Update on Hookah and E-cigarettes

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Big Sky Pulmonary Symposium
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Overview

- Montana Smoking Facts
- Background on Hookah
- Functioning and Devices
- Concerns about Hookah
- Prevalence and Lure
- Health Effects and Research
- Electronic Cigarettes
- Prevalence
- Concerns
- Research
- Legislation
- Resources
More than 1,400 Montanans die each year from tobacco-related disease.

Every year, Montanans pay more than $441 million in medical expenditures attributable to smoking; businesses pay more than $305 million in lost productivity due to illness and time off.

Nineteen percent of all adults in Montana smoke, and 38% of American Indian adults in Montana smoke. (BRFSS, 2013)

Montana adult males use spit tobacco at a rate that is almost double the national average (15% compared to 8%). (BRFSS, 2013)

Fifteen percent of Montana youth are current cigarette smokers and 13% are current smokeless tobacco users. (YRBS, 2013).

Montana Legislation

“Smoking" or "to smoke" includes the act of lighting, smoking, or carrying a lighted cigar, cigarette, pipe, or any smokable product and includes the use of marijuana for a debilitating medical condition as provided for in Title 50, chapter 46.
Grades for Tobacco Taxation

Many other regions, it’s called…..

“Hubble Bubble”
Waterpipe Tobacco

- Jurak, Tumbak, Ajami – washed and humidified tobacco (no flavoring)
- **Maassel (shisha)** – flavored tobacco
Hookah as a gateway
Amounts of Nicotine

- 1 cigarette has 10 mg of nicotine
- 1 cigar equals 1 ½ packs of cigarettes
- 1 can of smokeless tobacco equals about 3 packs of cigarettes
- 45 min. session of Hookah = nicotine in ½ pack of cigarettes
2011 Federal Legislation

Five cannabinoids JWH-018, JWH-073, CP-47,497, JWH-200, and cannabicyclohexanol became illegal in the US
Who is smoking hookah?
Positive effects of hookah smoking

- dizziness
- buzz
- pass the time
- fun
- reduce stress
- legal high
Negative effects of hookah smoking

- cough
- headache
- shortness of breath
- chest hurts
But why the light headedness and headaches?
# Carbon Monoxide (CO) Exposure

<table>
<thead>
<tr>
<th>CO Level (parts per million)</th>
<th>Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>no health risk</td>
</tr>
<tr>
<td>10 - 29</td>
<td>headaches, nausea</td>
</tr>
<tr>
<td>30 - 35</td>
<td>flu-like symptoms</td>
</tr>
<tr>
<td>36 - 99</td>
<td>drowsiness, vomiting, fatigue</td>
</tr>
<tr>
<td>100 +</td>
<td>confusion, brain damage, coma</td>
</tr>
</tbody>
</table>
ER visits

- 12 visits
- Headache, nausea and lethargy
- ER stay = 1-5 hours

Exhaled CO study

(n=200)

Average smoking time 2 hours
TB transmission

Mononucleosis

Chronic effects
What we do know about hookah smoke

- One hookah session versus one cigarette
  - 40 times the tar
  - 30 times the carcinogens
  - 2 times the nicotine
  - 10 times the carbon monoxide
Blood Nicotine Levels

Similar to a person who smokes **ten cigarettes per day**

### Is tobacco-free hookah safe?

<table>
<thead>
<tr>
<th>Tobacco</th>
<th>Non-Tobacco (Tea leaves)</th>
</tr>
</thead>
<tbody>
<tr>
<td>155 mg carbon monoxide</td>
<td>159 mg carbon monoxide</td>
</tr>
<tr>
<td>464 mg tar</td>
<td>513 mg tar</td>
</tr>
<tr>
<td>Carcinogenic PAH chrysene-106</td>
<td>124</td>
</tr>
<tr>
<td>Formaldehyde 59 mcg</td>
<td>117 mcg</td>
</tr>
<tr>
<td>Acetone – 118</td>
<td>163</td>
</tr>
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</table>

Shidaheh et al. 2012
E-Cigarettes
Patent

- “An electronic atomization cigarette that functions as substitutes for quitting smoking and cigarette substitutes”
Types

- Cigalikes

- Advanced personal vaporizers (APV)
  - AKA eGos

- Mods
Cartridges

- Disposable
- Refillable
Functioning of the device

Inside of Electronic Cigarette

LED blu  Smart Chip Controller  Lithium Ion Battery  Cartridge

The vapor is created by

Atomizer heats the eliquid  Heating Vapor Cell  Flavor liquid or eliquid  Silicone Tip
Business is soaring..

- By January 2014 there were 466 brands (each with its own Internet site)
- 7764 unique flavors

Zhu, et al., 2014 Tobacco Control
Montana Adult Survey

Figure 1. Reasons for trying electronic cigarettes among Montana adults, Montana Adult Tobacco Survey, 2013.

CDC Prevention of Chronic Disease:
Figure 2. Reasons for trying electronic cigarettes among Montana adults, by age and race. Montana Adult Tobacco Survey, 2013. Abbreviation: AI/AN, American Indian/Alaska Native.
Other smokers

- CDC National Youth Tobacco Survey
- 2011-2012
  - Experimentation doubled in this age group
  - 1.78 million experimenters
  - Use more common among Whites, young adults, higher income and LGBT communities

Why the increase?

• Youth access
• Aggressive marketing
• Low price
  ◦ Daily users report spending $33 vs. $175/month
• Widespread availability
Research

- Nitrosamines (cancer causing agent)
- Varying amounts of nicotine
- Particulate matter
- Irritability in throat
- Cartridge labeled as 0% nicotine contained nicotine
Concerns

- Flavor appeal
- Ease of access
- Undermine smoke-free laws
- Delays quit decisions
- Poor quality control
Poison center calls involving e-cigarettes

215 Calls per Month

1 Call per Month

September 2010 to February 2014
Physiological Effects (n=12-32)

- Mouth and throat irritation and dry cough at initial use
- No change in heart rate, carbon monoxide (CO) level, or plasma nicotine level
- Increase in respiratory impedance and respiratory flow resistance similar to cigarette use
- No change in lung function
- No change in cardiac function as measured with echocardiogram
- No increase in inflammatory markers

Some difference....

UK study – cross sectional household survey
  - N=5863
  - E-cig users more likely to report abstinence (OR= 2.23) compared to no aid (OR=1.38)

Question: abstinence measured to date of survey so could have been 1 day or 6 months – no measures provided

Jamie Brown, Emma Beard, Daniel Kotz, Susan Michie, Robert West Real-world effectiveness of e-cigarettes when used to aid smoking cessation: a cross-sectional population study, Addiction, 2014
No significant difference...

- 657 people were randomized
  - 289 to nicotine e-cigarettes
  - 295 to patches
  - 73 to placebo e-cigarettes

- At 6 months, verified abstinence was
  - 7 \cdot 3\% (21 of 289) with nicotine e-cigarettes,
  - 5 \cdot 8\% (17 of 295) with patches
  - 4 \cdot 1\% (three of 73) with placebo e-cigarettes

we had insufficient statistical power to conclude superiority of nicotine e-cigarettes to patches or to placebo e-cigarettes.

They are helpful...

Smokers who used e-cigarettes reported that e-cigarettes were helpful in smoking cessation and had used e-cigarettes to quit smoking.

Withdrawal symptoms decreased with use of second generation (n=22)


Oh no they’re not…

Ever using e-cigarette is not associated with intention to quit, quit attempt, and smoking cessation.

E-cigarettes did not help patients with cancer quit smoking


Let’s just vape in the air...

- N=723 flight attendants
  - 46.4% report seeing one smoked on a plane
    - Majority were passengers, some flight attendants and one pilot
  - 25% report seeing one smoked in airport
Air quality study

- N=9
- Gas phase – nicotine and glycerine
- Carcinogenic PAH increased 20%
- Aluminum increased 2.4 fold
- FeNO increased in 7/9

During the vaping sessions substantial amounts of 1,2-propanediol, glycerine and nicotine were found in the gas-phase, as well as high concentrations of PM$_{2.5}$ (mean 197 μg/m$^3$). The concentration of putative carcinogenic PAH in indoor air increased by 20% to 147 ng/m$^3$, and aluminum showed a 2.4-fold increase. PNC ranged from 48,620 to 88,386 particles/cm$^3$ (median), with peaks at diameters 24–36 nm. FeNO increased in 7 of 9 individuals. The nicotine content of the liquids varied and was 1.2-fold higher than claimed by the manufacturer.

Take home points

- Not merely water vapor
- No quality control – mainly produced in China
- Not enough evidence to support it as a cessation aid
- When heated and vaporized, propylene glycol can form propylene oxide, an International Agency for Research on Cancer class 2B carcinogen
- Glycerol forms acrolein, which can cause upper respiratory tract irritation
- Like any poison keep bottles away from small children
- None of the exposure studies have taken into consideration asthmatics
Regulation

- **2011 Court decision**
  - Denied FDA regulation of E-cigarettes as drug/device
  - Approved FDA regulation of E-cigarettes as a tobacco product
FDA proposal

- A ban on the sale to minors
- A prohibition on distributing free samples
- A ban on selling e-cigarettes in vending machines unless they are in places that never admit young people
- A requirement that e-cigarettes carry warnings that they contain nicotine, which is addictive
- E-cigarette manufacturers would be required to disclose the ingredients in their products
Current state laws

- 28 states’ laws regulate e-cigarettes
  - Youth access
  - Smoke-free areas
  - Excise taxation
    - Minnesota

Arkansas and Virginia explicitly excluded e-cigarettes from their laws
Current Legislation on E-cigs

<table>
<thead>
<tr>
<th>State</th>
<th>100% Smokefree Venues in Which Use of E-cigarettes Prohibited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. North Dakota</td>
<td>WRBG</td>
</tr>
<tr>
<td>2. New Jersey</td>
<td>WRB</td>
</tr>
<tr>
<td>3. Utah</td>
<td>WRB</td>
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**Laws Currently in Effect**

State Laws Restricting E-cigarette Use in 100% Smokefree Venues: 3
State Laws Restricting E-cigarette Use in Other Venues: 15
Local Laws Restricting E-cigarette Use in 100% Smokefree Venues: 274

"Electronic smoking device" means any product containing or delivering nicotine or any other substance intended for human consumption that can be used by a person to inhale vapor or aerosol from the product. The term includes any such device, whether manufactured, distributed, marketed, or sold as an e-cigarette, e-cigar, e-pipe, e-hookah, or vape pen or under any other product name or descriptor, and includes any component part of the product whether or not sold separately. The term does not include drugs, devices, or combination products approved for sale by the United States Food and Drug Administration, as those terms are defined in the Federal Food, Drug, and Cosmetic Act.
Take Home Points

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• None of the exposure studies have taken into consideration asthmatics or COPD
Resources

- Montana Adolescence Substance Abuse facts
- Evidence based and clinical practice guidelines
  http://1.usa.gov/1909qzl
- Medicaid coding for tobacco cessation
  http://bit.ly/16YIW5r
- YRBS statistics for Montana
  http://opi.mt.gov/Reports&Data/YRBS.html
- Department of Health and Human Services Best Practices for Smoking Cessation
  http://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/
- Association for the Treatment of Tobacco Use and Dependence
  http://www.attud.org/
- Montana Tobacco Use Prevention Program
- Fifty State Hookah Regulations
- Cessation Insurance/Medicaid Coverage in Montana
Thank you!

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