Distance Learning Campbell Week 4 Assign. 3 Nicotine Article Questions

**Directions:**

Read the article and answer the six questions that follow in **complete sentences.** I will send work back for grammar and sentence structure revisions.

**As the vaping epidemic continues**, **researchers point to well-known health risks associated with nicotine.**

Data show clearly that [young people are vaping](https://www.yalemedicine.org/stories/teen-vaping/) in record numbers. And despite the onslaught of reports and articles highlighting not only its dangers but the marketing tactics seemingly aimed to hook teens and young adults, the number of vaping users continues to climb.

These teens may be overlooking (or underestimating**)** a key ingredient in the vapors they inhale: nicotine. Though it’s possible to buy liquid or pod refills without nicotine, the truth is you have to look much harder to find them. Teens may not realize that nicotine is deeply addictive. What’s more, studies show that young people who vape are far likelier to move on to cigarettes, which cause cancer and other diseases.

**So, why is nicotine so addictive for teens?**

Nicotine can spell trouble at any life stage, but it is particularly dangerous before the brain is fully developed, which happens around age 25.

“Adolescents don’t think they will get addicted to nicotine, but when they do want to stop, they find it’s very difficult,” says Yale neuroscientist Marina Picciotto, PhD, who has studied the basic science behind nicotine addiction for decades. A key reason for this is that “the adolescent brain is more sensitive to rewards,” she explains.

The reward system, called the mesolimbic dopamine system, is one of the more primitive parts of the brain. It developed as a positive reinforcement for behavior we need to survive, like eating. Because the mechanism is so engrained in the brain, it is especially hard to resist.

When a teen inhales vapor laced with nicotine, the drug is quickly absorbed through the blood vessels lining the lungs. It reaches the brain in about 10 seconds. There, nicotine particles fit lock-and-key into a type of acetylcholine receptor located on neurons (nerve cells) throughout the brain.

**Physical changes caused by nicotine**

Nicotine can also cause physical changes in the brain, some temporary, and others that some researchers, like Picciotto, worry could be long-lasting.

Decades of cigarette smoking research have shown that, in the short term, the number of acetylcholine receptors in the brain increases as the brain is continuously exposed to nicotine. The fact that there are more of these receptors may make nicotine cravings all the more intense. However, those same studies found that the number of receptors decreases after the brain is no longer exposed to nicotine, meaning that these changes can be reversed.

But animal studies show nicotine also can cause issues with brain function, leading to problems with focus, memory, and learning—and these may be long-lasting. In animals, nicotine can cause a developing brain to have an increased number of connections between cells in the cerebral cortex region, says Picciotto. “If this is also true for humans, the increased connections would interfere with a person’s cognitive (learning) abilities,” Picciotto says.

To illustrate how this might work, Picciotto gives an example. A student sitting in a noisy classroom, with traffic passing by the window, needs to be able to focus her attention away from the distracting sounds so she can understand what the teacher says. “Brains not exposed to nicotine learn to decrease connections, and refinement within the brain can happen efficiently,” Picciotto says. “But when you flood the system with nicotine, this refinement doesn’t happen as efficiently.”

<https://www.yalemedicine.org/stories/vaping-nicotine-addiction/>

[*To learn more visit yalemedicine.org.*](https://www.yalemedicine.org/stories/)

Questions (6):

1. What is the highly addictive ingredient in many vaping products?
2. Why are teen more likely to buy vapors with nicotine than without nicotine?
3. What organ does the nicotine pass through to get to the brain?
4. How long does it take nicotine to reach the brain?
5. Why is the teenage brain more affected to the addictive nature of nicotine manipulating the dopamine system of the brain?
6. What brain functions are negatively affected by increased nicotine addiction?