

Briana Renda | Text Transcript | 3MT® CSAHS College Heat 2021

This is a text transcript for Briana Renda's Three Minute Thesis (3MT®) presentation, titled "Immediate and long-last effect of adolescent nicotine and stress exposure."

Transcript:

Briana Renda:

Although cigarette smoking in adolescence has been steadily declining, use of the primary reinforcer found in cigarettes (nicotine) has been dramatically increasing, particularly via the use of vaporizers like the brand name product JUUL. In the left two images, and we can see that in 2019 a quarter of grade 12 students reported nicotine vaping in the past month.

For students, JUUL products are easily concealed– they are sleek and don't contain the same lingering tobacco smell as a typical cigarette. This increases the ability for increased use and thus dependence. Though there has been a call for action such that flavourants and high content nicotine pods are being banned from these products, they are still widely used in youth, and a large proportion of youth report that they are not even aware that there is nicotine in the products.

We know there is a bidirectional relationship between stress and nicotine exposure such that early life stress is predictive of nicotine use and dependence, and stress reduction is a commonly reported reason for using nicotine.

We also know that biological sex can play a role in how an individual responds to both stress and nicotine exposure, thus it is important to investigate these effects on both sexes.

My research focuses on the immediate and long-lasting effects of individual or combined adolescent nicotine itself and stress exposure - particularly the effects on behaviour and the stress response, since nicotine stimulates the release of stress hormones, and stress circuitry can be altered as a result of adolescent nicotine and stress exposure.

In humans, it's hard to research long-lasting effects since the same participants would have to be tracked over the course of many years. However, rodents share similar brain circuitry and are a prime model for longitudinal studies of addiction and reward. A rodent's adolescent period is about a month long, and they reach adulthood at around 70 days old.

Thus, an experiment in rodents could provide information on the impact of adolescent exposure on adult behaviour and changes to the brain in only a few months as opposed to years. Given that adolescent nicotine vaping is steadily increasing now, it is important to obtain information that can be imposed onto the development of novel treatment options.

With the ongoing COVID-19 pandemic that has caused unique stress on adolescents, my research can help shed light on some potential outcomes this adolescent stress may have in relation to nicotine use, particularly the trajectory of current adolescent nicotine users. Given

that a large proportion of individuals that use nicotine are unsuccessful in quitting nicotine use with current smoking cessation therapies, and early onset of nicotine use increases nicotine dependence it is important to understand this relationship when developing treatment methods. By identifying alterations in adult behaviour and brain function or anatomy as a result of adolescent nicotine and stress exposure, my research can help provide targets for the development of novel therapies. Thank you!

On-screen content:

There is a slide included in the presentation shown at various times throughout the video. The slide contains two graphs on the leftmost side: a graph indicating cigarette smoking decline over the last decade, and the other graph indicating nicotine vaping increase over the last decade.

On the top right of the slide, there are graphics that depict an equation: COVID-19 stress plus nicotine equals unknown effects in adulthood. On the bottom right of the image, there is another chart depicting the human lifespan (in years) in comparison to the rodent lifespan (in days). There is emphasis around the adolescent period of both humans (ages 11-18) and rodents (P20-P40).

[End of transcript]