Welcome everyone. Welcome everybody. We're going to try to do an overview of headaches in three hours so you will hear our voices a lot for three straight hours, and we will navigate some cases, navigate some basics about headaches and give you a snapshot overview of how to approach these. Please, ask questions. We will have simple questions to make it as interactive as we can and given the limitations of virtual education, but we want you to ask questions and get a sense of what you want to get out of this training and how we can make it as valuable for you as possible. It is hard with 44 people virtually to ask what you want to get out of this training. As you go through, we will be monitoring the chat to get a sense of any questions that arise so we can always buy back and are not super rigid in that and we can try to navigate without.

I am Franz Macedo, I am the Co-Chief of the Pain Center here at the Minneapolis VA. I've been the Director of the Pain Center at the Minneapolis VA for about three years now and the Medical Director for the Headaches Center of Excellence and prior to this in part of my pain fellowship in 2012 I was in active duty for four years.

I'm Rebecca Vogsland I do PT and I'm the Rehab Director here at the Minneapolis VA and I spent the last eight years with the Pain Center and prior to that I did TBI and some musculoskeletal work for the outpatient programming. I want to thank Heather for helping us navigate and get all of this coordinated and of course, always thank you to the team for having us here again. We like giving this talk and this will be our first attempt in three hours to do it so we pared down some things but if there's anything missing like right in the chapter raise your hand we will be flexible with this and we have the ability to speed up or slow down if needed.

Disclosures. I don't have any disclosures. I contract basis do some teaching for healthcare professionals about pain and musculoskeletal stuff. Disclaimer that is on all of these slides. Reviews express this presentation are those of the author and not those of DOD and that was to choose ourselves.

This is what you're hoping to cover today. Epidemiology of headaches, some basics and pearls of wisdom for evaluation and the primary headaches and evidence-based treatment and secondary headache secondary base treatment and nonpharmacological care. So, we will try to get all through that which is an entire headache conference in three hours so again please ask questions.

We start off with the question. Which of these is not a primary headache? Please go ahead and select from that so when we get to the critical mass, we talked about this morning the need for some music so we definitely have to work on that it might actually crush the email system trying to get it back and forth. We are doing pretty well. We will move on from that. The answer to this one is most dramatic headache, and we will talk about it as we go through to the next slide.

The answer is posttraumatic headache. So, what is a primary headache. Primary headache is a headache were the headache itself is a problem and the three primary headache categories we talk about for primary headaches

or migraine headaches, tension type headaches and general encephalitis and we will get into that as we go and let's go back a couple of clicks there.

One of the things that migraine is the one thing that people think of the most and it only accounts for about 15-ish percent for all headaches but the reality is the tension headache is the most common at over two thirds of all patients have tension headaches and the reality is tension headaches don't go to their doctors much. They're not as severe so they're more likely to manage self-managed those. And another 15% is probably on the high end. Primary headaches can be significantly disabling but they're not life-threatening. That's one of the reasons there in the primary category there is no other underlying condition to the.

This is a nice graphic on headaches. It’s from the VA pharmacy academic detailing documents and it breaks down primary and secondary headaches and into my pockets and it divides a little bit easier so on the left most common and migrating clusters also your primary headache category and less common but more debilitating than tension and very common secondary headaches so medication induced is a common one so it secondary to medication overuse and secondary to traumatic brain injury and other things that require much more work on the right.

What is missing from this that I think they would have put in is a fourth one that refers to musculoskeletal issues. We will talk quite a bit about that here and I think that that was a missed opportunity for capturing what our clinicians are seeing in their offices and more so than tumors and vascular disorders.

The misdiagnosed musculoskeletal results in your medication overuse of that because you're not finding the correct underlying issue. What is important to know is this website at the top you can leave off after the first international presentation of headache disorders third edition is ICH the and if you click on it, it has a nice roadmap on the left of all the different headache subtypes and takes them by category and subdivides them further down so while we talk about and they are really only going to talk about migraine tension and primary headaches there are other primary headache disorders. This is one way through down there just also another primary headache disorders are caused headaches and exertional headaches and New Delhi persistent headaches which was in your term and that was not there before but now it is more prevalent. These are all primary headaches and they're nowhere near as prevalent as migraine tension, but they exist and there is some subdivided options. This is the website link to go to, to find that.

Accuracy in your coding is to the benefit of everyone. Taking the time to really parse that out might be useful.

Next poll question. Which I ready give you the answer to. What is the most common type of headache? All right. 100% so far 27 of the people have put out tension headache and that we will take it. I messed that up I just give this talk to our fellows and realize that the question was out of order but that's okay. Would like to make sure we hammer that home

from a diagnostic standpoint. At the ideology we talked about that so lifetime prevalence and this is some old data, and this is a lot of what is going to more likely, two thirds of people have a headache and their lifetime and tension is much more prevalent than migraine and this is hitting those numbers home.

So now we get to epidemiology. We talked about the most prevalent type and now we will think about what's the patient coming in her office most likely going to look like. Is a little bit were different than DOD and VA but still important to recognize. Based on the typical epidemiology what you expect to see the patient with their first migraine will look like?

Those answers are probably skewed by the audience a little bit. If you are in the younger population and the answer at the top would be the most come with the click. If it is migraines is definitely more prevalent in females and sort of all comers not just within the are the or VA is more commonly going to be in middle age and as you go forward so this is sort of the answer when you look at general epidemiology for headaches. Kind of early 20s, mid-20s is less common but mid-30s to mid-40s or early 50s is the peak of the curve of migraine problems and it is significantly higher in females relative to males. So, if you're seeing the younger population I fully appreciate why your with checkbox 1 on that one. Becky, I will let you go now.

Secondary headaches are something that we see a lot in VA and they are really prevalent in our military and veteran population for practices in sports medicine the ones we will talk about primarily will be posttraumatic headache so it is aimed for the primary headache that it resembles supposed dramatic headache and present with variable symptom profile so it can also fluctuate.

It can be one headache episode looks like a migraine and that another episode looks like a tension or maybe it looks a little bit more neck-ish. So typically when somebody has a posttraumatic headache we will name it for the most common phenotype so we will say post traumatic headache migraine like or migraine type. Cervicogenic is one that we will see quite a bit and that's what we think are the headache is actually caused by nociceptive input from the structures. And TMD if any of you were in Dr. Hawkins talk yesterday you did an awesome job covering TMD and oral facial components of pain and how that related to headache. We are looking at a leisure dysfunction related to structures in and around the job.

So, pathophysiology and migraine are messy. Yesterday asked our fellows what it and they is got a whole bunch of answers and you really have a great understanding 100%. One of the slides he took out is that the vascular theory or standalone vascular theory is not something that's accepted widely anymore. Then 15 years ago it was thought to be a vascular phenomenon but really there is three overarching somatic things related to pathophysiology. Cortical spreading depression and activation of the trigeminal vascular system and sensitize. These are the three global things that are underlying the underpinnings of migraine and what often ends up happening is that certain subtypes they may have one more than the other dominating where they have all the above and they may be

more severe so as we go through cortical spreading depression that's but self-propagating wave of the polarization and is moving from that visual cortex posteriorly that's associate with the or migraine and there is love bearing permeability associated with it so it follows the initial the polarization and that is one of the initial things is felt to be migraine but then a lot of people have migraines without the are also it cannot only be associated with the OR. It starts often be kicks off some of the process and some the symptoms people feel associated with that and some early depolarization and the next thing that is often seen as the activation of the trigeminal vascular system.

Trigeminovascular system has a whole lot of inflammatory mediators and neuropeptides listed so from the left is to me and you got three big peptides, if you had to pick one to remember, CGRP and Neurokinin A seems to be the ones to remember. They are associated with neurogenic information and then your information can peek into sensitization so initial the polarization and then you get neuropeptides, and you keep having that information repetitively over and over in your nervous system becomes desensitized.

So, what is sensitization? This is the definition increase sensitivity to nerve stimuli is a simplified definition and you can get into periphery initially and then it can contribute to the sensitization and further amplification, and you get that continues on the scalp and this whole slide is not specific to headache.

There is peripheral sensitization in central fantasize nation that occurs and the initial acute pain and depending on a whole bunch of factors that can result in central sensitization but this is involved in headaches and some of the symptoms people have with nausea and some of these overarching concepts.

I was in Dr. Hawkins class yesterday he did a really great job. You will hear some repeated themes if you were in that so I was smiling to myself as he was going through his talk and there's lots of things that will repeat themselves in the talk today it's really nice to see the alignment.

We talked about this a little bit, so these are probably the symptoms that are associated with this. These are the sensitization probably related to the peripheral sensitization like throbbing, pulsating and a lot of people would migraine describe pulsating and throbbing and worsening with positions. Hyperalgesia which is increased pain with painful stimuli or increased pain to a non-painful stimulus.

The case we will reference back to a few times in this talk is a woman that we managed in clinic. So 35-year-old with worsening headaches on the left are unrelated to injury or trauma. Headaches have been present for two years and prior to that might affect an occasional headache maybe once a month feeling that squeezing that would be okay with some ibuprofen. Now headaches are bothersome and interfering with her job. Had tried Imitrex with that did not really help much.

Ultimately, successful headache management depends on a few things. Getting an accurate diagnosis recognizing that people are allowed to have two or more different kinds of headaches. We need to make sure we are looking at all the available evidence in their history and your physical exam and not just trying to squeeze something into one senior headache diagnosis. We need to address risk factors and address impact. Those are really the key things that you want to home in on when looking at headache management.

What are the risks and their functional impact? Ultimately in the acute phase 1 summary has her headache right now we want to give them relief but the long-term overarching goal is going to be prevention so reduce overall severity and frequency because what we see in the data is that role disability your inability to function in the tasks of your life are most related to the headache frequency per month and less so about severity so if you have one headache a month that's very severe, that for the impact you for that day but if you have many headaches that are debilitating and really take a chunk out of your day every day that ultimately impacts more of your ability to do the roles and is associated with more of the sequela or the comorbidities we see with folks with a chronic headache condition.

We want to focus on engagement function and improving disability and we do that by looking at severity and frequency of headaches. When we are looking at evaluation, the history is really important. There is mnemonics here to help you but colder is something that we teach trainees related to how to structure your subjective and these are the things we want to revisit as you react reevaluating is the headache getting better than we did not write that out but I have our trainees write up that acronym in their subjective sections so if we look it will come up.

This is a red flag that will go into more detail and review of systems because that is the practice so we want to see what else might be going on that could be contributing to this headache. We will talk about disability indices and outcome measures and the physical exam.

So, the quality. What is it like? Is it throbbing, pulsing, try not to plant words in your patients mouth about this so tell me what it's like? What do you feel when you having a headache? What you feel after the headache. Sometimes if people are really having a hard time finding words it's best to let them describe it in their own terms. And onset not only how does your present headache start so what it's up to than what's it like when he begins and when those headaches begin? Is it something you had your life and is a something that just started now or something that has changed? Just like you have those body diagrams if you're working a primarily headache focus clinic at the really good practice to have a more zoomed in diagram where people can color and indicate where they feel their pain and remember because they're allowed to have more than one kind of headache you might want to be differentiating that like this is my primary or my worst headache or I most frequent headache happens here that I also have this P1, P2, P3 phenomenon.

Duration, how long does it last? Is it seconds, minutes, hours or days and does it change over time? Exacerbating factors including triggers so

is there something that can bring on a headache and once you have that headache what makes it feel worse? And relieving factors. So again, specifically to headache history you want to know about frequency.

And sometimes you may need to ask how many days per month do you not have a headache or how many days are you headache free and again it is not uncommon for folks to have headache exacerbation while they will say I have my migraine are my worst headache five days per month but it will also just have a low-grade headache maybe 20 days per month and sometimes it is important to ask how many headache free days per month do you have? And associated symptoms. Nausea and vomiting, weakness and numbness and tingling or facial droop any of those responses. You want to make sure you are specifying related to photophobia and photophobia does that make your headache worse or does that just make you feel very good because you already feel crummy and you have about headaches of those or differentiating factors.

When we look at functional impact of headache there are a number of tools out there that you can use. There's a headache disability inventory. I like that one. I think it is nice and it's a little bit longer, it's about 25 questions but it breaks headache down into the questions that are coded into emotional and functional impacts, and it can give you a nice picture of how these and how the headache is impacting their lives in different ways.

The headache scale was an offshoot of a McGill questionnaire and it's a nice one. It's another one I think 15 to 20 and hit 6 is really nice. It is not free which is unfortunate you have to pay to use it but it is six questions and it is not very specific all the time. There's a question on there that says for example how many days would you like to take a nap or a rest and depending on your life phase that could mean that could not instantly be related to your headache. And MIDAS validated another headache type as well.

So red flags, we will look for systemic systems or there are other secondary risk factors which is why you review systems and your medical history is important. We want to make sure we are paying attention to any new or changing headaches will have a history of cancer, HIV anyone to look for neurologic symptoms associated with the headache or that are a new and something that has a headache. Sudden onset so that's the idea of that thunderclap headache. Those are high risk and need additional workup and if your patient is older and over 50 and that is the first onset or that had a significant change in the kinds of headaches that had.

Previous headache history I keep saying change in pattern. Those are clues and postural positional change and precipitated by a [Indiscernible] we give this talk to her primary care colleagues this is one that's a little bit anxiety provoking for them because not everybody is comfortable with identifying were screening for papilledema. It just takes practice and looking at some normal and abnormal and what they would look like so this is a population that you see and I recommend grabbing folks and practicing looking at their eyes. Relevant history again looking at past and present medication use and you want to look at dosing of those medications particularly because could there be a

medication overuse component to this in they have not been titrated up to therapeutic dosing of medication. We want to look at medical history and family history, so migrants tend to run in families and we want to look at mental health or comorbidities. I'm going to have you started this one.

From exam standpoint these are the main global things you want to cover for headache so you want to do a cranial nerve evaluation and the complete cranial nerve evaluation like spreading including looking in the eyes and neurologic exam and myofascial screen and evaluate the cervical spine and related to all those thing that we go through here so neurologically at a minimum you want to do cranial nerve and look for pathologic reflexes things like clonus, Hoffmans in the head where you holding the hand up in your flicking the nail bed and lifting it up a little bit looking for the fingers and to just potentially lesion in a session their gait and balance and vision typically physicians are not going to a full visual screen but look at visual and assess for basic vision but definitely a visual check is appropriate because I can be affected in some headaches as well.

Musculoskeletal you definitely want to do that exam, so we have a lot of stuff here not a silly potentially has a provider you're granted every one of these exams what you want to the range of motion and look at the general posture and assess upper extremity strength and see if there is any specific rotation deficits or asymmetry if they rotate to the right and rotate the left and became very good and that brings on a headache that's information you will use to the site is a day musculoskeletal or joint thing and if anybody went to the or facial you want assess how well they can open their mouth and the opening and closing are there any deviations of the job learning clicking and pop being and whether they have at the moment or even by history nd is that occurring with members of pain worsened after eating the have worsening headaches and it's jaw pain and myofascial pain related to TMD or TMJ those are things you want assess and expand, inspect and look at the teeth and mouth.

From soft tissue exam you have to palpate and parent cranial region and sub occipital region and the upper traps and we talked about the muscles anyone to palpate all those things they may have tenderness there and you want to ask if you have tenderness doesn't refer up to your head or does is bring on your typical headache and otherwise it may just be a tender point like sitting in a video chat all day long five days a week but they are different so if you're palpating and you're heading on that are you hitting on the pain shooting all the up to the head is going to be informative. To that's also going to be done by the rehab colleagues and is less likely going to be done by the physician groups but if you're worried about that you want to talk with your team making sure that is being evaluated as well.

Well now back to the case. 35-year-old female presenting with worsening headaches and the world treatments have not been overly helpful. So this is our patient, you can get a sense of what TV show so the character of the headache is throbbing and pulsating and onset she describes these headaches as the gradual and onset and they will intensity over the course of about one hour so we talked about the left periorbital behind

the left eye and they last up to about one day so most times hours and not too much longer typically and worsened by activity and exercise. And relieved by wind out in the cold dark room cold back on the head quiet very common description of headache and relieving factors that the patient will tell you. The frequency headaches about the headaches per week for the last two years. So, over the last two years of been relatively stable but three times per week pretty consistent. And associated symptoms light and sound sensitivity does not vomit but have not shot. So, using that colder gives you more information and note your symptoms. And gait and balance and visual changes and sorry the coloration change no other red flags were noted. From a functional standpoint this is a hit HIT-6 score and you want to talk about how severe those are.

That is pretty up there. HIT-6 that is towards the top end of that and MIDAS that's the upper moderate or severe.

Medication standpoint she's taking ibuprofen once we got overly effective and still trying that is not doing a heck of a lot and is a family history or medical history of asthma and both her mother and grandmother had migraines and she has a mental health history of anxiety. Married with no kids, does not smoke, drinks too much alcohol drink per week and has about three cups of coffee per day plus an energy drink. My dear the life will be like the energy drink said one cup of coffee but that is been a decent amount of caffeine intake. From a lifestyle standpoint sleeping pretty well, exercise is about 30 to 45 minutes 4 days per week Eats regular meals occasionally misses a meal for every day because the work and then hydrates drinking about 316-ounce bottles of water, about 48 ounces of water per day. And really the exam pretty unremarkable that's the easy way to describe it. Neurologic exam did not show much in some diffused myofascial spine and some trigger points but they did not refer to the headache and the TMJ exam was unremarkable and really the motion was good and did not exacerbate the headaches and nothing suggesting too much of a musculoskeletal headache so now with all that information in the background history and the holder history watch is your working diagnosis right now.

That is the next poll question. Looking a pretty solid trend there. The bulk of people listed chronic migraine headaches so we can pull up to the next slide here.

The diagnosis is actually episodic migraines and the case is put together a purpose for a couple of reasons so to help you differentiate episodic and chronic migraine headache and we will get into the specific diagnosis of chronic migraine headache but it is based on the number of headache per month and all the chronic headaches have to have at least 15 headache days per month of any type and there's other descriptions if you have less than 15 headache days per month you don't by definition of a chronic migraine so that the person is a long-standing episodic migraines and is important as you're debating what you're going to do for treatment and what your treatment options are an appropriate base of the diagnosis so definition and differentiation between client episodic is important so this is episodic migraine.

She is right on that precipice between episodic and chronic so our goal is to meet and get her function to a level that's acceptable for her but we want to put something in place to keep her from tipping into that chronic migraine diagnostic category. So this is for everybody give this talk to an almost anybody picks chronic migraine and that helps us navigate through the definitions so this is from the clinical practice guidelines so the DOD clinical practice guideline which if you Google VA dear the space and you can find headaches from there and we were looking to work on this clinical practice guidelines of this is a nice table so it has your migraine and your cluster and tension headache all in one place and gives you the things that differentiate them so we highlight this.

As you go to the next slide so migraine headaches are going to be usually hours to a day or two typically and they are more moderate to severe so not as mild in severity and not as severe and they are more typical unilateral in the throbbing and pulsating and aggravated by routine is a pretty consistent historical would migraine headaches and the light sensitivity and sound sensitivity is a qualifying factor and nausea and vomiting as well and to we people don't have autonomic features and was tension headache is more often a bilateral squeezing type presentation and it is not by definition aggravated by routine activities or exercise activity and should make the tension headaches better and they should not have both light and sound sensitivity and should not have nausea and vomiting.

I keep saying should over and over because it's all spectrum and were talking about there is no clear demarcation were some of the has a migraine you cannot have features that blend the other way if you can have mixed headaches is important to recognize that but I definition when you ask your questions and taking your history you're using this information to figure out where the algorithm you're going and what you're more likely to target for treatments based on that diagnosis and that was the goal number 1 is making a good diagnosis and release the best items that you can and decide how to treat accordingly.

Cluster headache which we will spend more time severe and unilateral and in the trigeminal distribution cluster headache and their shorter lived and there really severe and they can be stabbing and boring like an ice pick in the eye and people are often very light restless whereas with the migraines the cold dark room they will want to move around, and they cannot get comfortable and they want prominent features.

In our case of at least this you think you should order imaging in this case? I think we are about 23 so just under half but pretty heavily weighted towards the ordering imaging so you can move that and there we go. Would agree with that I would say probably not over imaging in this case patient has two years of his stable pattern and if you've got that patient at the point in which they were one per month and it change significantly they had any other sort of concerning neurologics and we do more work up when you observe the patient it's been a stable pattern for two years is unlikely will find much on a workup that's concerning. It is not that you could not do it. You can probably think through how to

change a pattern over time but that two year of stability it is still there but it's two years of stability would argue against meeting anything urgent from an imaging standpoint but it becomes a greater change in pattern.

We have to balance that. What I like to call the itchy trigger finger for imaging that need to know her to have a look we have to balance that with the unintended consequences. What might they find that is benign that might send this patient into a tailspin? But if you found in my opinion if you found anything neurologic or any other complaints of visual stuff the gait instability dizziness anything that's abstract and classic case plus a change in pattern and in the absence of that ultimately not order imaging. These are this multiple different like American College of Radiology guidelines related to what you do when you are imaging if you can Google that one it's a huge document. This is from many years ago, 15 years ago like three buckets so working right to left in this case. Any of the bad stuff like meningeal signs, neurologic deficits, had a with cognitive impairment and imaging in your word about intracranial process and central nervous system process and the process is you have cancer or immune compromised and they have nuanced headaches or worsening headaches change in pattern and you should order imaging and get workup and is in the very middle but if a patient presents to the first headache in her life and over the age of 50 that is a red flag and should be evaluated with imaging and a full workup and in our world where developing a greater Mendoza patients that are seen by neurology for a full neurological assessment and they may come back to our world if everything is unremarkable.

And history of headaches history of seizures and they have not had headaches and having changes in the patterns you get a workup for of that. First or worst thunderclap yes, worsening frequency yes, progressive yes, these are the ones not so clear, and I think it's debatable on the left which is chronic daily headaches and there is no good indication for that. Headache that's always on the same side again not the greatest and once you define them the tend to stand on the same site. A lot of people would migraine system the same side and the problems on the right side does not often cross to the left. It can but it does not always.

A headache is not responding to treatment you may have to reassess the treatment more than workup looking for something sinister and it's all about the pattern and the stability of the neurologic symptoms and overarching presentation and less about the chronicity and lack of response to treatment. Just putting that out there.

What is the first step in managing this patient? This is a short answer which means you get to type. Choose your own adventure. Episodic migraines and tried [Indiscernible] of the great. With a couple of seconds. So far, we are going with the caffeine and acupuncture and PT and add TCA and acupuncture and tripped in rotation try different tripped in and I am assuming you're addressing energy drink for hydration giving them were battlefield. Vacation. I like that. Nice.

I don't know if people can see is a scroll up and down. We will talk about a lot of this stuff and we will cover a lot of this stuff so those are all very reasonable global soften how you can approach it some lifestyle stuff so medication some alternative options so we will talk about those.

This is a slide I borrowed from somebody and I don't remember who the guy was because he was lecturing in front of me in the conference so I was not even planning on paying attention because I was prepping for my slides and it was on the best headache two slide back to back that I've ever seen because it simplifies mentally a picture of how do you approach headaches. So he had his former bubbles, addressing medication overuse, acute management's appropriate meds for that, medical migraine prevention, natural migraine prevention so lifestyle modifications and addressing overuse.

These are the four buckets that he said these are the things you to think about entreating somebody and he broke it down further into three buckets. You should always in the yellow consider inappropriate medication for acute attacks or appropriate treatment to come up with a game plan people have a tool to use and depending on the number of headache days per month you decide how much you elevate entities other buckets so somebody is having five headache days per month you probably don't need to be considering the medication overuse because is not tipping them over and you probably preventative is not as much indicated in those cases. They are less necessary so you will focus on medical migraine prevention and lifestyle modification and if they tip over 10 days per month and a little more than two headache days per week you may be thinking about the additional repetitive because whatever you're doing for acute to your lifestyle is not cutting it so you may want to add that preventative and you will still duty lifestyle stuff. If you have somebody showing up in 15 days or more so 15 to 30 days, you want to step back a little bit and consider medication overuse might be at play. You want to step back and say what are they using and how often are they using it and how many different agents are they using all the time so it is not that each of these agents will talk about find timelines. Will start using whole bunch of things.

It's a nice way to think about breaking down your initial approach of what you're going to do and you're always going to be the one that is lower in the algorithm in addition to whatever you had on. So natural migraine prevention. You want to get people back to work in the should be active and remain active benefits education get back to school or get back to work and duty get back to duty and sleep, good sleep is super important. Eating regular meals and not skipping them and being active in exercising and hydration was mentioned and somebody mentioned caffeine introducing stimulants either reduced him down or eliminate them if at all possible and if you're drinking 5 to 6 cups of coffee is you don't want to stop cold turkey but temper them down in these caffeine - containing medications is important to consider in addition to coffee or tea or energy drinks whatever it might be and looking at triggers any triggers that might be occurring as well and how do they avoid or manage those triggers or some triggers you cannot avoid but how do you manage

them appropriately and complete avoidance at all is not good. If your trigger is work, you don't want to avoid work.

The one thing I like to say is avoid avoidance. We want to make sure you're not making your world smaller and smaller because that by all indication for headache and for chronic pain and for mental health just makes everything worse. Nothing good comes of that so we want to encourage you can attend school or work, if you can muscle through it, you should do that. And related to triggers we want to help people identify what they are and see if they can modify as opposed to saying no, I never go into that area because that brings on a headache or I never eat that. You want to be careful with absolutes so never and always and see if there's a way modify. So, we want to make the numbers very very little because that is problematic. It makes her management really difficult. And reduce stress.

Definitely work on stress management. Next poll question which is how much caffeine is considered too much caffeine. Your options are 120, 200, 350, 450. This is the first answer we had in a while. Looks like we had about pretty split between 250 thinking for couple people it would be 450. The answer to the question is 450 is too much and a lot of that is based on recommendations to limit caffeine and headache related scenarios reported milligrams and the cut point for 50 so you can see for couple coffee depending on the type of coffee it's 100 and 200 milligrams per ounce is a couple cups will get you there and as you can tell I've been drinking tea this entire time and I don't typically drink eight cups but energy drinks five hour energy has a lot of caffeine in it and there's other ones that are more depends on what energy drink you're looking for see want to be counseling them based on if you're drinking combination of these items it may be contributing to the overall caffeine aspect of the headache and again, how do we paper this down how we can get to a lower amount to see if that helps. That is important.

Food triggers, there is multiple triggers that are pretty much associated with headaches and migraine headaches so pretty consistently there and high nitrate stuff they can associate to MSG and different substitutes and alcohol. That causes vasodilation to but he may be adding to it when it's nitrates. These are all things for the patient to consider when you get your history what are your triggers? Are the things associated with it and trying to identify that? We got to be typing about the caffeine.

Caffeine withdrawal that's why we have to be careful with that so we will often when addressing lifestyle, I will help patients come up with a taper plan, not unlike the medication taper but we will do that sometimes with alcohol or sometimes we will do that would caffeine and sometimes I like to pair it with something else if there are other hydration and if caffeine containing beverage was the main source of hydration we will work on replacing so titrating down stimulant and titrating up water or other hydration options. Nicotine is again, that falls into that stimulant use, so we always advise our patients who are using tobacco product that nicotine -containing products in general to decrease or eliminate those.

Thank you, Alan, for a much better version of 400 milligrams of caffeine in apparently two 5 hour energy is enough. From this point forward as, we go through treatments we will talk about recommendations that are in the Department of Defense and will highlight those as you go through just include this. This is the next one which is the suggestions from that was education regarding dietary trigger avoidance for the prevention of migraine. So there is some evidence that suggests that is helpful so one the questions how do you frame this?

Again, the way we would talk about this with our patients has to do with their overall lifestyle and choices and I think motivational interviewing is a really great tool to use here when you're sunny get into discussions related to lifestyle modifications and readiness and willingness for change. I think you want to be careful when you want to know your patient's history if they have a history of an eating disorder or a food relationship you want to be thoughtful about this and you may want to start thinking about bringing in one of your behavioral health colleagues to consider helping address some of these issues because want to be careful that we don't lead somebody down a pathway that will get them into more trouble without a lifeline. I think those are really things to be thoughtful of when talking about by triggers and then talking about what you have in your social situations. That is going to happen to me in about one minute here. That's our testing of the notification system so there we go. Excuse me.

Those are ways to have those conversations in a thoughtful manner that really looks at the whole person instead of just saying drugs give you headaches. There's a lot of stuff in food without being specific and helping a patient really home in on what their specific triggers are. To just say things would nitrates. It might not be all things with nitrates and that can just be a generalization you're throwing out there and it might have nothing to do with nitrates. Headache diaries are really nice tool to use here before you go on a path of elimination or avoidance.

So nutraceuticals there's a number of options out there. The middle three magnesium work you 10 have mixed evidence. Magnesium probably being the one with the better evidence and headache and this recommendation here is specifically from the Academy of Neurology that is their last practice guideline or guideline for medication use and as of 2012 so nine years old has not been updated recently and is probably coming sometime soon in the Canadian Headache Society so you can see they both recommend but her brothers issues related to liver toxicity so that's not a great one and not one that we often recommend that people to get that or the ordered on Amazon or we get a supplement and take it so I'm not a huge proponent and there's not a lot of great evidence on it. No high-quality evidence but depending on the risk and benefit analysis you may consider it.

Magnesium big issue would be diarrhea if you're getting too much magnesium that could be an issue and that's another one that's on the list fever few but the Canadian Headache Society recommended against it actually strongly so that's when we don't usually recommend.

If you're in Canada, don't take it. If you are here -- just kidding. It's not something I would -- people are using it is surprising amount when I

first learned about this and I asked the patients and it is more common than I realized so I have been sharing this information in patients and just saying hey there's some conflicting recommendations but anytime it comes out with a strong against I think it is worth a caution.

So, from an acute treatment standpoint we talked about these early slides in the goal is to really knock the pain out at that two our window. A lot of the studies on acute treatment will get 30 minutes or two hours how many people are pain-free in that window that's with a usually uses the outcome measure in the studies of their optimal and when you're getting into the 15, 10 to 15 days per month of headaches but you're having less headaches and the maximum 2 to 3 days per week of those acute treatments are really based on if you take too much of it in the most effective and not waiting until they're having a lot of issues and symptoms and their less effective if you wait until later in the presentation. As far as guideline recommendations this is just one quick snapshot of what is recommended so a strong recommendation means that there was good evidence for it and good outcomes for pretty consistent across literature and a combination and I will be frank with you back in the years he never had that in there and the evidence after we work on this guideline was that for people that the combination is really good for people who don't respond to that alone and it's pretty good in isolation to.

It is a reasonable thing to consider any don't have to do some fancy-schmancy combo drop that probably cost way too much. As far as the other medications the suggestion is not quite as good evidence but still evidence of so they're less likely to reduce and read assault and medication overuse and they tend to take Tylenol too much and other Triptans medication options are not always as effective and there in your back pocket if you can tolerate it.

I'm going to in the interest of time move ahead because there some stuff in here and we will get to that. The next poll questions we just told you that Triptans recommended and also potentially in the next group suggested but if you're thinking about Triptans, what are the contraindications to Triptans? Choose your own adventure and type some answers.

So for hypertension, pregnancy, cardiovascular disease uncontrolled hypertension are in there a couple of times in recent MRI is in the chat and see BAs in the chat and those are all appropriate considerations so we will pause there those are the ones you can see here so control hypertension in all of these through there and all of those are in there and am not listing every single one because it's a long list in addition to the ones listed I agree with Nancy and recent stroke but the big ones remember in addition to those are ischemic heart disease or coronary spasm and uncontrolled hypertension for sure and there is a little bit of debate over this one because if those conditions are not really a constrictive issue than giving somebody that is probably not a huge issue but they are listed as potential contraindications so in the case three have somebody with a hemiplegic migraine unless you happen to be differently neighbor and urologists I would probably consult them for their input related to safety and that is what we generally do here.

We ask and we had people with aneurysm and hemiplegic migrants, and we say what are your thoughts on safety so we have a step back to look we are not missing anything, and somebody listed monoamine oxidation inhibitors so that supposed to be within two weeks of discontinuation as well so pretty good because almost nailed them all so that is great. And other options there are these dopamine receptor antagonists there a good option to consider. So, their options and they help with headache symptoms and with the nausea and vomiting and their beneficial options within reason making sure people not taking them constantly in high doses.

When we think about the phenomenon of sensitization, and we think about that barrage the peripheral barrage into the central system the antiemetics can play a nice role especially for those people who might be a little bit prone to the sensitized picture. I think that's the group that I see once to physicians puts him on a medical certificate into the largest impact in.

I am looking at the chat. So, we have this in your group here of medications that have become a more accessible in the last couple years and there is this small molecule receptor antagonists and remember in the diagram earlier when we highlighted EGRP is one of the vasoactive neuropeptides that are probably involved in migraine pathophysiology.

Talking about that there was a question in the chat related to for those on the phone and not on the computer there is a question related to Zofran whether that would be something that's appropriate to be used. It is not inappropriate per se, but it does not have as strong evidence of the others that were listed in the slide when we show from the evidence review. That used to be something that would work for somebody that I don't think there's a reason not to.

So, we talked about that. One of the things that's important is to go through as we get into this new fancier drugs on the market that are on all the TV commercials it's knowing that just because it's advertised does not literally mean it's more efficacious than something we have been using for years and years and years so a lot of the slides will have what the drugs are and I borrowed them from one of our former pharmacy residents was fantastic and put together a nice talk and it has a number needed to treat for pain reduction and they're not a small provider pretty sizable and they were for every single person so it's important to recognize that the two the biggest ones are the two on the market at least with really well evidence-based right now and notice while they are effective, they the placebo group does pretty well for the most symptoms so MBS is most bothersome symptom, not the Saudi Arabia crown Prince.

So 25% in the placebo group did well so only 20% better but it's pretty good but it's still pretty sizable for those. This is a typo. I apologize for that Lasmitidan is a receptor agonist it is in agonist and the next slide correct that in a binds to receptors in the nerve endings that are complex and what's really important is there are not 5-HT one receptors on blood vessels so there is no vasoconstriction with Lasmitidan so there's a potential for a lower cardiac risk. Gepant don't have as much

cardiac activity so in that category of people who have Triptans contraindications you will think about your gepant and Lasmitidan and I did a little search yesterday when I was talking to our residents and fellows as to why you pick one over the other and there was a systematic review earlier that was published on these two methods of drugs looking at efficacy and adverse events and Lasmitidan seems to be more efficacious than the gepant for headaches but has a larger adverse drug reaction with dizziness and somnolence and they felt that they were that the dizziness and somnolence could impair routine activity so now you're treating the migrant symptoms but they don't feel good enough to go out and be active so it is your fighting yourself as you're trying to treat it so they felt that even though they may be fairly more effective that it may be better to consider gepants. There is a little bit higher up in the algorithm of things to use for an abortive agent.

I will have you address the question or the statement in the chat, Franz.

Some patient developed -- are you asking about a specific patient or the risk of patient? It definitely can happen, and it can happen with that as well. I would agree with your statement. It can occur with any of those agents I listed earlier, and it can occur in combination I think we're likely so I'm not a huge fan. I'm not out there selling you should use the dopamine agents. I tend not to use them. I use them very infrequently and that very low doses once or twice a month because every pain medication the penny or practice when you start somebody on something they tend to be on it for life on this to get them on it off of it. So I think these are things you want to probably use a very targeted and very infrequently and really assess the efficacy to decide if you're going to give them in short amounts as people start taking them multiple times a day you start to run into problems.

I think what is nice is that begin with the end in mind especially for PRN medications. And have that conversation upfront with the patient when you are not even talking about a trial and acknowledging that you're hoping to have them not all for a long-term and what the offering might look like or the assessment phase and then the offering.

The aborted Triptans when you look at the number needed to treat for stuff so they're pretty good so the old stuff at the bottom really has much more efficacy across the board than the nearest stuff. The nearest stuff is there when you cannot use the older stuff and the side effect profile for other contraindications that's when you're moving up the ladder from bottom to top but really it's the best evidence-based the same number needed and these are the ones that are good options to consider when you cannot use Triptans are not nearly as strong so they are there and you should be considering it for that ischemic heart disease patient or stroke patient who have migraines and you cannot treat them if you don't have that tool in your pocket you have to go to another one and balance it out.

I'm reading the questions. I apologize. You read questions and I will go to the case and then you can answer the questions. That is a quick one.

You want to answer that? There was a question about dosing, and I will put that in there.

Back to the EB case. Here is a review we do not want to have to remember all about so she has tried both and she has tried ibuprofen. The question is what is the best medication approach? I think that is multiple-choice. Yes.

Let's see if there's another question in their related to that. We are getting some lifestyle modifications. Botox. Critical mass. 63% of the vote we had lifestyle modification. I think that when we look back at the graphic that Dr. Macedo showed and that is our next slide here, she falls into this category here, this medical migraine prevention because she's having 12 headache episodes per month. She is not quite up into that region but when we look at this been diagram for a reason. There are things that we might look at to try her on one of the gepants since you did not have any effects from Triptan and Naporoxin. I think lifestyle medication is important here and I think we have already addressed the concern for her caffeine use. We want to look at what should we be considering for prophylaxis?

When somebody's daily routine is significantly affected by their headaches and by their frequency of headaches, that is really what we want to be looking for it's time to get a prophylactic medication on board, more than two headaches per week requiring abortive use because and we're starting to worry about the potential for medication overuse headache a rebound. And if the abortive medications are ineffective, contraindicated or overused. I definitely think this case would fall into a good option for a prophylaxis. When we are prescribing prophylaxis, when you're trying to see if this effective, once you titrated up you're really looking to reduce frequency by 50%. Some our patients would take 30% of be happy with it but I think you should really swing for when looking at titration and balancing of that would potential side effect profile to target 50%. We want to make their abortions more useful for them and I think when people get on a really nice prophylactic treatment they do find that they are more responsive to taking the abortive medication. Again, quality of life, daily functioning you have to look at what are you measuring? That's when we go back to the smart goals and go to some of those headache disability indices, the MIDAS, HIT-6 those are all things you can use to objectively measure the impact of your prophylactic prescription. And again, balancing all of that with potential side effects. We brought it up and I see that if you put somebody on something that is making them unable to participate for the headache that's making them unable to participate, is that really a win?

Next medication recommendation. The next thing that came out of the clinical practice guidelines was a strong recommendation for angiotensin receptor blockers for episodic migraines. As a preventative it came out as a strong recommendation and again something I honestly did not utilize a whole lot before and am not running and starting everybody on angiotensin receptor blockers but it was pretty good and there's other ones that are most commonly used so the ARB are not really in the guidelines were as the other ones are in there pretty well studied and

oral magnesium and EGRP antagonist which we will talk more in detail are also recommended.

In the CPG there are specific denoting descriptions related to this on the lower end of the dosing, but I would have to look up the exact dosing I can look it up in between and tell you exactly what it is as I step aside from talking. So, we will go ahead here. Important is insufficient evidence stuff. There's a couple of things I will go through this so Gabapentin evidence had insufficient evidence and it's kind of a wash and is not trending really strongly and there also is not such a negative burden or harm or we should not recommend this at all or avoiding it but there is not strong evidence for this Gabapentin for headaches and that's important to know and not so much for migraine and is a drug to talked about the nutraceuticals, CoQ10, melatonin don't have the greatest evidence and we talked about that as well and some of the B6 and B12 even melatonin there probably pretty low but it's not quite the same many have potential adverse events.

At first combination pharmacotherapy that together random Triptan there's not a lot of good evidence. Is emerging but when we did is in 2020 was not that great. It was early 2019, 2020 and Valproate was a controversial one. One, consistently in all the recommendations for preventative medication or prophylactic medication for migraine however, the evidence is old and we do clinical practice guidelines for use the most recent evidence are in for this one it was a you and for about one decade worth of data so nobody is out there starting this in detail because there's not a lot of money in that so that's how studies tend to happen but even the systematic reviews have some benefit but the large side effect burden associated with that and because of bad the clinical practice guidelines were insufficient and they felt that it should be probably lower in your algorithm that all the other drugs that have a larger safety profile and efficacy.

The other one is abo/ona-botulinumtoxinA a.k.a. Botox. And there is other variance but for the prevention of episodic migrants is so not chronic migraines, episodic migraines there is no evidence for the use of abo/ona-botulinumtoxinA. Everything is messy because at 14.4 days people have significant burden then at 15.2 days of headaches per month but the definition of chronic migraine is 15 headache days per month for any three months in your life so it is the definition in a very simplified one. If you don't have that botulinumtoxinA is probably not recommended actually may be more harmful than beneficial for episodic migraines. Part of that is based on the number of headache takes which it improves by which is 1.2 to 2 headaches per month that an improved. The harms benefit analysis is not great for the headache burden.

Other things so your beta blockers contraindication to patients with asthma or under other treatment and have a lot of dizziness or syncope stuff you want to be careful and your anticonvulsants this has a lot of profiles so waking, hair loss, tremors all this other stuff and then thrombocytopenia and a big side effect burden and this is not indicated for childbearing age, topiramate and for people who are very thin you want to be careful and also carbonic and if you have a history of kidney stones you want to be very careful not to give that so in your history

want to ask those questions if they are of childbearing age and history of kidney stones and that is important to consider for a lot of weight loss issues if they are very thin you want to be careful. EGRP antagonists are monoclonal antibodies these are the big ones on the ads so those are most advertised out there. I will not even try to say all of the drug names. The bottom one is the one I can say easily but they are subcutaneous infections, and these are FDA approved for the prevention of episodic or chronic migraines.

A little stronger for chronic migraine from the sort of burdened standpoint. They cost 5 to $600 a month, depending what drug you pick and with which one you do. This is another quit chart snapshot. At the top and legality. You can see the number of mean migraine days and the reduction in that and again, only 1.2 reduction less here and two for modality and in between the two. The side effect profile is not terrible.

It's interesting, so, for whatever reason, Erenumab has more constipation associated with it and the other two have a relative caution for history of cardiovascular disease and it doesn't have that thing. It's probably the same general overarching match, but they're not exactly the same. So that mechanism in the second category, they're all monoclonal antibodies and act in a different place. So, Erenum -- it doesn't allow it to bind to the CGRPentisor. That binds to the CGRP receptor and keeps the peptide from bending to the receptor. Works similarly but not exactly the same. They might have a different profile. Double checking to make sure questions don't pop up. From a preventive drug treatment standpoint, this is also the same thematics. Start the low dose increase slowly.

You should be assessing efficacy always throughout and have a good starting point. Starting point. And then eventually move over and kind of figure out if you're piling up at two or three months if it's getting better or helping. Usually, you don't want too much. There is so much going to, you're not going to know right off of the bat and you have to consider all of the things that will interfere and a lot of those pregnancies are sort of contraindications in a lot of drugs and this is just another quick summary. It shows you the next of headache days improved or migraine days improved.

For Propranolol and it's systemic stuff in there and great limiting stuff. The reason why it's called Dopamax and works on the issues associated with renal, prevented and the next strongest thing going down. The new fancy things are not strong for reduction in headache days. The side effect profile is not as bad and that is often why we, people are excited about them. They tried a lot of things in this list. People can't tolerate the side effects and that is where you should be trying the things lower the list that have better evident. If they can't tolerate, move them into the higher-up stuff on the list opposed to be excited by everything now and fancy. There is a new and fancy drug every single day. And the new fancy device every day. All right.

So, Hopefully, we're have a pause here in a second. Which of those are part of the criteria for the diagnosis of chronic migraine? That is pretty good. The vast amount is greater than 15 migraine days per month. And then some people, about a third of that amount said 15 migraines and

migraines for at least six months. Okay. So those are the sort of strong answers. Nobody thought it was eight or three months. And this is the definition. It's actually important to know the definition. So, it should be 15 headaches days per month. Not specifically migraine headaches. You can have tension headaches or a migraine-like headache. I am sure probably always going to argue if you have a cluster-type headache thrown in there. 15 headache days per month of which eight of them have to be migrainish. Right? Migraine with aura or without aura -- aura and knocked it out with triptan, right and at least three months. It's not three consecutive months but any three months in your lifetime. If you have had any three months in the lifetime where you had eight migraine days and 15 headache days, you, by definition, have chronic migraine. Even if you don't have 15 headache days now. At any point in time, you had three months like that, that is the definition. Typically, people have it and then all of a sudden don't have it. You're not going to treat them with crop, migraine. They previously had it and got better. Generally, this is the definition. With people tip into the 15 days month, they hang there. You don't see a lot of people 15, 16, 17 and manically seven without treatment. Often, they're building up over time and the sensitization is getting worse and worse and worse.

And without intervention, I have never seen anyone spontaneously reduced out of a chronic migraine or diagnosis without intervention. I was answering a question in the chat related to protocol for pregnant women who was on regular prevention. And then become pregnant. You really optimize nonpharmacological treatment. It sucks. One of the nice things, we have often seen with the female patients who get pregnant is a reduction in the positive way related to their headaches. We have seen it the other way, but I think it's not uncommon to see an improvement as well. Still, that anxiety is there related to, well, I am on this proof lactic for my headaches. I think it's okay to let them be hopeful in that their bodies are changing during pregnancy, and it might be that their headache profile will be okay. Even without a prophylactic.

All right. We're going to move on. I am going to crank faster here for the moment in order to try to get to our break on time here. Here's risk factors for chronic migraine. So, there is modifiable, nonmodifiable stuff. The modifiable stuff is the one I will spend energy on, right. Looking at the account med overuse. Did they have bad treatment? Did they do a better job addressing lifestyle in the last five or six bullets there. You want to spend time on those thing. Botox or botulinum toxins are FDA approved for chronic migraine. There is specific protocol. We're not going to go into depth.

A couple of things suggested by the VA/DOD and the studies show that patients when they had and didn't respond to the first one often sometimes the second or third round would result in benefits or they would have an increase with the first or second and second and third after they hit the third, it was not much of an improvement arc. It's reasonable to consider that, even if someone feels the first round, unless it's intolerable side effects and they're based on the pre-empt steadies there. This is back from our "Game of Thrones" phase and does your part have a headache? It's interesting. We were looking at this. Patients with sort of ocular imploding headaches were more responders to

botulinum toxin treatment than exploding. Feeling like the pressure is going out versus crushing in. Those with the crushing inward ocular headaches were a higher responding rate relative to the other group. It's something to consider.

You look at the patients and they're presenting what, does it feel like? Does it feel like your eye is pushing out or crushing inward? It might be more apt to say, let's try Botox for that reason. You might respond better. That is both evidence-based and also a little harnessing placebo. It's super important. If you can't harness placebo, work on it. You want to tell people were you're going to be beneficial with this and that is probably going to engender trust and they'll feel good. If they feel a benefit, that will enhance that further.

All right, so, other migraine prevention stuff, there is some suggest stuff here. Suggest is really just for acute migraine. We threw that in there really quick. The siptheital nerve block that we will talk at the end about for account migraine treatment. You come in and have a severe headache, you can knock it out. It's not a preventative but in its own grab-bag group. And IV magnesium for account migraine treatment has evidence as well for CPG. We're going to be done with motion rape in a second and leave that -- migraine here in a second and leave that topic. Other questions? I think we have a break now. If you have questions, feel free to put that in the chat. We'll take a -- how long, Becky?

We were going to go through cluster before taking a break. I think it's a good time to take a break now, since we're an hour and a half in. Do wouldn't to do -- do we want to do, can people make it there and back in eight minutes? Bio break? Your body?

We'll pick back up.

Answer questions in the chat if you want. I will recap when we start back up. If we can start back at 10 tills. There we go. Look at. That never mind. Wonderful. Awesome. Thank you. I will answer questions as we're going through here.]

All right. As people come back, Dr. Macedo put in the link to the clinical practice guideline in the chat. So that is nice. There were some questions related to, let's go back. There were questions related to oxygen therapy. We're going to cover that in a couple of minutes. There was also a question related to the orbs. Dr. Macedo put in some dosing related to what was studied and ketamine for migraine. I am not going to talk about this. I will let Dr. Macedo mention it.

Yeah, so, I wrote a comment about ketamine at the bottom, which I think we'll have the bullet from the clinical practice guideline. I wrote them which is the case. The headaches with ketamine are limited. Pretty heterogeneous and not controlled studies, so, the data is not considered to be high-quality. That would be the kindest thing I can say about ketamine for a headache. Because of that and the negative misconceptions of ketamine and it was suggested against or recommend against. I will pull it up as we get there, and we'll have that slide. And we'll make sure to have that discussion as it comes up as well and we're going to

move pretty efficiently here. Please ask questions. We can always back up to stuff. I will probably go into my default mode, which is talking really fast and Becky's default mode is talking faster than me. If we talk too quickly, please let us know.

Why we work well together. We covered migraine in good detail. Covered the evaluation and specifics about it. We'll talk a couple of slides about tension make here to kind of, because it's the most common headache. It's lower intensity, but people still present with it. Becky and I were with some of our headache clinic staff or headache clinic staff at the conference where one of the neurology staff that presented this Boston, a really, really well-done conference. One of the states they said are all headaches are migraine until proven otherwise. We all shutter inside our rehab world, oh, no, that is not right. A lot of times that is how people approach it. I don't know who was talking about it, but someone said if you're a neurologist, everything is a migraine. If you're a PMR doctor, everything is [Inaudible] if not, you're hoping to get one of the two diagnoses, I guess. That was from yesterday. Which is true. You have your own filter. You try to make something for the box.

And tension headaches are the most common type. They can have the symptoms we talk about. Lower 9 it [Indiscernible], last longer and they're advice-like and tend to worsen in activity. Why do they happen? I don't know. Welcome to my answer every time I give you a pathophysiology. Probably a less severe version but more sensitization and less of the other stuff. The spasm, cervical referral might be involved as well but not sure if it's a chicken-and-egg issue.

Episodic and chronic are subdivided. So, episodic is, you know, greater than one per month. Chronic is going to be very similar to the other definition for chronic, which is greater than 15 days per month for any three months. Doesn't have as many of the other qualifying as chronic migraine does, so chronic think it headache is really 15 tension-type headaches for any three months ever or greater than 180 days per year, if it's not three full months. And so, bilateral indication, again, non-pulse sighting, squeezing, not associated with both photo and phobia and not vomiting but only mild nausea should be associated with it. If you have significant nausea or vomiting, it's not going to be a tension headache by definition.

More questions, interactive time. Which of the treatments are indicated in the management of tension-type headache? Do we have our poll thing coming up? There it is. All of the above seem to be winning now with 19. Pretty good. I can't get it to dial in perfectly. If you go forward to the next slide, I will let Becky take over once we get there. See. Here we go.

There we go. Here is our, from the clinical practice guideline, the suggestions or recommendations related to tension-type headache. So, there is a weak forker a suggest for physical therapy for the management of tension-type headache. Suggests also Ibuprofen for acute treatment or acetaminophen for acute treatment and evidence to support amitriptyline for prophylaxis. It was okay evidence. However, there was suggest against. Again, when we look at the safety versus efficacy profile,

botulinumtoxin injects for prevention. I was surprised to see how many folks had been referred for tension-type headache. That was some cleaning house we had to do related to our Botox clinic.

So, this is my first slide. I will let Dr. Macedo talk about this. Again, this fits in really nice with Dr. Hawkins talk from yesterday.

Yeah, and I unfortunately missed that. I wish I had gone. One of the things, there are a couple of papers that talk about the continuum of headaches. They didn't put one specific citation here. I am not stealing from them. Really the idea that we don't have a great sense of pathosizeiology why a migraine is a migraine and why tension is tension. There is a lot of overlap. Especially when you get into the severe migraine and cluster, they have features running into each other. One of the thoughts is that this is a spectrum. That there is not just, these are not three, so totally different distinct disorders, which is why where independence criteria grow. They make you go to this bucket or this bucket or this one. The reality is that it's probably more of a spectrum than that. People on the low-end or less present with the lower tension-type mild migraine. The most severe cases when the sensitization is out of control, you have significant cervical complex and auto mimic system -- [Inaudible] And cephalgia. You get stuff in between and migraine patients will have nausea and vomiting and photophobia and ge, z, phono and photo phobia. I can't talk. I apologize. You think I would be drinking the tea in here or something else.

The reality, people will have tension-type headache and sensitivity to light and not have the pulsating and throbbing and so it's a mix. So, it's reasonable to consider that it's a spectrum and where they are on the spectrum, you highlight more of that where you're going to treat and that is one of the purposes of the slides. Think about that and step back. Think of it more longitudinally, opposed to three buckets. So, the trigeminal autonomic cephalalgias, which of those are trigeminal autonomic cephalalgias, or TACs, as we call them?

All right. I think we got a lot of people in there in the 20-ish range. A vast amount of people said cluster. The success group was all of the above and some said just cluster and hemi crania. We'll go forward here to the next slide. The answer is -- pardon me, the answer is all of the above. All of them are trigeminal autonomic Cephalonia’s and based on clinical history, a normal neuroexam. The presentation, unilateral, Perry orbital, forehead, check-related, first v-1 distribution and have lackrymation, conjunctival inject, nasal stuffiness, ptsosis, all ipsilateral to pain. It's all going to be unilateral and symptoms on the seam side. Cluster is most common.

We talked about this slide already. I am not rereading it to you. It's a male predominant headache. And there is -- of the, there are four major ones being cluster, sunked, paroxishemicrania and have a gender predominance. The cluster is a male predominant headache here and for cluster, because it's the most common of the attacks, there is more studies specific in that. The CGB had recommendations for cluster headache. That can likely be applied to other headaches. We'll talk about those in a little bit. There was a suggestion for the use of galcanezumab

or lengality, studied for episodic cluster and was shown to be helpful. That is a great deal.

Not a lot of drugs are for cluster headache. That was great to know that. And there is a suggestion or weak 4 evidence for noninvasive stimulation and the account treatment of episodic cluster. Big on deal, if you have a patient with cluster headache and we talked the sever stabbing make, they can't get clear or comfortable. They don't happen for a time and then have a run of severe cluster headaches. If you can have something to help, you have two options with pretty solid evidence. You have them in your back pocket to consider. Those are things to remember if you have a patient presenting with cluster headaches. To be honest with you, probably any of the tax would be reasonable to consider the options for treatment. As far as the other end, oxygen was asked earlier. No other medications are proven help, why galcanezumab is not a big deal.

Oxygen therapy is a recommendation but not great recommendation. When a cluster headache by definition should respond immediately to high-dose oxygen. The evidence is not the greatest for that. We left it as an insufficient evidence, meaning doesn't mean you can't use it. You should consider it because it's low-risk, but it's not strongly evidence-based. The harms are not terrible but not great.

And it's important -- the hemicrania. Go ahead. Really quick, there is high suicidality, suicide risk sorted with some of those TACs, particularly cluster and that weighs into how we end up making the decisions in clinical practice guidelines, as Dr. Macedo says, the evidence is not strong for any of those. But, given their relatively low-risk profile and the risk of inaction, when there could be some potential for help, weighs into how we grade this, these responses for the recommendations.

The hemicrania, there is paroxysmal hemicrania, a continuous headache are the female predominant headaches. They're your male predominant, female predominant or hemicrania's. The paroxysmal on the patient will sit more quietly. It's more the entirety on the side of their head and not behind the eye but can be just behind the eye. If you have someone who presents with that and there are no contra indications, they're called intematheson response headache. And that is another name for paroxysmal hemicrania. People will respond quickly and dramatically. If you have a female patient, hemicrania or auto nottic teachers, that is not an indication. This is probably a reason to put into trial. Have to give them other GI prophylaxis. That can be tough on the gut.

I will be going to skip stuff here. Those are your four big TACs. Thrust or the left, and homeycrania. With conjunctionival engineering. Who thought of that? I have no idea. They named it sunk. That is what you have. The male predominant and hemicranias. Let's utilize the one-table, if you happen to look at the person who walks in your room and is moving more likely one way or another or this will help you get the answer, if you take a board exam.

And so, Yup, related to just headaches in general, so those were, these recommendations are not related to a particular kind of headache. The

evidence-based underneath them was not specific to migraine or tension or any particular headache diagnosis. So, there was weak or to moderate evidence for aerobic exercise or progressive strength training. They didn't compare the two. But there was evidence for both in headache irradiation of headache frequency and in function. So, improving funk. And mindfulness-based therapies. There is some potential biofeedback. Well, biofeedback fell into the other ones.

We did mindfulness in a different bucket. That would be your meditation and breathing, some of those body scams. Again, insufficient. Doesn't mean don't do it but that we didn't have enough evidence to make a suggestion forker against. So acupuncture, dried in willing are out for us. Ganglyon blocks, biofeedback and elimination diets that would be based on a certain immune marker. Again, some of the evidence we ran into, the issues with the evidence we ran into is that things were very old. So CBT and the biofeedback evidence is very old there is not a lot of stuff on biofeedback.

The other issue, was the things they were measuring for outcomes. It was not necessarily some of the things we were looking for. So, it might be less about headache frequency or headache intensity and more about sleep quality or a different kind of metric. The other issue we run into is when we compare things to sham when there is a really difficult sham comparator, for example, with dry needle acupuncture. Difficult to look at sham with those cupids of interventions.

We look at gadgetry. If you're in VA, you know you're barraged constantly by representatives trying to hock different gadgets. We found; we did look at the data for that. Insufficient evidence, north for or against, transcranial magnetic stem, eNeur, that went under and repurchased by someone else.

Transcranial direct surkept stimulation. Something being -- current stimulation, something like Alpha-stim, external trigeminal in everybody stimulation and sunra orbital electrical stimulation. We didn't find any tens on it, but it's a tens unit. The stem outers are tens units.

Different settings. We're not going to take a break since we did that already. This is Dr. Macedo's favorite slide in the entire deck. You can look at that. Just saying.

This is another patient that Dr. Macedo and I treated. This young woman fell off of a ladder working as a firefighter and had a brachial plexus injury to the right upper extremity. The next year, she hit her head when she fills lawyer error there and had ultima mental status. She hit her head again in 2005, slipping and falling and had a concussive episode there. She had no lakes prior to the fall or prior to those situations. Now, she has did bill at that timing hacks that build her [Indiscernible] that dull, aching right side of the skull and she has sharp shooting pains at the base of the right occiput and 52po -- and posterior scalp and feels like her head is being crushed or retro-orbiting. She has an aura onset. If we look at when they began, it was after her concussive episodes. When we look at onset of specific episodes, she has some aura and pergeron and will often wake with a headache.

Again, right-sided, back of the head and radiating. She will have a constant dull pain and exacerbations four to six times a week that can last hours or until she can go to bed. This is important to ask her how many headache-free days she had per month, which was in the single digits, if not zero. She was very sensitive to odors, elevator motions, other kind of visual stimuli and felt a warm bath and peppermint oil were of about it for going to sleep or relieving. She was seen by in ourology before coming to our clinic. Harari medication products include those few here, and she had some side effects that were not well-tolerated. On her headache disability inventory, she scored 74 out of 100, which is pretty high.

We look at the impacts in their domains, they impacted a lot of her function. She had some emotional response to this related to her symptoms and experience. Really, she was concerned about the things she could do. She had a high-income disability index score. That is pretty highly disabled related to your neck pain, and we looked at fear-avoidance. She had some concern related to physical activity, not too much. Work was really provocative for her. She worked in an office where she had to do a lot of screen time. That was particularly bothersome for her.

We have a video that is broken. This is okay. This is a football; I believe we had. So, Oh. Maybe we were going to pull it up. I forgot about that. It's not important. Just watch football. Or -- oh, wait. Are we going to play it? Just kidding. We are. The hit.

Don't do this like that. Don't do this. He just took it over! Knife through. Yeah, if you can hear the noise in that one, you can hear that hit. It's pretty disturbing. Oh, we have our second video. Right. This is a little bit better. If we can -- did I truncate this? This is a video in Iraq, I believe, and I can't remember where. You will watch as the folks, the caravan comes around the curve. So, there is a blast wave. What I would like you to kind of see in that is notice. Wait for it. We have a couple of different events related to this blast. Our camera gets messed with on the front end and on the back end. So, we're not going to go into a lot of detail about blast injuries and the impacts.

We'll go ahead and move on from that one. There. Okay. You can imagine what is happening to your fluid and air-filled organs related to the pressure from a blast. Let's see. Some information on post traumatic headaches. Those are pretty impactful for the folks we serve. It's the most common headache and the symptoms are the most common quality or symptoms related to that posttraumatic hook. We can move into, unfortunately, a lot of chronic daily headaches related to a post traumatic headache. And much higher in our U.S. military population than in the general public.

Unfortunately, this can lead to four times a medical related discharge or retirement, compared to patients with these kinds of headaches. Those are really impactful for the people that we serve on a daily basis. And I know you see that in your clinics. This is, again, from the academic details. It's just a really nice graphic that looks at the mixed nature of post traumatic headache. You can have migraine features and tension features or be mixed and vacillate at headache episode. You want to set

up your treatment plan related to the one that is most common or have a couple of treatment plans related to their Phenotype.

Cervicogenic headaches start from the neck, and this is a terrible picture. It's not this severe of an injury. Whether it's a bust injury or repetitive, sort of stress or trauma, that can add it. By definition, it is, you know, caused by something on the neck, whether it's the joints, nerves, ligaments, tissues -- ligaments, tissues or muscles and the headache is related to a specific cervical disorder or pain in the neck. It's worse and improved if you can improve the neck 59. If cervical range of motion is reduced and you do things that are provocative, they don't bring on the headache and moved in plains.

The last one, which is the most difficult one to meet as a criterion is ding a northeast -- abolished by nerve spy more specific to the world of interventional medicine and not germ ape to this group. Really -- germane to this group. If you can help the neck pain, that is one of the reasons to think cervicogenic in, is headache. It is caused by input from the neck itself. But what is messy, and I had to figure out what is our next slide that comes up, has a nice graphic of the trigeminal nuclear complex. It has input from the c1, c2, c3 nerves and input into the spinal cord and that is basically next door in and the micromanometer is on the low-lying nucleuses is. It's nearby irritated structures from the neck as they get into the spinal cord and they irritate the trigeminal system and the pain that can mimic the make or migraine headache and try autonomic cephalalgia with Perry orbital headache.

It's something to think where they might have a headache and the picture is more consist of when they turn their head to the right and it flares their headache, or you palp at that time structures. Cervical pain and okay septal in orolingual and cervical disk pain request can be examples of what you have.

And this picture, a Ricky Bobby reference. And this is the trigeminocervical complex on the left. You see the right bottom portion of the picture where the spinal nerves are coming in and send synapse so. You have your [Indiscernible] low-lying there until you can get a cross [Indiscernible]. Especially on the right are studies done where they injected [Indiscernible] of volunteers and you think it working from lower right to the top. When you are injecting in the lower segment, it causes neck pain in the lower, upper and middle neck. You cross into C-2-3, it's a big change. And injecting is saline, 14% of patients describe perry orbital pain. As you go up higher, you increase the percentage and look at occupancy one. The Inner spine and not just stimuli and brings up 85% of the patients with suborbital pain and 70% periorbital pain. There is no nerve going from the C 1-2 to the front of the eye. The okay sepital nerve probably stops around the number eight or forward. So, that crosswalk is the underpinnings that can occur.

As far as evaluation, those are the exam things done. The plexin rotations -- flexion-rotation test. You have them rotate. If there is a difference, one side versus the other, with the rotation, it's a highly sensitive specificity for cervicogenic and trigger points, where you repopulate an area and cause discomfort or a type ropey band. Topical

chord to prove my pain causing the headaches. This is a picture of her hour.

Actually, I will go back. Pardon me. Those are trigger points. The trapezius. The points palp 8th inning is in the blue x's. The classic referral pattern is in the blue painted on the area and so, trapezius can be the side of the neck to the posterior region and temporal is rogue.

Also, I can go to the front compared to the periorbital region. Your sign special muscles and trapezius can be though the oxygen region and upper temporary reason. A lot of mimicking and make instruction. TMD here, temporomandibular joint. You have that in your slides. It's the definition and if you're worsened by the cervicogenic in, headache. It said caused by [Inaudible] And gets worse when you have the TMJ pain. The headache gets better, and you can [Indiscernible] by jaw-specific moves.

There are trigger points in and around the TMJ. Your temporalis, your masseur reproduces a lot of periorbital pain ending to the 59 that can mimic headaches. Soar, our patient here, Mrs. About, we talked about, had a lot of findings. She had a plexus on the upper right extremity with [Indiscernible] and her nerves were clear, gait normal, static balance was 30 seconds when it was opened and not good when closed. She had no, some provocative issues when trying with visual fields and convergence that worsened some of her headache symptoms and dizziness. Nook was seen in the tempura mandibular joint. As far as her cervical range of motion, she has limiting as to one side and was -- limitations to the right and more on the right than the left. She had weakness in some of her deep neck flexors and had right upper extremity weakness. She had a lot of, when you palp it in and around her head and face, a significant amount of allodynia. And then tender throughout the right upper quarter shoulder, neck, and all of the way working your way up to the become, bright-ed and if you pal painted it around, there was probably the most intense area. They would refer to where I am facing. And then other neurodynamic tests were provocative. Sometimes for nerve 59 and sometimes for headache pain. A lot of things and since error activity in the system making her a very complex patient.

By the way, Beck, I think your camera got turned off during the videos. Look at that. Yeah. There you go. She had a history of mild TBI. We talked about the right upper extremity and, [Indiscernible]. The [Indiscernible] in. Her assessment, any time you're assessing people, you want to look at if there are triggers. I woke talked about that in-depth and referring appropriately. If they have significant stress, chronic stress response can make headache worse and birth or oral desensitization worse.

This is probably more for pain and not headaches but we're talking about us. That is as important as a recommendation option. Exercise. Those enactive have an increased prevalence and a frequency of migraines and chronic migraines. Activity is important. We talked about the social network and support and work and returning to work is super important as well.

So, [Indiscernible] fun daughter and worked in the healthcare setting. A lot of management stuff was put on her a source of stress for her. She had a supportive management this was not there but tried to get her to have time for appoint members. Still stressful and lots of family support. She didn't have any stress, management or keeping strategies and she also made it complex, didn't live super close to the clinic. In the VA, we're a large area from the Iowa border to Canada and she lived closer to the border than to us and it' a decent hook for her to come and get care and was complex.

So, now with all of that information, if you can remember all of the things we told you, which one of those diagnoses would you say are most appropriate. We have about 24, 25 people answered. Hovering right there, it looks like. The cervicogenic headache wins the race and chronic and post traumatic migraine phenotype was the next. We our working diagnosis was two of the three and that is okay. That was, you know, she had some migraine features. The location of the pain, worsening of symptoms and some other exacerbating factors migraine like in the setting of having a fall and head injury. So, fitting in that post traumatic migraine phenotype. And it's one of those rules that we live by. You're allowed to have more than one thing going on. It's split up so rigidly. We sat and Becky and I saw her close in succession. We can talk about we're doing the same general principal. What do we get after first? Doesn't have to be one or another. It can be both. The [Indiscernible] and post traumatic can look like a migraine.

Knowing that, how would you approach this? We didn't have a question for this one and this is what we did global for her treatment. We stepped back and said from a preventive standpoint, what did we do medication wise? We would try that for her. Interventionally, we hit her from every direction. So, interventionally, we had a conversation about, you know, you have occipital things and let's so how you respond. I can't remember which we did first. I think we did occipital nerve block first. It was helpful and didn't walk out anything, but up layered parts of the original Yen and served it later down the lone. I know we hear from the two because they each provided their own benefit. That was one thing we did and we -- with other sort of resources that were sort of you know, stress management. Mindfulness based things. Biofeedback, relaxation and limited CPT.

We took an approach from her. She was sensitive and I was limited what I could do with manual therapy. At first, that was not at all something I can do and/or I was able to do. We went in and treated more when we think about the somatic sensory stuff. And I would do treatment on her hand. That is associated with the common acupressure point as well and related to headache. We got her moving more and did more graded exposure. We trialed a bunch of other modalities, you know. This is someone who is pretty functionally impaired. I tried them all. I am not a huge supporter of gadgets. I will break them out and up fortunately, we didn't really see any success with any of those for her. Ultimately, with this kind of graded exposure to different stimulus and treat, I was able to get in and do some dry needling. That turned a key for us related to her allodynia.

This is a woman who had not worn her hair in a ponytail in a decade. And so, those were the little incremental ways we were measuring. How well she was able to brush her hair and tolerating brushing her hair. The shower on her head. And working in conjunction with visual therapy and choosing what we were not going to address. She had the issues. She was not falling or at risk. Going in and after the vestibular issues when she had the vision stuff and the overall sensitization, it was not a good choice. So, this is one where we put that on the far back burner and we're just new getting to it, frankly.

And the other thing, I think, to highlight here, we're lucky. We have a pretty integrated, interdisciplinary team here. We have a lot of conversations about the role of interventions as a cure and the bridge to allow her to tolerate some of the stuff. Occipital nerve blocks allowed to do the rest of the treatment on the right side and that is -- the patient was understanding, and I don't fix anything with needles and make nose quieter and told her up front that the whole goal of this is to calm the nose down a little bit to do the treatments and engage in them. You're likely not to need me anymore. As much as I like needles, that is how we sell it and I think it helps the veteran or patient understand it's what the full treatment plan is and it's only a tiny piece of the puzzle and not a focal point and allowed her -- and working with a ton. But made a difference for sure.

And I misspoke come I mean. We -- after he did the occipital nerve blocks, I could get in adoratory needle, and she was able to tolerate more manual things. We talked about toiling and pairing of interventions. Ultimately, we have flipped around the timing of her interventions and also, we do the MBB first and a few weeks after, we do the occipital nerve block. She gets sensitivity from the MBB. That is a lot on her system to go in there and so she gets some other a flare of irritation into that occipital nerve region after the MBB. After that, afterwards, she does much, much better. We're not doing dry need willing anymore. That was a time-limited course of care and now we do, as I said, we're moving into a vestibular treatment. The treatment of the other concomitant issues. It's great but long-haul.

All right. Questions about any of that? We have a half hour left. We'll get rocking. Please type questions as they come up. We'll answer them if we see them. So, last case here, Mr. RR, 50-year-old male Marine veteran was med board forward headaches in 2015. Daily headaches of seven years. A history of blast exposure. The headaches started after two months returning from deployment. Initially, that were once or twice a week and now they have kind of changed a bit. So, shows up in the clinic and the patient tells you the migraines are sharp, achy and throbbing. Again, my migraine as if they have a migraine. Happens all of the time. Makes are present when I wake up. They're frontal and hours per days for activity of any worker any type. What helps is medications. Only short-term. Not long-term benefit from them. A couple of hours, maybe. And currently taking Percocet one to two a day. As needed, five days a weekly that taking it. They're taking Ibuprofen daily. Triptans in the past, fioricet daily and it has a barbiturate in it. Take that daily for two years and not taking that anymore. Past medical history here for anxiety, PTSD. Smokes a half a pack a day and rare alcohol. Illicit substances and works

in I.T. but missed three weeks the last six months and not active at all. What we're hinting towards here is medication over-use headache. Right? Someone who took a lot of as-needed meds almost daily and at high volumes. That can contribute to medication overuse headache.

So, question, I think, yeah, 45. Is how many days of account medication use per month do you consider to be a wreck for medication overuse headache. Looking at the numbers here. Pretty good. I got like 20-ish answering. Looks like ten days was the winner in the race. 15 days was next and then five days was next. So, as we go forward here, that kind is there, and I will give you the answer is in two seconds. I promise. We talked about this a lot. When do you consider medication overuse headache? When someone is spending a half a month with the meds. That is a mean time. You get 15 days a month? Full bubble picture ahead in the beginning. They have the 15 make days for month and should be used in your brain. If you're regularly overusing more than of them, that show of use comes here and no this is actually from that same VEHICLE A pharmacies detailing document, and that it has the answer to the question. It could have been all of the 55. Could be messy. Depends on who drive every you are talking about.

That is the risk of overuse [Indiscernible] headache. That is the evident-based answer to the question. Inside more, every other day. Opioids are last and butalbital, a lot of predilection for medical release make. And opioids, too. They get messy. Patients will say I take the opioids for back pain every day. Not my headache. It goes in your entire system and affects your entire nervous system and can contribute to medication overuse headaches as well. So, if you're not taking a -- you can on how they're contributing to the diabetic headache and why you have to taper them off. Taping is tough. It's not an easy think this to do.

So, this is a couple of things you want to do. If you have the [Indiscernible] headache, you want to look at those risk factors. Those risk factors, whether you're starting someone on an acute med or getting them on a whole bunch of meds, they're risk factors for medication overuse headaches. If you have the risk factors and you're starting on them, you want to define that early in your head and note and be careful in on the two overprescribe PRN ms and account ms. So incentives is a risk factor and so is inactivity.

Whiplash, history and anxiety of depression. Missing work the last two years you guys have consistently had any evidence and bam a suggestion out of our clinical guideline. That is something you can screen for, and you can identify if they're at risk. Our guy had a lot of things on this bullet here he did. Man, it didn't fix that thing. But, he's taking Percocet, the medication overuse here by [Indiscernible] in the past. A history of anxiety, smokes, missing work and those are all risk factors. It will help define that potentially as well. Those were all of the ones this particular sample case had. One statement, and this is a statement from -- I can't remember where we got it now. I think it was -- oh -- go forward. [Indiscernible] me.

This is from the International Classification of make. It has this description of how to address medication overuse make. We talked about one and pretty much track about two. They say, that, you know, evident shows the majority of appreciates stop the overusing patient. Typically, that takes 12 or more weeks of washout period. You have to tell them get off of the drug and off of the offending agent, whatever it is for 12 to 16 weeks. If you offer two or three weeks, things are worse, you will get back into the same pattern. Generally, they're going to feel booed for a while you take them off something that causes a brawl or rebound effect and that is where other treatments and other things.

I talked about might be appropriate. File a preventive agent. Enter [Indiscernible] like occipital Murphy block and pal yate pain. Central advice is a part of the management. That is true and they ask like that is all you need and the reality is that this last bullet within probably the most up active thing in our view, all that is needed to discontinue medication overuse.

I don't know what they are talking about. Yeah. Yeah. I don't know -- and for everyone trying to treat -- yeah. It's hard. I think we, it's a tough sell, always. I think if you have someone With medication overuse make and you're in a primary care setting referring him to a headache clinic, that is a good thing to do. You leverage all of the tools that would exist in a specialty headache clinic. It's appropriate to educate about it and say I am going to get you plugged in. You have to hit people from all age jells as you're taking the music away. It's not easy to do that in isolation or in my clinic does frequently. It would be very hard to get people off. Even then, it's hard to get people off.

Think the point here is actually number two is that -- to really get a good plan in place and have you the why essentially written out and understand that you're going to check in with them. If it's not going well, then, then you will make modifications. I think part of the resistance to this is that afraid. Afraid of feeling really terrible and it's hard for them to understand that your goal is to make them feel less terrible. In the interim, having to acknowledge that they might feel crummy. Making sure they understand that you're walking along with them and you're going to check in with them and you're going to be willing to try other things to help them long this while they wash out. All of those, you know, the stuff under number 3 here, the lifestyle modification behavioral stuff. Short-term use of another medication can help. Prophylaxis, this means a space for interring procedures. Again, when you start to enter into some of those in-turn management strategies, you want to go in with the end in mind and talk about what the offramp will be. Maybe this is not someone you want to get into doing interventional procedures in perpetuity. While it might be appropriate while they wash out. So, I think having those up-front conversations and setting expectations up front with the patient really, really helps along this pathway. It's a lot about expectation management and fear management with those folks.

There was basically follow up strategies for managing withdrawal or settings that is no good evidence for one setting or strategy over the other. There is little data on this at all. It was a insufficient

recommendation. And there is not like one road map, you know, in order to get people off of medication they're overusing and that is what you need to do. Go back to the slide, the three bull the called educate, educate and educate. Develop trust and a plan. Think about the tools to add to your mix, the triptan or others.

That is so hard. Don't start people on that. So, assessment so -- this is important. We've kind of peppered this in along through our talk here. Treating these co-morbidities are important. We do see a higher incidence of comorbid mental health disorders in folks with persistent pain conditions across the board and inclusive of headache. Also, three problems, there might be a neurological link. It's not -- and it would be important to evaluate and treat for OSA some of our treatment [Indiscernible] aside from the sleep had Jean stuff might be CBT-I [Indiscernible] a structured approach to help people get on track with their sleep habits. This one here. I like this slide. This kind of highlights the uphill battle that we have with our patient population. I know you see this every day in your clinic. Our patients with depression, anxiety, pore sleep, stress, medication overuse and then one thing I want to highlight that may be people don't think about is poor self-efficacy.

This idea that they don't have an internal locust of control related to their symptoms and their life, related to their pain or their headaches, those are asphyxiators of a proceeding [Indiscernible] and unfavorable outcomes from preventive treatment. The things we could pick away at if we think of the modifiable factors in there and that would be sleep, medication, medication over use and technologies. We have to use these opposed to slapping them on a prophylactic treatment. That is food for thought in your treatment planning. Related to treatment, we have talked about trust in the last slides, therapeutic alliance. Making sure they have some sort of goals that are measurable so you can tell if we're making a difference.

Shared decision making, presenting people with the options and with your guidance and letting them kind of decide how they want to move forward. Follow-up is really important. There is a lot of that anxiety that there is going to be treated like a set it and forget it sort of thing with headaches. And ways to [Indiscernible]. If you have, you have your hawks on a good pattern. What happens if that pattern changes? Again, comorbid and this is all related to prevalence of comorbidities in patients with headache. Then looking at their role disability.

For a lot of folks with chronic headache, the role disability was more due to their mental health comorbidity than the actual headache themselves. As far as impacts. Exercise? So, there is a suggestion in physical therapy management for tension-type headache related to aerobic exercise and progressive strength training for the management of generalized make. Those are some of the nonpharmacologic things you to, I know people if the -- we can do other things in addition to exercise. Move those joints, try the finishes, try the tangents and make them feel better. Those are really the evidence-based suggestions for what we should be doing in physical therapy. You know, regular physical activity has lots of other peppy fits. Dr. Hawkins, again, referred to getting people moving for oral facial pain and though there is just this global

benefit. We know that it's got positive impacts on mental health as well and in addition to our overall physical health. You can do cardiovascular, and movement based. The nice thing, it's choosing your adventure. We tonight have evidence of stratification being better than the other, necessarily. So, it's whatever someone will like and do. That is what we want to get them to do. There is lots of other things related to treating physical impairments. If they, you know, if they have some weakness and tightness, they have limited range of motion, do all of those things. We want to make sure that we're decreasing whatever that kind of brief barrage is into the system. If won't to detective sensitivity overall. I think those, there are a lot of things we can't ignore. The opportunity for pain modulation also. Sometimes we just need to have a break. You need to feel better and that is okay. Behavioral treatments. There was a week four for mindfulness-based therapies. We mentioned that, you know, in-evidence for [Indiscernible] back and CBT. We talked about the reasons for that when we addressed that earlier in the talk. This. Okay. From AHS and the American Academy of Neurology, excuse me, they have all grade-a evidence for relaxation [Indiscernible] back and CBT. So, it kind of depends. Less strong evidence -- go ahead.

Yeah, the only think this I would add to this is that you mentioned one of the eliminating as in our CPG of the studies and unlikely the behavioral therapy and biofeedback that were effective in 2012 and had older evidence would not be effect of. And now, they don't really study it and we don't a review. When you think of the harms reduction models, those treatments, vent though they might be in the insufficient evidence sort of category and the last 7 slides, they're fantastic and we are trying to get people 9 gambling in this treatment and recognizing there is outside. Little to no risk of all of these things. What we talked about were adverse drug reactions or cardiovascular side effects. I will poke you in the need will with a version of that. This is type, a side effect here and you have to engage. It's frustrating at times. People don't want to engage. It's important to recognize that those three domains, mindfulness, and biofeedback are good things to do, despite CPG having the limitations and the negative, which is a long speech to that. Sometimes you read the bulleted racks and that might get lost in there.

Lost my cursor. There it is. Behavioral interring is, again. We talked about those. Mindfulness-based stress duck. There is relaxation training and CBT. They're all variations on a theme. Different approaches for some of the same outcomes and here we go. Acupuncture.

I think someone had just asked that. I don't remember the name. It slid down. Acupuncture. And this is where we landed, as far as the CPG with insufficient evident for and against the treatment of headaches. Some of that is based on the use of studies and sham. That was pretty effect of as was acupuncture and becomes hard to say, one needle or like is better than the other needing or like. Effect size was not huge. There was a statistic significance making it hard to sort of recommend something. If it's -- you look at a lot of things like statistical significance and the actual effect. How many points on a 10-point scale or 100-point scale? It's small and how many standard deviations were there and if it's very, very small, we end up sometimes with a recommendation where thousand up. Doesn't mean they can't be helpful. An insufficient recommendation.

What are hopeful is don't do it, but it's not strong evident for it. There is a balance I could have -- and significant heart and it's a reasonable thing to consider. Just recognize it. When you're using them, we talked about other treatments with bitter evidence and leverage. You shouldn't jump to the things with insufficient evidence and mindfulness, exercise have strong evident relatively speaking to acupuncture. We utilize acupuncture and still consider it. Battlefield is its own messiness. There is not a lot of data on that. When I say, data, I don't mean case studies. Randomized control trials, system at education reviews and matinal seize. That is what we look at when we look at those. Occasionally, retrospective cohort studies are incredibly well-designed. They meet muster for clinical practice guidelines. Like with the ketamine and you have smaller studies, they don't rise in the review and that is where they can be helpful as systematic reviews. Right?

Interdisciplinary care. There is multiple studies out there showing, again, there is not a ton of data specific for headache in interdisciplinary care. But those can be rather resource intensive. We have to choose our patients carefully. Again, they're hitting a lot of the same themes that we talked about. Just kind of all packaged together in a more intensive program. And this is what we have in our interdisciplinary team or -- that some other headache interdisciplinary programs have. Cleveland Clinic used to have one. We roll it into our intensive pain programming here.

All right, so, I think this -- oh, so this is kind of a thought question. Food for thought for you all. We don't have a formal poll question, but if you think about those resources, you know, what do you think might be something that you could add into your regimen in your clinic? Or have access to that you may be haven't thought of before in using to help manage your patients with headache? Overarching goal is to improve participation. I think we said that a thousand times here today. To really get people to engage. Have some sense of self-efficacy they feel some control and ownership and ability to, to affect their destiny. I think that is really important for folks. Oh, interventional procedures. Franz.

So, yeah, the needle things. So, from this case, interventional procedures, we're talking about these three areas. Nerve blocks, specifically two types of radiofrequency ablation. And so, there is, you know, multiple different people who think about what do you do [Indiscernible] for headaches? I don't say follow this exactly, but if someone has more tenderness and myofascial pain, I am thinking what are the treatments? They're not need will based to be honest with you. Maybe dry needling. Even though the evidence for that is not great.

Again, it's a means to an end to get people more doing more self-management and activity. If it's cervicogenic headache, we'll talk about that in a little. If [Indiscernible] neuralgia, there is evidence for occipital nerve blocks as well to be helpful. We talked about the suggestion for them for acute migraine management. There is data on, it's not a solid for chronic management as well. And the rationale for treating interventions towards the neck is based on the picture we talked

about earlier, the trigeminal-cervical complex. Trigger points and treating of them, they seem to be helpful.

The data is not wonderful on this but it's not unreasonable to tolerate it. As far as Botox I am not a proponent of that or the evidence good. It's evident you will lock at for trickle point treatments. Just go in and out and trying to just get a twist response is as effective as injecting staylin, or steroids or Botox. You're starting to inject Botox, a paralytic agent and steroid has a side effect profile. Anesthetic or dry need willing with the needling's probably equally effective. I tend to lean towards dry needling and find that useful. If the evidence is not great -- even though the evidence is not great on that one. As far as we talked about this for migraines, occipital injects for the account treatment and there are randomized control trials that show a reduction in severity and frequency. The risk, if you're doing it low is low. It's still an invasive procedure and has side effects and it's more invasive than the other things we talked about.

Cluster headaches. We talked about two treatments that have evidence for cluster headache. Galcaezumab and there is some sort of emerging data that trying occipital injects don't abate and may be beneficial, calling down the entire autonomic system and trigeminal system. If you tried them and they're on not working. There are multiple approaches. This gets esoteric. The vast majority of people, if you're doing bedside which is tough stuff, we will inject at the occipital ridge, a third over usually it's what we call Landmark of bass injection. If anyone has had a craniotomy, I will not do a goaded procedure in that area. You can do significant

harm. We here in our clinic have really pivoted to doing only occipital nerve blocks under ultrasound because we found there is not as much efficacy long-term doing them Landmark based and we moved them here to a lower area. I think the next slide shows it. And where they target a nerve kind of down at the -- in the occipital muscle and ridge. Anecdotally, I have seen a better benefit request that requiring ultrasound skills and you're looking for someone with ultrasounds this is the study referenced. Pinger et all and showed good-of-case after four weeks. The only reason this changed, I had people have fantastic benefit for six hours and nothing on the back end of it. I am injecting steroids and they're realizing no benefit. I don't want to keep just going insane with that. We adjusted and changed. I found that we have had better success and more longevity closer to, you know, six to eight weeks, if not longer from steroids injects longer and we inject here. Where the probe is located at the obliquus capital muscle in the neck. Just a noting.

Sphenopalatine blocks, this is like everything else, all of the rage. There is insufficient evidence. I didn't put that here, but there 7 sufficient evidence for sphenopalatine ganglion blocks. The least invasive version is putting lidocaine well, on a qtip and inside the nose on the module wall there and having a defusing effect. That is minimally invasive and can be helpful for the pig ran. Data is not wonderful but better than poking with a needle. An option to consider. There is, you know, randomized control trials. I will slip that slide for time.

And lastly, cervical RFA for headaches alone. There is not a lot of evidence. If cervical headache, there is good data for that. And so, cervical RFA has a number to treat at two for six months. Above the interring things die, it's probably the best evidence-based treatment we have got. It's invasive. You're sticking needles in their neck to test out and block them and sticking them on different need wills. It's not without risk but solidly a good treatment for neck pain this is not responsive to less invasive treatment. You should try therapy. Chiropractic, things less up vase of for neck pain. It's something to consider for sure. And I think that is our last slide. Take a deep breath. Okay.

And what questions do people have? That was our first three-hour outing with this. We apologize for going super-fast. I don't know if we want to close the slides and maybe have people put their cameras on if you have questions, we're happy to see faces after seeing each other's face for the last three hours? If you want to put your camera on, we will be happy to chat with folks. If you have questions, please put them in the chat. Believe our contact information might be in with the conference stuff. So, if you think of something later and you want to ask us, please feel free to reach out to us.

We appreciate it. Thanks. Are there any questions at all? That is a lot of stuff. We apologize for going as fast as we did. So. Yeah, the slides are in the file section, I believe.

In addition to the CPG, the full-length CPG, there is the pocket card, a summary for our clinicians. I believe a patient summary associated with that and also, so there are usually the compendium materials there as well.

We appreciate your patience and us going super-fast trying to roll through. We had great questions. If, like I said, if you have anything that comes up, feel free to reach out. I think our stuff is on the contact page. We're happy to answer questions as they come up.

Thank you all. Thank you.