Web Resources

Sites on teens, nicotine and e-cigarettes


Based on research that shows the adolescent brain is extremely sensitive to nicotine, Dr. Joseph DiFranza, of the University of Massachusetts Medical School, performed a four year study on sixth grade students. He found that students were very susceptible to nicotine addiction after only one or two days of inhaling cigarettes and that withdrawal symptoms occurred after inhaling only two cigarettes per day. His research design is described at this URL: http://www.ncbi.nlm.nih.gov/pubmed/17606835.

This 2013 publication based on studies of eighth and tenth grade smokers addresses how dependency develops in teen smokers. (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3662047/)

The University of Michigan survey data on e-cigarettes is shown in extensive table format showing numbers of smokers of tobacco and e-cigarettes in the 8th, 10th and 12th grade students. (http://www.drugabuse.gov/trends-statistics/monitoring-future/monitoring-future-study-trends-in-prevalence-various-drugs) Additional information about the study can be found on this URL: https://www.icpsr.umich.edu/icpsrweb/ICPSR/series/35.

Sites on e-cigarette sales regulations

The Public Health Law Center of the Mitchell Hamline School of Law in St. Paul, Minnesota provides a comprehensive list of e-cigarette regulations by state and the District of Columbia. These regulations were in effect as of May 22, 2015. A table by state provides data for the following items: “definition of ‘tobacco product’, taxation, product packaging, youth access/other retail restrictions, and smoke-free air legislation. Note that local laws may also apply. (http://publichealthlawcenter.org/resources/us-e-cigarette-regulations-50-state-review)

Sites on toxics in cigarette smoke

A 2010 report by the Surgeon General, “How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease”, contains research details on the potential toxics in cigarette smoke. Some of these chemicals are in tobacco leaves; others are formed during the burning process. For example, polyaromatic hydrocarbons are the products of incomplete combustion of tobacco. This article is very complete and includes details on the research procedures. For information on new versions such as e-cigarettes click on the marginal link, “Cigarette-like Products”. (http://www.ncbi.nlm.nih.gov/books/NBK53014/)

Sites on nicotine neural pathways

The 2014 Blausen Medical Galleries of medical images include clear, excellent images of cardiology, circulatory, gastrointestinal and neurology systems, as well as many others. This is a free-access library of images. Images of the mesocorticolimbic dopamine system (the nicotine neural pathway) are shown here: [https://en.wikiversity.org/wiki/Wikiversity_Journal_of_Medicine/Blausen_gallery_2014#Neurology](https://en.wikiversity.org/wiki/Wikiversity_Journal_of_Medicine/Blausen_gallery_2014#Neurology).

Sites on neurotransmitters

The neurotransmitters: serotonin, dopamine, gamma-aminobutyric acid (GABA) and acetylcholine are important for our physical and emotional health. A description and the symptoms and conditions of an imbalance in each of these four key neural transmitters are provided at this site: [http://knowmental.com/neurotransmitters-serotonin-gaba-dopamine-acetylcholine/](http://knowmental.com/neurotransmitters-serotonin-gaba-dopamine-acetylcholine/).

Sites on adrenaline

Students may have heard of humans performing extraordinary feats of strength in emergency situations. This site includes scenarios of adrenaline-fueled people lifting cars and fighting bears, while it also discusses how adrenaline is produced. ([http://entertainment.howstuffworks.com/arts/circus-arts/adrenaline-strength.htm](http://entertainment.howstuffworks.com/arts/circus-arts/adrenaline-strength.htm))

Sites on nicotine and health

The 2014 U.S. Surgeon General Report, “The Health Consequences of Smoking—50 Years of Progress”, discusses the effects of smoking as well as the introduction of e-cigarettes. This URL takes you to the executive summary of the report; Chapter 11 addresses questions regarding the use of e-cigarettes. ([http://www.surgeongeneral.gov/library/reports/50-years-of-progress/exec-summary.pdf](http://www.surgeongeneral.gov/library/reports/50-years-of-progress/exec-summary.pdf))


Researchers from Yale University, Massachusetts General Hospital and the University of California Irvine have created movies of neural activity changes during smoking using a linear parametric neurotransmitter Positron Emission Tomography (lp-ntPET) model that shows brain responses (dopamine release) over time to addictive substances such as nicotine. The process is shown in a video on this site: [http://www.jove.com/visualize/abstract/25327035/water-pipes-and-e-cigarettes-new-faces-of-an-ancient-enemy](http://www.jove.com/visualize/abstract/25327035/water-pipes-and-e-cigarettes-new-faces-of-an-ancient-enemy)

Sites on e-cigarette explosions and lawsuits

This reference describes several e-cigarette battery explosions attributed to charging the battery in the USB port of a computer or a car battery charger. ([https://www.smoketastic.com/exploding-e-cigs/3/](https://www.smoketastic.com/exploding-e-cigs/3/))


**Sites on e-cigarette language**


In case definitions of some of the terms used by e-cigarette knowledgeable students would be helpful, this URL contains a glossary of e-cigarette language terms. ([http://www.e-savuke.com/en/ecig_vocabulary.htm](http://www.e-savuke.com/en/ecig_vocabulary.htm)) And, this one contains a list of vaping vocabulary words. ([https://ecignvape.com/lingo/?age-verified=35a210d86c](https://ecignvape.com/lingo/?age-verified=35a210d86c))

**Sites on tobacco production**

This is one of the best resources I have found regarding cigarette tobacco additives. The article from the BBC News, “What’s in a Cigarette?” provides discussion by pro- and anti-tobacco lobbies and a scientist regarding the use of each of nine ingredients found in cigarette tobacco. ([http://www.bbc.co.uk/worldservice/sci_tech/features/health/tobaccotrial/inacigarette.htm](http://www.bbc.co.uk/worldservice/sci_tech/features/health/tobaccotrial/inacigarette.htm))

Additional information about the process of treating tobacco leaves is presented in a paper from the University of Kentucky, Department of Agriculture. Various processes used to cure tobacco are described in the report, “Harvesting, Curing, and Preparing Dark Fire-Cured Tobacco for Market”. ([http://www2.ca.uky.edu/agc/pubs/agr/agr152/agr152.pdf](http://www2.ca.uky.edu/agc/pubs/agr/agr152/agr152.pdf))

**Sites on nicotine as a plant defense mechanism**

This research article, “Plant Signaling and Behavior” presents research on plant signals that regulate the synthesis of nicotine in tobacco plants. Nicotine production is a major mechanism that tobacco plants use to ward off attacks from leaf-eating herbivores. ([http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2634150/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2634150/))

This article discusses procedures used by researchers to study the ability of tobacco plants to avoid attacks by herbivores while simultaneously encouraging pollinators. These plants have the ability to alter the composition of their nectar and to use nicotine to discourage pollinators from spending too much time at one flower. ([http://www.sciencedaily.com/releases/2010/01/100121135659.htm](http://www.sciencedaily.com/releases/2010/01/100121135659.htm))
Sites on use of tobacco by early Native Americans

Native South American shamans found the hallucinogenic properties of tobacco important for their ceremonies. Tobacco contains hallucinogenic harmala alkaloids, in addition to nicotine. Moreover, the native tobacco plant strains were more potent than today’s cigarette variety. This site contains interesting details of early Native American and later European use of tobacco. (http://www.biopsychiatry.com/tobacco/)

In chronological order, this site provides a history of tobacco use beginning with evidence of American Indian use in 1 B.C. to current use and legislation in the 1990s. (http://academic.udayton.edu/health/syllabi/tobacco/history.htm)

Sites on the history of e-cigarettes

This article in The Guardian provides a biographical sketch of Hon Lik, the Chinese pharmacist who invented the e-cigarette as a means to stop his heavy smoking habit. Smoking killed his father. His invention didn’t work for him as he continues to both smoke cigarettes and test-vape his e-cigarette flavors. (http://www.theguardian.com/society/2015/jun/09/hon-lik-e-cigarette-inventor-quit-smoking-dual-user)

Sites on FDA consumer updates

This FDA site is a consumer update page showing, “How to Recognize Tobacco in its Many Forms”. Pictures of tobacco in the forms of cigarettes, cigars, little cigars, cigarillos, dissolvable products, e-cigarettes (also referred to as: vape pen, e-hookah and hookah pen), traditional smokeless tobacco products, and water pipes (also referred to as hookah, shisha, narghile and argileh) are shown and described. Warnings to parents about these products and the lack of current FDA regulations are included. (http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm392735.htm)

Sites on the chemistry of nicotine

Pubchem provides much information including physical and chemical properties of nicotine, as well as the biochemistry, toxicity and biohazards and much more. Use this URL to reach the site: https://pubchem.ncbi.nlm.nih.gov/. Then enter nicotine in the search box.

Another site discusses how nicotine is metabolized in the body and the biomarkers that are used to detect the presence of metabolic products of nicotine in the blood, urine, saliva and nails of smokers. People exposed to second-hand cigarette smoke also test positive to for nicotine metabolic products long after exposure. (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2953858/)

Sites on nicotine replacement

The American Cancer Society discusses various FDA-approved replacement therapies to aid people who want to quit smoking, including how to use these products and possible side effects. This Web site stresses the importance of staying away from tobacco while receiving nicotine in a safer manner. (http://www.cancer.org/healthy/stayawayfromtobacco/guidetoquittingsmoking/guide-to-quitting-smoking-types-of-nrt)