#257 Seizure Basics

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SPEAKERS
Matt, Sara, Paul

Matt 09:09
Yeah, I won't go into too many of the details. But like it's not. You know, I think in terms of our training, it's you, we've witnessed seizures in the hospital, and there's something satisfying, not satisfying, but you're in this controlled environment, you can scream things like get me the Ativan, call rapid response, you have some, you have some kind of control over the situation. But this was actually just out in my day to day life. And it's a, it's a whole different thing than I think talking to another colleague, I feel like seizures are just if you don't have familiarity with them a really scary thing to witness. And that's bad, I think, presumably what we're dealing with here, so I'm not having any of the comforts of the hospital where I could just call a neurologist and be like, now what do I do? It was just a whole different kind of experience where I, you know, it's my main thing is just making sure everybody is being safe, and that no one was panicking more than they needed to. But I, I wonder, before we get rolling, I'm not sure if you meant to pitch the question, we're just gonna go ahead and roll with it.

Paul 12:08
Before we get started, if you could even tell us sort of basic fundamental stabilization principles for if someone should happen to witness a presumed seizure out in the wild? And how, what are the initial first steps we should take? And how should we deal with that?

Sara 12:21
Yeah, that's a great question. So kind of a house of God reference, always check your own pulse. Right? But I think the key is to stay with the person. So until they're awake and alert, and hopefully acting their usual state, if you can start timing, if you know if this is a person that you are known to have epilepsy or even if you like you said more out in the wild, if you can start timing the seizure, remaining calm check, if you if there's like a medical ID, and then the biggest thing that I will counsel patients as well as maintaining their safety, so or their or their significant other, for example, making sure that they're on their side, for instance, and, and if this happened, like at home, in bed, you know, not facing prone in the pillow, trying to, or if they're cooking something, and, you know, hopefully helping them

drop down to the side. And so I think, I think that's the biggest thing is like the safety element. And then of course, like the resuscitation aspect, making sure that the patient, or the person is not having any, you know, difficulty breathing the airway, or, you know, the ABCs, typically. And so I mentioned the timer, specifically, because we tend to get a bit worried when seizures are lasting longer than five minutes, typically. And so there's a higher likelihood of requiring intravenous medication. So if you can have that timer, again, the majority of seizures will subside after a few minutes. And then also, I think having a low kind of, you know, threshold to call 911, or an ambulance if the person's not coming to the usual state, if they're injured, because that's a huge, huge aspect for patients who have epilepsy, you know, physical health and any kinds of injuries that they might sustain. If the person starts clustering and having repeated seizures, and those are kind of the main kind of caution, but you don't have to do the old wives tale that so they speak about putting something in their mouth, they're gonna swell their tongue, you know, you don't have to put anything in their, in their mouth. Absolutely not. Don't try to restrain them or anything like that. And then, you know, if, if a health care professional has like a rescue agent, you know, if it's a certain time period that has passed, you can I put that in over their cheek area so that it can be easily absorbed, for example, like Pam wafers so that's kind of my schemer approach to triage

Paul 15:03
the timer things genius, just because subjectively It feels like it's lasting four and a half hours. So I think like when you're in the moment, it just You have no idea how time is passing when they're sort of panic and people are upset, o that that's incredibly helpful in terms of the postictal period, let's say the seizure resolves, and then the patient's eventually coming to serve any recommendations in terms of people getting up walking around sort of what, what sort of stabilization you do once the acute phase is over?

Sara 15:29
Yeah, I think it depends if this is a first time seizure, or if this is a patient with, you know, chronic epilepsy, it's all kind of individualized. So, if it's a first time seizure, I would certainly recommend getting, you know, an urgent evaluation. And the longer you know, somebody who has epilepsy, for example, is able to, to understand maybe if this was out of the ordinary if they had excellent seizure control, and then this was a breakthrough out, you know, well, well controlled for 10 years, for example. You know, I think that that warrants certain investigation, and then there are you know, epileptic syndromes, for example, where the frequency is even much higher. So it's, it's all dependent on how the person's seizure baseline is.

Matt 16:15
One other thing pertinent to this that we had talked about a little bit in pre recording, I had come across the recommendation in my reading to try to film the like, try to take a video if you can safely do so that you should try to video the seizure episodes. And probably this is more for chronic seizures. But I guess, you know, if someone's having what this sounds like a grandmal seizure, you probably don't want to just like, pull out your cell phone video and not help them. But that is something if there's enough people around, it might be helpful to have video of it just for when they do you get to a medical professional, they can show them what was happening. Is that something how often are people actually bringing you cell phone video these days?

Sara 16:55
Oh, yeah, that's, that's incredible, because I love watching the videos that patients will bring in, it's extremely helpful to when somebody might have multiple different types of episodes, I like to just call them spells, if somebody has any kind of paroxysmal event of unclear etiology. So a seizure, of course, being falling in that differential. So the differential being so wide, it kind of helps tell you Okay, were there signs, maybe it was this syncope, for example, or convulsive syncope? Was this. Maybe having features a typical features of a seizure? Could it be consistent with non epileptic event? And so I I'm a big fan of cell phone videos. And

Matt 17:40
so you started to give it to us a little bit there. So what's, what's your differential for someone like this, this patient that we presented you? He's in his 20s and 30s, he's on the ground moving rhythmically with his eyes rolled back. What sort of things are you thinking about that? This might be?

Sara 17:58
Yeah, so fortunately, I coauthored a chapter on this kind of topic with Dr. Joseph, as well. So the differential, I like to think about as for example, like cardiac, there's neurologic, and other, essentially. not that those are the two most important systems of the body, but you know, so, so kind of working through the cardiac, if anybody has, again, we're talking about paroxysmal events. So a cardiac dysrhythmia you know, can mimic these types of symptoms, if they have some kind of dysautonomia kind of falls in there. Of course, there's like a wide array of neurologic conditions, movement disorders can mimic it, sleep disorders, cataplexy, for example, migraine, you can have transient global amnesia. TIA is very commonly I think, are evaluated in the hospital setting syncope. And then there's kind of like the other you know, condition, can you have like a vestibular apathy, for instance, non epileptic event, like a psychogenic non epileptic event, and panic disorder, and so forth. But those are kind of like the main classes out how I help myself in triage in these cases.

Paul 19:22
When we went probably just to touch out of order, I think, just by the nature of the case, I wonder if we could go back for simple to me, and actually just define our terms. So you know, I think you were sort of careful to not say seizure, necessarily. And then there's you hear seizure disorder, then there's epilepsy. And I feel like there's a little bit there's probably some nuance between using those terms of some specificity. So could you just sort of go back on the most fundamental basic ways, kind of define seizure? seizure disorder, epilepsy, and then maybe we could sort of build our discussion from there.

Sara 19:49
Yeah, thank you. So, so seizures are transient, you know, paroxysmal events. Unfortunately, we can't we can't plan them like, Oh, yeah, I'm gonna happen at three o'clock. So I can go home, I can prepare. These are like so disruptive to somebody's life, the quality of life you can imagine. And so I kind of think about them based on their symptoms. So you'll have some level of alteration of consciousness potentially motor, sensory, or autonomic. And then there's, there's also kind of like the psychic, like deja vu, for example, manifestations that are reported. So there's seizure and then epilepsy, epilepsy is a chronic neurologic disorder. And there is a formal definition by the International league Against Epilepsy, which is the old definition is having had two unprovoked seizures more than 24 hours apart.

And now, currently, the criteria includes even having, you know, one unprovoked seizure with a higher risk of recurrence, greater than 60%, or being having a diagnosis of an epileptic syndrome, like a juvenile myoclonic epilepsy for, for instance. So, so that's kind of the definition. So epilepsy being recurrent seizures, they're very, very common. And then another term that I wanted to clarify, too, is drug resistant epilepsy, because like the gambit of treatments really opens up for patients who have tried adequate, like, for example, to medications, adequate trials, or did not, you know, tolerate to achieve some kind of seizure freedom. So that that's by definition, drug resistant epilepsy. And those patients are very well served on their kind of the referral path to seeing like a neurologist or an epileptology's, for additional treatments.

Matt 21:45
And I think I guess there's a number of ways we can take this. So with within types of seizures, for us as internist or in primary care, how important is it? Or to what extent do you think we need to know about the categories underneath seizure?

Sara 22:02
Yeah, so I think I always like kind of the big picture. So thinking about it, like, for example, where's the problem? So is it a focal epilepsy, meaning it's coming from one part of the brain and staying there, it can spread with or without associated impaired awareness. And then there's kind of the generalized epilepsies. So coming on at the same time, and then there's, there's a category of unknown and you know, infantile spasms, and other kind of things that can cause it. But those are kind of the main classification that I think about. And of course, the etiology is differ. So focal epilepsy being the most common. About two thirds of patients will have focal epilepsies. And I point this out, because clinically, it helps in treating these patients. So the medications, if, for example, if you don't know what's going on, then picking a more broad antiseizure medication is going to probably be the best option until you're able to, you know, to identify what's going on.

Matt 23:03
So, Paul, I don't know about you, but I find it always a little bit intimidating. And just to take the history and try to figure out was this a seizure or not? But that that seems to be something that is just is hard? It's hard to do in general? I don't I don't know if that's just my experience.

Paul 23:21
Oh, no, for sure. I think that the classic seizure/syncope debate, I feel like rages on, so I feel like automatic neurology console as they roll their eyes and like, Oh, God, not again, and I was just, I had to laugh at cardiac versus non cardiac seizure mimics. I'm just, there has to be cardiologists high fiving. Across the country, as it was in this episode. Now that's completely in keeping with a certain worldview.

Matt 23:44
Yeah. What were you taught about, like syncope with, like some seizure activity? What have you been taught reliably? How to Recognize that? I don't know that I ever was.

Paul 23:55

No, not reliably. Well, sometimes you can see jerking with syncope, and you're like, Well, that doesn't help me. Now what is right, and where do they bite their tongue and were they post-ictal or not? They don't necessarily good determination. So to answer your question, the short version is, I won't blame. I won't say I wasn't taught it. Well, maybe a better way to say this. I just didn't learn it well, so I will take any pointers that are offered this this episode.

Sara 24:17
Yeah. No, you guys bring up an amazing point, because it's a very common consultation and just evaluation in the clinic, too. So things that I think about when evaluating the syncope versus potentially seizure-like event, you know, is the event provoked by pain? Do they have a cardiac history, you know, history of an MRI or cardiac dysrhythmia? So that that's a very frequent thing that we do see, for example, in our elective like in Epilepsy Monitoring unit patients will come in for these paroxysmal events. And their goal is to be able to identify what's going on. So we have a continuous video, EEG that's happening. And very frequently do we diagnose cardiac, you know, third degree heart block, for example, or, you know, somebody becomes asystolic, and that's why they have a funny spell. So it's very frequent that we do see that but with syncope, I guess, you know, the duration of the episodes help, you know, as it was, what was the person doing with the exerting themselves beforehand, you know, postprandial kind of the other clinical aspects? Were they in the bathroom? I feel like the bathroom is always... Laughter

Matt 25:31
Yeah, the bathroom!

Paul 25:33
Invariably

Sara 25:33
its a dangerous place?

Matt 25:37
We had with - this is just a brief tangent - We had this guy at one of the Kashlak that I worked at many years back. And he just kept crashing his car because he had cough syncope, and he was just like, Oh, my God. And I think he was maybe it was, it was a crazy story. Maybe he was even smoking, but he'd just be like, he'd start to cough. And then he'd go into these coughing fits. And like, at least half the time he would pass out but he just like would not stop driving. And I saw him on one of these admissions where he'd like run through so his neighbor's fence or something like that in his pickup truck. So yes, so knew that that was a bit more clear cut. We were pretty sure he wasn't having seizures there. But it's not always that it's not always that clear cut.

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Paul 29:22
Go back to the subtypes,. If you don't mind talking about those a little bit more it sounds and please correct me if I'm misunderstanding that, in part, they're based on the underlying neuroanatomy and sort of where the seizures are coming from but then there's this idea of intact awareness and sort of like I

you know, I think early on, I thought, well, by definition, if you hadn't tact awareness with seizures, it wasn't a seizure then so I feel like I have misunderstood this for a long period of time. So can you talk us through, you know, we don't have to go through every single subtype. It's sort of exactly how some of them manifests and sort of what we should be what typically Stories are the big subtypes, if you don't mind going through.

Sara 30:03
So much like in neurology, it's all about real estate. And so depending on where the abnormal cortical activity, you know, where this electrical firing is happening, you can get quite a few different types of symptoms. So, intact awareness. So if it's not, you know, affecting your, your limbic structures and, and staying, for example, let's say occipital lobe epilepsy in patients who are having visual symptoms of form or otherwise, so they know something is happening, and they're aware of it. So hopefully, that can kind of address the intact awareness kind of component, temporal lobe epilepsy. So, you know, depending on the hemisphere, does the patient have deja vu? Who are the psychic type feelings? Or their automatisms, for example, very classically on the history of gathering is very helpful. Like if the parent or the significant others Oh, yeah, they're always chewing their lips or smacking their lips or doing something like that, that kind of helps you on semiology. And then, you know, frontal lobe epilepsy is very traditionally going to be having a component of hyperkinetic movements. So even for and more predominant, nocturnal or at sleep-wake kind of interval. So the patient can be bicycling in the middle of the night. And I would say those are some of the kind of broader categories of seizure types temporal lobe being the most common.

Matt 31:34
And with generalized is, this may be a dumb question with generalized do they tend to be having this like tonic clonic movements? Or can that what can they generalize look like? You just told us about the focal?

Sara 31:47
Yeah, so generalized epilepsies technically have a few different subtypes as well. There's like myoclonic jerks, for example, activity that somebody can have, absence seizures, or, you know, traditionally now, like the petite mall, or generalized epilepsy, they come on at once. And so those are some of the more common subtypes. I would say.

Matt 32:14
That's interesting, too. And I would have thought the myoclonus, would it because it's, I've seen it where it involves, like one limb, I would have thought that would have been more along the focal lines, but it's not it's it comes from a generalized?

Sara 32:27
Typically, yeah, a discharge - cortical myoclonus

Matt 32:31
Mm hmm. So it sounds like you've told us some of what the focal epilepsy looks like, and, and the generalized epilepsy looks like, and maybe how we can recognize cardiac. But I guess I feel a little bit

better the fact that people are trying to capture this on video, and you're really trying to dig into the history because it sounds like even if, if you're an expert on seizures, it's not always crystal clear if this is truly a seizure or not, but it's it sounds like you just have to be a detective, there's, there's not always an easy answer. Is that correct? Or is it Am I just am I just gave myself an easy out.

Sara 33:10
You're 100% Right. So unfortunately, these episodes, most commonly the patients are not aware of what's going on what's happening to them. Sometimes they're not even witnesses, you know, they're found down or you know, the patient. There was a, you know, a thud or something like that, that somebody is able to tell you what happened after the fact. But yeah, these, these can be challenging and gathering the history. But we do what we can and try to rick stratify them to have the risk, you know, do they have epilepsy risk factors, for example, family history of seizures or epilepsy? Do they have a prior history of febrile seizures, CNS infections, for example, concussion trauma, other things to help give your history and then of course, risk stratify them further with diagnostics, and it's all a sampling game. I shouldn't say game, but it's all about sampling. So if you can get if you're really suspicious, and getting longer EEG monitoring, as well, so you can order a routine EEG typically like 45 minutes, there's 24 to 48 hour ambulatory that patients can take that home. And then there's also Epilepsy Monitoring Units that are able to do continuous video EEG monitoring, because what's a bit challenging with any kind of paroxysmal event is, how frequently does it happen? is it happening once every year? Or is it happening, you know, several times a month or a week so? So it's there's a huge element of sampling as well. But any kind of a typical but stereotyped event should always raise the concern for potential seizure no matter how bizarre the symptoms are, if it's stereotyped, I think that's a huge clue.

Matt 34:58
I think the last one to dig into Oh, go ahead, Paul.

Paul 35:03
No, I was gonna so for the purposes of case, let's just say this, this patient is coming in for I don't know, STI screening, but they something relatively banal and then has as this witness seizure in the waiting room, and then you take them back. And you're. And really this is a new onset seizure event or anything like this before. So you take your history, and this is what you know, is what you've seen, basically. And there's nothing there were no obvious other triggers at all, I guess, for new seizures and adult patients sort of when, how aggressive Are you with neuroimaging? Does that automatically earn you a CT scan? Do you go right to MRI? So what? How does neuro engineering sort of what other work do you think about? Or do you just immediately do not pass go and just send them off to neurologists, which might be, which might be my move? But what sort of feel free?

Sara 35:46
Feel free to always send somebody to a neurologist. I think if there's any like question or, you know, concern, that's, that's a very appropriate referrals. So neuro imaging wise and diagnostics. So it depends kind of in the setting, I think if there were an ambulatory setting and having, you know, screening, like you mentioned, and they're back to their baseline, perhaps that that person, depending on the reliability, and their follow up, you know, you can either send them, if it's a first time seizure, actually, if it's first time seizure, I would definitely send them to an emergency department or try to work

them in so that they can get expedited evaluation. Could they have, you know, a tumor, for example, that that trigger that first time seizure? And that's kind of my approach, at least. So you want to make sure that this isn't emergent like, could it? Is it a traumatic issue, for example, in the elderly, which is one of the more common populations, kind of the children and elderly I would say, are the growing groups of people who have seizures. And so you want to get a CT scan, without contrast to evaluate any kind of traumatic component. Of course, by and large for chronic process, I always think about an MRI, an MRI without gadolinium to help an evaluation and with a seizure protocol, you can kind of put that into comments. And I say thank you to the neuro radiologists. That's my strategy. And I Oh, and they, they're able to do more thin cuts through the temporal lobes. So then you can evaluate for any potential, you know, smaller tumors or other kind of structural causes that could be contributing so. So CT, depending on the emergency in the acuity, with definitely an MRI at some point in the evaluation. And then if you know, there's any kind of concern for neoplastic process, of course, with gadolinium, and kind of from there,

Matt 37:37
and you mentioned the EEG, as well, would that be a part routine part of this for first first seizure, you would probably do an EKG as well.

Sara 37:46
Yeah, absolutely. an EKG is very helpful in helping to risk stratify the patient to help even with the patients who would like to come off of medications and kind of confirming their risk for recurrent t shirt to

Matt 38:04
Yeah, I had read that bias, though. I had read that like the EEG if it's negative, it's not as helpful. But if you if you find something intersectoral like between seizures that's abnormal than that. Maybe that's a higher risk person. Do you think of it that way? is in my experience, EEG is always normal or the person has diffuse slowing, because it's always encephalopathic patients admitted to the hospital that okay.

Sara 38:35
Yeah, so the slowing is, is sometimes can be a non is a nonspecific finding, generally slowing that is. And I think, as a general rule, you know, if you're not able to capture any intraductal abnormalities, longer sampling is always Yeah, can be a good option.

Matt 38:57
That's kind of like what we do with cardiac gear, you kind of you pick your the cardiac monitor based on how frequently they're having events. And if it's like, once every couple months, or once a year, then those people get, actually these implantable recorders. I don't know if there's something like that for seizures. I imagine there's some sort of very long term monitoring, but for this, there will be

Sara 39:20
Yeah, in the future.

Matt 39:21
Yeah, I know, we always get on our internal medicine boards. The question, okay, this this 20 year old person, 20 something person that Paul witnessed having the seizure. He was a college student, and he had been drinking alcohol and actually, he was drinking for locos. And he didn't sleep for the past 48 hours like, probably that person doesn't need neuroimaging, because it was maybe quite obviously provoked, but it is the workup you're talking about with CT and MRI and all that for somebody where there's no obvious provoking factor, you know, they don't have like hyponatremia or like the Four Loko case I just gave you Which is maybe 25th 1015 years ago, that would have been very believable before it was banned.

Sara 40:09
So, yeah, I mean, sometimes we can see things happen coincide. So somebody might have a provoked event. I mean, I think if it's if it's clearly like an alcohol withdrawal seizure, or something like very clear cut, it's a bit easier, but often times on further history gathering, you know, we tease out and sometimes patients actually have been having these other paroxysmal events or stereotyped deja vu events, but not really seen someone or if it was thought to be panic disorder or something like that. So depending I think it all depends on the clinical history and the individual, but I think for first time seizure, provoked or otherwise, I think it's certainly reasonable to still get some kind of neuro imaging.

Matt 40:52
Yeah. Okay. So low threat, low threshold to do that we won't be faulted for, for working, no, not at all seizure in an adult in an adult patient.

Sara 41:01
Correct. Sometimes, I think people think, Oh, it's a one time seizure, it's okay. But with that definition, you know, having one unprovoked seizure with greater than 60% chance of having another one, you know, that kind of buys them that epilepsy diagnosis. And, and sometimes that young patient population, the college population, that's always staying up, you know, it's also matches the timeframe of when some of these epileptic syndromes kind of start popping up. So

Paul 41:34
yeah, I wanted to ask, how is that 60% determined? Is that Gestalt, are there? Are there tools that help get you there? Like it's such a specific number? How are you determining what percent chance of a recurrent event?

Sara 41:46
Yeah, so that that's determine if they have like an abnormal ECG, or an abnormal MRI kind of helps by that 60%.

Matt 41:58
So let's say this patient here, eventually, he wakes up, and we find out his name is Cesar Jackson. And he's a little bit drowsy. But he does tell us that this is his first event. And I did want to ask you, let's say, Paul was a little bit suspicious, could this be a psychogenic non epileptic seizure, and I made a comment about that earlier, where hopefully, it didn't sound callous. But I have seen, one of the ways

that I was taught is that when patients are having these episodes, I've seen quite a few patients have them at this point. And they would sort of like, sometimes break out of it, or break into it very abruptly. And that was one of the ways that people would say, Oh, this wasn't a real seizure, because they, you know, they broke out of it to talk to us in the midst of this thing. And I don't know if that's a correct way to identify it. This was not a neurologist telling me that. So I would, I would love to know what you think, and how you identify them.

Sara 42:59
So this is a huge topic, in the in the neuro neurology world about functional neurologic disorders, how to manage them, and follow these patients who, who might have, for example, like you're saying non epileptic seizures, so I think of non epileptic seizures, or psychogenic non epileptic seizures as a subtype of functional neurologic disorder. And they kind of are at the interface of that neurology and psychiatry, you know, the mind is, the mind brain continuum is it's all one thing, but, you know,

Matt 43:37
fine grain continuum, Oh, my gosh.

Sara 43:42
But, you know, I think for the sake of medicine, they're kind of categorized separately. But oftentimes, these patients and individuals will have these paroxysmal, it can be events that appear convulsive, or alterations in their behavior and consciousness that resemble epileptic seizures, but they're not associated with any electrical like with any abnormal cortical activity. And that's the key and the gold standard is capturing one of these events, if you can on IE, G, and then you're able to make that that diagnosis competently. And these are these are extremely, very frequent and prevalent, I would say, there's also a coincidence of non epileptic events, and epileptic seizures, by the way, and approximately 10%. Sometimes the literature says about 20%. But that's also important because two things can always happen together. I mean, I think I think the estimated prevalence for non epileptic seizures is, is about it can occur and up to 20% of civilians. This is what I read worldwide. So it's a very, very common Yeah, thing. And so neurologists are trying to better understand this and the patients are not, you know, they're not faking the event or the episodes. The symptoms and events are very real. And so I think it's really important to diagnose them as early as possible, and get them on the right treatment plan, which is going to be a combination of a few different things it can be the gold standard is a cognitive behavioral therapy approach, and so that, you know, the earlier we get that diagnosis for the person, and hopefully adopt that kind of treatment algorithm, that they'll be able to improve. And so you give the patient the diagnosis, or you say,

Matt 45:36
do you say, Well, you know, I don't think they're true seizures, when we, when we get you, when we get you on the monitor, we don't see the seizure activity. So, you know, I don't think you actually have epilepsy is that you tell them that, or they used to call these pseudo seizures, but how do you explain it to a patient?

Sara 45:56

Yeah, so it's a very great question. And I think it's, it's always kind of like that shared decision making process with the patient and the family and seeing the adoption of that diagnosis in real time. And so, of course, the news is that there's no abnormal electrical activity that's causing these, these symptoms, and then kind of talking about that, that mind frame continuum kind of conversation that these can be external manifestations of either feelings of stress and bottling them in or, or this is, you know, a way of, of almost the symptoms coming out without you even being aware of. And so that's kind of why the cognitive behavioral therapy is such an effective treatment and being able to better you know, understand these, even when the patient does not have, for example, an acute stressor going on, you know, so

Matt 46:54
it sounds like it's a it's just one of those challenging words. You know, Paul, we're used to this, there's a lot of things akin to this in internal medicine. It's where it's just difficult to talk to patients about it.

Paul 47:07

Matt 49:06
I guess, with our patient, Mr. Jackson here. How are we going to decide if we're going to treat him or not? Let's say he gets an MRI. We put in the little wink smiley face to the neuro radiologists. They hook us up with some thin slices through the temporal lobes. And we don't we don't really find anything, no tumors, no scarring. And he tells us he hasn't had like prior meningitis doesn't seem to be provoked by anything. So how would you decide? You mentioned a couple times like their risk of recurrence. Are there calculators we can use or how do you know if their risk of recurrence is greater than 60% or not?

Sara 49:46
Yeah, that's a that's an excellent question. So the patient who has a first time seizure, you work them up, everything is normal, the risk of having a second you know unprovoked seizure is about 33%, actually. So it kind of becomes that, that shared decision making with the patient. And, you know, sometimes it only takes one seizure, and the person's like, I can never do this, like, this can never happen again, I want that insurance policy being started on an anti seizure medication. And other times, people might not necessarily want a pharmacologic treatment, and they'll want to assess and see if they'll have another episode. And so it's kind of a personalized choice.

Paul 50:35
We talked a little bit about initiation of medications to this patient, I think for me, oftentimes, the initial medication of choice when medication is chosen is somewhat of a mystery. Like I'm never quite entirely clear, I don't even know how to pronounce it, Theresa Tam, or like, I usually I just go with it the trade name. So I just say it really quickly and hope no one calls me on it. So I guess what I'd like to hear if you don't mind is tell us sort of about your general approach to choosing medication for someone who, who is going to be treated for seizure disorder for epilepsy and what how you think about what to prescribe and just go through your process of you know, I realized that this could be a whole two hour talking to myself, but just for me, if you could simplify it, that'd be very helpful.

Sara 51:15
Yeah, so it's, it's a very, like personalized individual approach, of course, and the goal I always think of for patients is to, you know, to try to get rid of the seizures to reduce the seizure frequency, and then at the same time, improve their quality of life. So how do you make sure to limit any potential side effects? And so that's kind of the approach. So it's always appropriate, you know, if to send a patient to a neurologist or an epileptologist. If you have questions for medications, that's a that's a great referral. I routinely think about the comorbidity somebody has when selecting an anti seizure medication. So do they have comorbid, migraine, depression, anxiety, things like that, that I don't want to necessarily worsen or that I can treat? Do they have like a neuropathy going on as well. So there are a lot more medications today than there were a few decades ago, fortunately. So common medications, for example, lamotrigine levetiracetam, that you said so beautifully, are very common ones that you see. And actually, I recently read this article in one of the journals, and it referenced this app that's been validated by experts to provide like an objective, reproducible method for selecting an anti seizure medication. And so I think that could be a potentially really interesting tool. And it was, it was called epipick.org. I actually just tried it. Yes, last night, I wanted to see how it worked. And so you can put an age, you know, certain comorbidities, and it almost gives you the medications and the starting doses. So that could be a potential tool for you, Paul,

Paul 53:06
just someone to tell me the answer. That's all we ever want to do.

Matt 53:10
Oh, you've been asking for that for like many shows recently. And this is the first time someone's actually told you what to do.

Sara 53:19
That's, that's a potential tool. But yeah, so it depends, you know, what their comorbid? Do they have bipolar disorder, maybe are going to be leaning more toward like lamotrigine or carb mass Pan? migraine, you're thinking about? Topiramate, potentially gabapentin, if they have comorbid neuropathy, or trigeminal neuralgia or a tremor, you know, certain kinds of comorbidities help the type of seizures that they have classically? And then what comorbidities do they have? You know, do they have a cardiac arrhythmia or something like that? I don't want to be picking a medication that's going to worse than that. And really that mood element. So I'm trying to pick something that's going to be more mood neutral if there's comorbid. Mood Disorders, which are extremely common in patients with seizure disorders. So I hope I answered that in a nutshell. But there's a lot to think about. Of course, it's like the personalized approach.

Paul 54:17
No, that's very helpful.

Matt 54:19
Of the common medications. We're going to be seeing patients that they'll see you and then they're coming to see us in our regional practice. And we have what sort of things might we need to monitor if they sometimes they fall off seeing the specialist. And then I have this patient who's on like

carbamazepine, and I'm seeing them and I'm just, you know, what, I have to look up like, what should I be monitoring here? Any with the common seizure medications, if we're in primary care, we're seeing patients on these anything we have to pay attention to?

Sara 54:52
Yeah, that's a great question. So carbamazepine for instance, or like any of the P 450. Do you have you know, are some of these medications can cause osteoporosis. So vitamin D supplementation is important. So checking their vitamin D levels. You know, and supplementing even if they were normal. But, and we're talking I guess in a once you know somebody who's established establish, establish patient. So sort of like routine seizure medication levels is certainly appropriate with routine labs like a CBC CMP. At least annually, I would say I can track if somebody is established and stable. And traditionally, if patients who've been on some of the older medications like phenytoin, for example, you know, if we can transition them to newer medications, there's a lot less monitoring and potential side effects too. So that's some of the considerations I think about.

Paul 55:50
Can I ask you to speak on some of the non medication options? I think specifically, the things I'm asked about, I think I've seen on board exams or like ketogenic diets or diet treatment, I, again, recognizing this is a whole other lecture unto itself. But if you just talk about general considerations in terms of dietary management of seizure disorder, that would be helpful.

Sara 56:08
Yeah, dietary, so dietary falls in that, like the alternatives to anti seizure medications. And I have co authored a paper on when drugs don't work, as well. So specifically, with diet, and typically ketogenic diet is going to be the case, like later in the treatment algorithm, so not as the only means of treating a seizure disorder. And it's, it's absolutely reasonable to refer patients who are wanting to be very serious about a potential dietary trial. So they'll need like a dietician need to check if they're in ketosis. I mean, depending on how serious it's going to be, versus like, potentially, you know, the modified Atkins diet. But these, these traditionally don't replace medications. But you know, it's something that they can try. And in the adult population, there's a bit of limited data available, but traditionally, in the pediatric patient population, there have been used as a ketogenic diet to reduce seizure frequency, and that's seen almost like approximately 40 to 70% of pediatric patients can experience a reduction of up to fit like greater than 50%. So it's, it's very compelling. And there are like adult studies and looking at that, and, you know, nearly half of the patients might have equal or greater than 50%, seizure reduction, about a third have been noted in one study to have like no improvement, and about 10% were unable to complete it, because it's a very strict diet.

Matt 57:40
I hope you like mayonnaise. Laughter

Sara 57:50
so, so it requires a lot of counseling and, and management. So we will refer patients to a dietitian as well. And so those are some of the considerations, of course, and making sure there's no undesired

weight loss, other kinds of symptoms, potential adverse effects, and, and so that that's kind of my thoughts on the ketogenic approach.

Matt 58:14
The ketogenic diet thing is interesting, because, supposedly, JJ Abrams, the guy from last in the Star Wars movies, his son has, I believe, he has a foundation called the Charlie foundation for a son who I believe is now an adult, but his son was had refractory seizures. And I guess doing research, he found that someone at Hopkins was, I believe it was Hopkins was doing research on ketogenic diet for seizures. And I think that's one of the ways it became popular, popularized in the past couple decades of using this to treat seizures. And then somehow now it's just spread to the public. And people are using it for like bodybuilding and weight loss and all these other things now, too, but it's just an interesting story. We should, we should probably talk about with Mr. Jackson, let's say we just put them on levetiracetam. Just because it's easy to say and that's, that's what, that's what most people seem to be put on. And we were now going to send them back out into the wild. He hasn't had any further seizures. We did. We did the MRI, we did the EKG, nothing interactively, all his labs looked okay. He now wants to know, I mean, he's a truck driver. So, fingers crossed, can you go back to work?

Sara 59:36
So driving is a huge aspect, in counseling patients with any kind of episode of loss of awareness. Whether it is you know, syncope for example, or an epileptic seizure, so that there are a lot of driving laws like state specific laws, so I would have to reference you know, dependence On the state, for example, I'm in Arizona, so three months, without having any episode of alternate alteration. I'd have to look up kind of the truck driving laws or what those are. But it's important piece, right? Yeah, see there independence, I mean, is heavily affected. Fortunately, there's Lyft and Uber and other services nowadays. So the driving piece is huge. And then the seizure precautions in general, or strategies how to reduce your risk of a seizure related injury. Because patients with seizures can have a lot of physical health component, they can have fractures or some serious it burns, for example, or other serious bodily injury. So that the keys, things that I think about, of course, that you all do so well, as well, when you discharge these patients is going to be safety. So wearing a helmet, when bicycling or if you're horseback riding or something like that. supervision around any kind of water. So if you're swimming or at the spa, or you know, of course, using a shower, rather than a bathtub, or if you're able to use a microwave versus a stove top, using an epilepsy safety pillow, for example, which was designed to reduce your risk of potential, you know, suffocation of lying face down there, there are quite a bit of heights, avoiding high ladders, for example, following driving regulations, trying to take medications as prescribed, avoiding locking the bedroom or bathroom, if somebody were to have event. So those are some of the main things that I think about safety being the big one. So if somebody were to have a seizure, while out swimming, or in the bathtub, there can be pretty life threatening. Yeah, outcome.

Matt 1:01:51
So as we mentioned before, he likes to stay up all night, drinking Four Loko? Let's say it still has caffeine, it's alcohol and caffeine, and he just likes to stay up, he sleeps a couple hours a night? Does he have to give up alcohol? And how much does he have to sleep? Can he continue this fun 20 yo something lifestyle?

Sara 1:02:17
So like patients who have seizures, for example, like the college age patient, of course, is this is very common counseling. So in general, we always talk about sleep hygiene and seizure, you know, stress reduction, sleep hygiene, of course, avoiding alcohol, that's not to say they'll never have an alcoholic beverage ever. But if they can help themselves in not having ways to reduce their seizure threshold, because it's always, you know, yeah, I kind of always outlet I say, Hey, everyone has a seizure threshold, I have one you have one and the medications help raise that threshold. And so things that can lower it, you know, we don't want these breakthrough seizures popping through. So that's kind of how I think about it. So

Matt 1:03:06
I forgot to the person quitting smoking, he's trying to quit smoking as well and he's on bupropion. He also has chronic back pain. He takes Tramadol for that. Sure. And perfect. Paul, anything else? What else? What else? Does he have any other common..

Sara 1:03:20
Is he on penicillin? Or some antibiotic? Laughter

Matt 1:03:25
Yeah. Well, this has been great. I think, unless Paul has other questions. Paul, are we missing anything? I mean, I know we've we are out on the table. But what else? What else do we need to ask? Before we let Sarah go? Why? I

Paul 1:03:39
I think one thing that I hope it's okay that I wanted to cover to go back to Sarah, you'd actually mentioned about comorbid depression in patients with seizure disorders. So in terms of considerations that we can actually address as primary care doctors, it seems like that's actually doing the reading much more prevalent than I think I was aware of. So I wonder if you wouldn't speak to sort of how common it is and what your approach is to patients who have a seizure disorder and depression or anxiety?

Sara 1:04:02
Yes, thank you for that question. So patients who have epilepsy have a higher risk of mood disorders like anxiety, depression, attention deficit disorder. There's a few really excellent review articles on this on this topic for primary care and kind of the comorbidities of epilepsy I highly recommend by doctors Joseph Survet and Catherine Knowy. I can put those in a link. But the emotional health aspect is huge because people with epilepsy have increased lifetime risk that is, you know, two to three times more likely to have depression, anxiety, and are twice as likely to report having increased risk of suicidal ideation and three times more likely to die of, of suicide. So, so it's a it's a big it's a big element of our, you know, day to day interactions with patients with epilepsy. So I do want to make a note that, you know, we commonly get asked about SSRIs and SNRIs, and, you know, be appropriate or other agents, but the key is ultimately having their mood disorders also stable, because that can beget the seizures. And vice versa, if you're having increased seizure frequency, that's not going to be positive with your mood. So, so it's never like a hard stop to stop one of those medications. It's just kind of an ongoing

discussion with, you know, their psych psychology psychiatrist or, or so. So, and we commonly will start SSRIs as well on patients.

Matt 1:05:37
Yeah, I hadn't realized that it was such a big overlap there. And I guess maybe part of its like, is it that people with mental health or mood disorders are more likely to have seizures? Or is it that there's there? Are they causative, you know, or is it just in association? I guess, maybe we don't maybe we don't know that or it's, it's impossible to know that. And I and I also had never Paul, I was also just reading about this that seizures are like stigmatizing for patients, which is something that I hadn't really thought about, either. I didn't realize how affecting it is, and I'm not sure if there's resources for patients that you recommend for them coping with that part of things, Sara?

Sara 1:06:20
Absolutely. It is heavily stigmatized. And I would say even you know today, but, but epilepsy is one of the most common neurologic conditions worldwide. 65 million people in the world, you know, around the world have epilepsy, over 3 million in the US and one in 26 people in the US can develop epilepsy at some point in their lifetime. So it's super common. I love the epilepsy.com website that I refer patients to because it's managed by a bunch of physicians who put this content in, and it's a very nice streamlined process and centralized resource, they have information on seizures, you know, alternate everything kind of we discussed. So even alternatives, for example, epilepsy surgery, which is an option for patients who have focal epilepsy, for instance, and who, who made that drug resistant subtype. And also devices, for example, which we do, we didn't talk about as much detail, but there, there are neurostimulation devices to help treat your epilepsy. So there's a lot out there. And so, I like the Epilepsy Foundation, what that website it's an excellent resource, they can take basic first aid certification, a lot of things and get some homework on there, too.

Paul 1:07:44
But it's heavily stigmatized or anything else that your friendly primary care doctor can help your friendly neighborhood epileptologist with like, I feel like oftentimes, what's your story or like, okay, that's your neurologist problem, Godspeed. Good luck. Like, is there anything else in terms of comorbid things that are very common or other are there practical things that we can sort of do to help us coordinate their care?

Sara 1:08:04
I think the mood disorders is a huge one that we talked about, which is, which is great, the physical health kind of aspects, you know, the accidents and injuries, the big one is definitely like early referral to a neurologist or to an epileptologist. If the patient has not responded to one or two medications, I think it's absolutely reasonable. There's, there's a very kind of a late referral process in the country for decades, because it almost takes like 15 years to get a patient into that epilepsy surgery evaluation. But if a patient is highly motivated, you know, we can we can get them to do that pre surgical evaluation, like I would say, very commonly within six months. So, so try to treat their seizures like you know, as aggressively as we can, if they don't respond, but the majority of you know, epilepsy does respond to one or two medications. But of course, a subset, you know, about a third of the intractable epilepsy is that we want to be able to treat those and evaluate those as soon as we can. So

Matt 1:09:14
Alright, so I think we'll give you a chance any Do you want to plug your website and can people follow you on Twitter, you on Twitter or other platforms?

Sara 1:09:28
Nothing to plug, I guess. Oh, I have I have a Twitter account.

Matt 1:09:36
Yeah. Sometimes our audience members, they'll reach out to our guests after the episode asking them just like follow up questions, or they'll tag we'll tag you when we send out this episode when we release it, and you might get some follow up questions there.

Sara 1:09:52
Well, thank you guys so much for having me.

Matt 1:09:54
Its been really fun. Same here. I learned a ton of stuff from you. Thank you so much.

Paul 1:10:06
This has been another episode of the Curbsiders bringing you a little knowledge food for your brainhole

Matt 1:10:11
yummy? ketones?

Paul 1:10:14
Laughter

Transcribed by MJ Allen, D.O.