own or by whatever is on contract? The economic reality is that when you make a generic drug, you have not put 9, 13, 15 years of research and developing costs into your drug. So, you just have this chemical compound that you are making and it is much cheaper because you don't have to pay all of those bills for all of those years. So, that is why generic is cheaper. They did not have to do the research and element, they don't have to have special guy and the special substrates, that frequently have to be put into place with the trade name.

The practical implications is that people are going to -- so, applying these pharmacological attributes of generics what we do with people, there are pros and cons. The bioavailability. How available is it to your body? There is a formula -- by the way, one of the countries we are having a big problem these drugs made in India. More so people say, oh, what's going on with the drugs in China? Actually, they are not so bad. The biggest problem is India. They have a lot of contaminants and that is something to be watched for. That's what happens when people buy drugs online. You don't know where it's coming from. The country of origin may very well be India could get a lot of junk. Let's see. The bioavailability is, how is your body going to be able to access that drug? That's all that means. Bio is life and availability is how much can this life body, this life force get into what is going on? And is basically metabolism. Some products are easier available because the dyes and substrates are not as complex. So, it can get into the system a lot faster. Some people are very sensitive to the differences. I have somebody who went to generic Nardol, and they decided couple of years ago they need to be gluten-free. The pill is this book -- pay, how much Clinton could be in there? Now they advertise themselves as generic free, the generic free versus gluten-free does not work for her. So does that one change they made the pill made a huge difference in her bioavailability. The Clinton. So, using a generic is that it could have the features, the individual physiology really relates to. The point of concern is where did it come from and am I going to see a difference between trade and generic with this person? And, do I need to change the dose? For example, one of the laws that the FDA has put out is that you can very how much of the actual active drug is present in the pill. And still call it that pill. So for example, if I was going to give you 100 mg of drug A, trade name drug A, and drug B is that she and her form of that drug, there might, and it still a 100 mg, but, it might not have 100 mg of medicine in it. It might have 80 mg of medicine in it. With that DA, there is some wiggle room. Between 25 and 33% can be varied.If I have somebody who has been doing very well on one milligrams of trade drug and now they have to go to generic because it don't make the trade anymore, it went off of patent or the insurance does not cover it or because their prescriber wants them to be on this generic form for one reason or another, they might milligrams. So you have to 100 -- they may need to go up to 125 mg of the exact same drug if it's available to make up for the difference it can happen with generic. So, that is one of the practical points that we have to keep in mind.

Transitioning from brand-name to generic is always an issue. Staff need to observe what is going on and try not to do too much of it. I would prefer one drug at a time sometimes you don't have that luxury document before, I do have some that are very sensitive to those transitions in the don't work well to know which one it is. Which one has to be trade? Transitions from one machine to another is also a clinical issue because once the that makes a generic version might use a whole bunch of one dye and a whole bunch of baking soda as a substrate and the other generic drug company active at the same drug is exactly the same potency but uses a different set of substrates and a different dye and the person could be sensitive to those differences. So any transition is something that has to be watched. So here is the FDA rules about generic compounds. The rule is that the trade does -- dose can be front to what is bioequivalent of you as, if it's 80% all the way up to 125% of the trade dose, so if you take 100 mg of trade drug in US, 80 to 125 mg could still be the same amount for that bioequivalent medication.

So, if somebody is very sensitive to side effects for their systems, the response is very narrow range of medication, that is the problem with a generic. You've got to watch them like a hawk and keep in mind that 80% of that is not going to address their symptoms or 125% might give them too many side effects. So, just keep that in mind.

Generic antiepileptic drugs. It has been suggested that AED's need to be exempt from substitution because you finally give somebody stabilized on antiepileptic drug and they're very hard to stabilize. Whether you're doing it for seizure management or mood management, it doesn't really matter. Antiepileptic drugs are a delicate process and if you then say, all right, now we're shifting all to generic, we are fighting that because we think that AED's should be exempt. That's which is very difficult. It could be associated with increased use of an AED for, you know, so that people using more and more AED on increased use of non-AED medications. So, it could end up hospitalizing people. And, if we can prevent a hospitalization that is number one on our list, quality of life and reducing their hospitalization rates. So basically, what it means for you is that you need to be aware of the change from trade to generic. It's a sensitive population, they're probably going to pick up on that difference. Manage the transition as much as possible. I managed, I mean one at a time. It helps to smooth out some of the complexities. Watch what is going on with the individual, talk about what is going on with the individual, the relationship with caregivers is very important. That individual trusts you, shares information with you, is performing their regular duties in front of staff members, precious information that could be very helpful and reassuring to the individual because they know that you are remaining up to date on these options. And it may change, this rule has been in place for number of years but is different from previous role so we will keep our finger on the pulse of that.

The new trends in teamwork is quite well researched lately, with people who have developmental disabilities and all of their caregivers. So you know, it is important for us to pay attention to that because the teamwork that happens with people with developmental disabilities actually can shape what happens with the pharmacologic outcomes. Drugs and everything. I talk a lot about medications and have two other modules to talk about from ecology. It's very important. Neurotransmitters and basic functioning of the body is so distorted that there is no way that the person's body can get in place. You have to have some outside chemical to approximate normal functioning but there's so much more that needs to be done in addition to giving somebody a pill and in order to make the pill works better, it's part of the whole process. The interdisciplinary communication about anything going on with the medication needs to be paid attention to.

Interdisciplinary medication is vital to best practices. You cannot be the best at what you, your individual discipline means, without input from somebody else. From another perspective or point of view and from everybody else deal with that individual who is getting services. So, vital communication. One needs to be communicated amongst ourselves are the things that we observe. Frequently, we see a lot and sometimes we don't take a lot of credit for what we see. We don't absorb that as much as we should. So, we need to communicate amongst ourselves on a regular basis, team meetings or family meetings or residential meetings. You need to make a productive meeting about it for you and not just meeting for the second meeting, but you have something that you are specifically going to be talking about and goals for that communication session. And if there has been a change from generic to brand-name or trade name, or the other way around, then that needs to be discussed. Everybody needs to know that that is what is going on. It's very precious information that comes out of that. Besides the behaviors and the observations that you need to have, there are impressionistic feelings that people have when they work with individuals who have developmental disabilities or work in any specialty area. In those impressions are valuable data. It needs to be shared. Communicate what you think is going on. You might not have a hard and fast definition for what you just saw, but you can say, well, he is different and I'm not exactly sure what it means that he's different, but, nothing else has changed and this is just something I want us to be paying attention to. So it's a very good process to be on top of, that your impressions are acknowledged and validated and that you acknowledge and validate other people's impressions. All they can do is help with the communication.

We are a unique group with caregivers. This is a specialty area that not a lot of people have any skill at and they might not understand where they are coming from with this. But, we have to share information in a way that recognizes everybody skill level. Everybody deals with the specialty area and has something to offer and we all need to absorb that. You all probably do but I have to say it out loud. You have to acknowledge that there have been previous difficulties in training people, new people to the business or changes in how things are done. People who have been in the specialty area for a very long time but big changes have happened, how is that trained about? What kind of information sharing happens? What kind of navigating the transition that has happened in the specialty area has been accomplished? How long has it been accomplished? So, communicating that information is very important. Incorporate how to observe behavior. Some individuals who work with this population are very focused on behaviors. And they communicate them. They're out there with them. But, some individuals, they just absorb that information and they don't put it back out there again and it needs to be discussed. It's not all just behavior, his behavior and communication. You have to arrange the information sharing in a logical way. But you mentioned before, have a focus for your meeting, have an intention, like an agenda, does not have to be a printed agenda. But just say, we are going to talk about Adam and we're going to talk that -- about Betty and both of them need to have some concrete tasks that they are going to be able to accomplish in the next month. What is it going to be and you want to talk about it and make the best possible path for them as an example. And be flexible. So if a crisis comes up, when you are supposed to be having a meeting about Adam and Betty, that you're able to talk about Cheryl in such a way that is competently communicated.

So, your team needs you and everybody who has developmental disability has a team of people who are interacting with them. And also, you need your team. This is a way of communicating that is helpful if you are all doing it together and ask yourself, does everybody else on this team know what is important? That I need to know these things? That this is what really helps me do my job better? In the most helpful pieces of information for anybody, of all of the people I have asked him to talk to over the years is observations, medication effectiveness, do the mental work. Is the pharmacology doing what it promises to do? What is the timing of the behavior that you are seeing? And, is there any side effects that could be attributed to these medications? That is something that everybody needs to know about. That is an important process.

So, examples of medication effectiveness and examples of side effects on client communication, very difficult to follow today. And we talked about the slurred speech be one of those side effects it needs to be addressed quickly. It could mean a couple of different things but they need to be addressed. So, back to your observation, that is what should be communicated, either writing, electronically or verbally. Client communication is difficult today. This client repeatedly demonstrate hyperactivity by his inability to sit still. There is a side effect of many medications, antidepressants and antipsychotic medications as well as semantically-based medicines that cause a side effect called akathisia. When we put "a" in front of something, that means it's not happening, and kathisia means that perception that the person can sit so. So, akathisia being that person feels that they can't sit still. So they are moving around and feeling uncomfortable and they might be pacing or dancing in such a way that they can't stop. That's a side effect. We can address that when it is a lower level. But, when it raises off, when akathisia is at a severe level, the person is very likely going to be violent or aggressive. The client may describe his feelings as sometimes my back tightens up or I get tongue tied and I try to talk, that can be a serious side effect of some psychiatric medications. Dystonic reactions, bad tone, the muffle is about. So, the trapezius muscle which is a kite shaped muscle that covers are back, a strong muscle, that goes into spasms, that person is going to be hurting, they are going to feel powerful about their meds, look at what my meds did to me, and they are just going to feel difficult and comfortable. And sometimes the tongue is a muscle that goes into spasms and that interferes with speech. The client noted to have rigidity and tremors. Rigid or tremendous extremities can be side effects of the medication and something that needs to be communicated. So how come you keep the team observations uppermost in everybody's minds? Communicate the benefit of why they are taking these medications. The timing of the communication. When is the best time to talk about these things? Not as people are rushing out the door are going to go to another meeting, or they are going to go into a performance evaluation, so they are preoccupied. The timing is important and needs to be done at a time when is best for everybody. And what are some memory enhancers of a keep your observations intact and share them? The steps for communication, very straightforward, describe why should I do this? Well for one, I need to know what you see because I don't see it. I'm not there all the time and this is the information I need you to help this person. Why is it important? It could be your quality of life or safety issue. Describe what he wants, weapons of observations do not, get a clear picture of what you are asking, and build upon what they already know. You are talking about your team members, you know what they know. And, you want to build on that. And, you want to give them a sense of importance about this because it is very important. Clarify what they just heard you say. Sometimes I can be unclear about this, so, I will ask. Explain the benefits, go over what they need to be doing and show your appreciation. People are putting extra effort into communication, they're putting extra effort into doing something that you like them to do. Show your appreciation. Lots of ways to do that. You can be straightforward and say I appreciate you doing this. But, it is an important feature to recognize people putting effort into something you find important.

This is how you stay current, videoconferences, conferences and seminars, webinars. Journals now are mostly electronics with pretty easy to stay up to date. If you have Internet access, you don't have to have special access to something called PubMed, it's appreciate for public forum for academically publish articles, journal articles, you can put in a topic, you can put in an author's name, you can put in a journal name and you'll get a list of 100 or thousands of things. Just type autism in, 15,000 articles are going to come up. And there will go back several years. The most current ones are first. So, journals are much easier to have access to the main were in years past. Colleagues. Everybody has wonderful experiences that could help expand your experiential database. And. Evidence. You know, what is going on with research in your area? What is the population of researchers who are doing things in your specialty area? Participate in research when you have a chance. Even on a very low level. If you don't want to go full bore into doing research and all of the things about it, you could be very helpful in collecting data on something. Ask around and see who is doing what and see if you can help. Of course, Association memberships, advocacy groups, autism advocacy groups are very active. I find them very helpful in many regards. The national alliance for the mentally ill, the mental health associations, professional organizations, very helpful and it always helps to listen to other people. So, that is the basic content. And, I have a labeled test questions but I think that they are called Poles on your, they should be coming up. And, so, question number one. The best way to reconcile a recipients medication regimen, and we did not specifically cover this but it's something that you can kind of figure out, go over the recipient current medication, remind the recipient which he or he is taking, write everything down recipient is taking on arrival. Track the changes throughout care. Highlight what should be taken and review with the recipient or caregiver. C, through you with medications with the caregiver and D, have caregiver bring all the medications and discard what is not being used. So, the answer. The correct answer, there are four answers there. Of course, the correct answer is number two, which is B, right on everything they're taking estimates they come into your service. As soon as they are aware of meeting services. And track what is going on throughout care and highlight for them what is taken out and what they should be taking, and the recipient and caregiver need to go over that.

, Next one, I'm going to give you a little bit more time before I give you the answer. So that I'm not just jump in and spoiling it for you. Second question. A developmentally disabled client is also being treated for depression. And an expected reaction to the antidepressant, we specifically talk about this, but, it is intuitive. An expected -- into the antidepressant after four weeks of treatment would be no significant change in so short of a time. Some medication side effects, complete resolution of depressive symptoms, or, a reduction of the depressive symptoms the patient was given. Change that to something else.

So, take a minute and I know we did not talk about that in detail. But, we did talk about psychiatric medications. And what do you think would happen after somebody is depressed in the need should be formal apology Billy -- the new to be pharmacologically treated and it has only been four weeks? So, the correct answer is four, which is D. You're going to see a reduction in four weeks of the symptoms. That's all. It's not going to completely go away, it's not going to have an effect at all. If it does, it's not the right mad. And, there might be some side effects. But, what you're mainly going to see is your reduction in those depressive symptoms. So this is an FDA generic question. Which of the following is the amount of drug absorbed per the amount administered? So, we talked about bioavailability, we talked about bioequivalence, drug absorption's and dosage. So the correct answer is number one, eight. I/O availability. How much access to that compound does the body have? Fourth question. Using the FDA bioequivalence rule, which does have a generic medication would be considered equivalent to a 100 mg dose of a brand name medication or trade, same thing? Brand name and trading are interchangeable. So take a look at those four options. 100 mg, 80 mg, 30 mg or 60 mg. And let me know what you think of what would be considered bioequivalent, according to the FDA rule that is currently in effect. About generics. And the answer is number two, 80 mg. If I was taking it 100 mg trade drug and it got switched over to generic, and 80 mg of the drug would be considered equivalent according to the FDA rules. It might be labeled 100 mg pill, even though it only has 80 mg of that medicine in it. That is what the law says. All right, and the last question. Recipients must be observed for which of the following medications impact. What do we want to see? The effectiveness, the length of time until you see an impact, side effects, or how long it sees until it wears off. So, those four, which do you think would be a must for observing? And it is all of them. I would like to know everything. I would definitely like to know if it's effective. I would definitely want to know how long this person has been taken this meant and when did you see the difference? Did you see the impact or the depression going down? Did he see their thinking clarify? Did you see their regression be minimized? Did you see their impulsivity being shaped by their environment? Did you see them adapt a little bit better to their circumstances? Was there mood more stabilized? What are the side effects? Are they trembling, are they stiff, do they have that restlessness? I want to know the side effects are. Innocent wearing off too quickly or is it taking forever to wear off? These are all things that are very important to us. So, at the conclusion, like right now, there is a survey that is going to pop up on your Internet browser but if you don't see it, just follow the link. It'll be in an e-mail that you get from, tomorrow? Or Monday? Oh, midnight. So if you don't see the survey, just follow that link. And any questions or comments you have? And I have questions, but if you have questions for Lisa, that is how you get a hold of Lisa and we have time. To answer questions.

I do have a question from Leslie who would like to know your thoughts on sudden death with Clozaril , or SSRIs?

Well, I can tell you, Leslie, I have thoughts about everything. Sudden death is a problem with anybody with a psychotic process. Most specifically people who have schizophrenia, to a lesser extent people who are schizoaffective. So, whether they have a developmental disability or not, people with schizophrenia die 25 to 30 years earlier than they are supposed to. Regardless of the medications they are on. And we don't know why and because sudden death. It is a very disturbing, very problematic issue. We have done a fair amount of research on it, a few years ago, some of us had the bright idea that maybe they have a different blood component. That makes him die so early. It usually is cardiac, but, we don't know why they, they were not having cardiac problems before they died of a cardiac column. So, a 36-year-old who would die. Why is that person dying who we just saw two weeks ago and was perfectly fine?

So, we tested over 500 people with schizophrenia for this particular blood component thinking it was a little bit higher and maybe their blood was a little bit thicker and stickier and maybe it made it much more likely. They had exactly the same blood component as everybody. So, that idea was complete fungus as far as our research was concerned. So, sudden death is an issue that has been going on for decades. It has gotten much more precise because we are doing research on it. We used to think that people who died early died a few years earlier than they should have of sudden death but now we know that it is much more specific. 25 to 30 years earlier than they should be dying. A tremendous loss of life. And we don't know why. Okay. Having said that, that is a diagnostic issue. Now let's look at the meds. It's happening with Clozaril or Clozaril with an SSRI, a selective serotonin reuptake inhibitor. SSRI and Clozaril go very nicely so they are given together but if you have somebody on Clozaril, the chances of them being schizophrenic is already high. So there sudden death is already very high on the table because they already have schizophrenia or likely have schizophrenia and are at risk for dying early. Dying early because of the medication is highly unlikely. That has never been born out in any research or any psychological or pharmacological autopsy that we do on people. Frequently, people who are on Clozaril and have sudden death because they have schizophrenia have a tremendously high level of Clozaril in their body, but, and my first autopsy was like, that is a really high level of Clozaril, what happened? Well it just accelerates him goes right off the chart when the person dies. It stops being metabolized and the metabolites pile up in so looks like a very high dose of Clozaril but not where they were at. That would be overdose. So, in terms of an excavation for why somebody would die on Clozaril taking SSRIs, you don't overdose on an SSRI, you don't I taking too much Clozaril, the most you have is lots of drooling and probably a seizure, cataplexy which is a cardiac muscle side effect of taking Clozaril, usually does not lead to death. So the most likely explanation, not knowing the details of the case is that it was probably sudden death from the diagnosis of schizophrenia or something similar as opposed to the treatment for the diagnosis that the person had. That's what I've got. Is that it?

That was the only question.

Well, thank you for hanging in for all of the pharmacology minutia items are brought up on new trends. We have a couple of other pharmacological intervention modules. Lisa will keep you informed about that.

And, I just wanted to repeat, while actually, there was some audio problems at the beginning. So I would just like to make sure that everybody is aware of, today's webinar was new trends in pharmacology and developmental disabilities and professional development webinars which are introduction with RTI an aluminum group, and other health professionals are supported through the Medicare Medicaid coordination office or MSCO in the centers for Medicare or Medicaid services and CMS to ensure beneficiaries enrolled in Medicare and Medicaid have access to seamless, high-quality healthcare and includes a full range of covered services in both programs. To support the efforts to deliver more integrated, coordinated care to Medicare, Medicaid enrollees, MMCO is developing technical assistance and actionable tools based on successful innovation to care models such as this webinar series. To learn more about current efforts and resources, these visit resources for integrated care at www.resourcesforintedratedcare.com for more details. As always if you have questions or concerns, please contact me at 518-449-2976. Thank you.

Thank you. See you next time.

[ Event concluded ]