ROBERT KANIECKI: So why is this relevant to those of you in obstetrics, those of you in family practice? Well, the relevance is headache is a huge issue, both in the pregnant person and in the postpartum world. So if you see 5% of pregnancies are complicated by a new headache or a different headache, and then in the postpartum state you see 40% of women report headache postpartum-- that's postpartum week 1. So the first week postpartum, 40% of women will report a headache.

About half of those roughly are primary headaches-- migraine and tension type headache, tension type being the most common. But half of them are secondary. And you'll hear about preeclampsia and eclampsia shortly, and the post dural puncture headache being another common one, as well. But the point is the first week postpartum is 50/50. It's 50/50 of something bad, something that you need to be concerned about rather than a primary headache syndrome.

So we in headache divide the topic categories into 13 families and roughly 300 subtypes. This is the international classification of headache disorders. I'm not going to bore you any further besides this slide. So this outlines the way we visualize headache. And on the left hand side of the slide, you have the primary headaches. In our world those are defined by clinical criteria. Migraine, tension, cluster-- there's no test for this, this is basically defined by how long the headaches last, what associated symptoms occur, et cetera.

On the right hand side of the slide the criteria are more pathology-based. So on the left headache is the problem, on the right headache is a symptom of the problem. And the good news-- or the bad news-- is there is extensive overlap between the two in terms of symptoms. So when we talk about the different headaches that we're going to be reviewing here shortly, knowing the symptoms-- where the headache hurts, how it hurts-- really is not all that valuable.

Because a subarachnoid hemorrhage headache, and a migraine headache, and a reversible cerebral vascular constriction syndrome headache might share a lot of overlap in terms of how they throb, how much nausea occurs, how light sensitive you are. So we're not going to need to worry about, OK, do you remember all the features? We outline the highlights and I think that will be sufficient. So we start with secondary. And that's every time we see a headache patient, whether it's in the office, in the emergency department is do I need to be worried about this person? Secondary headache syndromes right up front.

So there's a big divide. So you'll find that we have primarily in our mind first thing out of the gate, is there somebody I need to be worried about? Are they coming down the Monongahela? Are they sailing down the Mon with something bad ready to crash right at the point, or they just have a primary headache? But the symptoms look pretty similar. There is a shade of difference though. As you can see the two rivers coming together to meet the Ohio shade slightly differently. So how do we distinguish them and what do we worry about?

So here we have the ones to worry about in pregnancy. So the primary headaches-- migraine and tension type-- we don't worry about. But on the right, the big hitters. So a little bit about those and how do we distinguish left-hand from right-hand.

So this is all commerce. So if you look at the reason to emphasize secondary headache first is not because of the numbers, it's not because of the prevalence of secondary headaches is it, right? Secondary headaches, in terms of presentations, only 1% to 3%. Most people that come to see us have migraines. Most people that go to see an EMT, most people who go to see obstetrician or a gynecologist, most that go to ophthalmology, chiropractic care, the majority of people who come in for headaches, you're going to see migraine.

Although migraine is not the most common headache, it's the most common headache requiring consultation. 40% of the population has tension type headache, they go take care of their tension type headaches at home. They don't necessarily need to see us. The ones that come to see us are going to be migraine, as you see there. So it's pretty amazing. If a patient comes to see you in a typical setting and they report I have headaches and you guessed they have migraine, you're right 9 out of 10 times. Where in medicine can you be right with a guess with a single chief complaint 9 out of 10 times?

However, pregnancy ups the ante. So 35% of presentations-- this was a recent review from Robbins at Montefiore in a big patient population. 35% of acute headache presentations are something secondary in the pregnant and postpartum patients. So although it's 1% to 3% overall, in this situation it's a little more concerning.

So that takes us back to the red flag. So who do we worry about? Who do we worry about overall? This is any headache patient in any setting here are the red flags we look for. And I highlight the one in the middle because special clinical circumstances. If you have a patient who has breast cancer and comes in with new headaches, you'd be concerned. If you ask somebody who is on warfarin and comes in with new headaches, you'd be concerned. Or immunosuppressive agents for Crohn's, new headache.

Well, pregnancy is one of those settings. So by definition a new or different headache in the pregnant or postpartum woman [SNAP] already has one red flag. You already have one red flag that says I need to seriously think about imaging this patient and/or testing them further, right out of the gate.

Then you've got two others to look for. So how can you then increase your diagnostic accuracy, I guess, in pregnancy in postpartum women using this red flag list? Well, the one other one to focus on would be the one all the way at the bottom. The woman has an abnormal examination of any kind-- hypotension, hypertension. The hypertensive woman that comes in with severe headache you're going to be concerned about. That's a no brainer to you folks now. Abnormal examination is not just hemiparesis, it's stiff neck, it's pupil asymmetry, it's hypertension.

The other one to highlight is the second one from the top, the abrupt onset, the thunderclap attack. [SLAPS DESK] Most primary headaches don't do this. [SLAPS DESK] They don't. They don't all of a sudden. They start slowly and build or they build over an hour. Even cluster builds over minutes. When somebody says it was maximum within the first minute, within the first five minutes, you have to be concerned.

So that's where you're going to look for. All right, two things. I'm already worried about anyone who's pregnant and postpartum now if they have any abrupt onset attacks, any thunderclap attacks, and any examination findings whatsoever-- hypertension, again, being one of those-- we're going to be more concerned and more likely to work them up.

So what do we do? Well, here are the typical ways to work somebody up. Usually when you have an abrupt onset thunderclap attack, the typical first worst headache is what? What are we trained in medical school, the first worst thunderclap headache is typically subarachnoid hemorrhage.

So when you have the first worst, when you have that abrupt onset, CT is typically the way we go. So when you show up in an emergency department with that first worst, that's what you get, CTLP, CTLP. That's third year medical school. So we do think about that and worry about subarachnoid hemorrhage. The work up, and now diagnostically we typically prefer MRI in all other settings besides that very acute onset. So emergent, maybe CT, otherwise you look at MRI. I'll show you the safety data on those. Special settings lumbar puncture, whether we're looking for two things, blood in the pregnant woman, blood or intracranial pressure-- so pressure measurement. And in the postpartum woman we add on typically looking for infection, particularly after a epidural anesthetic. So no role for EEG in the typical headache work up.

So here is the different procedures we can use. And as you can see, head CT is considered to have minimal risk when you use abdominal shielding. MRI is no known risk. There's been questions of whether noise of MRI or heat related to MRI is of any concern, but right now there appears to be no risk to the fetus when we use MR. So that appears to be our modality of choice. And then we look at what-- can you use dye? You can see CT contrast is FDA category B. So if it's necessary we do so. MRI is category-- gadolinium is category C. Because I'm not going to get back to this, postpartum CT dye also does not appear to have any negative impact on a delivered baby, on a nursing infant. So CT dye is quite acceptably used postpartum.

So what do we see? Well, when we do MRIs we see some really great stuff. And this is idiopathic intracranial hypertension, typically later in pregnancy. And we see the intracranial pressure up. Most recently I had somebody this week who we tapped and had opening pressure of 380. And surprisingly, no papilledema. But described it very typical for progressive pressure headache with, again, opening pressure of 380 millimeters.

Here you see the typical findings, number one, an empty sella, which is the black arrow. That's the most common finding in this particular condition in any state. The second most common you see is widening of the optic nerve sheaths. And then the other one is flattening of the posterior aspect of the globe. Because the pressure intracranially is being pushed up against the optic nerve, right? So the optic nerve is widening, and it's pressure against the head, which causes that flattening, which is what gives us the big problem of visual loss in patients with this condition.

You're going to hear a little bit about a lot about pre-eclampsia and eclampsia, but this is a typical finding. Early on you can see the first set of images up top, this is one week into the postpartum state and to this headache. There are changes on flare, but there are no DWI changes on the right. But further on a couple of weeks later down the road you start to see DWI changes, as well. So MRI findings that are typical of eclampsia or preeclampsia.

Reversible cerebral vasoconstriction syndrome. This is a increasingly recognized disorder that is typically associated with vasogenic substances. So we have vasogenic substances of the placenta that appear to be responsible pregnancy postpartum. But this is cocaine, marijuana, Sudafed, SSRIs a fairly common one as well. But right now the most common source of this in the population is actually marijuana.

So it ain't benign for all those that are using marijuana medicinally and say there are no problems with marijuana. I don't think you'd want to have that. So on the top images, you start to see some of the flare changes, and actually that subarachnoid blood, the top two left images. So it's a little subarachnoid hemorrhage. These are characterized by recurrent thunderclap headaches. They have subarachnoid hemorrhage headaches again, and again, and again. It's really a very interesting phenomenon, recurrent thunderclaps. Down below you see the little strings and beads is what it's called, the string of beads. I don't know, it doesn't look like pearls to me. But if you can really visualize that, it's probably some strings and some beads on the bottom one.

Lymphocytic hypophysitis. We are always-- again, in medical students, they always seem to be quizzed on pituitary apoplexy. They know shehan syndrome like the back of their hand. In 24 years of headache practice I've seen one case. One. This is an interesting one, because the pituitary gland does funny things. And a lot of times when something in the pituitary looks awry, somebody goes out and pulls the pituitary out. And in this case the pituitary is just fine. It's a little inflamed. This is lymphocytic hypophysitis, also seen during pregnancy. It's an inflammatory disorder which presents a pituitary enlargement. You can see the pituitary gland, the bottom right image, is enlarging and it densely enhances.

So it looks more like a tumor than it does a hemorrhage. And that enhancement is inflammation. Often there's a biopsy performed, but regardless do not take the pituitary out if it looks bad because sometimes it's fine. Some steroids will just take care of this condition right out of the gate.

So those are bad things. Now that you're sufficiently worried and you're worried about taking care of those people, the majority of folks, again, are going to be migraine. Why? Because migraine affects the population that you're seeing, so my population is yours. My population is the irritable bowel population. My population is the anxiety clinic population. The depression clinic, bipolar clinic. This is the nervous system of migraine. And so it biologically is more active in women of childbearing age. Boys and girls are about the same until puberty. Actually, boys outnumber girls, and then girls take off, you can see there.

So my favorite slide in the talk, because I gave this years ago now, 15 years ago I gave this at a group was called I Am Woman. This was a series in-- anybody from southern Virginia, Lynchburg, Virginia, in that area? So this is Lynchburg, Virginia. And this was a public program. So I gave this public presentation, they said, we need you to come down and speak the group, was 400 women. And this was advertised. They have medical topics and other types of things over the course of the year, twice a year.

So I went down, it was in the fall, and they asked me to come down. They said, can you talk about hormones and headache? I said, sure. So I had a title called sex hormones and headache. I think, yeah, that's going to catch them. I get off the plane, there's a big billboard advertising this for the community. It says-- basically the title of my topic was really small, but it said, I Am Woman-- which is the title of the series-- and my picture, really big.

So my brother lived in Richmond, Virginia at the time, got a hold of the image from the newspaper, put it on mugs, t-shirts, Christmas ornament that year that I got. It's hanging on my tree. So I am Woman. I get to this program. And the first talk was about a bladder condition. I can't remember which one, hyper or hypoactive. There was a bladder disorder, and I get in, and I hear them. They are just hooting and hollering, because I was running late. And they're having a good time. It's like there's adult beverages going on here in Lynchburg. This is not Lynchburg, Tennessee, This is Lynchburg, Virginia.

I thought, oh, they're having a great time, and I get in, and I put this slide up. I get up, I start my presentation, this is slide number two. And a woman sitting in the first row, I said, what do you guys think about this? And the women said, oh, hormones. And a woman stands up from the first row and says, I'm tired everybody blaming hormones.

I said, OK. So what are your thoughts? Because again it was kind of interactive. So she gets up and I'm up on a stage. She gets up and marches all the way up on the stage, comes behind my podium, grabs my laser pointer, and she goes up. I'm going to go off mic for a second. She goes up to this and she says, it has nothing to do with hormones, it has all to do with men. Because look what happens when we start to date. And then we're stupid enough to get married, and then we get smarter, we start getting divorces that we need. and then you men finally have the good sense to start dying off for us.

So I thought, ah, now you'll remember that curve forever. Because that's exactly what we see, that increase and decrease. I couldn't let her go. She goes off to thunderous applause. I have lost the audience. I said, wait, I said, come back. So she comes back up. I said, why the increase in men? Can we blame you guys? She said, you even give yourselves headaches. And then she walked off. But now you remember it.

Here's migraine, again, defined by clinical criteria. Forget this. What do you want to look for? I want to look for headaches that last hours to days. Are you a headache person? So before we talk about this headache today, tell me, have you been a headache woman? Were you a headache young lady? When did you get your first headache? And simply, have you ever had headaches that make you sick? Have you ever had headaches that get severe, and you ever had headaches that make you sensitive to light or noise? Severity, sickness, sensitivities. That's what you're looking for. Headaches that last hours or days that make you sick, make you sensitive, and could make you severe enough to put you down, miss work or school.

But here's aura, because here is where we're going to find that slice, a little bit, that water between the Monongahela and the Allegheny getting a little shadier. So you say, OK, they're migraine people. The good news is migraine without aura, which we'll see it here in a second, usually get better in pregnancy. You're not worried about those so much. It's migraine with aura.

So here's typical aura, and I bet most of you before this wouldn't think of these as typical auras. So the first one you see highlighted is fully reversible visual symptoms. So the twinkling lights. I get twinkling lights, I lose my vision for half an hour, you're all comfortable with that. Next one, typical aura, numbness and tingling in my hand and face, my lips, my cheek, my throat. Probably getting a little more nervous. And then I lose my words, I can't talk. Those are all considered to be typical auras.

This woman comes to see me with two or three or four of these attacks in my clinic, I don't need a scanner. This is a typical aura. However, this starts for the first time in pregnancy, you scan. So although I'm not worried about this woman, she's not pregnant or postpartum, if this starts up for the first time in pregnancy or postpartum, you're doing scans even though these are typical auras. So migraine without aura typically improves. Migraine with aura generally does not. And that's the problem because that's the one with the neurological symptoms. And sometimes you get your first aura during pregnancy.

So here's migraine without aura. Boy, I'd love to tell women to go ahead and get pregnant. They say, oh, what am I going to do when I'm pregnant? I have all this medicine I have to take. I say, go get pregnant. This is the best treatment preventive medication we have for migraine besides menopause. So for you, go get pregnant. If you have migraine without aura, it's real good for your headaches. Now, we'll talk about other issues, but here you see that.

Management now, that's where the challenge is. All right, now I've got migraine, the scan's normal or I'm comfortable it's migraine. How am I going to manage them? The top one here is not all that relevant to you. That's when patients are in rebound, over-using medication. We have to address that in the outpatient setting. That's not something that typically is a big deal in pregnancy.

But this is where we start, what natural things can you do to help yourself? Well, it's all about schedule regulation. And guess what happens when you're having hyperemesis the first trimester, and what's your sleep, like and what your fluid intake like, what's your caloric intake like? That's where we start to see more trouble.

So we'd like to regulate things. The migraine brain does much better. And the reason for this, we're learning more and more, the physiology of migraine has a lot to do with hypothalamic circuits, and it has a lot to do perhaps with why women may have a lot more trouble than guys. But if we can keep that hypothalamus, that schedule regulator, that internal clock in rhythm-- sleep pattern, meal pattern, exercise pattern-- these patients do much better. So get them doing the natural things. The more they do here, the less medicine we're going to need.

Here are the meds. So these are available in your handout. So acetaminophen, I'm going to give you the asterisk is for a reason. Acetaminophen has level A evidence for migraine. However, it was never studied in moderate to severe migraine. It has level A evidence in mild to moderate migraine. So it has level A evidence for living room migraine, not level A evidence for emergency room migraine. So milder migraine, yes, it has data, but there's a caveat to that. The caveat's to the last two, prochlorperazine and mediclopramide. That's level B data, but only an intravenous and rectal formats, not orally. So there's not data-- at least alone as monotherapy-- in acute migraine.

And then the asterisk of butorphanol is that nasal spray has level A evidence, but the injectable has level C. So that's where the asterisks come in. But as you can see, the B drugs is where we start. Acetaminophen 1,000 and mediclopramide 10. And I know Zofran is a big favorite among all practitioners as opposed to mediclopramide or prochlorperazine. But it has no data in headache and actually often makes headache worse. So if you can use these substances, you're better off with mediclopramide or prochlorperazine.

Triptans. So specifically as you see up here, the triptans are category C. Well, what's the data? Well, the triptan registry, which is largely sumatriptan based-- sumatriptan was approved over 20 years ago and has been on the market since 1993, approved in '92. So it's been around a long time. And that the triptan registry, which was largely sumatriptan, shows no significant problems.

A meta analysis that just was published last year looked at 4,200 exposures. And as you can see up there, there was no increased risk of malformation or prematurity. There was an increased risk of miscarriage in the first trimester among those who were exposed to triptans, but it was very small.

There was also interestingly an increased rate of congenital malformation in the migraine population that didn't take triptans. So are triptans somehow protective? Did they induce a spontaneous abortion in a patient that already had some type of a malformation? Who knows? But it's interesting information that has to be followed up.

We love relaxation training and biofeedback, but people can't afford it or spend neither the money nor time on this. So we often turn to meds to prevent migraine. And you see I've got no Bs. There's Cs and Ds. So in terms of prevention during migraine, we typically try to go towards the beta blockers. But the beta blockers have a range of ratings. So although I, for example, you can use a lot of atenolol for migraine prophylaxis, atenolol is actually a category D drug. So metoprolol being probably the one, and propranolol being the two that we use most frequently in this setting. By the way, the tricyclic antidepressants, as you see, amitriptyline also has category C rating. Topiramate was downgraded from C to D a couple of years ago.

Onabotulinum toxin is category C, pericranial blocks we do all the time. So when women are stuck, they're are very, very frequent, we can do pericranial blocks, occipital nerve, auriculotemporal, supra-orbital, basically pericranial blocks similar to the way Botox is done. But those pericranial blocks don't have onabotulinum toxin. What they have in them, there are two different substances. We use either bupivacaine or lidocaine. In this case, in pregnancy lidocaine is preferred. So lidocaine is category B.

Magnesium has an asterisk to it. I think most of you are familiar with this. Because in our world in headache, this was bigger news. Perhaps this is more known to you, but IV magnesium sulfate at high dose beyond five to seven days has been associated with increased risk of osteopenia and skeletal fractures in the delivered baby. So we use it all the time. But it was downgraded from category A to category C. So IV high dose magnesium sulfate is now deemed by FDA to be unsafe, particularly if delivered beyond five to seven days.

So what do we do with magnesium oxide that we do prophylactically? No one knows. So it's a question mark right now. Do we still use it? Yes. So we still use magnesium oxide, we do not do magnesium sulfate, but we'll do magnesium oxide at 400 to 500 milligrams, but not the super doses we sometimes use otherwise.

But here's the other thing. When you have a woman with migraine, bad things are more likely, not with the migraine. So look at those odds ratios. So the woman with migraine is at high risk for a number of different issues. Now she's delivered. To our list we add three things, meningitis, low pressure headache-- again, we stuck a needle in her now so she has two possibilities there-- and then cervical artery dissection that occurs during delivery.

So here is an abrupt onset postpartum headache. Sounds like a stroke, this lady comes in, little bit of tingling in her hands. Has these loose densities, these hypo densities, and then has this scan. She's 22. Had three pregnancies, this was her fourth. Postpartum she comes in with this abrupt onset headache. She has a family history of hemiplegic migraine. She has had migraine with aura since she's been six.

What she had was cadasil. The genetic disorder that makes you more likely to have stroke, dementia, mood disorder, she actually had a history of depression as well. The giveaway, and for our residents there, the key image here is the bottom one, that was anterior temporal. That's the give away for this particular case. So there tend to be symmetric white matter changes, but those anterior temporal lobe are the key ones. Those are the ones you'll find on your examinations.

But here's our postpartum right pituitary hemorrhage. This is the one where surgeons do get involved often in pituitary apoplexy. And the one below is low pressure. So the spinal headache not only gives you findings of intracranial hypotension clinically, but you can see subdural hemorrhage or subdural fluid accumulation. You could see meningeal enhancement and then cortical vein thrombosis, which is the bottom right side.

This is a woman that dissected both of her carotids during labor and then had a stroke from it with a cut off at the posterior branch of the right MCA, as those of you guys can see that. What do we use postpartum? Well, the list opens up a lot wider. So you can see there L1 ratings.

Naproxen gets an L3, we use a lot of naproxen. So for the neurologist, this is one where we change naproxen to ibuprofen postpartum. Aspirin-- baby aspirin is OK L1, but L3 for high dose aspirin, which is typically what we use in migraine, you can see there mediclopramide, a good one as well. And triptans, L3, but sumatriptan has been approved by the American Academy of Pediatrics as safe. So we typically go to that one, again, data, like in pregnancy, we're going to use a triptan, we use sumatriptan.

And there are preventive agents. So the list is a lot bigger than we had during pregnancy. You can see L2 for amitriptyline, venlafaxine, propranolol, metoprolol. Atenolol, again, not a great player. So stay away from atenolol, that's the message here. If you liked atenolol before this for non-pregnant patients, great. But for pregnant, postpartum, not so good.

And finally, the Choosing Wisely campaign. This is a in your handout. But these are the elements of choosing wisely in headache, what we want to avoid. And you see there, butalbital and opioid containing products. You see the statement that's listed there. Well, that's headache in general. We're a little bit more liberal, as you all know, with these products during pregnancy because we have to be. But long term, once the woman has delivered they should be taken off their butalbitals, their fiorinal, fioricets. They should be taken off hydrocodones, their codeines, postpartum. Because this is now recommended to stay away from these things.