



MIGRAINE WORLD SUMMIT

TRANSCRIPT

INTERVIEWS WITH WORLD-LEADING EXPERTS

HOW MUCH IS TOO MUCH EXCEDRIN MIGRAINE?

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Introduction (00:05): Again, in Excedrin, it's caffeine; it's acetaminophen or Tylenol; and aspirin. So, all three agents have good data that they can be effective for the treatment of headaches in general. So again, it made sense for the manufacturer to say, "Let's throw these three together and help people get rid of their headaches." But again, it's not so much the aspirin or the acetaminophen, but it's the caffeine component, which again, can lead to medication overuse or rebound headache as well as sleep dysfunction.

Carl Cincinnato (00:34): Excedrin has been around since the 1960s to help treat headache. In 1998, it was granted FDA clearance to market Excedrin Migraine. It then became one of the first migraine medications available to consumers without a prescription in America. Millions of units are sold each year, but what do we know about its risks? Is it safe to take it whenever we need or want to? Can it lead to medication overuse headache (MOH)? To help us evaluate this treatment option and to tell us what we need to know is Dr. Paul Mathew from Harvard Medical School. Dr. Mathew, welcome back to the Migraine World Summit.

Dr. Mathew (01:07): It's great to be back. Thank you, Carl.

Carl Cincinnato (01:09): What is Excedrin Migraine, for those who may not have heard of it?

Dr. Mathew (01:13): So, Excedrin Migraine is a combination tablet. It contains caffeine, acetaminophen, better known as Tylenol, as well as aspirin. So, it's a medication that we call a combination analgesic because it has three different components.

Carl Cincinnato (01:28): Why does it include caffeine?

Dr. Mathew (01:30): So, that's a great question. Caffeine is a well-known — as I tell my patients — double-edged sword. It is a component that really helps to cut through a headache. Unfortunately, after the headache has resolved, the body likes caffeine, and its way of telling you that it wants more is sometimes a headache, which is commonly known as a rebound headache or a medication overuse headache. As you know, products that have instant reward or instant gratification are often very appealing choices, but oftentimes patients don't realize the consequences. And again, it is marketed over the counter (OTC), so people think it's safe, it's effective, and then they'll get into a cycle of repetitive use.

Carl Cincinnato (02:10): Does it have a role in your practice with some of your patients?

Dr. Mathew (02:13): So, Excedrin Migraine, typically not. And again, it is because there are so many other treatments out there that are specific for migraine. There's the triptans, the CGRP antagonists known as the gepants. So I mean, with so many other options that do not involve that potential for medication overuse headache or rebound headache, it really doesn't make sense to go there. I will tell you that many patients, when we have this conversation, they're terrified because, a lot of the time, they will be very concerned that caffeine is public enemy No. 1. And that there will be this rampage of every doctor they've seen demanding that they stop caffeine in every single form, which I personally think is a little inhumane just because many of us are so used to that routine of having a cup of coffee in the morning to start your day.

Dr. Mathew (03:04): So what I typically suggest to patients is continue your caffeine consumption in the form of beverages, but cut out the Excedrin. And then, once people kind of get OK with that, then I slowly suggest limiting their coffee consumption to one to two cups before noon. Just to give you a sense, a cup of coffee, if we're talking 8 ounces, has about 95



milligrams [mg] of caffeine. One ounce of espresso has about 64 mg of caffeine. While an adult dose of Excedrin, which is two tablets, has 130 mg of caffeine, so again, it is a significant amount of caffeine, especially if you're doing that in addition to any beverages that you're consuming that have caffeine.

Carl Cincinnato (03:50): Are there any other painkillers or analgesics that include caffeine in them?

Dr. Mathew (03:54): Yeah, so for the reasons I just mentioned about instant gratification and helping it cut through a headache, there's another compound that's a combination analgesic known as Fiorinal and Fioricet. Both of those medications not only contain caffeine, they also contain another medication called butalbital, which unfortunately is another medication that can give some instant relief. It can [have] muscle-relaxing properties. It also has some anti-anxiety properties, but unfortunately, it also has that effect of dependence and can lead to medication overuse headache and rebound headache. And for that reason, Fioricet and Fiorinal are both actually banned in some European countries. You might be wondering what's the difference between Fioricet and Fiorinal. Fioricet contains Tylenol; that's easy to remember: "T" in Tylenol, "t" in Fioricet, while Fiorinal has aspirin instead of the Tylenol component.

Carl Cincinnato (04:51): So, it's got aspirin plus this sort of, is it an opioid or a narcotic ingredient?

Dr. Mathew (04:56): So butalbital is actually a barbiturate, so it's not exactly an opioid, but at the same token, it is a controlled substance. So if you approach your doctor asking for a prescription, it will be controlled, treated as a controlled substance. There will be some background checks; your pharmacist may actually ask for identification before they'll fill the prescription. So although it's not an opioid, I do kind of treat it in the same way in terms of dependence, rebound headache, and all these things.

Dr. Mathew (05:24): And I cannot not mention the three-headed dragon here, Fioricet with codeine. So there you're talking about caffeine, and butalbital, and codeine. So you're talking about something that will lead to rebound headaches via three different methods. Problematic for patients who have headaches of any kind of elevated frequency just because the more you take these things, the more it becomes a slippery slope. And the analogy I often use with medications like this in terms of rebound headache, it's like putting out a grease fire with water. Initially, you may feel some relief, but the reality is it's actually spreading and making the situation worse.

Carl Cincinnato (06:02): So, let's talk about medication overuse headache; you've mentioned it a few times now. We know about withdrawals that we can have from caffeine if we're drinking caffeine as part of our coffee each day during the working day or the working week. And then, on weekends, maybe we get up a couple hours later and we've got a bit of a headache. Maybe it's not a migraine; maybe it's just a headache. That's caffeine withdrawal and a bit of a rebound, I guess, effect there. How does it work with taking these treatments for migraine and migraine rebound?

Dr. Mathew (06:34): So that is, that's a loaded question, to say the least. First of all, there is that, your body, as I had mentioned, liking caffeine, wanting more, and kind of giving you these symptoms of headache, feeling lethargic, feeling drowsy, even feeling moody and irritable. I think many of us who drink coffee on a regular basis may have experienced those mild



symptoms when you don't get to that next cup on time. And again, that's amplified if you're in a situation where you're having coffee, you're having an espresso, and then you're also using these caffeine-containing medications.

Dr. Mathew (07:07): The other thing I will say is that when you do consume these larger doses of caffeine, people typically will know, "OK, let me have a cup or two earlier in the day because I know if I drink later in the day, I'm going to have trouble falling asleep and staying asleep." Unfortunately, that logic does not necessarily cross over to Excedrin and medications containing caffeine. So they will then take this medication; it'll help to get rid of the headache. Unfortunately, it'll then disrupt their ability to fall asleep and stay asleep, which, as you know, then primes the next day to be more likely to develop a headache.

Dr. Mathew (07:38): And the visual that I've used on the Migraine World Summit, which I will share with you again: If this is where you start your day, and this is where you need to get a full-blown migraine if you didn't sleep all the night before, or you're having this kind of capping withdrawal rebound situation, you start your day here, and then it doesn't take much stress — missing meals, hormonal fluctuations, weather fluctuations — boom — full-blown migraine.

Carl Cincinnato (08:01): I like that visual of having that sort of threshold and how the triggers accumulate, like they're additive to then tip you over into a migraine attack if you're not careful.

Dr. Mathew (08:12): Exactly. And people often forget this additive effect, as you had mentioned, because people will have a slice of pizza and say, "Oh my God, I had a migraine; I'm never going to eat pizza again." Meanwhile, ignoring not sleeping well the night before, going through really severe caffeine withdrawal. So it's very easy to get hung up on a particular trigger and then assign all the blame there when really you need to look at it much more globally.

Carl Cincinnato (08:36): And I know firsthand from keeping a diary for an extended period of time, just how complicated it is; you could have a hundred migraine attacks, and not one has the exact same combination of different triggers and variables going on behind it. So it can be a little bit more trickier than first meets the eye when it comes to understanding what your real triggers are and how to best manage them.

Dr. Mathew (08:57): The other thing, Carl, which you might be getting to, is many people think over-the-counter: safe, which as you and I both know — not the case. When you take NSAIDs [nonsteroidal anti-inflammatory drugs] or aspirin too frequently — good for inflammation, good for pain — but what that does is it reduces the lining, or the buffer, in your stomach that blocks the acid in the stomach from hitting the walls of your stomach. So, when that happens initially, you have a little bit of stomach irritation, which is known as gastritis. When that continues, you can actually develop a bleeding ulcer.

Dr. Mathew (09:29): So when patients ask me, "How much is too much? You wrote on the prescription, 10 to 15 tablets a month or some kind of guidelines." I tell people, "That's a very loose guideline. If you experience any stomach irritation at all, that's your body's way of saying, slow down; you're taking too much." Give yourself a break before you take any more. Or if you do require NSAIDs, frequently going on an acid blocker is what many of us will put patients on, whether it's omeprazole or something like that. So you're reducing the level of acid in your stomach, so you can take a little bit more of these medications for abortive treatment. Which then brings us to another point. Of course, if you are taking these medications frequently, that's definitely not a good thing.



Dr. Mathew (10:10): NSAIDs like aspirin, ibuprofen, naproxen, they not only affect the stomach but over time, can cause kidney issues. And then, on the other side of the coin, there's acetaminophen, commercially known as paracetamol or Tylenol, over time that can affect liver function. So people think that they have good control of their headaches while taking megadoses of either acetaminophen and/or an NSAID, but meanwhile, they're causing a lot of issues with their liver or kidneys.

Dr. Mathew (10:35): Meanwhile, they could have taken a low dose of a preventative, whether it's an oral or onabotulinumtoxinA or one of the new CGRP agents, much safer for your body. And often I tell people, "Why run to treat a migraine when you can prevent one from happening, and then ultimately use less medication in the process?" And Carl, I know I've used this phrase with you, as well: "You should control your migraines. Your migraines should not control you."

Carl Cincinnato (11:02): Yeah. And I think a lot of people in the audience who have had chronic migraine who might be watching will probably be thinking it's easier said than done. And they really do need a comprehensive treatment plan that explores medicinal but also the behavioral lifestyle aspects of it. And I think, for the purposes of our acute discussion today, you mentioned a ton in that answer. I'd love to just go back to gastritis, which you mentioned as a potential symptom that you're taking too many of these over-the-counter medications. What are some of the early symptoms of gastritis if we're worried about experiencing some gut issues around medication use?

Dr. Mathew (11:38): When you use NSAIDs like aspirin, ibuprofen, naproxen, such medications, it can manifest as acid reflux, which GERD is commonly called gastroesophageal reflux. This is when acid in your stomach builds to a certain point and now will trail up your esophagus, particularly when you're lying flat, like at nighttime when you're sleeping. Not only is heartburn annoying and irritating, your esophagus, which is the tube that connects your mouth to your stomach, was not intended to hold acid.

Dr. Mathew (12:09): And when acid goes up there, it not only causes irritation, but it can sometimes transform the tissues. It's called Barrett's esophagus, which can be precancerous. So continuing to have heartburn is not a good thing because, again, it does increase the likelihood of you developing one of these acid-reflux-associated symptoms, like Barrett's esophagus. And then the irritation is one thing, but again, eventually it can cause a bleeding ulcer, which can be lethal if it's large enough.

Dr. Mathew (12:37): So, [in] my practice, Carl, is I actually give people a prescription NSAID when I think it's warranted, and that way I know, No.1, how many tablets they have on hand. And No. 2, if they're going to take something, I'd rather it be a little potent, less frequently, than to have an unlimited supply of ibuprofen or some other medication like that, which oftentimes they'll buy from one of these big-brand stores, and they'll get 300 tablets, and they'll think, "Well, it's over the counter; it's perfectly safe." Or they'll say, "Oh, it's buffered, so this is not going to affect my stomach," which is not the case.

Carl Cincinnato (13:11): That's a really interesting, I think, philosophy to have: better to take a stronger dose less often than something lower dose, but daily all the time. Yeah. And you mentioned over the counter; sometimes it's referred to as OTC; that's when you can just go ahead and buy something in a pharmacy or a supermarket without a script. So, coming back to



Excedrin, you mentioned that it had 130 mg of caffeine. Remind me what the other ingredients are in Excedrin.

Dr. Mathew (13:42): Again, in Excedrin, it's caffeine; it's acetaminophen or Tylenol; and aspirin. So, all three agents have good data that they can be effective for the treatment of headaches in general. So again, it made sense for the manufacturer to say, "Let's throw these three together and help people get rid of their headaches." But again, it's not so much the aspirin or the acetaminophen, but it's the caffeine component, which again, can lead to medication overuse or rebound headache as well as sleep dysfunction.

Dr. Mathew (14:11): So, with these patients, generally when I see them for the first time, I do a lot of lifestyle coaching in my practice, but I say, "Continue your caffeine consumption through coffee and things like that, limited to before noon. Stop the Excedrin altogether. Here's a number of medications that I'm going to give you." I usually give people an NSAID, a nausea medication, as well as a triptan, or one of the new CGRP medications. And I say, "I want you to start using these instead of the Excedrin."

Dr. Mathew (14:39): A lot of the time, they're not quite as happy initially because they are going through some degree of caffeine withdrawal. So I tell them, "You may not be thrilled with how these work initially, but over time, you'll probably find them to be more effective." And I also remind people that any abortive medication will tend to be much more effective the earlier you take it. So, I use the analogy of putting out a lit match — very easy. Putting out the fire once the whole building is on fire — really much more challenging.

Dr. Mathew (15:07): And then, in terms of when you treat and how you treat, if you treat a headache early or a migraine early, it may be a low-grade headache that goes away within an hour or two, versus if you wait too long, the medication will now just kind of take the edge off. And they may have trailer days of headache, day two, three, and four, which may not have even happened had you treated early on day one. So it's very difficult for many patients to get their heads wrapped around this, and even some clinicians, that treating early will actually lead to a reduction in medication use because day two, three, and four may not have even happened.

Carl Cincinnato (15:41): Yeah, great advice. And you've mentioned NSAID a couple of times. Can you tell us what an NSAID is and how is it different from what Excedrin is?

Dr. Mathew (15:51): So, an NSAID — that's an acronym for nonsteroidal anti-inflammatory. So NSAIDs include, as I had mentioned, ibuprofen, naproxen, aspirin — all these things work as NSAIDs. So it's a broad category. So it makes perfect sense when the manufacturers were coming up with Excedrin to say, "Let's throw an NSAID in there." Aspirin is one of the best-known, so they probably figured that that's a good choice. It's one of the oldest.

Carl Cincinnato (16:19): How much does a pack of Excedrin cost? It's not expensive, is it?

Dr. Mathew (16:23): Yeah, my guess is it's probably in the same price range as ibuprofen comparably. So when the public sees "migraine" on the label, they'll assume, OK, this is migraine-specific. This is probably a better choice than ibuprofen or acetaminophen alone. And then, of course, they take it, the proof is in the pudding; they feel better: It gets rid of the headache, and they're happy, and they continue to use it. For people who have headaches once or twice a month, they're very fortunate in terms of that respect that they're not happening all that often.



Dr. Mathew (16:56): And for these people, they will use Excedrin, and since it's such infrequent use, they may not get into this trouble. But at the same token, it can escalate; all it takes is for that person to go through a stressful situation at work, periods of sleep interruption, such as a newborn child. Any of these life circumstances can then hurl them into, "I need to use this medication more often." And then that cycle of medication overuse can start. And so that's why many of us, even if the patient is using it at a safe frequency or infrequently and they're not likely to develop medication overuse headache, better to pull it from their hand before that potential actually comes up, and give them other tools that may actually work better because they're migraine-specific and will not have this potential consequence.

Carl Cincinnato (17:41): That makes a lot of sense; it's a slippery slope even if you're only taking small doses. And I think for our audience and your patients, I would imagine you're seeing probably some pretty severe, frequent, intractable symptoms amongst your patient population. Likewise, for our audience, there's not typically a lot of people who are just episodic who have one attack a year who are watching. It's people who are fairly frequent and have some significant level of disability. Do you know if Excedrin can be bought outside the U.S.? Is it available in countries like Canada or Europe?

Dr. Mathew (18:10): I believe those or similar products are available. I know a lot of the major pharmacy chains make an equivalent, which is basically the same thing. They just don't call it Excedrin. So yeah, I'm sure it's available globally. And again, it does not have the butalbital component in it, so it's not banned as Fioricet and Fiorinal are in some countries.

Carl Cincinnato (18:34): And to be totally transparent, the ingredients that it includes — caffeine, aspirin, acetaminophen (which is paracetamol in some other countries) — those are common ingredients that you can buy and you can put together yourself if you really wanted to. But it doesn't mean you necessarily should, because, as we just spoke, it's a slippery slope, but it does seem to be effective for those people who are taking it sparingly on an infrequent basis.

Dr. Mathew (18:59): I mean, some patients will have their own cocktail, right? They will take an ibuprofen, they'll take a Tylenol or a paracetamol, and then they'll have an espresso. So instead of taking a pill of caffeine, they'll modify it with a caffeinated beverage.

Carl Cincinnato (19:13): Is there any evidence that suggests that it is effective? Have there been clinical trials or research to show that this is an effective option for people?

Dr. Mathew (19:22): Yeah, I believe even for an OTC, it has to go through some trials for them to be able to market it the way they do. And certainly, there are trials that show aspirin's effective, and there's data to show that acetaminophen is effective, and caffeine, also. So each component has been studied, and I'm sure there's some data regarding the combination of them. I mean, it would only make sense if, individually, they work well that the combination should work even better.

Carl Cincinnato (19:48): Are you familiar with any data about how long it lasts once you take a dose of Excedrin?

Dr. Mathew (19:53): I don't remember the half-lives off the top of my head, but usually it's out of your system in less than a day.



Carl Cincinnato (20:00): And apart from gastritis, are there side effects that people should be, or patients should be aware of? Maybe some common side effects, and maybe some other adverse events or more serious?

Dr. Mathew (20:11): The aspirin component can affect your kidneys, and the acetaminophen/Tylenol component can affect your liver. You need to take it pretty frequently at pretty high doses to start to cause those issues. But I do worry about patients who are on other medications that can affect liver or kidney function. And sometimes this can unfortunately be the straw that breaks the camel's back or other medical problems.

Dr. Mathew (20:34): So, for example, in a patient who already has some form of kidney disease from diabetes, let's say. And now they're going on heavy doses of NSAIDs, that's someone I'd really be concerned about. Or on someone or in a patient who is on a medication that affects liver function and now is taking these mega doses of Tylenol, whether it's in the form of Tylenol, paracetamol by itself, or in a combination product like Excedrin.

Carl Cincinnato (20:57): We've interviewed a few other experts talking about inflammation as well as comorbidities, which are conditions that run in common with migraine. And there seems to be a common theme that if you have frequent migraine, the chances are pretty high that you also have another chronic illness or chronic disorder. And chances are that chronic illness or chronic disorder is inflammatory-based, which means that we may be taking a bunch of other medications for these other things, which could be an autoimmune [disorder], it could be arthritis. And so, it's very easy to get your script from your doctor in one of those areas, get your script from your migraine doctor, and then any gaps you plug, you might just buy over the counter. And for that to slip your mind and not tell your doctor, it sounds like could have pretty devastating consequences if the doctor isn't across everything that you're taking.

Dr. Mathew (21:47): Right, exactly. And so, most headache specialists, including myself, when I first meet a patient, I will ask them what [they're] currently taking. But I'll also run through lists of both acute treatments and [abortives] and preventative treatments that they've taken in the past, just to really get a sense of where they've been, what's been effective, what's been ineffective. And certainly, taking a thorough history, including what other medications you're taking over the counter, is extremely important.

Carl Cincinnato (22:14): Now when it comes to, I guess warnings and risks, we spoke about medication overuse headache. Can you take Excedrin on an empty stomach, or do you need to take it with food?

Dr. Mathew (22:25): There's a misnomer to some degree that NSAIDs that are not taken through the stomach don't affect the stomach, but that's not true. Maybe to a lesser extent, but typically they say, "Take it with food." But again, the effects of NSAIDs on the stomach are not the pill directly attacking the stomach, per se. They have an effect on the lining of the stomach. So taking it with food may reduce some of the pill irritation, but again, other effects of the NSAIDs happen chemically through that barrier that is protecting the stomach.

Carl Cincinnato (22:58): Are there any people or any health conditions that you're aware of where you absolutely should not touch Excedrin?

Dr. Mathew (23:04): So, people with liver disease, people with kidney disease, they should definitely be avoiding it. And I would also argue people who have sleep disorders should be very



careful; adding caffeine is another layer of complexity that's complicating the management of their sleep disorder.

Carl Cincinnato (23:22): We know that sleep and migraine often — well a lot of people with migraine have sleep disorders, as well, so there's something to be said there. What about if you're pregnant or breastfeeding? Is Excedrin safe to take or not?

Dr. Mathew (23:38): Yeah, generally, we avoid NSAIDs while women are pregnant. There are certain windows where they can be safe, but I generally will defer that decision to the OB [obstetrician]. Fioricet actually has a very long history of being used comfortably by many obstetricians, although even there are better options. Sumatriptan has very large pregnancy registry safety data, so I don't even bat an eye now when one of my patients becomes pregnant. I discontinue some of their acute treatments and put them on sumatriptan, even if they didn't find it tremendously effective in the past. It's certainly better than over-the-counter preparations, and we do have the safety data. So even if they're on a different triptan during pregnancy, I will switch them to sumatriptan, because that's a very critical time where you don't want to take a chance and you definitely want to go with the data and make sure it's a safe treatment option.

Carl Cincinnato (24:30): We had a few questions from our community and from viewers, and one of them was from Roxanna. And she said: [Excedrin's] the only medication that seems to work for my attacks. However, I take way too much. I need a better alternative. How would you respond to her?

Dr. Mathew (24:44): Yeah, no. So, for Roxanna, I would take a broad approach where I would probably recommend a preventative regimen that'll help reduce the number of headaches she's having. I would also take a look at her sleep schedule, her exercise routines, her diet; all of these things certainly play an influence, as well. And then giving her some reasonable options in terms of alternative acute treatments. Taking someone's acute treatment away that they've been using for some time and not offering an alternative, I think, is very cruel. And so, I would certainly recommend some other treatments with, as I mentioned, that caveat, "This may not work quite as well initially as the Excedrin. But again, over time, you'll probably find it does work more effectively because they are migraine-specific."

Carl Cincinnato (25:31): Susanna had a question. She said, well, she said: I would love to hear about Excedrin Migraine because, when I've been on a prescription that works, sometimes Excedrin Migraine is still the only thing that stops an attack. My neurologist cautions me against taking OTCs frequently but also says, "Do what you need to to handle attacks." Is that a fair sort of plan for Susanna?

Dr. Mathew (25:54): I mean, I can tell you about my practice. I will typically give people an NSAID, an anti-nausea medication — which, I like promethazine — that can be a little sedating. Just because if you have a headache and your usual treatments haven't worked, having something that can make you a little drowsy, curb your headache, and curb your nausea is very useful. So in response to Susanna, I would say it makes sense to have a couple of different options in your toolbox, and this is a situation where every patient's different and every patient's migraines are different. So, in terms of what medications work best, what combinations work best, all highly variable for different people.



Carl Cincinnato (26:30): You mentioned a couple of alternatives with the NSAIDs, the anti-nausea treatments, the triptans, the gepants. What kind of combinations do you put together there that seem to be quite effective for your patients? And is it all of them together, or is it kind of a few of them?

Dr. Mathew (26:48): Yeah, so just so you know, there's a commercial medication called Treximet, which is a combination of naproxen and sumatriptan. So, we have very good evidence that NSAIDs do pair pretty well with triptans. And I'll tell you, in my clinical practice, patients who use NSAIDs will sometimes pair them up with gepants, as well. So yeah, combination therapies can be quite effective. What I will say is that when I do give a prescription NSAID, I'll typically give 20 to 30 tablets with the instructions of, "As soon as you feel a headache coming on, you can try the NSAID. And if that gets rid of it, fantastic. If it doesn't get rid of it pretty quickly, within 10 to 15 minutes, you'll have a good sense of ... 'I don't think the NSAID is stopping this. Let me throw in my second-line treatment, which could be a triptan, which could be a gepant.'" So that's kind of how I strategize it to patients.

Carl Cincinnato (27:40): Where can we learn more about what you are doing or follow your work?

Dr. Mathew (27:44): So, Carl, a few places you could go. I was a writer for the Harvard Health Blog, so I'm a big fan of edutainment, which is when you can provide education kind of in a fun format. So if you just search, "Harvard Health Blog, Paul G. Mathew," it'll give you a number of titles that I wrote. There's one on sleep apnea called "Snored to Death." There's one on vertigo called "Spinning Out of Control." So those are kind of light, easy reads that have useful clinical information. If you search on the Brigham and Women's Hospital, "Paul G. Mathew," you'll find my clinical page there. And then, for additional patient resources, I would definitely check out the National Headache Foundation as well as the American Migraine Foundation.

Carl Cincinnato (28:26): Fantastic, we'll link to those in the show notes. Dr. Mathew, thank you so much for joining us again on the Migraine World Summit.

Dr. Mathew (28:33): My pleasure, Carl. Thank you.