

EMCrit Jan 17 2022

But let me start by saying that I did re-listened to that old podcast, and read the comments and your replies, and you stated some very inciteful things on the real value of the HINTS exam which some people have seemed to forgotten. So first, I'll try and recap and re-emphasize the role of HINTS in the assessment of patients who might be having a stroke presenting with dizziness.

In a nutshell, HINTS is to be applied to patients with the AVS. And that means that they have constant dizziness, nausea, vomiting, their symptoms get worse with head movement, they have some difficulty walking, and very importantly, they have nystagmus at rest. Meaning, that you can see nystagmus when they're looking straight ahead, or off to either side 30 degrees. And the basic differential in these patients who present to the ED with AVS is: is this VN? (which is more common) or is this a PCS, which is less common but obviously much more worrisome. And as you pointed out in your comments, the first line of defense against missing a PCS that presents with constant dizziness and nystagmus is NOT the HINTS exam. It's to look for central features that wouldn't be expected to be seen in a patient with a peripheral cause, like vestibular neuritis.

And these central features can be found in the central part of my Big 3 of vertigo algorithm, which is in the current edition of Tintinalli, and also if you google CMAJ and my last name Johns, you can find an article with it.

And the central features are: New significant headache or neck pain, (which would be concerning for cerebellar hemorrhage or vertebral artery dissection, the usual stroke symptoms like focal weakness or paresthesias, and then the posterior circulation symptoms, sometimes called the dangerous D's (diplopia, dysarthria, dysmetria, dysphonia and dysphagia And of course, vertical nystagmus at rest. But remember, this doesn't include vertical upwards nystagmus seen during a positive DHT. And the last big one, inability to walk unaided. Please don't discharge a patient in a wheelchair who normally ambulate well, with a diagnosis of peripheral vertigo.

Yeah, really important to screen your dizzy patients for these important neurologic findings. What's been happening with HINTS in the last 11 years? It seems like there was great enthusiasm initially, but now not so much. So can HINTS be done by regular pit docs?

Yes, you're right, initially there was a lot of interest and enthusiasm about HINTS but unfortunately when people started to actually do it without proper training or understanding when to use it, or how to do it, they started to feel unsure about HINTS and there has been some papers showing that we aren't using it correctly.

But there is a bigger question to answer first, and that is, what aspect of vertigo, a common presenting patient complaint, are we currently doing pretty well? And the answer is, we're not doing anything well in vertigo! The Dix-Hallpike test was described over 70 years ago, and the Epley maneuver almost 30 years ago. Yet there are still papers coming out in the last year that show that if you present to an ED with PC BPPV, (the most common and curable cause of vertigo that we see in the emergency department,) you're more likely to get a useless CT head than an Epley maneuver. That's just tragic in my opinion. And there's poor evaluation of vertigo right across the board. We miss a lot of dizzy strokes, with all the morbidity and mortality and medicolegal consequences associated with that, and almost never diagnose VM, which is a common cause of vertigo,

All of this leads to a frustrated patient and a frustrated and fearful doc.

Even the people we call for help when we are uncertain about vertigo, like ENT and neurologists don't necessarily like and understand vertigo either!

The only group of people who consistently understand vertigo extremely well are those ENT or neurologists who have undertaken fellowship training in vertigo. And there's precious few of those people around. Most ED docs have never met one. And the ones that exist tend to write papers about vertigo aimed at their peers, and not front line providers like us.

Are you suggesting that ED doc need to become vertigo experts?

No, we don't need to know how to diagnose 3rd window syndromes, or bilateral vestibulopathy, or Persistent Postural-Perceptual Dizziness or the dozens of other rare and not time sensitive diagnoses that vertigo experts need to know how to make. This is really important. But we do need to recognize the common and important causes of vertigo almost as well as vertigo experts. Kind of like how we don't need to know everything that a cardiologist knows, but we need to be able to be as almost as good as them, at knowing if the ST elevation on the ECG is a STEMI, or BER, or pericarditis. And **we** need to know if our dizzy patient has BPPV, VN or a PCS. What I call the Big 3 of vertigo.

So, yeah, we have challenges in all aspect of vertigo right now.

But in fact is, is that HINTS **isn't** that hard to do, but it's not hard to do wrong, or on the wrong patient population. And the interpretation is a little tricky, but given the many complex things that ED docs do (u/s, intubation, etc etc.) it's certainly something we can do right. And I've taught it to the residents in our program in Ottawa, and have had feedback from our local dizzy experts, that proper vertigo education is making a difference when they see the patients referred to their Rapid Access Dizzy Clinic.

But is the proper use of HINTS spreading across the world like wildfire? Well not so much. And it isn't hard to find ED docs who say we can't do it and shouldn't use it. And there are a few reasons for the failure of widespread correct use of HINTS. For one, there are so few emergency physicians who are Vertigo champions out there to lead the way. If I were to have hold a convention of all the ED docs who are committed vertigo education champions in North

America, I think there would be less than 10 at the table. Compare that to committed u/s champions, where there would be thousands.

And another reason is that some of the non-adopters of hints actively campaign against it. I've seen people on youtube suggest that you can kill people with the HIT (which is nonsense) or that the HIT can only be done by neuro-otologists. I had one guy on twitter say that "you can't rely on the flick of an eyeball to send patients home." Funny enough though, he's probably happy to rely on squiggly lines on an ECG, and shadows on an u/s screen to make clinical decisions. Listen, back in the 1990's we didn't just throw a bunch of ultrasound machines at people and expect without training they'd become competent at using them. But for some reason we think that could happen with HINTS. And frankly the cards have been stacked against all aspects of Vertigo for decades.

Peter, you've been around a more than a couple of decades haven't you? over 30 years? You must have some historical perspective on how we got to the bad place that we're in with vertigo.

Yeah, when I started my practice in 1989 knew as little about vertigo as any ED doc. But since I was the new guy, I was of course assigned the worst topic you could possibly get to teach the residents and that, of course, was the weak and dizzy lecture. And I taught what was in textbooks at the time, and frankly it was all useless crap. And unfortunately some of those poor approaches are still prevalent and being propagated today. One of the big ones is that the tables of the characteristics of central vs peripheral vertigo can aid you in making a diagnosis. I'm sure you probably studied them yourself. And you first look at them, you think oh, great, I just have to figure out which side my patients presentation is more like, and that will tell me if they have a central or peripheral cause for their vertigo. But these tables are doomed to fail, because you have to put BPPV and VN on the peripheral side, because they are the most common causes of peripheral vertigo. The most deadly and dangerous cause of central vertigo, the one that makes us fearful of vertigo, is of course PCS, so of course it goes on the central side of the table. But it turns out that the characteristics of BPPV and VN are actual quite different. They last a different length of time, their nystagmus is generally quite different, and there is a different effect of head movement on them. Yet they're both on the peripheral side of the table. And dizzy strokes and VN, which of course are on the opposite sides of the table, can both present with the same sudden onset, same duration of symptoms and the same nystagmus. So that's why vertigo experts developed the HINTS exam So any central vs peripheral table trying to reconcile this dilemma becomes unintentional misleading and in fact dangerous to use.

What other myths or misconceptions are still out there?

Yeah, you can still find people teaching that the most important question to ask a dizzy patient is "what do you mean by dizzy?" And this isn't any more helpful than asking someone with

chest pain what their pain is like. You have burning pain in your chest? Oh, here's a PPI, you should be feel better soon! And if they say there's an elephant on their chest, just whisk them away to the cath lab!

Interesting, so you think that these vertigo myths are partly to blame why we aren't keen on HINTS?

Absolutely. If you talk to anyone who has been in practice for a few years, you'll find that they fear the vertigo patient, and find it frustrating to see them. That's because they learn these poor approaches to vertigo, apply them to the patients they see, and find that "what do you mean by dizzy?" and the central vs peripheral tables don't really help them make a diagnosis. So they go from being the vertigo naive to being the vertigo confused. And most people don't like seeing patients they find confusing, so they try and avoid them. And this just solidifies their bad knowledge base, and they have entered what I call the Vertigo Vicious Cycle of Vexation, and soon, they are doing a CT on everyone, giving them meclizine and roll the dice by sending them home and hope they don't come back as a stroke.

So what what approaches do you suggest instead? What about the Timings and Triggers approach?

Yeah, this is Jonathan Edlow's approach, and he knows vertigo extremely well. He is beyond a vertigo champion. In terms of the assessment of vertigo by emergency physicians, he is a world leader. We agree on almost everything about vertigo. But we do look at things a bit differently. Look, I'm a pragmatist. I realize that practicing ED doc's heads are already filled with vertigo misinformation and they have limited bandwidth that they are willing to devote to vertigo. Edlows Timings and Triggers paper is 24 pages long, including 5 tables, 2 algorithms and zero videos. Trying to teach vertigo without videos is like trying to teach how to ride a bicycle with an infographic. And he tends to overcomplicate things. He considers one of the pearls of his approach to be the introduction of the concept of spontaneous and triggered episodic vestibular syndromes. I find they just add an unnecessary layer of complexity to an already difficult topic.

That's why I suggest using my Big 3 approach, which leads you through the clinical presentation and appropriate bedside testing that will allow you to diagnose the most important causes of vertigo that we see in the ED. And they are: BPPV, VN and PCS syndromes. So I try and limit my teaching to things ED docs need to know at the bedside in order to help their patients, and stay out of trouble.

In contrast to the EVSs, AVS is a crucial concept that we need to understand. Because the AVS is where the tricky strokes live. But here is another point that Edlow and I disagree on. He loosens the definition of AVS a bit, to include patients **without** nystagmus. And his algorithm states that you can do the HIT on patients without nystagmus, but you can't rely on it's results. This doesn't make sense to me.

You see the problem is that the HINTS exam was never tested on a population of patients with dizziness but without nystagmus. And including dizzy patients without nystagmus in the definition of AVS has the unintended consequences of bringing in other causes of vertigo for which the HINTS exam was never intended to diagnose. So in short, don't apply HINTS to patients without nystagmus. I made a video on that too. LOL

Ok, but what do you do with the dizzy patients with no nystagmus?

You know I struggled with that question for a while, then Machner published a paper in 2020 that introduced a very useful concept the called Acute Imbalance Syndrome. He found that the patients that are still dizzy in the ED, and are have difficulty walking, but NO nystagmus have a high incidence of acute findings on delayed MRI. If the ABCD2 score was 4 or over, 50% had abnormalities on their MRI, mainly strokes. The reason for this is that almost all patients with VN have spontaneous nystagmus. So if you don't see it, it takes VN off the differential. And that leaves a lot of badness, mainly strokes. I recently reviewed a case where a patient an acute presentation of dizziness, vomiting, difficulty walking but NO nystagmus and was sent home as a peripheral vertigo disorder. They unfortunately returned a few days alter with a serious PCS. So I think that's your answer. Worry about patients with Acute Imbalance Syndrome.

What about HINTS plus? What's that all about?

In 2011, Kattah and David Newman-Toker published another paper with more patients with AVS and introduced HINTS plus. The "plus" is the addition of a bedside test of hearing to the other three components of HINTS (nystagmus, TS, and HIT). Looking for a new hearing loss will increase your sensitivity for picking up stroke. That's because the AICA, the anterior inferior cerebellar artery, supplies blood supply to part of the cerebellum but also to the labyrinth which contains the end organs of balance and hearing. So if you suffer from an AICA stroke, you'll develop an acute hearing loss, dizziness and nystagmus and a cerebellar stroke. So rub your fingers a couple of inches away from the patients ears, and if you find a new hearing loss in one ear, this should concern you for an AICA stroke and is a HINTS plus central result. So it makes the HINTS exam more sensitive for stroke. It loses some sensitivity, because viral labyrinthitis can produce a AVS with new hearing loss, but that's fairly rare. Which is rarer, AICA stroke or labyrinthitis is not known. Let's just say if I see an older person with vascular risk factors that come in with an AVS and new hearing loss, I'm going to be worried about an AICA stroke. But if a young healthy person says they've had a cold for a couple of days, and now their ear hurts and the TM is red and now they have developed an AVS with a hearing loss or tinnitus, I'd probably call that viral labyrinthitis. Everything in between depends on where you practice, the availability of MRI and your local medico-legal environment.

.

If people read your big 3 approach and watch your videos, how will they know they're ready to use the HINTS exam to make clinical decisions in AVS patients?

First, you have to be able to give the indications for using HINTS, and list all the central features I described, and you can chart the results of the HINTS plus exam appropriately, all without referring to notes. And then the hardest part I think is this: You have had a vertigo champion watch you perform the HINTS exam, and should have been able to produce a video of you performing the HIT and producing a clearly abnormal HIT. This part is a little harder to do given the current pandemic but I recently made a video about the physical aspect of performing the HIT, and I think it can be very helpful to watch that. I also gave a zoom tutorial to emergency medicine residents in Taiwan and watched about a dozen of them perform the HIT test and gave them corrective feedback and I think it worked out pretty well.

People might think that that's a pretty high bar perhaps, but compared it to the training that is generally required to be signed off on u/s, I don't think it's unreasonable.

Are there any other areas in vertigo that we need to improve on?

Yes, LOL a few. First of all, just the fundamental skills of how to observe and record nystagmus. The number of times I've read in a medical chart just the words "The DHT was positive". Or "Nystagmus was seen" is shocking. I mean, if you see a patient with chest pain, you don't just right "abnormal ECG"

Secondly, be aware that there is more than one type of BPPV. Posterior canal, the more common one, is where the DHT is the diagnostic test, and it shows vertical upward and rotatory nystagmus, and the Epley maneuver is the cure.

But HC BPPV is probably about a third of BPPV cases seen in the ED, and it presents with either no nystagmus during the DHT, or horizontal nystagmus. So if you think someone has BPPV, but the DHT is negative or you see horizontal nystagmus, do the supine roll test, which is dead easy, and if it's HC BPPV, there is a maneuver called the Gufoni maneuver, which can cure them easily. I have a video for that.

And lastly, if your patient says they're dizzy, but doesn't fit the diagnosis of BPPV, or VN or PCS, ask them about whether they ever get migraine headaches. And whether they have had many episodes of vertigo before. Because VM is a common cause of dizziness and almost never recognized in the ED.

Peter, you mentioned that many ED docs are fearful of and frustrated by vertigo patients and have entered what you termed the vertigo vicious cycle of vexation and have basically given up. Do you think that we overcome this?

BPPV is the hook that we can use to get ED docs interested in vertigo, because once you understand that well, and you start diagnosing the most common cause of vertigo and curing them too, it actually becomes fun! That's how I got into vertigo. It becomes rewarding instead of frustrating.

And once you know how to screen patients for central features, and then do the HINTS plus exam on all AVS patient, which are almost all VN, you'll gain the confidence that you won't send home a stroke. So you will be confident and find seeing vertigo patients rewarding, instead frustrating and scary.