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## Update on Botulinum Toxins for Aesthetic Indications: Duration, Anatomy, and Other Patient-Centric Considerations

### Announcer:

Welcome to CME on ReachMD. This activity, entitled "Update on Botulinum Toxins for Aesthetic Indications: Duration, Anatomy, and Other Patient-Centric Considerations" is provided by Prova Education.

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Chapter 1: Overview of available & emerging BoNT-A products

### Dr. Bloom:

Hello, and welcome to this educational series looking at botulinum toxins and their aesthetic indications. We will focus on the current landscape of neuromodulators, as well as look at some of the emerging neuromodulators to come.

This is CME on ReachMD. I'm Jason Bloom, and with me today is Dr. Carolyn Jacob, dermatologic surgeon from the Chicago, Illinois, area.

All right, let's get started. Dr. Jacob, can you give us a current look at all the neuromodulators on the market today, as well as a look into some of the emerging ones to come on the horizon?

### Dr. Jacob:

Sure. So there's 4 on the market currently in the United States. The first one that came out was onabotulinum toxin, and it's indicated for the lateral canthal lines, as well as the frontalis muscle and the glabellar structures. Those dosings differ between 20 units for the forehead, 20 units for the glabella, and about 24 units for the lateral canthal lines. In the original studies, they did show that their product lasted for about 4.5 months for patients. Then we also have abobotulinum toxin, a different total mouse units, and so they're not comparable, which gets a little confusing for people. But it's FDA-cleared for the treatment of the glabellar complex. We use, typically, 50 units in this area, and in their studies, they showed that this could last up to 6 months or more depending on dosing. We also have incobotulinum toxin, also approved for the glabellar creases. Also at 20 units, but again, not comparable to other units. And then we have prabotulinum toxin, also for 20 units at the glabellar structures.

What's really interesting too, though, we have a new one that's a player in the market that's not approved yet, but it will be soon, called relabotulinum toxin. And it's a little different because it comes as a premixed form. It's already a liquid, and you would just draw up the product directly out of the vial, so it kind of takes away a lot of the hassle of the premixing, the measuring, having the saline to mix with the product, and may create more ease for your office and your staff members as well. They're looking for indication for both the glabellar complex and the lateral canthal lines, and the really nice thing about it is that they've found that it did last over 24 weeks for most patients, and patients were very satisfied – over an 89% satisfaction rate for the 1-month follow-up with the 2-point glabellar improvement. And also, most patients were still satisfied with their outcomes 6 months after their treatment.

### Dr. Bloom:

That's great. That's really fascinating. I'm really looking forward to seeing especially some of the new products that are coming.

Now, that was a great overview, but can you give us a brief look at some of the hydro-studies, the clinical trials that have been done, and what they've shown?

**Dr. Jacob:**

Sure, so it's really interesting, because we think of this 150-kilodalton [kDa] protein as being similar from product to product. However, one study actually showed that within each vial, there's differing amounts of the actual nanograms of protein. And so we're finding that in higher dosing for some of the products, like abobotulinum toxin, they were able to push that longevity of duration out to about 8 or 9 months by increasing the dosage. However, when one looked at onabotulinum toxin, that was not the case. So by doubling the dose, they could get about 4 more weeks of duration for that product, but they didn't see any further duration by tripling or quadrupling that dose. Same thing with incobotulinum toxin, they were able to get a few more weeks out by doubling or tripling the dose, but certainly not – you didn't have a quadrupling of the duration by quadrupling the dose. So it's interesting. It's something to have a conversation about. I'm not sure how it'll play out for patients, because again, one has to take into consideration the dosing and how we are going to be reconstituting this. Because if you're doing different dilutions and you're doing a higher dosing, you'd actually have to have the amount of saline that you're mixing it with, because you could also then increase the spread of the actual product.

**Dr. Bloom:**

Right, I think that makes sense. I mean, you don't want to use too much reconstitution volume, as you said, which can actually cause the product to spread more. But, yeah, I mean, that's great to know, that you can, with especially some of the more protein in the vial, that we know due to some studies, you can get a longer duration by increasing the dose.

**Dr. Jacob:**

Yeah, and patient satisfaction is what we are looking for.

**Dr. Bloom:**

So this has been an excellent discussion of some of the market availability and the horizon for botulinum toxins. In the next course, we're going to talk – my favorite – anatomy. Stay tuned for that.

Chapter 2: Anatomy and other patient-centric considerations

**Dr. Bloom:**

Welcome back. So we've just looked at the current and the future landscapes for neuromodulators. In this section, we're going to look at anatomy. So, Dr. Jacob, let's talk about that anatomy. When you're looking at patients and evaluating them for neuromodulator injections on the face, what are some things you look at to really evaluate those patients?

**Dr. Jacob:**

Sure. So there's a lot of differences in strength of the muscles. So when one is evaluating the glabellar complex, we always ask people to kind of knit their brows together and see how strong or big and bulgy the muscles can be. That sometimes allows us to know placement, allows us to know if their corrugators have a little bit more elevation or if they're more horizontal. So there's a lot of nuances when treating that glabellar complex with the standard 5-injection dosing that we do that we want to take into consideration. Probably the first thing that I have to notice though, too, is brow placement. So whenever you're thinking about treating a patient, you have to look at their brows, because women are naturally supposed to have a brow that's a centimeter above the orbital rim, whereas men should have a brow that's more flatter at the orbital rim. And we don't want to turn one into the other, so brow ptosis is a big concern if you're treating frontalis muscle, and also not creating an arch where one does not need to be.

**Dr. Bloom:**

Totally. I mean, and we see patients all the time that have deep wrinkles or rhytids in their foreheads, and they have low brows, and they say, "You know, can we just put some neuromodulator in my brows to lift it?" And we explain that that's actually contraindicated in this kind of situation because if you weaken a patient who has strong wrinkles, they're relying on their forehead to lift their brows, and you can actually turn that into a worse situation where the brows drop further.

**Dr. Jacob:**

Well, I think that's really important, the education that we have to give the patients, which includes, "I know the forehead lines bother you, but we're going to actually be treating your glabellar complex as well, because we need to balance that out." And then sometimes, we're also talking to them about the lateral canthal lines, because those are also depressors of the brow. So then they can actually get a little bit of a lift by treating those as well.

**Dr. Bloom:**

Every single time we're talking to patients, we're actually educating them and explaining how we're going to use the pull of some muscles and weaken the pull of other muscles to get the desired results.

**Dr. Jacob:**

Exactly. And one other thing we sometimes notice, too, is if they've had neuromodulator done before, they'll recruit other muscles to squinch them tighter, so bunny lines come into play. Sometimes the medial orbicularis oculi muscle will start to squinch and give them other wrinkles that they didn't notice before because they are really strong animators. So it's good to have a discussion about that as well.

**Dr. Bloom:**

Well, that was another great course, and thank you guys for watching. Stay tuned for the next course as we talk about how to prepare the injections as well as importantly avoiding pitfalls and complications.

Chapter 3: Preparation and planning to avoid pitfalls

**Dr. Bloom:**

For those tuning in, you're listening to CME on ReachMD. I'm Dr. Jason Bloom, and here with me today is Dr. Carolyn Jacob. We're discussing updates in botulinum toxins and best practices for treating patients.

Welcome back. We're almost ready to demonstrate the injection techniques, but first, let's discuss the preparation of both the product and the patients for these botulinum toxin injections.

So this is an important topic. Tell me, how do you prep the botulinum toxin for injection for the patients?

**Dr. Jacob:**

Sure, so we know that we have to mix the powdered neuromodulator with the saline, and there's different ways that you can choose to do this. So some people like to use a smaller dose of saline, say 1.5 or 2 mL, and some of us like to have a little bit bigger dilution of 2.5 mL. And the reason being is that occasionally you like to tweak things differently, so depending on how much diffusion you're asking for, you want to have a bigger amount of spread, you're going to actually have a larger dilution. Some people want it to be extraordinarily precise, and they'd rather do more injections on the patient and have a very concentrated solution. So those are all things that you need to decide upon and think about prior to treating your patient.

**Dr. Bloom:**

Well, I think that's all very important. I think it's important to understand, though, if you do have multiple injectors in your practice, to make sure that they know exactly what the reconstitution volume is so that there's no errors in the preparation of the product.

**Dr. Jacob:**

Absolutely, because you need to know what you're doing for each patient, and you need to have all of your assistants on board. So we try to do the same dilution throughout the practice and then let the nuances be how we place that product into the patient.

**Dr. Bloom:**

Totally. That makes complete sense.

**Dr. Jacob:**

Great. Well, let's take a little look at some animation regarding how one can reconstitute the neuromodulators that we currently have.

[ANIMATION PLAYS:

**Narrator:**

Botulinum toxin is an injectable neuromodulator commonly used as part of an overall facial rejuvenation plan.

AbobotulinumtoxinA (Dysport®) comes in powder form in a 300-unit vial and should be reconstituted with either 1.5 mL or 2.5 mL of preservative-free 0.9% sterile saline. Insert the needle at a 45-degree angle and allow the diluent to be pulled into the vial by partial vacuum. After adding the saline diluent, gently rotate—do not shake—the vial until the white substance in the vial is fully dissolved. When fully reconstituted, abobotulinumtoxinA should be a clear, colorless, and particulate-free solution.]

**Dr. Bloom:**

Well, that was a great look at the reconstitution process, and I think it should be noted that relabotulinum toxin is coming on the market, and that could potentially be really interesting because it is a liquid form of toxin, which eliminates the whole reconstitution process. There's none of that error in the reconstitution, so I think that could be very interesting for us in the future.

**Dr. Jacob:**

I think it'll simplify things for people's offices, because you don't have to mix it; you don't have to know how much you're mixing it with. You can draw it straight out of the vial, and just go ahead and use it. So it'll be very interesting to see how well it works for everyone.

**Dr. Bloom:**

Well, thank you guys for listening to this portion of the course. In the next course, we're going to look at our actual injection techniques with some of these aesthetic indications for botulinum toxins. Stay tuned for that.

Chapter 4: Demonstration of best practices for BoNT-A injection techniques

**Dr. Jacob:**

Welcome back. And now, we're going to incorporate some of the techniques we've learned in the past 3 sessions into real play with our patient here. Dr. Bloom?

**Dr. Bloom:**

So this is our patient, Stephanie. She's 50 years old, and today what we're going to be doing is treating her glabella area in between the eyes, as well as the nasalis muscle on either side of the nasal sidewall or nasal bridge. The glabella is made up mainly of 2 different muscles. The first is the procerus muscle, which is a vertically running muscle that is responsible for the horizontal crease over her nasal bridge. Additionally, we have the corrugator muscles, which, if you bring your brows tight together, you can see here are responsible for the vertical creases in between the eyes as she brings her brows together. So we're going to treat both these muscles – the corrugators as well as the procerus muscle – with neuromodulator.

So I ask the patients, will you bring your brows tight together for me? And you can see here, first the horizontal line running across the nasal bridge. I'm going to treat that with 10 units of abobotulinum toxin. Additionally, when she brings her brows together tight, you can see there is a skin insertion of the corrugator muscle that makes that dimple laterally. The key is to treat the corrugator both at the head and the tail of the muscle. You do not want to treat lateral to that dimple in the skin, which is its skin insertion, or else you're going to treat the frontalis muscle and potentially drop the brow. So, Stephanie, will you bring your brows tight together for me? Good. And I like to treat the head of the corrugator – again, 10 units – as well as the tail of the corrugator muscle, 10 units. Now we'll treat this side. If you'll bring your brows tight together. Good. Again, another 10 units at the head of the corrugator and 10 units at the tail of the corrugator. I'm always directing my injections away from the eye, and I'm also protecting the muscle as I put my finger just underneath the orbital rim.

**Dr. Jacob:**

So, Dr. Bloom, a couple questions here. Have you heard of some people who choose to try to grab the skin, as if they're lifting up the muscle? What do you think about that?

**Dr. Bloom:**

I mean, I think that's an option. You just need to make sure that you're grabbing the actual muscle belly and not the skin itself. But the muscle does run right underneath the skin, so I also – I really do like to see the patients animate prior to doing the injection so you can really see the lateral insertion of the muscle into the skin.

**Dr. Jacob:**

And sometimes, we'll find also in patients that some have a little bit more horizontal corrugators, and some are a little bit more angled. And so I think that's perfect, when you're asking them to make that face, to make sure you're getting towards the tail, not over the tail, and not just assuming that it's like in the package inserts, where it says it's 1 cm above this. It varies a lot.

**Dr. Bloom:**

Absolutely. You have to look at the patient anatomy. Some have very thin corrugators and some are very wide.

**Dr. Jacob:**

Mm-hmm. And the other thing to keep in mind, too, is that because we're treating the depressors of the brow, this will really help someone who has a little bit more low-set brows, because that's the one thing we have to keep in mind when we're assessing the patients is we don't want to get an atoxin into that frontalis muscle, as you had already mentioned, because they need to be able to lift their brows and we want to give them a little lift by treating the depressors.

**Dr. Bloom:**

I totally agree, and for a patient like Stephanie here, I think this is going to be excellent, especially for her medial brow area because her brow here is just about at or below the orbital rim, so releasing that medial brow or treating the medial brow depressors with the neuromodulator will help to allow the frontalis muscle to lift that up.

**Dr. Jacob:**

And I know we teach these a lot, but I've seen other people try to teach it where you're injecting into or below the brow. What do you think about that?

**Dr. Bloom:**

If we're trying to treat the lateral brow and get that up, I do like to inject underneath the brow, which weakens the lateral aspect of the orbicularis muscle, which is also a brow depressor. But I don't like to treat above the brow to try to raise it. I think the risk of hitting that frontalis muscle, which is the only brow elevator, can cause some brow ptosis, which is opposite what we want to do.

**Dr. Jacob:**

And I think that staying high enough above the brow – I always teach, when I'm teaching the residents, to do the first injection near the level of the medial canthus, because women oftentimes overpluck their brows or their brows have simply fallen out and so they're too lateral. And then again, not treating underneath the medial brow because you can get into that levator palpebral muscle and cause an actual eyelid ptosis.

**Dr. Bloom:**

Yeah, that's why I was kind of keeping my finger here, to prevent the theoretical backflow of toxin.

**Dr. Jacob:**

Perfect.

**Dr. Bloom:**

Okay. Now we're going to treat over the sides of the nasal bridge, the nasal sidewall, and those muscles are called the nasalis muscle, also known as the bunny lines. So, Stephanie, if you would squinch your nose like you smelled something bad. You can see these lines here that are forming. I usually use about 15 units of abobotulinum toxin here on each side. And I'm just going to treat – about half of it – and then above. And then we'll do the same thing on this side. Stephanie, if you'll turn towards me – perfect. Squinch your nose like you smelled something bad. Done half...perfect.

**Dr. Jacob:**

And that nasalis muscle is pretty thin fibers that are right down onto the bone; is that correct?

**Dr. Bloom:**

Exactly. I'm kind of feeling the tip of my needle touch the bone and backing off a little bit. So going down to the periosteum's perfect for this area.

**Dr. Jacob:**

And I noticed that you did 2 injections there. Is that just to be able to more broadly cover the area?

**Dr. Bloom:**

Exactly. I want to treat all of the nasalis fibers rather than just spot treating one area.

**Dr. Jacob:**

And it probably depends, also, on how you choose to dilute your abobotulinum toxin. So those of us who do more dilute treatment might inject in fewer spots, and those who do more concentrated treatment might need to do a little bit more injections to cover it.

**Dr. Bloom:**

Totally. Dilution allows for a little bit more diffusion of the product, so I tend to be a little bit more concentrated with more spot treatments.

So now that we've treated the glabella and the nasalis on this patient, we're going to see in the next patient the treatment of the platysma bands in the neck with neuromodulator.

**Dr. Jacob:**

And for our next patient, we have this beautiful, 50+ patient, who is gracious enough to show us her platysmal bands.

**Dr. Bloom:**

So if you would – let's see. We're going to treat these bands here, right underneath her chin, and flex the neck, as I say. And you can see when she activates this muscle, it tends to strengthen or tighten those bands on either side of her neck, underneath her chin. So as we know, neuromodulator weakens muscles, so what we're going to do is place the neuromodulator in a vertical fashion along the length of the band in order to weaken the muscle and relax that so when she activates the muscle, she doesn't see that.

**Dr. Jacob:**

Yeah, and interestingly, because the platysma kind of intercalates at the jawline and then down to the clavicle, when people make this particular face – and they don't do it normally except when you're talking, it'll happen – it pulls down on the jawline. And so we sometimes get a little bit of a lift of the jawline when the platysma is treated because of the cording. So they call that a Nefertiti lift, if you do a little along the jawline as well.

**Dr. Bloom:**

Yes, you can kind of come underneath the jawline and treat that, and this will lift up. Okay, if you will activate the neck muscles – perfect. And I'm just going to pinch this up, and small little aliquots of the muscle...

**Dr. Jacob:**

How many units are you doing for the injections, approximately?

**Dr. Bloom:**

Well, when I draw it up, we're drawing up 30 units of abobotulinum toxin. So I think I did about 5 injections, so maybe about 6 units per injection. In the second side – I'll have you turn towards me a little bit, again flex the neck. I pinch the muscle; you can see the band.

**Dr. Jacob:**

You can feel the muscle underneath there, too. Because the area is so thin, when you pinch it, you're actually feeling you can kind of roll the muscle if you need to.

**Dr. Bloom:**

And she has a pretty thin neck. Good, then let's see, look straight ahead. Good, and activate the muscle one more time. Good.

**Dr. Jacob:**

And again, I think people are most bothered by these because of Zoom and the ability to see what they look like when they're actually talking and moving, which normally people wouldn't make this face for a picture, so it wouldn't be the first thing they thought of, but I think now people are starting to notice it more.

What do you tell your patients after they've had the platysma treated? Are there any rules or regulations for them?

**Dr. Bloom:**

The same kind of thing that goes for if we're doing neuromodulator in general, and I say avoiding things where your head is below the level of your heart for about that day. In the morning, they can resume their normal activities, but for that day, I like to keep their head above the level of their heart.

**Dr. Jacob:**

And I think, too, that for people who are good at working out, sometimes I'll just let them know that they might have a little bit of a weakness if they're cheating on sit-ups, because a lot of us use our platysma to begin the actual sit-up motion instead of our core. So it will make you better at Pilates if you get this done.

**Dr. Bloom:**

So as you can see, a very safe, quick, and easy treatment to treat the bands in the neck.

The next patient, we're going to look at the treatment of the masseter muscle with neuromodulator to help slim the lower face.

So here we have our lovely patient, and if you'll sit up for us. If you'll look straight ahead in the camera. She has good volume in her upper face, but you can see her lower face here, in the masseter area, towards the back of her face is a little bit wide. The 2 most pleasing facial shapes would be an oval or a heart shape. When people notice some of the width in the lower face and more of a triangular appearance, the 2 ways to improve that are to add volume to the upper face or to slim the lower face. In this case, we're going to slim the lower face, and we do that by injecting some neuromodulator into the lower face to actually atrophy the masseter muscle and create a more pleasing facial shape. If you sit back for us, we're first going to talk about the anatomical borders of the masseter muscle on this side. And then turn your chin away so we can see. So the area of injection is actually a square box, and it's bounded by 4 important anatomical boundaries. The first is if you draw a line from the inferior aspect of the tragus here to the corner of the mouth. That represents the superior border. The inferior border is the mandible, or the jaw. And then I will ask our patient, bite down on your back teeth. Good. And I can actually localize the anterior and the posterior aspect of the masseter muscle.

So our area of injection is going to be actually right in this box, and I like to do 3 small injection points to make sure I'm actually addressing the entire muscle belly in this case.

So for this patient, we're going to do the injection. I also like to have the patient bite down on the back teeth, again localizing the anterior front border of the masseter and the posterior border in between my fingers like this.

**Dr. Jacob:**

And I notice you're using a longer needle. Tell me about that.

**Dr. Bloom:**

I like to use a longer needle rather than the smaller insulin syringe so that I can actually treat the entire muscle, because there are deep and superficial muscle fibers to the masseter muscle. As you can see, 3 small injections to treat that side.

**Dr. Jacob:**

Do you have any cautions that you tell patients about before doing this?

**Dr. Bloom:**

I mean, mainly I tell them things like we've – any kind of neuromodulator, we tell them to avoid NSAIDs [nonsteroidal anti-inflammatory drug] and things like alcohol, just because you can get a little bit more increased bruising. But nothing specific to this area.

Let's see, if you'll turn towards me, all the way. Perfect. Same thing – and again, I'm just going to show you, the inferior border is the mandible. An imaginary line from the inferior aspect of the tragus to the corner of the mouth. And then bite down on the back teeth. Good. I can really feel that muscle here. I'm localizing it between my fingers. And 3 little injections. I'm using 75 units of abobotulinum toxin in this patient to treat her masseter hypertrophy.

**Dr. Jacob:**

And I noticed that you're staying low and somewhat lateral. Tell me a little bit about that.

**Dr. Bloom:**

One of the risks that you can get from this procedure is actually extravasation of the neuromodulator into some of the anterior muscle fibers, such as like the risorius, and patients can notice some changes to their smile. Obviously, those are concerning to the patients. They're never permanent, and they go away as the neuromodulator wears off, but certainly by kind of localizing it directly in between my fingers, I'm kind of staying right within that muscle belly to prevent those kind of issues.

**Dr. Jacob:**

Perfect. And that's also where you want the atrophy to occur. When do you tell patients to expect that atrophy to be noticed?

**Dr. Bloom:**

We usually tell patients anywhere – they start to see it around maybe 6 weeks, a month to 6 weeks, and noticing it out to 3, 4 months, whereas normal neuromodulator treatments in my office, we see patients back at about 3.5, 4, 4.5 months – this, I tend to dose it about every 6 months. So maybe they'll come in every other treatment for their normal neuromodulator and get treatment in the masseters.

**Dr. Jacob:**

And I think that also, patients will comment that that ability to not clench their teeth does last about 5 to 6 months, so that seems to be the feedback, at least, that we're getting as well. So they're pleased with the contours and also pleased that they are saving their teeth, too.

**Dr. Bloom:**

Unfortunately, that's all the time we have for today. I'd like to thank the audience for listening in to this activity. I especially would like to thank Dr. Carolyn Jacob for coming in and all your valuable input today.

**Dr. Jacob:**

Thanks so much for having me.

**Announcer:**

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