Roth J, Chang A, Ricci B, Hall M, Mehta N. Why not a podcast? Assessing narrative audio and written curricula in obstetrical neurology. *J Grad Med Educ.* 2020;12(1):86–91.

Supplemental Material

Stroke in Pregnancy Learning Objectives and Sample Questions for Pre- and Post-test

Learning objectives:

-Determine which neurological symptoms, if any, warrant a workup in pregnancy.
-Describe the safety profile of various neuroimaging modalities in pregnancy.
-List the appropriate steps in the diagnosis and management of acute stroke, both in pregnant and non-pregnant patients, with attention to differences between the two populations.
-Appraise the risks and benefits of acute stroke treatment in pregnancy, including intravenous thrombolysis and mechanical thrombectomy.
-Discuss pregnancy-specific stroke risk factors.
-Discuss the secondary prevention of ischemic stroke in pregnancy, and specifically, the safety profile of blood thinners (antiplatelet and anticoagulation).
-Identify labor and delivery considerations in pregnant patients who have had a stroke.

1) A 27-year-old woman with history of migraine with aura presents at 33 weeks gestation with one week of right arm weakness and clumsiness in the context of severe headache. Which of the following is the test of choice?
    a. MRI, MRA and MRV brain with gadolinium
    b. MRI, MRA and MRV brain without gadolinium
    c. Head CT with contrast
    d. Head CT without contrast
    e. Carotid ultrasound
    f. None; it is most appropriate to clinically observe this patient, who is probably having a migraine with aura
2) Which of the following neuroimaging modalities is safest in pregnancy?
    a. MRI brain with gadolinium
    b. MRI brain without gadolinium
    c. Head CT with contrast
    d. Head CT without contrast
    e. None of these imaging modalities is safe, and therefore they are not used in pregnancy
3) A 27-year-old woman with history of migraine with aura presents at 33 weeks gestation with one hour of right arm weakness and clumsiness in the context of severe headache, prompting neurology, emergency medicine and ob/gyn concern for possible acute stroke. Which of the following statements about acute stroke diagnosis and treatment is most accurate?
    a. Head CT is absolutely contraindicated in pregnancy, and therefore determination of acute stroke therapy is made based on clinical history and examination alone.
    b. Intravenous tPA (IV-TPA) is absolutely contraindicated in pregnancy, and therefore the treatment of acute stroke in pregnancy is largely supportive.
    c. This patient should be treated exactly like any non-pregnant patient, receiving a head CT and CTA, and intravenous tPA, as is the standard of care.
    d. Treatment of pregnant women with stroke with IV tPA is determined on a case by case basis, with attention to severity of symptoms and risks of the drug.
    e. A “stat” MRA with gadolinium is the appropriate first step for determining if the patient is a candidate for mechanical thrombectomy, the preferred acute stroke treatment for pregnant patients.
    f. Mechanical thrombectomy cannot be performed in pregnancy due to the risks associated with intravenous contrast administered during the procedure.

4) Which of the following statements regarding stroke risk in pregnancy is most accurate?
    a. Stroke risk factors in pregnancy can include enhanced coagulability, hypertension, preeclampsia/eclampsia, and migraine.
    b. Risk of stroke in pregnancy approximates the stroke risk in the general population of young women of childbearing age.
    c. Hyperlipidemia is a common stroke risk factor in pregnancy because lipid profile in pregnancy is typically altered; cholesterol-lowering medications can safely be used in pregnancy to modify this risk.
    d. Caesarian section confers no increase in stroke risk.
    e. Smoking is considered less of a stroke risk factor in pregnancy because pregnant women do not tend to smoke cigarettes.
5) A 27-year-old woman had a stroke in a prior pregnancy and is current pregnant again. She was determined to have no underlying coagulopathy, and the cause of the prior stroke was migrainous infarction. What is the appropriate therapy for this patient during the current pregnancy?
    a. Antiplatelet therapy with aspirin 81mg/day, blood pressure control
    b. Antiplatelet therapy with aspirin 325mg/day, blood pressure control
    c. Anticoagulation with warfarin, titrated to appropriate INR, blood pressure control
    d. Anticoagulation with low-molecular weight heparin, blood pressure control
    e. Blood pressure control alone – no blood thinners are safe in pregnancy
6) Which of the following factors is the primary determinant of anticoagulation versus antiplatelet treatment as secondary stroke prevention?
    a. The age of the patient.
    b. The gender of the patient.
    c. Whether the patient is pregnant.
    d. The suspected etiology of the stroke.
    e. The blood pressure of the patient.
    f. The presence of a heart murmur.
7) A 27-year-old woman with prior stroke due to inherited coagulopathy is treated with low-molecular weight heparin (LMWH). Which of the following statements regarding labor and delivery considerations is most accurate?
    a. Caesarian section is preferred to vaginal delivery in women with stroke who are taking LMWH because the timing can be controlled most easily.
    b. Cessation of LMWH 24-48 hours prior to epidural or spinal anaesthesia (epidural or spinal) is crucial; however, vaginal delivery can occur in patients taking LMWH.
    c. Both LMWH and low-dose aspirin should be discontinued at least 24 hours prior to labor and delivery, to reduce bleeding risk. However, anaesthesia (epidural or spinal) can be safely performed in either scenario.
    d. LMWH use is equally safe in caesarian section and vaginal delivery.
    e. Patients taking aspirin should be switched to LMWH one week prior to delivery.

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Supplemental Material

Migraine in Pregnancy Learning Objectives and Sample Questions for Pre- and Post-test

Learning objectives:
-Identify the key clinical features of migraine
-Outline the pathophysiology of migraine attacks
-Describe the safety and efficacy of a number of migraine medications, both preventative and acute therapy, in pregnancy.
-Define the affective component of pain
-Discuss non-medication strategies to treat migraine in pregnancy and
-Identify labor and delivery and postpartum considerations and in pregnant patients with migraine

1) A 29 year old woman with history of migraine without aura presents at 6 weeks gestation with throbbing, unilateral headaches lasting 4-72 hours with light sensitivity and nausea. Which of the following next steps is most appropriate?
    a. MRI, MRA and MRV brain with gadolinium to look for aneurysm, mass, and cerebral venous sinus thrombosis
    b. Urine protein and blood pressure check to identify preeclampsia
    c. Urgent CT of the head
    d. Obtain further history and exam, including details of the prior history of migraine headache and family history
    e. Lumbar puncture
2) Which of the following physiological changes is thought to be most related to sensitivities to light and sound in a migraine patient?
    a. Injury to the blood vessels and meninges
    b. Hypersensitivity (sensitization) of the central nervous system and sensory nerves
    c. Central nervous system release of norepinephrine and serotonin from neurons
    d. Hypersynchronous neuronal activity resulting in spike and slow wave activity
    e. None of the above; the physiology of migraine is completely unknown
3) Which of the following preventative medications should be *avoided if possible* as a migraine preventative drug in a pregnant patient?
    a. Magnesium oxide
    b. Amitriptyline
    c. Metoprolol
    d. Topiramate
4) Which of the following statements regarding the acute treatment of migraines in pregnancy is accurate?
    a. Sumatriptan can be used sparingly in pregnancy – but it can raise the blood pressure in the third trimester.
    b. Acetaminophen is seldom used for pain in pregnancy because of its high risk to the developing fetus, in particular, closure of the patent ductus arteriosus.
    c. Ibuprofen is a Category A medication and is commonly used throughout the entirety of pregnancy.

   d. There are no appropriate drugs to use in pregnancy; women with migraines should get used to the pain and counseled that childbirth is much more painful.

5) What is the *affective* component of pain?
   a. The emotional component of pain
   b. The organ systems the pain affects
   c. The people in the community who support an individual with chronic pain
   d. The blood pressure and heart rate changes that occur with pain
6) Which of the following statements regarding *non-medication therapies* for migraines in pregnancy is accurate?
   a. The age of the patient is the primary determinant of the success of non-medication strategies in general
   b. Most pregnant patients are not interested in treatments for migraine other than medication
   c. There is little evidence but no harm in herbal supplementation (feverfew, butterbur) for migraine treatments during pregnancy
   d. Strategies like biofeedback and cognitive behavioral therapy, applied to migraine, are strongly evidence-based and can reduce migraines by 30-60%.

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Supplemental Material

Questionnaire

Thank you for participating in this study! We would like some feedback at this time. Do not put your name on this form – results are anonymous.

1) Which educational format did you use to learn about neurological issues in pregnancy?
    a. Podcast
    b. Written case
    c. Both – in which case, please write here which one you JUST completed: _____ (all questions should pertain to the format you JUST completed)
2) Which topic did you learn about in pregnancy? _____

3) Before this educational exercise, how knowledgeable were you about the topic your learned about, on a scale of 1-5, 5 being "very knowledgeable" and 1 being "not knowledgeable"?

    1 2 3 4 5

4) Before this educational experience, how knowledgeable were you about neurological issues in pregnancy in general, on a scale of 1-5, 5 being "very knowledgeable" and 1 being "having very little knowledge"?

    1 2 3 4 5
5) After this educational exercise, do you feel more confident about seeing a pregnant patient with the neurological condition you learned about?
    a. Yes
    b. No
6) Before this educational exercise, how interested were you in neurological issues in pregnancy, on a scale of 1-5, 5 being "most interested" and 1 being "not very interested." Don't worry: you can be honest.
    1 2 3 4 5
7) What is your preferred methods to learn in each of the following medical education scenarios? (Examples: Journal article (original research), Online written review (ie, UpToDate™), Textbook, Case reports, Discussion with attendings who are "experts" on the topic, Grand Rounds,Noon conference/resident conferences, Podcast, Video, Blog)
    a. Updates on a common medical disorder like afib in which there have been recent developments?

        _____

    b. Overview of a rare disorder (genetic, for example) you are seeing for the first time in the clinic/ER?

        _____

    c. Understanding of a controversial area in your field (screening PSA, for example)?

        _____

    d. Knowledge of an important "niche" area you might see once every few months (care of refugees, for example)?

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7) Please rate the following statements about the educational program you experienced, on a scale of 1-5, with 5 being "strongly agree" and 1 being "strongly disagree:"

"The program maintained my interest"
1 2 3 4 5

"The program sparked my interest in this topic"
1 2 3 4 5

"The program improved my skills/knowledge"
1 2 3 4 5

"The program was enjoyable"
1 2 3 4 5

"The program was entertaining"
1 2 3 4 5

"The program provided satisfaction"
1 2 3 4 5

"I would use this educational format again to learn about something in my field"
1 2 3 4 5

"I would like to see this format used more often in medical education"
1 2 3 4 5

"I would be interested in attending a workshop to learn how to use this format to educate others"
1 2 3 4 5

General comments:

Thank you!!

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Supplemental Material

Feedback Questionnaire Results: descriptive statistics for experience ratings by curriculum type[1]

Descriptor	Module Average Score (95% Confidence Interval)		
Likert Score[1] (n)	Podcast *(n=28)*	Written *(n=32)*	p-value[2]
Maintained interest	5(4-5)	4 (4-4.75)	0.001
5	19	8	
4	7	17	
3	1	6	
2	0	1	
1	0	0	
NR	1	0	
Sparked interest	5(4-5)	5(4-5)	0.152
5	14	11	
4	10	14	
3	3	5	
2	0	1	
1	0	1	
NR	1	0	
Improved skills/knowledge	5(4-5)	4.5(4-5)	0.316
5	17	16	
4	10	15	
3	0	1	
2	0	0	
1	0	0	
NR	1	0	
Enjoyable	4(4-5)	4(3-5)	0.001
5	18	9	
4	9	11	
3	0	11	
2	0	0	
1	0	1	
NR	1	0	
Entertaining	5(4-5)	3(2.25-4)	<0.001
5	17	3	
4	9	10	
3	1	11	
2	0	4	
1	0	4	
NR	1	0	
Provided satisfaction	5(4-5)	4(3.25-4.75)	0.061
5	14	8	
4	11	16	
3	2	5	
2	0	2	
1	0	1	
NR	1	0	
Would use it again in my field	5(4-5)	4(4-5)	0.124
5	17	13	
4	8	12	
3	2	3	
2	0	4	
1	0	0	
NR	1	0	
Want to see used more often in medical education	5(5-5)	4.75(3.5-5)	<0.001
5	19	8	
4	6	8	
3	2	7	
2	0	5	
1	0	4	
NR	1	0	
Motivated to create similar educational modules	5(4-5)	4(3.5-5)	0.185
5	12	7	
4	5	9	

3 2 1 NR	3 6 1 1	8 5 3 0	
Increased Confidence about Obstetrical Neurology (N,%)	28 (100.0%)	29 (90.6%)	0.990

[1]Likert Scale (1-5) represents participant ratings. Participants were asked to rate a series of statements about the educational program they experienced, on a scale of 1-5, with 5 being "strongly agree" and 1 being "strongly disagree." See also supplementary material (questionnaire).
[2] Values adjusted for prior specific knowledge, prior general knowledge, prior interest, specialty, prior survey exposure, and case.