TECHNICAL REPORT

American Academy of Pediatrics
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Incorporating Recognition and Management of Perinatal Depression Into Pediatric Practice

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abstract

Perinatal depression is the most common obstetric complication in the United States, with prevalence rates of 15% to 20% among new mothers. Untreated, it can adversely affect the well-being of children and families throught increasing the risk for costly complications during birth and lead to deterioration of core supports, including partner relationships and social networks. Perinatal depression contributes to long-lasting, and even permanent, consequences for the physical and mental health of parents and children, including poor family functioning, increased risk of child abuse and neglect, delayed infant development, perinatal obstetric complications, challenges with breastfeeding, and costly increases in health care use. Perinatal depression can interfere with early parent-infant interaction and attachment, leading to potentially long-term disturbances in the child's physical, emotional, cognitive, and social development. Fortunately, perinatal depression is identifiable and treatable. The US Preventive Services Task Force, Centers for Medicare and Medicaid Services, and many professional organizations recommend routine universal screening for perinatal depression in women to facilitate early evidence-based treatment and referrals, if necessary. Despite significant gains in screening rates from 2004 to 2013, a minority of pediatricians routinely screen for postpartum depression, and many mothers are still not identified or treated. Pediatric primary care clinicians, with a core mission of promoting child and family health, are in an ideal position to implement routine postpartum depression screens at several well-child visits throughout infancy and to provide mental health support through referrals and/or the interdisciplinary services of a pediatric patient-centered medical home model.

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To cite: Rafferty J, Mattson G, Earls MF, et al. Incorporating Recognition and Management of Perinatal Depression Into Pediatric Practice. *Pediatrics.* 2019;143(1):e20183260

BACKGROUND

Depression is experienced by women most often during their childbearing years.[1] Over the last several decades, research has revealed that untreated maternal depression during pregnancy or the first year after childbirth can have significant adverse effects on the well-being of women, infants, and their families. Maternal depression experienced around the time of childbirth can increase the risk for costly complications during birth and can contribute to long-lasting and even permanent effects on the child's development.[2] Only in the last decade has universal screening for maternal depressive symptoms during the perinatal period been recommended by professional health care associations, including the American College of Obstetricians and Gynecologists (ACOG),[3] American Academy of Family Physicians (AAFP),[4] and American Academy of Pediatrics (AAP).[1] However, screening remains far from universal. In 1 study, nearly 6 out of 10 women screening positive on the Edinburgh Postnatal Depression Scale (EPDS) had not spoken to a health care professional about their symptoms or concerns.[5] It is estimated that 50% of women who are depressed during and after pregnancy have their depression go undiagnosed and untreated, which makes it the most underdiagnosed and undertreated obstetric complication.[6] However, most mothers (80%) report being comfortable with the idea of being screened for depression.[7] Among pediatricians, 90% in 1 study reported assuming responsibility for identifying maternal depression, but most (71%) rarely or never assessed for it, and almost all (93%) reported having never or rarely provided mental health referrals.[8] From 2004 to 2013, screening rates by pediatricians for maternal depression increased from 13% to only 44% in periodic surveys by a number of organizations, including the AAP.[9] Inadequate perinatal depression screening rates and limited access to evidence-based treatment are attributable to the stigma associated with mental health, patient apprehension about openly admitting to emotional struggles, limits in provider education and skill sets, and systemic limitations around delivery of and payment for screening.[7,10,11]

There has been increased attention given to perinatal depression, including the release of the US Surgeon General's Report on Mental Health in 2000 in which postpartum depression and psychosis was mentioned,[12] the 2000 report of the US Surgeon General's Conference on Children's Mental Health,[13] and a recent review article in the *New England Journal of Medicine*.[14] Congress designated increased funding to address screening and treatment of perinatal depression through the Health Resources and Services Administration's Maternal and Child Health Bureau in 2004.[2] In 2018, Congress designated $5 million for programs used to address maternal perinatal depression in the 2018 Omnibus Funding Bill (public law 114–255). This funding will be used to support state grants primarily aimed at establishing, improving, and maintaining programs to train professionals to screen and treat for maternal perinatal depression.

The most recent update of the AAP's *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition* includes a recommendation for pediatric providers to screen for postpartum depression at 4 well-child visits in the first 6 months of life and refer to appropriate evaluation and treatment services for the mother and infant when indicated.[15] In 2009, the AAP released a policy statement, "The Future of Pediatrics: Mental Health Competencies for Pediatric Primary Care," emphasizing the unique role pediatric providers have in screening for mental health concerns in children and families, including parental depressive symptoms, and working with families to improve mental health outcomes.[16] The National Academy of Sciences published its report on parental depression in 2009, emphasizing the role of the AAP Medical Home Initiative in reducing perinatal depression occurrence.[17,18] It was followed by a clinical report from the AAP that was focused on recognition and management of perinatal and postpartum depression in 2010[1] and the US Healthy People 2020 objectives to reduce the proportion of mothers experiencing perinatal depression (maternal, infant, and child health objective 34) and to improve overall maternal and child perinatal health.[19] It is within this context that the National Institute for Health Care Management released a report concluding:

> *The consequences of allowing maternal depression to go underdiagnosed and untreated are detrimental to the health of all mothers and their children. Knowing a woman's risk of developing depression peaks during her childbearing years, it is vital for all health care providers to recognize the symptoms of depression and understand the risk factors associated with maternal depression to identify and treat depression as soon as possible.*[2]

In 2016, the US Preventive Services Task Force (USPSTF) reviewed available research and asserted that direct and indirect evidence shows a "moderate net benefit" to screening for perinatal depression because it contributes to a significant reduction in overall prevalence of depression and associated morbidities.[20,21] In addition, in 2016, the Centers for Medicare and Medicaid Services (CMS) sent a directive to all state Medicaid directors clarifying that maternal postpartum depression screening can be billed under well-infant visits as a "screening of the caregiver."[22] Both the USPSTF and CMS encourage universal maternal postpartum depression screening

by pediatric providers, with appropriate payment by insurers. The USPSTF specifically states that "screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow up."[21] This requires close partnerships between pediatricians, family physicians, adult primary care physicians, and obstetricians, mental health providers, and other community agencies.

Recent research also has begun to examine the influence of a father's affective state on a child's early development and well-being.[23,24] Available evidence indicates that fathers independently experience higher rates of depression after the birth of a child, which adversely influences parenting and positive interactions.[25] Paternal depression may present differently with substance use (alcohol and drug-related comorbidity), domestic violence, and compulsive behavior, which impairs parenting and can undermine breastfeeding.[26,27] There are virtually no empirical studies on the rates or effects of depression among same-sex partners or nonbiological parents.

This technical report aims to review the definitions of perinatal depression, along with its epidemiology, to discuss the serious consequences for child development and to highlight efforts across the country that have demonstrated effectiveness in increasing early screening and treatment. The technical report reviews the evidence and rationale underlying recommendations in an accompanying policy statement[28] concerning the role of the pediatric provider as a clinician and advocate in ensuring timely identification of perinatal depression and referral to evidence-based treatment programs. With this report, we provide an update to the 2010 clinical report from the AAP on this subject.[1]

DEFINITIONS

Perinatal depression is characterized by an episode of major depression, including 2 weeks of depressed mood and neurovegetative symptoms (alterations in sleep, appetite, concentration, energy level, etc), as described in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*, occurring during pregnancy or after delivery. Although the diagnostic criteria for major depressive disorder (MDD) did not undergo significant change between the fourth edition and the *DSM-5*, the specifier "with perinatal onset" replaced the traditional distinction between antenatal and postpartum onset.[29] The reason for this change is that 50% of MDD identified during the postpartum period actually begins before delivery.[30] With this change, there is emphasis on the utility of early screening, detection, and management throughout pregnancy, not just after delivery. In fact, in 2015, the ACOG released a committee opinion recommending mothers be screened for depression at least once during the perinatal period[3] expanding the window for recommended screening into the antenatal period. Despite changes in nomenclature and disease conceptualization, much of the literature and current guidelines continue to reference only depression after delivery using the term, "postpartum depression."

There is controversy around the time course of perinatal depression, with the *DSM-5* referencing symptom onset occurring any time during pregnancy or within 4 weeks of delivery. However, many professional organizations, including the ACOG, expand the criteria to include onset of symptoms up to 12 months after delivery. Although most of the biological factors influencing mood may be less relevant at the later stage, there are significant ongoing psychosocial stressors that increase risk, especially with the added responsibilities of caring for an infant.[3]

Perinatal depression is 1 of a few recognized mood disorders that may occur around pregnancy and delivery (Table 1). "Postpartum blues" is a transient state of increased emotional reactivity occurring in approximately 50% to 80% of mothers after labor and delivery. They may cry more easily, be irritable, or demonstrate emotional lability. Peak onset is 3 to 5 days after delivery, often when women begin lactating, and duration is days to weeks. Psychiatric history, environmental stress, cultural context, and breastfeeding do not seem to be related.[2,31] Mothers with postpartum blues do not meet *DSM-5* criteria for a mood disorder, and treatment is generally supportive, because symptoms generally lessen and resolve with time.

"Postpartum psychosis" is a rare event with an estimated incidence of 2 in every 1000 deliveries. Often, the onset is within the first 1 to 4 weeks of delivery, with agitation, irritability, mood lability, delusions, and disorganized behavior. Often, it is conceptualized as on a spectrum with perinatal depression, but the preponderance of data suggests that postpartum psychosis is an overt presentation of bipolar disorder.[33] In the *DSM-5*, such a patient may meet criteria for major depression or bipolar disorder (type I or II) with psychotic features or a brief psychotic episode. Again, the "with peripartum onset" specifier is added if onset is within 4 weeks of delivery.[30] Risk factors include personal and family history of bipolar depression and schizoaffective disorder. Hormonal shifts, sleep deprivation, environmental stress, and stopping mood-stabilizing medications are believed to be

TABLE 1 Characteristics of Postpartum Blues, Perinatal Depression, and Postpartum Psychosis

Type	Course	Prevalence	Symptoms
Postpartum blues	Onset in first few wk after labor, peaks at 3–5 d postpartum (with lactation), and usually resolves in <2 wk.	50%–80% of mothers	Crying, weeping Sadness Irritability Exaggerated sense of empathy Anxiety Mood lability ("ups and downs") Feeling overwhelmed Insomnia Fatigue and/or exhaustion Frustration
Perinatal depression		15%–20% of mothers from conception to 1 y postpartum	Persistent sadness, emptiness, hopelessness, frequent crying, irritability Loss of interest in caring for self and/or child, enjoyable activities, and/or poor bonding with infant (attachment) Changes in appetite or wt Insomnia or hypersomnia Fatigue and/or exhaustion, decreased motivation Poor concentration or indecisiveness; difficulty remembering Feelings of worthlessness, guilt, inadequacy Suicidal thoughts Possibly anxiety, including bizarre thoughts, obsessions, and/or fears
Prenatal depression	Onset during pregnancy, peaks in first trimester, then declines. Symptoms last at least 2 wk.	Up to 13% of mothers (incidence: 2%–7%)	
Postpartum depression	After delivery, rates increase and peak at 3 mo postpartum. Symptoms present any time in the first y after delivery and last at least 2 wk.	Up to 10% mothers (incidence: about 7%). Up to 4% of fathers (incidence 4%–25%)[32]	
Postpartum psychosis	Onset 1–4 wk postpartum.	1–2 cases in every 1000 new mothers	Auditory hallucinations and delusions (including commands and/or beliefs that need to harm the infant) Visual hallucinations Agitation, irritability, anger Insomnia Mood lability or highly elevated mood Disorganized thoughts and behaviors High levels of anxiety Paranoia; distrusting of others Confusion Thoughts of harming or killing self, others, or the infant

Adapted from Santoro K, Peabody H. *Identifying and Treating Maternal Depression: Strategies and Considerations for Health Plans. NIHCM Foundation Issue Brief.* Washington DC: National Institutes of Health Care Management; 2010:3.

contributing factors. Postpartum psychosis is an emergency, because there is risk of infanticide and up to a 70-fold increased risk of suicide.[33]

EPIDEMIOLOGY

Various sources estimate up to 15% to 20% of women experience perinatal depression in the United States, with worldwide prevalence almost double in low-income countries.[3,9,34–36] The Centers for Disease Control and Prevention surveyed 29 reporting areas across the United States in the 2009 Pregnancy Risk Assessment Monitoring System (PRAMS) (most recent published data) and found a prevalence of self-reported depressive symptoms ranging from 7.7% in Illinois to 19.9% in Arkansas.[37] The Agency for Healthcare Research and Quality conducted a systematic review as part of its Evidence-Based Practice Program in 2015, reviewing 30 epidemiological studies of perinatal depression (as confirmed by clinical assessment or structured interview). They estimated that at any given time, 12.7% of women meet criteria for an episode of MDD during pregnancy, with an additional 7.1% meeting criteria in the first 3 months postpartum. The rate of newly diagnosed cases or incidence of MDD during pregnancy was 7.5% during pregnancy and 6.5% in the first 3 months postpartum.[35] Authors of a more recent large epidemiological study found comparable results, with period prevalence rates of 12.4% during pregnancy and 9.6% in the postpartum period; incidence rates were 2.2% and 6.8%, respectively.[38] Studies have suggested that even higher rates of postpartum depression may be seen in low-income or ethnically diverse populations, teenagers, individuals with a previous history of perinatal depression, and those with a personal

TABLE 2 Risk Factors for Perinatal Depression

Risk Factors	Additional Risk Factors Specific for Depression After Delivery
History of depression	Depression before or during pregnancy
History of anxiety	Anxiety before or during pregnancy
Preexisting stressor or relationship issues	Experiencing stressful life events during pregnancy or the early postpartum period
Lack of social support	Traumatic birth experience
Unintended, unwanted pregnancy	Preterm birth and/or infant admission to neonatal intensive care
Medicaid insurance or uninsured	Breastfeeding problems
Domestic and/or family violence	
Lower income or socioeconomic status	
Lower education	
Smoking and substance use	
Single status	
Young parents (<30 y of age)	
Having previous children	

As reviewed in Lancaster et al,[49] Robertson et al,[50] and Underwood et al.[42]

or family history of postpartum depression or major depression.[7,36,39]

The prevalence of depression during pregnancy is highest during the second 2 trimesters.[40] Controlling for antenatal medical complications and past maternal psychiatric history, including depression, in late pregnancy has been shown to be associated with obstetric and pediatric complications, including increased need for epidural analgesia, operative deliveries, preterm birth, and neonatal intensive care admissions.[41] In the postpartum period, peak prevalence is at 3 months after delivery (12.9%) and then remains steady through 7 months at 9.9% to 10.6%.[35] A recent study in New Zealand revealed that even at 9 months postpartum, more than 5% of women endorsed significant depressive symptoms.[42] These figures provide further empirical support for the expanded definition of perinatal depression with a time course of up to 1 year postpartum and the expanded time frame of monitoring for symptoms.

The incidence of paternal postpartum depression ranges from 4% to 25% in community samples,[32] and maternal postpartum depression was identified as the strongest predictor, with 24% to 50% incidence in families in which there was also maternal postpartum depression.[23] New fathers are 1.38 times more likely to be depressed than age-matched males.[43] In at least 2 prevalence studies, 4% of fathers experienced clinical depression in the first year of the child's life.[44,45] In an 18-city study, 18% of fathers of children enrolled in Early Head Start had symptoms of depression, and fathers with depression had higher rates of substance use.[23] In general, men are more likely to avoid emotional expression, deny vulnerability, and not seek help, which may help explain discrepancies in prevalence rates.[46,47]

RISK FACTORS AND COMORBIDITIES

Multiple conditions are believed to increase the risk for perinatal depression (Table 2), although it is often difficult to clearly distinguish confounding factors and comorbidities. It was identified in PRAMS data from 2004 to 2005 that younger, non-Hispanic African American mothers were most likely to report postpartum depression symptoms.[48] The PRAMS data also revealed that women who had lower educational attainment and who received Medicaid benefits for their deliveries were more likely to report depressive symptoms. In all or nearly all of the 17 states participating in PRAMS, depressive symptoms were significantly associated with 5 possible co-occurring issues or comorbidities: use of tobacco during the last 3 months of pregnancy, physical abuse before or during pregnancy, partner-related stress, traumatic stress, and financial stress during pregnancy.[48] In 14 states, maternal depressive symptoms were significantly correlated with delivery of an infant with low birth weight and experiencing emotional stress during pregnancy. NICU admission was associated with maternal depressive symptoms in 9 states.[48]

It is documented that maternal stress, whether attributable to complications of the pregnancy or the mother's psychosocial situation, may contribute to and result from perinatal depression. Perinatal depression is strongly associated with previous miscarriage, past pregnancy complications, chronic medical disease, and shorter gestation and labor.[51] Psychosocial risk factors for perinatal depression include low socioeconomic status, being a single mother, being a teenager, having low self-esteem, prenatal anxiety, substance use, poverty, history of mood disorder, family history or past medical history of depression, having poor social support, and experiencing general life stress.[49,50,52,53] Having an infant with a difficult temperament is also a risk factor for perinatal depression,

but a mother's perception of her inability to soothe her infant has a stronger association with postpartum depression than the actual duration of infant crying or fussing.[54]

Unwanted and unplanned pregnancies and relationship stress, including domestic violence and lack of social support, also have strong associations with perinatal depression.[49,55] Perinatal depression may be comorbid with marital discord, divorce, family violence (verbal and/or physical), and substance use and abuse.[56] The directionality of effect and potential reinforcement between these issues and perinatal depression is complex and warrants more study.

The etiology of perinatal depression is likely multifactorial, but there is evidence for a significant genetic basis. Familial trends in MDD are well established: first-degree relatives of someone with MDD have nearly 3 times the risk of developing it than those without such a family history.[57] Among women with a family history of postpartum depression, 42% experienced depression after their first delivery compared with only 15% of women with no such family history.[58]

Depression and anxiety are common comorbidities in the general population, with almost 60% of individuals with a diagnosis of MDD meeting criteria for an anxiety disorder at some point during their lifetime.[59,60] Depression and anxiety are also comorbidities in the perinatal period; in 1 review, anxiety had the strongest correlation with antepartum depression.[49] Biologically, studies have revealed that women with perinatal depression have abnormal stress hormone levels, particularly increased cortisol secretion, which is believed to be an underlying factor in anxiety symptoms.[61] Maternal anxiety is independently related to obstetric and pediatric complications, which compound the risk for perinatal depression. Anxiety symptoms in pregnancy are associated with preterm birth, low birth weight infants,[62] increased rate of cesarean delivery, reduced duration of breastfeeding, and increased maternal health care use within 2 weeks of delivery.[63] Maternal anxiety has also been connected to altered infant immune system function,[64] altered patterns of infant gastrointestinal microorganism growth,[65] and some limited research suggests that neural structures are modified that may predispose the child for anxiety disorders.[66] In terms of fathers, a correlation has also been documented between fathers who have preterm infants and higher levels of self-reported depression and anxiety symptoms.[67]

EFFECTS AND CONSEQUENCES

Effect on the Parent-Child Dyadic Relationship

In a classic experiment from the 1970s, researchers manipulated interactions between mothers and infants, illustrating that infants not only attempt to spontaneously initiate social exchanges but also modulate affect and attention around the presence and absence of reciprocal response. In the experiment, mothers first engaged in face-to-face reciprocal interactions (eg, when the child smiled, the mother smiled back, etc) in a laboratory with their 2- to 6-month-old infants. Mothers were then instructed to leave the room and reenter sitting opposite the infant with a "still face" (ie, an unresponsive "poker face"). In response, the infants reacted with fussiness, averting their gazes, slumping in their infant seats, and then reattempting to elicit interaction with a smile before finally giving up.[68] In later replications, exposure to the still face produced physiologic changes in the infants, such as increase in heart rate and decreased vagal tone.[69] When the mother reentered and again responded reciprocally, the infant's behavior and physiologic changes recover. This paradigm has been repeated with fathers and their infants demonstrating identical results,[70] and limited additional research further support the important role of paternal attachment.[71,72] This study ultimately reveals that the emotional life of an infant is heavily influenced by social interactions, particularly with parents, and the loss of parental engagement and reciprocity can be emotionally, behaviorally, and physiologically distressing, even if just temporarily.

"Attachment" describes the emotional connection between a child and parent that is characterized by a desire for closeness to maintain a sense of security, especially during times of stress and separation.[73–75] From a psychoanalytic perspective, the primary dyadic relationship serves as a prototype for all future social interactions.[74] Furthermore, the model is transactional, so rejection from a parent may cause the child to interpret the parent as rejecting as well as the self as unlovable.[76] From an organizational perspective, children progress through a hierarchy of relevant developmental tasks, each building on each other. Early effects of being raised by a parent who is emotionally absent and depressed, if sustained, can carry forward and adversely influence future adaptation.[77] Research suggests that parent-child relationships or attachment likely influences a child's ability to integrate positive representations of parents and of the self.[78] Therefore, high-quality parent-child dyadic interaction facilitates a secure attachment, which is 1 important factor in promoting early life resiliency, emotional regulation, and cognitive development.[79] Adaptations

to the still-face experiment described provide some support for this claim, because infants at 6 months of age who were assessed as "securely attached" with their parents recovered faster with more "positive expression" immediately after the still-face exposure.[80]

Supportive behaviors by mothers that have been identified as especially important for cognitive and socioemotional development include following the child's interests and attention, responding contingently, and stimulating the child's engagement with his or her environment through verbal and practical encouragement. Parents who are depressed speak less, are less responsive (eg, smiling), present with flat affect, and express more negative emotions.[81–83] Mothers and fathers who are depressed are less likely to engage in enrichment activities with their child, including reading, singing, and storytelling.[25] Mothers with perinatal depression also demonstrate less reciprocal interaction; distorted perceptions of the infant's behavior, particularly rejection; less positive attribution, leading the child to irritability; less sensitivity and attunement; apathy; and lower rates of breastfeeding.[84,85]

Ultimately, insecure mother-child attachment is associated with social withdrawal from daily activities and less interaction. As early as 2 months of age, infants look at mothers who are depressed less, and infants of mothers with a history of poorly or untreated perinatal depression tend to demonstrate poor behavioral regulation, less explorative play, and lower activity levels. The infants have poor orientation skills and tracking, lower activity level, and irritable temperament. There is an increased risk of feeding and sleeping problems as well as failure to thrive.[81,86,87] Infants of mothers with untreated perinatal depression cry a lot because of difficulty with both self-comforting and being soothed by others. They may be apathetic, avoidant, clingy, or indifferent, and they tend not to exhibit any maternal preference or anxiety around strangers. Long-term impact of insecure attachment extends to preschool and older children with anxiety, behavior problems, poor peer relationships, school problems, and depression.[88] Such behaviors may even serve to worsen a parent's sense of worthlessness, rejection, and depression.[89]

Effect on the Child

In the prenatal period, maternal stress and depression negatively affect fetal growth and development.[90] Stress hormones, such as cortisol, are chronically elevated in states of generalized anxiety and depression, and they readily pass through the placenta. Animal and human studies reveal that increased maternal cortisol levels have been associated with decreased placental size, increased rates of fetal growth restriction, and premature delivery.[91–93] Norepinephrine, another stress hormone, does not cross the placenta, but it may influence the placental environment through peripheral effects, including increasing uterine arterial resistance and decreasing blood flow and oxygenation, resulting in fetal growth deprivation. Norepinephrine has also been associated with increased risk of preeclampsia.[94] Consequently, in 1 study, it was found that antenatal maternal depression led to a 34% increase in the odds of a developmental delay using the Denver II Developmental Screen in children at 18 months of age. This effect was statistically significant and independent of any postnatal depression.[95]

In the postpartum period, the still-face experiment revealed that social development starts early. In the experiment, infants demonstrated basic abilities to connect facial expression to emotional states, to have social and emotional awareness of others in their environment, and to adjust affect and attention in response to their parent. It also revealed that the absence of reciprocal interactions can have emotional consequences, including distress and withdrawal. This basic understanding of early emotional states combined with attachment research has given rise to transactional or social relational models of development. These models suggest that a child's emotional regulation, as well as possibly the child's physical, cognitive, and social well-being, depends heavily on close, intimate parent-infant relationships that begin early in life. Through mutually reinforcing and reciprocal interaction patterns, infants develop building blocks for social exchanges and future relationships, including the skill of turn taking, which is the basis for the pragmatics of language development. The theory suggests that as the child grows, his or her network of relationships becomes complex, which may promote more advanced levels of interactions, such as language and coordinated behaviors.[96–98] It would follow that physical, social, and cognitive development are likely inextricably linked, and disruption of early reciprocal relationships may have long-term adverse effects on overall development and health.

This reasoning has been supported by the body of research investigating adverse childhood experiences (ACEs), such as abuse, neglect, and family dysfunction. In a retrospective 1998 study of a large adult population, it was found that ACEs were common, which may point to high levels of resiliency present in childhood.[99] Those with high levels of risk behaviors and disease as adults (eg, obesity, smoking, depression, suicidality) reported being exposed to multiple ACEs as children. Childhood exposure to

household mental illness, such as perinatal depression, was 1 of the more common ACEs reported, and it was often associated with other ACEs, such as exposure to parental substance use or domestic violence. The conclusion has been that accumulation of ACEs throughout childhood as well as their presence during particularly sensitive periods, such as early childhood, may have long-lasting effects on development and overall health into adulthood and may even contribute to an intergenerational cycle of recurring ACEs.[99,100]

Since the original ACEs study was conducted in 1998, there has been growing evidence, including prospective studies, directly associating perinatal depression with increased risk for problematic psychological and socioemotional development in children over time.[101–105] The longer a mother continues to experience depression, the more likely the child's developmental issues are to persist with less response to intervention.[106–108] In 1 study of children with internalizing symptoms (anxiety, depression), a history of maternal depression during the child's first 2 years of life was the best predictor of elevation in baseline cortisol levels at 7 years of age.[109] Prolonged cortisol elevation in preschool children predisposes them to anxiety disorders and social withdrawal.[110–112] Children of mothers with perinatal depression have been documented to have lower standardized scores of mental and motor development, poorer self-control, and social adjustment difficulties up to 5 years of age. Children of mothers with depression also had lower IQ with more attentional problems and difficulty with mathematical reasoning up to 11 years of age.[88,112,113]

In addition to primary associations with poor long-term outcomes for the child, untreated perinatal depression is also strongly tied with other unfavorable states and events that may add to the adverse effect on a child's overall health and development, including the following:

- child abuse and neglect;
- failure to implement the injury-prevention components from anticipatory guidance (eg, car safety seat and electrical plug covers)[114,115];
- failure to implement preventive health practices for the child (eg, Back to Sleep)[114,116–119]; and
- difficulty managing chronic health conditions such as asthma or disabilities in the young child.[117,120]

Families with a parent with depression have been reported to overuse health care and emergency facilities because of somatic complaints[120] and often fall behind on well-child visits and immunizations.[121] Perinatal depression also reduces a mother's chances of continued breastfeeding because of decreased satisfaction, more reported complications, and lower self-efficacy.[84]

The adverse effect of accumulating ACEs on child development may be mediated through the development of toxic stress, or the state of excessive, persistent, repetitive, and/or uncontrollable adversity without the buffering of a safe, stable, nurturing, and responsive parent to promote adaptive coping. Over time, toxic stress has consequences on brain architecture and disrupts multiple organ systems through chronic activation of stress hormone responses, cytokines, and immune modulators. The association between toxic stress states in early childhood and impaired language, cognitive and socioemotional development, and even lifelong disease has been independently validated.[122–124]

There is growing evidence that perinatal depression in parents contributes to elevated stress hormone levels in infants, suggesting that it is likely a contributing factor to toxic stress states. In 1 study, children exposed to mothers with postpartum depression had elevated levels of salivary cortisol levels during infancy[125] and at 3 years of age compared with children in a control group.[126] This effect was also revealed with adolescents at 13 years of age after controlling for current maternal or adolescent depression, experience of undesirable life events by the adolescent, maternal partner conflict, and duration of maternal depression.[127] Therefore, not only is the parent with depression impaired in his or her ability to function as a supportive buffer of adversity, but also, there may be a direct long-term activation of the child's stress responses. Persistent elevation of cortisol can disrupt the developing brain's architecture in the areas of the amygdala, hippocampus, and prefrontal cortex, affecting learning, memory, and behavioral and emotional adaptation.[122–124]

Animal studies with rats reveal compelling evidence for a causal relationship between maternal behaviors and stress reactivity in offspring through individual differences in neuronal gene expression transmitted from mother to pup through parenting behaviors in the first week of life. There is natural variation in maternal rat licking and/or grooming and nursing behaviors, so litters were split between mothers varying in levels of such behaviors. Pups exposed to less maternal care not only went on to provide less care to their own future young but also demonstrated increased gene expression in brain regions regulating behavioral and endocrine responses to stress.[128]

The influence of paternal depression on children and families has only recently been explored.[27,72] A large study from the United Kingdom revealed that paternal postpartum depression, when

maternal postpartum depression was controlled for, was associated with adverse emotional and behavioral outcomes in children at 3 to 5 years of age, particularly conduct disorder in sons.[44] Fathers with depression negatively interact not only with their partners but also with their child, including being less likely to play with the child outside.[25] Furthermore, it is well documented that a father's affective state mirrors that of the mother, so there may be a compounded adverse effect on the child's social and emotional development.[23,71]

Fortunately, perinatal depression is identifiable and treatable. Early identification via screening increases access to timely care and significantly reduces the potential negative consequences for the child and family. Even brief psychosocial interventions within primary care settings have shown to be efficacious.[129] Recent studies have revealed that supports to increase maternal engagement and responsiveness can reverse gene expression patterns related to stress via epigenetic pathways and, thereby, buffer initial adverse effects of perinatal depression (DNA methylation and neuroendocrine functioning).[130]

PREVENTION

Antenatal Depression

Prevention of perinatal depression is challenging, given the complex biopsychosocial factors that influence the entire perinatal period. Historically, much of the focus has been exclusively on reducing risk factors, comorbidities, and adverse outcomes related to depression in the postpartum period, particularly on childhood development. There is growing evidence that untreated antenatal depression is 1 of the highest risk factors for meeting criteria for postpartum depression.[51,94,131,132] Early identification and management of depressive symptoms antenatally are needed to optimize the postpartum environment and prevent such symptoms from persisting.[50,131,133] Recommendations by several professional organizations, such as the Centers for Disease Control and Prevention,[48] the National Center for Children in Poverty,[134] the Center on the Developing Child,[123] the AAFP,[4] and the ACOG[3] have included screening women for depression routinely by antenatal providers, such as obstetricians, family physicians, nurse midwives, behavioral health providers, and other primary care clinicians.

Ideally, pediatric providers can collaborate with obstetric antenatal care providers so that maternal risk factors for perinatal depression are accurately communicated through all transitions of care.[133] Establishing this line of communication can be facilitated through a prenatal visit with the pediatric provider.[135] A prenatal visit with the pediatric provider is the first visit recommended in *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition*.[15] An AAP clinical report defines the prenatal visit as important in building a relationship with the mother and father, coordinating services, and providing key anticipatory guidance and prevention education in the context of the upcoming birth.[135] If there are identified risk factors for perinatal depression, this visit allows the pediatric patient-centered medical home (PPCMH) to coordinate resources for the anticipated primary care and mental health needs of the mother and the mother-child dyad. More research is needed to understand and promote dyadic mother-child and parent-child mental health across the entire perinatal continuum.[131] Advocacy is needed to ensure payment to pediatric providers for prenatal visits and services.[135]

Postpartum Depression

A variety of interventions have revealed some success in preventing postpartum depression. Delivery room companions who provide early support with child-mother interaction combined with home visitation programs with nursing interventions, including cognitive behavioral therapy (CBT), have been shown to be successful, particularly for women at risk for depression, minorities, and underserved populations.[136–138] In another study, midwives were trained to provide individualized emotional support to mothers throughout their pregnancy, which led to improved continuity of care between antenatal and postpartum providers and reductions in symptoms of postpartum maternal depression.[139] In addition, prenatal childbirth classes or weekly parenting classes offered postpartum are potentially effective educational environments in which mothers and fathers can be engaged with messages around postpartum parental depression recognition and prevention.[139]

Finally, Practical Resources for Effective Postpartum Parenting (PREPP)[140] is 1 promising brief mother-infant dyadic intervention. PREPP is aimed at promoting the infant's sleep while reducing fussing and/or crying. This is achieved through integrating evidence-based caregiving techniques, traditional psychotherapy approaches, psychoeducation, and mindfulness meditation through a training program for at-risk women. As a result, mothers reported an increased sense of accomplishment, rest, and effectiveness while the incidence and severity of postpartum depression symptoms declined. PREPP revealed strong effects on reducing depression symptoms at 6 weeks, but the effect was not sustained beyond that period.[140] This suggests a role for pediatric providers in providing ongoing parenting education along

with evidence-based strategies for coping with stress.

SCREENING

National and State Integrated Screening Systems

Despite the growing empirical evidence and support for screening for perinatal depression that leads to early identification and referrals for effective treatment, implementation of screening by pediatricians has been slowly increasing from 13% in 2001 to 47% in 2013 in periodic surveys.[9,21] In January 2016, the USPSTF completed its most recent review of the evidence for perinatal depression screening, providing a "grade B recommendation" for implementation. The task force found that there is a moderate net benefit to screening for perinatal depression, particularly when treatment such as psychotherapy or counseling can be made readily available.[20,141,142] Moderate net benefit refers to a situation in which the evidence supporting a prevention practice indicates a determined effect on health outcomes, but assessing the magnitude of effect may be limited by issues with the number, size, quality, consistency, and generalizability of available studies. The report specifically stated that there is "… convincing evidence that screening of pregnant and postpartum women in primary care improves the accurate identification of depression" and "… adequate evidence that programs combining depression screening with adequate support systems in place improve clinical outcomes for pregnant and postpartum women."[143]

In May 2016, CMS sent an informational bulletin (https://www.medicaid.gov/federal-policy-guidance/downloads/cib051116.pdf) to all state Medicaid directors stating, "since maternal depression screening is for the direct benefit of the child, state Medicaid agencies may allow such screening to be claimed as a service for the child as part of the Early and Periodic Screening, Diagnostic, and Treatment benefit." State programs can train providers to screen and refer mothers with positive screens if necessary, and states are eligible for Medicaid administrative matching funds to help with the cost of training.

The Well-Women Task Force is a collaborative initiative hosted by the ACOG. Existing guidelines were reviewed to develop consensus recommendations on the care of adolescent and adult women. This task force asserted that, in addition to providers offering annual screening for depression in adolescent and adult women using a validated tool, additional screening for depression is specifically recommended in the postpartum period.[144] The 2017 *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition* recommendations from the AAP also now include screening for maternal depression by the 1-, 2-, 4-, and 6-month well-child visits.[15]

On the state level, health care providers, academic centers, Medicaid programs, legislatures, and local professional bodies, including AAP chapters, have been working for decades to incorporate maternal perinatal depression screening with standardized tools into prenatal, postpartum, and periodic well-child visits. Ideally, screening would be conducted within a system of care that also provides access to additional mental health evaluation and treatment when concerns are identified. Although such interdisciplinary integration is not always available or feasible, progress has been made. New Jersey and Illinois (2008) were the first to pass legislative requirements for perinatal depression screening, which resulted in increased awareness, conducted assessments, and referrals for treatment. In 2010, Massachusetts policymakers led the way by creating a statewide Postpartum Depression Commission to advocate for screening and treatment and to monitor implementation. Several other states have since made efforts to provide training and support even without a formal legislative mandate. In addition, a growing number of state Medicaid programs are now paying for perinatal depression screening. For more information on related state laws and policies, contact AAP State Advocacy at stgov@aap.org. Many states have developed quality improvement programs, community support groups, media campaigns, and other resources to improve both provider and public awareness of the need for early identification and treatment of perinatal depression.[145] Ultimately, such state-level efforts have fostered early identification and treatment of affected parents and have increased public awareness of screening protocols and procedures and appropriate referrals for additional family assessment, support, and treatment. The recent AAP recommendations are for universal screening of infant behavior and development[146] and partnering with mental health care providers to implement evidence-based treatments during early childhood.[147] These recommendations are increasingly being adopted by pediatric providers in all states.[15] An important aspect of screening is to also assess for common perinatal depression comorbidities that adversely affect child development, behavior, and the family environment, including substance use, domestic violence, and food insecurity. Standardized screening tools are now, more than ever, being used to assess for such comorbidities.[148]

State perinatal depression screening efforts were also aided when the National Quality Forum developed

a quality measure (National Quality Forum Measure 1401) that assesses whether a maternal perinatal depression screen was administered to a patient's mother at 1 face-to-face visit with her provider during the first 6 months of the child's life.[149] This measure was endorsed by the CMS for the Electronic Health Record Incentive Program in March 2013.[150] The quality measure was anticipated to help with the adoption of perinatal depression screening by providers participating in Meaningful Use Incentive programs, although these programs have since been modified.

Role of the Primary Pediatric Clinician and the PPCMH

Perinatal depression is a pertinent issue for the primary care clinician because of the significant risks to the health and well-being of the infant and the family.[2] Pediatric primary care practices, particularly those identifying as PPCMHs, can build a system to implement postpartum depression screening, to connect affected families to supportive community resources, and to refer parents for additional treatment when indicated.[1]

Early identification and appropriate treatment of perinatal depression can result in more favorable outcomes for the expectant and postpartum mother,[143] her infant, and the entire family.[1] As mentioned, prevention and screening for risk factors and comorbidities of perinatal depression start well before birth in the preconception and antenatal periods where obstetric providers, midwives, and family and adult primary care practitioners are optimally positioned. The ACOG has specific recommendations for antenatal screening as well as collaboration between obstetric providers and their pediatric colleagues to facilitate ongoing assessment, treatment, and support for women with perinatal depression and their families.[3] Ideally, this occurs through handoffs that include important information on antenatal screening, risk factors, and comorbidities of perinatal depression, particularly the existence of any intimate partner violence, substance use, or obstetric complications. The prenatal visit, recommended by the 2017 *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition* recommendations from the AAP, is an opportunity for obtaining such information, assessing existing supports, and providing direct education to potential parents about expectations during the first few days of a child's life and the symptoms of perinatal depression.[15,135,151]

In the postpartum period, the USPSTF and CMS recommend screening of parents by pediatric providers caring for infants with a validated tool at the 1-, 2-, 4-, and 6-month well-child visits. This recommendation is supported by the current understanding of when postpartum depression peaks in prevalence. Repeated screenings are important, because mothers who may not be comfortable disclosing initially may do so at later visits as trust and familiarity builds with the pediatric provider. Perinatal depression is also associated with missed appointments, so having multiple screening times also increases the probability that such families are screened and maximizes opportunities for identification of concerns and engagement in ongoing supports and pediatric health surveillance. Pediatric providers can also screen for and promote healthy social-emotional development in the infant using general developmental and specific social-emotional screening tools when risks factors for or maternal symptoms of postpartum depression are present. In the postpartum period, the parents' primary care and mental health providers are important partners that can communicate with and work with pediatric providers to prevent, buffer, and ameliorate the adverse effects of postpartum depression on the family.[81–83,142]

The PPCMH setting provides an interdisciplinary infrastructure to both implement postpartum depression screening and respond to specific concerns. PPCMHs may have embedded services or expertise from multiple disciplines, including care managers, lactation consultants, social workers, and pediatric mental health providers. Collocating or integrating mental health and pediatric primary care services has been shown to help with access to and compliance with mental health services for infants, children, and their parents. Having these services collocated or integrated also facilitates communication across services, particularly using a shared medical record.[152,153]

Over the well-child visit schedule, the pediatric provider, ideally as a part of a PPCMH, develops a longitudinal relationship with the infant and his or her parents starting at an early age. As trust is built in the provider-patient relationship, it provides opportunities to emphasize the importance of both infant and parental mental health.[16] Well-child visits have an important role in assessing social determinants of health and promoting healthy social-emotional development in young children.[15,16,154] In addition, well visits offer opportunities for screening for psychosocial stressors and concerns, including parental depression, as mentioned previously, as well as intimate partner violence, substance use, poverty, food insecurity, and homelessness.[154] These psychosocial issues can have a compounding effect with perinatal depression and can promote an environment of toxic stress.[155] Recognized in the AAP policy statement, "The Future of Pediatrics:

Mental Health Competencies for Pediatric Primary Care,"[16] is the unique advantage of the primary care clinician, particularly in a PPCMH context, for surveillance, screening, and addressing child and parental mental health outcomes through:

- longitudinal, trusting relationship with the family, including the creation of a safe space for discussion of psychosocial issues;
- family centeredness, including attention to the parents' emotional needs;
- unique opportunities for prevention and anticipatory guidance, including communication and discussion with families in a way that fosters early detection and intervention of emerging social-emotional and mental health concerns and problems;
- understanding of common social-emotional and learning issues in the context of development;
- experience in coordinating with and referring to a broad range of relevant specialists and community-based agencies, particularly those that are focused on the care of children with special health care needs and their families; and
- familiarity with chronic care principles and practice improvement.[156]

Several validated and effective screening instruments for perinatal depression have been developed and are readily available (reviewed in detail below).[1,3] However, despite having access to these screening tools, many physicians do not screen for perinatal depression.[8,21] Many barriers to screening for perinatal depression are reported by providers, including the lack of time to screen and competing demands, inadequate knowledge about the validated tools available and how to appropriately document findings, lack of or insufficient reimbursement to screen and discuss results, and fears associated with legal implications of screening.[7,10] Studies reveal that providers who rely solely on observational cues and do not use validated tools to screen tend to underdiagnose parental depression.[157,158] As a result, many women may erroneously attribute their changes in mood, fatigue, sleep, eating, body weight, and other symptoms of postpartum depression to their pregnancy and do not seek necessary support.[3]

There is some evidence that screening for perinatal depression can also be conducted effectively in emergency department and pediatric inpatient settings for the mother of an infant in the first year of life.[159,160]

Perinatal Depression Screening Tools

Multiple screening tools exist that can efficiently identify patients at risk for perinatal depression, and most are available free online (Table 3). If there is an interest in reproducing any of these tools, it is important to check with the authors and/or developers of the tools to honor any of the copyright requirements and/or requests for permission for use. Before using any screening tool, it is also important to have detailed policies and protocols about how to address identified depressive symptoms, including follow-up or referral to a licensed mental health provider, if necessary. Knowledge of appropriate emergency mental health resources is important. Immediate action is required at any time during the administration of a screening tool if a parent expresses any concern about the infant's safety or if the parent reports being (or pediatric provider suspects the parent is) suicidal, homicidal, severely depressed, manic, or psychotic.[161] Appropriate documentation of perinatal depression screenings includes the screen used, results, discussion with the parent including anticipatory guidance, and the plan for follow-up and/or referrals.[6]

The EPDS[163] is a free, widely-used 10-question instrument that is used specifically to screen for perinatal depression. The EPDS was originally developed for screening postpartum women in outpatient, home-visiting settings or at the 6- to 8-week postpartum examination. The tool has been validated with numerous populations and is available in Spanish[164] and for fathers.[165–167] Of note, it includes reverse-scored items that can be used to assess reliability of responses. The most recent 2016 recommendations of the USPSTF clearly conclude that there is sufficient evidence to support the use of the EPDS as an effective screening tool for depression in pregnant and postpartum women.[20] The Survey of Well-being of Young Children (SWYC) (www.theSWYC.org) is a validated developmental and psychosocial screening tool that now includes the EPDS in the 2-, 4-, and 6-month questionnaires (available in English, Spanish, Burmese, Nepali, and Portuguese).[168] The EPDS has some benefit in identifying anxiety disorders as well but is not focused on somatic symptoms or parent-infant relationships.

A total score of 10 or more on the EPDS is a positive screen indicating a concern for depression, which necessitates further discussion in which providers can clarify the findings, determine acuity of concerns, and, if necessary, make appropriate referrals for further assessment and treatment of the parent (as described below).[129,163] It is important to note that similar to all screening tools, the EPDS is not a diagnostic instrument. In situations in which there is any indication of suicidal ideation (on the EPDS question 10 or in discussion), if the parent expresses concern about his or her ability to maintain the infant's safety, or if the pediatric provider suspects that the parent is suicidal or

TABLE 3 Valid Screening Tools for Perinatal Depression

Screening Tool	No. Items	Sensitivity and Specificity[a,b]	Available for Free
EPDS	10	Mothers (score >9–12) Sensitivity 80%–90% Specificity 80%–90% Fathers (score >10) Sensitivity 90% Specificity 78%	Yes[c]
PDSS	35	Sensitivity 80%–90% Specificity 80%–90%	No http://www.wpspublish.com/store/p/2902/postpartum-depression-screening- scale-pdss
PHQ-2	2	Sensitivity 100% Specificity 44.3%–65.7%	Yes[c]
PHQ-9	9	Sensitivity 75%–89% Specificity 83%–91%	Yes[c]
Beck Depression Inventory–II	21	Sensitivity 75%–90% Specificity 80%–90%	No http://www.pearsonclinical.com/psychology/products/100000159/beck-depression-inventoryii-bdi-ii.html

All of the above screening tools take <10 min to complete, on average, and are available in Spanish.

[a] Validity specifically for postpartum depression as reviewed in Myers et al.[162]

[b] For EDPS only; as reviewed in Siu et al.[21]

[c] Indicated free screening tools are available on the AAP Web site: https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Screening/Pages/Screening-Tools.aspx; https://brightfutures.aap.org/materials-and-tools/tool-and-resource-kit/Pages/Developmental-Behavioral-Psychosocial-Screening-and-Assessment-Forms.aspx.

homicidal, it is considered a positive screen that warrants an immediate evaluation for safety of the parent and/or infant, often in an emergency psychiatric setting. Immediate action with a referral to an emergency psychiatric setting has also been recommended with scores greater than 20 or if there is clinical concern that the parent may be severely depressed, manic, or psychotic.[163]

The accuracy of the EPDS as a screening tool in pregnant and postpartum women has been established by a recent USPSTF review of 23 studies (n = 5298) comparing the accuracy of the EPDS with a diagnostic interview. Sensitivity of the EPDS using a cutoff of 13 ranged from 0.67 (95% confidence interval [CI], 0.18–0.96) to 0.8 (95% CI, 0.81–1.00) for the detection of MDD. Specificity for detecting MDD was consistently 0.87 or higher.[20,141,143] Two studies in this review were conducted in the United States (1 specifically among African American women) demonstrating an average sensitivity of approximately 0.80. The positive predictive value for detecting MDD would be 47% to 64% in a population with a 10% prevalence of MDD.[143,169,170] The Agency for Healthcare Research and Quality also reviewed validity statistics for various screening tools among postpartum women specifically and found that the EPDS had a sensitivity of 80% to 90% and specificity of 80% to 90%.[162] Higher cutoff scores for EPDS have been proposed (up to a threshold of 13) to limit false-positive results.[171] Recently, shorter versions of the EPDS have been validated, including a 2-question screen for adolescent mothers.[172]

The EPDS has demonstrated cross-cultural sensitivity,[163] including the Spanish version, which showed acceptable performance characteristics.[143] The EPDS is also available in French, Dutch, Swedish, Spanish, Chinese, Thai, Turkish, and Arabic. Cutoff scores may vary in different populations.[173]

One screen that has been used over the last decade in some primary care settings is the Patient Health Questionnaire-2 (PHQ-2).[174,175] The PHQ-2 is a simple, free general depression screening tool (ie, not limited to use in the postpartum period or with women) with 2 questions about depressed mood and anhedonia that are derived from the longer 9-question Patient Health Questionnaire-9 (PHQ-9) (discussed in the following paragraph). The PHQ-2 does not include a question about suicidality. The PHQ-2 has been studied in both primary care and obstetric populations.[176] The 2 questions in the PHQ-2 are:

1. Over the past 2 weeks, have you ever felt down, depressed, or hopeless?
2. Over the past 2 weeks, have you felt little interest or pleasure in doing things?

A person is asked to choose 1 of 4 possible choices for each question that comes closest to how he or she has been feeling: not at all (0), several days (1), more than half the days (2), or nearly every day (3). A score of 3 out of a maximum of 6 is the accepted cutoff for a positive screen, with a sensitivity of 83% and a specificity of 92% for MDD.[176] Studies in postpartum populations, specifically, reveal that the sensitivity of the PHQ-2 is 100% and the specificity is 44.3% to 65.7%.[162]

The most recent USPSTF review[143] concluded that no studies of screening in pregnant or postpartum women conducted with the PHQ-2

met methodologic inclusion criteria. As a result, the USPSTF currently has determined that there is not sufficient evidence to support the use of the PHQ-2 at this time as a primary screening tool in pregnant and postpartum women.[20] Yet many practices continue to use it as an initial screen. If a parent screens positive with the PHQ-2, then the recommendation is that it be followed up with a more comprehensive screening tool (eg, PHQ-9, discussed in the following paragraph, or the EPDS).[174,175]

The longer 9-question PHQ-9 has been used as a primary screening instrument for perinatal depression and to monitor for worsening or improvement of perinatal depression symptoms over time.[177] The PHQ-9 has also been widely used to screen nonpregnant adults[178] and adolescents for depression.[179] The diagnostic validity of the PHQ-9 has been established in both primary care and obstetrical clinics,[179,180] although the USPSTF concluded that the data were insufficient for specific use in postpartum depression screening. In addition to the questions from the PHQ-2, the PHQ-9 also asks how often over the past 2 weeks the person has been bothered by different problems related to sleep, lack of energy, feeling bad or letting someone down (feeling like a failure), appetite, concentration, speaking slowly, or being restless. Similar to the PHQ-2, the respondent is asked to choose 1 of 4 responses for symptoms corresponding to how often they are experienced, ranging from not at all to nearly every day. The PHQ-9 specifically asks about suicidal thoughts and how any of the identified symptoms affect the respondent's ability to function at work, at home, or in interacting with other people. Scores of 5, 10, 15, and 20 on the PHQ-9 represent mild, moderate, moderately severe, and severe depression, respectively. PHQ-9 scores ≥10 had a sensitivity of 88% and specificity of 88% for MDD[180] and among postpartum women had a specificity of 75% to 89% and specificity of 83% to 91%.[162] However, the most recent USPSTF review[143] concluded that no studies of screening in pregnant or postpartum women conducted using the PHQ-9 met methodologic inclusion criteria. Although the USPSTF currently has determined that there is not sufficient evidence to support the use of the PHQ-9 specifically in pregnant and postpartum women,[20] it still continues to be used widely.

Other screens are available with a cost and may be used by adult and mental health providers during the pregnancy or postpartum period and much less often by pediatric primary care clinicians. However, some adult and pediatric providers may choose to use these in partnership with mental health providers who are collocated, integrated, or linked with an obstetric, family medicine, or pediatric practice. The Beck Depression Inventory (BDI-II)[181] is a 21-question scale that is a self-report tool used to provide more feedback on severity of depressive symptoms. This tool is currently endorsed by the USPSTF[141] as an effective screening tool for postpartum depression and also continues to be endorsed by the USPSTF for use in screening all adolescents between 12 and 18 years of age for depression.[182] Two additional tools are the Hamilton Depression Rating Scale (HAM-D)[183] and the Postpartum Depression Screening Scale (PDSS). The Hamilton Depression Rating Scale uses an interview format and is mostly used in research settings. The PDSS is a 35-question screen that identifies patients at high risk for depression but is less commonly used.[184] Among postpartum women, the PDSS has a sensitivity and specificity of 80% to 90%.[162] It should be noted that these screening tools include constitutional symptoms such as insomnia, changes in appetite, low energy, etc, which may be normative in pregnancy, so their specificity is lower for perinatal depression.[3]

A drawback to these currently less commonly used questionnaires is that they tend to yield higher estimates than clinician-administered interviews, so clinical assessment is recommended but often not conducted. Also, studies differ in their methods in terms of cutoff scores, reporting of cutoff scores, and use of scores as continuous measures in analysis.[61] Just as with the EPDS, these other questionnaires are only screening tools, and they do not diagnose MDD or perinatal depression. Diagnosis requires a face-to-face clinical assessment and, in some circumstances, referral for clinical correlation by an appropriately licensed health care professional.[129]

Infant Assessment

Routine well-child visits allow for pediatric providers to assess and promote healthy early child development, including assessing overall family strengths and supports and the child's social-emotional adjustment.[15,142,146] Identified developmental concerns and delays in an infant may be the only indication of perinatal depression, difficulty with early adjustment as a new family, as well as many other factors. When developmental delays are present in the child, they often increase the stress and decrease the perceived efficacy experienced by the mother.[185] Therefore, several screening tools (some are free online) can be used to assess the child's social-emotional development, family supports, and early family adjustments. These tools can be used whenever there are developmental concerns or delays, particularly if the mother presents with other risk factors identified or has been previously diagnosed with perinatal depression. These tools include the

Ages and Stages Questionnaire Social Emotional-2,[186] the Early Childhood Screening Assessment,[187] the SWYC,[148,168] and the Baby Pediatric Symptom Checklist, which is included in the SWYC,[188,189] among others. Guidance on these and other similar screening tools is available in a policy statement and technical report about early childhood emotional and behavioral problems.[147]

DIAGNOSIS AND TREATMENT

As discussed, screening tools alone are inadequate for diagnosing perinatal depression, but when they indicate concerns, the pediatric provider's role is to discuss results and facilitate referral for appropriate supports and treatment. Some PPCMHs may have mental health, social work, lactation support, and other such services collocated or even integrated directly into a visit, which decreases stigma and improves access.[153,190] In the context of discussing screening results, an opportunity exists to validate parents' experiences and inquire about existing supports available to them and their family in times of transient acute stress. These supports may include extended family, friends, and even therapists or counselors who are providing mental health treatment. It is also a time when careful attention can be given to assessing for any risk of suicide or harm to the infant as well as the presence of other psychosocial stressors or comorbidities in addition to depression.

As was previously discussed, rates of intimate partner violence and substance use are elevated in families in which a parent has perinatal depression symptoms. If there is specific concern for domestic or intimate partner violence or substance use, especially in the perinatal period, then state agencies may require notification. Many national and community agencies are available to support families as well. Information about local organizations available to support victims of intimate partner violence can be accessed through the National Domestic Violence Hotline at http://www.thehotline.org or 1-800-799-SAFE.

A positive screen leads to a discussion with the parent about the specific mental health concerns and symptoms identified in the screening tool and/or during a patient encounter.[142] There is literature showing that, in addition to pediatric providers, such a discussion can be conducted by the parent's primary care provider, obstetric provider, or a licensed mental health provider with perinatal expertise.[129] There may be times when the screening is positive, without suicidal ideation or risk of harm to the infant, and the mother is not interested in a referral for further evaluation and diagnosis. It is important for the pediatric provider and/or other members of the PPCMH to inquire about existing supports and clarify the psychosocial concerns and comorbidities, such as domestic violence and substance use, that may affect the welfare of the infant and to follow-up to monitor the abatement of risk.

When a screen is positive in "low-risk" situations, without suicidal ideation or risk of harm to the infant, a pediatric provider may consider recommending the mother to follow-up with her obstetric or primary care provider for additional discussion and also closely monitoring the infant and mother with a visit or telephone call before the next scheduled well-child visit. The pediatric provider may also recommend adjustments in schedule to provide adequate sleep, additional supports from community agencies such as quality child care, home visiting, mother's morning out programs, or other programs. There are additional office-based interventions that a pediatric provider can implement that will be discussed below.[1] In discussion with the parent and family, it may be determined that referrals to mental health and specialty providers are necessary for diagnostic evaluation, psychotherapy, or even consideration of psychiatric medication management.[142]

In "high-risk" situations in which there are concerns for suicidal ideation, risk of harm to the infant, or severe mental illness, there may be urgent or emergent need for referral to an emergency psychiatric setting for evaluation and treatment.

Regardless of the level of risk or modality of treatment, it is important to explain to parents the assessed need for follow-up or referral, specifically if further evaluation and treatment is necessary by a parent's primary care provider or a mental health specialist. If perinatal depression is ultimately diagnosed, then reassurance can be offered that pediatric providers can work with such adult providers and community organizations to support the parent and his or her ability to best care for the child. Consideration of risk factors, parent's previous psychiatric history, and former treatments, if known by the pediatric provider at the time of referral, is important to communicate through the transition in care to develop an accurate risk profile.[3,191]

Access to Treatment

Although progress is being made in identifying and effectively treating perinatal depression, the cumulative shortfalls in mothers receiving effective treatment are still large. In a recent study, only 49% of women with antenatal depression and 30.8% of women with postpartum depression were screened and identified in practice. In addition, 13.6% of women with antenatal depression and 15.8% of women with postpartum depression received any treatment, and only

8.6% of women with antenatal depression and 6.3% of women with postpartum depression received adequate treatment. Ultimately, 4.8% of women with antenatal depression and 3.2% of women with postpartum depression achieved remission.[192]

Despite the consequences of untreated perinatal depression and the presence of a range of options for effective, evidence-based treatment, most mothers with perinatal depression do not seek therapy and treatment for themselves and their infants.[11,193] Mothers may not seek therapy because of concern about perceptions of others (ie, stigma), cost and a lack of insurance coverage, need for child care during the mental health visit, lack of access to a trained provider and lack of knowledge about perinatal depression, unrealistic beliefs about coping with being a mother, feelings of failure, and fears about using mental health services.[11] These challenges are compounded by the symptoms of depression, especially low energy and motivation, which adversely affect a mother's ability to access help.

Fortunately, data suggest that when providers speak to patients about their depression, they are more likely to become engaged and seek treatment. Use of provider notification systems and motivational interviewing techniques can assist providers in engaging their patients in discussions about their depression.[194] A study from the University of Michigan found that a single motivational interviewing session can increase rates of treatment adherence, particularly through the process of identifying and challenging practical and psychological barriers to care.[195]

In many pediatric clinics and PPCMHs, care coordinators have a significant role in developing and maintaining a referral network of community resources and specialty providers for perinatal depression. They can often follow through to ensure patients are able to access necessary specialty providers in a timely manner.[16,196] An integrated frontline mental health provider, such as a licensed clinical social worker or counselor, can provide immediate triage for a positive screen, conduct additional assessments, offer support, and coordinate follow-up and referrals for the infant, mother, and family. Regardless of whether a clinic has a care coordinator or integrated mental health provider, many sources emphasize the importance of close working relationships and communication between pediatric providers and mental health providers, adult primary care providers, and other agencies in the community with expertise in the evaluation, treatment, and/or support of the mother with perinatal depression and the mother-infant dyad.[1,3]

Emergency and/or Urgent Situations

Many screening tools have critical thresholds above which they recommend that the pediatric provider take immediate action, which usually means referring the parent to an emergency psychiatric setting to ensure safety with timely evaluation and treatment. If question 10 inquiring about suicidality on the EPDS is positive,[161,163] if question 9 inquiring about suicidality on the PHQ-9 is positive, if the parent expresses concern about maintaining the infant's safety during any screening, or if the pediatric provider is concerned at any time with screening that the parent is suicidal, homicidal, severely depressed, manic, or psychotic, immediate evaluation is warranted in an emergency psychiatric setting (ie, calling 911) or by a crisis team that can respond directly to the provider (if available in the community).[161] Although the ultimate goal is to support the mother so she can best care for her child, in a situation in which the mother requires immediate evaluation, it is important that someone is available to specifically maintain care for the infant. An ideal process is that the mother is not left alone at any time, and if sent to an emergency psychiatric setting, the mother is accompanied by a trusted adult or staff member.

If the provider's level of concern is elevated but an emergency intervention is deemed not necessary, precautions are taken to promote safety, including having the mother leave with a support person (not alone), ensuring adequate supervision of the mother and infant at home, composing a specific safety plan (including phone numbers and steps for accessing help urgently), and scheduling close follow-up. Pediatric providers can be prepared by having a current list of contacts for pediatric and adult emergency mental health providers on hand. Fortunately, most positive perinatal depression screens do not necessitate urgent or emergency action by the pediatric provider.[197] Intervention for the mother ranges from support, to therapy, to therapy plus medication, to emergency mental health services and hospitalization.[198,199]

Infant and/or Dyadic Interventions

In promoting evidence-based mental health treatments for infants and their mothers with perinatal depression, most approaches caution against implying any blame or carrying an exclusive focus on challenges faced by the mother. Strengths-based approaches that are focused on the infant-mother dyad are promoted on the basis of some evidence of efficacy in generally addressing attachment issues and developmental concerns in other settings.[147,200,201] Most of these dyadic interventions are focused on infant-mother attachment, but limited evidence is now suggesting the importance of

supporting attachment with fathers and nontraditional families.[202] For example, there are specific evidence-based dyadic interventions that have been used with high-risk families, often in the setting of interpersonal violence or abuse, such as Child Parent Dyadic Psychotherapy[203] and Attachment and Biobehavioral Catch-up.[204] Circle of Security[205] has been specifically validated for use specifically with mothers with perinatal depression and their infants.[147,201] Videotaped interactions of mothers and their infants with feedback and coaching has shown efficacy.[94]

Dyadic psychotherapy is an evolving field. These interventions may not be readily available in all areas and require mental health providers to obtain specialized training. Pediatric providers can play an important role in advocating for increased availability of such services, specialized training, and availability of a specialized workforce with experience working with young children, parents, and families.

Office-Based Supportive Management by Pediatric Providers

Pediatric providers can have an important role in partnering with parents, families, and various other involved providers to manage and support parents with perinatal depression. However, considering the demands placed on pediatric providers in most settings, it is essential to evaluate what is feasible and effective for any given practice and in the context of each individual family. It is important that the pediatric provider consider collaborating closely with the mother's adult providers, mental health care providers, and various local agencies to provide optimal support for the mother-child dyad within the entire family structure.

When time and resources allow, pediatric providers can offer parents in low-risk situations office-based interventions. Components of most office-based interventions include:

- explanation and open dialogue with the mother and family to help reduce stigma, normalize the stress faced by new families, and ultimately, foster early identification of those who may need additional resources ("demystification");
- communication about the potential impact on the infant and need for infant screenings and surveillance;
- initial and ongoing support, which includes providing validation and empathy for the mother's experiences and identifying community resources to promote family wellness; and
- reinforcement, when necessary, through referrals to evidence-based treatment programs. Referrals may take the form of a mental health provider for the parent or lactation support for the mother, as will be discussed later.

Demystification is directed at removing the mystery about maternal and paternal depression—that postpartum depression can affect any parent, that it is not the parents' fault, and that it does not imply "bad" parenting. Depression is treatable, and the support facilitated by the pediatric provider for appropriate intervention is an essential ingredient.[1] Having an infant and expanding the family is a transition that can be difficult when there are other stressors involved. However, many parents also experience resiliency factors, such as stable housing, adequate family and/or friend supports, and access to care, which may help attenuate the risk of perinatal depression.

The AAP Task Force on Mental Health promoted the use of a common factors approach to routine mental health assessment[206] to engage families and build an alliance.[16] *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition* provides health promotion themes, including family support, child development, and mental health. Specifically, it includes surveillance for parental socioemotional well-being and for social determinants of health.[15] The common factors theory asserts that therapies can be designed for broad classes of people rather than specific individuals who are deemed "at-risk" or fit a specific diagnostic category.[206] The common factors theory emphasizes that providers can influence behavioral change in patients and families through specific evidence-based interaction approaches, such as motivational interviewing, integrated into routine visits. A mnemonic for a group of common factors that can be routinely assessed and monitored throughout the scheduled well-child visits is "HELLPPP," which stands for hope, empathy, language, loyalty, permission, partnership, and plan.[206] In the absence of an urgent psychiatric crisis, pediatric providers can build alliance and common understanding over time that will foster greater disclosure and recognition of mental health needs and social-emotional concerns. For example, pediatric providers may recognize the need for anticipatory guidance and education on parenting and lifestyle issues (eg, sleep, exercise, diet, rest) that ultimately could mitigate the risk of depression and promote the mental health of parents and children. More details are available on the AAP Mental Health Initiatives site, with a resource in the AAP Mental Health Toolkit at https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Pages/Primary-Care-Tools.aspx.

Following is an example of how a brief intervention can be designed by using the common factors approach within the context of a PPCMH to provide support to a parent when

there are concerns for perinatal depression:

- Hope: increase the parent's hopefulness by describing realistic expectations and reinforcing the value and strengths of the mother-infant relationship and understanding and responding to the infant's cues;
- Empathy: communicate empathy by listening attentively;
- Language: use the parent's language to reflect your understanding of the concerns for perinatal depression;
- Loyalty: communicate loyalty to the parent by expressing your support and commitment to help;
- Permission: ask for permission to share information;
- Partnership: partner to work together to address common concerns; and
- Plan:
  - encourage infant and parent routines for predictability and security;
  - encourage focus on wellness: sleep, diet, exercise, stress relief;
  - Ask about concerns regarding breastfeeding, and support and/or encourage if the mother is able to breastfeed. It is important to address specific worries and try to reassure the mother when she is doing well with the breastfeeding and her infant is adequately gaining weight;
  - encourage social connections and supports;
  - depending on the degree of concern from the perinatal depression screening, refer the parent and infant dyad to mental health providers who use evidence-based treatments, and follow-up closely; and
  - make referrals to a variety of agencies and efforts in your local community as available and described below.[206]

Other brief interventions that could take place when there are concerns for postpartum depression could include:

- encourage understanding and response to the infant's cues; emphasize the importance of observing nonverbal behavior;
- encourage routines for predictability and security;
- encourage focus on wellness (sleep, diet, exercise, stress relief);
- acknowledge personal experiences;
- promote realistic expectations and prioritizing important things; and
- encourage social involvement and bolster social networks and supports.

Partnering With Community Agencies

Mental health providers are an important resource, but many community agencies can also provide essential support, such as home-based services or partial hospitalization programs that specialize in addressing stressors of the postpartum period. Part C of the Individuals with Disabilities in Education Act (IDEA) governs how states and community organizations and programs provide services to infants and children from birth to 3 years of age with disabilities or developmental delays, with or without an established condition. This legislation supports early intervention programs that provide family-centered services to help children from birth to age 3 develop skills necessary to promote health and positive development in early life. Early intervention programs can provide education and assessment targeting the infant-parent dyad, often by modeling positive interactions and play.[1,207] However, in many areas, early intervention referrals can be difficult to facilitate because of limitations in state-specific eligibility requirements (emphasizing cognitive, motor, and language delays but not social-emotional delays) and insufficient funding. Inadequate funding may also limit the ability of such services to provide adequate and uniform interventions addressing social-emotional developmental delays for infants and the mother-infant dyad across sites.[207] These challenges to accessing early intervention are concerning given the inextricable connection of social-emotional development to physical health, language acquisition, and cognitive development.

Early Head Start, Head Start, home-visiting programs, and postpartum support groups are additional examples of community resources that are available in many areas. There are opportunities in various regions for public health nurses, lactation specialists, parent educators, and facilitators of family support groups (see http://www.motherwoman.org or www.postpartum.net) to form partnerships with pediatric providers aimed at reducing perinatal depression.

In Massachusetts, the legislature has funded an adjunct to the Massachusetts Child Psychiatry Access Project (MCPAP) called MCPAP for Moms. This statewide project improves access through providing immediate consultation and referral services to pediatric providers and other providers when a positive perinatal depression screen is identified in the community. Furthermore, MCPAP for Moms has created a toolkit for pediatric providers that is available free of charge (www.mcpapformoms.org). The Substance Abuse and Mental Health Services Administration also has a similar toolkit that describes how community service agencies can approach perinatal depression, specifically through forming

effective partnerships with pediatric providers.[208]

Psychotherapy and Psychological Interventions

Several validated individual psychological treatments are offered by mental health professionals to help mothers with perinatal depression.[199] Psychotherapy is often preferred by women over medication during the perinatal period because of perceived adverse effects of medication on pregnancy and with breastfeeding.[209] Many women identified with mild to moderate postpartum depression are optimally treated with psychotherapy and do not require medication.[198]

The USPSTF[143] evaluated the efficacy of psychological treatment with trials in postpartum women, revealing a 28% to 59% reduction in symptoms of depression at follow-up compared with usual care. All 10 trials of a CBT intervention showed an increased likelihood of remission from depressive symptoms with short-term treatment (7–8 months). At the 1-year follow-up, there was a 35% increase in remission rates with CBT compared with usual care (pooled relative risk, 1.34; 95% CI, 1.19–1.50).[20] There is little risk of adverse effects from psychotherapy. In women with antenatal depression, CBT-based interventions have also been shown to be effective in preventing depression recurrence during the perinatal period.[136] The USPSTF has recommended that clinicians consider CBT or other evidence-based counseling, such as interpersonal psychotherapy, when managing depression in pregnant or breastfeeding women.[141,199]

Different methods of delivering interpersonal psychotherapy and CBT are being developed and preliminarily show reduction in depression prevalence. These methods include postpartum telephone-based and telecare sessions using CBT, relaxation techniques, and problem-solving strategies,[210] Internet-based CBT,[211,212] and home-based CBT.[213] A recent Cochrane review evaluated computer or Internet-based interventions to address perinatal depressive symptoms and suggested promising trends, but such interventions are largely still in development.[212] Small studies of additional alternative treatment options, including yoga, massage, light therapy, acupuncture, and omega-3 fatty acids in fish oil, show some limited efficacy, but more research is needed.[4,214] There are no formal recommendations for these treatments at this time.

Psychotropic Medications*

Pharmacologic treatment of depression is often indicated during pregnancy and/or lactation. Review and discussion of the risk of untreated versus treated depression is advised. Consideration of each patient's previous disease and treatment history, along with the risk profile for individual pharmacologic agents, is important when selecting pharmacologic therapy with the greatest likelihood of treatment success. Psychotropic medications, particularly antidepressants such as selective serotonin reuptake inhibitors (SSRIs), may have a role in the management of postpartum depression depending on the presenting symptoms and needs of individual parents. Most often, psychotropic medications are managed through referrals to adult primary care, psychiatric, or other qualified mental health professionals. However, pediatric providers can still play a role in dispelling myths, providing education, and responding to specific concerns about medications that a parent may have, particularly as they relate to the health and welfare of the infant. A detailed discussion comparing psychotherapy and psychopharmacology is outside the scope of this article, but a Cochrane review of a few studies consisting of mothers with postpartum depression showed that there is no difference between the effectiveness of antidepressants and psychological or psychosocial treatments.[215]

Despite the availability of effective medications, many mothers prefer not to use psychotropic medications in the perinatal period because of the fear of adverse effects.[216] Discussions about the risks and benefits of using or withholding medications are important for parents to have with their own adult health care providers so they can make informed decisions regarding the role of antidepressant medications used antenatally or in the postpartum period, especially while breastfeeding. Studies about the long-term effects on the infant of maternal antidepressant medication use, such as SSRIs, during pregnancy are mixed, because it is difficult to control for many other cooccurring factors that may influence birth outcomes, including maternal illness or problematic health behaviors.[216] In 1 study, mothers made a list of potential risks and benefits of treatment with medication in the context of their therapeutic goals for a healthy pregnancy and postpartum period. An exercise like this should be conducted in partnership with appropriate providers, including the parent's prescriber, who can provide accurate information.[4,198] The pediatric provider can also play an important role in reinforcing and

* This section on pharmacological management of perinatal depression is being included to provide context to the pediatric provider; it is not to imply that pediatric providers would or should be instituting psychiatric care for adult parents. It is acknowledged that even when referred to appropriate mental health specialists, parents will often still return to pediatric providers caring for their children with questions or concerns. This section is not meant to be an exhaustive resource, but rather it is used to provide a basic overview of core understandings around perinatal psychopharmacology that may be relevant.

sharing accurate information about various treatment options.

Untreated and severe perinatal depression poses significant risk for morbidity and occasionally mortality for the mother and fetus during pregnancy. Studies have demonstrated that the risks associated with untreated depression are far more detrimental (including suicide) than the unclearly associated risks of growth effects, neurobehavioral outcomes, preterm birth, low birth weight, structural malformations, and respiratory distress, which vary among studies.[198,217–219] Yet, many mothers choose to stop taking psychotropic medications during pregnancy, although they report significant symptoms of depression, placing them at high risk for the sequela of perinatal depression.[209] In mothers who are suicidal, homicidal, manic, or psychotic, there is often an urgent need for medication in the context of an emergency or inpatient psychiatric setting.[198]

The AAFP,[4] ACOG,[3] Academy of Breastfeeding Medicine (ABM),[191] and American Psychiatric Association[198] endorse the appropriate use of antidepressant medications during the perinatal period. The ABM recommends consideration of each patient's previous disease and treatment history, along with the risk profiles for individual treatments when choosing the treatment with the greatest likelihood of treatment effect.[191] The ABM states that in the "setting of moderate to severe depression, the benefits of [psychotropic medication] treatment likely outweigh the risks of the medication to the mother or infant."[191] Therefore, antidepressant medications can be an important option to consider for parents with perinatal depression symptoms, particularly if their symptoms are not responsive to therapy or they have previous positive response to medications.

Detailed guidance in regard to specific medications is outside the scope of this article, but SSRIs have become the mainstay of treatment of moderate to severe major perinatal depression because of their favorable profiles of adverse reactions.

Parents often express concerns to and have questions for pediatric providers regarding the use of antidepressant medication while breastfeeding. There is increasing evidence to support the safe use of these medications during lactation. The ABM has developed a clinical protocol on the use of antidepressants in breastfeeding mothers but stipulates, "[There is] no widely accepted algorithm for antidepressant medication treatment of depression in lactating women."[191] In the context of breastfeeding, it has again been asserted that the benefit of effectively treating perinatal depression far outweighs the risks to the infant through breastfeeding.[220,221] Clinical studies in breastfeeding patients who are using sertraline, fluvoxamine, and paroxetine suggest that the transfer of these medications into human milk is low and that there is even lower uptake by the infant. No or minimal adverse effects on infants have been reported after the use of these 3 medications in lactating mothers themselves.[216,220,221] Sertraline was preferred over the other 2 drugs, because many studies have shown that human milk and infant plasma have low to undetectable concentrations of this drug.[216]

Many parents may experience combined or sequential treatment with psychotherapy, such as CBT, and antidepressant medication management. This may implicate multiple providers, which emphasizes the importance of collateral communication. Evidence suggests that combined treatment may lead to even further benefit[198] and may be preferred for some women with high risk of relapse and co-occurring conditions, such as anxiety disorders.[199] More studies are needed to evaluate the relative efficacy of different psychotherapeutic approaches as well as other psychological and psychosocial treatments, with and without medication.[199]

CODING AND BILLING

Given the 2016 recommendations by the USPSTF and CMS, providers are encouraged to bill for perinatal depression screening at 1-, 2-, 4- and 6-month well-child visits. However, coding may vary by state or payer. The AAP Web site, state AAP chapters, and specific payers can be consulted with any questions. A new *Current Procedural Terminology* code, 96161, for the administration of a mother-focused health risk assessment for the benefit of the patient was approved by the American Medical Association in 2016. Providers can consider the opportunity to bill for time-based counseling and coordination of care with a separate evaluation and management code with a 25 modifier when there are significant concerns for maternal depression.

CONCLUSIONS

There is strong evidence that parental, particularly maternal, depression during pregnancy and the first year after childbirth (perinatal depression) has profound negative consequences on the well-being of women and infants, including family dysfunction, disruption of critical infant brain development, cessation of breastfeeding, and increased health care use, and may place the child at increased risk for future anxiety and depression. A growing body of research shows that fathers are also at increased risk of perinatal

depression, which can magnify the adverse effects on an infant's social-emotional development.[23,45,167] Perinatal depression is the most prevalent ACE and can lead to toxic stress and present challenges to essential early attachments between children and their parents.[100]

With a core responsibility to promote the well-being of children and the benefit of longitudinal relationships with families, pediatric providers have a critical role in screening and supporting parents and their infants with concerns for perinatal depression. This responsibility includes supporting parents at risk for or with a diagnosis of perinatal depression and communicating and working with adult obstetric, primary care, and/or mental health providers. If indicated, referrals to community agencies or specialty providers may be necessary for support, diagnostic evaluation, or treatment.

Over the past decade, multiple professional health care and regulatory bodies have recommended routine perinatal depression screening. Most recently, both the USPSTF and CMS have reviewed the evidence and have recommended screening consistent with those asserted by the AAP's *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Fourth Edition*. These recommendations have encouraged, even mandated, many commercial insurers to pay for screening. Medicaid programs are now encouraged to cover and pay for screening for perinatal depression. The recommendation for maternal depression screening is once during pregnancy and then during the infant's well visits at 1, 2, 4, and 6 months of age.[15,20] However, despite the efforts of many state and local AAP and AAFP chapters and other advocacy groups, perinatal depression screening remains far from universal in clinical practice or payment.[140] As more providers are screening and identifying psychosocial risk factors in diverse clinical settings, more emphasis needs to be put on improving collaboration and transitions of care throughout the perinatal period. Finally, there are many models around the country of creative and effective interventions to promote early identification and treatment of perinatal depression. Best practices and evidence-based treatments for parents and the parent-infant dyad need to be identified, advocated for, and brought to scale to allow access to care to promote the best outcomes for women and their infants.

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ABBREVIATIONS

AAFP: American Academy of Family Physicians
AAP: American Academy of Pediatrics
ABM: Academy of Breastfeeding Medicine
ACE: adverse childhood experience
ACOG: American College of Obstetricians and Gynecologists
CBT: cognitive behavioral therapy
CI: confidence interval
CMS: Centers for Medicare and Medicaid Services
DSM-5: *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*
EPDS: Edinburgh Postnatal Depression Scale
MCPAP: Massachusetts Child Psychiatry Access Project
MDD: major depressive disorder
PDSS: Postpartum Depression Screening Scale
PHQ-2: Patient Health Questionnaire-2
PHQ-9: Patient Health Questionnaire-9
PPCMH: pediatric patient-centered medical home
PRAMS: Pregnancy Risk Assessment Monitoring System
PREPP: Practical Resources for Effective Postpartum Parenting
SSRI: selective serotonin reuptake inhibitor
SWYC: Survey of Well-being of Young Children
USPSTF: US Preventive Services Task Force

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DOI: https://doi.org/10.1542/peds.2018-3260

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: No external funding.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

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