OBSTETRIC CARE CONSENSUS **EVIDENCE MAP**

SUPPLEMENTAL DIGITAL CONTENT

**Evidence Map**

Pregnancy with Anticipated Delivery at Age 35 and Beyond

OBSTETRIC CARE CONSENSUS NUMBER 11

|  |  |  |
| --- | --- | --- |
| **Antepartum** | | |
| **Maternal Risks** | | |
| **RECOMMENDATION STATEMENTS**  We suggest that pregnancy with anticipated delivery at and beyond 35 years of age be recognized as a risk factor for adverse maternal, fetal, and neonatal outcomes when counseling patients and determining management plans. Nuanced counseling will be dependent on the pregnant individual’s specific age and comorbidities. (GRADE 2C)  We recommend daily low-dose aspirin for the reduction of preeclampsia for pregnant individuals age 35 or older in the setting of at least one other moderate risk factor. (GRADE 1B)  We suggest counseling that vaginal delivery is safe and appropriate if there are no other maternal or fetal indications for cesarean delivery. Counseling should include a discussion of the risks of cesarean, the patient’s comorbidities, and the patient’s preferences and goals. Advancing patient age alone is not an indication for cesarean delivery. (GRADE 2B) | | |
| **SUPPORTING EVIDENCE**  **Related Guidelines**  United States Preventive Services Task Force (USPSTF) Recommendations Statement 2021: Aspirin Use to Prevent Preeclampsia and Related Morbidity and Mortality: Recommends the use of low-dose aspirin (81 mg/day) as preventive medication after 12 weeks of gestation in persons who are at high risk for preeclampsia (Grade B)  American College of Obstetricians and Gynecologists (ACOG) and Society for Maternal-Fetal Medicine (SMFM) Practice Advisory 2021: Low-dose aspirin (81 mg/d) prophylaxis is recommended for: Pregnant individuals at high risk of preeclampsia with one or more of the following risk factors: History of preeclampsia, especially when accompanied by an adverse outcome, Multifetal gestation, Chronic hypertension, Pregestational type 1 or 2 diabetes, Kidney disease, Autoimmune disease (ie, systemic lupus erythematous, antiphospholipid syndrome), Combinations of multiple moderate-risk factors  ACOG Committee Opinion #743 2018: Low-Dose Aspirin Use During Pregnancy: Maternal age of 35 years of older is a moderate-risk factor for preeclampsia. Consider low-dose aspirin if the patient has one or more moderate risk factors. | | |
| **Category I**  Systematic reviews/meta-analyses  Bayrampour 2010 all included studies illustrated an increased risk of cesarean birth among older women; fifteen studies adjusted this association for potential confounders, which suggests that a valid and independent association is likely to exist between advanced maternal age and cesarean birth; however, the associated factors for this increased risk are not totally understood in the literature  Pinheiro 2019 advanced maternal age women are at a higher risk of adverse obstetrical and perinatal outcomes; in both comparisons, worse outcomes were more prevalent in the older group, suggesting that poorer outcomes are more prevalent with increasing age | **Category II**  Rademaker 2021 the risk of adverse maternal and perinatal outcomes for women over 40 years old surges as age increases; a novel aspect was the consistent increased risks not only for primigravid women but also for multigravida  Smithson 2021 there were several important significant differences in the outcomes between women of very advanced maternal age women and women of advanced maternal age, especially concerning hypertensive disorders and cesarean delivery rates  Bergholt 2020 advanced maternal age (AMA) is associated with increased risk of cesarean section in women undergoing labor induction with a single cephalic presentation at term without a previous cesarean section; the absolute risk of cesarean section is 3-5 times higher across 5-year age groups in nulliparous relative to multiparous women having induced labor  Scime 2020 of the pregnancy complications studied, advanced maternal age only modified the association between preterm birth (PTB) and preeclampsia, such that older women with preeclampsia have a higher risk for spontaneous/iatrogenic PTB than younger counterparts  Casteleiro 2019 results support the association between AMA and suffering repeated abortions; likewise, being of AMA was associated with a greater risk of suffering from gestational diabetes, especially among primiparous women, as well as being associated with both instrumental deliveries and cesareans among both primiparous and multiparous women  Claramonte Nieto 2019 maternal age is an independent risk factor for adverse obstetric outcomes; age ≥ 40 years was associated to relevant increased risks and reveals to be an adequate cut-off to define AMA in our population  Kanmaz 2019 most of the prenatal complications were found to increase in the advanced maternal age group; the caesarian section rate was found to be higher in all advanced maternal age groups; there was no significant relationship between 5 Minute Apgar scores of <7 and perinatal mortality and post-term pregnancy and parity; globally, advanced maternal age pregnancy shows an increase as a result pregnancy complication will increase; it is important to make an appropriate follow-up for pregnancies of advance maternal age mothers  Kim 2019 advanced maternal age is an independent risk factor of emergency ceasarean section (CS) due to nonreassuring fetal heart rate or arrest disorder during the trial of vaginal delivery; the risk of emergency CS was also increased when labor induction was performed; therefore, the risk of emergency CS needs to be considered, especially when the labor induction is planned, in women aged 40 or more  Leonard 2019 pre-pregnancy health and cesarean delivery are important risk factors for severe maternal morbidity but do not explain an increasing trend of severe maternal morbidity in California during 2007–2014  Marozio 2019 maternal age over 40 years is an independent risk factor for adverse pregnancy outcomes, particularly for the mother; pregnancies in women over 40 years should be considered at risk and carefully monitored with individualized care protocols  Molina-Garcia 2019 advanced maternal age is associated with a higher incidence of pathology during pregnancy and dystocic labor  Salman 2019 AMA primiparous women attempting trial of labor (TOL) have comparable outcome to those seeking scheduled cesarean delivery (CD), however, women with failed trial of labor (fTOL) have higher rates of adverse neonatal outcome  Arya 2018 detected a dose–response association between maternal age and the risk of multiple maternal and fetal complications  Frederiksen 2018 women older than 40 years have a high-  er risk of chromosomal abnormalities, miscarriage, and  birth before 34 weeks of gestation than younger women  and should be monitored accordingly; no increased risk  was observed for stillbirth and other congenital malformations; several factors increase the risk of adverse  pregnancy outcomes, but advanced maternal age drives  a high proportion of the total risk score  Martin 2018 cesarean delivery rate increased as age increased; 40.4% for ages 35-39 and 47.9% for ages 40-54  Muto 2018 the rate of intrapartum emergency CS in older nulliparous women at term was approximately 21%; induction of labor should be recognized as a significant factor for emergency CS  Nakano 2018 induction of labor (IOL) failed in 44% of nulliparous advanced maternal age (AMA) women; hypertensive disorder and immature cervical status should be considered as independent risk factors for emergency CS among such women  Sheen 2018 while differential risk was noted across maternal age categories, women aged 45 years old and older were at highest risk for a broad range of adverse outcomes during delivery hospitalizations  Cakmak Celik 2017 extremely advanced maternal age (EAMA) mothers and their offsprings have similar peri and neonatal risks compared to younger mothers, except lower 5th minute Apgar scores; conclude that with good perinatal care, EAMA women and their babies can pass through the perinatal period with similar risks of younger women  Dunn 2017 following IOL, AMA was associated with a two-fold increased likelihood of birth by CS in both nulliparous and multiparous women; however, the majority of AMA women birthed vaginally  Fayed 2017 adverse pregnancy outcomes show a continuum with the advancement of maternal age; adolescents mother are more likely to have vaginal delivery; however, they are at increased risk of preterm delivery; advanced maternal age is associated with increased risk of preterm delivery, gestational diabetes and CS  Ogawa 2017 very advanced maternal age (≥ 45) was related to greater risk for adverse birth outcomes compared to younger women, especially for maternal complications including cesarean section, preeclampsia, severe preeclampsia, and placenta previa; the magnitude of the influence of age also differed by fertilization method and by parity  Lavecchia 2016 planned cesarean section is a key factor significantly influencing maternal morbidity and mortality in healthy women with advanced maternal age; when possible, planned cesarean deliveries should be avoided in this population  Osmundson 2016 compared to non-AMA women, women age > 50 years with a singleton pregnancy experience significantly higher rates of cesarean delivery; however, the majority of those who undergo a trial of labor will have a vaginal delivery; neither a trial of labor nor a prelabor cesarean delivery is significantly associated with maternal or neonatal morbidity; these data support either approach in women of extremely AMA  Posthumus 2016 the presence of both medical and non-medical risk factors early in pregnancy predict the occurrence of adverse outcomes at birth; furthermore, the risk profiles for adverse outcomes differed according to socioeconomic status (SES) and ethnicity  Richards 2016 primary cesarean delivery risk continues to increase above age 35 regardless of prior vaginal birth, with the highest risk among women aged 50 years and older  Bereczky 2015 study revealed a highly significant decrease of mean gestational age and mean fetal weight, as well as a higher incidence of comorbidities and pregnancy-related complications in those aged ≥ 35 years; assume that comorbidities, maternal and fetal indications to perform CS, in the more mature age group, were a main determinant of the elective or iatrogenic preterm deliveries, which might have contributed to further complications; moreover, previous CSs were likely a promoting factor for further CSs  Islam 2015 found increased risks of some adverse obstetric outcomes among advanced-age women of age 35 and above; data indicate higher risk of gestational diabetes, preeclampsia, gestational hypertension, spontaneous abortion, prolonged labor, cesarean section delivery, and overall higher risk of any delivery complications among advanced-age mothers  Schimmel 2015 AMA, especially primiparous, has more adverse maternal and neonatal outcomes than younger women; however, these did not include mortality; consistent antenatal care may explain this  Barton 2014 in healthy women, both advanced maternal age and obesity negatively influence pregnancy outcomes; women who delay pregnancy until age 40+ years may modify their risk for cesarean section, preterm birth, and low-birth-weight infants by reducing their weight to nonobese levels before fertilization  Jacquemyn 2014 multivariate analysis confirmed advanced  maternal age to be a significant factor in low birth weight,  preterm delivery, hypertension, diabetes, CS and perinatal mortality; mothers at age 45 and older have a significantly increased risk for low birth weight, preterm delivery, hypertension, diabetes, CS and perinatal mortality  Laopaiboon 2014 AMA predisposes women to adverse pregnancy outcomes; the findings of this study would facilitate antenatal counselling and management of women in this age category  Favilli 2013 when single indication of induction of labor with prostaglandins is considered, advanced maternal age represents a significant independent risk factor for cesarean delivery  Timofeev 2013 maternal and obstetric complications differed by maternal age, as did rates of elective cesarean delivery; women aged 25.0-29.9 years had the lowest rate of serious neonatal morbidity  Canto 2012 population of older mothers showed a higher risk for being delivered by cesarean section and for developing either preeclampsia or gestational diabetes; the overall neonatal outcome was unaffected; these data may be helpful to counsel patients about their pregnancy expectations and possible outcomes  Takahashi 2012 CS rate was 50.0% in primiparous women aged > 40 years; in addition, CS caused by dystocia was almost twice as frequent in primiparous women aged > 40 years as in women aged 35–39 years; among late pregnancies, primiparous women aged 40 years and older had higher risk of CS  Carolan 2011 interventions in labor and birth increased with maternal age, and this effect was seen particularly for cesarean section among women admitted privately  Wang 2011 operative delivery is increased in AMA, including caesarean sections, as well as instrumental vaginal deliveries in nulliparous women; in multiparous women, however, only the rate of caesarean section before labour was increased; AMA had no significant effect on other adverse obstetric and perinatal outcomes irrespective of parity  Roos 2010 nulliparity, advanced maternal age and obesity were the strongest risk factors for postterm pregnancy and CS following labor induction in postterm pregnancy; including maternal risk factors to the cervical assessment may improve prediction of vaginal delivery following labor induction in postterm pregnancy  Chan 2008 obstetric outcome in women aged 40 years or older was influenced by parity; cesarean delivery and preterm birth before 37 weeks were independently associated with older age irrespective of parity; advanced age is a risk factor for preterm birth  Diejomaoh 2006 AMA of 40 years and over was not associated with adverse maternal and perinatal outcome, although the incidence of caesarean section was significantly increased in these women  Callaway 2005 maternal and neonatal outcomes in this series were generally good; there was a significantly increased rate of CS; overall, this study is reassuring for women aged 45 and over who have good general health and a chromosomally normal fetus  Chibber 2005 appropriately screened women, aged 50 years or older, can deliver successfully; during pregnancy, they appear to be at increased risk of pre-eclampsia and gestational diabetes; a significant majority can expect to deliver via cesarean  Kozinszky 2002 the risk of cesarean section at this advanced age is 6.54-fold; the determinants are included in the pregnancy, delivery and neonatal outcome  Prasad 2000 no increase in complications of pregnancy though there was an increased CS rate and perinatal mortality rate | **Category III** |
| **Fetal Risks** | | |
| **RECOMMENDATION STATEMENTS** | | |
| Given increased rates of multiple gestations for pregnant individuals with anticipated delivery at age 35 years or older, we suggest a first trimester ultrasound. (GRADE 2C)  We recommend prenatal genetic screening (serum screening with or without nuchal translucency [NT] ultrasound or cell-free DNA screening) and diagnostic testing (chorionic villus sampling [CVS] or amniocentesis) options be discussed and offered to all pregnant individuals regardless of age or risk of chromosomal abnormality. After review and discussion, every patient has the right to pursue or decline prenatal genetic screening and diagnostic testing. (GRADE 1A)  We suggest a detailed fetal anatomic ultrasound for pregnant individuals with anticipated delivery at age 35 years or older given the increased risk of aneuploidy and potential increased risk of congenital anomalies in this population. (GRADE 2C)  Due to increased risk of both large for gestational age and small for gestational age neonates, we suggest an ultrasound for growth assessment in the third trimester for pregnant individuals with anticipated delivery at age 40 years or older. (GRADE 2C)  We suggest offering antenatal fetal surveillance for pregnant individuals with anticipated delivery at age 40 years or older given the increased risk of stillbirth. (GRADE 2B)  We recommend proceeding with delivery in well-dated pregnancies at 39 0/7 – 39 6/7 weeks of gestation for individuals with anticipated delivery at 40 years and older due to increasing rates of neonatal morbidity and stillbirth beyond this gestational age. (GRADE 1B) | | |
| **SUPPORTING EVIDENCE** | | |
| **Related Guidelines**  ACOG Committee Opinion #828 2021: Indications for Outpatient Antenatal Fetal Surveillance: Committee Opinion provides guidance on and suggests surveillance for conditions for which stillbirth is reported to occur more frequently than 0.8 per 1,000 (the false-negative rate of a biophysical profile or modified biophysical profile) and which are associated with a relative risk (RR) or odds ratio for stillbirth of more than 2.0 compared with pregnancies without the condition.  ACOG Practice Bulletin #231 2021: Multifetal Gestations: Twin Triplet and Higher-Order Multifetal Pregnancies: All women with multifetal gestations, regardless of age, are candidates for routine screening for fetal chromosomal abnormalities. The optimal gestational age for initiation of surveillance in pregnant individuals with uncomplicated dichorionic twins is not known. However, for patients with uncomplicated dichorionic twin pregnancies, weekly antenatal fetal surveillance may be considered at 36 0/7 weeks of gestation.  ACOG SMFM Practice Bulletin # 226 2020: Screening for Fetal Chromosomal Abnormalities: When considering screening test characteristics, no one test is superior in all circumstances, which results in the need for nuanced, patient-centered counseling from the obstetric care professional and complex decision making by the patients; each patient should be counseled in each pregnancy about options for testing for fetal chromosomal abnormalities. Maternal age is a factor associated with the likelihood of chromosomal abnormalities  ACOG Practice Advisory 2018: Clinical Guidance for Integration of the Findings of The ARRIVE Trial: Labor Induction Versus Expectant Management in Low-Risk Nulliparous Women: Based on the findings demonstrated in this trial, it is reasonable for obstetricians and health-care facilities to offer elective induction of labor to low-risk nulliparous women at 39 weeks gestation. However, consideration for enactment of this elective induction of labor intervention should not only take into account the trial findings, but that this recommendation may be conditional upon the values and preferences of the pregnant woman, the resources available (including personnel), and the setting in which the intervention will be implemented. A collaborative discussion with shared-decision making should take place with the pregnant woman. Additionally, as induction of labor involves coordination between the health care provider and the infrastructure in which induction and delivery will occur, it is critical that personnel and facilities coordinate polices related to the offering of elective induction of labor. Current guidance from the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine recommends that if the maternal and fetal status allow, cesarean births for failed induction of labor in the latent phase can be avoided by allowing longer durations of the latent phase (up to 24 hours or longer) and requiring that oxytocin be administered for at least 12–18 hours after membrane rupture before deeming the induction a failure.  ACOG Committee Opinion #589 2014: Female Age-Related Fertility Decline: Education and enhanced awareness of the effect of age on fertility is essential in counseling the patient who desires pregnancy. Women older than 35 years should receive expedited evaluation and treatment after 6 months of failed attempts to become pregnant or earlier, if clinically indicated. In women older than 40 years, immediate evaluation and treatment is warranted.  American Institute of Ultrasound in Medicine (AIUM) and SMFM Consensus Report (Wax 2014): Indications for a detailed fetal anatomic examination include but are not limited to the following conditions: 1) Previous fetus or child with a congenital, genetic, or chromosomal abnormality, 2) Known or suspected fetal anomaly or known growth disorder in the current pregnancy, 3) Fetus at increased risk for a congenital anomaly, 4) Fetus at increased risk for a genetic or chromosomal abnormality, 5) Other conditions affecting the fetus | | |
| **Category I** | **Category II** | **Category III** |
| Randomized controlled trials  Grobman 2018 induction of labor at 39 weeks in low-risk nulliparous women did not result in a significantly lower frequency of a composite adverse perinatal outcome, but it did result in a significantly lower frequency of cesarean delivery  Walker 2016 among women of advanced maternal age, induction of labor at 39 weeks of gestation, as compared with expectant management, had no significant effect on the rate of cesarean section and no adverse short-term effects on maternal or neonatal outcomes | Li 2021 maternal age was ascertained to be a strong risk factor for fetal sex chromosome aneuploidies (SCAs), and the incidence of fetal SCAs depended on clinical indications  Palatnik 2020 nulliparous women ≥30 years have higher risk of small for gestational age (SGA) compared to nulliparous women age 20–29; in contrast, both nulliparous and multiparous women ≥ 40 years have an increased risk of SGA<5th percentile  Lei 2019 advanced age decreases the incidence of 45, X, but increases the risk of sex chromosome trisomy, especially 47, XXX and 47, XXY  Martin 2019 twin birth rates declined among mothers aged 30 and over, with the largest declines among older mothers aged 40 and over  Okmen Ozkan 2019 incidence of non-chromosomal anomalies does not increase in fetuses of pregnant women aged over 35 years, in contrast to chromosomal anomalies  Frederiksen 2018 women older than 40 years have a high-  er risk of chromosomal abnormalities, miscarriage, and  birth before 34 weeks of gestation than younger women  and should be monitored accordingly; no increased risk  was observed for stillbirth and other congenital malformations; several factors increase the risk of adverse  pregnancy outcomes, but advanced maternal age drives  a high proportion of the total risk score  Goetzinger 2017 AMA is associated with an overall decreased risk for major anomalies; these findings may suggest that the “all or nothing” phenomenon plays a more robust role in embryonic development with advancing oocyte age, with anatomically normal fetuses being more likely to survive  Best 2016 found little evidence that advanced maternal age is a risk factor for congenital heart disease (CHD)  Valent 2016 lowest neonatal morbidity risk is at 39-week gestation with a significantly increased risk observed thereafter, especially in women >40 years  Walker 2016 AMA is a significant risk factor for antepartum stillbirth particularly at term; attention should be given to stillbirth due to mechanical causes, maternal disorders and associated obstetric factors in such women  Zapata-Masias 2016 maternal age ≥40 years was associated with poorer obstetric and perinatal outcomes and increased the risks of cesarean section, intrauterine growth retardation, and fetal macrosomia  Levine 2015 while overall cesareans increased, there was no difference in primary cesarean and induction rates for AMA women after implementation of antenatal testing for AMA  MacDorman 2015 presented 2013 fetal and perinatal mortality data by maternal age, marital status, race, Hispanic origin, and state of residence, as well as by fetal birthweight, gestational age, plurality, and sex  Ciancimino 2014 AMA could be considered an important risk factor only for spontaneous abortion (SA) and preterm delivery (PTD) and does not influence neonatal outcomes except for congenital malformations  Hedegaard 2014 a gradually more proactive and differential earlier labour induction practice is likely to have mainly been responsible for the substantial reduction in stillbirths in Denmark  Jacquemyn 2014 multivariate analysis confirmed advanced  maternal age to be a significant factor in low birth weight,  preterm delivery, hypertension, diabetes, CS and perinatal mortality; mothers at age 45 and older have a significantly increased risk for low birth weight, preterm delivery, hypertension, diabetes, CS and perinatal mortality  Mutz-Dehbalaie 2014 women older than 40 years carry an increased risk for stillbirth; important amendable risk factors are obesity and poor antenatal care  Fox 2013 in AMA patients, antepartum surveillance and delivery at 41 weeks appears to reduce the risk of stillbirth to that of the non-AMA population; routine antepartum surveillance should be considered in all AMA patients  Shnorhavorian 2011 several maternal factors are associated with the risk of congenital urinary tract anomalies (CUTA), including diabetes mellitus and maternal renal disease; this information can be used for prenatal counseling and management of women with these risk factors  Reddy 2010 there are multiple independent risk factors for antepartum stillbirth; however, the value of individual risk factors of race, parity, advanced maternal age (35– 39 years old) and body mass index (BMI) to predict term stillbirth is poor; results do not support routine antenatal surveillance for any of these risk factors when present in isolation  Sutan 2010 AMA, maternal smoking, and shorter maternal height were associated risk for unexplained antepartum stillbirth but screening based on these factors would be of limited value  Bahtiyar 2008 AMA is an independent predictor of intrauterine fetal demise (IUFD), and a strategy of antenatal testing in those > 40 years of age beginning at 38 weeks may be considered  Hoffman 2007 AMA is associated with an increased rate of fetal death and other adverse obstetrical outcomes; antepartum fetal surveillance may be warranted in these women  Reddy 2006 women who are of AMA are at higher risk of stillbirth throughout gestation; the peak risk period is 37 to 41 weeks  Miller 2005 after excluding women with other indications for antepartum testing, fetal anomalies, and delivery prior to 34 weeks, stillbirth was twice as common in women 35 years of age or older as in those younger than 35 years; the increased rate of stillbirth does not appear to be explained by a higher rate of uteroplacental insufficiency  Canterino 2004 fetal deaths are increased among older women (≥ 35 years); fetal testing in women of advanced maternal age may be beneficial  Reefhuis 2004 young and advanced maternal ages are associated with different types of birth defects; underlying causes for these associations are not clear  Hollier 2000 AMA beyond 25 years was associated with significantly increased risk of fetuses having congenital malformations not caused by aneuploidy |  |
| **Health Equity** | | |
| **RECOMMENDATION STATEMENT** | | |
| We recommend that obstetrician-gynecologists and other obstetric care professionals are aware of the disproportionate rates of most adverse maternal and perinatal outcomes in Black and American Indian and Alaska Native pregnant individuals 35 years and older. We recommend that they understand ways racism contributes to perpetuating these outcomes. (GRADE 1B) | | |
| **SUPPORTING EVIDENCE** | | |
|  | | |
| **Category I** | **Category II**  Bornstein 2020 results point to significant racial/ethnic differences in the overall prevalence, as well as the temporal changes in the prevalence, of these pregnancy risk factors/complications during the 2007–2018 period; these findings could potentially contribute to our understanding of the observed racial/ethnic differences in maternal morbidity and mortality  Kim 2020 results show that both chronic stress and racism may develop accelerated PTB risk among minority women; future research should use more objective and accurate chronic stress measures to ascertain the complex relationships among chronic stress, racial discrimination, and maternal age underlying the racial/ethnic differentials in PTB  Schummers 2019 findings confirm risks associated with first births to women younger than 20 and older than 30 years, provide easily interpretable risk curves and illuminate variability in these relationships across categories of maternal race in the United States  Moaddab 2018 the current United States maternal mortality ratio is heavily influenced by a higher rate of death among non-Hispanic black or unmarried patients with unplanned pregnancies; racial disparities in health care availability and access or utilization by underserved populations are important issues faced by states seeking to decrease maternal mortality | **Category III**  CDC Pregnancy Mortality Surveillance System (PMSS) Maternal and Infant Health provides data on infant and maternal mortality  CDC Infant Mortality data from 2018, infant mortality rates by race and ethnicity were as follows: Non-Hispanic black: 10.8, Native Hawaiian or other Pacific Islander: 9.4, American Indian/Alaska Native: 8.2, Hispanic: 4.9, Non-Hispanic white: 4.6, Asian: 3.6 |
|  | Creanga 2017 the pregnancy-related mortality ratio and the distribution of the main causes of pregnancy-related mortality have been relatively stable in recent years  Creanga 2014 severe maternal morbidity disproportionally affects racial/ethnic minority women, especially non-Hispanic black women; there is a need for a systematic review of severe maternal morbidities at the facility, state, and national levels to guide the development of quality improvement interventions to reduce the racial/ethnic disparities in severe maternal morbidity |  |