


On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE letter for each course you attended! Your feedback is important to us as our Conference Advisory Board considers content and speakers for future meetings to provide you with the best education possible.



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Pregnancy And the Eye What to Do When Caring for Two

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Vision Expo West 2022


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Disclosures

- Ocular Therapeutix
- Glaukos
- Horizon
- Quidel
- Eyevance
- Alcon
- Tarsus
- Allergan
- Thea
- Kala
- Ivantis
- Orasis
- RVL
- Oyster Point
- Dempe
- Bruder

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Congratulations, you're pregnant!....



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Now, here's a list of all the things to worry about



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But why are we worried

- Spontaneous abortion of the pregnancy
- Transference of medication both during pregnancy and during breastfeeding
 - Causing complications during pregnancy for both mother and child
 - Birth defect rates from medication use
 - Topical vs Oral

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New-ish FDA Pregnancy and Lactation Categories

- 8.1 Pregnancy includes labor and delivery
- 8.2 Lactation including nursing mothers
- 8.3 Females and males of reproductive potential

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Old FDA Pregnancy and Lactation Categories

- Category A
 - The safest drugs to take during pregnancy. Controlled studies show no risk or find no evidence of harm
- Category B
 - Animal Studies show no risks but there are no controlled studies on pregnant women
- Category C
 - Animal studies have shown risk to the fetus, there are no controlled studies in women, or studies in women and animals are not available.

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- Category D
 - There is positive evidence of potential fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (i.e. life threatening condition to mother).
- Category X
 - Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk. The drug is contraindicated in women who are or may become pregnant.

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Compendium of Pharmaceuticals and Specialties (CPS)

- Reference book containing drug monographs
- Most monographs provided by manufacturers
- Others provided by CPhA editorial staff and peer reviewed

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Motherisk Program

- Counselors
- Peer-reviewed, in house statements prepared from published primary literature i.e. abstracts
 - Highlight strengths and limitations of various studies
 - Evaluate and discuss risk-benefit profile of the drug

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Optometrist Prescribing for Pregnant Patients

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When in doubt.....

Contact the patients OB/GYN

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Oral Medication

- Can NOT be prescribed
 - Antibiotic
 - Chloramphenicol, neomycin, ciprofloxacin, doxycycline, tetracycline, sulfonamides, trimethoprim
 - Systemic tobramycin is category D
 - Pain relief
 - Codeine, ibuprofen/Motrin
 - Steroids
 - Category C
 - Contraindicated due to their teratogenic effect and role in CSR
 - Call OB/GYN

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Oral Medication


- CAN be prescribed
 - Antivirals
 - Oral Acyclovir, Valacyclovir and Famcyclovir
 - Category B
 - Oral Acyclovir is OK for lactating women
 - Antibiotics
 - Often needed for skin and soft tissue infections
 - Augmentin, erythromycin, azithromycin, amoxicillin
 - Category B
 - Pain relief
 - Tylenol
 - Tylenol #3 (short term)
 - In breastfeeding patients Hydrocodone is preferred
 - Alternative therapy: meditation and acupuncture during certain trimesters



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Topical Medications


- Dilation drops
 - Occasional is acceptable: risk vs benefit
 - Alternative: consider shorter acting agents
 - Tropicamide 0.5%
 - Category C
- NO phenylephrine
 - May cause fetus heart to beat to slowly or cause birth defects
 - Minor fetal malformations reported with use of systemic phenylephrine, atropine and homatropine



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Topical Medications


- Antibiotics drops
 - Similar to oral
 - Fluoroquinolones used when benefits>risk, consult OB/GYN
 - SE shown in studies to fetus
 - Tobramycin category B, safe for use
 - Less severe bacterial infection
 - Erythromycin, polymyxin B, topical azithromycin
 - Severe ulcers or bacterial keratitis
 - Fortified cephalosporin's category B



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Topical Medications

- Allergy drops
 - Lastacast category B
 - All other antihistamine category C
- Anesthetic
 - Proparicaine is category C



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Glaucoma drops

- Most are category C
- Prostaglandins have concern for induction of labor and miscarriage
- Beta blockers caution in first trimester and discontinued shortly before birth to prevent neonatal beta blockade
- CAI has teratogenic and hepatorenal effects
- Miotic appear to be safe but are still category C
- Alphagan is category B
- DO NOT use in lactation, can cause sleep apnea and CNS depression in infant
- No oral diamox

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Topical Medications


- Steroids
 - Unlike oral, no known teratogenic effect however is category C
- Restasis
- Category C
- Decrease systemic absorption
 - Punctal occlusion?
 - Punctal plugs?



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Misc

- Anti-VEGF
 - Systemic absorption is low
 - Bevacizumab can't cross the placenta barrier but is category C
 - Could still affect placental vasculature
- Ranibizumab is category C
- pegaptanib (Macugen) is category B



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Ocular and Systemic Changes During Pregnancy

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Refractive Shifts

- Hormonal changes during first trimester causes changes in thickness of the cornea
- Water retention
- Increase in lens curvature
- Accommodation loss and insufficiency
- Resolve shortly after breastfeeding discontinued
- Other less common causes
 - Shifts in cataracts, DM, accommodative spasm
- Usually a myopic shift but hyperopic can also occur

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Refractive Shifts

- Studies show approximately 40-75% of pregnant women experience a change in their distance vision
- Mehdizadehkashi et al.
 - Second trimester
 - 51% DVA OU affected
 - 11% NVA OU affected
 - Third trimester
 - 74.7% DVA OU affected
 - 20.2% NVA OU affected
- Postnatal 8.2% DVA and 4% NVA still affected at
- Most studies found women's vision returned to pre-pregnancy refractive error shortly after birth and cessation of breast feeding

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Dry Eye Disease

- Changes to cornea and lacrimal system can lead to DED or worsening of pre-existing DED
- Changes have been noted in tear film physiology
 - Possible immune reaction to the lacrimal duct cells and destruction of acinar cells by prolactin
- Physical dehydration from nausea and vomiting
- Secondary contact lens intolerance
- Decrease in corneal sensitivity in third trimester

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Dry Eye Disease

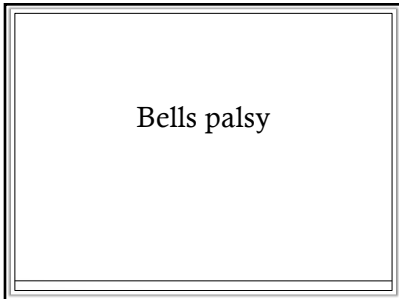
- Safe treatments during pregnancy
 - Punctal Plugs
 - Artificial tears
 - Omega 3 and 6 Fatty Acids
 - Steroids?
 - Category C
 - Restasis?
 - Category C
 - Xiidra?
 - No category assigned, data not available

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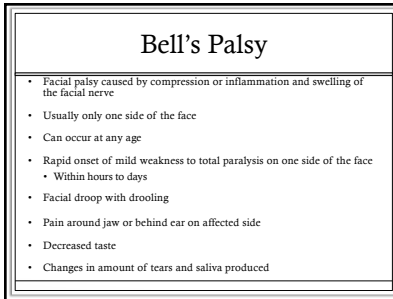
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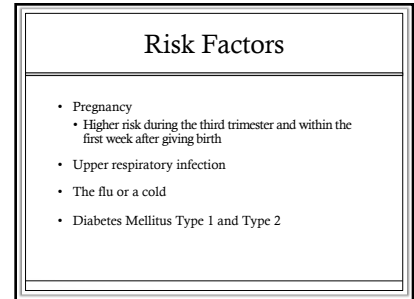
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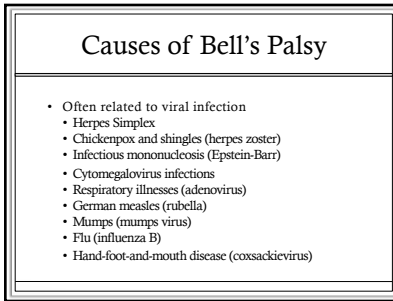
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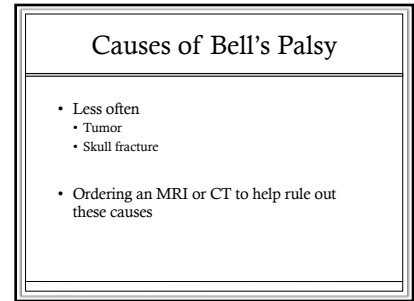
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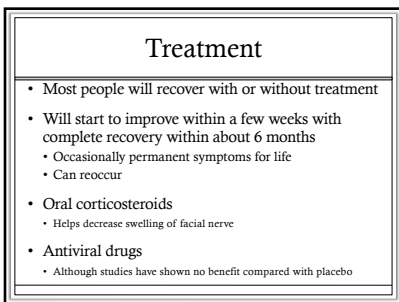
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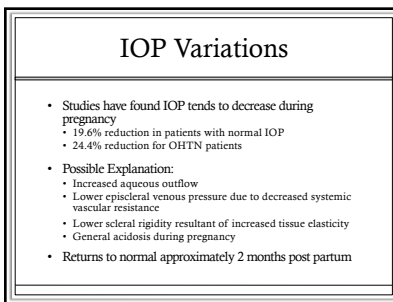
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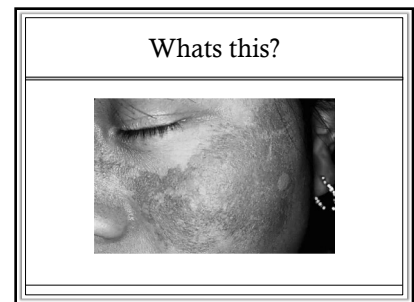
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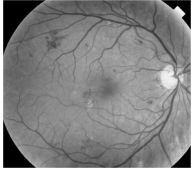
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Adnexa Changes

- Increased pigmentation around the eyes may occur
 - “pregnancy mask”, Cloasma, or melasma
 - Caused by increased estrogen, progesterone and melanocyte stimulating hormone
- Occasional unilateral ptosis occurs
 - Returns to prior position after delivery
 - Thought to be result of fluid and hormonal effects on the levator aponeurosis

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What's this?



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Gestational Diabetes

- Like other types of diabetes, gestational affects how your body uses glucose
- Gestational DM has a small risk of developing retinopathy
 - 10% pt without DR prior to pregnancy develop NPDR during pregnancy
 - Baseline examination in first trimester is usually sufficient when pt is absent of visual symptoms

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Diabetic Retinopathy

- Patients who already have DM and diabetic retinopathy may note quick progression
- Pt with NPDR show 50% progression during pregnancy
- 5-20% pts with severe NPDR progress to PDR
- Up to 45% progression can be seen in pts who already have PDR

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AOA Practice Guidelines

- Gestational Diabetes
 - Occurs in second to third trimester and glucose tolerance usually returns to normal within 6 weeks after pregnancy ends
 - Since it is relatively short and temporary it does not have a high likelihood they will develop retinopathy
 - Retinal evaluation for diabetic retinopathy in these patients is not indicated


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AOA Practice Guideline

- Diabetes Mellitus Type I and II
 - Women with pre-existing diabetes who are planning on being pregnant or become pregnant
 - Should have a comprehensive eye exam prior to planned pregnancy or during first trimester
 - Should have a follow-up each trimester of pregnancy

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What's this?



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Preeclampsia/Eclampsia

- Preeclampsia triad in a normotensive pregnant woman
 - BP > 140/90mmHg
 - Edema
 - Proteinuria after week 20 of pregnancy
- This triad plus contractions without any other cause is eclampsia

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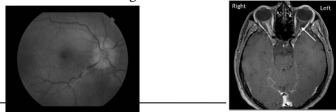
Preeclampsia/Eclampsia

- Preeclampsia incidence is 5%
 - Ocular sequelae in 1 out of 3
 - Blurred vision
 - Photopsia
 - Scotoma
 - Diplopia
- Signs of retinopathy mimic HTN retinopathy
 - Most common finding retinal arteriolar narrowing
- Will return to normal after patient is post partum

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Multiple Sclerosis

- Patients with MS may note a decrease in attacks during pregnancy
- Will possibly increase the first 3 months postpartum
- Optic Neuritis may occur as a result of immune mediated changes

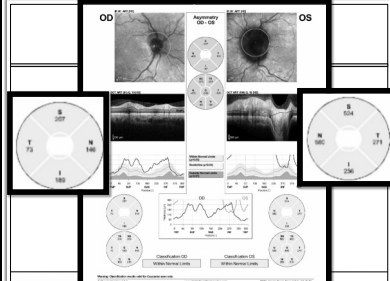


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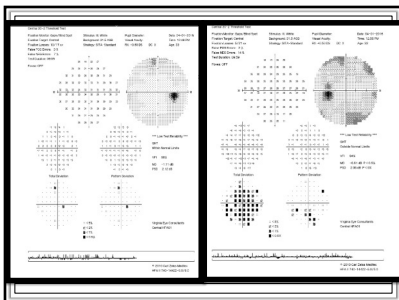
Idiopathic Intracranial Hypertension

- Increased intracranial pressure with no known cause causing bilateral edematous ONH
- Visual field defects, OCTG elevation
- Diplopia and photopsia less often
- Headaches and tinitis
- Caused by increase in weight during pregnancy that triggers and overproduction of CSF

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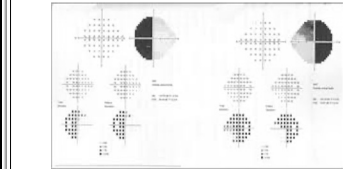
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IIH Treatment

- Diagnosis with MRI without contrast of brain and orbit followed by LP to confirm diagnosis
- Based on exclusion
- Pts are usually monitored with no treatment given the possible side effects to the fetus from Diamox and Topamax
- Serial LP throughout pregnancy and sometimes a tube shunt or OHN fenestration if vision is at high risk

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What's causing this?



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Pituitary Adenoma

- Previously asymptomatic PA or microadenomas may grow during pregnancy
- Headaches,
- visual field changes (bitemporal)
- Decreased VA
- After pregnancy will usually shrink
- If patient is known to have this prior to pregnancy, should monitor with visual fields for tumor growth

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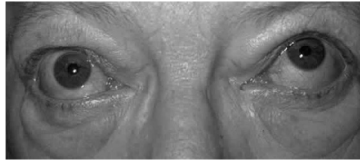
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Pituitary Gland

- Patients without a pituitary adenoma can also experience visual field defects when the pituitary gland grows during pregnancy
- Can mimic PA VF defects with a bitemporal defect

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What's this?



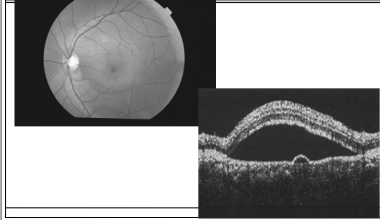
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Graves disease

- Most common cause of hyperthyroidism during pregnancy
- May exacerbate during first trimester
 - Then subside during the rest of pregnancy
 - Re-exacerbate during postpartum period
- Usually treat with propylthiouracil

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Whats this?



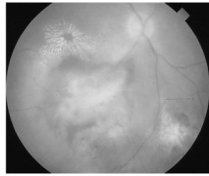
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Central Serous Retinopathy

- Noted decreased vision with unilateral or bilateral metamorphopsia
- Believed to be caused by increased levels of endogenous cortisol
 - Will resolve a few months after delivery
 - Increased risk for reoccurrence in future pregnancies
- Most frequently occurs in the third trimester
 - Only 20% of non-pregnant CSR patients had this
- Study by Perkins et al.
 - 90% of pregnant CSR patients had fibrous subretinal exudate

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Whats this?

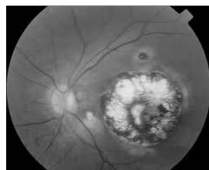


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Toxoplasmosis

- Parasitic disease by *Toxoplasma gondii*
 - Eating undercooked contaminated meat
 - Infected cat feces
 - Mother to child transmission during pregnancy
- Congenital infection occurs when primary infection during pregnancy
 - transplacental transmission

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Toxoplasmosis

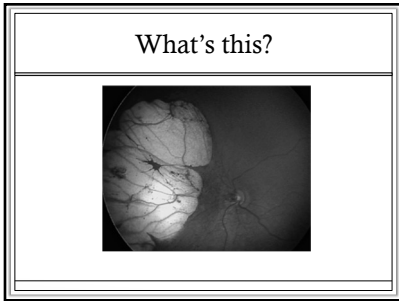
- First trimester infection can severely effect the fetus
- More commonly occurs in third trimester
 - Maternal and fetal circulation in greatest contact
- Latent infection in mother may become active
 - Retinochoroiditis findings

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Toxo Treatment

- Mother can be treated with oral macrolide antibiotic spiramycin
 - Avoid sulfamethazole/trimethoprim combo
 - Causes neonatal kericterus
- OB/GYN involvement

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Zika and Pregnancy

- CDC Northern United States status
 - No current reports of transmission in Eastern US since 2018
 - Higher elevation areas Western US have a risk of Zika however they are at an altitude the mosquito does not live
- However, many places you travel to may have the virus
- Zika contracted by a pregnant women
 - Early fetal loss
 - Intrauterine fetal demise
 - Intrauterine growth restriction

<https://www.cdc.gov/nczod/zika/information>

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Congenital Zika Syndrome

- Fetus's exposed to the Zika virus while in utero develop CZS
- Rate of birth defects declines with each trimester of infection
 - 1st – 8%, 2nd – 5%, 3rd – 4%
- Brain developmental abnormalities
- Retinal manifestations, optic nerve defects, retinal vessel abnormalities, glaucoma, microphthalmia, cataracts, colobomas
- Extremities defects

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COVID and Pregnancy?

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Ocular Assessments of a Series of Newborns Gestationally Exposed to Maternal COVID-19 Infection

Olivia Herrera-Sanchez, MD, MSc, Natashia Ferreira-Santos, d.o, Cruz, MD, Danilo Alberto Cerveza-Rosa, MD, et al

- **Results** A total of 165 newborns (age range at examination, 1 to 18 days) were evaluated. Of these, 123 (74.5%) were born at full term, and 42 (25.5%) were born preterm.
- Maternal gestational age at the time of COVID-19-positive test varied from first to 40th gestational weeks.
- Six newborns (3.6%) had positive polymerase chain reaction findings for SARS-CoV-2.
 - None had ocular abnormalities.
- Of those exposed during gestation
 - 1 presented with venous engorgement and vascular tortuosity.
 - 7 had intraretinal hemorrhages
 - 2 were diagnosed as having retinopathy of prematurity.

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Conclusion

- The low rate of ocular abnormalities suggests that there is not a moderate or high increased risk of ocular abnormalities in newborns of mothers with COVID-19.
- Additional controlled larger studies needed to rule out a low increased risk.
- Vertical transmission of SARS-CoV-2 seems to be possible and should be a concern, especially in a condition that could be asymptomatic that is so widespread in the population and that could bring a substantial burden to patients and to the health care system even at low rates of congenital infection.

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Wrap Up

- Remember what's ok to use and when in doubt ask the patients OB/GYN
- Knowing what your pregnant patient may be experiencing or is at risk for is important

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Questions?

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