OB/GYN Webinar Series 2019-2020

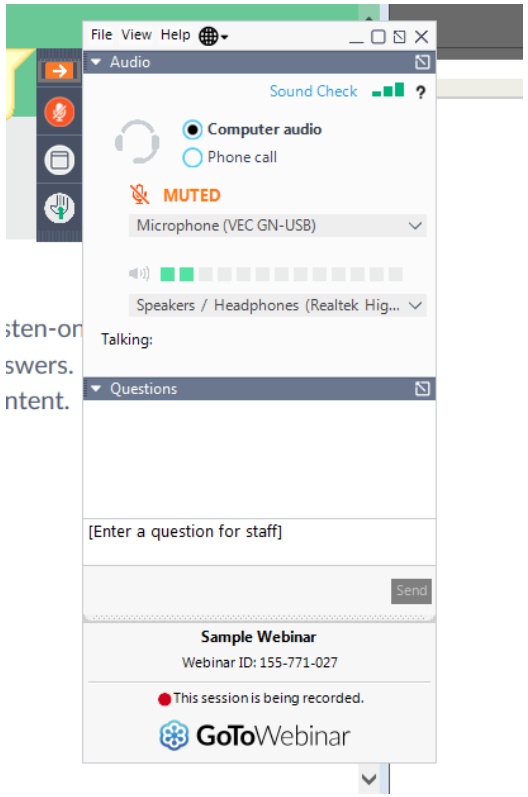
Hot Topics in Obstetrical Care

Tuesday, October 22, 12:00pm- 1pm EDT

Presented by:

Questions/Comments During the Webinar

Use the Question box in your webinar toolbar



THC/Marijuana Pregnancy

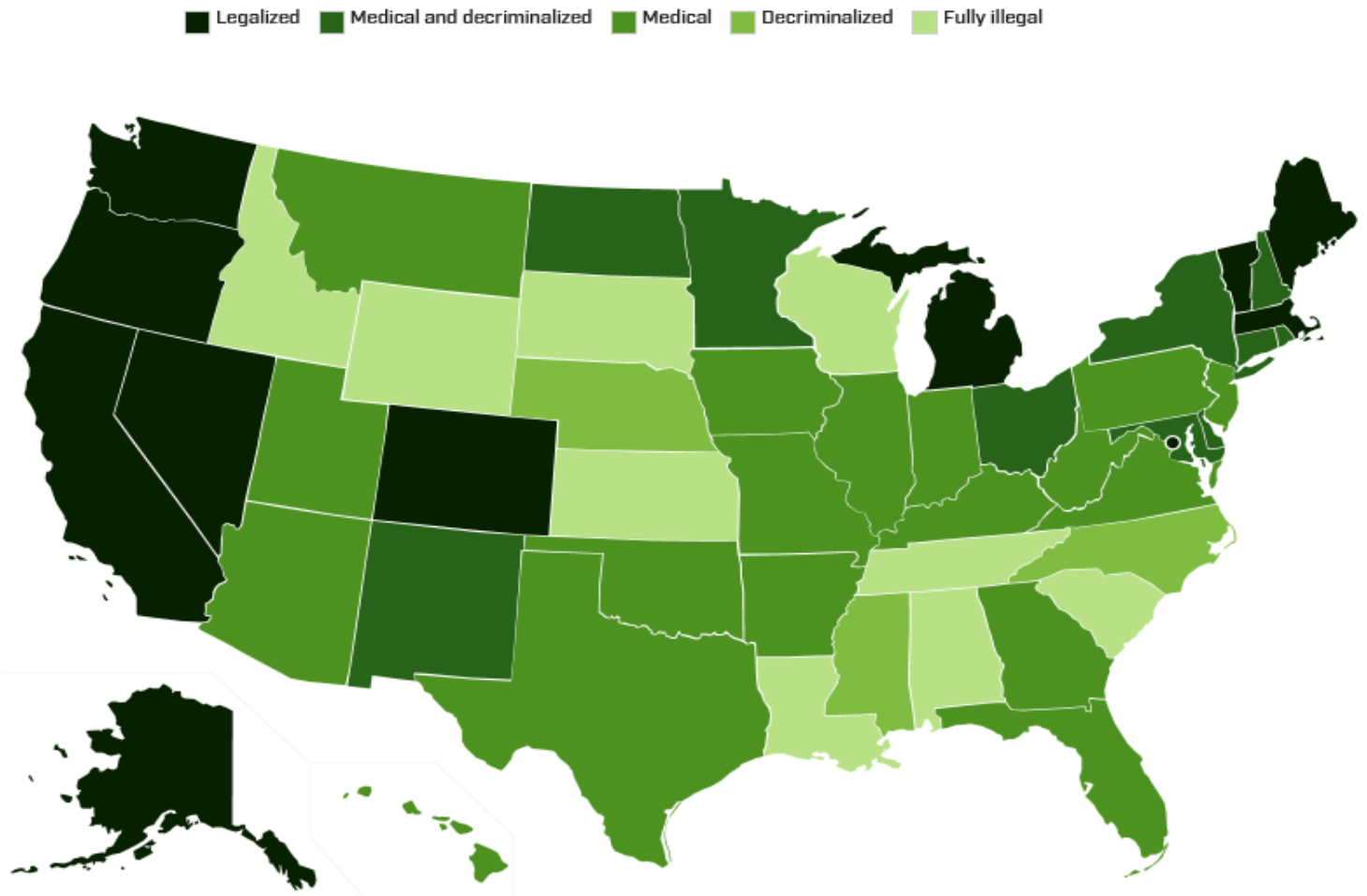
Marjorie Meyer MD

- Acceptability of marijuana/THC is changing rapidly with legalization
- Use is likely increasing at least partially due to disclosure
- Access for smoking and edibles is high
- There is a perception it is safe: perhaps safer than known medications

Last Updated: *October 2019*

Note: State status reflects current laws at time of update, not pending legislation or future dates upon which marijuana becomes available medicinally or recreationally.

* Enactment is pending until future date.



Marijuana use in pregnancy and lactation: a review of the evidence

Torri D. Metz, MD, MS; Elaine H. Stickrath, MD

TABLE 1
Testing for marijuana in biological samples

Biological sample	Duration of positive result	Test limitations
Maternal urine	2–3 days in occasional users[63] Several weeks in chronic users[64]	Chronicity of use determines duration of positive result[63]
Maternal serum	2–3 days in occasional users[6] Several weeks in chronic users[6]	Chronicity of use determines duration of positive result[63] Invasive sample Shorter half-life than urine[6]
Maternal hair	Several weeks[65]	Less accurate for marijuana than other drugs[65] False positives from passive exposure[65] Not clinically used due to cost and inaccuracy
Meconium	Positive result indicates second- and third-trimester exposure[26,66,67]	Small amount of detectable THC in the samples[68] High false-positive rate (up to 43%)[15] Send out to reference laboratory Costly and impractical at many sites
Neonatal hair	Positive result indicates third-trimester exposure[66]	Costly and impractical at many sites Less sensitive than meconium[66]

THC, delta-9-tetrahydrocannibinol.

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015.

How do we know people are using?

Urine and serum can be positive for long periods of time even in urine

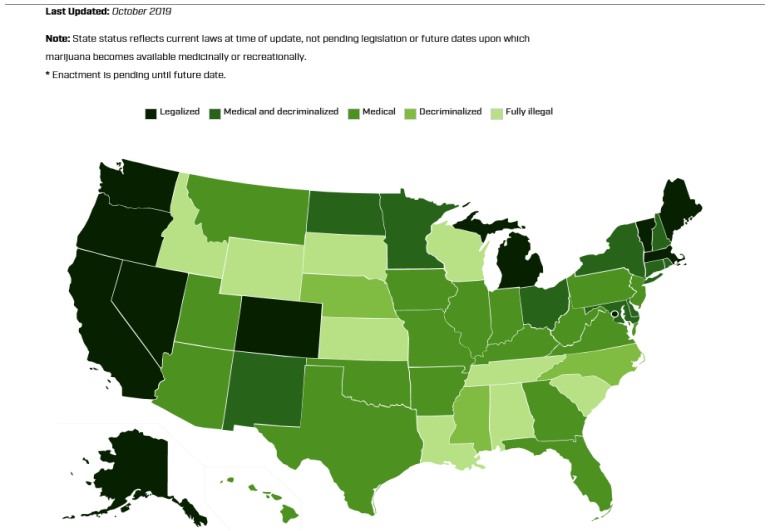
(even this fact should disturb pregnant pts)

2015

FIGURE
An increasing number of states in the United States have legalized both medicinal and recreational marijuana use

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015.

2019



Why do women use THC/marijuana in pregnancy?

<u>Attitudes and Beliefs:</u>
Two thirds of adults surveyed in a UK study noted that cannabis was either “not very harmful” or “not at all harmful. (only 5% thought same of heroin).

<u>Nausea/Vomiting:</u>

- There are 2 studies investigating the
- relationship between marijuana use and
- nausea and vomiting of pregnancy.
- Women who used marijuana in pregnancy were more likely to report severe nausea (3.7% vs 2.3%; prevalence ratio, 1.63; 95% confidence
- interval [CI], 1.08e2.44). The treatment of nausea with marijuana was not specifically addressed in the study.
- Westfall et al19 reported on the prevalence of nausea among 79 women who used medicinal marijuana in pregnancy. Forty of these women (51%) used marijuana to treat nausea and vomiting of pregnancy, and 92% of them believed it was effective. There was no control group, no documentation of quantity used, or a demonstration of effect on symptoms of nausea other than subjective report by survey after the pregnancy.

Whether marijuana is effective for nausea and vomiting in pregnancy is unknown. This is in contrast to B6/unisom or compazine, which are effective and safe (and odansetron after first trimester).

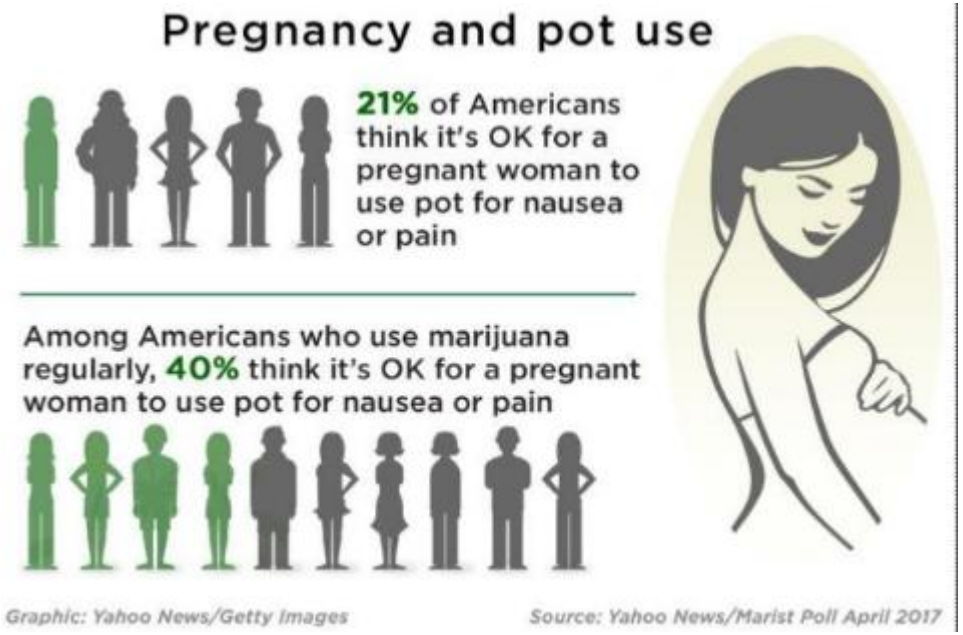


TABLE 2
Summary of marijuana and fetal growth restriction studies

Study and number in cohort	Marijuana-exposed women, n (%)	Setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs or regression coefficients with 95% CIs reported when available)	Limitations and comments
Prospective cohort studies[a]							
Day et al, 1991[32] (n = 519)	324 (62)	Single institution	Self-report by prenatal interview in each trimester of pregnancy	Frequency: light (0–2.9 joints/wk), moderate (3–6.9/wk), and heavy (≥1 joints/d)	SES, obstetric hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with SGA Isolated higher birthweight in heavy third-trimester users compared with nonusers (3357 g vs 3215 g; P = .04)	Increase in birthweight in marijuana users compared with nonusers Women who use marijuana were intentionally oversampled
El Marroun et al, 2009[25] (n = 7452)	459 (6)	Population-based study in The Netherlands	Self-report at study enrollment	Frequency: daily, weekly, monthly Reported use: only before pregnancy, use in early pregnancy, or ongoing use	Standard demo, psych hx, EtOH, fetal sex, tobacco Excluded women with other drugs	Use before pregnancy did not affect growth Early pregnancy use decreased growth 11.18 g (−15.26 to −7.10)/wk Ongoing marijuana use decreased growth 14.44 g (−22.94 to −5.94)/wk	Only study with serial ultrasounds to assess fetal growth (detailed in fetal growth section of text) Marijuana use not well quantified
Fergusson et al, 2002[22] (n = 12,129)	606 (5)	Population-based study in United Kingdom	Self-completed questionnaire at 18–20 wks gestation	Frequency: 1 time/day, 2–4 time/wk, 1 time/wk, <1 time/wk before pregnancy, first trimester and ongoing	Standard demo, other drugs, EtOH, tobacco	Ongoing use 1 or more/wk throughout pregnancy was not associated with lower birthweight −84.20 g (−174.70 to 6.40)	Self-report data collected at 18–20 wks' gestation, no later pregnancy data
Fried et al, 1984[33] (n = 583)	84 (14)	Referred to study by primary obstetrician/study ads	Self-report by prenatal interview in each trimester of pregnancy	Frequency: irregular users (≤1 joint/wk), moderate (2-5/wk), heavy (>5/wk)	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with LBW	Marijuana use not well quantified, averaged over the course of pregnancy
Gray et al, 2010[26] (n = 86)	38 (44)	Single institution	Self-report by prenatal interview in each trimester of pregnancy Biological samples	Frequency: number of joints/day by trimester Presence of THC in maternal saliva and meconium	Standard demo, OB hx (parity only), tobacco Excluded women with other drugs, or heavy EtOH	THC in meconium associated with lower birthweight (3429 g vs 2853 g; P < .001), persistent effect in multivariable logistic regression Self-report alone was not associated with lower birthweight	Study designed to assess tobacco exposure primarily Sampling strategy for high prevalence of use not reported

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

TABLE 2
Summary of marijuana and fetal growth restriction studies *(continued)*

Study and number in cohort	Marijuana-exposed women, n (%)	Setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs or regression coefficients with 95% CIs reported when available)	Limitations and comments
Tennes et al, 1985[5] (n = 756)	257 (34)	Two affiliated institutions	Self-report by structured interview at 1 prenatal visit and postpartum	Frequency quantified by trimester: light (≤1 times/wk), moderate (>1 time/wk but <1 time/d), heavy (≥1 times/d)	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No effect on birthweight when considered by trimester or as a total amount consumed during pregnancy	Possible recall bias, only 2 sessions of self-report, which was then reported by trimester of use Marijuana use not well quantified
Zuckerman et al, 1989[35] (n = 1226)	331 (27)	Single institution	Self-report by structured interview at 1 prenatal visit and postpartum Biological sampling	Reported use: yes/no THC in maternal urine at time of prenatal or postpartum interview	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Positive urine toxicology screen for THC associated with 79 g decrease in birthweight (P = .04) No association when only self-report considered	Possible recall bias, only 2 sessions of self-report Marijuana use not well quantified
Secondary analysis of prospective cohort[a]							
Bada et al, 2005[28] (n = 8637)	812 (9)	Multicenter, 4 university-based centers	Self-report by structured interview prior to delivery	Reported use: yes/no	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with LBW (OR, 1.08; 95% CI, 0.85–1.36) or SGA (OR, 0.9; 95% CI, 0.73–1.11)	Not designed to assess marijuana specifically (Maternal Lifestyle Study[74]) Marijuana use not quantified
Gibson et al, 1983[75] (n = 7301)	392 (5)	Two affiliated institutions	Self-report by structured interview at 1 prenatal visit and postpartum	Frequency: ≤1 times/wk, >1 time/wk	Standard demo, OB hx (parity only), EtOH, tobacco	No association with LBW after excluding premature neonates	Marijuana use not well quantified
Janisse et al, 2014[29] (n = 3090)	748 (24)	Single institution	Self-report by structured interview at each prenatal visit	Proportion of prenatal visits with reported use: 1–33%, 34-66%, or 67-100%	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	55 g decrease in fetal growth with ongoing marijuana use (reported at 67–100% of visits) (P < .004)	Study designed to assess EtOH exposure Population limited to African Americans Marijuana use not well quantified

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

TABLE 2
Summary of marijuana and fetal growth restriction studies *(continued)*

Study and number in cohort	Marijuana-exposed women, n (%)	Setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs or regression coefficients with 95% CIs reported when available)	Limitations and comments
Hatch et al, 1986[69] (n = 3857)	366 (10)	Planned delivery at single institution	Self-report by structured interview early in pregnancy	Frequency: none, occasional (≤1 times/mo), regular (≥2 times/mo)	OB hx, standard demo, other drugs EtOH, tobacco	Regular use in white women associated with LBW (OR, 2.6; 95% CI, 1.1–6.2) Regular use in white women associated with SGA (OR, 2.3; 95% CI, 1.3–4.1)	Self-report data collected early in pregnancy, no later pregnancy data Differing results by racial group Marijuana use not well quantified
Hingson et al, 1982[34] (n = 1690)	237 (14)	Single institution	Self-report by structured interview postpartum	Frequency: <1 time/mo, <1/wk, 1–2 times/wk, ≥3 per week	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Neonates 95 g smaller than nonusers with use <3 times/wk (P < .01) Neonates 139 g smaller than nonusers with use ≥3 times/wk (P < .01)	Possible recall bias, most exposure data collected postpartum, small subset with prenatal interview (n = 328) Marijuana use not well quantified
Hurd et al, 2005[27] (n = 139)	44 (32)	Women undergoing elective termination at a single center at 17–22 wks	Self-report by structured interview at time of termination Biological samples	Frequency: light (0–0.4 joints/d), moderate (0.41–0.88/d), and heavy (>0.89 joints/d), THC in maternal urine or meconium	Standard demo, gestational age at termination, EtOH, tobacco Excluded women with cocaine/opiates	Increasing self-reported use not associated with decreasing weight Decreased birthweight in marijuana-exposed (either urine/meconium positive toxicology or self-report) fetuses by 14.53 g (−28.21 to −0.86)	Growth assessed in midgestation prior to presentation of most growth abnormalities Women in study were undergoing elective termination of pregnancy
Kliegman et al, 1994[70] (n = 425)	34 (8)	Single institution	Self-report by structured interview at time of delivery Biological samples	THC in maternal urine at time of delivery	SES, OB hx, standard demo, other drugs, EtOH, tobacco	No association with LBW (OR, 2.28; 95% CI, 0.27–19.5)	Study designed to assess cocaine exposure primarily Marijuana use not quantified
Linn et al, 1983[71] (n = 12,424)	1246 (10)	Single institution	Self-report by structured interview postpartum	Frequency: occasional, weekly or daily use	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with LBW for any use of marijuana (OR, 1.07; 95% CI, 0.87–1.31)	Possible recall bias, exposure data collected postpartum Marijuana use not well quantified

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

TABLE 2
Summary of marijuana and fetal growth restriction studies *(continued)*

Study and number in cohort	Marijuana-exposed women, n (%)	Setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs or regression coefficients with 95% CIs reported when available)	Limitations and comments
Kline et al, 1987[74] (n = 2815)	275 (10)	Two overlapping prospective cohorts at 3 urban hospitals	Self-report by structured interview at 1 prenatal visit	Frequency: <1 time/mo, 2–3 times/mo, 2–3 times/wk, 4–6 times/wk, daily	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with FGR in early cohort Decreased growth with increased use (127 g less with 2–3 times/wk, 143 g less with 4–6 times/wk and 230 g less with daily) in late cohort	Study designed as a case-control study with SAB as primary outcome Differing results for 2 overlapping prospective cohorts Marijuana use not well quantified
Saurel-Cubizolles et al, 2014[4] (n = 13,545)	156 (1)	Population-based study, all births in France during a single week	Self-report by structured interview 2–3 d postpartum	Frequency: <1 time/mo, 1–9 times/mo, ≥10 times/mo	SES, standard demo, EtOH, tobacco	No association with SGA for <1 time/mo use (OR, 1.29; 95% CI, 0.61–2.72) or for use ≥1 times/mo use compared with nonusers (OR, 1.30; 95% CI, 0.66–2.56) Also no association with SGA for non-tobacco users, marijuana only	Recall bias Low prevalence of use concerning for ascertainment bias for marijuana exposure Marijuana use not well quantified
Shiono et al, 1995[40] (n = 7470)	822 (11)	Multicenter, 7 university-based clinics	Self-report by structured interview at 1 prenatal visit Biological samples	Frequency: number of times/wk THC in maternal serum	SES, OB hx, medical hx, standard demo, other drugs, tobacco	No association with LBW	Study designed to assess
Teitelman et al, 1990[75] (n = 1206)	95 (8)	Planned delivery at single institution	Self-report by structured interview early in pregnancy	Reported use: yes/no	OB hx, s demo, o EtOH, to		

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

Adverse outcomes:

- Review of IUGR:
- In summary, there may be a small decrease in growth with exposure to marijuana in pregnancy.
- However, the clinical significance of this decrease is questionable, with reported growth differences on the order of 100 g.

Major confounder: use of tobacco and other drugs.

Bottom line: If pts are using marijuana, use it as an opportunity to discuss tobacco or other substance use.

TABLE 3
Summary of marijuana and preterm birth studies

Study and number in cohort	Marijuana- exposed women, n, %	Study design and setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs with 95% CIs reported when available)	Limitations and comments
Prospective cohort[a]							
Day et al, 1991[32] (n = 519)	324 (62)	Single institution	Self-report by prenatal interview in each trimester of pregnancy	Frequency: light (0–2.9 joints/wk), moderate (3–6.9/wk), and heavy (≥1 joints/d)	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No effect on length of gestation No association with PTB	Women who use marijuana were intentionally oversampled
Dekker et al, 2014[59] (n = 3184)	213 (7) with pre-pregnancy exposure	International multicenter	Self-report by structured interviews at 20 wks	Timing of use: before pregnancy, first trimester	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Prepregnancy use associated with spontaneous PTB with intact membranes (OR, 2.34; 95% CI, 1.22–4.52)	Study designed to develop screening tests for PTB and other adverse obstetrical outcomes Marijuana use not quantified
Fried et al, 1984[33] (n = 583)	84 (14)	Referred to study by primary obstetrician/ study ads	Self-report by prenatal interview in each trimester of pregnancy	Frequency: irregular users (<1 joints/wk, moderate (2–5 joints/wk), heavy (>5 joints/wk)	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Heavy use of marijuana reduced the length of gestation by 0.8 wks ($P = .008$) Increasing use associated with decreasing length of gestation	Marijuana use not well quantified by trimester, averaged over the course of pregnancy
Hatch et al, 1986[60] (n = 3857)	366 (10)	Planned delivery at single institution	Self-report by structured interview early in pregnancy	Frequency: none, occasional (<1 times/mo), regular (>2 times/mo)	OB hx, standard demo, other drugs EtOH, tobacco	Use associated with increased rate of PTB (<37 wks) in white women (OR, 1.9; 95% CI, 1.0–3.9) No association with PTB in women of other races	Marijuana use not well quantified, especially for more frequent users Self-report data collected early in pregnancy; no later pregnancy data
Kliegman et al, 1994[10] (n = 425)	34 (8)	Single institution	Self-report by structured interview at time of delivery Biological samples	THC in maternal urine at time of delivery	SES, OB hx, standard demo, other drugs, EtOH, tobacco	No association with PTB (OR, 1.89; 95% CI, 0.34–10.50)	Study designed to assess cocaine exposure primarily Marijuana use not quantified

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

TABLE 3
Summary of marijuana and preterm birth studies (continued)

Study and number in cohort	Marijuana- exposed women, n, %	Study design and setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs with 95% CIs reported when available)	Limitations and comments
Saurel-Cubizolles et al, 2014[4] (n = 13,545)	156 (1)	Population-based study, all births in France during a single week	Self-report by structured interview 2-3 d postpartum	Frequency: <1 time/mo, 1-9 times/mo, ≥10 times/month	SES, standard demo, EtOH, tobacco	Any marijuana use associated with spontaneous PTB (OR, 2.15; 95% CI, 1.10–4.18) No association with PTB when only women with marijuana use and no concurrent tobacco use were analyzed (OR, 1.22; 95% CI, 0.29–5.06)	Recall bias Low prevalence of use concerning for ascertainment bias for marijuana exposure Marijuana use not well-quantified
Shiono et al, 1995[40] (n = 7470)	822 (11)	Multicenter, 7 university-based clinics	Self-report by structured interview at 1 prenatal visit, biological samples	Frequency: number of times per week THC in maternal serum	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with PTB when marijuana use assessed by self-report or positive serum assay for THC (OR, 1.1; 95% CI, 0.8–1.3) Increased odds of PTB with positive serum assay in isolation but not with self-report	Study designed to assess association between vaginal infections and PTB Marijuana use not well quantified
van Gelder et al, 2010[30] (n = 5871)	189 (3)	Population-based, US National Birth Defects Prevention Study	Self-report by structured interview 6 wks to 24 mo after delivery	Reported use: yes/no by trimester	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with PTB (OR, 1.0; 95% CI, 0.6–1.9) No difference by trimester of use	Recall bias, interview up to 2 y postpartum Not designed for marijuana exposure specifically (birth defects registry) Marijuana use not well quantified

CI, confidence interval; *EtOH*, alcohol use; *Medical hx*, medical history; *OB hx*, obstetrical history; *OR*, odds ratio; *PTB*, preterm birth (<37 wks); *SAB*, spontaneous abortion; *SES*, socioeconomic status; *Standard demo*, some measure of standard demographics including maternal age, race, body mass index; *THC*, delta-9-tetrahydrocannabinol.

[a] Studies that did not adjust for tobacco use and retrospective cohorts are not included in this summary table.

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015.

TABLE 3
Summary of marijuana and preterm birth studies (continued)

Study and number in cohort	Marijuana- exposed women, n, %	Study design and setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs with 95% CIs reported when available)	Limitations and comments
Linn et al, 1983[31] (n = 12,424)	1246 (10)	Single institution	Self-report by structured interview postpartum	Frequency: occasional, weekly, or daily use	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with PTB (OR, 1.02; 95% CI, 0.82–1.27)	Possible recall bias, exposure data collected postpartum Marijuana use not well quantified
Tennes et al, 1985[5] (n = 756)	257 (34)	Two affiliated institutions	Self-report by structured interview at 1 prenatal visit and postpartum	Frequency quantified by trimester: light (<1 times/wk), moderate (>1 time/wk but <1 times/d), heavy (>1 times/d)	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No odds ratio reported for PTB (0% PTB rate in >3 times/wk users and 7% in nonusers) Total marijuana use in pregnancy positively correlated with increased gestational age at birth ($r = 0.10$), average of 2 d longer gestation with daily use	Possible recall bias, only 2 sessions of self-report No PTB (0%) in the nonusers as comparison group Finding of longer length of gestation not replicated in other human studies
Secondary analysis of a prospective cohort[a]							
Bada et al, 2005[28] (n = 8637)	812 (9)	Multicenter, 4 university-based centers	Self-report by structured interview prior to delivery	Reported use: yes/no	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	No association with PTB (OR, 1.21; 95% CI, 0.9–1.61)	Not designed to assess marijuana specifically (Maternal Lifestyle Study[72]) Marijuana use not quantified
Gibson et al, 1983[73] (n = 7301)	392 (5)	Two affiliated institutions	Self-report by structured interview at 1 prenatal visit and postpartum	Frequency: <1 times/wk, >1 time/wk	Standard demo, OB hx (parity only), EtOH, tobacco	High proportion of PTB among >1 time/wk users (25% vs 6% in nonusers; $P < .001$)	Marijuana use not well quantified
Janisse et al, 2014[29] (n = 3090)	748 (24)	Single institution	Self-report by structured interview at each prenatal visit	Proportion of prenatal visits with reported use: 1–33%, 34–66%, or 67–100%	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Not associated with PTB	Study designed to assess EtOH exposure primarily Population limited to African Americans Marijuana use not well quantified

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

Preterm Birth:

- Multiple other prospective cohort studies and secondary analyses fail to provide a definitive answer regarding preterm birth and marijuana use.
- The majority of studies demonstrate no increased risk of preterm birth.

Bottom line: If pts are using marijuana, use it as an opportunity to discuss tobacco or other substance use.

TABLE 4
Summary of marijuana and congenital anomalies studies

Study and number in cohort	Marijuana-exposed women, n (%)	Study design and setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs with 95% CIs reported when available)	Limitations and comments
Any major congenital malformation							
Linn et al, 1983[71] (n = 12,424)	1246 (10)	Prospective cohort Single institution	Self-report by structured interview postpartum	Frequency: occasional, weekly, or daily use	SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco	Rate of major malformation: 2.6% nonusers, 3.2% occasional, 3.9% weekly, 3.6% daily No association with major congenital anomalies (OR, 1.36; 95% CI, 0.97–1.91)	Possible recall bias, exposure data collected postpartum No data on trimester of exposure Marijuana use not well quantified
Gibson et al, 1983[73] (n = 7301)	392 (5)	Secondary analysis of a prospective cohort Two affiliated institutions	Self-report by structured interview at 1 prenatal visit and postpartum	Frequency: ≤1 times/wk, >1 time/wk	Standard demo, OB hx (parity only), EtOH, tobacco	Rate of major malformation: 4.2% in cohort, rates by nonusers and users of marijuana not provided No association with congenital anomalies, no OR reported	No data on trimester of exposure Marijuana use not well quantified
Gastroschisis							
Forrester et al, 2007[941] (n = 316,508)	829 (0.3)	Retrospective cohort from a Hawaiian birth defects registry	Self-report in medical record or positive urine toxicology screen at delivery	Reported use: yes/no THC in maternal urine at time of delivery (ordered clinically)	None	n = 109 total cases of gastroschisis, n = 3 cases of gastroschisis in marijuana-exposed Rate ratio of marijuana users compared with women with other live births, 23.11; 95% CI, 4.69–69.34	Low prevalence of marijuana use (0.3%) indicates incomplete ascertainment of exposure No adjustment for possible confounders No data on trimester of exposure Marijuana use not well quantified
van Gelder et al, 2009[942] (n = 10,241 cases with anomalies and 4967 controls)	610 (4)	Retrospective cohort from a multistate birth defects registry	Self-report by structured interview 6 wks to 24 mo after delivery	Reported use: yes/no from 1 month before pregnancy to end of pregnancy	Standard demo including maternal age at delivery, EtOH, tobacco, folic acid use, maternal diabetes	n = 485 total cases of gastroschisis, n = 189 cases of gastroschisis in marijuana-exposed No association with gastroschisis (OR, 1.3; 95% CI, 0.9–1.8)	Possible recall bias, women interviewed 6 wks to 24 mo after delivery No data on trimester of exposure Marijuana use not well quantified

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015. (continued)

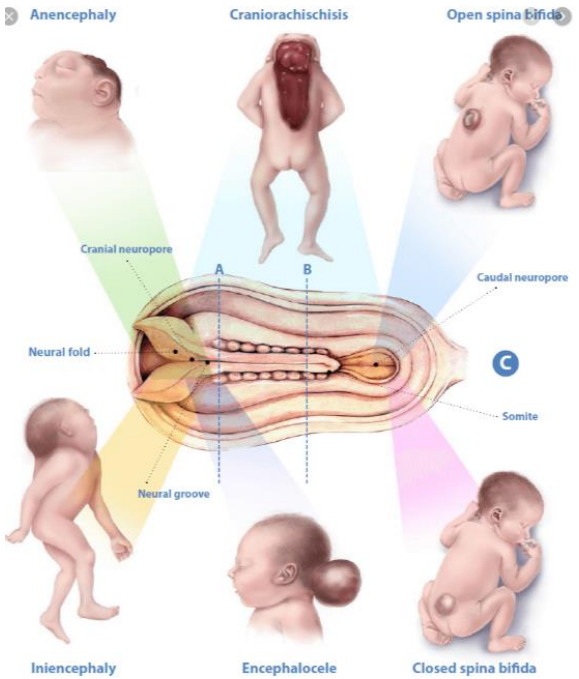
TABLE 4
Summary of marijuana and congenital anomalies studies (continued)

Study and number in cohort	Marijuana-exposed women, n (%)	Study design and setting	Data source	Marijuana measure	Other variables considered in analysis	Findings (adjusted ORs with 95% CIs reported when available)	Limitations and comments
Ventricular septal defect							
Williams et al, 2004[43] (n = 122 cases with a VSD and 3029 controls)	253 (8)	Retrospective cohort from Atlanta Birth Defects Case-Control Study	Self-report by structured telephone interview postpartum	Reported use: ≤2 d/wk, >3 d/wk from 3 months before pregnancy to end of first trimester	Cases matched to controls by birth year, race, birth period, and hospital of birth Adjusted for maternal age, multivitamin use, maternal diabetes	n = 122 total cases of VSD, n = 20 cases of VSD in marijuana exposed Marijuana use associated with VSD (adjusted OR, 1.90; 95% CI, 1.29–1.81)	Possible recall bias, women interviewed after delivery Incomplete ascertainment of confounding factors Marijuana use not well quantified
van Gelder et al, 2009[42] (n = 10,241 cases with anomalies and 4967 controls)	610 (4)	Retrospective cohort from a multistate birth defects registry	Self-report by structured interview 6 wks to 24 mo after delivery	Reported use: yes/no from 1 mo before pregnancy to end of pregnancy	Standard demo including maternal age at delivery, EtOH, tobacco, folic acid use, maternal diabetes	n = 927 total cases of perimembranous VSD, n = 34 cases of perimembranous VSD in marijuana-exposed No association with VSD (OR, 0.9; 95% CI, 0.6–1.4)	Possible recall bias, women interviewed 6 wks to 24 mo after delivery No data on trimester of exposure Marijuana use not well quantified
Anencephaly							
van Gelder et al, 2009[42] (n = 10,241 cases with anomalies and 4967 controls)	610 (4)	Retrospective cohort from a multistate birth defects registry	Self-report by structured interview 6 wks to 24 mo after delivery	Reported use: yes/no from 1 month before pregnancy to end of pregnancy	Standard demo including maternal age at delivery, EtOH, tobacco, folic acid use, maternal diabetes	n = 244 total cases of anencephaly, n = 12 cases of anencephaly in marijuana exposed Marijuana use associated only with anencephaly in a subanalysis restricted to first month after conception exposure (OR, 2.5; 95% CI, 1.3–4.9)	Possible recall bias, women interviewed 6 wks to 24 mo after delivery No data on trimester of exposure Marijuana use not well quantified

Congenital Anomalies:

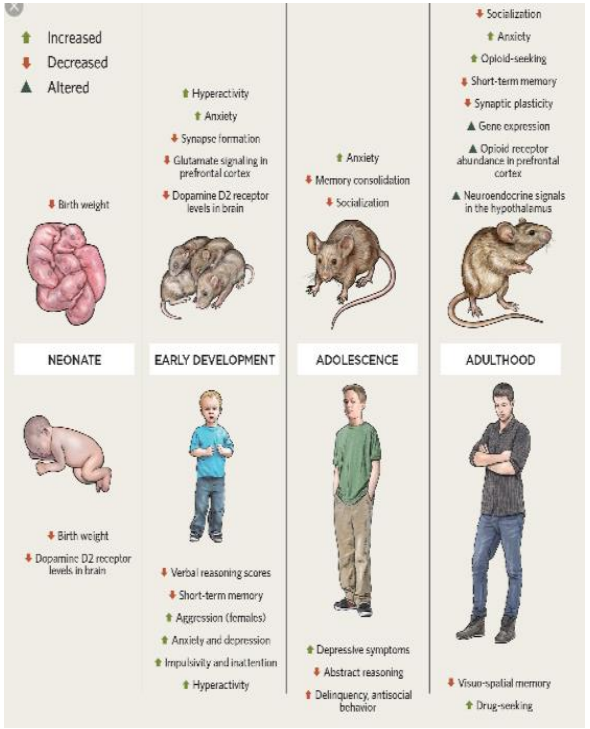
Current evidence does not support an association between marijuana exposure and any specific congenital birth defect (all existing data confounded by other exposures)

Bottom line: If pts are using marijuana, use it as an opportunity to discuss tobacco or other substance use.



There are 2 large cohorts with both short- and long-term follow-up of
children exposed to marijuana in utero.

- The Ottawa Prenatal Prospective Study looked at the effects of prenatal marijuana and tobacco use on 180 offspring of primarily middle class, white, low risk patients in Ottawa, Canada, at
- various developmental ages.
- Younger than age 4 years, there were no differences in behavior problems, intellect, visual perception, language, or sustained attention and memory tasks between children born to mothers who used marijuana and those who did not.
- However, after the age of 4 years, there were differences in behavioral
- problems and poorer performance on visual perception tasks as well as language comprehension and sustained
- attention and memory difficulties in
- exposed children.
- By the age of 9-12 years, there was no difference between exposed and unexposed children in global intelligence quotient scores or performance on visual tasks and impulse control.
- Pittsburg study: low income, high risk
- Similar concerns re: behavior



<u>Neurobehavior:</u>

Although the human research in neonatal and childhood development following marijuana exposure is flawed by factors including the concurrent use of other substances, variability in exposure dosing and frequency, other genetic or environmental factors, and a reliance on self-reported data, there is a concerning pattern of altered neurodevelopment with early, heavy maternal of marijuana.

Bottom line:

- ***It is clearly not good for development. We just have difficult measuring/establishing how bad it is alone***
- ***There is biologic plausibility: it clearly crosses the blood brain barrier and alters neurotransmitters***
- ***If pts are using marijuana, use it as an opportunity to discuss tobacco or other substance use.***

- Cannabinoids consumed by lactating mothers reach the newborn during breast-feeding.
- The amount that reaches the infant is estimated at 0.8% of the mother's exposure.
- There is some evidence that marijuana use inhibits milk production by inhibiting prolactin secretion
- Adverse neurodevelopment reported but not controlled for confounders
- >80% of women that used marijuana in pregnancy continued during breastfeeding
- Remember the toxicology slide: measurable in system in chronic users for weeks
- Remember breastmilk has a lot of fat: THC fat soluble

<u>Breastfeeding/Lactation:</u>

- Women should clearly be educated regarding the potential adverse effects of ongoing marijuana exposure through breast milk and encouraged to stop using marijuana while lactating.
- Marijuana should not be a contraindication to breastfeeding

Bottom line:

- ***It is clearly not good for development. We just have difficult measuring/establishing how bad it is alone***
- ***There is biologic plausibility: it clearly crosses the blood brain barrier and alters neurotransmitters***
- ***If pts are using marijuana, use it as an opportunity to discuss tobacco or other substance use.***

- Usual approach to unknown substances
- Assess risk/benefit
- Emphasize what we do know about medications that can help with their symptoms that have less uncertainty
- Minimize exposure: it hangs in your system (and babies) for a long time (term babies have a lot of fat)

TABLE 5

Recommendations for clinicians regarding marijuana use in pregnancy

Recommendations
Screen all women verbally for marijuana use at intake to obstetrical care
Consider rescreen later in pregnancy
Consider urine toxicology screening in high-risk patients
Recommend avoiding marijuana in pregnancy
Marijuana crosses the placenta
Counsel women regarding uncertainty of effects on perinatal outcomes
Possible increased risk of stillbirth
Possible increased risk of preterm birth (mixed data)
Counsel women regarding uncertainty of effects on offspring
Possible adverse effects on neurodevelopment
Possible increased risk of fetal growth restriction (mixed data)
No established association with specific congenital anomalies
Refer women who use marijuana and desire cessation to appropriate resources
Local substance-use programs
Do not otherwise modify clinical care
Growth ultrasounds not indicated outside study protocols
Screening for preterm birth with cervical length not indicated
Antenatal surveillance not indicated
Recommend avoiding marijuana while lactating
Marijuana is passed to the neonate in breast milk
Possible adverse effects on early neurodevelopment
Provide counseling, but do not withdraw lactation support

Recommendations in the Table above reflect the opinions of the authors after a thorough review of the existing literature on marijuana in pregnancy and lactation.

Metz. Marijuana in pregnancy. Am J Obstet Gynecol 2015.

Remind pts: Marijuana not good for them

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Adverse Health Effects of Marijuana Use

Nora D. Volkow, M.D., Ruben D. Baler, Ph.D., Wilson M. Compton, M.D., and Susan R.B. Weiss, Ph.D.

Table 1. Adverse Effects of Short-Term Use and Long-Term or Heavy Use of Marijuana.

Effects of short-term use
Impaired short-term memory, making it difficult to learn and to retain information
Impaired motor coordination, interfering with driving skills and increasing the risk of injuries
Altered judgment, increasing the risk of sexual behaviors that facilitate the transmission of sexually transmitted diseases
In high doses, paranoia and psychosis
Effects of long-term or heavy use
Addiction (in about 9% of users overall, 17% of those who begin use in adolescence, and 25 to 50% of those who are daily users)*
Altered brain development*
Poor educational outcome, with increased likelihood of dropping out of school*
Cognitive impairment, with lower IQ among those who were frequent users during adolescence*
Diminished life satisfaction and achievement (determined on the basis of subjective and objective measures as compared with such ratings in the general population)*
Symptoms of chronic bronchitis
Increased risk of chronic psychosis disorders (including schizophrenia) in persons with a predisposition to such disorders

* The effect is strongly associated with initial marijuana use early in adolescence.

N Engl J Med 2014;370:2219-27.
DOI: 10.1056/NEJMra1402309

Review

Maternal Marijuana Use and Adverse Neonatal Outcomes

A Systematic Review and Meta-analysis

Shayna N. Conner, MD, MSCI, Victoria Bedell, MD, Kim Lipsey, MLIS, George A. Macones, MD, MSCE, Alison G. Cahill, MD, MSCI, and Methodius G. Tuuli, MD, MPH

CONCLUSION: Maternal marijuana use during pregnancy is not an independent risk factor for adverse neonatal outcomes after adjusting for confounding factors. Thus, the association between maternal marijuana use and adverse outcomes appears attributable to concomitant tobacco use and other confounding factors.

(Obstet Gynecol 2016;128:713–23)
DOI: 10.1097/AOG.0000000000001649

Bottom line:

- ***It is clearly not good for development. We just have difficult measuring/establishing how bad it is alone***
- ***There is biologic plausibility: it clearly crosses the blood brain barrier and alters neurotransmitters***
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WEED & THE AMERICAN FAMILY

Melissa Vaughn, a 37-year-old stay-at-home mom in the Boston area, believes that brownies saved her baby. Specifically, those made with Betty Crocker Fudge Brownie Mix — and pot-infused butter.

Before she baked her first batch, she tried everything else she could find to alleviate her severe morning sickness, called hyperemesis, which began around four weeks into her first trimester and got progressively worse.

"I would constantly vomit," Melissa (not her real name) tells Yahoo Beauty. "I couldn't keep any food down. I couldn't keep any water down. I was totally incapacitated, in bed, unable to function. And I lost 12 pounds in seven days."

https://news.yahoo.com/marijuana-saved-pregnancy-safe-pot-moms-100111720.html

<u>Nausea and vomiting in pregnancy:</u>
Your fetus will not starve if you do not smoke pot.

There are FDA accepted medications that can help

Do not use your symptoms as the excuse: if you want to continue use, that is your choice. Just realize there are other ways we know more about that can help with your symptoms.

INTERIM UPDATE

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

ACOG COMMITTEE OPINION

Number 722 • October 2017 (Replaces Committee Opinion No. 637, July 2015)

Committee on Obstetric Practice

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

INTERIM UPDATE: This committee Opinion is updated as highlighted to reflect a limited, focused change in the language and supporting evidence regarding marijuana use and neonatal outcomes.

Marijuana Use During Pregnancy and Lactation

ABSTRACT: *Cannabis sativa* (marijuana) is the illicit drug most commonly used during pregnancy. The self-reported prevalence of marijuana use during pregnancy ranges from 2% to 5% in most studies. A growing number of states are legalizing marijuana for medicinal or recreational purposes, and its use by pregnant women could increase even further as a result. Because of concerns regarding impaired neurodevelopment, as well as maternal and fetal exposure to the adverse effects of smoking, women who are pregnant or contemplating pregnancy should be encouraged to discontinue marijuana use. Obstetrician–gynecologists should be discouraged from prescribing or suggesting the use of marijuana for medicinal purposes during preconception, pregnancy, and lactation. Pregnant women or women contemplating pregnancy should be encouraged to discontinue use of marijuana for medicinal purposes in favor of an alternative therapy for which there are better pregnancy-specific safety data. There are insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged.

Recommendations

The American College of Obstetricians and Gynecologists recommends the following:

- Before pregnancy and in early pregnancy, all women should be asked about their use of tobacco, alcohol, and other drugs, including marijuana and other medications used for nonmedical reasons.
- Women reporting marijuana use should be counseled about concerns regarding potential adverse health consequences of continued use during pregnancy.
- Women who are pregnant or contemplating pregnancy should be encouraged to discontinue marijuana use.
- Pregnant women or women contemplating pregnancy should be encouraged to discontinue use of marijuana for medicinal purposes in favor of an alternative therapy for which there are better pregnancy-specific safety data.
- There are insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged.

<u>Vaping:</u>

Do not forget that lung injuries/pneumonitis in general are WAY worse in pregnancy. Mortality is higher regardless of cause.

Questions?

This webinar was recorded and will be available to view within 5 days at vchipobstetrics.org

UPCOMING Webinars

Collaboration with UVMMC, Vermont Dept. of Health, VCHIP

All webinars are recorded @ vchipobstetrics.org

Upcoming Webinars:

- 01/21/ 20 – 12-1pm EST – Screening, Treatment and Access for Mothers and Perinatal Partners (STAMPP)
- 02/18/20 – 12-1pm EST – Discharge Opioid Prescribing after Childbirth & Pubic Health Topic
- 03/17/20 – 12-1pm EST – Joint Commission Mandates & Public Health Topic

Register at
vchipobstetrics.org

Thank you!