

# Lessons Learned from Tobacco in the E-Cigarette Epidemic

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**JOHNS HOPKINS**  
M E D I C I N E

# Presentation Outline

- Understanding the scientific and political history of how combustible cigarettes were identified as harmful.
- Identify current concerns of electronic cigarettes.
- Understand the role of community in impacting the current epidemic of e-cigarette users.

# Disclosures

- Recipient of Cigarette Restitution Funds

# SMOKING *and* HEALTH

REPORT OF THE ADVISORY COMMITTEE  
TO THE SURGEON GENERAL  
OF THE PUBLIC HEALTH SERVICE



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service

# SMOKING *and* HEALTH

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**1964**



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service

1950

→1964

Wynder E, Graham E. Tobacco smoking as a possible etiologic factor in bronchiogenic carcinoma. JAMA. **1950**;143:329–336.

Doll R, Hill AB. Smoking and carcinoma of the lung. BMJ. **1950**;2:740–748.

Levin ML, Goldstein H, Gerhardt PR. Cancer and tobacco smoking: a preliminary report. JAMA. **1950**;143:336–338.

1950 1953

→ 1964

# Tobacco Consumption and Mortality From Cancer and Other Diseases

HAROLD F. DORN, Ph.D.

1950 1953

1957

→ 1964

# CIGARETTES PERIL HEALTH, U.S. REPORT CONCLUDES; 'REMEDIAL ACTION' URGED

## CANCER LINK CITED

Smoking Is Also Found 'Important' Cause of Chronic Bronchitis

WASHINGTON, May 15 (AP)—The Surgeon General today announced that the use of cigarettes contributed as substantially to the American death rate from "aggressive" chronic bronchitis as cancer.

The conclusion that made the report gave an explicit health warning for adults. The Surgeon General said that possible lung cancer deaths could be cut by 50 percent if the population that smokes cigarettes were to stop.

The report also said that the use of cigarettes was a "major" cause of chronic bronchitis, a disease that causes difficulty in breathing and is a leading cause of death among smokers.

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WASHINGTON (AP)—Luther Terry, US Surgeon General, at news conference here in Washington.

US Surgeon General  
Leroy Burney



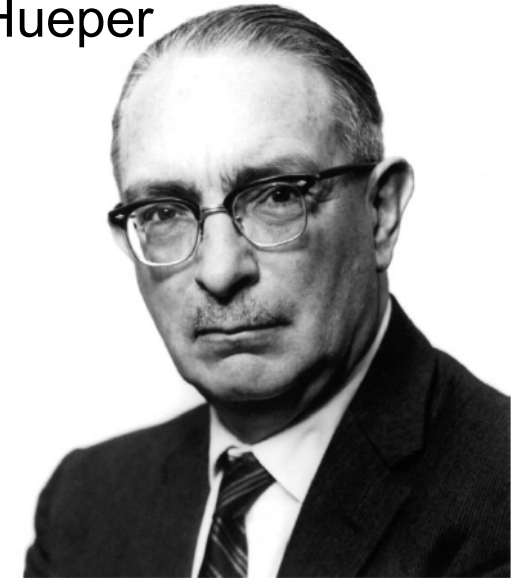
1950 1953

→ 1964

## Tobacco Industry Research Committee

- Aim: Promote negative claims against cigarette hypothesis
  - 1954: Wilhelm Hueper
    - Strongly opposed the Cigarette-Cancer Hypothesis

Hueper

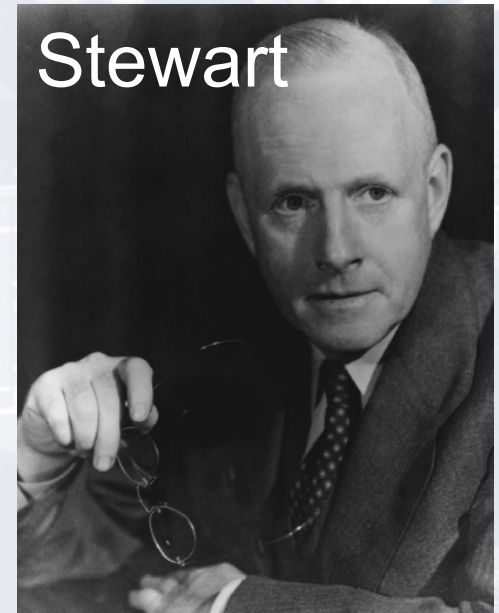


1950 1953

→ 1964

## Tobacco Industry Research Committee

- Aim: Promote negative claims against cigarette hypothesis
  - 1950s: Harold Stewart
    - Strongly opposed the Cigarette-Cancer Hypothesis

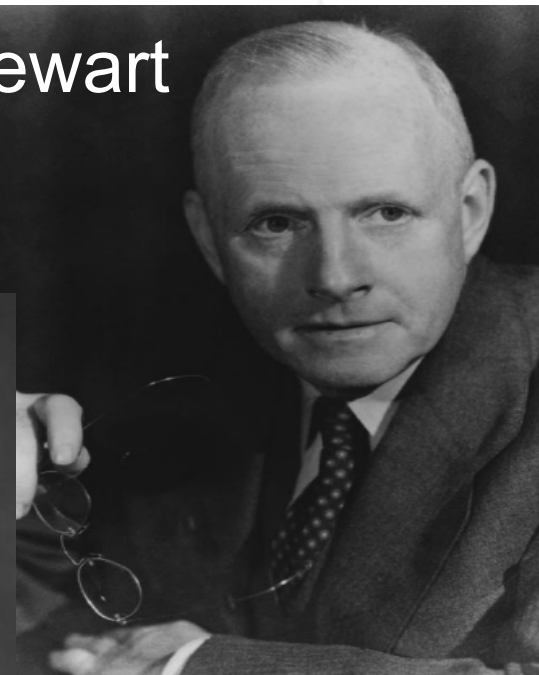


Stewart

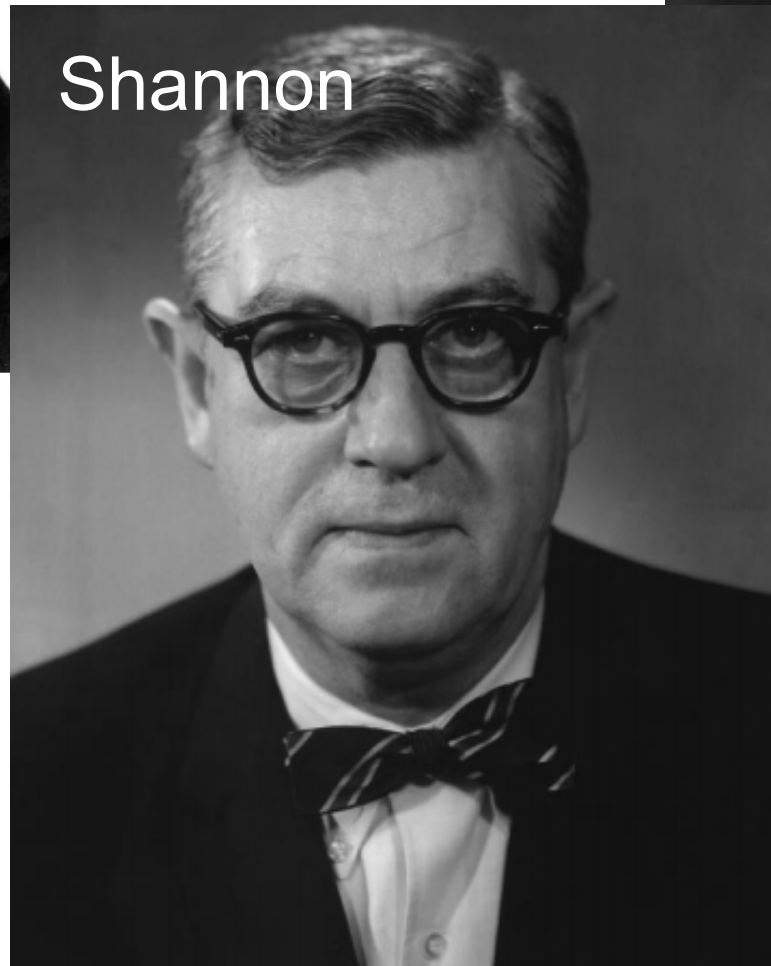
Hueper



Stewart



Shannon



1950 1953

1957 1959 → 1964

# Tobacco Consumption and Mortality From Cancer and Other Diseases

HAROLD F. DORN, Ph.D.

*A study of some 200,000 life insurance policyholders contributes striking evidence that regular cigarette smokers are subject to increased risk of dying from lung cancer, as well as cardiovascular disease, certain respiratory diseases, ulcers, and cirrhosis of the liver.*

## **PRESSURE BUILDS**

In the early 1960s, the new administration's health leaders initially showed little enthusiasm for further action on tobacco.



The American Cancer Society

The American Heart Association

The American Public Health Association

The National Tuberculosis Association

*All sent a joint letter to President Kennedy*

1950 1953

1957 1959 1961

1962 1964

## PRESS CONFERENCE May 23<sup>rd</sup>, 1962

Q. Mr. President, there is another health problem that seems to be causing growing concern here and abroad and I think this has largely been provoked by a series of independent scientific investigations, which have concluded that cigarette smoking and certain types of cancer and heart disease have a causal connection. I have two questions: do you and your health advisers agree or disagree with these findings, and secondly, what if anything should or can the Federal Government do in the circumstances?



1950 1953

1957 1959 1961 1962 1964

## PRESS CONFERENCE May 23<sup>rd</sup>, 1962

**THE PRESIDENT.** That matter is sensitive enough and the stock market is in sufficient difficulty *laughter* without my giving you an answer which is not based on complete information, which I don't have and, therefore, perhaps we could — I'd be glad to respond to that question in more detail next week.





That comment was the final push for the Kennedy Administration

- Formed:

**Surgeon General's Advisory Committee on Smoking and Health**

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# Electronic Cigarettes

- Modern electronic cigarette: 2003 by Hon Lik
  - A pharmacist
  - Intended to find a safer alternative to traditional cigarettes
  - 2004: Began to be sold in Asia
  - 2007: Introduced to US



# Electronic Cigarettes

## Royal Academy of Physicians

- 2007 Statement: Harm reduction in nicotine addiction
  - Discussed nicotine is relatively harmless and if an alternative to tobacco could be used for nicotine delivery, many lives could be saved.



# Electronic Cigarettes

## Royal Academy of Physicians

– 2014 Statement: Harm reduction in nicotine addiction

*The RCP recognises that electronic cigarettes and other novel nicotine devices can provide an effective, affordable and readily available retail alternative to conventional cigarettes.*

*The RCP also recognises that these new products present potential risks as well as opportunities for individual and population health, and therefore advocates proportionate regulation to maximise the overall public health benefit.*

# Electronic Cigarettes

## Royal Academy of Physicians

– 2016 Statement: Harm reduction in nicotine addiction

*E-cigarettes appear to be effective when used by smokers as **an aid to quitting smoking.***

*E-cigarettes are not currently made to medicines standards and are probably more hazardous than NRT.*

*However, the hazard to health arising from long-term vapour inhalation from the e-cigarettes available today is unlikely to exceed **the harm from smoking tobacco.***

# Electronic Cigarettes

## A Randomized Trial of E-Cigarettes versus Nicotine- Replacement Therapy

*NEJM 2019 February*

Reported 1-year abstinence was twice that (18%) in e-cigarette group versus nicotine replacement therapy (9.9%)



# Electronic Cigarette – Rebuttal

## Forum of International Respiratory Societies

### 2014 Statement of the 7 international societies:

- *The safety of electronic cigarettes has not been adequately demonstrated.*
- *The addictive power of nicotine and its untoward effects should not be underestimated.*
- *The potential benefits of electronic nicotine delivery devices, including harm reduction and as an aid to smoking cessation, have not been well studied.*



# Electronic Cigarette – Rebuttal

## Forum of International Respiratory Societies

### 2018 Statement of the 7 international societies:

- *To protect youth, electronic nicotine delivery systems should be considered tobacco products and regulated as such. All forms of promotion must be regulated.*
- *The sale of electronic cigarettes to youth must be banned in all nations.*
- *Electronic cigarettes have been claimed to be safer than combustible cigarettes, but comparison to the most lethal product in the history of the world is faulty. The appropriate comparison would be to non-use of tobacco products.*

# Electronic Cigarettes - Rebuttal

## A Randomized Trial of E-Cigarettes versus Nicotine-Replacement Therapy

*NEJM 2019 February*

Reported 1-year abstinence was twice that (18%) in e-cigarette group versus nicotine replacement therapy (9.9%)

**NRT + Bupropion 1-year abstinence rate: 20%**

**Varenicline at 26-weeks has been reported at 26%**

# Electronic Cigarettes - Rebuttal

## A Randomized Trial of E-Cigarettes versus Nicotine-Replacement Therapy

*NEJM 2019 February*

Reported 1-year abstinence was twice that (18%) in e-cigarette group versus nicotine replacement therapy (9.9%)

**80% of the e-cigarette arm was still using the product at 1-year, raising the concern for long-term use health risk**

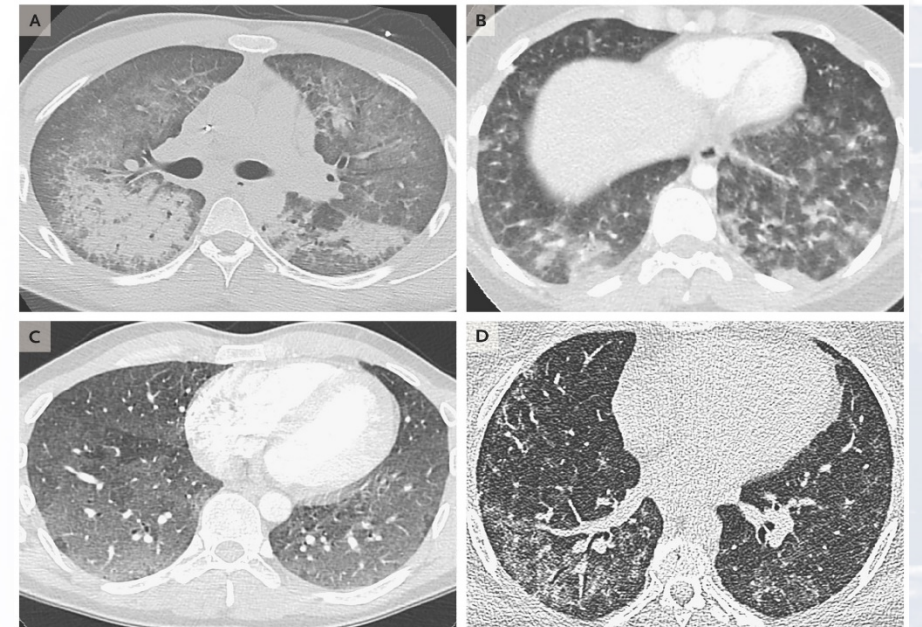
# Electronic Cigarettes – Rebuttal

Pulmonary Illness Related to E-Cigarette Use in Illinois and Wisconsin — Preliminary Report

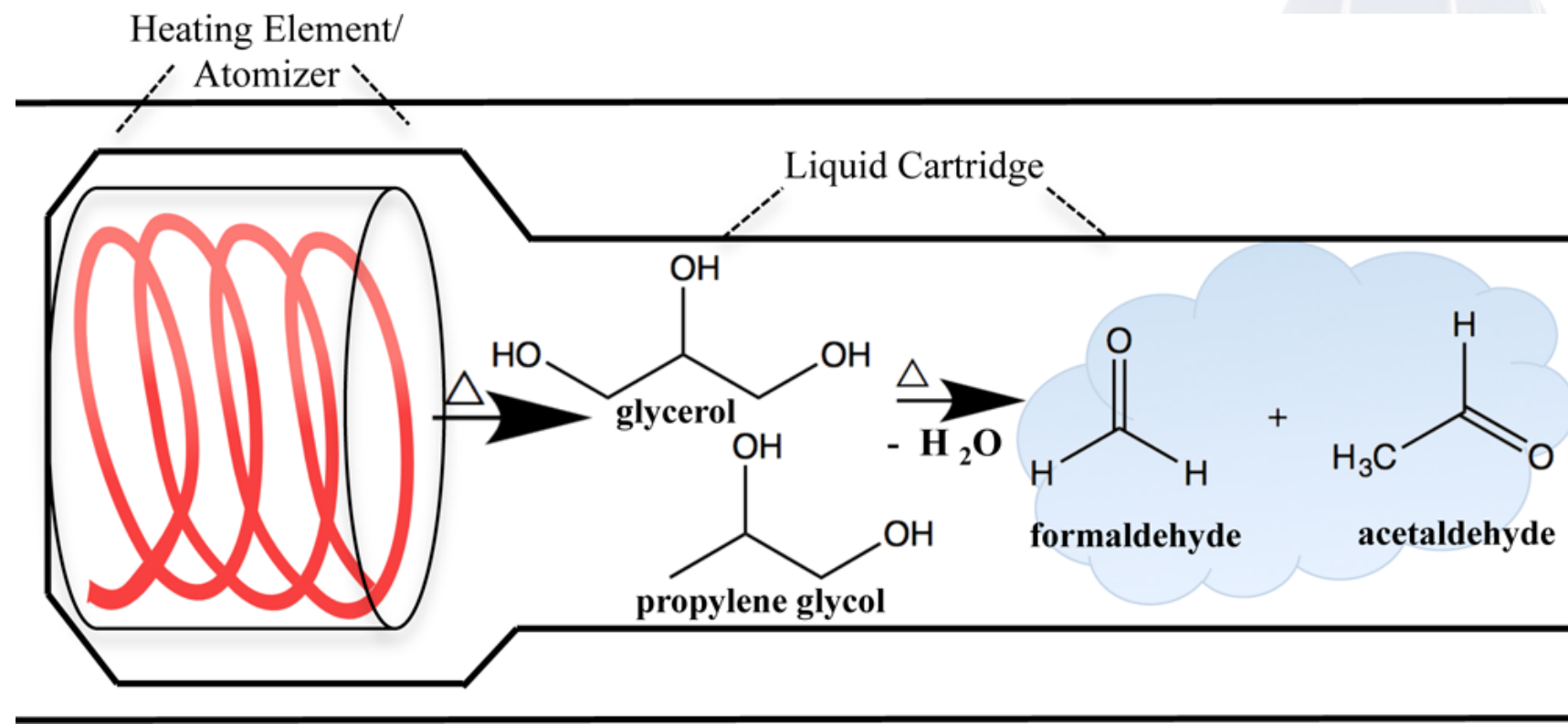
*NEJM September 2019*

Vaping may disrupt immune cells in the lungs, mouse study finds

*NBC Health News 2019*



# Anatomy of an Electronic Cigarette





# Anatomy of an Electronic Cigarette

**Based on information from e-cigarette manufacturers, a full e-cigarette cartridge provides approximately 300 puffs.**

**The average e-cigarette user may be inhaling formaldehyde at concentrations that would be unacceptable in the workplace, and they are doing this nearly 300 times each day.**

# Combustible Cigarettes & Electronic Cigarettes

## – A shared history

---

- Conflicting views from medical groups, outside forces influencing information, along with strong individual beliefs
- Concern for one public health issue (death from combustible cigarettes) may blind one from another (harm from e-cigarettes)

"THE PREMIER LEADER IN E-CIGARETTES AND E-LIQUIDS"

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Electronic Cigarette  
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Simelyue Technology

**FIN**

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**USA MIX FLAVOR**  
**18 MG**

Logic Smoke  
 DISPOSABLE ELECTRONIC CIGARETTE  
 1877 HIGH

**Rocket**  
**POP**

**COOL AND REFRESHING**

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**CROSS BAR**  
 Electronic Cigarettes

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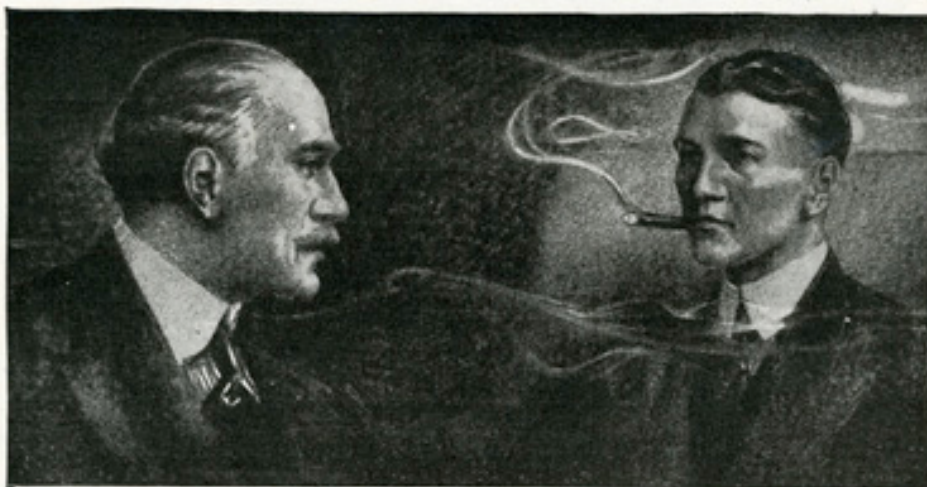
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## Tobacco Is Hurting You

Look at the facts square in the face, Mr. Tobacco User. You may think tobacco is not hurting you.

That is because you haven't as yet, perhaps, felt the effects of the nicotine poison in YOUR system. For you know that nicotine, as absorbed into the system through smoking and chewing tobacco, is a slow working poison. Slow, yes—but sure.

Tobacco is lowering your efficiency. It slows a man down. Makes it harder for you to concentrate your mind on your work. You haven't near the amount of "pep" and energy you would have if you stopped using it. There's many a man twice as old as you in years who's twice as young in energy, simply because he lets tobacco alone.

Some day you will realize to what an alarming extent tobacco has undermined your system.

When your hands begin to tremble—and your appetite begins to fail—and your heart seems to "skip a beat" now and then—and slight exertion makes you short of breath—then you have a right to suspect that TOBACCO is getting the upper hand.

Any well-informed doctor will tell you that these are only a few of many symptoms of tobacco poisoning. And YOU know that the use of tobacco in any form is an expensive, utterly useless habit. You know you ought to quit.

## Tobacco Habit Banished Let Us Help You

It doesn't make a particle of difference whether you've been a user of tobacco for a single month or 50 years, or how much you use, or in what form you use it—whether you smoke cigars, cigarettes, pipe, chew plug or fine cut or use snuff—Tobacco Redeemer will positively remove all craving for tobacco in any form in a very few days. Not the slightest shock to the nervous system. Your tobacco craving will usually begin to decrease after the very first dose—there's no long waiting for results.

Tobacco Redeemer contains no habit-forming drugs of any kind and is marvellously quick, scientific and thoroughly reliable.

It is in no sense a substitute for tobacco. After finishing the treatment you have absolutely no desire to use tobacco again or to continue the use of the remedy. It helps to quiet the nerves and make you feel better in every way.

**Results Guaranteed** A single trial will convince you. Our legal-binding, money-back guarantee goes with each full treatment. We will refund every cent you pay for the treatment if after taking it according to the easy-to-follow directions, it should fail to banish the tobacco habit completely.

**SEND Coupon for Free Proof** Let us send you our free booklet on the deadly effects of tobacco, together with testimonial letters from men all over the country telling how they have been absolutely freed from the tobacco habit by this simple home treatment. You could not ask for stronger proof that Tobacco Redeemer will free you from the habit than the evidence we will gladly send on request. Just mail the coupon—a postal will do.

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Please send, without obligating me in any way, your free booklet regarding the tobacco habit and proof that Tobacco Redeemer will positively free me from the tobacco habit or my money will be refunded.

Name \_\_\_\_\_  
Street and No. \_\_\_\_\_  
Town \_\_\_\_\_ State \_\_\_\_\_

NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC

# Stop Naturally!

Tobacco users, think a moment of the state of your body; run a few steps and you are exhausted.

**That's Tobacco at Work On Your Heart.**

Hold out your hand and watch it tremble—Think how trifles irritate you.

**That's Tobacco at Work On Your Nerves.**

Your vigor, the power to do the right thing at the right time, is slipping away.

**That's Tobacco at Work On Your Manhood.**

## DON'T TOBACCO SPIT AND SMOKE YOUR LIFE AWAY,

when you can easily and forever destroy that nerve-craving and eliminate nicotine from your system with NO-TO-BAC. Are you one of the tens of thousands of tobacco users who want to stop and can't for a day without actual suffering? To you we say, truthfully, you will find quick and permanent relief in

# NO-TO-BAC

**GUARANTEED TOBACCO HABIT CURE.**

What better proof than the sale of over a million boxes in three years. Start today and see how quickly No-To-Bac kills the desire for tobacco, steadies the nerves, increases weight, makes the blood pure and rich, tingling with new life and energy. The old man's feeling is made young again and—happy.

**POOR MAN STOP**  
wasting your money on the tobacco habit. You can't afford it. It will keep you poor—poor in purse and poor in health—stop it with the aid of No-To-Bac and quit.

**PUBLISHER'S BURNING YOUR MONEY!**  
The poor men of America burned and chewed up \$600,000,000 worth of tobacco-money last year. You helped. Great tobacco trusts absorb millions at the expense of your nerve force and manhood. Does it pay? Get cured. Buy No-To-Bac under your own name.

**DRUGGIST'S GUARANTEE.** Any druggist is authorized to sell No-To-Bac under absolute guarantee to cure. Written guarantee, free sample of No-To-Bac, Booklet called "Don't Tobacco Spit and Smoke Your Life Away" mailed free. Address THE STERLING REMEDY CO., Chicago, Montreal Can., New York.

NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC NO-TO BAC



# Persuasion

- An active attempt to change belief and attitude
  - Caveat: Difficult!
- Elaboration Likelihood Model
  - Two Routes to Persuasion:
    - *Systematic (central)*
    - *Superficial (peripheral)* Processing

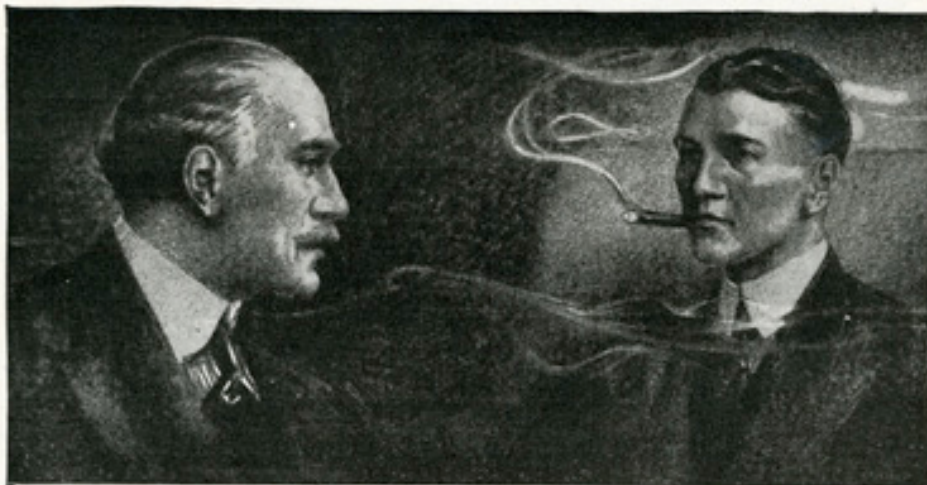
# Persuasion

**Central Processing:** deeper, elaborative processing (effortful); attention to message content.

*Versus*

**Peripheral route:** little thought.

- Consumers **do not process** the message **arguments** carefully, but instead **base** their **responses** on some **peripheral cue**
- For **instance** the degree to which they **like** the **source** of the message, or background music
- The **peripheral** route is more **temporary** and **shallow** in its effects.



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# Heuristic Cues: Peripheral Processing

- The Attractiveness Heuristic (Halo Effect).
- The Familiarity Heuristic (Mere Exposure Effect).
- The Expertise Heuristic (status of communicator).
- The Message Length Heuristic (number of arguments).
- Feelings as Cues to Attitudes (misattribution of source of mood).

# Central Processing

## The Four Stages of Systematic Processing:

- **Attention** to Message (it must be noticed to be effective).
- **Comprehension** of Message (if incomprehensible, message will have no effect or if misunderstood, an undesired effect).
- **Elaboration & Reaction** (cognitive & emotional response).
  - (Emotional/Cognitive reaction to message may induce bigger effect than actual message content).
- **Acceptance** or **Rejection** of message (or attitude shift in *opposite* direction: Boomerang Effect).

# What Determines the Processing Mode? Peripheral or Central?

- **Motivational Influences:**
  - The Need for Accuracy (Accountability).
  - Self-Relevance (Ego Involvement).
- **Cognitive Influences:**
  - Ability to Process (Understanding).
  - Attention Resources (Cognitive Load)
- **Personality Variables (Individual Differences):**
  - The Need for Cognition (thinking/problem solving).
  - Self-Monitoring (concern with self-presentation).
- **Emotion and Persuasion:** evidence contradictory, but..
  - Positive Moods tend to induce Peripheral Processing.
  - Negative Moods (e.g. Fear) induce Central Processing
    - BUT can induce defensive rejection if mood becomes extreme



Exposure to Advertising



Motivated to Elaborate?

Low involvement

Peripheral Route

High Involvement

Ability to Elaborate?

No

Yes

Central Route

# KEY POINT

Reactions to message  
are as important as the  
the *message itself*.

# KEY ACTIONS

1. Understand the severity of the epidemic
  - Vaping-related health injuries
  - Vaping in youth epidemic
2. Partner with organizations
  - American Lung Association, American Thoracic Society
  - Local Health Department
3. Devise strategies to prevent and treat

# Questions

**Panagis Galiatsatos, MD, MHS**

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