CURRENT ISSUES WITH ELECTRONIC CIGARETTES AND VAPING

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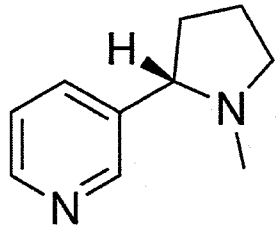
HEALTH AND SOCIOLOGICAL ISSUES

- FDA REGULATION
  - MARKETING
- MEDICAL USES
- HEALTH EFFECTS
  - ADDICTION
  - CARDIOPULMONARY
  - NEUROLOGICAL

REGULATORY FRAMEWORK

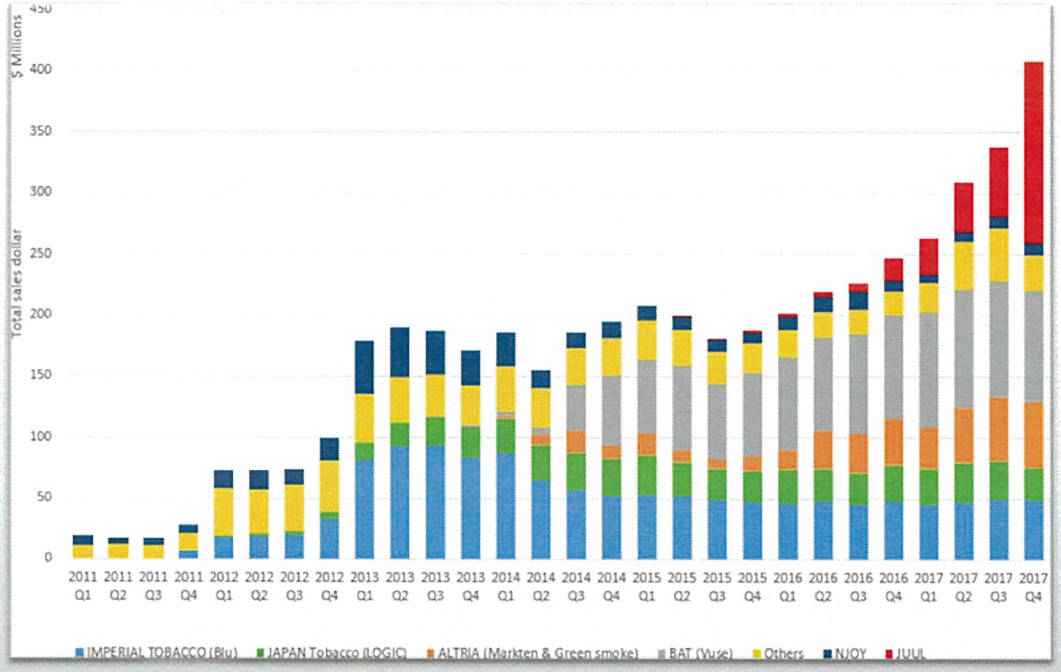
- ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) OR E-CIGS ARE A COMPLICATED ENTITY
- NICOTINE IS AMONG THE MOST ADDICTIVE CHEMICALS KNOWN
  - NICOTINE IS A MILD STIMULANT
- IS NICOTINE A MEDICINE?
  - YES, BUT ONLY TO TREAT ADDICTION TO NICOTINE IN TOBACCO PRODUCTS



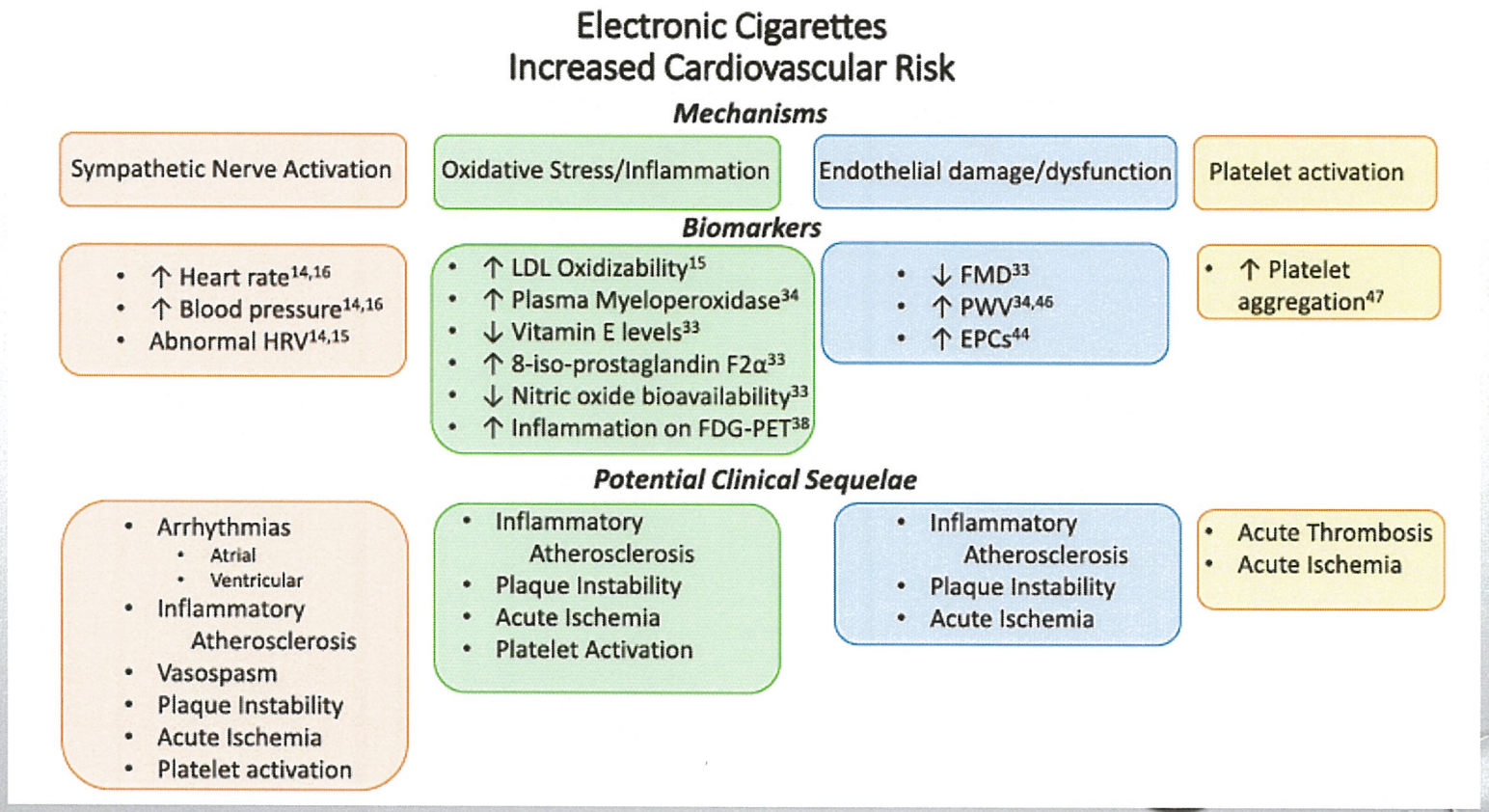
- WHO REGULATES AN ADDICTIVE STIMULANT THAT IS OCCASIONALLY A MEDICINE?
  - FDA, VIA THE FOOD, DRUG AND COSMETICS ACT.
  - **"WARNING: THIS PRODUCT CONTAINS NICOTINE. NICOTINE IS AN ADDICTIVE CHEMICAL."**

VAPING TRENDS

- OVER THE PAST DECADE, ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) HAVE DRAMATICALLY INCREASED IN TERMS OF USAGE AND SALES
- BIG TOBACCO LED THE WAY, BUT INDEPENDENT COMPANIES (JUUL) ARE EMERGING
- LOCAL DISPENSARIES ARE ALSO EMERGING, BUT HARDER TO QUANTIFY



POTENTIAL CARDIOVASCULAR EFFECTS OF E-CIGARETTES



WHO SHOULD QUIT SMOKING?

- EVERYONE

WHO IS ACTUALLY PRESSURED TO QUIT SMOKING?

- PREGNANT MOMS
  - NICOTINE REPLACEMENT (PATCH OR ECIG) IS OFTEN RELIED UPON
  - NICOTINE IS PREGNANCY CATEGORY D = THERE IS EVIDENCE OF HUMAN FETAL RISK, BUT THE POTENTIAL BENEFITS FROM THE USE OF THE DRUG IN PREGNANT WOMEN MAY BE ACCEPTABLE DESPITE ITS POTENTIAL RISKS.
  - CHANTIX, OTHER PHARMACOLOGICAL TOOLS FOR SMOKING CESSATION

WHO SHOULD QUIT SMOKING?

- EVERYONE

WHO IS ACTUALLY PRESSURED TO QUIT SMOKING?

- HEART FAILURE PATIENTS
  - TYPICALLY FIRST NOTED IN PATIENTS WITH HIGH BLOOD PRESSURE
  - NICOTINE MAY INCREASED BLOOD PRESSURE AND WORSEN OTHER CARDIOVASCULAR SYMPTOMS

E-CIGARETTES MAY HELP PEOPLE QUIT TOBACCO USE

Table 4. Urges to Smoke in Participants with Abstinence at 1 Week or 4 Weeks after Quit Date.*

Variable	1 Wk after Quit Date		Mean Difference (95% CI)	4 Wk after Quit Date		Mean Difference (95% CI)
	E-Cigarettes (N=158)	Nicotine Replacement (N=131)		E-Cigarettes (N=186)	Nicotine Replacement (N=132)	
Score for frequency of urge	2.5±1.1	2.8±0.9	−0.4 (−0.6 to −0.1)	1.9±0.9	2.2±0.8	−0.3 (−0.5 to −0.1)
Score for strength of urge	2.7±1.1	3.2±1.0	−0.5 (−0.7 to −0.2)	2.1±1.1	2.4±1.0	−0.3 (−0.6 to −0.1)
Composite urge score	2.6±1.0	3.0±0.9	−0.4 (−0.6 to −0.2)	2.0±1.0	2.3±0.9	−0.3 (−0.5 to −0.1)

* Plus–minus values are means ±SD. Scores for frequency of urge ranged from 1 (not at all) to 6 (all the time). Scores for strength of urge ranged from 1 (no urges) to 6 (extremely strong). The composite score (range, 1 to 6, with higher scores indicating more severe urges) is an average of the frequency and strength scores.

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E-CIGARETTES MAY HELP PEOPLE QUIT TOBACCO USE

CORRESPONDENCE

E-Cigarettes versus Nicotine-Replacement Therapy for Smoking Cessation

Normalizing vaping and modeling addictive behavior might escalate the extent of the epidemic among youth.[2] Nicotine adversely affects brain development, and as noted in the editorial by Drazen et al.[4] in the same issue of the *Journal*, teens who vape are more likely to start smoking than those who do not.[5] Caution is advised when choosing e-cigarettes, with consideration of their comparable effectiveness to FDA-approved medications but uncertain long-term harms.

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VAPORS CONTAIN MORE THAN JUST NICOTINE

- E-LIQUID IS A FORMULATION OF PHOSPHOLIPIDS AND/OR GLYCEROL
- SEVERAL WELL-KNOWN CARCINOGENS ARE GENERATED IN THE PROCESS OF VAPORIZATION
- OTHER CONTAMINAI
- ADDITIONALLY, INDE
  E-LIQUIDS

Comparison of sample toxicants emitted by tobacco cigarettes and e-cigarettes

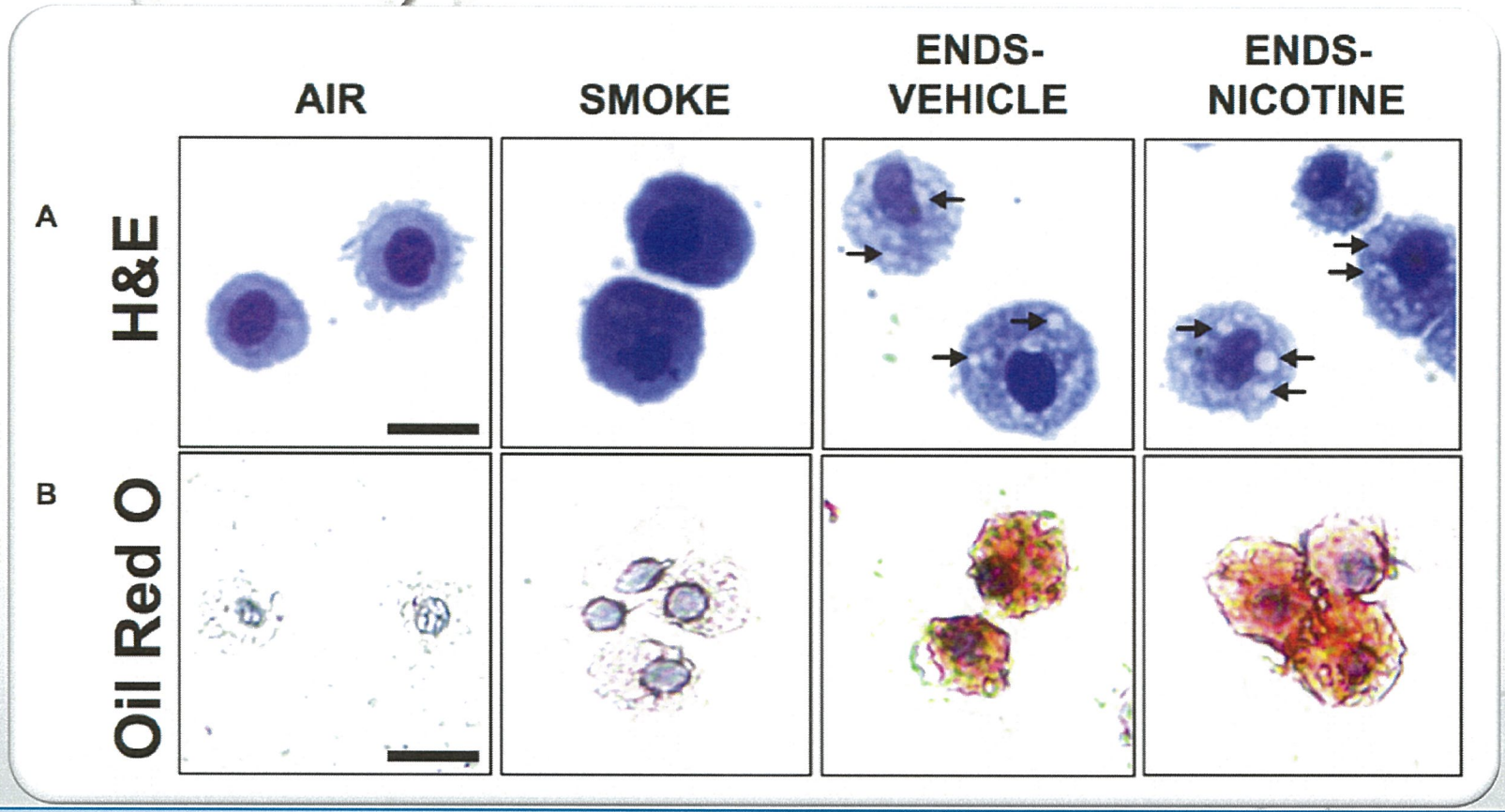
Toxic compound	Tobacco cigarette (µg in mainstream smoke)	E-cigarette (µg per 15 puffs*)	Average ratio (conventional vs electronic cigarette)
Formaldehyde	1.6–52	0.20–5.61	9
Acetaldehyde	52–140	0.11–1.36	450
Acrolein	2.4–62	0.07–4.19	15
Toluene	8.3–70	0.02–0.63	120
NNN**	0.005–0.19	0.00008–0.00043	380
NNK**	0.012–0.11	0.00011–0.00283	40

* The authors assumed smokers of e-cigarettes would take an average of 15 puffs per vaping session, corresponding to smoking one tobacco cigarette.
** Tobacco-specific nitrosamine, a carcinogenic compound that originates in the curing and processing of tobacco.
Adapted from Goniewicz et al. (2014)[4]

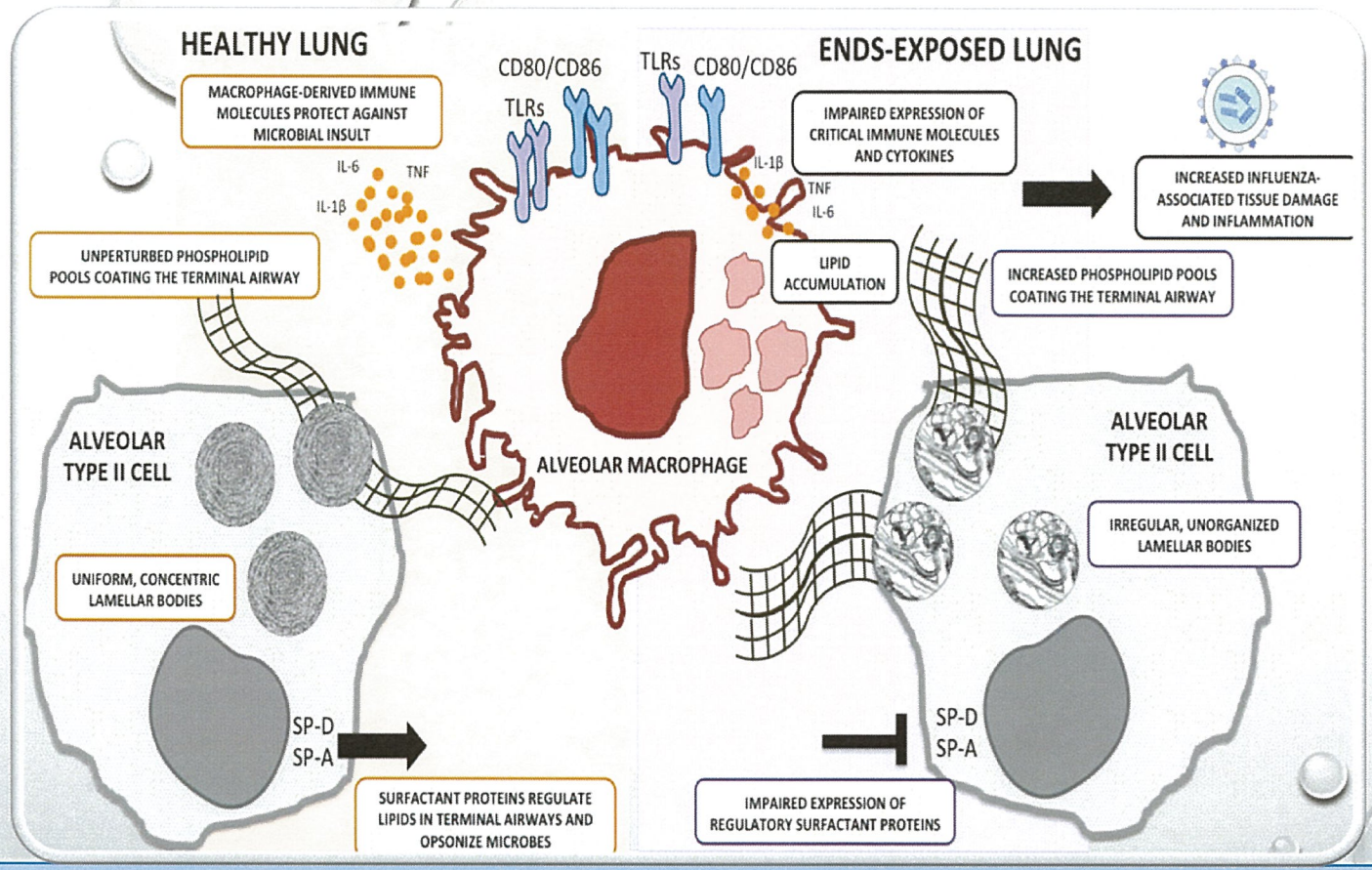
Environ Health Perspect 122:A244-A249, 2014

ONGOING EFFORTS TO STUDY E-CIGARETTES AT UNM ARE LIMITED

- MARY WALKER, PH.D., COLLEGE OF PHARMACY, MAINLY EXAMINING CIGARETTE SMOKING
- MIND NETWORK DOES LIMITED STUDIES OF NEUROLOGICAL EFFECTS
- CAMPEN WORKS ON A SUBCONTRACT WITH BAYLOR COLLEAGUES STUDYING THE PULMONARY AND VASCULAR TOXICITY
- UNM HAS LIMITED RESOURCES FOR EXPOSURE AND CHEMICAL CHARACTERIZATION OF POTENTIAL CONTAMINANTS
- STRONG FUNDING IN OTHER AREAS (OPIATES, ENVIRONMENTAL TOXICANTS) PULLS MANY INVESTIGATORS AWAY FROM THIS FIELD



LONG-TERM E-CIG EXPOSURE ALTERS LIPID HANDLING IN LUNG IMMUNE CELLS (J CLIN INVEST, IN PRESS, 2019)



THIS TOXIC EFFECT WAS DRIVEN BY CHRONIC INHALATION OF THE E-LIQUID, NOT THE NICOTINE

NEXT BIG THINGS: VAPORIZED MARIJUANA

- VAPING OF MARIJUANA AND ACTIVE COMPONENTS (CANNABINOIDS) IS ALSO A GROWING TREND
- AS WITH TOBACCO, VAPING LIKELY DELIVERS FEWER TOXIC COMPONENTS THAN THE COMBUSTED FORM.
- POPULARITY OF THE DEVICES AND FORMULATIONS OF THC MAY BECOME PROBLEMATIC
  - EASE FOR ABUSE
  - TARGETING MINORS