



E-Cigarette Use and Other Nicotine Replacement Therapies During Pregnancy

An important and potentially controversial issue is the use of e-cigarettes during pregnancy. The problem with trying to determine their safety and implications is that e-cigarette use in pregnancy has hardly been studied. Although e-cigarettes may be safer than real cigarettes, understanding that nicotine is highly addictive, is present in unregulated amounts in e-cigarettes, and is readily absorbed into the body is important

All e-cigarettes basically work the same way: Inside, there's a battery, a heating element, and a cartridge that holds nicotine and other liquids and flavorings. Some e-cigarettes are disposable while others have a rechargeable battery and refillable cartridges. E-cigarettes produce a vapor that looks like smoke.

There is a wealth of information regarding tobacco smoking's harmful effects on pregnancy outcome. The US Food and Drug Administration classifies nicotine as a Pregnancy Category D drug, meaning that it is considered toxic. Animal studies have indicated that nicotine is harmful to both the mother and developing fetus, adversely affecting the fetus' developing central nervous system. However, the question remains as to whether it's the nicotine or the other elements of tobacco smoke that are so harmful in human studies. Cigarette smoking delivers thousands of chemicals, some of which are well-documented reproductive toxins (for example, carbon monoxide and lead). Studies have documented a wide range of abnormalities at the cellular level in placentas, fetuses, and newborns of pregnant women who smoke. The multiple toxins in cigarette smoke, rather than nicotine, are likely responsible for a great number of the adverse reproductive outcomes associated with smoking.

With this in mind, it *may* be that e-cigarettes are safer than regular cigarettes. The greatest danger from tobacco is the smoke, and e-cigarettes don't burn. Tests show the levels of dangerous chemicals they emit are a fraction of what one gets from a real cigarette. However, there are still several questions that remain unanswered:

- What are the potential risks of e-cigarettes when they are used as intended?
- How much nicotine or other potentially harmful chemicals are being inhaled during use?
- Are there clear benefits associated with using e-cigarettes?
- What impact does using an e-cigarette have on pregnancy and child outcomes?

Questions also arise regarding e-cigarettes and breastfeeding. Certainly, e-cigarettes would avoid second hand smoke inhalation by the infant and prevent the possibility of cigarette ashes burning the baby. The limited available data indicate that minimal amounts of nicotine are excreted into breast milk and that breastfeeding mothers can use various forms of nicotine replacement therapy safely.



Here is what it comes down to:

- Cigarette smoking during pregnancy is responsible for a great deal of maternal and infant illness and death in the United States.
- Quitting smoking is one of the best things women can do for their pregnancy and their baby. But, addiction to nicotine prevents many pregnant women who wish to quit smoking from doing so.
- The safety and efficacy of nicotine replacement therapy to help pregnant women stop smoking has not been well studied.

Conclusion

What do we do with this information? We need good, well-designed studies of nicotine replacement therapy in pregnancy. These studies should include gum, spray, e-cigarettes, and transdermal patches. Of these options, the formulations that provide nicotine intermittently (gum, spray, e-cigarettes) would be preferable to the transdermal patch, which delivers nicotine continuously. Make no mistake, though: the nicotine inside the e-cigarette cartridges is addictive. When users stop using it, they can have withdrawal symptoms including feeling irritable, depressed, restless and anxious. An infant who is abruptly cut off from nicotine, whether at birth or at cessation of breastfeeding, can display these same symptoms of withdrawal.

The effects of e-cigarettes on a pregnant woman's and fetal health have yet to be determined and should not be considered a "safe" alternative to cigarettes until more is known about them.