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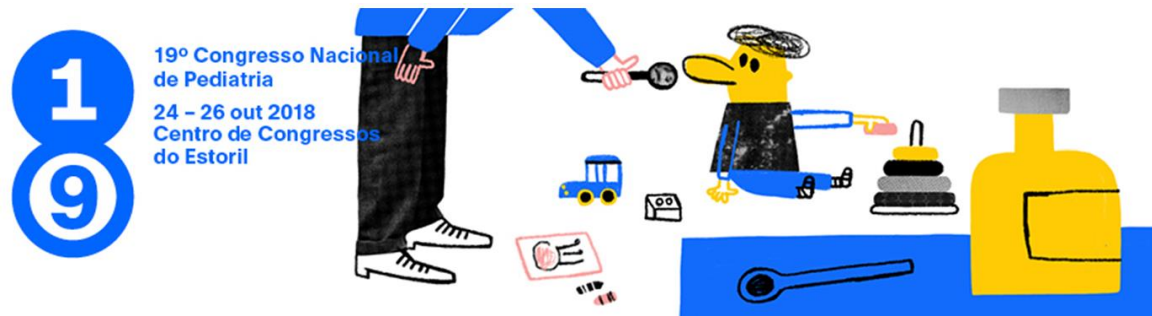
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É RELEVANTE O TABACO QUE SE FUMA? VIAGEM ENTRE O FUMO PASSIVO E O AQUECIDO!

Grupo sTOPPagE

Controlo e Prevenção do
Tabagismo em Idade Pediátrica

Carolina Constant



19º Congresso Nacional
de Pediatria
24 - 26 out 2018
Centro de Congressos
do Estoril

25 DE OUTUBRO DE 2018

Resumo

- Fumo de tabaco e cigarros convencionais
- Fumo ambiental do tabaco (FAT)
 - Fumo passivo
 - Fumo em terceira mão
- *Electronic Nicotine Delivery Systems (ENDS)*
 - *Tobacco heating systems (THS)*
 - Cigarros electrónicos e outros dispositivos
- Consequências para a saúde

Tabaco

SMOKING TOBACCO

Tobacco smoking is the act of burning dried or cured leaves of the tobacco plant and inhaling the smoke. Combustion uses heat to create new chemicals that are not found in unburned tobacco, such as tobacco-specific nitrosamines (TSNAs) and benzopyrene, and allows them to be absorbed through the lungs.

Manufactured cigarettes are the most commonly consumed tobacco products worldwide. They consist of shredded or reconstituted tobacco, processed with hundreds of chemicals and various flavors such as menthol, and rolled into a paper-wrapped cylinder. Usually tipped with a cellulose acetate filter, they are lit at one end and inhaled through the other. Most prevalent: Worldwide

Kreteks are clove-flavored cigarettes. They may also contain a wide range of exotic flavorings and eugenol, which has an anesthetic effect, allowing for deeper and more harmful smoke inhalation. Most prevalent: Indonesia

Roll-your-own (RYO) cigarettes are hand-filled by the smoker from fine-cut loose tobacco and a cigarette paper. RYO cigarette smokers are exposed to high concentrations of tobacco particulates, tar, nicotine, and TSNAs, and are at increased risk for developing cancers of the mouth, pharynx, larynx, lungs, and esophagus. Most prevalent: Europe and New Zealand

Bidis consist of a small amount of crushed tobacco, hand-wrapped in dried temburni or tendu leaves, and tied with string. Despite their small size, bidis tend to deliver more tar and carbon monoxide than manufactured cigarettes because users must puff harder to keep them lit. Most prevalent: South Asia (and are the most heavily consumed smoked tobacco products in India)

Pipes are made of briar, slate, clay, or other substances. Tobacco is placed in the bowl, and the smoke is inhaled through the stem. In South-East Asia, clay pipes known as sulpa, chillum, and hookli are widely used. Most prevalent: Worldwide

Sticks are made from sun-cured tobacco and wrapped in cigarette paper—for example, hand-rolled brus. Most prevalent: Papua New Guinea

Water pipes, also known as shisha, hookah, narghile, or hubble-bubble, operate by water filtration and indirect heat. Flavored tobacco is burned in a smoking bowl covered with foil and coal. The smoke is cooled by filtration through a basin of water and consumed through a hose and mouthpiece. Most prevalent: North Africa, the Mediterranean region, and parts of Asia, but now spreading around the world

SMOKELESS TOBACCO

Smokeless tobacco is usually consumed orally or nasally, without burning or combustion. Smokeless tobacco increases the risk of cancer and leads to nicotine addiction similar to that produced by cigarette smoking. There are different types of smokeless tobacco: chewing tobacco, snuff, and dissolvables.

Chewing tobacco is an oral smokeless tobacco product that is placed in the mouth, cheek, or inner lip and sucked or chewed. It is sometimes referred to as "spit tobacco" because of the tendency by users to spit out the built-up tobacco juices and saliva. Most prevalent: Worldwide

There are many varieties of chewing tobacco, including plug, loose-leaf, chimo, toombak, gutkha, and twist. Pan masala or betel quid consists of tobacco, areca nuts (*Areca catechu*), slaked lime (calcium hydroxide), sweeteners, and flavoring agents wrapped in a betel leaf (*Piper betle*). There are many varieties of pan masala, including kaddipudi, hogesoppu, gundi, kadapam, zarda, pattiwala, kiwam, and mishri. Most prevalent: India

Moist snuff consists of ground tobacco held in the mouth between the cheek and the gum. Manufacturers are increasingly packaging moist snuff into small paper or cloth packets to make the product more convenient. Moist snuff products are known as snus, khaini, shammas, nass, or naswa. Tobacco pastes or powders are similarly used, placed on the gums or teeth. Fine tobacco powder mixtures are usually inhaled and absorbed through the nasal passages. Most prevalent: Scandinavia and US but becoming worldwide; banned in several countries

Dissolvable smokeless tobacco products dissolve in the mouth without expectoration; they contain tobacco and numerous added constituents whose purpose is to deliver nicotine to the user via oral mucosal absorption. They are often extensions of well-known cigarette brands, such as Camel Sticks, Strips, and Orbs; Marlboro Sticks; products by Star Scientific (Ariva, Stonewall); and Zerstoyte Mint by Japan Tobacco. These newest oral smokeless tobacco products are developed for use by smokers in any situation where they cannot or choose not to smoke. Most prevalent: High-income nations

Dry snuff is powdered tobacco that is inhaled through the nose or taken orally. Once widespread, particularly in Europe, the use of dry snuff is in decline. Most prevalent: Europe



Constituintes do fumo do tabaco

- Nicotina
 - Alcalóide vegetal com propriedades psicoactivas
 - Efeitos no SNC → desenvolvimento de dependência
- Alcatrão
 - Partículas sólidas suspensas no fumo do tabaco
 - Cancerígenos
- Monóxido de carbono
 - Gás inodoro formado durante a combustão do tabaco
 - Tóxico: reduz a capacidade de transporte de O_2

Fumo do tabaco

Deadly Chemicals in Tobacco Smoke

Tobacco smoke contains more than **7,000 chemicals** and compounds. Hundreds of these are toxic, and at least **69 are cancer-causing**.



As Found in Tobacco Smoke Includes

Acetone	Paint Stripper
Acetylene	Welding Torches
Arsenic	Ant Poison
Benzene	Napalm
Butane	Lighter Fluid
Cadmium	Car Batteries
Carbon Monoxide	Car Exhaust Fumes
DDT	Insecticide
Formaldehyde	Embalming Fluid
Hydrogen Cyanide	Lethal Execution by Gas
Lead	Old Paint, Leaded Gasoline
Methanol	Rocket Fuel
Nicotine	Cockroach Poison
Phenol	Toilet-Bowl Disinfectant
Polonium 210	Nuclear Weapons
Toluene	Industrial Solvent
Vinyl Chloride	Plastics



Fumo ambiental do tabaco (FAT)

- Fumo em segunda mão ou fumo passivo
 - Corrente principal do fumo expirada pelo fumador + corrente secundária libertada directamente para a atmosfera
 - Corrente secundária mais nociva (carcinogénios, partículas mais pequenas)
- Fumo de tabaco em terceira mão
 - Resíduo tóxico que permanece nas superfícies após consumo de tabaco ter terminado (semanas a meses)

Cessação tabágica. Programa-tipo de actuação. DGS 2007
Cheraghi M and Sundeep Salvi S. *Eur J Pediatr* 2009
Drehmer *et al*, *Pediatrics* 2014



Secondhand
**smoke can
infiltrate** into
other units
**through
hallways** and
stairwells.

There is **no safe level** of **secondhand smoke exposure**



Secondhand smoke can **travel within multiunit housing** and common areas through **doorways, cracks in walls, electrical lines, ventilation systems and plumbing.**



Opening windows and using fans **does not completely remove secondhand smoke.**



Heating, air conditioning and ventilation systems **cannot eliminate exposure to secondhand smoke.**

cs267154



Kids in Cars

Protecting youth from secondhand smoke exposure in vehicles

Is smoking in a vehicle
really that bad?



YES!

Secondhand smoke (SHS) levels in vehicles can be extremely high. Average SHS exposure in a car is roughly equal to the exposure from sitting in a smoky bar for three hours.



After the driver is finished smoking, it can take more than 25 minutes for the fine particles in secondhand smoke to disperse and for air quality to return non-smoking levels.



Bohac, D., E. Waldart, and Z. Zhou, 2016. Passenger Vehicle Secondhand Smoke Particulate Measurements. ASHRAE and AIJC. IAQ 2016 (forthcoming), Alexandria, VA, 2016 and Bohac et al 2010.

Electronic Nicotine Delivery Systems (ENDS)

- *Tobacco heating systems (THS)*

- Produtos de tabaco aquecido ou produtos sem combustão
- ‘Heat-not-burn’ tobacco products
- Dispositivo aquece o tabaco mas a temperaturas inferiores aos cigarros convencionais
- Exs. *Glo*, *IQOS*, *TEEPS*

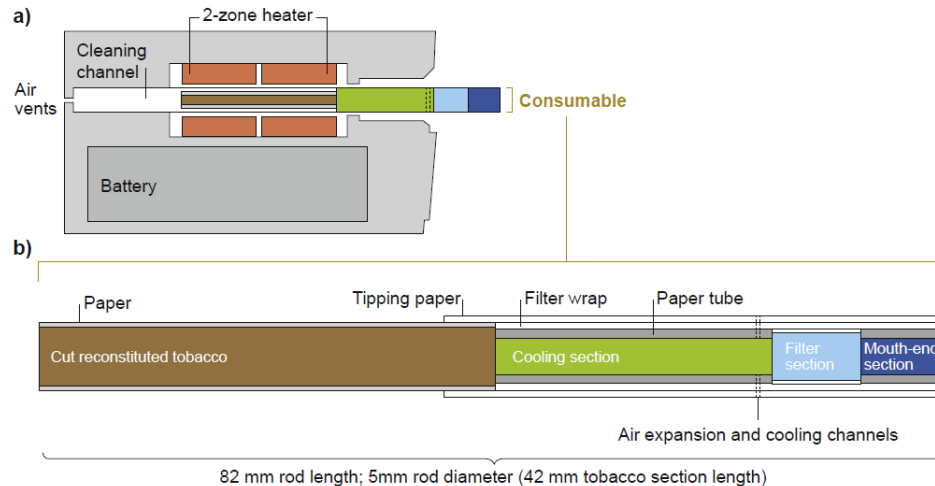


Fig. 1. Schematic drawing of THP1.0. (a) Heating device with a tobacco consumable inserted; (b) physical construction of the tobacco consumable.

- Cigarros electrónicos

- Dispositivo que aquece líquido → vapor que pode ser inalado
- Exs. *Juul*

Simonavicius E, et al. *Tob Control* 2018
Fearon IM, et al. *Regulatory Toxicology and Pharmacology* 2018
Forster M, et al. *Regulatory Toxicology and Pharmacology* 2018

Cigarros electrónicos (*E-cigarettes*)

Fearon IM, et al. *Regulatory Toxicology and Pharmacology* 2018
www.drugabuse.gov

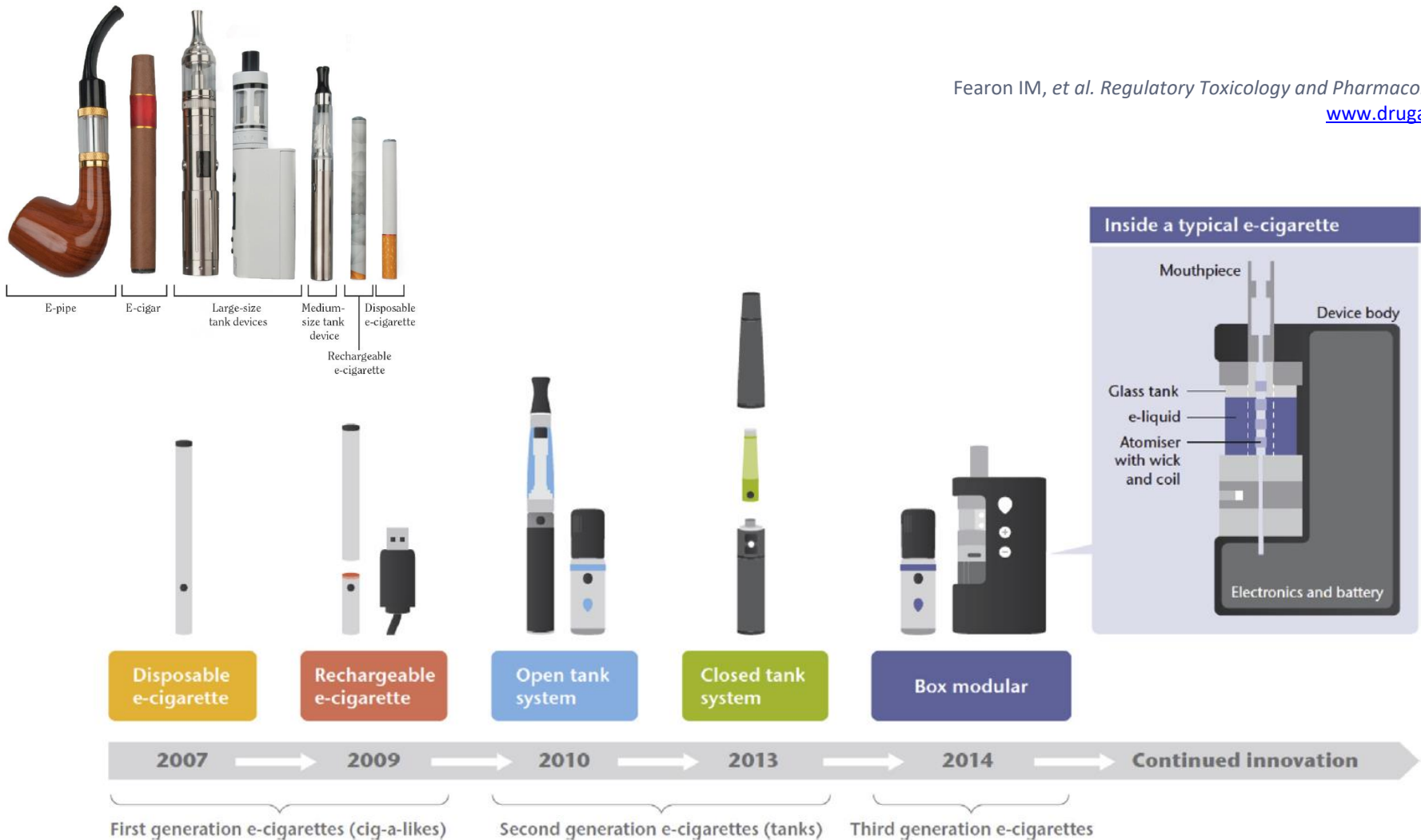
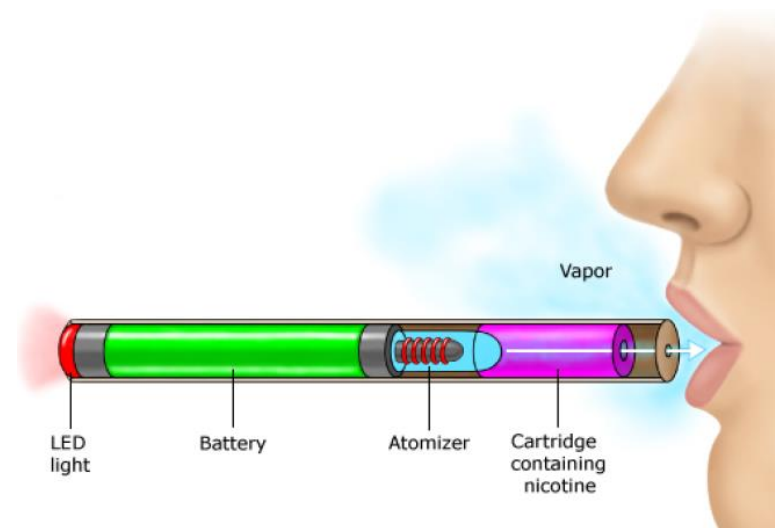
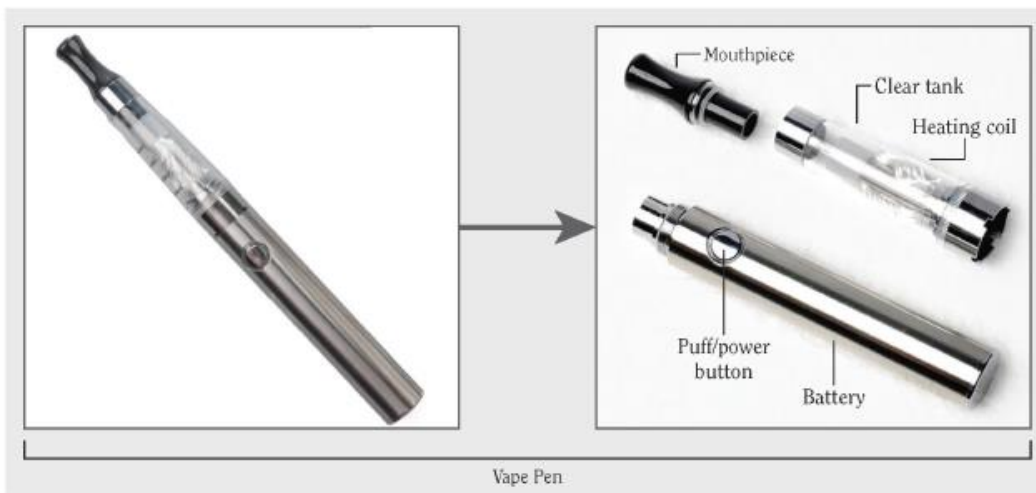
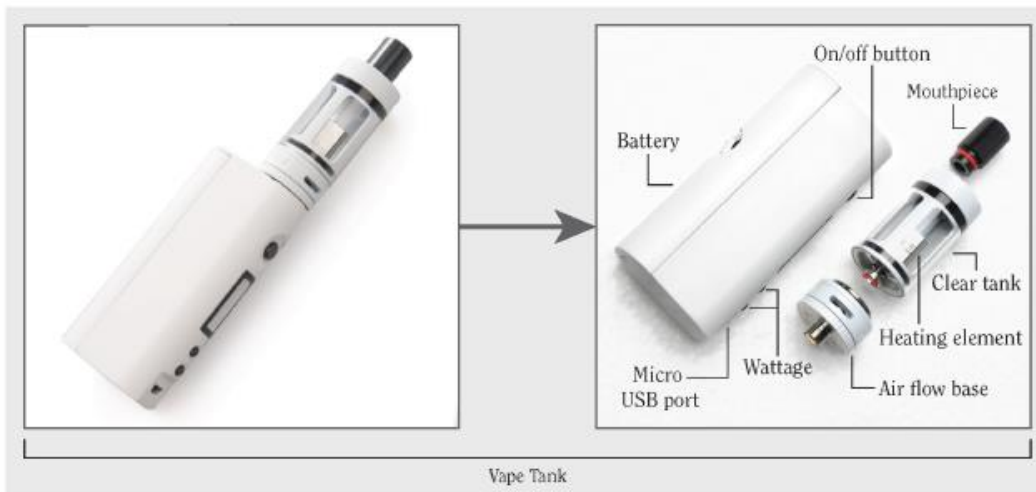


Fig. 1. Evolution of e-cigarette design. Images represent the types of device in each category and show the evolution of e-cigarettes from disposable and rechargeable 'cig-a-like' devices, through the second-generation open- and closed-tank/cartridge systems, to third-generation box modular devices.

Como funcionam os cigarros electrónicos



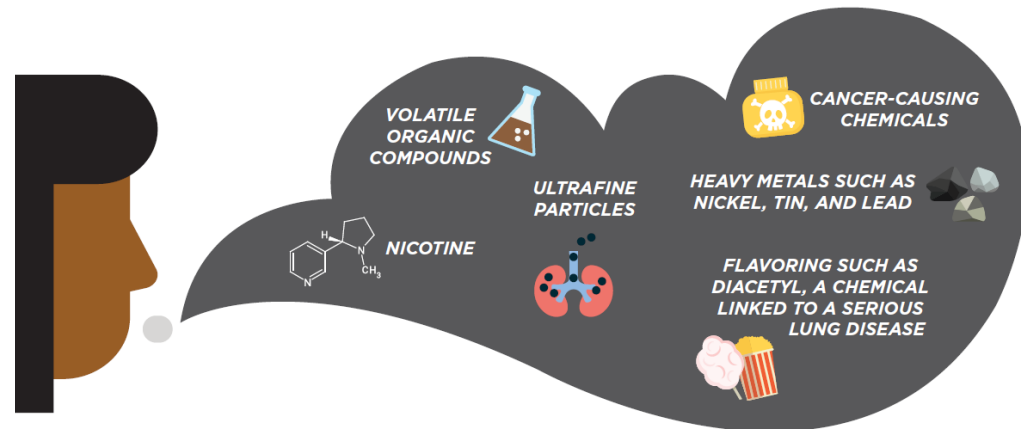
*E-Cigarette Use Among Youth and Young Adults
A Report of the Surgeon General
Rigotti, NA et al UpToDate 2018*

Constituintes dos cigarros electrónicos

- Nicotina
 - Diferentes concentrações, existindo cartuchos sem nicotina
- Propileno glicol/glicerol
 - Solventes
- Aromas
 - >7000 sabores disponíveis
- Outros
 - Metais, compostos orgânicos voláteis, compostos carbonilo, nitrosaminas específicas do tabaco

WHAT IS IN E-CIGARETTE AEROSOL?

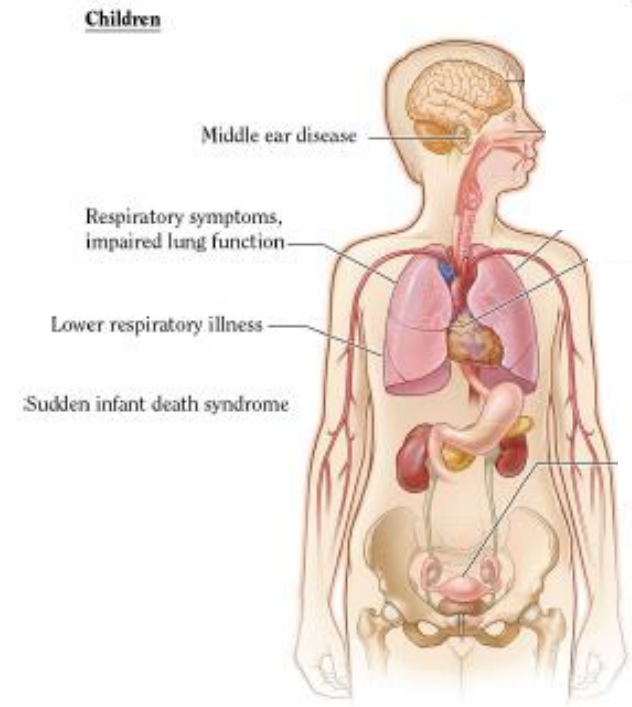
THE E-CIGARETTE AEROSOL THAT USERS BREATHE FROM THE DEVICE AND EXHALE CAN CONTAIN HARMFUL AND POTENTIALLY HARMFUL SUBSTANCES:



It is difficult for consumers to know what e-cigarette products contain. For example, some e-cigarettes marketed as containing zero percent nicotine have been found to contain nicotine.

Consequências para a saúde da exposição ao FAT

- Riscos específicos na criança
 - Prematuridade e mortalidade perinatal
 - Desenvolvimento e crescimento fetal
 - Morte súbita no lactente
 - Sintomas e doenças respiratórias: asma, diminuição da função pulmonar, doenças tracto resp inferior, sintomas respiratórios crónicos
 - Aterogénese
 - Doença do ouvido médio
 - Desenvolvimento psicomotor
 - Neoplasia na infância



Samet J *et al* UpToDate 2016
CDC. Health consequences of Smoking – 50 years of progress: a report of the Surgeon General. 2014

Consequências para a saúde da exposição ao FAT



Secondhand smoke and the **harmful** chemicals in it are known causes of **Sudden Infant Death Syndrome**, **RESPIRATORY INFECTIONS**, **ear infections**, and **asthma attacks** in infants and children. They are also known causes of **HEART DISEASE**, **stroke**, and **lung cancer** in adult nonsmokers.

Consequências para a saúde dos cigarros electrónicos

Binns C, et al Asia Pacific Journal of Public Health 2018

- Dispositivo
 - Queimaduras por mau funcionamento durante armazenamento ou utilização
 - Exposição ao *e-liquid*, por via oral ou cutânea, pode causar convulsões, lesão cerebral anóxica, acidose láctica e morte
- Exposição à nicotina
 - Efeitos semelhantes aos que ocorrem com cigarros convencionais
- Exposição ao vapor
 - Diferente dos constituintes dos cigarros convencionais
 - Mas também contém substâncias potencialmente tóxicas, que variam consoante líquido e/ou dispositivo usado
 - Desconhecem-se efeitos de inalação crónica de *e-cigarettes*

Consequências para a saúde dos cigarros electrónicos

- Exposição ao vapor
 - Carcinogénios, mas em concentrações inferiores aos cigarros convencionais
 - Risco cardiovascular a longo prazo
 - Função respiratória e sintomas respiratórios

ARE E-CIGARETTES LESS HARMFUL THAN REGULAR CIGARETTES?



VS



YES, but that doesn't mean e-cigarettes are safe.

E-cigarette aerosol generally contains fewer toxic chemicals than the deadly mix of 7,000 chemicals in smoke from regular cigarettes. However, e-cigarette aerosol is not harmless. It can contain harmful and potentially harmful substances, including nicotine, heavy metals like lead, volatile organic compounds, and cancer-causing agents.

Cigarros electrónicos e Saúde Pública

- Impacto incerto
 - Efeito na iniciação de consumo por jovens
 - Dependência de nicotina
 - Transição para cigarros convencionais
 - Renormalização do acto de “fumar”
 - Intoxicação accidental de nicotina
 - Embalagens seguras para crianças
 - Exposição ao vapor em segunda mão
 - Evidência limitada nos efeitos para a saúde
 - Expectável que seja menos tóxico que cigarros convencionais

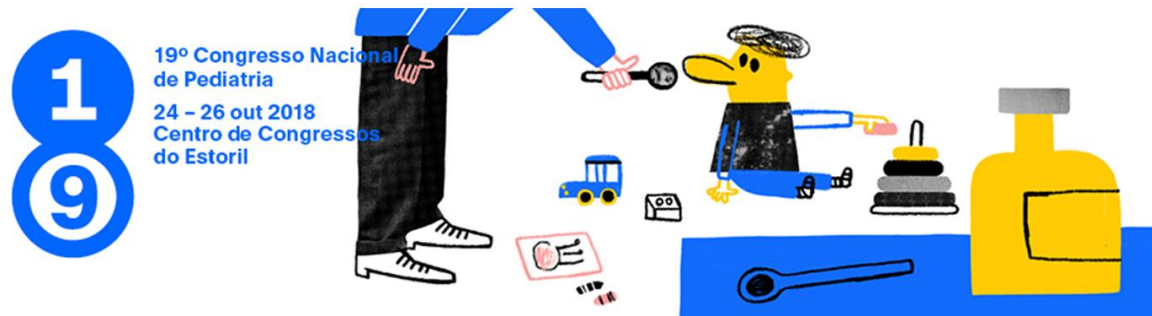
Rigotti, NA *et al*/ UpToDate 2018
Britton J *BMJ* 2016

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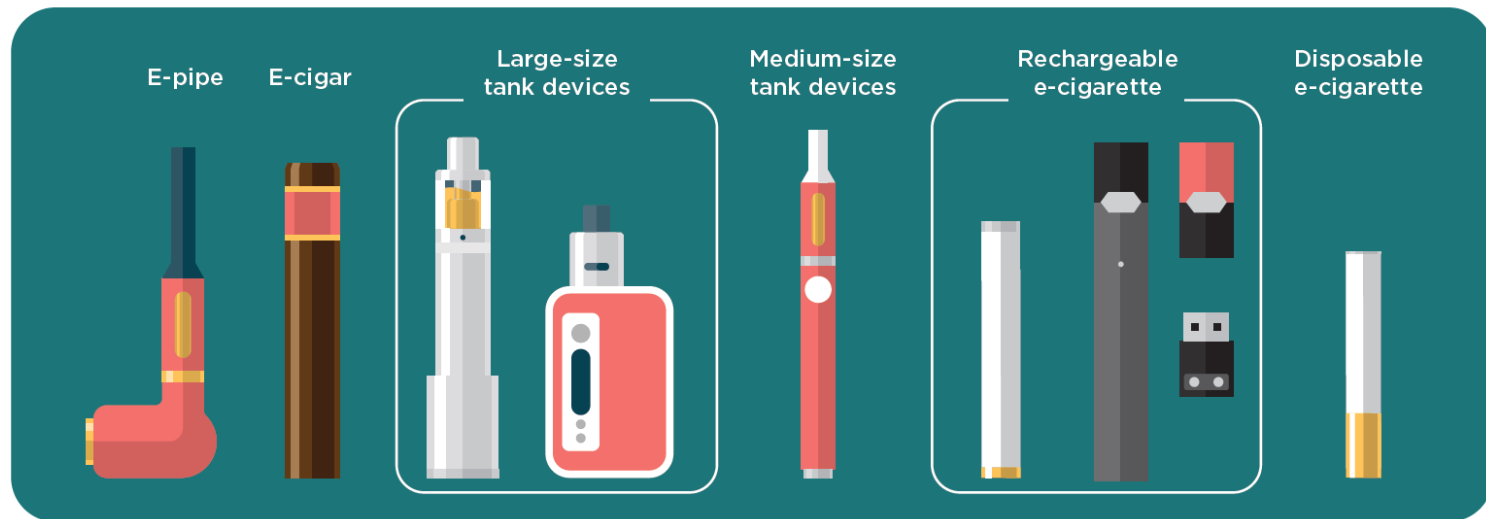


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WHAT ARE E-CIGARETTES?

- » E-cigarettes are known by many different names. They are sometimes called “e-cigs,” “e-hookahs,” “mods,” “vape pens,” “vapes,” “tank systems,” and “electronic nicotine delivery systems.”
- » Some e-cigarettes are made to look like regular cigarettes, cigars, or pipes. Some resemble pens, USB sticks, and other everyday items.
- » E-cigarettes produce an aerosol by heating a liquid that usually contains nicotine—the addictive drug in regular cigarettes, cigars, and other tobacco products—flavorings, and other chemicals that help to make the aerosol. Users inhale this aerosol into their lungs. Bystanders can also breathe in this aerosol when the user exhales into the air.
- » E-cigarettes can be used to deliver marijuana and other drugs.



CS284159-B



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

WHO IS USING E-CIGARETTES?

E-CIGARETTES ARE NOW THE MOST COMMONLY USED TOBACCO PRODUCT AMONG U.S. YOUTH.

IN THE U.S.,
YOUTH ARE
MORE LIKELY
THAN ADULTS
TO USE
E-CIGARETTES

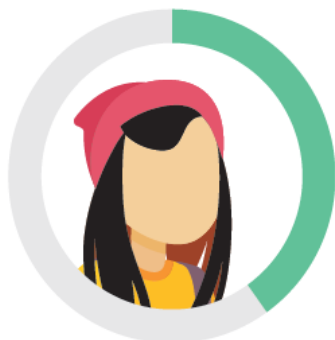


4.3%
MIDDLE SCHOOL
STUDENTS

In 2016, more than
2 MILLION
U.S. middle and high school
students used e-cigarettes in
the past 30 days, including:

11.3%
HIGH SCHOOL
STUDENTS





AMONG CURRENT E-CIGARETTE USERS AGED 18-24 YEARS,
40.0% had **NEVER BEEN** cigarette smokers

ADULTS

In 2016, **3.2%**
of U.S. adults were current
e-cigarette users

IN 2015, AMONG ADULT E-CIGARETTE
USERS OVERALL:

29.8%

were former
regular smokers

11.4%

had never been
regular cigarette
smokers



58.8%

were current regular
cigarette smokers





More than 7,700 flavors of e-cigarettes exist, including fruit and sweet flavors that appeal to children and youth.



It is not safe to use e-cigarettes near children: There are cancer-causing chemicals in the exhaled e-cigarette vapor.



Minors can easily purchase e-cigarettes online, or – in some states – at convenience stores.

E-cigarettes: A Threat to Health

The American Academy of Pediatrics believes e-cigarettes and other electronic nicotine delivery systems are a significant danger to the health of children and nonsmokers. For more information, visit bitly.com/AAPpolicy.



Less than half a teaspoon of a nicotine-containing e-cigarette solution can be fatal to the average toddler.



Ads for e-cigarettes are targeting adolescents and appear on TV, radio, and online.



Most e-cigarettes contain nicotine. Nicotine is a highly addictive, harmful drug.

AMERICAN ACADEMY OF PEDIATRICS
Julius B. Richmond
Center of Excellence

www.richmondcenter.org

THE EVIDENCE SO FAR SHOWS THAT E-CIGARETTES ARE FAR SAFER THAN SMOKING



E-cigarettes contain nicotine but **not cancer** causing tobacco



Nicotine is addictive, but does **not cause cancer**



Tobacco is the biggest cause of preventable death in the UK



Over **100,000 deaths** per year



Passively breathing vapour from e-cigarettes is **unlikely to be harmful**



Growing evidence shows e-cigarettes are helping people to **stop smoking**



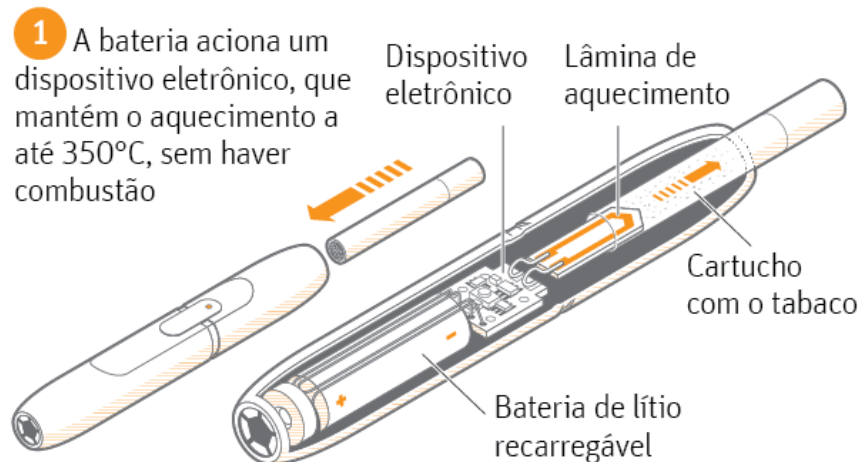
LET'S BEAT CANCER **SOONER**
cruk.org



FUMAÇA DIFERENTE

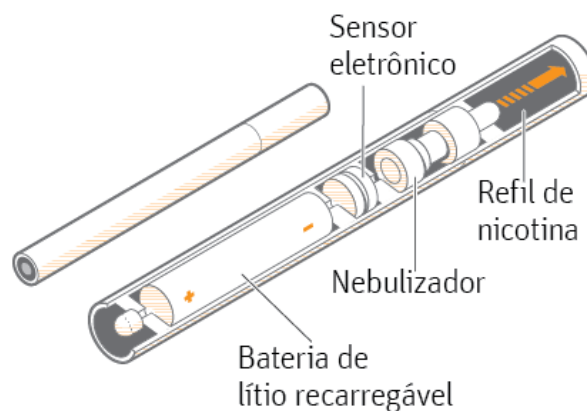
Conheça dois tipos de fumo sem queima

AQUECIMENTO DE TABACO



2 Um bastão com tabaco é encaixado na lâmina de aquecimento. Com a temperatura elevada, é liberado um vapor inalado pelo fumante

CIGARRO ELETRÔNICO



1 O usuário coloca um líquido em um reservatório (juice), que pode ou não conter nicotina

2 Quando ele traga, um sensor eletrônico aciona um nebulizador que vaporiza o líquido

Electronic Nicotine Delivery Systems e gravidez



-
-

Li G, et al. *Toxics* 2018

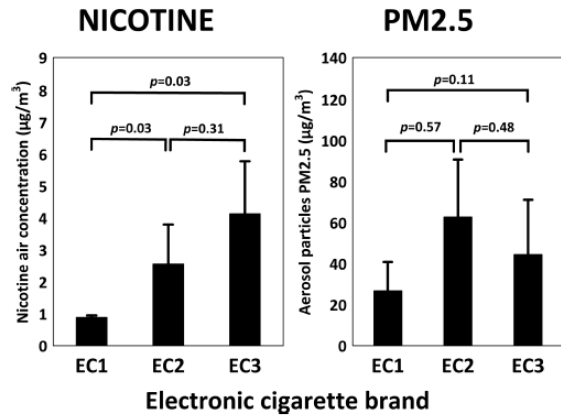


Figure 1. Effect of e-cigarette brand on nicotine (left) and aerosol particle (right) concentration in the air inside exposure chamber.

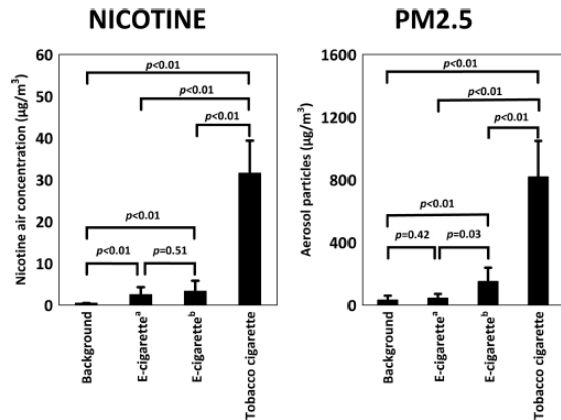


Figure 2. Comparison of indoor air nicotine (left) and aerosol particle (right) concentrations released from e-cigarette with background values and tobacco cigarette smoking.

Note. ^aVapor generated with smoking machine (Study 1); ^bVapor exhaled by users (Study 2).

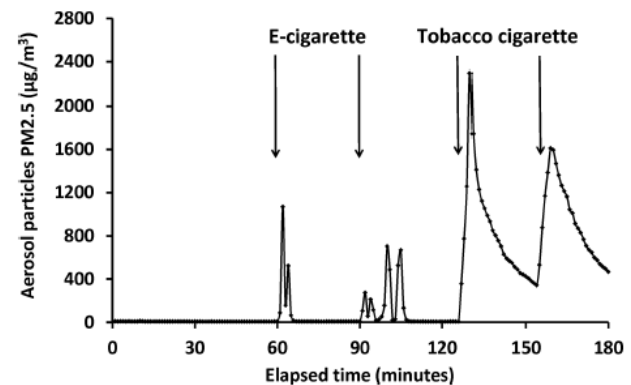


Figure 3. Changes of aerosol particle PM_{2.5} concentrations during experiment of e-cigarette use and tobacco cigarette smoking in exposure chamber.