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The Risks Associated With Maternal Antidepressant Use During the Prenatal and Postnatal Stages of Development

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Over the past decade, maternal antidepressant use has skyrocketed in the United States. Maternal depression, which was once categorized as an extremely rare condition, is now the leading cause of disability in American women aged 18 to 44 (Stewart, 2005). In spite of the published data that document the risks associated with antidepressant use in maternal and pediatric populations, physicians throughout the United States continue to prescribe these drugs to pregnant and lactating women. Never before in the history of humankind have we witnessed the intentional drugging of pregnant women and nursing mothers in order to alleviate specific emotional feelings. This unprecedented drugging of maternal populations has led many in the scientific community to question the reliability of current-day depression assessments, as many scholars have pointed out that the available assessment tools are highly subjective and lack scientific validity. The goal of this article is to offer a scientifically sound alternative to the current medical model's definition and treatment of maternal depression and to explore the historical, neurological, hormonal, familial, political, economical, and cultural correlates that have been associated with maternal depression in the United States.

[AuQ1] **Keywords:**

While no one can confirm the exact number of pregnant women and/or nursing mothers who are currently prescribed antidepressants in the United States, it is certain that prescriptions for antidepressants among maternal populations have increased dramatically over the past decade (Mills, 2006). Relatively recently, the pharmaceutical industry has inundated the American consumer with advertisements for a plethora of antidepressant medications. In tandem, the media have heralded that antidepressants are safe for mothers and their developing babies in spite of the fact that a multitude of scientific research has documented the deleterious effects of such drugs (Breggin & Breggin, 2008; Einarson, Schachtschneider, Halil, Bollano, & Koren, 2005; Mills, 2006).

Throughout evolutionary time, mammalian mothers have experienced profound hormonal alterations during pregnancy and during the postpartum stage of development. These primordial, physiological alterations were not, for the majority of historical time, considered to be a symptom of a mental disorder but were widely accepted as an integral component of the maternal life course. According to ethological data, maternal hormonal alterations are part of our evolutionary heritage and have been documented across cultures, across time, and across mammalian species (Stuart-Macadam & Dettwyler, 1995).

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What *has* been altered over the past 10 to 20 years is the West's *perception* of maternal hormonal alterations. The Western medical model has recently constructed a paradigm that suggests that shifting moods during pregnancy and the postpartum period are indicators of a serious chemical imbalance in the brain. What was once viewed as a normative developmental stage has now been redefined as a mental disorder that requires dangerous and addictive pharmaceutical drugs in order to control undesirable emotions. The medical community and the pharmaceutical industry have recently joined forces in order to add credence to the theory that a chemical imbalance is responsible for fluctuating maternal moods in spite of the fact that not a shred of scientific evidence exists to support this theory (Breggin, 2001).

How did we convince a whole generation of Americans that pregnancy and the postpartum period require antidepressant drugs? If the disordered brain hypothesis is correct, what mechanism could possibly be responsible for altering the human brain over the past decade? The answer is of course that the maternal brain has not been recently recalibrated, nor are millions of maternal brains "chemically imbalanced." Many Americans have swallowed the myth of the "chemical imbalance" hypothesis, yet few are informed that there are no empirical tests known that can verify the existence of a "chemical imbalance" in the human brain (Breggin, 2001). Maternal depression has no physical or metabolic markers, and, as a result, there are no medical tests that can confirm the existence of maternal depression. Rather, the diagnosis of depression is based solely on the existence of specific feelings and/or thoughts that last for 2 weeks or more (American Psychiatric Association, 1994). [AuQ2]

According to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV,* American Psychiatric Association, 1994), depression is diagnosed via a checklist that documents particular feelings and/or behavior patterns. Symptoms of depression include changes in sleep patterns; feelings of worthlessness; difficulty thinking, concentrating, or making decisions; sadness; helplessness; or "feeling down in the dumps" (American Psychiatric Association, 1994, p. 349). While it is certain that physicians and the pharmaceutical industry promote the theory that a biochemical, neurological imbalance is responsible for the previously mentioned feelings, the fact of the matter is that the scientific community does not possess the technological capacity to measure neurotransmission or synaptic concentrations in the human brain (Breggin & Cohen, 1999).

While no one is suggesting that mothers do not experience changes in sleep patterns, feelings of worthlessness, difficulty concentrating, sadness, or feeling down in the dumps, many scientists *are* questioning the use of antidepressants as the standard method of treatment for maternal emotional distress (Breggin, 2001; Stolzer, 2005). Clearly, American [AuQ3] mothers have become dependent on antidepressant drugs in order to alleviate the wide-ranging emotions associated with the maternal condition, yet few are cognizant of the risks associated with such drugs.

RISKS ASSOCIATED WITH ANTIDEPRESSANT USE DURING PREGNANCY

According to epidemiological studies, depression is the leading cause of disability among American women aged 18 to 44, and the vast majority of women diagnosed with depression are treated with antidepressant drugs (Stewart, 2005). This should come as no surprise,

as, according to Breggin and Breggin (2008), hundreds of articles have been published around the world that have proclaimed that antidepressants are safe for mothers and their developing babies. However, to date, there exist no significantly powerful, double-blind, randomized controlled trials to substantiate the safety claims made by the media or by those within the medical community (Hallberg & Sjoblom, 2004; Zeskind & Stephens, 2004).

Chambers, Hernandez-Diaz, and Van Marter (2006) reported a significant association between the use of antidepressants after the 20th week of pregnancy and persistent pulmonary hypertension (PPHN) in the newborn. PPHN is a serious medical condition that results in low blood flow to the lungs and the circulatory system. PPHN has also been significantly correlated with cognitive delays, neurological abnormalities, hearing loss, and death (Lipkin et al., 2002). In 2005, the Food and Drug Administration (FDA) issued a report that concluded that the use of antidepressants by pregnant women was associated with an increase in birth defects (FDA, 2005), while Health Canada has issued warnings that the use of antidepressants may result in feeding problems, jitteriness, respiratory distress, and seizures in the newborn (Moses-Kolko, Bogen, & Perel, 2005).

Determining the actual number of infants that are exposed to antidepressant drugs in utero is extremely difficult as evidenced by a published FDA panel report in 2004, but researchers have speculated that the numbers have increased dramatically over the past decade (Mills, 2006; Pediatrics Subcommittee of the Anti-Infective Drugs Advisory Committee, 2004). While antidepressant use in maternal populations continues to grow at an alarming rate, researchers have begun to openly question the safety of such drugs for maternal and pediatric populations.

Wogelius et al. (2006) concluded that there is an increased risk of congenital malformations after exposure to antidepressants in early pregnancy, while Louik, Lin, Werler, Hernandez-Diaz, and Mitchell (2007) found significant increases in cardiac defects in the newborn. Major cardiac malformations in the neonate have also been reported when maternal antidepressant use in the first trimester (Bernard et al., 2007).

According to research published in the *American Journal of Psychiatry,* Suri et al. (2007) found that prenatal antidepressant use is associated with lower gestational age at birth and an increased risk of premature birth. Interestingly, Suri et al. concluded that the presence of depressive symptoms alone (i.e., depression with no medication) was in no way correlated with the risk of lower gestational age at birth or with an increase of preterm birth. Further scientific evidence suggests that maternal antidepressant use is also significantly correlated with respiratory complications, convulsions, and hypoglycemia in the newborn (Kallen, 2004; Oberlander, Warburton, Misri, Aghajanian, & Hertzman, 2006).

Antidepressants "work" by increasing the levels of synthetic serotonin in the brain. However, when serotonergic processes are overstimulated artificially, they tend to become *less* reactive (Breggin & Cohen, 1999). This artificially induced brain damage produces effects very similar to that of amphetamine or methamphetamine use and has been correlated with manic psychosis, suicidality, loss of impulse control, agitation, violence, anxiety, and a marked decrease in nurturing behaviors (Breggin & Cohen, 1999). All classifications of antidepressants have been shown to cross the placenta, and it can be deduced that the detrimental side effects of such classifications of drugs are more pronounced in the

neonate than in maternal populations (Breggin & Cohen, 1999; Koren, Matsui, Einarson, Knoppert, & Steiner, 2005).

Rahimi, Nikfar, and Abdullah (2006) conducted a meta-analysis of data from multiple clinical studies and found that maternal antidepressant use is significantly correlated with spontaneous abortion. Thormahlen (2006) concluded that there are significant adverse effects associated with maternal antidepressant use that include but are not limited to poor neonatal adaptation, irritability, lethargy, and tremors.

Alwan, Reffhuis, Rassmussen, Olney, and Friedman (2007) demonstrated that maternal antidepressant use in the first trimester is associated with a pediatric condition known as anencephaly (i.e., being born without a forebrain). Anencephaly is a fatal defect and is 2.4 times greater in women who had taken antidepressants early in pregnancy. Alwan and colleagues also found that maternal antidepressant use is significantly related to delayed bone development (ossification) in the neonate.

Withdrawal symptoms are routinely reported in pediatric populations who were exposed to antidepressants in utero. According to the medical literature, the most common withdrawal symptoms include irritability, high-pitched or weak crying, poor muscle tone, hypertensive crisis, tremoring, tachycardia, sleep disturbances, rapid respiration, bowel obstruction, respiratory complications, and increased rates of admission to neonatal intensive care (Breggin & Breggin, 2008; Levinson-Castiel, Merlob, Linder, Sirota, & Klinger, 2006; Slightly & Ruiz, 2001). [AuQ4]

According to Fogel (2006), the kidneys, central nervous system, and the liver are the least developed organs in the neonate and are, consequently, the organs most dramatically affected by maternal drug use during the prenatal stages of development. Proponents of maternal antidepressant use often neglect to inform the public that (a) the dosage of the drug(s) administered to the pregnant woman is based on maternal weight, which is often 20 to 30 times that of the developing infant, and that (b) as a result of ongoing physiological development, the unborn baby is much more susceptible than the mother is to the teratogenic effects associated with maternal drug use (Fogel, 2006). [AuQ5]

POSTPARTUM DEPRESSION

Mothers throughout the world experience pronounced emotional changes after giving birth. According to published research, approximately two-thirds of all new mothers experience episodes of crying, confusion, mood swings, and depressed moods that typically begin without warning (O'Hara, Schlechte, Lewis, & Varner, 1991; Yalom, 1968). Throughout human history, female family members, female friends, and doulas helped women understand that these negative emotional states were transitory and that they were a normative part of the maternal experience. Only recently have the medical community and the pharmaceutical industry redefined these maternal emotions as indicators of a "chemical imbalance" that require daily doses of dangerous and addictive drugs.

Across mammals, across historical time, and across cultures, the perinatal and postnatal stages of development have been universally defined as a major developmental transition. New roles are formed, new responsibilities are apparent, and sacrifices that were once never contemplated need to be made. Bringing a new life into the world is permeated by powerful and primordial emotions that range from ecstasy to despair. Having a child is a

life-altering experience, and the emotions that accompany this experience indelibly alter the maternal life course (Fogel, 2006). According to researchers, fear, anxiety, sleeplessness, confusion, and sadness are normative components of the postpartum period (Fogel, 2006; Westbrook, 1978). All mammalian mothers must go through a transitory period, and this period is often marked by uncomfortable emotions. Only in the recent past has this unique transitory developmental stage been redefined as a "mental disorder" that requires pharmaceutical intervention.

Conception, pregnancy, birth, and lactation are intrinsically intertwined variables [AuQ6] (Stolzer, 2005). These ancient physiological mammalian processes have been altered greatly over the past 100 years because of the interference of the medical community, societal pressures, and specific cultural belief systems (Stuart-Macadam & Dettwyler, 1995; [AuQ7] Stolzer, 2005). The mother and child share a unique physiologic interdependence, as each requires the other if optimal developmental processes are to occur (Stuart-Macadam & Dettwyler, 1999). Breast feeding is a critical component of this mother–child interdependence and has been referred to by the surgeon general of the United States as one of the most important contributors to maternal and infant health (U.S. Department of Health and Human Services, 2000).

Decades of research has demonstrated that physicians educated in the United States have little if any training in the area of human lactation (Freed et al., 1995; Stolzer & Hossain, 2005, 2006). If comprehensive lactation education were required in American medical schools, physicians would be equipped to impart critical information to their female patients regarding the integral role that breast feeding plays in preventing postpartum depression. During the act of breast feeding, the pituitary gland releases two very powerful hormones called oxytocin and prolactin. Prolactin has been referred to in the medical literature as the "mothering hormone," as it has been significantly associated with maternal relaxation and maternal desire to stay in close physical proximity to her offspring (Lawrence, 1989; Sobrinho, 1993). Prolactin has also been found to inhibit aggression and to significantly reduce anxiety (Uvnäs-Moberg, Widstrom, Nissen, & Bjorvell, 1990).

Oxytocin and prolactin are both dose–response-specific variables, as the amount of these hormones manufactured in the maternal bloodstream is dependent on the frequency and duration of breast-feeding behaviors (Lawrence, 1989; Stuart-Macadam & Dettwyler, 1995). Considerable medical data confirm that these hormones increase maternal responsiveness and nurturance and decrease negative moods in maternal populations (Insel & Shapiro, 1992; Newton, 1971).

While the media continue to inundate the American consumer with advertisements for antidepressant drugs, the American Medical Association has consistently remained silent about the empirical data that demonstrate that exclusive and long-term breast feeding significantly decreases maternal depression. Lothian's (2005) research clearly demonstrates that oxytocin is highly correlated with maternal serenity and responsiveness, while Insel and Shapiro (1992) concluded that high circulating levels of oxytocin lead to generalized feelings of well-being and contentment in the lactating mother.

Klaus (1998) has suggested that breast feeding biochemically facilitates optimal attachment between mother and baby and increases maternal feelings of competency and emotional well-being. Sarnyai and Klovacs (1994) found that secreting high levels S__ of oxytocin in the maternal bloodstream is strongly correlated with decreased drug E__ dependency in maternal populations. Other researchers have called oxytocin a highly L__

effective antistress system that can prevent a multitude of diseases in maternal populations (Buckley, 2002). [AuQ8]

Oxytocin, a nanopeptide hormone, has been found to positively influence maternal behavior patterns, and the amount of oxytocin in the maternal bloodstream has been shown to depend on the intensity, frequency, and duration of breast-feeding behaviors (Insel & Shapiro, 1992; Levine, Orna-Zagoory, Feldman & Weller, 2007). Supplementing human milk with formula, day care, scheduled feedings, pacifier use, and unisleeping patterns have all been found to decrease oxytocin levels in lactating humans (Johnston & Amico, 1986; Stuart-Macadam & Dettwyler, 1995).

Extensive epidemiological data demonstrate that oxytocin acts as a natural antidepressant, lowers blood pressure and corticosterone levels, and induces an anti-stresslike pattern through decreased activity in the sympathetic nervous system (Bertolini, 1987; Uvnäs-Moberg & Petersson, 2005). In addition, women who practice exclusive and long-term breast feeding are rated as more calm and socially interactive as measured by the Karolinska Personality Inventory Scale (Uvnäs-Moberg & Petersson, 2005).

The medical literature has clearly established that oxytocin levels are significantly lower in patients who have been diagnosed with major depression (Frasch, Zetzsche, & Jirikowski, 1995). If indeed we are serious in our endeavor to alleviate the symptoms associated with maternal depression as outlined in the *DSM-IV,* perhaps we could begin by demanding that the medical community be informed of the empirical data that demonstrate the protective effects associated with exclusive and long-term breast feeding and the unique role that oxytocin and prolactin play in preventing depression in maternal populations.

RISKS ASSOCIATED WITH ANTIDEPRESSANT USE

According to the published data, antidepressant use has been associated with an increase in suicidal thoughts, bleeding events, anxiety, nervousness, insomnia, weight loss, mania, headache, difficulty concentrating, confusion, hallucinations, seizures, sexual dysfunction, respiratory failure, and liver disease (Sandoz Corporation, 2009). Other side effects of antidepressant use include cardiovascular irregularities, nausea, diarrhea, tremors, weight gain, rectal hemorrhage, agitation, amnesia, acute brain syndrome, vertigo, panic attacks, psychosis, neurosis, paranoid reactions, hostility, eye hemorrhage, and death (Glaxo Smith Kline, 2009; Sandoz Corporation, 2009).

The data explicitly states that the effects of antidepressants on labor and delivery are unknown in humans and that, since it is known that all classifications of antidepressants cross the placenta, adverse effects are possible in the newborn (Sandoz Corporation, 2009). Because antidepressants are excreted in human milk, antidepressant use in lactating mothers should be avoided (Glaxo Smith Kline, 2009; Sandoz Corporation, 2009).

Accurate estimates of the pediatric risks associated with maternal antidepressant use are extremely difficult to obtain as published risks are based on controlled trials and do not take into account drug dosage, detection techniques, setting, or physician judgment (Glaxo Smith Kline, 2009).

The fact of the matter is that although physicians across the United States continue to prescribe antidepressants to pregnant women and nursing mothers, the FDA has not

approved any antidepressants for use during pregnancy or lactation (Breggin & Cohen, 1999), nor does the pharmaceutical industry recommend antidepressant use for pregnant or lactating women (Glaxo Smith Kline, 2009; Sandoz Corporation, 2009).

THE PHARMACEUTICAL INDUSTRY AND THE MEDICAL COMMUNITY

In order to understand the meteoric rise in maternal antidepressant use over the past decade, one must be aware of the financial alliance that exists between the pharmaceutical industry and the medical community. It is common knowledge that the pharmaceutical industry routinely funds major medical conferences and is the major funding source for research in the mental illness arena. Furthermore, over the past decade, it has become standard practice for the most elite American medical journals to carry advertisements for a multitude of antidepressant medications (Breggin & Cohen, 1999).

It is also worth noting that the pharmaceutical industry contributes more than $1 million a year to the American Academy of Pediatrics in the form of a renewable grant. In addition, published data confirm that the pharmaceutical industry contributed more than $3 million to the building fund for the American Academy of Pediatrics headquarters in the state of Illinois (Baumslag & Michels, 1995). Other groups that accept financial support from the pharmaceutical industry include the Association of Women's Health, Obstetric and Neonatal Nurses, the American Psychiatric Association, the National Association of Neonatal Nurses, and the American Medical Association (Baumslag & Michels, 1995; Breggin & Cohen, 1999).

Individuals also benefit financially from their alliance with the pharmaceutical industry. Medical students and individual physicians routinely receive school loans, grants, payment for journal articles, gifts, and/or trips to medical conferences. In addition, it has been documented that outright cash has been given to physicians who will recommend specific classifications of drugs (Baumslag & Michels, 1995). In the early 1990s, Margolis (1991) reported that the pharmaceutical industry spends $6,000 to $8,000 in promotion per doctor per year. Margolis goes on to state that "the acceptance of gifts in virtually any form violates the fundamental duties of the physician of nonmaleficence, fidelity, justice and self improvement; the medical community must articulate this position clearly, and it should act accordingly" (p. 51).

According to Breggin and Cohen (1999), psychiatrists often get phone calls from pharmaceutical representatives asking them to accept $100 for listening to a didactic program initiated by the pharmaceutical industry in order to sell specific drugs. Free dinners are also customary, and, amazingly, these dinners and/or "educational" phone calls qualify as continuing medical education credits for physicians. In addition, medical textbooks are often written by pharmaceutical advocates, and it has been documented that these textbooks routinely omit or negate the empirical evidence that documents the risks associated with antidepressant drugs (Breggin & Cohen, 1999).

The time has come to demand that the financial alliance between the pharmaceutical industry and the medical community be severed. Patients have a fundamental right to informed consent and to scientifically based information surrounding the risks associated with antidepressant drugs. Of course, women have a right to choose what drugs they ingest, yet at the present time that choice is an illusion because facts are being

systematically withheld by physicians and pharmaceutical companies alike. The doctrine of informed consent is an integral component of the physician–patient relationship. Providing patients with nonbiased, scientifically substantiated information regarding the risks associated with antidepressant drug use would ensure that the doctrine of informed consent is being properly implemented and that women are making informed decisions relative to their health and the health of their children.

ALTERNATIVES TO MATERNAL ANTIDEPRESSANT USE

Data confirm that approximately two-thirds of women around the world will experience depressed emotional states after the birth of a baby (O'Hara et al., 1991). Crying, fluctuating moods, confusion, sadness, and depression have all been documented in maternal populations during the postpartum period. Although research indicates that maternal depression has been correlated with variables such as life stressors, lack of social support, financial uncertainty, and poor marital quality, transitory hormonal shifts are also significant predictors of depressive states in maternal populations (Green, 1998; Loh & Vostanis, 2004).

While it is certain that pharmacological intervention is now widely accepted as the gold standard for treating maternal depression, there are several other alternatives available that do not involve the use of dangerous and addictive drugs. Exercise, exclusive and long-term breast feeding, informal social support groups, and supportive friends and family members have all been found to be effective tools in combating maternal depression (Breggin & Breggin, 2008; Insel & Shapiro, 1992; Newton, 1971; Uvnäs-Moberg et al., 1990).

It has been clearly established that antidepressant medications can cause serious and life-threatening complications in maternal and pediatric populations (Breggin & Cohen, 1999; Chambers et al., 2006; Koren et al., 2005; Sandoz Corporation, 2009). For those women who have difficulty overcoming prenatal or postnatal depression, talk therapy has been found to be an extremely safe and effective alternative to dangerous and addictive antidepressant drugs. Leichsenring and Rabung (2008) looked at the effectiveness of long-term psychodynamic psychotherapy and concluded that according to a comparative analyses of controlled trials, long-term psychotherapy was extremely effective in combating maternal depression.

O'Hara, Stuart, Gorman, and Wenzel (2000) found that for postpartum women meeting the *DSM-IV* criteria for major depression, interpersonal psychotherapy is an effective treatment that does not involve risks for maternal and pediatric populations. According to O'Hara and colleagues, interpersonal psychotherapy significantly reduces depressive symptoms and improves social functioning. Additional research provides evidence that postpartum depression improves with in home nurse visits and group therapy (Gjerdingen, 2003).

Charbol et al. (2002) conducted a controlled, randomized study that found that cognitive-behavioral therapy was significantly correlated with the prevention and treatment of postpartum depression. Other researchers have concluded that intensive talk therapy is an effective method of antidepressant treatment during pregnancy and therefore should be considered an efficacious and scientifically validated means of overcoming depression in maternal populations (Spinelli & Endicott, 2003).

According to the literature, there are many safe and effective ways of dealing with maternal depression that do not include the use of psychotropic drugs (Breggin & Breggin, 2008; Gjerdingen, 2003; Leichsenring & Rabung, 2008). Perhaps it is time that physicians across the United States begin to inform their patients of the myriad of ways to treat maternal depression that do not include pharmacological intervention. If indeed the oath "do no harm" is to be taken seriously, we should expect no less from our esteemed medical professionals.

CONCLUSION

The alarming rates of maternal antidepressant use in the United States is due in part to the widespread acceptance of a pseudotheory that insists that depression is the result of a serotonergic imbalance in the human brain. The fact of the matter is there is no way to identify neurotransmitter imbalance (i.e., a "chemical imbalance"), nor is there any scientific proof that a monamine deficit exists (Breggin, 2001; Stahl, 2000). Physicians and pharmaceutical companies alike continue to perpetuate this glaringly evident pseudoscience in spite of the volumes of empirical research that refute the validity of the neurobiochemical imbalance theory (Breggin, 2001; Stahl, 2000). The pharmaceutical industry, the medical community, and the mass media have created a blitz in the American consciousness as they actively perpetuate the theory that a biochemical atrophy is responsible for uncomfortable emotional feelings. Interestingly, what is consistently kept secret from the American public is the data that document that antidepressant drugs are no more effective than active placebos in combating depression in human beings (Healy, 1999; Moncrieff, 2007).

No matter what the prevailing theory is regarding depression, the fact remains that antidepressant use in pregnant women and nursing mothers is extremely dangerous. All antidepressant classifications of drugs cross the placenta and enter into the fetal bloodstream, thus affecting the neurological functioning of the unborn baby. Furthermore, antidepressant drugs are detected in maternal milk and have the potential to cause serious and life-threatening effects in the infant (Breggin & Cohen, 1999; Glaxo Smith Kline, 2009; Sandoz Corporation, 2009).

Significant withdrawal effects from antidepressants continue to be reported in the literature. Problems with balance, sensory abnormalities, aggression, impulsivity, sleep disturbances, anxiety, agitation, uncontrolled crying, depersonalization, mood fluctuations, abnormal movements, and hyperactivity have all been documented in individuals who are discontinuing antidepressant drugs (Breggin & Cohen, 1999). Instead of informing patients that these symptoms are the result of antidepressant withdrawal, the majority of physicians will provide additional psychotropic drugs in order to alleviate the symptoms brought on by the initial prescription of antidepressant drugs, thus adding additional risk potential in maternal and pediatric populations (Breggin & Cohen, 1999).

The time has come to demand that empirical, nonbiased scientific research is guiding conventional therapeutic practice. No one is disputing that maternal depression exists. The conflict arises over the *cause* and *treatment* of maternal depression. Proponents of the mainstream medical model insist that a "chemical imbalance" is responsible for depressed emotional states and that brain-altering drugs are needed in order to correct this neurological imbalance in spite of the fact that data do not support this hypothesis.

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Holistically centered models vehemently object to the suggestion that multifarious human emotions can be explained by a simple and reductionistic biochemical abnormality. Humans are extraordinarily complex creatures that are influenced by a myriad of factors. Diet, exercise, social relationships, evolutionary predisposition, economics, familial processes, historical time, spiritual functioning, hormonal fluctuations, and specific cultural dictums have all been found to influence emotional processing. According to holistic theory, in order to change specific emotional feelings, one must alter behavior patterns at both the micro and the macro level of human existence. Of course, the acceptance of the medical model's explanation of depression is much more convenient, as the prescribed treatment is to swallow a pill to alleviate emotional distress. More holistically centered treatments require an internal locus of control and huge amounts of determination and perseverance in order to construct and maintain a healthy emotional balance.

The bottom line is that we must begin to educate the public regarding the serious risks associated with antidepressant use in pregnant and nursing women. No antidepressant drugs have been approved by the FDA for the treatment of depression during pregnancy or lactation, and it is time that this fact is known. We can state unequivocally that we simply do not know all the immediate or long-term risks associated with antidepressant use during the prenatal or postnatal stages of development. What we do know is that pregnancy and lactation are unique periods in the maternal life course and a time when most women are in frequent contact with medical providers (Stewart, 2005). The time has come to utilize the knowledge we have gained thus far, to implement the doctrine of informed consent, and to demand that women are educated about alternatives to dangerous and addictive antidepressant medications during the prenatal and postnatal stages of development. We should expect no less.

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[AuQ1] Please provide 4 to six keywords for article.

[AuQ2] Author: In the third paragraph, the DSM fourth edition was published in 1994. I changed this throughout. Okay?

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