E-cigarettes: separating the science from the hype

Jacqueline Bowden
Manager, Tobacco Control Research and Evaluation
• Currently an issue dividing the tobacco control community

• E-cigarettes have received rapid market penetration despite many unanswered questions

• Policy makers around the world are under pressure
Overview

- What are e-cigarettes?
- Prevalence of use
- The hype: e-cigarette marketing
- The science
- Royal College of Physicians report
- What does all this mean for patients in Australia?
What are e-cigarettes?
LED lights up when the smoker draws on the cigarette

Sensor detects when smoker takes a drag

Heater vaporises nicotine

BATTERY controls heater and light

CARTRIDGE holds nicotine dissolved in propylene glycol
Fluids contain

- Many come premixed from China, but some are now made in the US and Europe
- Origins and quality of the ingredients are often unknown
- Fluids* may contain:
  - Nicotine (in varying concentrations)
  - Humectants: propylene glycol (or vegetable glycerin) for vapor production
  - Flavorings (tobacco, menthol, coffee, vanilla, fruit, cotton candy, etc.)
- *Metal particles have also been found in the fluids
### AEROSOL COMPOSITION

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Compounds</th>
<th>Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>Chlorobenzene</td>
<td>Benzo(ghi)perylene</td>
</tr>
<tr>
<td>glycerin</td>
<td>Crotonaldehyde</td>
<td>Acetone</td>
</tr>
<tr>
<td>Flavorings (many)</td>
<td>Propionaldehyde</td>
<td>Acrolein</td>
</tr>
<tr>
<td>Nicotine</td>
<td>Benzaldehyde</td>
<td>Silver</td>
</tr>
<tr>
<td>NNN</td>
<td>Valeric acid</td>
<td>Nickel</td>
</tr>
<tr>
<td>NNK</td>
<td>Hexanal</td>
<td>Tin</td>
</tr>
<tr>
<td>NAB</td>
<td>Fluorine</td>
<td>Sodium</td>
</tr>
<tr>
<td>NAT</td>
<td>Anthracene</td>
<td>Strontium</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>Pyrene</td>
<td>Barium</td>
</tr>
<tr>
<td>Benzene</td>
<td>Acenaphthylene</td>
<td>Aluminum</td>
</tr>
<tr>
<td>P,m,xylene</td>
<td>Acenaphthene</td>
<td>Chromium</td>
</tr>
<tr>
<td>Toluene</td>
<td>Fluoranthenene</td>
<td>Boron</td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>Benz(a)anthracene</td>
<td>Copper</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Chrysene</td>
<td>Selenium</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>Retene</td>
<td>Arsenic</td>
</tr>
<tr>
<td>Styrene</td>
<td>Benzo(a)pyrene</td>
<td></td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>Indeno(1,2,3-cd)pyrene</td>
<td></td>
</tr>
</tbody>
</table>

Compounds in yellow are from FDA 2012, Harmful and Potentially Harmful Substances – Established List
E-cigarette legislation
E-cigarette legislation

• The supply of e-cigarettes containing nicotine in Australia is illegal

• In Australia, generally, if devices look like cigarettes then they are treated as cigarettes, and the same rules with their marketing and use apply

• In the UK there are few restrictions on the marketing and sale of e-cigarettes

• E-cigarettes have been banned in Canada

• Greater awareness of e-cigarettes is apparent in countries where they are permitted
How prevalent are e-cigarettes?
Awareness of e-cigarettes (among smokers and ex-smokers)

<table>
<thead>
<tr>
<th>Country</th>
<th>Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>39%</td>
</tr>
<tr>
<td>U.S.</td>
<td>73%</td>
</tr>
<tr>
<td>UK</td>
<td>54%</td>
</tr>
<tr>
<td>Australia</td>
<td>20%</td>
</tr>
</tbody>
</table>

Tried e-cigarettes (among smokers and ex-smokers)

Current users of e-cigarettes (among smokers and ex-smokers)

- Canada: 1.0%
- U.S.: 6.0%
- UK: 4.0%
- Australia: 1.0%

Current user of e-cigarettes - UK
(among smokers and ex-smokers)

Source: www.smokinginengland.info/latest-statistics
The hype:

e-cigarette marketing
E-cigarette Marketing
E-cigarette Marketing
Marketing: Healthier choice

GENERAL HEALTH BENEFITS OF SWITCHING TO THE ELECTRIC CIGARETTE

- Health benefits same as when you quit smoking
- No more smoker’s cough and phlegm
- Sense of smell is back
- Better physical stamina and cardio
- No more wheezing and tightness in chest

© 2009 K. Nacheff www.e-cigarettepedia.com
Marketing: avoid smoking bans
Marketing: avoid smoking bans

Dear Smoking Ban,

BLU ELECTRONIC CIGARETTE

Take back your freedom to smoke anywhere with BLU electronic cigarettes. BLU produces no smoke and no ash, only vapor, making it the smarter alternative to regular cigarettes. It's the most satisfying way to tell the smoking bans to kiss off. Okay, maybe the second-most satisfying way.

New BLU Smart Pack

BLUCIGS.COM

18+ only.

CALIFORNIA PROPOSITION 65 Warning: This product contains nicotine, a chemical known to the state of California to cause birth defects or other reproductive harm.
Marketing: delay quitting

Considering all I'd heard, I decided to either quit or smoke True. I smoke True.

DON'T QUIT... SWITCH TO BLU

Visit blucigs.com
If this is your first visit, be sure to check out the FAQ by clicking the link above. You may have to register before you can post: click the register link above to proceed.

AussieVapers | The original Australian e-cigarette community
Welcome to the AussieVapers | The original Australian e-cigarette community.

General E-Cigarette Discussion forums

<table>
<thead>
<tr>
<th>Title</th>
<th>Last Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Cigarette / Vaporization Discussion Forum (22 Viewing)</td>
<td>What's the nice postman have... by mercury 16-09-14 08:34 PM</td>
</tr>
<tr>
<td>E-Cigarette / Vaporization: Hardware Discussion (24 Viewing)</td>
<td></td>
</tr>
<tr>
<td>E-Cigarette / Vaporization: eJuice / Nicotine / E-Liquids (10 Viewing)</td>
<td></td>
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<tr>
<td>New Vapers Forum (29 Viewing)</td>
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</tr>
<tr>
<td>E-Cigarette / Vaporization: Political and Media discussion (4 Viewing)</td>
<td></td>
</tr>
<tr>
<td>E-Cigarette / Vaporization: Expert Reviews, technical discussion and DIY</td>
<td></td>
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</tbody>
</table>
The science
Latest evidence – two main claims

1. E-cigarettes increase quitting
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• The efficacy of e-cigs as a cessation tool has not been fully established
Latest evidence – two main claims

1. E-cigarettes increase quitting
   • The efficacy of e-cigs as a cessation tool has not been fully established

2. They are safer in the long-term
Latest evidence – two main claims

1. E-cigarettes increase quitting
   - The efficacy of e-cigs as a cessation tool has not been fully established

2. They are safer in the long-term
   - The health risk of long-term use is unknown although probably less than that of smoking cigarettes
Concerns currently being researched

• Dual use with conventional cigarettes which may result in smokers continuing to smoke rather than quit

• Gate-way for young people - potential to induce nicotine addiction in non-smokers
Concerns

• Safety: accidental poisoning of children as bottles are often not in child-proof packaging and are not accompanied by warnings.
Concerns

• Reports of tobacco companies purchasing e-cigarette companies
  – Raises concerns about promoting normalization of tobacco use
Tobacco industry involvement

Cigarettes may appear to be different, but there is no healthier choice.

Cigarette packs use different names, numbers and colours so they all appear to be different. But what you should know is that even though light, mild and low tar cigarettes feel smoother on the throat and easier on the chest, they can deliver the same amount of toxins as full strength cigarettes.

The fact is, whatever the pack colour, whatever the number, whatever they are called – all cigarettes are toxic and they all cause serious damage.
Royal College of Physicians report

released 28\textsuperscript{th} April
Pursuit of conventional tobacco control strategies encourages more smokers to quit.

Quitting is difficult as people are addicted to nicotine but are harmed by other constituents.

Not made to medicines standards, probably more hazardous than NRT (unlikely to exceed 5% of the harm caused by tobacco).

“In the interests of public health it is important to promote the use of e-cigarettes, NRT and other non-tobacco nicotine products as widely as possible as a substitute for smoking in the UK.”

Royal College of Physicians report, UK
What does all this mean for patients in Australia?
How to respond to patients

• Support a smoker’s quit attempt, we don’t want to undermine motivation

• There are many options to assist people to quit and a range of approved aids such as nicotine patches & gum

• It is illegal to sell e-cigarettes that contain nicotine

• The efficacy as a cessation aid has not been established and the quality may be variable

• More research is needed on the health risks of e-cigs to quit smoking and for long term use

• Dual use of cigarettes and e-cigarettes should be strongly discouraged