Postpartum Depression

HOW TO RECEIVE CREDIT

- Read the enclosed course.
- Complete the questions at the end of the course.
- Return your completed Evaluation to NetCE by mail or fax, or complete online at www.NetCE.com. (If you are a behavioral health professional or Florida nurse, please return the included Answer Sheet/Evaluation.) Your postmark or facsimile date will be used as your completion date.
- Receive your Certificate(s) of Completion by mail, fax, or email.

Faculty
Anele Runyion, RN, MS, received her diploma in nursing from Berea College School of Nursing in Berea, Kentucky. She subsequently received a Baccalaureate and Master's degree in psychiatric nursing from the University of California, San Francisco. She has extensive experience in psychiatric nursing, including adolescent and adult psychiatry. (A complete biography appears at the end of this course.)

Faculty Disclosure
Contributing faculty, Anele Runyion, RN, MS, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Division Planners
Jane C. Norman, RN, MSN, CNE, PhD
Alice Yick Flanagan, PhD, MSW

Director of Development and Academic Affairs
Sarah Campbell

Division Planners/Director Disclosure
The division planners and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Audience
This course is designed for all healthcare professionals who work directly with pregnant women, new mothers, and infants. The target audience is primarily those in the obstetric/gynecologic, neonatal, and psychiatric fields, but all healthcare professionals who provide services to women will benefit from this course.

Accreditations & Approvals

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Designations of Credit
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AACN Synergy CERP Category A.

Social Workers participating in this intermediate to advanced course will receive 15 Clinical continuing education clock hours.

A complete Works Cited list begins on page 54.

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About the Sponsor

The purpose of NetCE is to provide challenging curricula to assist healthcare professionals to raise their levels of expertise while fulfilling their continuing education requirements, thereby improving the quality of healthcare.

Our contributing faculty members have taken care to ensure that the information and recommendations are accurate and compatible with the standards generally accepted at the time of publication. The publisher disclaims any liability, loss or damage incurred as a consequence, directly or indirectly, of the use and application of any of the contents. Participants are cautioned about the potential risk of using limited knowledge when integrating new techniques into practice.

Disclosure Statement

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Course Objective

The purpose of this course is to allow healthcare providers to detect postpartum depression using screening tools and a clinical assessment to intervene early and prevent the devastating consequences of the disorder.

Learning Objectives

Upon completion of this course, you should be able to:

1. Discuss the prevalence of postpartum depression (PPD), including historical and transcultural perspectives.
2. Identify risk factors for PPD evident prior to pregnancy, during pregnancy, and after birth.
3. Review the effects of biochemistry, such as serotonin, estrogen and progesterone, cortisol, and thyroid, on the development of PPD.
4. Describe the role of family history, stressful life events, and psychosocial factors in the etiology of depression.
5. List the emotional, physical, and cognitive symptoms of postpartum blues.
6. Discuss emotional, physical, cognitive, and behavioral symptoms of PPD.
7. Identify severe forms of postpartum disorders, focusing on postpartum psychosis and cases of infanticide.
8. Review the clinical assessment of PPD, including the Edinburgh Postnatal Depression Scale (EPDS) and the Postpartum Depression Screening Scale (PDSS).
9. List the effects of PPD on maternal bonding, mother-infant attachment, and a child's socioemotional and cognitive development.
10. Describe the potential long-term effects of PPD on children.
11. List maternal and familial complications of PPD, including marital conflict, suicide, and homicide.
12. Discuss self-care strategies for recovery, such as nourishment, sleep, rest and relaxation, exercise, and socializing.
13. Review the role of education in the diagnosis of and recovery from PPD.
14. Discuss the physiologic treatment of PPD with postpartum hormone treatments.
15. Specify pharmacologic treatment strategies, noting benefits, adverse reactions, and risks.
16. Discuss psychosocial interventions used in the treatment of PPD.
17. List strategies for preventing PPD, including screening, postpartum debriefing, companionship in the delivery room, psychotherapy, midwife continuity of care, and progesterone preventive treatment.

Sections marked with this symbol include evidence-based practice recommendations. The level of evidence and/or strength of recommendation, as provided by the evidence-based source, are also included so you may determine the validity or relevance of the information. These sections may be used in conjunction with the course material for better application to your daily practice.

INTRODUCTION

The World Health Organization (WHO) has designated the first 28 days after birth as the neonatal period. Although it has never been officially designated, the postpartum period is considered to start about an hour after the delivery of the placenta and is complete six weeks after birth. After six weeks, the mother's physical status will largely return to the nonpregnant state in most instances [1].

The nature of the association between childbirth and mental disturbance is of great interest. It is during this critical postpartum period that the mother and her infant are the most vulnerable to both physical and emotional problems. During this time, there must be increased concern for women who are the most vulnerable to postpartum depression (PPD).

The etiology of PPD is complex and not readily understood by many healthcare professionals. Neurophysiologic changes, underlying postpartum changes, the stress of childbirth, and predisposing factors, such as genetics, the environment, and psychologic stressors, combine to produce PPD in some women. Furthermore, there are distinguishing characteristics in brain chemistry that involve a theory of cyclical hormonal patterns and mood disorders in women. Psychosocial factors such as past history of mood disorder; family history of depression; stressful relationships with spouse, family, and friends; and lack of sufficient social support also play a role in the development of PPD.

Please note that persons with PPD are referred to as women and mothers throughout this course. While most persons with PPD are cisgender women, it is important to acknowledge that persons of many gender identities and relationships to an infant may give birth and experience PPD. Further, there is some evidence that sexual minority women may be at greater risk for PPD and postpartum anxiety, indicating a possible role of sexual identity-based stigma and stress [241]. It is important to that patients be questioned regarding their preferred pronouns and titles and that this information be respected. This is an essential aspect of patient-centered care and will improve rapport and patient outcomes.

CATEGORIES OF POSTPARTUM MOOD DISORDERS

Postpartum mood disorders are generally divided into three categories: postpartum blues, or "baby blues," PPD, and postpartum psychosis. These conditions do not exist on a continuum; each category is a distinct postpartum state [2].

Postpartum blues, a mild and transient depression in the immediate postpartum period, occur in up to 85% of new mothers [3]. The condition is characterized by mild dysphoria, with symptoms such as tearfulness, fatigue, sleep disturbances, and physical exhaustion, that lasts a few days following delivery. The majority of women experiencing postpartum blues recover spontaneously within three to five days [2; 3; 4].

PPD occurs in approximately 10% to 15% of new mothers [2; 3; 5]. According to multiple studies, PPD occurs at the same rate in new mothers around the world [6]. There is little evidence to suggest that any country or class of persons is not at risk for PPD. Symptoms usually occur shortly after childbirth but may occur as late as one year after delivery. PPD is a serious, long-lasting type of depression in women that can have harmful consequences for the mother and child if undetected and untreated [3].

The symptoms of PPD are similar to the symptoms of any major depressive disorder. However, due to the unique issues regarding the mother-infant relationship, the adaptation to parenthood following the delivery of a baby, and the impact of the mother's depression on the infant, PPD should be considered in its own right as a unique mood disorder suffered by postpartum women [7].

The third type of postpartum mental disturbance, postpartum psychosis, occurs in 1 to 2 of every 1,000 new mothers [8; 9]. If undetected and untreated, postpartum psychosis presents a danger to both the life of the mother and her infant. Infanticide is rare but does occur in 1 of 250,000 women with postpartum psychosis [10]. An estimated 5% of patients with postpartum psychosis will attempt infanticide or suicide [9].

Screening for postpartum mood disorders as early as possible following childbirth is essential for early detection and treatment. Treatment strategies include a combined approach to address both the physiologic and psychologic factors that precipitate PPD. If the condition is detected and treated early, there is a greater likelihood of complete symptom relief in a shorter time span than if detection and treatment are delayed. Screening early for PPD in all new mothers, with referral of affected women to appropriate healthcare professionals, should become the standard of care for all childbearing women.

HISTORICAL PERSPECTIVE

Documentation of PPD can be traced to the writings of Hippocrates in the fourth century B.C.E. Hippocrates described melancholia as a state of "aversion to food, despondency, sleeplessness, irritability, and restlessness" [6]. Galen (131–201 C.E.) described melancholia as "fear and depression, discontent with life, and hatred of all people" [6]. Greco-Roman medicine recognized melancholia in the form of fear, suspicion, aggression, and suicidal thoughts. In 1436, the life story of a young mother was published and described how she felt "insane" and despaired of her life and survival after the birth of her first child [11].

In the 19th century, two French physicians became interested in PPD. In 1838, Dr. J.E.D. Esquirol documented 90 women with emotional problems and divided their illnesses into three types: illnesses that occurred during pregnancy, those that occurred immediately after childbirth, and those that occurred six weeks or more after birth. Many of these women had suffered in silence for fear of being stigmatized, misunderstood, or removed from their families [2].

In 1858, Dr. Louis Victor Marcé similarly observed 300 French women using the three categories established by Dr. Esquirol. He concluded that the types of emotional illnesses occurring in the postpartum time frame had unique characteristics of their own. He was convinced that there was an element in the body's physical mechanism causing postpartum illness, although he could not identify it. Marcé's conclusions have become important cornerstones of modern thinking on PPD and the endocrine system [2].

The symptoms of puerperal septicemia in women following birth confused the issue of PPD until the more widespread use of hand washing, antiseptic techniques, penicillin, and other antibiotics in the early 1900s. The removal of the toxicity of septicemia from the hazards of childbirth seemingly uncovered the problems of PPD [10]. In 1926 in the United States, two researchers declared that depression after childbirth was no different than any other depression in women. The term "postpartum" was not used in any textbooks describing depression in women at that time [11]. The "blues" that had long been recognized by midwives were brought to the attention of psychiatrists by Dr. Bruce Pitt in England. In 1964, Pitt interviewed 100 women at the Royal London Hospital between day 7 and 10 after birth. He discovered that 50% of these women had felt tearful or depressed since giving birth. For six of these women, the depression lasted a month or longer [10].

In 1971, Dr. Katherine Dalton, a British obstetrician, published the results of a survey conducted among 500 women from birth to six months postpartum. She concluded that 7% of the women developed PPD severe enough to require medical treatment, although none required hospitalization. With the publication of these findings in the *British Journal of Psychiatry*, psychiatrists and psychologists began to appreciate that depression experienced by new mothers extended beyond the postpartum blues [10].

The Marcé Society, an international medical society founded in 1980, has held conferences throughout the world to further the study of PPD. In 1987, the *British Journal of Psychiatry* published an article that established the standard of care for screening for PPD [12]. The Edinburgh Postnatal Depression Scale (EPDS) was introduced and has subsequently become the standard screening tool for PPD [10; 12].

In the United States in the 1980s, women began to be recognized as having distress and inability to care for their infants after birth. Counseling was provided to assist these women to resolve their stresses and conflicts. In 1986, Dr. James Hamilton presented the idea that postpartum disorders were biologically driven. Mainstream medicine and psychiatry did not address these problems at the time, resulting in inadequate recognition and treatment [13].

In the last decade, greater emphasis has been placed on the role of a woman's brain chemistry in the development of depression in the postpartum period. The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), published by the American Psychiatric Association, does not recognize PPD as a distinct entity. Instead, patients must meet the criteria for a major depressive episode and the criteria for the peripartum-onset specifier (onset during pregnancy or in the four weeks following delivery) [14; 15]. Limiting the onset of symptoms of depression to within four weeks postpartum has been considered too restrictive by some researchers and clinicians [2]. Postpartum Support International has argued that the timeframe should be extended to six months postpartum. Debate continues regarding how PPD fits into the larger classification of depressive disorders [16; 17].

There are many mother and baby admission units in psychiatric hospitals in England, Wales, Canada, Australia, and New Zealand [18; 19]. In the United States, Sichel and Driscoll established a mother-baby admissions unit in a Boston Psychiatric Hospital during the 1990s. A mother-baby day hospital has also been established at Brown University Medical School in Rhode Island [20]. In 2011, the first inpatient perinatal psychiatric unit for new mothers with severe PPD in the United States opened at the University of North Carolina at Chapel Hill hospital [21]. Several states have passed legislation either mandating screening for PPD or mandating education of PPD for all pregnant women [22; 23; 24; 25]. In 2015, federal legislators introduced a bill titled "Bringing Postpartum Depression Out of the Shadows Act of 2015 [H.R. 3235]." The legislation would authorize the Department of Health and Human Services to make grants to states for screening and treatment for maternal depression [26]. This bill was not passed by the Senate. However, the 2019 budget included provision for a task force to address maternal mental health and to present findings to Congress in 2020 [229].

CULTURAL PERSPECTIVE

Although PPD occurs worldwide, cultural differences can influence the perception of depression in women. Culture influences the expression and interpretation of symptoms, the definition of stressors, the nature of the social support system, and the relationship between healthcare provider and patient. Culture also dictates whether certain expressions of symptoms are socially acceptable. An individual's view of illness and health is also culturally bound. Displays of emotion may be encouraged in some cultures and discouraged in others [27].

Anthropologic studies show that cultural perceptions shape attitudes toward illness. Many cultures may not recognize depression as a disorder due to cultural differences or religious interpretations of emotional expressions. In some cultures, such as Nepalese, it would be considered inappropriate for a woman to seek treatment for sadness. In India, depression is viewed as a spiritual experience, described as the "suffering of the spirit" [28]. Muslims in some Arab countries also perceive depressive symptoms as a religious experience, connoting

a deep understanding of the tragic nature of the human condition. Cultures that place a high value on social harmony, including many cultures in Africa and Asia, may encourage and support the suppression of internal conflict in women. Women living in these cultures would likely be reluctant to discuss emotional issues with their healthcare providers.

The explicit or implicit gender roles present in various cultures also affect expressions of PPD. Many women live in subordinate roles to their husbands and/or family in a patriarchal culture that disallows independent expression of self. Feelings may be suppressed in these cultures to safeguard women from cultural exclusion or punishment [28].

In Western societies, the hospital stay has generally been shortened to very few days following birth, after which the new mother is left virtually on her own. However, some cultures have rituals and myths surrounding childbirth that acknowledge the special attention required for postpartum women during their recuperation period. For example, a seven- to eight-day period is observed in some parts of the Philippines, during which time the new mother is given a special diet, heat treatment, and herbal medications, and she is expected to rest at home. The Ibido people of Nigeria create a "fattening room" for new mothers, where they are cared for by older women and are expected to only eat, sleep, and care for their infants. Other cultures have similar special rituals that accord distinct recognition to the new mother [2]. Whether the incidence of PPD is lower in these cultures is yet to be determined.

Dr. Laurence Kruckman, an anthropologist who has studied various cultural rituals, asserts that North American women may experience postpartum emotional disorders because [2]:

- The postpartum period is not structured as a distinct event that has particular needs.
- There is little social recognition of a woman's transition to the role of mother.
- Mothers receive minimal assistance after childbirth, including information about caring for themselves and their children.

Given these differences in cultural perception of sadness and depression and of childbirth, it is interesting to note that studies conducted in Canada, Puerto Rico, France, West Germany, Italy, Lebanon, Korea, New Zealand, and Taiwan show incidences of PPD comparable to those reported in the United States and the United Kingdom [13]. PPD has also been reported in women in Uganda, Sumatra, and Guatemala [10]. In addition, a study of 2,423 White, African American, Hispanic, and Asian/Pacific Islander women who had recently given birth in Massachusetts found that being foreign-born was associated with postpartum anhedonia in each group except Hispanics [29]. However, this may be linked more to the unique stressors of living as an immigrant or away from family.

In order to provide optimum care, healthcare professionals should understand how depression is viewed in the culture of the women who seek treatment. The cultural views of motherhood and the rituals and myths of childbirth should be taken into consideration when treating any woman during and after her pregnancy.

RISK FACTORS

RISK FACTORS EVIDENT PRIOR TO PREGNANCY

PPD affects women of all ages, economic statuses and racial/ethnic backgrounds. Any woman who is pregnant or has given birth can develop PPD. Whether the birth is a first child or one of multiple births has not been shown to affect the incidence of PPD. However, women with a history of depressive episodes have a greater risk for developing PPD than women with no prior history of depression. The risk of PPD is highest in women younger than 25 years of age with a prior history of mood instability. Among these women, it is estimated that 30% to 40% will have a postpartum episode of depression [30]. There are additional risk factors evident prior to pregnancy that may increase the chances of developing PPD, including [5; 30; 32; 70; 225]:

- Past history of depression or other mental health problems
- Family history of mood instability
- Difficulties in relationships with the father of the baby or family, especially the woman's own mother
- Insufficient social support or peer support group
- Onset of depression immediately prior to conception
- Social or financial stressors, such as money or housing problems
- Mood disturbances, such as premenstrual syndrome (PMS)
- Infertility treatment
- History of abuse
- High school or lower levels of education

RISK FACTORS EVIDENT DURING PREGNANCY

Depression may occur during pregnancy and, if not treated, continue and worsen after childbirth. The number of women who develop depression during pregnancy is difficult to determine. In many cases, depression during pregnancy is not recognized or treated because normal pregnancy can cause similar symptoms, including fatigue, sleep disturbances, stronger emotional reactions, and changes in body weight. However, it is important that depression during pregnancy be diagnosed and managed, as it may be harmful to both the mother and the infant if not treated [19].

Treating depression during pregnancy is a challenge because the vast majority of antidepressants cross the placenta and can have negative effects on fetal development. Psychiatrists, family practice physicians, and obstetricians may find themselves in a dilemma when diagnosing and treating depression in pregnant women. As previously noted, the onset of depression may not become evident until symptoms become severe due to the similarity of depressive symptoms and neurovegetative signs during pregnancy [33]. Although diagnosis and treatment pose a serious challenge, early recognition, diagnosis, and treatment are warranted [33]. Indication of certain risk factors that may contribute to depression during pregnancy can be helpful in a prenatal assessment. Risk factors for an onset of depression during pregnancy include [5; 33; 225]:

- History of depression or substance abuse
- Family history of mental illness
- Lack of support from family and friends
- Anxiety about the fetus
- Problems with a previous pregnancy or birth
- Marital or financial problems
- Young maternal age
- Single mother
- Stressful life event, such as moving to a new area or death of family member
- Excessive fatigue
- Feelings of worthlessness
- Divorce

According to the U.S. Preventive Services Task Force, risk factors for depression during pregnancy and postpartum include poor self-esteem, child-care stress, prenatal anxiety, life stress, decreased social support, single/unpartnered relationship status, history of depression, difficult infant temperament, previous postpartum depression, lower socioeconomic status, and unintended pregnancy.

(https://jamanetwork.com/journals/jama/fullarticle/2484345. Last accessed March 27, 2020.)

Level of Evidence: Expert Opinion/Consensus Statement

RISK FACTORS EVIDENT AFTER BIRTH

Risk factors for PPD following the birth of a baby are similar to those present prior to conception and during pregnancy. Any combination of the following factors should be considered concerning, as it indicates a potential to develop PPD [5; 32; 34; 225]:

- Persisting postpartum anhedonia without sufficient social support
- Feeling detached from the infant, not wanting to hold the baby, having negative thoughts about the baby
- Persistent sleep disturbances
- A fussy infant who has problems feeding or has colic
- Signs of developing depression, such as anxiety or feeling overwhelmed
- Birth complications or a difficult labor
- A birth that did not live up to expectations
- Having an infant with special needs
- Excessive fatigue
- Feeling overwhelmed with responsibilities of new parenthood and experiencing persistent self-doubt about mothering ability
- Stress from changes in home and work routines, coupled with unrealistic expectations of motherhood
- Feelings of loss: loss of identity or self-image, loss of control, loss of body image, or feeling less attractive
- Previous episode of PPD
- An episode of anxiety or depression during pregnancy
- Prior experience of postpartum blues after delivery
- History of mood changes related to normal menstrual cycle
- Any major changes resulting in undue stress during pregnancy, such as a death in the family, unresolved conflict with her spouse, divorce, or moving from one location to another

ETIOLOGY

The integration of biochemistry, hormonal functions, genetic history, stressful life events, and psychosocial factors allows the potential for an occurrence of PPD. Any episode of depression in women is affected by the considerable impact of female biology on the emotional lives of women. The full consequences of female reproductive events and their effect on brain chemistry should be considered in any assessment of depression in women [13].

It is acknowledged that brain chemistry has a major role in producing depression. In some ways, a woman's brain functions differently than a man's brain, which in turn affects the experiences and manifestations of depression [13]. Sex differences in depressive episodes begin to appear as early as adolescence, a time of major changes in the neuroendocrine reproductive cycle with the onset of menses. This indicates the significant impact that brain chemistry has in the development of mood disorders in women [35].

The areas of the brain affected by female reproductive hormones (i.e., estrogen and progesterone) are the same as those known to regulate mood stability and behavior. Therefore, it may be concluded that different hormonal circumstances can alter mood and anxiety in a woman [13]. There are several events associated with a woman's reproductive cycle that provoke mood instability in predisposed individuals, including the use of oral contraceptives, phases of the menstrual cycle, pregnancy and the postpartum period, and menopause. The vulnerability of women for mood instability bears some relationship to the fluctuation of ovarian steroids during specific phases of the reproductive cycle [36; 37].

The areas of the brain associated with anxiety and mood disorders are the limbic brain and the cortex. The paralimbic cortex is the first layer of the cortex that surrounds the limbic brain. The cingulate gyrus is a part of the limbic brain that is believed to be involved in the fight/flight response, mood regulation, and the maternal bonding process. It works collaboratively with other structures of the limbic

brain. The instinct for mothering, nurturing, and the emotional responses of the mother toward her infant emanate from the cingulate gyrus area of the brain. This area has evolved to allow for the development of bonding behavior between mother and infant, thus assuring the attachment process [13].

In addition to the cingulate gyrus, the limbic brain is composed of the amygdala, hippocampus, hypothalamus, and thalamus. In concert with the cortex, these areas of the brain recall, correlate, store, and impart emotion to all experiences. The amygdala is an almond-shaped structure that responds to perceived threats to determine whether to fight, flee, or freeze. It is believed that this segment of the brain modulates the production of the neurotransmitters serotonin and norepinephrine. Researchers have discovered that the amygdala is overactive in depressed persons. This finding correlates with the clinical assessment of the simultaneous occurrence of stress with depression [13].

The hippocampus is involved in the creation of memories and in the modulation of stress responses and emotions. The hypothalamus, which is connected to the pituitary gland, orchestrates the menstrual cycle, thyroid function, physiologic stress responses, body temperatures, the sleep-wake cycle, appetite, growth, and lactation. Secretions from the hypothalamus stimulate the release of hormones from the pituitary gland. The feeling of fear, which is an emotion that colors perception, emanates from this area of the brain. Unresolved fear can lead to an incapacitating anxiety, which may also be present in depressed persons [13].

Every significant event in life is accompanied by emotions. These events are thus emotional experiences that are "recorded" in the brain. The "emotional brain" is thought to consist of the prefrontal cortex, which is the area located directly above the eyes, and the frontal cortex. The prefrontal cortex is significantly involved with developing judgment [13]. Sichel and Driscoll refer to the connections between the limbic brain, the paralimbic brain, and the prefrontal cortex as the "prefrontal limbic complex" [13]. This complex has a large role in processing emotions, regulating mood, and storing memories. The memories of powerful life experiences, both stressful and pleasurable, are stored in this area of the brain.

Intellect and good judgment are functions of the prefrontal cortex that override the instinctual urges of the limbic brain; the cortex acts as a buffer to inhibit impulses originating from the limbic brain. If it is too overwhelmed by hormonal fluctuations, the prefrontal cortex may no longer be able to inhibit angry and/or aggressive impulses. Aggressive behavior breaks through when chemical dysregulation within the mood pathways overcomes the buffering effects of the prefrontal cortex. The chemistry of the mood pathway must be stabilized and the disruption in the limbic brain soothed to allow the prefrontal cortex to function properly. If the chemical equilibrium between the paralimbic areas and the cortex is disrupted, then mood regulation can be destabilized [13].

Neurotransmitters are the chemical messengers that allow the nerve cells within the brain to communicate with each other. They help determine the mood pathways in the brain and serve as a chemical messenger system that travels through and innervates the prefrontal limbic complex [13].

Although there are numerous neurotransmitters, those that primarily affect anxiety and mood are dopamine, serotonin, norepinephrine, gamma-amino butyric acid (GABA), and glutamate. Together, these neurotransmitters regulate thinking, emotions, and behavior. Dopamine is involved in learning, memory, and emotional arousal. Norepinephrine is a hormone similar to adrenaline that is released during stress. A lack of norepinephrine may be associated with depression [38]. An excess of norepinephrine can produce agitation or irritability, which also frequently accompanies depression. GABA regulates how fast messages are sent along the nerve cells and helps to maintain a steady rhythm. Excessive stimulation of nerve cells produces a sense of anxiety [34].

These neurotransmitters are operative in both sexes. However, reproductive hormones that act in the same areas of the brain play a part in producing the unique characteristics of depression in women [19]. It is thought that the dramatic rise in reproductive hormones during pregnancy and the equally dramatic fall in these hormones following childbirth neurochemically affect those areas of the brain associated with mood stability. During pregnancy, the elevated levels of estrogen and progesterone have the effect of elevating mood. After delivery, the precipitous drop in the levels of these hormones creates a lowering of mood in some women [13].

The fact that these hormones are measured as nearly absent immediately following delivery of the baby and the placenta is a significant factor in producing depression in women whose brain chemistry may have already been destabilized by earlier events. These hormones are not produced again until approximately six weeks after delivery, when the next menstruation begins [10].

BIOCHEMICALS INVOLVED IN POSTPARTUM DEPRESSION

Serotonin

Serotonin is a neurotransmitter known to be involved in mood and anxiety disorders. It is one of the major classes of chemical messengers known as monoamines and is associated with the induction of emotional calmness and the perception and regulation of pain, restful sleep, sexual behavior, and appetite control. A person's general level of well-being depends largely on his or her levels of serotonin [19].

Serotonin imbalance is thought to be one of the causes of depression, and it may be a source of PPD. Inadequate amounts of serotonin may lead to sleep disturbance, agitation, worry, lethargy, and hopelessness, all of which are symptoms of depression [39; 40]. Multiple studies have linked low-expressing serotonin transporter (5-HTT) genotypes and PPD, and this is an interesting area of research for future treatment options [41].

Serotonin levels in the brain are regulated by reabsorption into the nerve cell, breakdown within the synapse, availability of storage, timing of release, number of receptors, and the amount of tryptophan in the daily diet. Changes occurring in any of these areas can alter the serotonin pathway and/or availability and lead to anxiety or depression. Serotonin is formed from tryptophan, a basic protein building block stored in nerve cells. Adequate levels of tryptophan are essential to ensure the availability of serotonin. Alternatively, a depressive state can be induced by a depletion of tryptophan [13].

As noted, there are numerous estrogen and progesterone receptors in the same area of the brain where serotonin acts. Research has indicated that reproductive hormone levels seem to influence the availability of tryptophan [42]. The serotonin pathway is heavily influenced by hormonal fluctuations occurring normally during the menstrual cycle and during other major reproductive events, including the postpartum period. The integrity of this serotonin pathway may be jeopardized after childbirth due to the precipitous drop in estrogen and progesterone [13].

Estrogen and Progesterone

Women have a greater lifetime risk than men for depression, with two times the incidence of depressive episodes or recurrent depression [43; 44]. Because higher risk is correlated with gender, it is highly likely that reproductive hormones in women play a role in mood instability [43; 44].

Stabilization of brain chemistry is necessary in order for all systems to function normally. Any disturbances in any one area of the prefrontal-limbic complex affects all other areas. A woman's reproductive cycle and the resultant shifts in hormone levels within the brain can produce a disruption. If a woman's brain chemistry has been altered by previous stressful life events, hormonal shifts can be the catalyst that destabilizes the system and disrupts the capacity to stabilize mood. The impact of normal hormonal fluctuations caused either by the menstrual cycle or reproduction on an already destabilized brain chemistry may induce depression [13].

Estrogen

Estrogen and progesterone can induce changes in all of the neurochemical pathways involved in mood disturbances. This may be a vital aspect of mental health for women, but it remains largely unstudied [13; 44; 45]. Estrogen and progesterone influence serotonin levels as well as the function of the other neurotransmitters [42].

Estrogen receptors are present in many areas of the brain; however, they are found significantly clustered in the limbic area. Estrogen appears to help maintain the orderly firing rates of serotonin, dopamine, acetylcholine, and norepinephrine from nerve cells, which are involved with promoting positive moods, memory, thinking, perception, motivation, appetite, sex drive, anxiety, and stress responses. Estrogen can affect the action of these chemicals by altering the number of receptors on the nerve cells, slowing the breakdown of neurotransmitters, and enhancing sensitivity. Estrogen also enhances glutamate activity; glutamate is another neurotransmitter that encourages mood stability [13].

Sichel and Driscoll believe that estrogen may act within the brain as a natural antidepressant and mood stabilizer [13]. When estrogen levels drop, as they do after childbirth, this effect would presumably be reversed. Fluctuations of estrogen levels at any point during a woman's reproductive cycle can disrupt the delicate balance of neurotransmitters and affect a woman's mood stability. Thus, under normal circumstances, estrogen could be regarded as protecting women against depression [46; 47].

Mood changes, however, do not occur in all women during their menstrual cycle or during the postpartum period [48]. Therefore, it seems that some women have a natural resilience to withstand the impact of hormonal changes. In a study to explore possible early biomarkers of PPD, researchers found that serum estradiol and estriol levels were similar among patients with and without PPD, indicating that a difference in sensitivity of the pathway, at the receptor level or the targets themselves, may be responsible for onset of PPD [49]. In fact, the women in the study who developed PPD were found to be more likely to have an estrogen-sensitive gene expression pattern, indicating that genetic testing of at-risk women may be useful in guiding treatment decisions in the future. Other researchers have proposed that a subgroup of women who constitute a "hormone-sensitive" PPD phenotype may be particularly sensitive to the effects of perinatal changes in hormone levels. Study of this subgroup independent of other PPD phenotypes may identify the underlying pathophysiology and help in the development of novel treatment targets [50].

Progesterone

Progesterone is produced during the second phase of the menstrual cycle and functions to dismantle the nerve connections established by estrogen, decreasing the number of available estrogen receptors [13]. Like estrogen, progesterone is also available in large quantities during pregnancy and drops significantly after childbirth.

Estrogen, progesterone, and endorphins work in concert to influence the brain's chemical pathways. The hypothalamus is responsible for controlling reproductive hormones (i.e., follicle-stimulating hormone [FSH], luteinizing hormone [LH], estrogen, and progesterone), mood, weight, and the circadian day/night rhythm. When an event changes the production or availability of any one of these, there can be an upset of the delicate balance of all the components. During the abrupt decline in estrogen and progesterone, for example, following labor and delivery, there may be a subsequent instability of mood, sleep, and weight (gain or loss) [10].

Conversely, as soon as conception occurs, levels of estrogen and progesterone begin to rise. When the placenta takes over the production of estrogen and progesterone from the ovaries, the level of progesterone rises to 50 times higher than the normal peak of progesterone during the menstrual cycle, and the level of estrogen rises to 130 times higher than the normal peak [10; 19]. The amount of hormones produced by the adrenals also increases during pregnancy; therefore, twice as many corticosteroids are produced. During pregnancy all of these hormones are controlled by the hypothalamus, the placenta, and the fetal adrenals [10].

As noted, after childbirth and delivery of the placenta, there is a precipitous drop in the levels of estrogen and progesterone. A small amount of estrogen is present, but progesterone is almost completely absent. As a result of these falling levels, available serotonin also decreases. There is an approximate six-week period postpartum during which estrogen and progesterone production is absent; this persists until a new menstrual cycle begins. It is during this critical period, between birth and six weeks postpartum, that a new mother is considered to be the most susceptible to emotional disturbance [10].

Studies conducted by Dalton and colleagues in the United Kingdom indicated a correlation between symptoms in women who were feeling postpartum blues and a drop in blood levels of progesterone [10]. Levels of progesterone were measured over a five-day period. As progesterone levels decreased, women in the study reported increased feelings of sadness [10].

Another study administered high doses of estradiol and progesterone to women, then withdrew it abruptly. Researchers found that 62% of women in the study with a history of PPD had an onset of mood disorder. Interestingly, none of the women without a history of PPD demonstrated symptoms of a mood disorder [30].

Cortisol

Traumatic events provoke a stress response and the release of cortisol, along with other stress hormones. While necessary for survival, this protective stress hormone can exhaust or overwhelm an individual if its level remains too high. When the stress response continues unabated, the nerve cells can continue to maintain the response after the precipitating event has ended, causing emotional distress [13].

In pregnant women, placental hormones stimulate the production of cortisol, the level of which remains high until the placenta is delivered. There is conflicting evidence regarding the role of cortisol levels in PPD [51; 52; 53; 54]. Discrepancies in the studies of cortisol and PPD may result from the lack of control for variables that influence cortisol levels, such as stressful life events. However, it is possible that the sustained high levels, and subsequent drop, of cortisol may have an effect on mood stability in the postpartum period. Some have suggested that women for whom cortisol levels remain higher after delivery of the placenta may have a greater risk of developing PPD [52].

Thyroid Hormones

The role of the thyroid gland is to produce thyroid hormones, including levothyroxine (T4) and L-triiodothyronine (T3). These hormones influence the body's metabolism as well as the function of many organs. T3 is the more biologically active hormone, and it is thought to be the hormone that functions at the cellular level. When the thyroid is underactive, nonfunctioning, or has been surgically removed, hypothyroidism, or insufficient production of thyroid hormone, will develop. Thyroid hormones affect the body's metabolism in multiple areas, including the regulation of vitamins, proteins, carbohydrates, electrolytes, water, and the immune system. They can also alter the actions of other hormones and drugs.

Approximately 5% to 7% of postpartum women have abnormal thyroid levels [55; 56]. Thyroid dysfunction is associated with depressed mood, and in one study, having a thyroid-stimulating hormone (TSH) level greater than 4.0 mU/L at delivery was associated with increased risk for depressive symptoms at six months postpartum [42; 57; 58; 59]. Thyroid dysfunction has not been consistently identified in PPD; however, there may be a subgroup for whom it does play a role.

If thyroid levels remain abnormal, it can alter the effectiveness of the treatment for depression [13]. Therefore, laboratory tests of thyroid function, particularly in women with signs or symptoms of thyroid dysfunction, should be included in the evaluation for PPD. Screening for thyroid dysfunction in the postpartum period may help identify women at risk for PPD; however, consensus guidelines do not advocate screening of all women [42; 60; 61].

EVIDENCE-BASED PRACTICE RECOMMENDATION

According to the American Thyroid Association, there is insufficient evidence to conclude whether an association exists between postpartum depression and postpartum thyroiditis. However, as it is a potentially reversible cause of depression, women with postpartum depression should be screened for thyroid dysfunction and appropriately treated.

(https://academic.oup.com/jcem/article/97/8/2543/2823170. Last accessed March 27, 2020.)

Level of Evidence: B (At least fair evidence that the service improves important health outcomes and benefits outweigh harms)

FAMILY HISTORY

Some families appear to be more prone to depressive illness than others [13]. Therefore, a woman's genetic makeup may be a risk factor for PPD. A detailed family history specifically documenting incidences of depression or mental illness is useful in any PPD assessment.

With this in mind, certain traits are possible indicators of disturbances in brain chemistry and mood instability in some individuals [30]. Some important traits that may become evident when taking a patient's history include:

- Family history of suicide or a preoccupation with suicidal thoughts
- Family history of depression
- Family history of addiction to alcohol or drugs
- Poor judgment as indicated by inappropriate or impulsive financial, sexual, or violent behavior
- Aggression
- Grandiose expressions and behaviors
- Family history of bipolar disorder
- Unstable or chaotic lifestyles
- Lack of empathy for others
- Enmeshed or estranged family system
- Family history of bouts of rage or physical abuse
- Extremely rigid parents (disciplinarians)
- Compulsive behavior

The presence of any of these traits in a woman's family may be indicative of a family history of alterations in brain chemistry and mood instability, which may have been inherited by the patient [2; 13; 30].

As noted, some women seem to display a resilience to chemical dysregulation, and these women do not have mood destabilization at critical junctures in the hormonal reproductive cycle. Much research is being conducted in this area of inquiry to determine the role genetics play in protecting from and/or inducing PPD [13]. As discussed, genetic differences in estrogen signaling, cortisol levels, and serotonin expression have all been linked to higher risks of PPD [41; 49; 52].

STRESSFUL LIFE EVENTS

Childhood traumatic events and powerful emotional responses to those events are unconsciously encoded in the paralimbic cortex area of the brain. A woman who has endured traumatic events early in life can become psychologically and biochemically overloaded. These biochemical changes then predispose her for a depressive episode in response to various reproductive events later in life, including pregnancy and childbirth. Over time, it becomes increasingly difficult to maintain physiologic and psychologic balance. When a woman's history is examined closely, certain stressful life events preceding PPD may be present. These stressful events, many of which may have occurred early in life, sensitize the brain and may affect its biochemistry and subsequent behavior. Evidence of prior mood disturbance is often present in a depressed woman's history [13].

The brain's mood pathways can presumably be restored to normal following one depressive event without any further episodes, assuming that the depression is treated aggressively and appropriately. However, research has shown that 70% of those who become depressed will have another depressive episode [13; 62].

PSYCHOSOCIAL FACTORS

Part of a woman's preparation for motherhood involves her expectation and anticipation of the event and her ideals regarding labor, delivery, the child, and how she will feel. These ideals are often based on the image of the "perfect" mother or "perfect" child. A significant discrepancy may exist between what is expected and the actual delivery and birth of the baby. Confusion, unhappiness, and guilt may be the result. Even the happiest of new mothers feel some disappointments, and high concern over mistakes and perfectionism are risk factors for PPD [63; 64].

It is observed that women with PPD do not experience the initial stages of motherhood as they had fantasized; consequently, their disappointments are more intense and severe. Women with postpartum blues or depression may seem unable to deal with disappointments with equanimity. When a woman is already biochemically predisposed to depression, unfulfilled expectations, unanticipated losses, and/or lack of social support create the potential for PPD to develop. For a woman with PPD, disappointments will be felt more intensely and with a greater degree of emotional sensitivity and self-criticism [63].

There are many expectations attached to having a baby. For a woman without a positive relationship with her mother, there may be a desire to demonstrate that she can be a better parent to her child, or she may have the fantasy that having a baby will bring her emotionally closer to her mother. If a woman feels that her own mother was a poor role model, she may have conflicting emotions about becoming a mother herself. This can lead to self-criticism and intensify feelings of being a "bad mother," which often accompany depressive symptoms of PPD [13].

Fears of being a "bad mother" or admitting to thoughts of harming one's baby may be particularly heightened among racial/ethnic minority women who are greater risk for having children removed or being deemed "unfit" by child welfare workers [233; 234]. This appears to be especially prevalent in African American and Black families and may be a barrier to seeking care [235].

In some cases, the child may have been conceived with the idea that it would improve a relationship with the partner or bring greater harmony to a marriage [63]. Pregnancy conceived to resolve a troubled marriage may actually worsen an already difficult relationship as a result of the additional adjustments a pregnancy demands. Due to the hormonal changes caused by pregnancy, women may be particularly sensitive. Disharmony in a marriage can trigger depression in a pregnant woman, making her more vulnerable to PPD [19].

Desertion of a partner or husband during or after pregnancy produces enormous stress on a new mother. The lack of support that a partner affords to the new baby may create a crisis and negatively impact the woman's ability to care for her child. Mixed emotions of anger, guilt, and insecurity can be critical stressors if a woman's partner is absent or unsupportive. Marital conflict is a common finding among depressed pregnant women and women with PPD [65; 66].

In some families, especially in some cultures, enormous value is placed on male heirs; therefore, there may be a considerable amount of pressure to have a male child. In these cases, having a female child can be a huge disappointment, and the woman may feel that she is a failure [63].

The psychologic impact of infertility may also play a role in the development of depression in some women. Impaired fertility affects approximately 12.3% of women of childbearing age in the United States [67]. Studies of women receiving fertility treatments have shown that these women generally had less satisfaction with life, higher levels of anxiety, and tested higher on the depression scores than women who were fertile [19]. Infertility had an impact on sexuality and self-esteem, and women being treated for infertility were likely to blame themselves and to avoid contact with friends [68]. Women receiving, or who have received, fertility treatments require compassion, understanding, and support. Treatments can take considerable time and require a woman to deal with the emotional and mental consequences of hope and loss. Fertility medications themselves, which generally act on the pituitary gland, may disrupt mood stability [19].

The expectations of motherhood carry an immense emotional weight. Fantasies about the kind of mother a woman will be establish presumptions of having to behave, respond, and feel a certain way. When a woman's reactions do not correspond to these idealized fantasies, there may be resulting feelings of failure and self-defeating disappointment [63; 69]. Most women have coping mechanisms that allow them to deal with the conflicting emotions of disappointment and joy, or love and resentment, and are able to enjoy being mothers. Women with PPD have great difficulty dealing with these ambivalent, conflicting feelings and, as a result, are unable to maintain emotional balance [63].

TYPES AND SEVERITY OF POSTPARTUM DISORDERS

POSTPARTUM BLUES

Postpartum blues, also referred to as "baby blues," is the most common type of postpartum mood disturbance, occurring in approximately 70% to 85% of all new mothers [3; 70]. Its onset is usually shortly after birth, and it generally resolves within 10 days [2; 3]. A study by Iles et al. indicated a characteristic pattern of mood changes that peaked on day 5 after delivery and declined by day 10, perhaps best described as a period of emotional upheaval following birth [71]. Incessant crying and tearfulness are the most common emotional expressions of postpartum blues [2; 3].

Miller and Rukstalis prefer the term "postpartum reactivity" to describe the mood fluctuations that occur with postpartum blues, as they believe the term "blues" is often confused with depression [72]. However, the term "baby blues" has been popularized in modern culture and is often used to describe the phenomenon that occurs shortly after birth. It is important to distinguish the postpartum blues from PPD both to avoid confusion and to aid in treatment.

Postpartum blues are characterized by heightened responsiveness to stimuli, wide mood swings, tearfulness, and irritability. The exhaustion and fatigue experienced by women following birth significantly alters sleep patterns, further inducing mood alterations and irritability secondary to sleep deprivation [73]. The cause of the postpartum blues is considered to be primarily physiologic in nature [72].

The incidence of postpartum blues varies in different cultures; however, it has been demonstrated in every culture in which it has been studied [72; 74; 75; 76; 77]. Psychosocial variables that affect postpartum blues tend to influence how women express their emotions, but not whether the blues occur [72]. Therefore, research into the most accurate assessment tool for postpartum blues and depression across cultures is ongoing [3; 39].

As discussed, incessant crying and tearfulness are the most common emotional expressions of the postpartum blues. The tearfulness is not necessarily linked to sadness, but occurs in response to numerous environmental triggers, such as insufficient milk production, too much or too little attention from nurses, or a sarcastic remark [10]. Essentially, an emotional oversensitivity exists. All of the emotions associated with childbirth are normal and healthy so long as they are not excessive and resolve within one to two weeks [10]. The signs and symptoms of postpartum blues include [10; 13; 72]:

Emotional Symptoms

- Crying easily
- Mood swings
- Feelings of sadness for no reason
- Irritability towards the baby and/or the other parent
- Anxiety
- Excessive worrying
- Emotional sensitivity

Physical Symptoms

- Fatigue
- Apathy
- Exhaustion
- Inability to sleep

Cognitive Symptoms

- Poor concentration
- Confusion
- Slowness to learn new skills (e.g., bathing and feeding the new baby)
- Mental fatigue

Healthcare professionals in contact with a mother who is experiencing postpartum blues should listen to her without judgment and explain that what she is experiencing is not uncommon, she is not to blame, and the symptoms should soon resolve, allowing her to return to her normal state. Women are treated by one set of healthcare professionals during prenatal visits and an entirely new set after childbirth. This can produce its own set of problems. The attitude of nurses and other healthcare professionals towards mothers who are experiencing postpartum blues can help or hinder the mothers' recovery [10].

The postpartum period is a challenging time for any mother, but may be particularly difficult for first-time mothers who may feel insecure and apprehensive about their new maternal responsibilities. Attending to the demands of a new infant who requires total care while also recovering from fatigue and sleeplessness can be overwhelming. In some countries, home visits are key in providing emotional support and practical advice to new mothers as a matter of routine. For example, in the United Kingdom, it is common for nurses to make home visits to provide support and advice to new mothers. In the United States, however, this is less common, with minimal support often available for mothers during this unique and stressful time. In most instances, a mother is discharged from the hospital to her home situation and is left to navigate the postpartum period and care for herself and her new baby on her own [2].

An estimated 10% to 25% of women experiencing the transient state of postpartum blues will subsequently become seriously depressed [2; 3; 78]. The development of a more serious depression involves psychologic and psychosocial factors that are not prevalent in the development of the postpartum blues. An early warning sign for more serious depression is feeling overwhelmed combined with suicidal ideation; this should not be ignored. Feeling overwhelmed is normal after childbirth, but feeling suicidal is not. Being overwhelmed and/or distressed for longer than two weeks should be a warning signal that the patient requires an evaluation for depression.

POSTPARTUM DEPRESSION

With an annual live birth rate of nearly 4 million in the United States each year, an estimated 600,000 women experience PPD in the United States [79; 80]. Women who miscarry or whose children are stillborn are also susceptible to PPD. When this group is included in the figures, an estimated 900,000 women suffer from PPD each year [80]. Several studies have shown that PPD occurs with greater frequency in the first 3 months following childbirth than in the 6 or 12 months following [81]. Although exact percentages vary, it has been reported that between 40% to 90% of PPD cases occur within three months after childbirth. Nonetheless, women should be carefully assessed throughout the first year after childbirth, as PPD can occur up to one year postpartum [66; 70].

In some cases, the first symptoms of PPD occur within hours or days after birth and increase in severity over the following weeks. When this is the case, mothers often do not understand what is happening; they do not understand why they are not happy about the new baby in the way that they are expected to be [10].

It has been posited that PPD diagnoses should be exclusive to the postpartum period [10]. If a woman has been depressed prior to giving birth, depression in the postpartum period may be diagnosed as recurrent depression. PPD has been formally defined as, "the first occurrence of psychiatric symptoms severe enough to require medical help, occurring after childbirth and before the return of menstruation" [10].

Women for whom PPD is their first incidence of depression tend to experience a shorter duration of symptoms, be significantly less likely to experience recurrent depression outside the postpartum period, and be more likely to experience subsequent PPD [66]. Whether PPD is determined to be the first episode of depression may depend upon the clinician's history-gathering skills. Many women who are diagnosed with PPD as a first episode of depression may realize, upon careful examination, that they have experienced depressive symptoms in the past, although the symptoms may never have been diagnosed as depression [13; 82].

Whether it is the first or a recurrent depressive episode, PPD is a serious, debilitating depression that affects the mother in profound ways. PPD is classified as a major depressive disorder [13]. It is characterized as a downward spiral in total functioning, involving mood changes and changes in bodily functions, including appetite, concentration, sleep-wake cycles, and energy levels [13; 82].

Similar to postpartum blues, the symptoms of PPD can be classified as emotional, physical, cognitive, or behavioral. Ultimately, the mind and body are both affected by biochemical dysregulation of the brain.

Emotional Symptoms

The emotional symptoms of PPD may include [2; 3; 5; 10; 13; 82]:

- Pervasive sense of sadness and melancholy
- Loss of interest and enjoyment in life
- Loss of interest in all or most of usual activities
- Irritability and emotional outbursts
- Unpredictable tearfulness and crying spells
- Hopelessness and helplessness
- Suicidal thoughts
- Feeling overwhelmed
- A sense of emotional numbness or of feeling trapped
- A strong sense of failure, inadequacy, and guilt
- Fear of being alone
- Feelings of shame

Physical Symptoms

The physical manifestations of PPD are diverse and include [2; 3; 5; 13; 82]:

- Sleep disturbances (i.e., sleeping either too little or too much)
- Increased or decreased appetite
- Weight gain or significant weight loss
- Decreased energy, lethargy, and fatigue
- Restlessness and agitation
- Loss of libido and disinterest in sexual activity
- Headaches
- Chest pains and palpitations
- Hyperventilation

Cognitive Symptoms

When PPD affects cognitive abilities, it may present as [2; 3; 10; 82]:

- Thoughts of worthlessness
- Recurrent thoughts of death or suicide
- Difficulty concentrating
- Memory problems
- Difficulty thinking clearly and making decisions
- Pervasive anxiety with excessive fear and worry
- Excessive concern about the welfare of the child
- Negative self-talk
- Thoughts of harming the baby

Behavioral Symptoms

Finally, the behavioral symptoms of PPD are [2; 3; 10; 82]:

- Withdrawal from her infant, spouse, family, and friends
- Physical neglect of herself and/or her infant
- Physical and mental exhaustion
- Inability to cope with daily routine
- Lack of concern for herself or her infant
- Neglect of personal environment

Symptoms may vary among women and over time in any one woman. Not every woman will have all of these symptoms. There are some general ways these symptoms might be expressed, giving the clinician clues to look for in women who might be predisposed to PPD.

Due to the shame experienced by some women with PPD and the subsequent secrecy with which they may hide their symptoms, it may not be obvious to a clinician how this illness impacts mothers and their children, spouses, and families. Women with PPD who ask for help often find that their problems are minimized or trivialized. It is crucial to understand how much women suffer from this disorder and acknowledge that their symptoms are not trivial. A description of the most common symptoms of PPD may therefore be helpful in diagnosing and managing the disorder.

Pervasive Sense of Sadness and Melancholy

Some women may feel sad most of the time; others have days in which their moods seem more normal and they feel good. However, the good moods do not last more than one or two days, after which the sadness falls upon them again.

Loss of Interest and Enjoyment in Life and Usual Activities

Women who are depressed suffer from lethargy, fatigue, and apathy. Family and friends may find it difficult to accept that activities that once brought the individual pleasure no longer interest her. It may be too difficult for women with PPD to generate sufficient energy to even engage in certain activities.

Irritability and Emotional Outbursts

Irritability is one of the main mood changes most women experience with PPD. This type of irritability is characterized by emotional swings from anger to distress. Frequently, attacks of irritability end with uncontrollable sobbing. Mothers find that this irritability is out of their control, which adds to the distress [3; 10]. If the irritability continues, it can make dealing with the tasks of caring for an infant very difficult and can damage other relationships. Irritability may be expressed either verbally or through physical violence. Mothers may describe themselves as intolerant, impatient, jittery, short-tempered, spiteful, or quarrelsome. Irritability varies in its intensity among women with PPD and may develop in the weeks to months after childbirth.

Unpredictable Tearfulness and Crying Spells

Another of the most common symptoms of PPD is tearfulness and uncontrollable sobbing, with or without discernible external stimuli. These symptoms are also common among women who experience the postpartum blues; however, if these symptoms continue beyond two weeks after birth, they should be considered as part of the onset of PPD.

Sleep Disturbances

All new mothers experience a change in sleep patterns. Due to the baby's presence and the need for feedings during the night, most new mothers suffer from some degree of sleep deprivation. There is a different quality to sleep problems in women with PPD. These women have difficulty getting to sleep, have disturbed sleep, and/or wake early and are unable to go back to sleep. Insomnia is a common complaint. Even when they do sleep, it is never enough; the sleep is not refreshing. Five hours of solid sleep is often recommended; however, women with PPD are rarely able to sleep for that length of time. It is usual for new mothers to have their sleep interrupted by a crying baby, but women with PPD report that they cannot go to sleep even when the baby is settled and goes to sleep. They may lie awake worrying. Although rare, some women with PPD report sleeping too much [2; 82].

Feeling Overwhelmed and Unable to Cope

Most mothers realize that they have new responsibilities and demands with the arrival of a child. Some new mothers feel overwhelmed by the constant demands of caring for infants, fulfilling the role of mother and wife/partner, and maintaining other relationships. They may also feel pressure to run the household smoothly, especially if caring for additional children. Bothered by fatigue and lack of sleep, it is difficult not to feel overwhelmed at times. However, mothers experiencing PPD can feel overwhelmed by the smallest tasks, such as changing diapers. A strong feeling of helplessness and a lack of confidence in her ability to cope undermines any self-confidence she may have enjoyed prior to her depression.

Hopelessness and Helplessness

For some women with PPD, there is a loss of hope in life. Women may wish they were dead and have thoughts of suicide. Although thoughts of harming oneself are prevalent among women suffering from PPD, these drastic thoughts often are not that they actually want to die, but that they want the situation to change and feel hopeless about being able to change it. In some instances, thoughts of suicide may become too strong to resist, and some women with PPD do complete suicide. Any thoughts of suicide should be taken seriously and warrant immediate intervention [2; 69].

A Sense of Failure and Inadequacy

An inability to cope with everyday functions may lead to a negative self-concept and negative self-talk. The negative perception of self can be so convincing that an individual believes she is incompetent as a woman, wife, and mother. Such feelings are difficult to eliminate for women who are depressed [69].

Thoughts of Worthlessness or Guilt

One of the most prominent features that a woman with PPD experiences is that somehow she is not worthy of having a child; she may feel that because of the depressive symptoms, she is a bad mother. These thoughts may cause an individual to detach herself, in an effort to hide perceived inadequacies from others. Women who believe that they are "bad mothers" also have significant feelings of guilt. There is an accompanying loss of self-confidence in other areas of life that is difficult to shake. These women may have excessive guilt about any minor wrongs committed in the past [2; 69].

Difficulty Concentrating, Thinking Clearly, and Making Decisions

The loss of concentration associated with PPD may cause women to forget things that ordinarily come easily, such as turning off the stove or putting things away. Everyday tasks may become so difficult that they seem monumental. In order to cover up the confusion, women may avoid certain activities. Women who were previously leaders or extroverts or who enjoyed a high level of confidence prior to childbirth may be distressed by a loss of confidence. Loss of confidence is often accompanied by a desire to withdraw from one's surroundings, become detached, and avoid socializing or making contact with other people [10; 69].

Pervasive Anxiety with Excessive Fear and Worry

Anxiety is a common symptom that accompanies depression. Symptoms of anxiety may be felt emotionally, cognitively, and/or physically. Anxiety permeates everything a woman with PPD experiences, bringing with it a feeling of dread that does not resolve with any amount of reassurance. Anxiety can be incapacitating, affecting the ability to think, concentrate, or make sound decisions [34; 69].

Thoughts of Harming the Baby

Any thoughts of harming the baby should be taken seriously, and immediate help should be given. Unfortunately, suicide and homicide can be consequences of PPD. Although a mother may not wish to harm her baby, these thoughts may have an alarming obsessive quality that could eventually override her ability to make rational judgments to control her behavior [2; 69].

POSTPARTUM PSYCHOSIS

Postpartum psychosis is an extreme condition that can occur during the postpartum period. The term "psychosis" is defined as a mental state characterized by being out of touch with reality [2]. Postpartum psychosis affects approximately 1 or 2 in 1,000 first-time mothers [3; 15]. For women who experience psychosis after the birth of their first child, the risk increases by 50% for subsequent deliveries [15]. The major risk factors for postpartum psychosis are a personal history of PPD or psychosis, a family history of depression, or the presence of bipolar disorder [3; 15; 43; 69]. One study found that nearly 10% of women hospitalized for psychiatric conditions before delivery went on to develop postpartum psychosis after their first child was born [83]. When it does occur, psychosis in a new mother constitutes a psychiatric emergency, requiring immediate treatment and, in many cases, psychiatric hospitalization.

Women are seven times more likely to be hospitalized for a psychotic episode during the first month after delivery than at any other time before or after childbirth [69]. For women with a history of postpartum psychosis, the risk of psychiatric hospitalization after childbirth is increased [8]. One-half of all psychotic mothers are admitted to a psychiatric hospital within 14 days of delivery [13]. In one study, 90% of women with postpartum psychosis had an onset of symptoms within four weeks of delivery [83]. In most women, symptoms develop within the first two weeks postpartum [3].

Several studies have indicated that the incidence of postpartum psychosis worldwide has been essentially unchanged over the last century and a half [8; 84; 85]. The fact that the rate has remained constant suggests that modern scientific medical care and the mother's physical health are not factors in the development of the condition. Although the prevalence has remained unchanged, maternal morbidity and mortality have been greatly reduced [8].

Psychosis may take different forms depending upon a woman's history of prior psychiatric illness. Psychotic disorders in the postpartum period are typically characterized by an abrupt onset, severe symptoms, and dramatic, difficult, and disruptive features [3]. As noted, symptoms of psychosis usually occur in the first few days to weeks after childbirth. However, in some cases psychosis occurs immediately following delivery [3; 8].

Postpartum psychosis may not be obvious unless the mother is questioned about her emotions and mental status. She may be successful at hiding her psychotic thinking until it manifests in her behavior. Psychosis may also be delayed until after the mother stops breastfeeding, which produces a secondary hormonal shift and may trigger depressive or psychotic symptoms in predisposed women. Fortunately, postpartum psychosis is rare [3]. Nonetheless, it is the most dangerous and tragic postpartum disorder and should not be overlooked [2].

Postpartum psychosis is characterized by hallucinations, delusions, confusion, extreme agitation, inability to carry on a coherent conversation, and inability to sleep or eat [3; 69]. Moods may swing from euphoria to homicidal or suicidal ideation in a short period of time without warning. The risk of suicide or infanticide requires immediate attention. Safeguards should be established to protect the mother from harming herself or her baby until psychiatric intervention becomes available [13]. Irrationality is the hallmark of postpartum psychosis, and a mother's behavior may be peculiar or described as bizarre. She may engage in frenzied activities, as though in response to stimuli not apparent to anyone other than herself [10].

Psychotic women may become paranoid or suspicious of other people's intentions or behavior. Women may imagine that people are ridiculing or talking about them. In extreme cases, individuals may refuse food or prevent their infants from feeding appropriately [2; 69]. Psychotic mothers feel alienated from what is going on around them, and to the observer, they may appear obviously disturbed.

Mood alterations may suggest a postpartum manic-depressive psychosis or bipolar disorder. Women with this illness have extreme polarity of moods, from bliss to deep depression [69]. The manic state is marked by physical hyperactivity, a rapid rate of speech, disconnected thought patterns, and grandiose ideas. There may also be periods of anger or aggression, with verbal or physical manifestations. Delusions may center on perceived special powers, fame, or capability to carry out enormous exploits. The infant may also be incorporated into the delusions, creating a risk of harm. The depressive phase is profound in its depth of despair. Bipolar psychosis is dramatic and usually (although not always) occurs in postpartum women who have a history of bipolar disorder prior to pregnancy [2; 69].

Psychosis may also result in auditory or visual hallucinations [69]. Visual hallucinations present distorted or unreal images of the people around her, the environment, or her baby, and they can be very disturbing and frightening. Auditory hallucinations include hearing voices that appear to come from sources that are not present. These hallucinations become dangerous when they issue commands to commit certain acts that would ordinarily be against her will; these are called command hallucinations. If these commands coerce a woman to hurt her baby and are too compelling for her to resist, they may lead to infanticide [2; 69].

Women with postpartum psychosis may also feel pressured to get rid of the baby or to give the baby away because they are convinced something is terribly wrong with it or with themselves. Women may completely reject their babies and refuse to have anything to do with them as a result of delusions that the baby is defective. Some express the belief that death would be an improvement for the child. Reassurances ordinarily do not work in cases of postpartum psychosis; no amount of evidence to the contrary will change the attitude towards the baby. In these circumstances, a mother should never be left alone with the child. Furthermore, the baby should not be forced upon her, as she could harm the child in her delusional state [10]. As the mother's psychosis is treated and her delusions abate, assisting her in bonding with her infant, under direct supervision, becomes possible.

Another symptom of psychosis is confusion or disorientation [69]. Confusion is defined by a lack of awareness of identity, surroundings, or time. Disorientation, on the other hand, is characterized by forgetfulness from one moment to the next. If confusion and disorientation are present, organic brain conditions should be ruled out. An acute organic brain condition is a medical emergency and should be diagnosed and treated immediately. Generally, when the condition is corrected, the symptoms will resolve [2]. As with the onset of any psychotic or delirious symptoms, toxic, metabolic, and neurologic causes should be ruled out. Toxic delirium and psychosis may present with similar symptomatology [8; 86].

If, for some reason, a psychotic mother must be cared for at home, it is essential that both the mother and her baby remain under constant observation by family or friends who have been educated about postpartum psychosis and know when and whom to call in case of an emergency. A psychotic mother's actions are totally irrational, and irreversible damage can be done if she is left alone [2]. Possible other sources of supervision include home health providers or social workers.

Relatives and friends should be warned of the possibility of psychosis returning even if a mother is treated in a psychiatric hospital and released. There is a danger of psychosis returning at the resumption of menstruation, even if the mother is undergoing continuous psychiatric outpatient treatment. Twenty-four hour surveillance is necessary at this vulnerable time [3; 10].

INFANTICIDE

It is estimated that 1 in every 250,000 women with postpartum psychosis commits infanticide [10]. Any time a new mother is psychotic, the risk of infanticide should be considered. There is always a possibility that the mother will incorporate the baby into her delusional thinking, and this will increase the risk of infanticide [2; 3]. When healthcare professionals are unaware of the symptoms of psychosis and how dangerous the condition is for the mother and her baby, tragedy can occur. Psychotic mothers retain little ability to appreciate what they are doing; some may kill their infants unwittingly in a state of confusion, when out of touch with reality [13].

In general, healthcare professionals should be alert for early signs of psychosis, such as agitation, hyperactivity, or restlessness following delivery [69]. Suspicious, paranoid ideations might manifest as a certainty that there is something seriously wrong with the baby or that nurses are hurting or trying to poison the baby. These symptoms are usually indicators that the mother is in the early phases of a psychosis; they should be reported immediately to facilitate a psychiatric consultation [10].

It is also important to note that cases of child abuse and infanticide are not limited to mothers who are psychotic. A study of mothers of children younger than 3 years of age found that 41% of depressed mothers had thoughts of harming their child [87]. However, postpartum psychosis is a significant risk factor for both ideation of child harm and completed infanticide.

Legal Issues

In the United Kingdom, it was lawyers, not medical professionals, who first appreciated that a mother who killed her baby was temporarily mentally disturbed. The crime of infanticide was introduced into law in England and Wales in 1922, and later amended in the Infanticide Act of 1938 [87; 88]. This law states that a mother who kills her own child can be charged with a lesser offence of infanticide, not murder. Murder, if proved, must be punished by a prison sentence. This only covers the killing of an infant younger than 12 months of age and does not extend to other individuals [10]. At least 20 other countries with infanticide laws have followed the British precedent, including Australia, Canada, Germany, India, Japan, and the Philippines [236].

Given the rigidity with which the legal system in the United States views mental illness, infanticide becomes legally challenging. By the time a case of infanticide reaches trial, the mother's mental status has usually improved and is no longer psychotic. An aggressive prosecutor can make it appear as though the psychosis was fabricated to cover up the crime. In many cases, there are inadequate records to support the mother's claim that she did not know what she was doing and that she killed her child, "in a fit of insanity, which has since passed" [8]. However, change may be coming to the United States. In 2018, a law was passed in Illinois (PA100-0574) to recognize postpartum illness as a factor in criminal cases [237]. This law makes PPD and postpartum psychosis mitigating factors in sentencing.

The public understandably finds infanticide repugnant and incomprehensible. Without proper instruction from the judge at trial and without a specific law to guide jurisprudence in cases of infanticide, it is difficult for a jury to acquit a mother when an infant has been killed. However, given the media focus on cases of infanticide, some guilty verdicts have been overturned in the Court of Appeals. There may be a tendency toward leniency developing in the United States; however, mothers in the United States who commit infanticide may face the death penalty [89]. In a case study of 24 infanticide cases in the United States in which postpartum psychosis was the defense, 33% of defendants were found not guilty by reason of insanity, 17% were given probation, and 42% were incarcerated, with 8% sentenced to life in prison [87]. The laws in the United States that govern insanity pleas and infanticide remain inconsistent, differing from state to state [88; 89; 90]. The DSM-5 includes the diagnosis of major depressive disorder "with peripartum onset"

specifier. This specifier applies if the onset of mood symptoms occurs during pregnancy or in the four weeks following delivery [14]. Some had lobbied for the specifier to include the six months following delivery [91]. Judges, without precedents to follow, generally attempt to give broad latitude to infanticide defendants [8].

Broad latitude shown to infanticide defendants by the justice system is a step in the right direction, but it does not fully address the realities of postpartum psychosis. Sichel and Driscoll have stipulated that, "there is a difference between a person who kills with malice and one who kills under the influence of postpartum psychosis" [13]. There are women who do harm their children with malice; however, the criminal justice system, when properly supplied with accurate information regarding postpartum psychosis, should conceivably be able to enact laws that protect women who kill their infants while under the influence of postpartum psychosis [13; 89].

Spectrum of Infanticidal Thoughts and Actions

Infanticidal fears, or women who think about or are frightened about harming their baby and manage to resist, have not been studied carefully. There are few statistics on the frequency of these fears in women with PPD or postpartum psychosis. Mothers may not readily confess to such fears if they are aware that they may be incarcerated or that their children may be removed from their care [10].

Dalton studied PPD and, in her research, saw an unusual number of women charged with infanticide or who, under the influence of postpartum psychosis, have very nearly killed their children. She noted three varieties of infanticide: those occurring shortly after birth while the mother is acutely psychotic; those occurring with the return of menstruation; and those occurring during "domestic feuds." According to Dalton, many of these incidents "do not appear in the press or in law reports and remain hidden from the public" [10].

ASSESSMENT FOR POSTPARTUM DEPRESSION

CLINICAL ASSESSMENT

Data from the Centers for Disease Control and Prevention (CDC) Pregnancy Risk Assessment Monitoring System (PRAMS) and the U.S. Preventive Services Task Force (USPSTF) indicate that 10% to 15% of new mothers suffer from PPD, and up to 85% experience postpartum blues [92; 93; 94; 95]. A 2017 study found a decline in PPD from 14.8% in 2004 to 9.8% in 2012 [230]. The rate of depressive disorders diagnosed at the time of delivery increased from 4.1 per 1,000 hospitalizations in 2000 to 28.7 per 1,000 hospitalizations in 2015 [231]. The CDC has therefore recommended that healthcare providers address the issue of PPD during prenatal visits, preferably during the third trimester [92]. Other sources, including the USPSTF, recommend assessing for depression throughout the prenatal period [94; 96]. The USPSTF has stated that screening pregnant and postpartum women for depression may reduce depressive symptoms in women and that screening instruments can identify pregnant and postpartum women who need further evaluation and who may need treatment [94]. The screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up [94; 97].

Consultation with patients about their risk for psychiatric illness during the postpartum period also should be discussed [92; 96]. Clinicians should understand that knowing about a pregnant woman's mental and emotional state is as important as knowing about her neurophysiologic status. This initial assessment should include a psychosocial history that is sufficiently comprehensive to determine a woman's vulnerability to developing PPD [96]. Early detection and treatment of depression during pregnancy can prevent a more serious downward spiral into PPD following delivery [94]. Early treatment has also been shown to decrease the duration of PPD [73].

Both the USPSTF and the American College of Obstetricians and Gynecologists recommend that assessment for depression using a standardized, validated tool occur at least once during the perinatal period [94; 97]. Women with current depression or anxiety, a history of perinatal mood disorders, or risk factors for perinatal mood disorders should receive close monitoring, evaluation, and assessment [97]. Women most likely to suffer from PPD often describe pregnancy as "one of the worst times of my life" or a "very hard time" [98]. In order to avoid a delay in learning about a woman's problems caring for the baby or herself, a plan for early detection of women at risk for PPD should be in place [94; 97].

Specific areas should be addressed in the initial clinical assessment [13; 96]. This includes asking a woman about any prior history of depression or hormonal mood changes, such as premenstrual irritability. Patients should also be asked if they have ever been treated for depression or if any family members have been depressed, suicidal, or hospitalized for a psychiatric illness [94; 96].

Many women are reluctant to reveal a personal history of mental disorder; therefore, education regarding the occurrence of postpartum blues and PPD should accompany the discussion about personal history. Educational materials should be available and distributed in clinics or women's health centers. Questions asked by clinicians will make more sense to a woman if she understands that PPD is a complication of childbirth and that she is undergoing an evaluation for her sensitivity to this condition. Reassuring patients that most women go through pregnancy and childbirth with minimal problems can help to put them at ease.

Although women may initially be reluctant to reveal personal information regarding their mental/emotional state or psychosocial history, many women who have had PPD relate how they wish that someone had told them about the illness before it happened to them. This is important because knowing what is causing their altered moods and behavior helps to give women a sense of control [11; 99; 100].

The lack of openness, public awareness, and education about PPD contributes to its secrecy. Ignorance of this disorder causes women to not seek treatment, which in turn can allow the depression to worsen and potentially endanger both the mother and her baby. Educational materials made available to pregnant women are an excellent way to begin an assessment of a woman's risk for developing PPD.

When an assessment indicates that a prenatal woman is at risk for developing PPD, she should be referred to a mental health clinician for further evaluation. A collaborative relationship between the woman's healthcare provider and the mental health clinician should be maintained throughout the woman's pregnancy and postpartum period [94]. Establishing specific boundaries at the outset makes for better, more effective treatment for the mother [73]. Kennedy et al. recommend an interdisciplinary model of care that includes practitioners from the mental health, women's health, medicine, pediatrics, nursing, nutrition, and social work fields [73]. A team approach will most likely serve the mother's and her family's needs. It is essential that an accurate diagnosis of depression is made by a qualified professional. If clinicians cannot detect high risk on their own, they should refer the patient to a specialist. As stated, the USPSTF recommends that the assessment be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up [94; 97].

Various states have enacted PPD legislation that mandates that information regarding PPD be made available to women and their families. For example, New Jersey specifically requires that physicians, nurse midwives, and other licensed health care professionals providing postnatal care to women screen new mothers for PPD symptoms prior to discharge from the birthing facility and at the first few postnatal check-up visits [23]. Hospitals and other healthcare facilities must provide departing fathers/partners and/or other family members with written information about PPD as needed, including its symptoms, methods of coping with the illness, and treatment resources to overcome the spillover effects of the

illness and improve their ability to be supportive of the new mother. Illinois requires professionals to screen new mothers before discharge, to invite PPD screening at prenatal visits and at each well-baby checkup until the infant's first birthday, and to provide information to partners and families [24]. Other states (e.g., Minnesota) require that materials regarding PPD be made available to new mothers, partners, and their families, but do not specifically mandate screening [101]. Healthcare professionals should be familiar with state law in their jurisdiction.

Healthcare professionals who have 24-hour contact with women after delivery should be equipped to recognize women who are struggling with depressive symptoms beyond postpartum blues. These women should be referred for psychiatric consultation and follow-up before being discharged from the hospital. These women should also be given an emergency number to call if suicidal or infanticidal ideation emerges. To assist the healthcare professional in detecting which women are at highest risk, several screening tools have been developed; two examples of validated instruments are the Edinburgh Postnatal Depression Scale (EPDS) and the Postpartum Depression Screening Scale (PDSS).

EDINBURGH POSTNATAL DEPRESSION SCALE

The EPDS has been developed to assist primary care professionals to detect mothers suffering from PPD. The EPDS was created at health centers in Livingston and Edinburgh and consists of ten short statements. The mother chooses one of the four possible responses to indicate how she has been feeling during the past week. The responses are then given a score between 0 and 3. Most mothers complete the scale without difficulty in less than five minutes [12].

A validation study showed that mothers who scored above 13 were likely to be suffering from a depressive illness of varying severity. Nevertheless, the EPDS score should not override clinical judgment. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt during the previous week, and in doubtful cases, it may be usefully repeated after two weeks. The scale will not detect mothers with anxiety neuroses, phobias, or personality disorders. Users should be instructed to [12]:

- Underline the response that comes closest to how they have been feeling in the previous seven days.
- Complete all ten items.Avoid discussing answers with others.
- Complete the scale by herself. However, if a patient has limited English proficiency or difficulty reading, she may require assistance.

The EPDS may be used to screen women at six to eight weeks postpartum. The pediatric health clinic or postpartum check-up may provide suitable opportunities for its completion.

The EPDS is limited to certain depressive symptoms and does not evaluate a woman's exhaustion, irrational irritability, or thoughts of harming her baby. These symptoms should be examined during a clinical assessment by asking specific questions relevant to these areas. Nonetheless, the EPDS is the most widely used screening tool available to detect PPD [10]. Given prenatally, the EPDS has been shown to effectively identify women at risk for PPD [102]. The EPDS may be accessed online at http://www.fresno.ucsf.edu/pediatrics/downloads/edinburghscale.pdf.

POSTPARTUM DEPRESSION SCREENING SCALE

Beck and Gable developed the PDSS, a 35-item self-report instrument, in an effort to improve early detection of PPD [103]. The screening scale is composed of seven dimensions, each of which consists of specific questions relevant to the dimension being measured (***Table 1***).

POSTPARTUM DEPRESSION SCREENING SCALE (PDSS)	
Dimensions	**Sample Statement**
Sleeping/eating disturbances	Tossed and turned for a long time trying to fall asleep
Anxiety/insecurity	Felt really overwhelmed
Emotional lability	Cried a lot for no real reason
Cognitive impairment	Thought I was going crazy
Loss of self	Felt like I was not normal
Guilt/shame	Felt like a failure as a mother
Contemplating harming oneself	Just wanted to leave this world

Source: [103] *Table 1*

Women are asked to indicate their degree of disagreement or agreement with each item on a scale of 1 (strongly disagree) to 5 (strongly agree). The validity of this scale to detect PPD has been tested and validated to be effective for screening women after delivery [103; 104; 105]. Additionally, a woman's response to items in the self-harm dimension can be used to gauge her level of suicidal thinking.

The test yields an overall severity score falling into three ranges:

- Normal adjustment
- Significant symptoms of PPD
- Positive screen for major PPD

The PDSS is available in short and long versions, with a manual for use in clinical settings.

COMPLICATIONS OF POSTPARTUM DEPRESSION

PROBLEMS IN THE MOTHER-INFANT RELATIONSHIP

The occurrence of PPD raises concerns about the quality of the mother-infant relationship and the potential impact of a mother's depression on the infant. One important aspect of the mother-infant relationship is a mother's adjustment to her baby and her understanding of her infant's needs and communications. When a mother's depression interferes with her sensitivity to her baby, their interactions can have a negative effect on the child [106; 107].

EVIDENCE-BASED PRACTICE RECOMMENDATION

Where there is evidence of impairment in the mother-infant relationship as a result of maternal depression, the Scottish Intercollegiate Guidelines Network recommends additional interventions specifically directed at that relationship be offered.

(https://www.sign.ac.uk/assets/sign127_update.pdf. Last accessed March 27, 2020.)

Level of Evidence: C (Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal, directly applicable to the target population and demonstrating overall consistency of results)

Bonding

The benefits of bonding are well known. Most hospitals have incorporated a ritual of mother-infant bonding that occurs shortly after delivery, whereby the infant is placed in the mother's arms. It is often referred to as the moment of "falling in love," when the mother looks into the eyes of the infant and the infant looks back. Whether born of myth or scientific reasoning, bonding is considered an important element in initiating the mother-infant attachment. The ritual is important, but not essential. If, for some reason, this initial bonding is missed, as in the case of a caesarean section, it is obtainable the moment the mother sees her baby for the first time [108].

Bonding, in actuality, is a process of closeness, comfort, and familiarity that develops over time [19]. When the process of bonding with an infant is disrupted, it can have long-term consequences for the future relationship between mother and child. The delay in developing attachment may be unusually prolonged and delayed with a clinically depressed mother. This attachment difficulty may take different forms. The mother may not be nurturing to the infant, or she may have limited interaction with the infant. In some cases, the depressed mother may reject her baby emotionally and refuse to have anything to do with the infant. The mother may have an adverse sentiment towards the baby and handle the baby with irritability. Depressed mothers may also be outwardly angry or resentful toward the infant. Some mothers are so consumed with fears of harming their child that they avoid even touching him or her. All of these emotions and attitudes toward the child affect the process of attachment [2; 109].

Klier and Muzik describe the role of perinatal psychiatry in maternal-infant bonding issues [110]. They classify the disorders of mother-infant bonding into three groups [110]:

- Delay, ambivalence, or loss in maternal response: Ambivalence or delay in bonding may be due to a mother's disappointment about her feelings toward the infant. She may have no feelings, feel estranged from the infant, or feel the infant is not hers.
- Rejection (threatened or established): Rejection of the infant is expressed through strong negative feelings. The mother may dislike or hate the infant and express regret over the infant's birth. There is a notable absence of affectionate behavior, such as kissing, hugging, cooing, and cuddling. Essentially, she wants to keep the infant away from her. A mother may feel trapped by motherhood, and the infant is the source of the entrapment. She may wish the infant would be stolen, given away, or killed.
- Pathologic anger: Pathologic anger toward the infant may be a mild form, which causes the mother distress but is controllable. Alternatively, it may be more severe, leading the mother to scream or yell at the infant or have an impulse to harm or kill the baby.

A study of approximately 100 subjects found that mother-infant bonding disorders were present in 29% of those diagnosed with PPD [111].

Bonding difficulties should be assessed immediately to determine if intervention is necessary. Women may be reluctant to admit these problems, but they also may be grateful to receive help from someone who understands their distress [110].

Mother-Infant Attachment

Researchers of infant behavior have come to acknowledge that the establishment of social relationships is a primary process of development. When a child successfully accomplishes communication with others, normal development occurs. A child who does not engage the world successfully will not develop normally, regardless of the source of the failure. Success or failure depends upon three critical processes [112]:

- The integrity and capacity of the infant's physiologic systems and central nervous system to organize and control physiologic states and behavior
- The integrity of the infant's communicative system to express the infant's intention for action to the caretaker and the extent to which the infant succeeds
- The caretaker's capacity to read the infant's communications appropriately and willingness to take appropriate action

These processes make up what is called "mutual regulation," which is the capacity of both the mother (or other caregiver) and infant to express their intentions, appreciate the intentions of the other, and allow each other to achieve their goals [112].

The literature on maternal-child interactions supports the concept of caretaker behavior as an external regulator of the infant's states. Maternal body warmth modulates infants' physiologic systems [108; 112]. The quality of a caretaker's efforts affects the function, structure, and neurochemical architecture of the infant brain. Both mother and infant appreciate and adjust their behavior in relation to their partner's behavior and the state of the interaction. This system of meaning is established long before the child can engage in words, and the effects have lifetime consequences [112].

Both mother and infant develop the skill to sense when the interaction fulfills the infant's needs or when the mother's intervention met her intention. Adjustments are made as they develop sensitivity to each other's responses. This is how the mother-child relationship develops and sets the course for the development of future relationships for the infant. The development of an effective sense of self and a reliable relationship with caregivers is crucial for the establishment of stable and secure relationships in the future [112; 113].

Studies have shown that when the mother is depressed, a break in the mutual regulatory system occurs [114]. Depressed mothers disrupt the interaction in two distinct ways: intrusiveness and withdrawal. It has been reported that intrusive mothers with PPD engaged in rough handling, spoke in an angry tone of voice, and interfered with their infants' activities. Withdrawn mothers, by contrast, were disengaged, unresponsive, and affectively flat and did little to support their infants' activities.

Both disruptions have a deleterious effect on the infant's development [112]. The infants of intrusive mothers eventually adopt an angry and protective style of coping, which is used defensively in anticipation of the mother's behavior. Infants of withdrawn mothers attempt to regulate their own emotional states. They may fail at social connectedness due to the mother's lack of response. Eventually, the infant will attempt to regulate their affective states, resulting in passivity and withdrawal [115]. Infants of either intrusive or withdrawn mothers develop a negative affective core characterized by anger and sadness, a representation of the mother as unresponsive and untrustworthy, and a representation of themselves as ineffective and helpless. This does not lead to successful normal development unless some intervention changes the mother's interaction style [112; 115; 116].

IMPACT ON SOCIOEMOTIONAL AND COGNITIVE DEVELOPMENT

Research on infants' early social development demonstrates a remarkable sensitivity to the quality of their interpersonal environment from the first days of life [95; 106; 117]. Findings from a study conducted at the Winnicott Research Unit in London suggest that exposure to maternal depression in the early postpartum months may have an enduring influence on child psychologic adjustment. Researchers report that, "depression has been found to be associated with insensitive and negative maternal interactions with the infant in the early postpartum months, particularly if the depression persists" [118].

Parents are crucial figures to an infant, acting as the primary partners in teaching their children, through their interactions, how to modulate their emotional states. These lessons help children learn to cope with failure, anger, and frustration, as well as how to channel these emotions into productive activities. A faulty foundation can result in a failure to cope as the child enters a larger social arena.

A mother's unresponsiveness or inappropriate parenting during infancy may prevent the child from achieving the developmental goals of social interaction and object exploration. If an infant learns that a parent is unavailable and unreliable, it interferes with the infant's development of a sense of mastery and control over events; the infant develops a sense

of helplessness and hopelessness [112]. Infants eventually become aware of their mothers' anger, sadness, or hostility and begin to react to their parents' state of mind. Infants also must cope with their own sadness, anger, and apprehensiveness. Tronick and Weinberg speculate that infants become hypervigilant of their mothers' emotional state in order to protect themselves [112]. They must also protect themselves from their mother's responses by disallowing a high level of emotional arousal. Therefore, they become emotionally constricted. One study has indicated that, at the end of the first year, infants of depressed mothers express less intense emotional reactions to stressful situations and are less emotionally responsive than infants of nondepressed mothers. These early patterns can lead to the development of pathologic methods of coping [112; 115].

Typically, mothers learn to read their infants' intentions and to understand how they can respond to fulfill their infants' needs. A mother eventually knows that when the infant cries it is because he or she is hungry, cold, or needs a diaper change. This is learned through interaction with the infant. These interactions take place over time and are part of a child's process of establishing social relatability.

A depressed mother may misread an infant's intentions and react angrily rather than supportively. This confuses the infant and may ultimately cause the infant to stop attempting to interact socially for fear of rejection. The pattern that is established does not promote a healthy or successful strategy for reaching out to others. In order to facilitate healthy interactions, it is essential for a mother to comprehend her infant's state of consciousness and for the infant to comprehend the mother's state of consciousness [112].

Studies have attempted to research cognitive functioning in infants of mothers with PPD at 18 months and 5 years of age. Results of these studies suggest that the quality of the mother's communication was influenced both by her mental state and the level of adversity that she experienced [119]. Further research supported this study, indicating that PPD may have lasting adverse effects on a child's cognitive development [120]. A review of studies showed that PPD reduced children's cognitive performance by impairing maternal mental and behavioral care [117]. A study of 1,053 mothers of infants 6 to 18 months of age found that 46.7% (491 mothers) suffered mild to extremely severe depression. The results indicated a correlation between mothers' depression levels and developmental delay in infants and a significant correlation between mothers' depression and development delays in gross-motor and problem-solving skills [121].

The way in which a mother engages with her infant in the postpartum months comes to influence the general nature of infant cognitive performance. One study considered a concept, originally proposed by Winnicott in 1956, that a depressed mother's interactions with her infant could be "good enough" to sustain a relationship without serious negative outcomes [119]. In instances in which there are no additional adverse circumstances at home for the mother, she may be able to provide "good enough" mothering in spite of her depression. Campbell and Cohn confirm that a consistent variable affecting a positive outcome in the early postpartum mother-infant relationship is a depressed mother's ability to provide a "good enough" environment for her infant [7].

In a separate study, latent depressive cognitions were investigated in 94 children of depressed and nondepressed mothers in a situation of mild stress [122]. Results indicated that children who had been exposed to maternal depression either in the previous 12 months or at any other time during their lifetime were more likely than children whose mothers were not depressed to express thoughts of hopelessness, pessimism, and low self-worth.

Kurstjens and Wolke found that long-term effects may be present when a mother's depression is chronic [123]. In the postpartum period, chronic depression in mothers may make infants more vulnerable to negative outcomes; short-lived depressions may have fewer consequences for the quality of the mother-infant relationship and for infant development. It is thought that short-lived PPD with an onset in the first few weeks postpartum and resolution by four to five months should have less of an impact on the quality of the attachment than depressions lasting six months or longer [123]. A longitudinal study of 296 mother-child dyads found that maternal depression at 30 to 90 days postpartum and at 12 months was significantly associated with the language development of infants at 12 months of age, with the impact correlated with the duration of the mother's depression [95].

However, some studies have shown that women experiencing depression in the early postpartum period may continue to have difficulties in their relationship with their infants, despite remission of their symptoms [7]. Factors influencing a more positive outcome for the mother-infant relationship include satisfaction with spousal support and help with childcare and involvement in early treatment for PPD [7; 73; 124; 125].

It is important to identify factors that might buffer the mother-infant relationship in order to secure a more positive outcome. Studies suggest that chronically depressed mothers who remain at home full-time without support may have more difficulty relating to their babies than mothers who work outside the home at least part-time [7]. Mothers who benefit from considerable support and help from others may be considered low risk. The other parent of the child and other family members may provide childcare and sufficient support to help circumvent potential problems, or alternate caregivers may help buffer the infant from stressful interactions with a depressed mother. The partner's presence, level of functioning, and willingness to participate in childcare alters the consequences of PPD for children [7; 124].

POTENTIAL LONG-TERM EFFECTS ON CHILDREN

A study has been completed assessing the long-term effects on the children of mothers who were depressed three months postpartum [126]. In a community sample from two general practices in London, 149 women were given psychiatric interviews at three months after childbirth, and 89% of their children were assessed at 11 years of age. The children of women who were depressed at three months postpartum suffered attention deficit problems, difficulty with mathematics, and were more likely than other children to have special educational needs. The cognitive deficits present at 11 years of age may be a result of the quality of the infant's social environment in the first three months of life. Problems were noted in the children whether or not the mothers' depression continued beyond three months. Boys were more severely affected than girls. These effects on cognitive development were not altered by the parent's intelligence quotient (IQ) or socioeconomic status, or by the mother's later mental health problems. In this study, PPD was a risk factor for children's subsequent cognitive and behavioral problems. These findings demonstrate a long-term legacy of PPD that continues to affect children's intellectual development into adolescence [126]. Subsequent studies have reported similar findings [127; 128; 129].

Protective factors make a difference in long-term outcomes. Successful breastfeeding can offer an emotional interaction between mother and infant that fosters regulation of attention and learning. Mothers' levels of distress and self-preoccupation are seemingly reduced during the act of breastfeeding, while focusing on the infants' satisfaction [126]. Furthermore, not all depressed mothers are insensitive toward their infants.

CONFLICTS IN THE MARITAL RELATIONSHIP

PPD puts a strain on marital relationships. According to Dalton and Horton, PPD is a significant medical cause of marital and relationship breakdown [10]. This is especially true when a woman's depression is untreated and/or chronic. Marital conflict and dissatisfaction are generally common in the first year after childbirth; PPD intensifies stress on the relationship during this period. Support from the baby's other parent or a partner is critical to a woman's recovery from PPD and may act as a buffer to the mother-infant interaction. Most partners do offer support to women coping with PPD. However, as the effects of depression multiply, they may become impatient or frustrated by the extra burden. In some cases, husbands or partners may be unsupportive or become verbally abusive, intentionally or unintentionally. Even when a husband or partner is supportive, the woman may feel, due to her depression and feelings of being overwhelmed, that it is not enough [63]. Lack of communication and misunderstandings of feelings, behavior, and attitudes are common occurrences. Each partner perceives the other as being uninterested in his or her activities. Given that women with PPD are often preoccupied and withdrawn, these problems may not be resolved and miscommunication can grow. Women may feel ashamed to ask for help, which can create a strain in the relationship [63].

Three areas have been identified as the most affected: the need for practical support, emotional needs, and sexuality. These are complex issues that should be dealt with, and most couples struggle to resolve conflicts in these areas. Assistance from health or mental health professionals may be needed and has shown to be helpful to women with PPD and their husbands or partners [63].

SUICIDE

Statistics show that psychiatric disorders, and specifically suicide, account for 20% to 30% of all maternal deaths [130]. A review of deaths from 2006 to 2008 identified psychiatric illness as the leading cause of maternal deaths in the United Kingdom [131]. In the United States, suicide is considered the greatest cause of maternal mortality in the year following childbirth [132].

Approximately 5% of women with postpartum psychosis complete suicide. Therefore, suicide prevention in a woman with PPD or psychosis should be a high priority [133; 134; 135]. Although there are no specific statistics for suicide rates among women with PPD, a 2013 study of service women in the United States found that suicidality (i.e., completed suicides, suicide attempts, and suicide ideation including thoughts of self-harm) was 42 times more prevalent in first-time mothers with PPD than in those without [136]. The risk of suicide in people with a major depressive disorder is about 25 times that of the general population. Most suicides in depressed persons are among those who do not receive treatment [137].

For women with PPD, suicide is an ever-present possibility [10; 136]. Many women with PPD have reported continual fears of suicide or suicidal thoughts. These women may act on suicidal thoughts out of hopelessness and a sense of desperation. Family members and those close to mothers with PPD should be instructed to keep the danger of suicide in the forefront of their minds at all times. A failed suicide attempt may be followed by a completed suicide if it is not taken seriously and appropriate treatment undertaken.

Eight out of ten suicidal persons give some sign of their intentions [138]. Persons who talk about suicide, threaten to attempt suicide, or call suicide crisis centers are 30 times more likely to attempt suicide than those that do not [138]. Although not all suicidal individuals indicate their plans, nearly three-fourths of all persons who die from suicide have visited a physician in the four months before

their deaths [138]. It is therefore advisable that mental status and signs of suicidal ideation be assessed at every contact with postpartum women [139].

Recognizing warning signs of suicidality is essential to suicide prevention. Warning signals may include [138; 140]:

- Feelings of despair and hopelessness. The more these feelings are described as unbearable, the more likely it is that the idea of suicide will enter the person's mind.
- Organization of surroundings or affairs. When a woman is making preparations for her absence or giving away prized possessions, it is possible she is seriously considering suicide.
- Establishment of a specific suicide plan. If a person has a specific method in mind, she is more likely to follow through on suicidal thoughts.
- Alcohol or drug abuse. Substance abuse in a depressed person has the effect of enhancing impulsive behavior and clouding judgment.
- Improved feeling of well-being. Paradoxically, a person with depression is more likely to attempt suicide just when she is on the way to recovery.

HOMICIDE

As noted, approximately 5% of women with postpartum psychosis commit infanticide [133]. Therefore, postpartum psychosis poses an immediate danger to the infant, who may require protection from the mother. Mother-infant interactions require supervision until the mother is successfully treated for her psychosis. There are no statistics available to indicate how many mothers with PPD (but not psychosis) commit infanticide. Although a psychotic mother may be a threat to her infant if she goes untreated, there is no evidence to date to suggest that these mothers are a danger to other people [133].

If a mother with PPD or postpartum psychosis tells any family member or healthcare professional that she is having thoughts of harming her baby, she should be taken seriously and immediate help should be forthcoming. If she is not already being treated for depression or psychosis, she should be referred immediately for psychiatric consultation and treatment. A mother who expresses concern that thoughts of harming her baby are becoming strong and she is afraid she might act on them should be supervised when she is with her baby. Alternatively, she may require hospitalization. A mother with PPD or postpartum psychosis who indicates that she has thought about harming or wants to harm her baby should never be dismissed.

STRATEGIES FOR RECOVERY

SPONTANEOUS RECOVERY

Postpartum blues produce symptoms of increased emotionality and sensitivity in new mothers. These symptoms are transitory and usually resolve within 5 to 10 days without the necessity of formal treatment. However, there is no clear evidence that women recover spontaneously from PPD [141]. Mothers who are breastfeeding may appear to have recovered from depression when, in fact, they have not. Some women may breastfeed their children for months to years, during which time they may be protected from depression by the production of prolactin. Depression may appear in these women after they stop breastfeeding [19]. Other studies of PPD and breastfeeding practices suggest that a mother's breastfeeding self-efficacy can both put her at risk for PPD and can predict a change in symptoms of currently experienced PPD [142; 143]. This should all be taken into account when assessing women for recovery and symptom resolution, and it should also reinforce the need for early screening for PPD [143]. It has been suggested that there may be a possibility for spontaneous recovery in depressed women with milder symptoms and a shorter duration [144].

Unfortunately, withholding treatment while waiting for a spontaneous recovery may put women at risk for a more chronic or severe depressive episode [145; 146].

SELF-CARE

For women with PPD, the reduction of stress is essential to protecting against further anxiety and to help the brain restore its own potential for self-regulation. In addition to the professional treatment a woman receives for her depression, she may choose to engage in certain activities to reduce stress and to promote a calmer, more relaxed state of mind [13; 147].

Caring for a new baby is demanding, and mothers who are depressed can easily feel overwhelmed. To take care of the baby adequately, she must also take care of herself. Eating healthily, getting enough rest and relaxation, doing gentle exercises, and socializing are all part of maintaining and promoting health.

Diet

New mothers should consume two to three portions daily of protein-rich foods, such as fish, cheese, eggs, nuts, or meat. Four to five portions of fruit and vegetables should also be part of the diet [10]. Dalton and Horton recommend that starchy foods every three hours be added to the regular diet for a woman with PPD [10]. This may allow women with PPD to maintain sufficiently high blood sugar levels required to effectively utilize available progesterone. A carbohydrate-rich food should be eaten within one hour of waking and one hour before bedtime. Foods high in carbohydrates include flour, rice, potatoes, oats, and corn. Starchy foods added to a healthy diet of fruits, vegetables, and protein are not necessarily fattening; this may be stressed to new mothers.

Tryptophan is a vital amino acid that must be consumed, as the body does not produce it. Tryptophan can be obtained through plant or animal proteins, such as peanuts, brown rice, soybeans, fish, turkey, and beef. In the brain, tryptophan is converted into serotonin, which facilitates a calming effect [19]. Ensuring that sufficient quantities of iron, folic acid, and vitamin A are being obtained is also an important aspect of the postpartum diet [1].

Research has indicated that omega fatty acids may have a protective effect against PPD. In a Norwegian study of omega-3 fatty acid levels (generally from seafood consumption) in women throughout and after pregnancy, a low omega-3 index in late pregnancy was associated with higher depression score three months postpartum [148]. A 2012 meta-analysis supported this finding, noting that poor omega-3 intake is common among women of childbearing age [41].

Rest and Relaxation

Sleep is necessary to restore a woman's mood and brain chemistry following pregnancy, labor, and delivery. The brain requires a minimum of five hours of uninterrupted sleep per day to restore itself to normal functioning [13].

If possible, a spouse or other caregiving partner can alternate nights getting up to take care of the baby, allowing the mother to sleep at least five hours at a time. Knowing in advance that arrangements for nighttime feedings and attention to the baby can be made, mothers may ask for help without feelings of guilt or inadequacy [5]. Because women with PPD often complain of insomnia, a safe sedative may be prescribed to allow patients to obtain enough sleep.

As women with PPD may be overstressed and overly focused on perceived inadequacies, only those things that are of high priority, such as taking care of herself and the baby, should be attempted. Ideally, she should obtain assistance with household chores, such as cooking, cleaning, and shopping, at least for the first few weeks to allow more time for her to rest. Extended family can be useful if they are available and willing to help [5]. Family members or friends should also be allowed to help with childcare and other activities of daily living. This will free the mother's time for therapy sessions, support groups, and unpressured time with the baby [5].

Exercise

Exercise is important to a sense of well-being, as it enhances production of endorphins in the brain. Exercise can also help to promote a sense of calm, relaxation, and better sleep. For women with PPD, exercises should be gentle, not strenuous, and may include walking, swimming, physical therapy, and massage [149; 150].

Socializing

Although it may be difficult to do, a woman should be encouraged to discuss her feelings with her partner/husband, close family members, and intimate friends. Hiding feelings due to shame and embarrassment contributes to isolation and loneliness. Therefore, although it may be difficult, it will ultimately help a depressed woman to have companionship. Isolation can lead to a sense of detachment from others, which may make depressive symptoms worsen. The depressed woman should avoid spending all of her time alone. Whenever possible, she should be encouraged to get dressed and leave the house.

It is also important for a woman with PPD to spend time alone with her partner/husband when the baby is quiet or asleep. These times together can be productive for both parents and allow them to be together without the usual stress of caring for a new baby [5].

EDUCATION

Knowledge about PPD can be very helpful to new mothers who suffer symptoms of depression. Women have reported that not understanding their symptoms greatly added to their distress [11; 100]. Given the effects of PPD on new mothers, it is vital to send a new mother home with proper education about one of the most common complications of delivery and its effects on her and her baby. In addition to having patient education materials on PPD readily available, it is equally important for healthcare professionals to educate women about parenting skills. Taking the time to discuss the care of a new baby can make a big difference in helping new mothers feel competent and confident.

According to the American Psychiatric Association, education about the symptoms and treatment of major depressive disorder should be provided to postpartum mothers in language that is readily understandable to the patient.

(https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/mdd.pdf. Last accessed March 27, 2020.)

Strength of Recommendation: I (Recommended with substantial clinical confidence)

Partners also need education regarding PPD and potentially coping with a depressed mother. In cases when PPD has been diagnosed, a partners' education might consist of suggestions regarding their supporting role in assisting their partner through recovery. The following suggestions may be helpful [10; 63; 149]:

- Listen without giving logical advice or trying to fix the problem.
- Offer hope that she will recover.
- Take care of the baby as much as possible.
- Ensure that the mother gets at least five continuous hours of sleep during the night whenever possible.
- Make regular, unsolicited offers of assistance.
- Hire household help, if possible.

Partners should not feel helpless or useless if they have been advised about how to offer emotional and practical support to mothers with PPD [63]. Partners often find that they have unexpected physical and emotional adjustments after having a baby. They may experience their own form of exhaustion as a result of changes in household schedule, interrupted sleep, increased financial responsibilities, and concern for the mother's emotional and physical needs. Partners should be encouraged to participate as much as possible in educational activities and to also seek professional help should they begin to feel overwhelmed with the additional burdens of new parenthood and PPD [149].

There is some evidence that men may experience a form of PPD following the birth of their child [151; 152]. The strongest predictor of paternal PPD in one study was the presence of maternal depression, with symptoms tending to arise after those of the mother [152]. Therefore, fathers should also be assessed for signs and symptoms of depression in the postpartum period, particularly when their partner is depressed. Educating both parents can assist them to work together for mutual benefit and for the benefit of the baby, and may alleviate possible marital discord. In one analysis, fathers reported fewer depressive symptoms if they received support from midwives, child health nurses, and their partners (mothers) [240].

TREATMENT STRATEGIES

PHYSIOLOGIC

Hormone Therapy

A reduction in hormones after delivery is thought to be a major factor in the etiology of PPD in predisposed women. Therefore, the use of hormonal treatment as prophylaxis or a treatment component seems plausible. Since 1970, several studies were carried out investigating the efficacy of either estrogen or progesterone in the management of PPD. There are several problem areas in these studies, both in regards to methodologic issues and in the use of different hormones in the studies [153]. More structured research is necessary in order to ascertain efficacy.

Estrogen

The value of estrogen in the treatment of PPD is supported by studies conducted between 1970 and 2002. However, methodologic shortcomings make the studies unreliable. The use of estrogen in the postpartum period, particularly the use of synthetic estrogen, may have significant side effects [153]. In addition, more recent evidence indicates the impact of reproductive hormones may be mediated by differences in sensitivity to estrogen among postpartum women [49].

Measurements of hormonal levels proved to be one methodologic flaw. Levels of hormones measured from plasma sampling determine the total amounts of progesterone and estrogen rather than the free fraction, which is unbound to plasma proteins and freely permeates into the central nervous system. It is this biologically active fraction that modulates the synthesis of proteins, neurotransmitters, and receptors in the central nervous system. Thus, serum levels of hormones may render inaccurate results [153]. Dalton and Horton stipulate that the only accurate method of measuring free estrogen and progesterone levels is via saliva testing [10].

In 1996, Gregoire et al. conducted a double-blind, placebo-controlled study of estrogen skin patches in the treatment of PPD [154]. The women who participated in the study had either severe or chronic depressive symptoms that began 3 months postpartum and persisted up to 18 months. The women were assessed monthly using the EPDS. Although the study concluded that estrogen was better than placebo in relieving both dysphoric mood and biologic symptoms of depression, many of the women who received estrogen took antidepressants simultaneously [154]. The use of estrogen combined with antidepressants requires further consideration.

Other studies have been conducted evaluating estrogen as a treatment for PPD; however, many of these studies were also complicated by the coadministration of antidepressants, which leads to inconclusive evidence of the benefits of estrogen alone to treat PPD. Whether estrogen is of value in the treatment of PPD is yet to be determined [153; 155; 156].

There are concerns regarding the risks associated with the use of synthetic estrogens in the postpartum period, including the increased risk for the development of deep vein thrombosis, cardiovascular complications, endometrial hyperplasia, problems with breastfeeding, and increased depression. The safest dosage and route of administration should be clarified before it can be recommended [153]. There are no reported studies on the use of natural estrogen in the treatment of PPD [155].

Estrogen may be taken orally, vaginally, transdermally, or through a device inserted into the uterus. Natural estrogens are available through the use of skin patches, transdermal creams, or vaginal creams [13]. Natural transdermal estrogen creams, such as bio-identical 17-beta estradiol and vaginal creams, are available only from compounding pharmacies.

According to the Scottish Intercollegiate Guidelines Network, the use of estrogen therapy in the routine management of patients with postpartum depression is not recommended.

(https://www.sign.ac.uk/assets/sign127_update.pdf. Last accessed March 27, 2020.)

Level of Evidence: B (High-quality systematic reviews of case control or cohort studies, directly applicable to the target population, and demonstrating overall consistency of results)

Progesterone

It has been suggested that only naturally occurring progesterone has mood-elevating properties [10]. Thus, studies using synthetic progestogens as prophylaxis or treatment for PPD are not comparable to studies using natural progesterone.

Critics of Dalton's use of progesterone both as prophylaxis and treatment for PPD cite methodologic problems and the fact that the dosages are not standardized. Other criticisms include the fact that patients who participated in the studies were volunteers and there was not an adequately constructed control group against which to test the treatments [153]. Although criticisms of Dalton's progesterone treatments persist, no further studies have been conducted on the use of natural progesterone for the treatment of PPD [155].

One problem with the use of progesterone is that it cannot be given successfully by mouth or as a skin patch, but must be administered by injection or vaginal or rectal suppository. According to Dalton and Horton, 400-mg suppositories administered twice daily are the minimum effective dose [10]. However, empirical data has not found progesterone to be effective in the treatment of PPD and it may intensify depressive symptoms in some patients [157].

As with estrogen, the largest concentration of progesterone receptors is in the limbic area of the brain, which is considered to be the center of emotion. The amount of progesterone present in the blood is not as important in regards to PPD treatment as the amount of progesterone that reaches the nuclei and is then metabolized [10].

Progesterone receptors will not transport molecules of progesterone in the presence of adrenalin, because during times of stress the receptors transport corticosteroids rather than progesterone into the nuclei. If there is low blood sugar, the progesterone receptors transport glucocorticoids back into the cells in preference to progesterone. This helps to explain why oral progesterone is not effective. Oral progesterone must pass through the liver, which contains many progesterone receptors that metabolize the progesterone before it reaches the brain. Also, progesterone does not pass easily through the skin into the blood stream and is therefore not suitable for administration by cream or patch. There are no routine laboratory tests to determine the number or function of progesterone receptors [10].

Progesterone therapy may be given with any other medications, including antidepressants. It is considered safe for women who are breastfeeding. Progesterone should be halted for a 14-day period every month beginning with menstruation. As noted, the minimum effective dose for management of depressive symptoms is 400 mg suppositories twice daily or, alternatively, one 50 mg injection daily. These doses can be titrated upward to a maximum of six 400 mg suppositories daily or one 100 mg injection daily. Blood sugar should be monitored and kept stable [10].

Given the controversy over treatment of PPD with estrogen or progesterone, consensus has not been reached on the use of hormonal treatments for PPD. This area of inquiry deserves further study.

PHARMACOTHERAPY

Healthcare professionals should engage in a dialogue with patients with PPD to determine the treatment or medication that works best and to attempt to establish an informed decision. There is no way to know in advance which medication will be the most effective in treating PPD for an individual. If a woman has taken an ineffective medication for depression in the past, then it is wise to avoid it. If a medication has been effective in the past, it should be considered the drug of choice [2]. The main classifications of antidepressants used to treat depression are selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), and atypical antidepressants.

Selective Serotonin Reuptake Inhibitors

SSRIs affect the action of the neurotransmitter serotonin. When serotonin is released in the synapse between neurons, it is reabsorbed by the brain cells, through the process of reuptake. Depression is assumed to be connected with decreased availability of serotonin and other neurotransmitters; therefore, interference with the reuptake of serotonin allows more to be available to boost communication in the brain. SSRIs inhibit only the reuptake of serotonin. Because SSRIs affect only one neurotransmitter, they presumably have fewer uncomfortable side effects than the more traditional antidepressants [158; 159]. The more acceptable side effect profile of SSRIs makes them the drugs of choice for many depressive disorders [159; 160].

Some of the most commonly used SSRIs are fluoxetine, paroxetine, sertraline, fluvoxamine, escitalopram, and citalopram [159; 161]. Of these drugs, fluoxetine, paroxetine, and sertraline are prescribed most often [159; 162]. Fluvoxamine, which is approved to treat obsessive-compulsive disorder, is sometimes used off-label to treat depression [161].

Benefits

The major benefit of SSRIs is their effectiveness in reducing symptoms of depression more quickly than the tricyclic antidepressants. These medications are also less likely than other antidepressants to have adverse interactions with other medications. However, some do exist [161].

SSRIs are especially useful if given in the early stages of depression, when symptoms are mild-to-moderate and are particularly effective in patients with obsessive-compulsive symptoms (particularly fluvoxamine) [161]. However, they are also effective for severe depressive disorders. Administration of an SSRI should result in elevated mood, lessened depressive symptoms, and an increase in self-confidence. Women should also experience less fatigue and a renewed ability to care for themselves and their babies. As depression improves, medication may be gradually decreased and eventually discontinued altogether [158; 160].

Treatment with antidepressants as early as possible in the course of the illness may shorten and lessen the symptoms of PPD, affecting change within several weeks rather than months. Antidepressant treatment also reduces parenting stress. Improvement in the mother-infant interaction then has the benefit of reducing the negative impact of PPD on child development [127; 133]. It should be noted that the effects of the SSRIs may not be seen for many days or weeks after instituting treatment.

Possible Adverse Reactions

The side effects of SSRIs are generally considered to be milder than traditional antidepressants, although there are still several side effects. They may initially increase anxiety or panic symptoms, and so should be avoided in patients whose depression includes these features. Those sensitive to SSRIs may have more severe reactions. Side effects may include [163; 164]:

- Loss of appetite, weight loss
- Increased appetite, weight gain

- Nausea
- Allergic reactions, rash
- Dry mouth
- Headache
- Nervousness
- Restlessness
- Manic or hypomanic behavior
- Agitation
- Irritability/Anxiety
- Tremors
- Dizziness
- Increased sweating
- Insomnia
- Convulsions (rarely)
- Sexual dysfunction
- Drowsiness

Side effects that do occur usually subside after two weeks, when the body adjusts to the medications [161; 165]. Adverse drug interactions have been noted with [163; 164]:

- All other antidepressants
- Antihistamines
- Diabetes medications
- Antihypertensives
- Psychotropic drugs
- Caffeine
- Alcohol
- Cough suppressants
- Theophylline
- Tobacco
- Warfarin

These substances should be avoided while taking an SSRI for depression [164].

There are also certain medical conditions that warrant caution when considering the use of SSRIs, including [163; 164]:

- Epilepsy
- Individuals receiving electroconvulsive therapy
- A personal or family history of bipolar disorder
- Heart disease
- Liver or kidney disease (Severe kidney or liver disease can result in higher than normal levels of the SSRIs.)
- Bleeding disorders
- Manic-depressive disorder
- Pregnancy or breastfeeding

Patients should be cautioned not to abruptly stop taking SSRIs, as withdrawal symptoms may occur [165; 166].

Risks

The U.S. Food and Drug Administration (FDA) has alerted healthcare professionals and the public regarding a potentially life-threatening condition called serotonin syndrome. Serotonin syndrome, or serotonin toxicity, results from an excess of serotonergic activity in the central nervous system. It is seen only rarely in postpartum women, usually when multiple antidepressants, such as TCAs, MAOIs, St. John's wort, or opioids are combined. Serotonin syndrome is a medical emergency that requires immediate treatment. Symptoms and signs of this syndrome include [167; 168]:

- Restlessness
- Tachycardia
- Diarrhea
- Nausea
- Vomiting
- Overactive reflexes
- Loss of coordination
- Hallucinations
- Hyperthermia
- Hypertension
- Coma

A risk of violent behavior has been associated with the use of SSRIs in a small number of people. In adverse drug event monitoring in the United Kingdom, violent events were reported in 56 of 13,741 (0.41%) patients taking paroxetine and 60 of 12,692 (0.47%) patients taking fluoxetine [169]. At the time of the study, researchers concluded that instances of serious violence among individuals using antidepressants were likely to be very rare [169]. However, Swedish researchers examined data from more than 850,000 individuals and found that SSRI use was linked to a 43% increased risk for violent crime among people 15 to 24 years of age. There was no significant association among older individuals [170].

An increased risk of suicidal thinking and behavior has been observed in young adults 18 to 24 years of age who are taking antidepressants, generally during the first one to two months of treatment. In 2004, the FDA issued a black-box warning about the increased risk of suicidality for all antidepressants. The warning has been updated and states that, "antidepressants increased the risk [compared to placebo] of suicidal thinking and behavior (suicidality) in short-term studies in children and adolescents with major depressive disorder and other psychiatric disorders. Anyone considering the use of [any antidepressant] in a child or adolescent must balance this risk with the clinical need" [171; 172]. The warning statements also emphasize that depression and certain other psychiatric disorders are themselves the most important causes of suicide [172].

Patients of all ages, including adolescent mothers with PPD, should be monitored carefully for clinical worsening, unusual changes in behavior, or suicidal risk both if treated with antidepressants or if no pharmacologic treatment is offered. Families and caregivers should be advised of the need for close observation and communication with the prescriber [172]. Fluoxetine is approved for use in children and adolescents for the treatment of major depressive disorder. Fluoxetine, sertraline, and fluvoxamine are approved for use in children and adolescents for the treatment of obsessive-compulsive disorder [163]. The remaining antidepressants are not FDA-approved for use in children [163; 172; 173]. The issue of treatment of depression in the pediatric population is hotly debated and requires additional research [174; 175].

The FDA has recommended that healthcare providers consider the following points when treating patients with antidepressants [172]:

- All patients being treated with antidepressant medications, particularly those being treated for depression, should be watched closely for worsening of depression and for increased suicidal ideation or behavior.
- Close observation may be especially important when antidepressant medications are started for the first time or when doses have been changed.
- Patients whose symptoms worsen while being treated with antidepressants, including an increase in suicidal ideation or behavior, should be evaluated immediately.
- Consideration should be given to changing the therapeutic regimen, including discontinuing the medication, in patients whose depression is consistently worse or who are experiencing symptoms that might be precursors to worsening depression or suicidality, especially if these symptoms are severe, abrupt in onset, or were not part of the person's presenting symptoms.

Patients taking antidepressants should be encouraged to be alert to the emergence of anxiety, agitation, panic attacks, insomnia, irritability, hostility, aggressiveness, impulsivity, akathisia (i.e., psychomotor restlessness), hypomania, mania, other unusual changes in behavior, worsening of depression, and suicidal ideation, especially early during antidepressant treatment and when the dose is adjusted. Families and caregivers of patients should be advised to observe for the emergence of such symptoms on a day-to-day basis, as changes may be abrupt.

Such symptoms should be reported to the patient's prescriber or health professional, especially if they are severe, abrupt in onset, or were not part of the patient's presenting symptoms. Symptoms such as these may be associated with an increased risk for suicidal thinking and behavior and indicate a need for very close monitoring and possibly changes in the medication [171; 172].

Women who are planning to breastfeed should be made aware that antidepressant medications are secreted in breast milk, and breastfeeding while taking antidepressants exposes infants to potential effects of these drugs. However, the concentration of antidepressants in breast milk represents relatively low doses. In general, if lower-risk interventions are not effective, pharmacotherapy should be considered. As with any medication use, the benefits should be carefully weighed against the risks to the patient and infant. The same risk assessment should apply to continuing breastfeeding in those with severe depressive symptoms. For those taking antidepressants, toxic symptoms appearing in an infant should be reported immediately [133].

The AAP recommends exclusive breastfeeding for six months, with continuation for one additional year as mutually desired by the mother and child. If breastfeeding is helping a mother bond with her infant (rather than contributing to symptoms), it should be incorporated into PPD treatment. Alternatively, if breastfeeding is contributing to a woman's distress, she should not feel guilty for choosing to seek alternative forms of feeding.

Studies have shown that SSRIs peak in the breast milk seven to nine hours after maternal dosing. The highest concentrations are found in the hindmilk [163; 176; 232]. The best time to nurse is one hour before taking the SSRIs. If a mother must breastfeed during the peak concentration, she may nurse for a brief period and discard the hindmilk, which will help to reduce the amount of medication the baby receives [177].

A few studies of breastfeeding children have found low infant serum levels of sertraline [178; 179]. Another study indicated the relative safety of nortriptyline, paroxetine, and sertraline [180]. Although sertraline may appear to be the safest SSRI for breastfeeding mothers, the long-term neurobehavioral development of exposed infants has not been investigated [163; 176]. A review of evidence about the safety of each SSRI during pregnancy found evidence suggesting a teratogenic potential of the whole SSRI class. The teratogenic effects are mainly in the heart region, often described as septal defects [181].

Fluoxetine produces the highest proportion of infant levels (22%), elevated more than 10% above the average maternal level, and fluoxetine has a longer half-life than either sertraline or paroxetine [166]. Two case reports of nursing infants whose mothers were taking fluoxetine related instances of increased irritability, colic, increased crying, decreased sleep, increased vomiting, and watery stools [176]. The long-term neurobehavioral development of infants exposed to fluoxetine has not been investigated. It is a drug "of concern" and should be used with caution in nursing mothers [163].

The Scottish Intercollegiate Guidelines Network recommends avoiding doxepin for treatment of depression in women who are breastfeeding. If initiating selective serotonin reuptake inhibitor treatment in breastfeeding women, then fluoxetine, citalopram, and escitalopram should be avoided, if possible.

(https://www.sign.ac.uk/assets/sign127_update.pdf. Last accessed March 27, 2020.)

Level of Evidence: D (Non-analytic studies or expert opinion)

In the past, the AAP has maintained a list of drugs for which the effect on nursing infants is unknown but may be of concern [182]. However, in 2010 the AAP retired this guideline [183]. The AAP now states that only a small proportion of medications are contraindicated in breastfeeding mothers or are associated with adverse effects on their infants [184].

Prescribers are advised to follow labelled warnings and consult online tools, such as LactMed (https://www.ncbi.nlm.nih.gov/books/NBK501922), for up-to-date information on medication use during breastfeeding [184; 185].

Serotonin-Norepinephrine Reuptake Inhibitors

SNRIs act by inhibiting the reuptake of the neurotransmitters serotonin and norepinephrine. This results in an increase in the extracellular concentrations of serotonin and norepinephrine and therefore an increase in neurotransmission [186; 187]. Most SNRIs, including venlafaxine, desvenlafaxine, levomilnacipran, and duloxetine, are several-fold more selective for serotonin over norepinephrine.

Benefits

SNRIs are a newer class of antidepressants, with use in the United States beginning in the 2000s. As such, there is not a large body of evidence comparing SNRIs to other available antidepressants. Venlafaxine is especially beneficial in treating anxiety in depressed patients. At lower doses (75 mg/day), venlafaxine acts much like an SSRI; SSRI-like side effects such as gastrointestinal upset often improve at higher doses (150–300 mg/day) [187]. However, discontinuation syndrome has been reported to be markedly worse for venlafaxine when compared to other SNRIs. The SNRIs also have an important role as second-line agents in patients who have not responded to SSRIs

Adverse Reactions

Safety, tolerability, and side effect profiles of SNRIs are similar to SSRIs, with the exception that the SNRIs have been associated (rarely) with sustained elevated blood pressure. SNRIs can be used as first-line agents, particularly in patients with significant fatigue or pain syndromes associated with the episode of depression [186; 187]. Typical side effects include [163]:

- Headache
- Fatigue
- Dizziness
- Insomnia
- Anxiety
- Nausea
- Xerostomia
- Sexual dysfunction
- Weakness
- Diaphoresis

The manufacturer of venlafaxine specifically does not recommend breastfeeding during therapy [163].

Tricyclic Antidepressants (TCAs)

TCAs act by increasing levels of both serotonin and norepinephrine in the brain. In this way, TCAs differ from SSRIs in that they affect two neurotransmitters rather than just serotonin, and they have a different side effect profile. As with SSRIs, there is no way of knowing which antidepressant will be most beneficial to each individual woman [159].

The most common TCAs are clomipramine, amitriptyline, nortriptyline, desipramine, trimipramine, and imipramine. Treatment with TCAs should be at the lowest possible therapeutic dose to minimize possible side effects. To be most effective, antidepressant treatment should be combined with counseling or psychotherapy in most instances [188].

Benefits

The main benefit of TCAs is their long history of effectiveness in treating depression. TCAs were first utilized in the late 1950s and have amassed a record of treatment success [188]. Therefore, TCAs remain a viable option. Women for whom PPD is a recurrent depression may have a prior history of success with one of the TCAs, which makes the choice easier [160].

Some benefits of TCA use are the same as those described for SSRIs, including the reduction of symptoms and the potential positive effects of the mother's rapid recovery. Relief from symptoms can help a mother function despite continuing depressive symptoms and difficulty coping with problems.

The degree of response, from a slight relief of symptoms to complete relief, depends on a variety of factors related to the individual woman and the severity of the depression being treated [159]. A potential benefit of nortriptyline for breastfeeding women is that it usually produces undetectable infant levels [180]. There are no food restrictions with any of the TCAs, with the exception of caffeine and alcohol.

Adverse Reactions

TCAs tend to have more adverse side effects than SSRIs. Although side effects associated with TCAs vary with the individual and the specific antidepressant taken, in some cases, the side effects may make the drug unusable for some women. Some typical side effects are [163; 189]:

- Drowsiness
- Anxiety
- Restlessness
- Dry mouth
- Constipation
- Blurred vision
- Urinary retention
- Cognitive and memory difficulties
- Weight gain
- Increased sweating
- Dizziness
- Decrease in sexual ability and desire
- Muscle twitches
- Fatigue and weakness
- Nausea
- Increased heart rate
- Arrhythmias (very rare)

These side effects usually resolve within two weeks and can be reduced by lowering the dosage or switching to another TCA. If the adverse effects are unbearable or if they do not resolve, use of the medication is discontinued. When discontinuing an antidepressant, doses should be gradually tapered to avoid withdrawal symptoms [159].

Risks

There are a variety of factors that contraindicate the use of TCAs. TCAs should not be prescribed to anyone with a history of heart disease, as they may cause cardiovascular problems. There have also been cases of TCAs triggering manic episodes in patients with a personal or family history of bipolar disorder [190; 191]. It is also important not to prescribe TCAs with any of the following medications or other items, as there are risks of dangerous interactions [189]:

- Bicarbonate of soda
- Oral contraceptives
- Some sleeping medications
- Some anticoagulants
- Aspirin
- Other antidepressants
- Diabetes medications
- Antiarrhythmic medications
- Mood stabilizers and anticonvulsants
- Pain medications and anesthetics
- Blood pressure medications
- Stimulants
- Weight loss drugs
- Diuretics
- Thyroid supplements
- Tobacco
- Antihistamines
- Alcohol
- Antibiotics
- Sedatives and tranquilizers
- Estrogen
- Disulfiram
- Antipsychotic drugs
- Antifungal agents
- Ephedrine

Heart arrhythmias have been reported in adolescents taking desipramine; therefore, extreme caution is advised about the use of desipramine with adolescent mothers [159; 189]. The drug is not FDA approved for use in pediatric patients [163]. Due to the possibility of serious cardiac complications, TCAs can be lethal if misused at high doses [163]. Because suicidality is a risk in PPD, the danger of overdosing should be considered in prescribing TCAs [188].

As approximately 50% of all new mothers choose to breastfeed, treatment with antidepressants should be of concern [133]. As mentioned, while essentially all antidepressant medications transfer to breast milk, different medications are excreted at different levels. The treatment goal should be to minimize the amount of antidepressant the baby receives while maximizing the mother's emotional health. For healthy, full-term babies, the known benefits of breast milk could outweigh the potential hazards of most antidepressant medications [177]. The TCA doxepin should be avoided due to a case report of infant respiratory distress. Data on citalopram, fluvoxamine, bupropion, and venlafaxine are more limited, and their use cannot be recommended during breastfeeding. One study evaluating the potential consequences of TCA exposure through breast milk followed exposed children through preschool age and found that exposed children were developmentally similar to non-exposed children [186].

Monoamine Oxidase Inhibitors (MAOIs)

There are a small number of people for whom MAOIs are the best treatment [159]. Monoamine oxidase, an enzyme found in the brain, destroys neurotransmitters such as serotonin and norepinephrine. MAOIs act by inhibiting the activity of monoamine oxidase, blocking the breakdown of the neurotransmitters and making more serotonin and norepinephrine available to the neurons [192; 193]. The traditional MAOIs are phenelzine, tranylcypromine, selegiline, and isocarboxazid [192; 193].

Benefits

MAOIs work more quickly than TCAs and provide relief from symptoms shortly after beginning treatment. MAOIs are generally prescribed for people who do not initially respond to TCAs or SSRIs and for cases of atypical depression. Due to their stimulating effect, MAOIs may be preferable in the treatment of chronic low-level depression [159; 163].

Adverse Reactions

The side effects of the common MAOIs are generally minimal. When adverse effects do occur, they include dizziness, rapid heartbeat, loss of sexual interest, and food interactions [163; 192]. MAOIs can react with certain foods, alcohol, and some medications to produce a severe reaction. Reactions, which may not appear until several hours following ingestion of the medication, may include a severe rise in blood pressure, headache, nausea, vomiting, rapid heartbeat, confusion, seizures, stroke, psychotic symptoms, or coma [192].

Foods that contain a high level of tyramine can interact with MAOIs [163]. These foods mostly consist of aged cheeses; smoked, dried, or fermented meat; fish; air-dried sausages; soy products; red wine; beer and ale; fava beans; ripe figs; Brewer's yeast or yeast extracts; pickled or salted herring; beef or chicken liver; overripe bananas or avocados; sauerkraut; soups made from beef bouillon or Asian soup stocks, such as miso soup; white wine; gin; vodka; sour cream; yogurt; saccharine; and chocolate. Any of these foods can cause problems if ingested in large amounts [194].

Drug interactions are similar to those described for TCAs and may occur with [163; 195]:

- Other antidepressants
- Asthma medications
- Cold, cough, allergy, sinus, and decongestant medications
- Diabetes medications
- Antihypertensives

- Mood stabilizers
- Painkillers and anesthetics
- Sedatives and tranquilizers
- Stimulants and street drugs
- Weight loss and appetite-suppression medications

MAOIs should also never be combined with SSRIs due to the risk of serotonin syndrome [159; 163]. Serotonin syndrome, or serotonin toxicity, results from an excess of serotogenic activity in the central nervous system. The symptoms include tachycardia, diaphoresis, hypertension, hyperthermia, clonus, and disseminated intravascular coagulation. It is seen only rarely in postpartum women, usually when multiple antidepressants, such as SSRIs, SNRIs, TCAs, MAOIs, and St. John's wort, are combined [159; 163].

Brexanolone

In 2019, the FDA approved the first drug specifically for the treatment of PPD [226]. Chemically, brexanolone is identical to endogenous allopregnanolone, a hormone that decreases after childbirth. It modulates GABA-A receptors, which become dysregulated in the postpartum period [163]. It is administered as a continuous IV infusion over a total of 60 hours (2.5 days) [226].

At the time of its approval, it is available only through a restricted program called the Zulresso Risk Evaluation and Mitigation Strategies Program that requires the drug be administered by a healthcare provider in a certified healthcare facility. Patients must be enrolled in the program prior to administration of the drug [226].

Benefits

Studies indicate that infusion of brexanolone results in a significant and clinically meaningful reduction in HAM-D total score in women with severe PPD, compared with placebo [227]. The drug appears to have a rapid onset of action and durable treatment response, adding a novel option for women with severe or refractory disease [227; 228].

Adverse Reactions

Side effects to brexanolone can occur after the infusion has concluded and the patient has been discharged home. Moderate effects include sedation, dizziness, faintness, xerostomia (dry mouth), and skin flushing. More serious and/or potentially life-threatening effects include loss of consciousness, severe sedation, anaphylaxis, and suicidal thoughts (particularly in those younger than 25 years of age) [238].

Risks

Brexanolone includes a black-box warning regarding the risk of serious harm due to the sudden loss of consciousness and for potential risk to children. During treatment, patients are monitored every two hours for loss of consciousness. If loss of consciousness occurs, treatment is immediately discontinued until the patient regains consciousness and symptoms resolve. Patients are also monitored for hypoxia via continuous pulse oximetry with alarm throughout treatment. If hypoxia develops, treatment is immediately terminated [239]. While receiving the infusion, patients must be accompanied during interactions with their child(ren). Patients should be counseled on the risks and instructed that they must be monitored for these effects at a healthcare facility for the entire 60 hours of infusion. Patients should not drive, operate machinery, or do other dangerous activities until feelings of sleepiness from the treatment have completely dissipated [226].

PSYCHOSOCIAL INTERVENTIONS

Individual Therapy

Often, individual therapy and antidepressant medications are combined in a treatment regimen. However, some women with PPD will respond well to psychotherapy alone [63]. The decision of whether to use a medication is based on a complex combination of factors that include the severity of symptoms, the individual's preferences, the response to other treatments or changes in support, and the risk of side effects. In many cases, support and education alone are not effective treatments for PPD, and medication

must be added. The presence of certain symptoms, such as loss of concentration, severe insomnia, confusion, extreme indecisiveness, and severe feelings of guilt, indicate that psychotherapy alone will not be a sufficient treatment option. It is important to remember that in severe cases of PPD, medications may contribute to a quicker, fuller, and longer-lasting recovery [63; 196].

Success has been reported with the use of interpersonal psychotherapy [66; 196]. However, it is unclear whether individual psychotherapy is effective prophylaxis to prevent recurrence of PPD in the five years after the initial onset of depression. Individual psychodynamic psychotherapy and cognitive behavioral therapy have also been effective in the treatment of PPD [196; 197; 198]. All women with PPD should be offered psychosocial treatment, and this is of particular urgency for women with severe symptoms or psychosis. Some women, however, may refuse treatment.

Group Therapy

As is well known, group therapy is an established form of professional treatment involving several individuals with similar issues meeting together at a specified time. The group is usually led by a singular therapist, but may include more than one group leader. Group therapy sessions may be limited to a specific number of meetings or may be ongoing. Meetings may be structured, with a set agenda or format for each group, or nondirective, with no specific topic except those issues that the participants decide to discuss. To obtain the best results, group therapy should be combined with individual psychotherapy rather than undertaken as a singular therapeutic regimen, especially for those depressed mothers who require individualized care.

The advantages of group therapy are that it is cost effective, reduces isolation, and offers support and empathy from others with similar problems. The disadvantages are that there is no one-on-one interaction between the therapist and each individual, and the group is not specifically tailored to meet each individual's particular needs [34]. Additionally, some mothers' childcare responsibilities may interfere with their ability to attend and participate in group therapy sessions [199]. A feasibility study on the effects of telecare therapy (i.e., a combination of cognitive-behavioral therapy, relaxation techniques, and problem-solving strategies) indicated that this may be an effective treatment option for women with PPD who are unable to attend group therapy sessions or support groups [200].

Support Groups

Social groups and self-help groups specifically established for women with PPD may be very helpful. These groups are not intended to provide therapeutic outcomes, but are created to provide support, empathetic listening, understanding, and information, all of which are important for depressed mothers. Women who wrote about their experiences with PPD specified that these groups gave them valuable practical guidance on day-to-day issues [11; 99].

Self-help groups for PPD are usually led by a woman who has personal experience with PPD. This woman shares her knowledge and experience as guidance for other women, helping them deal with PPD. Resources for treatment of PPD and practical advice are usually part of such groups. They are also beneficial experiences for those women who feel alone and isolated [63].

According to one study, social support groups did not positively affect depressive symptoms per se, but did have a positive effect on the mother-infant interaction [66]. Another small study found that depression scores following participation in a weekly peer support group were similar to a community sample [31]. Support groups and self-help groups are no substitute for formal treatment. Like group therapy, they are best used as an adjunct to traditional therapy and medical intervention.

Overall, both psychosocial (e.g., peer support, nondirective counseling) and psychologic (e.g., cognitive behavioral therapy, interpersonal psychotherapy) interventions have been found to be effective in reducing symptoms of PPD and, more recently, to be effective in preventing PPD [201]. These interventions significantly reduce the number of women who develop PPD. However, the long-term benefits are unknown and larger trials are needed to determine the specific benefits of each type of intervention [201; 202].

Psychiatric Hospitalization

Mothers suffering from severe mental illness in the postpartum period will inevitably require psychiatric hospitalization as part of their treatment. Unless the mother and infant are admitted together to a specialty unit, there may be little or no contact between them for several days or weeks. Separation of the mother and infant may have negative consequences [203]. However, the consequences (e.g., delayed bonding, cessation of breastfeeding) are secondary to the patient's and child's safety.

The physical separation of mother and infant protects the infant from the potential risks of interaction with a severely ill mother. However, separating mother and infant may have adverse effects on their subsequent relationship and the infant's socioemotional development. Although there are concerns about admitting infants with their mothers to psychiatric hospitals, there is no evidence of major disadvantages, and the advantages afforded to the mother and infant seem to be great [203].

Other concerns about the effects of separation include stunting of parenting skills and lack of infant attachment. These concerns have led mental health units in some countries to develop ways to provide psychiatric care for mentally ill mothers without separating them from their children [204].

Studies have shown that mothers separated from their infants during hospitalization have a longer duration of illness and experience greater difficulty bonding with their infants than mothers jointly admitted to a mother-baby unit. Most of the mothers admitted to a mother-baby unit showed a positive clinical outcome and were discharged home to care for their infant without further supervision. Mothers in a supportive social relationship had the best chance for a positive outcome [205].

Mother-baby units have been difficult to maintain in the United States. Although they offer significant advantages to mothers and families, data to support cost effectiveness are not available, which is a barrier to implementation [206]. As an example, the Women and Infant's Hospital, associated with Brown Medical School in Rhode Island, has operated since 1999. Services are provided in a mother-baby day hospital. The hospital admits both pregnant women with psychiatric problems and postpartum psychiatric patients for therapy [20].

PREVENTIVE STRATEGIES

Prevention of PPD is of utmost interest to researchers and clinicians, and it is clear that preventing severe depression would have clear benefits for mothers and children. Two barriers to effective and efficient postpartum care in the United States have been identified: the lack of parity between insurance coverage for mental and physical illnesses decreases access to care, and the current model of postpartum care fails to incorporate screening and follow-up. In developing a prevention model in the United States, these concerns should be taken into account. The types of prevention strategies employed should be determined by the risk factors with which a woman presents. Early detection and treatment are keys to a full recovery [207]. Healthcare professionals involved in childbirth education are in an excellent position to offer pregnant women anticipatory information about postpartum complications, including PPD [124].

SCREENING

An effort to place greater emphasis on identifying any previous psychiatric illness in pregnant women and their families, combined with the continuous observation of the psychologic well-being of women during pregnancy, will enable potential sufferers of PPD to receive treatment at the earliest possible stage. In addition to screening for PPD during pregnancy, screening at six weeks, three months, and six months postpartum should become routine. It remains the primary responsibility of physicians treating women of childbearing age to ensure that all healthcare professionals involved in prenatal care have a full knowledge of the devastating effects of PPD and actively work to detect women at risk as early as possible [10]. As noted, the EPDS is the most accepted and widely used screening tool available today and takes only a few minutes to administer. Having a standardized mechanism of screening available for all pregnant women should become the standard of care. Without a formal assessment, most depressive symptoms will remain undetected by primary care health professionals [201].

EVIDENCE-BASED PRACTICE RECOMMENDATION

The Scottish Intercollegiate Guidelines Network recommends inquiry about depressive symptoms should be made, at minimum, on booking in and postpartum at four to six weeks and three to four months.

(https://www.sign.ac.uk/assets/sign127_update.pdf. Last accessed March 27, 2020.)

Level of Evidence: D (Non-analytic studies or expert opinion)

POSTPARTUM DEBRIEFING

For all women who have given birth, prevention planning should consist of an unstructured debriefing in the postpartum ward by a nurse, midwife, or someone functioning in a similar capacity. Studies show that providing women the opportunity to talk about their feelings following delivery allows them to integrate and make sense of their birth experiences. One study of postpartum debriefing, which is regularly utilized in many British and Australian hospitals, showed that unstructured debriefing resulted in a significant decrease in the likelihood of depressive symptoms [207]. These results indicate that even a short meeting with a nurse or similar professional involving listening, support, counseling, and explanations may be sufficient to prevent PPD in some first-time mothers. Evidence in support of formal, structured debriefings is inconclusive [208; 209; 210].

COMPANIONSHIP IN THE DELIVERY ROOM

It is believed that negative perceptions of labor and delivery, particularly a lengthy or difficult labor, may be a precursor to developing PPD. It is also posited that not having a supportive companion during labor and delivery might place women at risk for PPD. This would suggest that preventive work can be carried out in the delivery room [207; 211; 212; 213].

One study examining companionship during labor and delivery designed an intervention involving a community volunteer to provide support during labor and delivery. The companion was instructed to use touch and verbal communication to comfort, reassure, and praise the woman. The study found that depression scores were significantly lower for women with a companion during labor and delivery compared to those women who did not have a companion [207]. A 2013 meta-analysis did not find evidence that companionship during delivery improved maternal mental health in the postpartum period, but the authors concluded that there was no harm with the use of support during childbirth and it could be considered due to the positive effects on the labor experience and newborn responsiveness [214]. They also state that "continuous support from a person who is present solely to provide support, is not a member of the woman's social network, is experienced in providing labor support, and has at least a modest amount of training, appears to be most beneficial" [214].

BRIEF PSYCHOTHERAPY

Interpersonal psychotherapy and cognitive behavioral therapy have been useful in preventing depression among at-risk persons. Consequently, there is interest in determining whether brief psychotherapy could be used to prevent PPD among predisposed women. In one study conducted among women who were considered at high risk for developing PPD, the effectiveness of group psychotherapy was tested [215]. Risk factors were identified as previous episodes of depression, mild-to-moderate levels of depressive symptoms, poor social support, and a life stressor within the past six months. The therapy consisted of four weekly, one-hour group sessions based on an interpersonal psychotherapy model. Each group was comprised of four to six women. The study found that improvement in depression scores was significantly greater among women in the intervention group compared to women receiving no therapy. Women receiving brief psychotherapy were significantly less likely to develop PPD. Authors of another study followed 34 women with perinatal depression through a nine-week cognitive behavioral therapy group program. On completion of the program, 80% of the women showed a clinically significant improvement in depressive symptoms as well as meaningful gains in social support, mother-infant bonding, and quality of partner relationship [216]. These findings suggest that brief group psychotherapy may be an effective prevention strategy for women who are at risk for PPD. However, more research is necessary to determine the usefulness of this treatment [216; 217].

A single, brief cognitive behavioral therapy session taking place prior to being discharged from the hospital has also been shown to be effective in preventing PPD in at-risk women. In this study, women were considered to be at-risk if they were experiencing elevated depressive symptoms shortly after birth. The therapy given was a one-hour, individual session consisting of education, support, empathetic listening, and a cognitive-behavioral approach to dealing with ideas of perfectionistic standards. The researchers concluded that a single, brief intervention provided to high-risk women focusing on education, support, and modification of maladaptive thoughts can help to reduce the incidence of PPD [207]. While long-term effectiveness remains unclear, psychosocial and psychologic interventions (i.e., professionally based postpartum home visits, telephone-based peer support, interpersonal psychotherapy) have been found to significantly reduce the number of women who develop PPD [201].

The Mother-Infant Dyad

Most interventions to prevent PPD focus on just the mother rather than on the mother-infant dyad. One study examined the effectiveness of practical resources for effective postpartum parenting, a new PPD prevention protocol that aims to treat women at risk for PPD by promoting maternally mediated behavioral changes in their infants, while also including mother-focused skills [218]. Fifty-four women were included in this randomized control trial. Results indicate that this novel, brief intervention was well tolerated and effective in reducing maternal symptoms of anxiety and depression, particularly at six weeks postpartum [218].

Another study tested perinatal dyadic psychotherapy (PDP), a dual-focused mother-infant intervention designed to prevent or decrease maternal PPD and improve aspects of the mother-infant relationship that are related to the child's development [219]. Forty-two first-time mothers with depressive symptoms (recruited from hospital postpartum units) and their 6-week-old infants were enrolled and randomized to receive either the PDP intervention or usual care plus depression monitoring by telephone. The PDP intervention consisted of eight home-based, nurse-delivered mother-infant sessions consisting of supportive, relationship-based, mother-infant psychotherapy and a developmentally based infant-oriented component focused on promoting positive mother-infant interactions. Measures of maternal depression, anxiety, self-esteem, parenting stress, and mother-infant interaction were collected at baseline, post-intervention, and three-month follow-up. Depression and anxiety symptoms and diagnoses decreased significantly and maternal self-esteem increased significantly across the study time frame, with no differences between the two groups.

There also were no significant differences between the groups on parenting stress or mother-infant interaction. No participants developed onset of PPD during the study. The authors concluded that although this novel intervention holds potential for treating depression in the context of the mother-infant relationship, usual care plus depression monitoring showed equal benefit [219]. Further research is needed.

A novel maternal-infant dyadic group therapy intervention was the focus of an open-label pilot study that targeted mothers with mood or anxiety disorders and their infants 6 to 12 months of age [220]. Three 12-week groups were conducted using evidence-based maternal and mother-infant dyadic strategies to enhance mood, insight, parenting, and mentalizing capacity. Outcome measures included recruitment and retention rates, reasons for nonparticipation, and missed sessions. Enhanced insight, parenting capacity, affect regulation, and positive interaction with the infant were supported with self-report surveys and interviews [220].

CONTINUITY OF CARE

Prevention studies involving care by midwives or other healthcare professionals suggest that the incidence of PPD in the general population may be reduced by providing personalized care to women in the hospital and at home after childbirth [201]. Continuity of care is ensured if the same professional provides personalized care during home visits. Ideally, the same nurse or midwife would provide care throughout the antepartum and postpartum periods, tailoring the care to the individual woman's needs rather than to a standardized care plan. A program focused on continuity of care, individualization, and emotional support has the potential to prevent or minimize the effects of PPD and could be implemented for many pregnant women [201; 207; 221; 222]. Home visits should become the standard of care of at-risk women [201].

Because women are more likely to be engaged with health care during pregnancy, those involved in their care have a unique opportunity. By emphasizing prevention, addressing disparities, and focusing on integrating behavioral healthcare into primary care settings, those involved in the care of women can dramatically and positively impact women's health [223].

PREVENTIVE HORMONE TREATMENT

The use of hormones in the prevention of recurrence of PPD was first reported in 1964 [10]. There is some conflicting evidence regarding the efficacy of progesterone and estrogen, and the use of synthetic progestins is associated with increased risk of developing PPD [155; 224].

If utilized, it is advised that, upon completion of labor, the patient is given 100 mg of progesterone by injection daily for seven days, followed by a 400 mg suppository twice daily until the return of menstruation. The dosage of suppositories may be increased if the mother experiences a return of mild early symptoms. Each woman should also be equipped with information about the symptoms of PPD [10]. At the end of two months, if menstruation has not begun and no symptoms appear, the number of suppositories may be reduced and then discontinued. If menstruation has begun and symptoms appear, progesterone should be given from day 14 of the cycle until the next menstruation. Natural progesterone should only be given in the prescribed method of administration. Studies have been conducted on progesterone preventive treatment in 1985, 1989, 1994, and 1995 [10]. In these studies, the prevention of symptom recurrence was 90% to 92% successful.

A comprehensive meta-analysis published in 2000 and updated in 2008 concluded that synthetic progestogens should be used with caution in the postpartum period and that the role of natural progesterone in the prevention and treatment of PPD requires further evaluation. Estrogen therapy was found to be of modest value for treatment of severe PPD, while its role in the prevention of recurrent PPD requires further research [46; 47; 155].

CONCLUSION

PPD is a major complication of childbirth. Given the potential negative consequences for the mother, baby, and entire family, early detection and treatment are essential. Studies have shown that PPD not only responds well to treatment, but is preventable [207]. Further, there is evidence that rates of PPD and severity of symptoms increased during the COVID-19 pandemic, attributed partially to pandemic-related stress and lack of available support [242; 243]. However, there remains a knowledge gap about PPD and its effects on women and children. This knowledge gap exists in most facets of society, including the healthcare sector. PPD remains a misunderstood illness that is often improperly diagnosed and treated.

All healthcare professionals who treat pregnant women should assess their patients for the early warning signs and risks of PPD and undertake the appropriate courses of action [124]. Devastating cases of suicide and infanticide can be prevented, and the potential harm to families through isolation and neglect can be minimized.

In addition to educating themselves, healthcare providers should educate all pregnant women about the symptoms of PPD and the resources available to treat it. Screening for PPD and education about PPD should become the standard for postpartum care.

GLOSSARY

Adrenal glands: A pair of small glands above each kidney responsible for producing numerous hormones, including adrenaline; also referred to as adrenals

Acetylcholine: A neurotransmitter released and hydrolyzed in certain synaptic transmissions of the nervous system and in the initiation of muscle contraction

Adrenaline: A neurotransmitter produced by the adrenal gland released in response to fear, heightened emotion, or other physiologic stresses

Amygdala: A group of neuronal nuclei in the dorsomedial temporal lobe that subserve informational learning in conjunction with the hippocampus

Brain stem: The portion of the brain, composed of the medulla oblongata, the pons, and the midbrain, that governs a variety of vegetative functions and contains sensory and motor fibers of passage

Cerebral cortex: The outermost region of the cerebrum, consisting of several dense layers of neural cell bodies and including numerous conscious centers; also referred to as gray matter

Circadian rhythm: A biologic rhythm about one day in length

Cortex: The outer layer of an organ, such as the brain

Corticosteroids: Hormones produced by the cortex of the adrenal glands

Cortisol: A steroid hormone produced and released by the adrenal gland that helps to regulate blood sugar, blood pressure, and bone growth as well as other functions

Dysphoria: A lowering of mood, characterized by malaise, unrest, or anxiety

Endocrine gland: An organ that releases hormones into the blood to act on distant cells

Endometrium: The inner lining of the uterus

Estrogen receptor: A protein on some cells to which an estrogen molecule can attach

Etiology: The causative agent of a disorder or disease

Follicle: A cyst or sac in which each egg in the ovary develops

Follicle-stimulating hormone (FSH): A hormone produced by the pituitary, acting on the ovary to ripen the follicles and produce estrogen

Gonadotrophin releasing hormone (GnRH): A hormone from the hypothalamus that stimulates the ovaries in women

Hippocampus: The area of the brain involved in learning and memory

Hormone receptors: Compounds that transport hormone molecules into the nucleus of cells

Human chorionic gonadotropin (hCG): The placental hormone of pregnancy

Hypothyroidism: An underactive thyroid function caused by abnormally low levels of circulating thyroid hormone; symptoms include physical and mental sluggishness, weight gain, hair loss, and infertility

Hypothalamus: A portion in the brain that produces hormones that initiate the reproductive cycle as well as other functions

Limbic system: A group of structures in the brain operating below the level of consciousness important in regulating such behavior as eating, drinking, aggression, sexual activity, and expressions of emotion; the emotional brain

Luteinizing hormone (LH): The hormone secreted by the pituitary that triggers ovulation and the production of progesterone

Menarche: The first menstruation at puberty

Menstrual clock: A specialized portion of the hypothalamus responsible for the cyclical timing of menstruation

Neurotransmitters: Chemical signals that communicate among neurons, resulting in electrical impulse activity, altered gene expression, growth, and survival

Oxytocin: A hormone produced by the pituitary gland that causes uterine contractions

Pituitary gland: A pea-sized gland located between and behind the eyes in the base of the brain that secretes hormones to control many other glands in the body, including ovaries, thyroid, and adrenal glands; it is controlled by the hypothalamus

Postpartum: The period following childbirth, generally considered to be six weeks

Progesterone: A hormone produced by the ovaries for the preparation of the lining of the uterus and the production of numerous corticosteroids

Steroids: A family of lipid molecules including cholesterol and the naturally-occurring hormones estrogen, progesterone, and testosterone

Synapse: The junction between nerve cells

Thyroid gland: A gland located in the neck in front and on each side of the trachea that secretes thyroxin and other hormones responsible for numerous metabolic and essential processes

RESOURCES

American College of Nurse-Midwives
http://www.midwife.org

National Institute of Mental Health
https://www.nimh.nih.gov

Postpartum Education for Parents
http://www.sbpep.org

Postpartum Support International
http://www.postpartum.net

U.S. Department of Health and Human Services Office on Women's Health
https://www.womenshealth.gov

APPENDIX

MISCONCEPTIONS AND MYTHS REGARDING PPD: PATIENT EDUCATION

Myth: *Women who have PPD are weak and lacking in character. They probably bring it on themselves.*

Fact: There are numerous factors that cause PPD. Women who have PPD are no weaker than any other women nor do they bring it on themselves.

Myth: *Depression is just an excuse to get out of difficult circumstances.*

Fact: Depression is not an excuse nor is it sought deliberately by any person. It happens to them. The sufferer should not be blamed for her depression.

Myth: *PPD is just a temporary sadness or something a woman can just "snap out of" and "pull herself together."*

Fact: PPD is not simply sadness or something a woman can just "snap out of." PPD can impair a woman's social and physical functioning to the point of disability and even suicide.

Myth: *There is nothing a medical professional can do about depression. It is untreatable.*

Fact: Depression is caused by an interaction of biologic and environmental influences. It is a treatable condition.

Myth: *Once depressed, it is a lifetime problem. The person never recovers.*

Fact: Depression can recur and seem to be a lifetime problem for some people. However, depression is a treatable illness, and the depressed person can recover and live a normal, healthy life.

Myth: *Women with PPD are demonstrating that they are self-centered and manipulative.*

Fact: Women with PPD are suffering an emotional disorder. Their symptoms are real, not manipulative.

Myth: *Depression does not require medical treatment. One can cure depression by will power, buying a new dress, throwing a party, drinking champagne, or taking a vacation.*

Fact: Depression requires medical treatment. Will power alone cannot cure depression, as it involves experiencing a lack of pleasure in things of everyday life such as shopping, partying, and vacations. Drinking alcoholic beverages can worsen depression.

Myth: *Medications used for treating depression are habit forming.*

Fact: Medications used for treating depression are not habit forming. As depression goes into remission, drugs can be tapered off and stopped.

Myth: *When a depressed mother expresses suicidal ideation, she has no intention of acting on them. She is probably just trying to get special attention.*

Fact: Suicide is always a risk with a mother who is depressed. Any expressed suicidal ideas should be taken seriously.

Myth: *People who do complete suicide just do it; they do not talk about it.*

Fact: People who complete suicide have generally given clues to their friends and family of their intentions. These clues are often not understood or not taken seriously.

Myth: *If a person is suspected of having suicidal thoughts, one should not talk about it as it will make it worse.*

Fact: An empathetic, tactful discussion about suicidal thoughts with a person who is depressed often alleviates the risk of suicide and assists the person to obtain appropriate medical care.

Myth: *Only women from lower socioeconomic levels suffer from PPD.*

Fact: Low socioeconomic status can be a factor for PPD; however, it affects women across all socioeconomic levels.

FACULTY BIOGRAPHY

Anele Runyion, RN, MS, received her diploma in nursing from Berea College School of Nursing in Berea, Kentucky. She subsequently received a Baccalaureate and Master's degree in psychiatric nursing from the University of California, San Francisco. She has extensive experience in psychiatric nursing, including adolescent and adult psychiatry.

For twenty years she was psychiatric nurse consultant and coordinator of psychiatric nursing consultation at San Francisco General Hospital. She was Assistant Clinical Professor in Mental Health, Community and Administrative Nursing at the University of California, San Francisco. She created and co-chaired a National Psychiatric Consultation/Liaison Conference in 1987, which provided continuing education in nursing. This conference meets annually and has subsequently become an international conference.

She created a brief curriculum and practicum in consultation/liaison nursing for graduate nursing students at UCSF that is currently being practiced. As a psychiatric nurse consultant, she assisted non-psychiatric nurses in the hospital to assimilate and integrate psychological principles into their practice. During this time, she developed a protocol for management of acute post-traumatic stress response. This protocol was adopted by the hospital as a standard care plan for nursing management of patients with acute post-traumatic stress response in the non-psychiatric areas of the hospital.

Ms. Runyion has published and spoken nationally. She was listed in Who's Who in American Nursing in 1991-1992 and 1996-97. Currently, she is a self-employed consultant and writer.

Implicit Bias in Health Care

The role of implicit biases on healthcare outcomes has become a concern, as there is some evidence that implicit biases contribute to health disparities, professionals' attitudes toward and interactions with patients, quality of care, diagnoses, and treatment decisions. This may produce differences in help-seeking, diagnoses, and ultimately treatments and interventions. Implicit biases may also unwittingly produce professional behaviors, attitudes, and interactions that reduce patients' trust and comfort with their provider, leading to earlier termination of visits and/or reduced adherence and follow-up. Disadvantaged groups are marginalized in the healthcare system and vulnerable on multiple levels; health professionals' implicit biases can further exacerbate these existing disadvantages.

Interventions or strategies designed to reduce implicit bias may be categorized as change-based or control-based. Change-based interventions focus on reducing or changing cognitive associations underlying implicit biases. These interventions might include challenging stereotypes. Conversely, control-based interventions involve reducing the effects of the implicit bias on the individual's behaviors. These strategies include increasing awareness of biased thoughts and responses. The two types of interventions are not mutually exclusive and may be used synergistically.

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