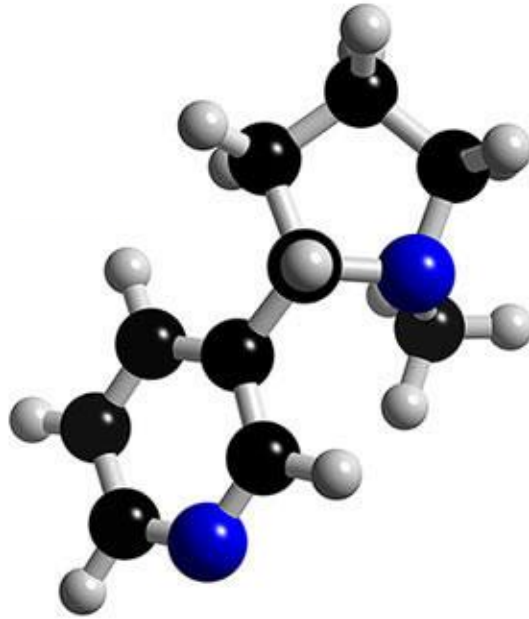




Comprehensive approach to Nicotine: Misperceptions, Regulation and Science

The Public Health View

Nicotine



Tobacco Products contain many chemicals

CHEMICAL COMPOUNDS IN CIGARETTE SMOKE

A SUMMARY OF A SELECTION OF HAZARDOUS COMPOUNDS IN CIGARETTE SMOKE & THEIR EFFECTS

ESTIMATED NUMBER OF CHEMICAL COMPOUNDS IN CIGARETTE SMOKE

7,357

70

NUMBER OF THESE COMPOUNDS WITH CONFIRMED CARCINOGENIC ACTIVITY



The compounds shown below are all found in cigarette smoke. The mass figures, given in μg , take into account both mainstream (inhaled) and sidestream smoke. 1 μg is equal to 1 millionth of a gram. Amounts of these compounds vary in different brands of cigarettes - these figures are approximate.

NICOTINE



- Approx. 919 μg per cigarette
- Addictive
- Increases heart rate
- Increases blood pressure
- Increases blood glucose
- Lethal dose: around 500-1000mg

N-NITROSAMINES



- Large class of compounds
- Several are tobacco-specific
- Known human carcinogens
- Most carcinogenic: NNK & NNN
- NNK: approx. 0.3 μg per cigarette
- NNN: approx. 2-50 μg per cigarette
- May cause reproductive damage

BENZENE



- Approx. 46-272 μg per cigarette
- Known human carcinogen
- Damages bone marrow
- Lowers red blood cell count
- May harm reproductive organs

AROMATIC AMINES



- Large class of compounds
- Includes 2-aminonaphthalene:
- Known human carcinogen
- Linked with bladder cancer
- Approx. 0.04 μg per cigarette

ACETALDEHYDE



- Approx. 680-1571 μg per cigarette
- Known animal carcinogen
- Probable human carcinogen
- Irritant to skin & eyes
- Irritant to respiratory tract

1,3-BUTADIENE



- Approx. 36-191 μg per cigarette
- Known human carcinogen
- Suspected human teratogen
- Irritant to eyes & skin
- Irritant to upper respiratory tract

ACROLEIN



- Approx. 69-306 μg per cigarette
- Possible human carcinogen
- Known DNA mutagen
- Irritant to skin & nasal passages
- May contribute to heart disease

POLYAROMATICS



- Large class of compounds
- Includes benzo[a]pyrene:
- Known human carcinogen
- Known DNA mutagen
- Affects reproductive capacity
- Up to 0.14 μg per cigarette



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MAJOR SOURCE: 'CHEMICAL CONSTITUENTS IN CIGARETTE SMOKE - A REPORT TO THE NEW ZEALAND MINISTRY OF HEALTH', J. FOWLES, M. BATES & D. NOITON, MARCH 2000

Hazard Index Analysis

Theoretical Cancer Hazard Index (arbitrary units)

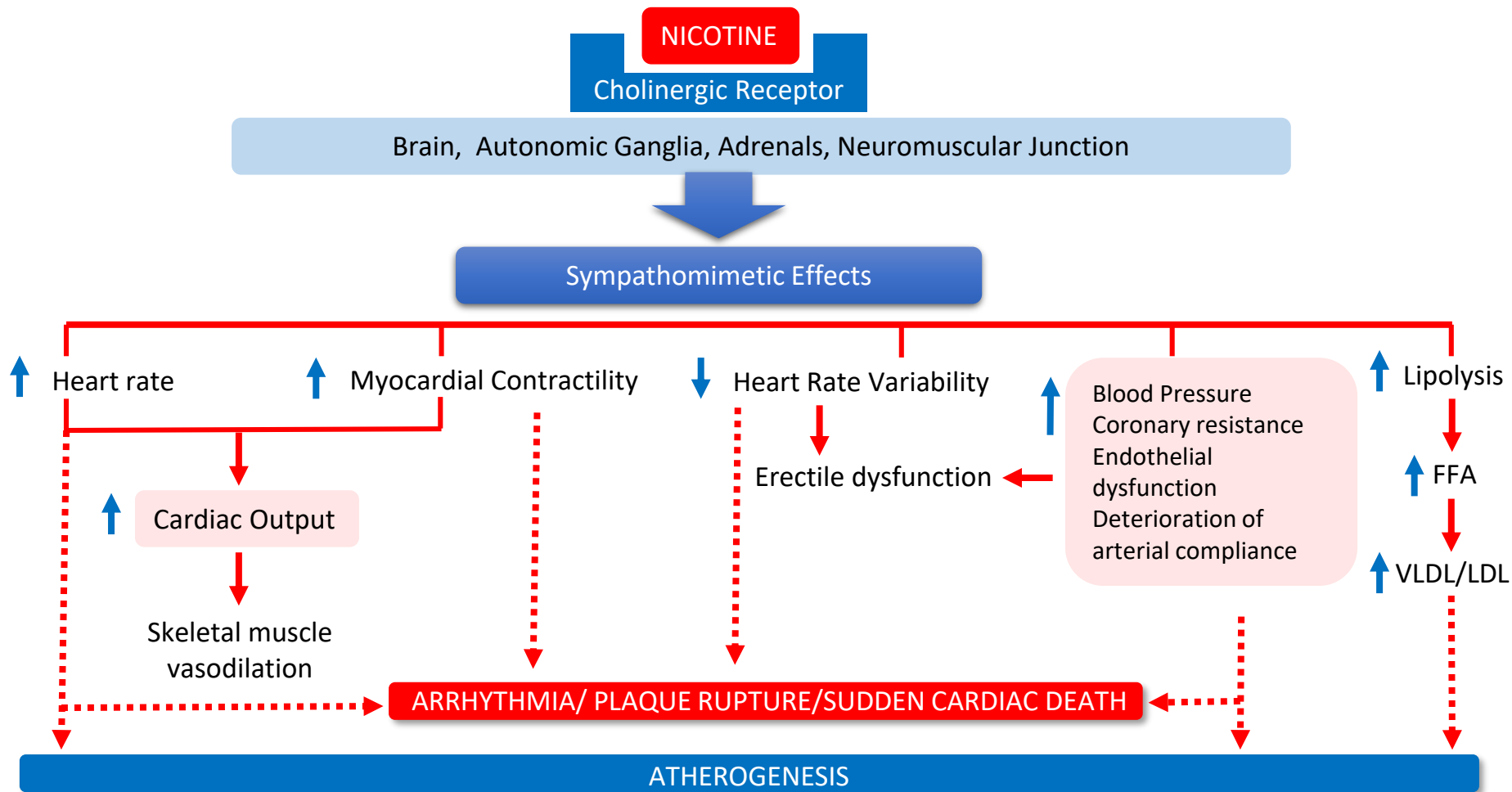


- Lead (0.01%)
- 2-Aminonaphthalene (0.02%)
- 4-Aminobiphenyl (0.06%)
- Benzo[a]pyrene (0.18%)
- N-Nitrosornicotine (0.19%)
- Quinoline (0.41%)
- 1,3-Butadiene (0.45%)
- Arsenic (0.61%)
- NNK (1.9%)
- Chromium (4.4%)
- Cadmium (4.9%)
- Pyridine (5.7%)
- Benzene (6.1%)
- Acrylonitrile (10%)
- Acetaldehyde (20%)
- Formaldehyde (20%)
- Isoprene (25%)

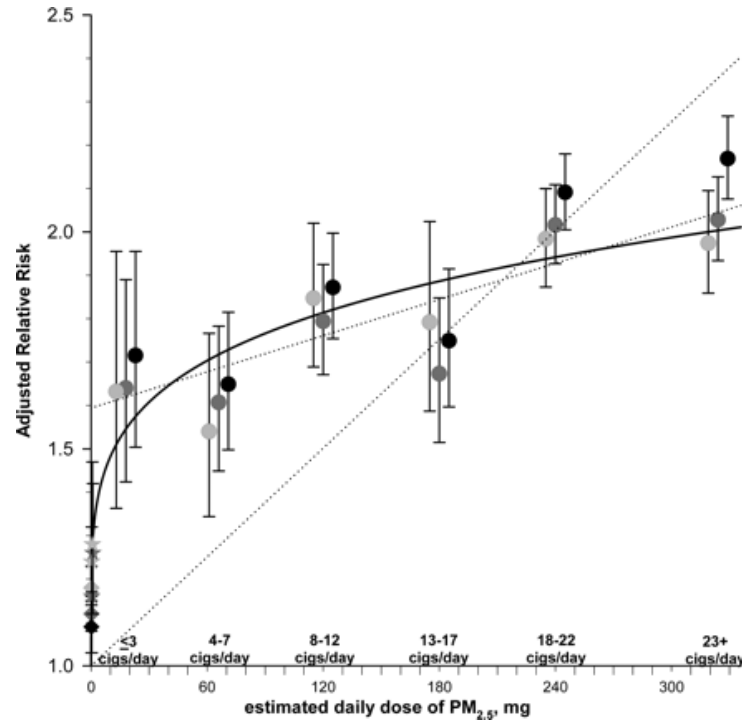
Theoretical Non-Cancer Hazard Index (arbitrary units)



- Resorcinol
- Selenium
- 2-Butanone
- Acetone
- Styrene
- o-Cresol
- Toluene
- m/p-Cresol
- Phenol
- Nickel
- Ammonia
- Chromium
- Catechol
- Carbon monoxide
- Arsenic
- Hydroquinone
- Benzene
- 1,3-Butadiene
- Pyridine
- Acrylonitrile (0.17%)
- Lead (0.19%)
- Propionaldehyde (0.21%)
- Formaldehyde (0.41%)
- Cadmium (0.66%)
- Acetaldehyde (2.4%)
- Hydrogen cyanide (7.2%)
- Acrolein (88.5%)



Non-linear relationship between smoking and cardiovascular disease

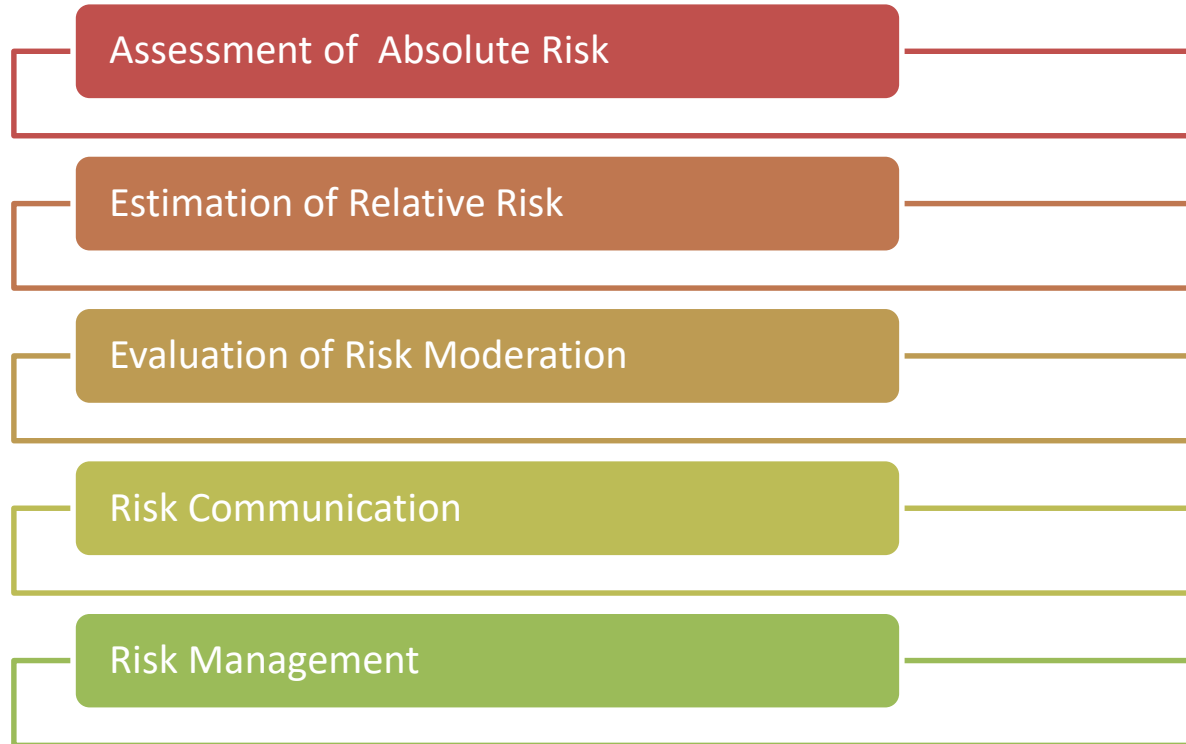


Most of the risk of smoking is at low doses: 80% of the harm at <3 cigarettes per day

A continuum of risk



Assessment and Communication of Risk





Risk Communication as Part of FDA's Comprehensive Approach to Nicotine: Whose Job is it Anyway?

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History of Deception?

- “Light, Low, Mild” Claims – not so much
- Section 911 MRTP
- Nicotine = tobacco?

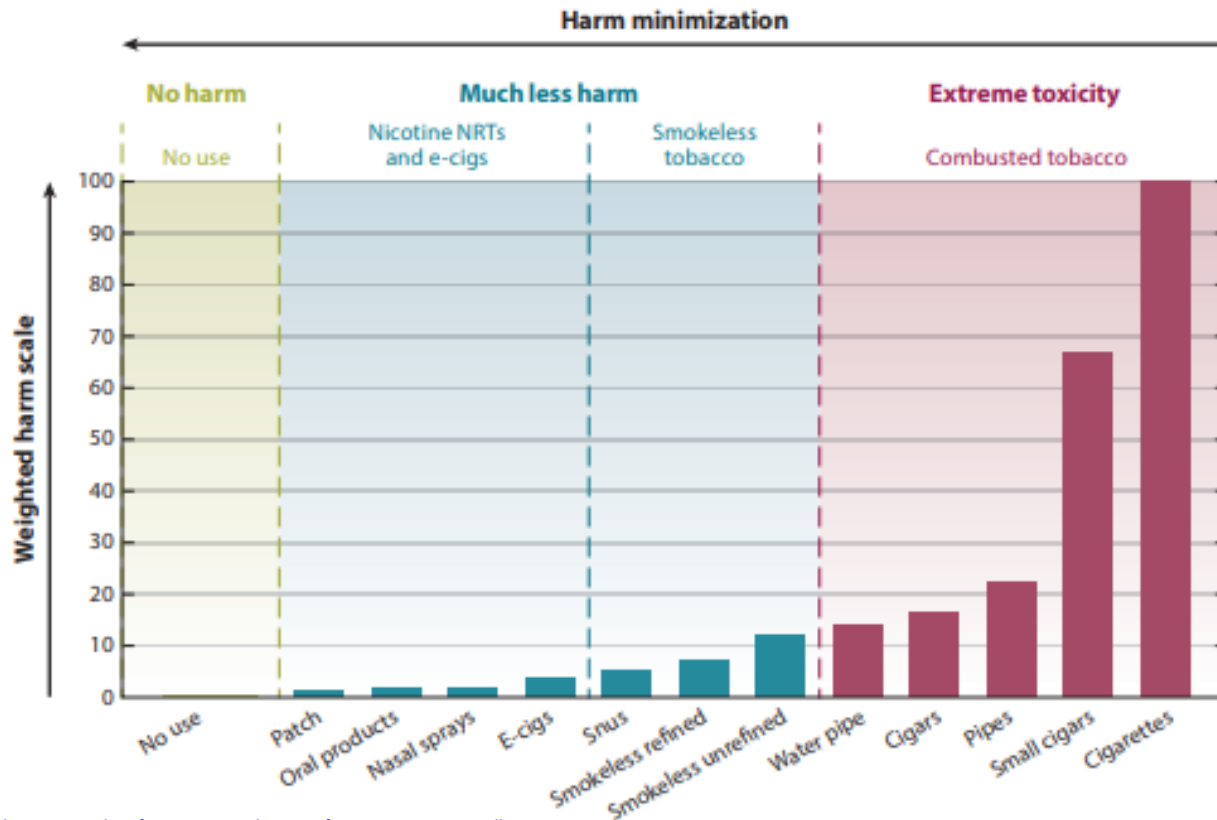


New Era of Tobacco Harm Reduction

- Next gen products offer real THR opportunity
 - the Continuum of Risk
- Without a doubt *less harmful* that smoking
 - See RCP, PHE, NASEM, even American Cancer Society



The Continuum of Risk



See [Harm Minimization and Tobacco Control: Reframing Societal Views of Nicotine Use to Rapidly Save Lives](#)

David B. Abrams, Allison M. Glasser, Jennifer L. Pearson, Andrea C. Villanti, Lauren K. Collins, Raymond S. Niaura
Annual Review of Public Health 2018 39:1, 193-213

Public Perception

- How should this be communicated to the public
- FDA appears to acknowledge Continuum of Risk – see Deeming Rule preamble, Commissioner’s remarks, etc.
 - Drowned out by louder anti voices and eager media



Food and Drug Administration

- FDA's outreach efforts focus on harms of nicotine, not relative risk
 - Impact on adolescent brain
 - Addictive
 - Cardiovascular impact
- All important concerns, but why such a one-sided approach to communication?



Resistance to Truth – Why?

- Ideology based on precautionary principle
- Fear of the unknown – long-term impact?
Population risks?
- Tobacco industry “baggage” hampering real next gen reduced risk products



A Different Approach: UK

- British government now actively promoting vaping, physicians encourage patients to switch from cigarettes
- UK has second-lowest smoking rate in Europe



Correcting Misperceptions

- FDA encourages industry to engage in dialogue – but the law prevents truthful communication of modified risk without approval
- First Amendment challenges to Section 911 MRTP provision now pending
- What role do the public health NGOs play?





Thanks!

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Risk Communication as Part of FDA's Comprehensive Approach to Nicotine: Whose Job is it Anyway? Role of Industry

Jim Solyst

Vice President, Federal Regulatory Affairs
Swedish Match North America



OVERVIEW

- Use Commissioner Gottlieb Language
- Be Willing to Reach Out to Audiences
- Tell Stories; Provide Context
- Seek Opportunities to Work with Non-Industry Organizations
- The Audience is not FDLI
- State and Local Initiatives

Use Commissioner Gottlieb Language

- There is only one FDA Commissioner, and hopefully he is considered a credible source. And there is an abundance of language from Commissioner Gottlieb: July 28, 2017 Announcement; articles, speeches, Statements when issuing ANPRMs.
- Statements made by anyone from a regulated industry is suspect.
- Always better to quote a credible party: such as a satisfied customer, or an academic researcher for science based issues.

Be Willing to Reach Out to Audiences

- Company staff should serve as “ambassadors” and be willing to have informal conversations or formal presentations describing the harm (or lack thereof) of nicotine and the continuum of risk.
- Personal examples:
 - Swedish American Chamber of Commerce;
 - Swedish Ambassador
- Start with: “As stated by FDA Commissioner Gottlieb...”

Tell Stories; Provide Context

- For Swedish Match it is the “Swedish Experience” and the story is:
 - Human health evidence regarding nicotine
 - Very low smoking rates in Sweden and Norway
- Stories about how we got in the situation we are in
 - Lynn Kozlowski article in Harm Reduction about how US smokeless products ended up with the current warning labels:
 - *Origins in the USA in the 1980s of the warning that smokeless tobacco is not a safe alternative to cigarettes: a historical, documents-based assessment with implications for comparative warnings on less harmful tobacco/nicotine products*

Seek Opportunities to Work with Non-Industry Organizations

- There is a need for organizations such as:
 - Foundation for a Smoke Free World;
 - Duke Margolis Center for Health Policy;
 - Iowa Attorney General Tom Miller lead initiative.
- It would be nice to see academic institutions break out of the confines of research and address policy and risk communication needs.
- But can they deal with the controversy that seems to come when there is industry involvement?

The Audience is not FDLI

- I have spoken/written to more FDA officials than I have nicotine users
- Recent session with retailers:
 - They are dealing with a huge influx of products; every week a manufacture asked them to carry a new product.
 - Is this new product safe? Not is it “low risk”, but rather will it explode?
 - How much nicotine is in the product and where does the nicotine come from? Is the manufacturer trustworthy?

State and Local Initiatives

- Need to communicate with state and local legislative bodies who are considering bills.
- Are they willing to let FDA take the lead? Do they care what Commissioner Gottlieb says?