

Continuing Education Program for Nursing & Dietetic Professionals

Translating Epidemiology Into Sound Public Health Advice

A Problem, Key Concepts, and a Pearl or Two



SPEAKER:
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Communication/Publications

- Monthly newsletter reaching 13,000
- Website
- American Journal of Lifestyle Medicine
 - Circulation 30,000
- PCNA pages in the Journal of Cardiovascular Nursing
 - Circulation 5,000
 - Indexed



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Professional - Clinical Tools



NEW Edition! National Guidelines and Tools for Cardiovascular Risk Reduction- A Pocket Guide

- Includes guidelines on primary and secondary prevention of CVD, assessing Framingham risk and women's guidelines
- Includes chapters on lifestyle (nutrition and exercise), cholesterol, hypertension, overweight and obesity, diabetes, and smoking cessation
- Each chapter includes: up-to-date statistics, key guideline tables from national org. (ATP III, JNC7) patient resources, pharmacological therapies, target goals, and ICD 9 codes

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Understanding Epidemiology is Important!

- Mixed media messages leads to confusion.
 - TV, Newspapers, Magazines
 - Take “new science” and sensationalize without careful analysis.

- Going to the primary source for health information before giving advice.

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Epidemiology and Clinical Practice

- Public Health messages in the media.
 - According to the CDC, 88% of people in America learn about health issues from TV and more than 50% of regular TV viewers report they trust the health information in popular shows to be accurate.
 - In 2001, CDC forms the Entertainment Education Program in partnership with Hollywood.
 - In May 2004 episode of ER with 24.8 million viewers covered youth heart disease, obesity and 5 A Day. Viewers reported more healthy behaviors after viewing the show.

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Mixed Messages from the Media about Epidemiology

New York Times (2-17-09)
"Vitamin Pills: A False Hope?"

New York Times (7-20-09)
"Tossing out the Diet and Embracing the Fat"

Boston Globe (1-2-07)
"Articles on Diet can be Unhealthy, Study Says"

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More Mixed Messages from the Media

Washington Post (2-25-09)
"A Drink a Day Raises Women's Risk of Cancer"

New York Times (3-31-09)
"One Drink a Day Tied to Lower Death Risk"

New York Times (6-16-09)
"Alcohol's Good for You? Some Scientists Doubt it"

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A Mixed Message?



The final result of moderate drinking.

SATAN IN SOCIETY
Compiled by: Norman M. Roumanc
American Publishing Company, 1903

Results from a Nutritional Epidemiologic Study

	RR (95% CI)
Nondrinkers	1.04 (1.02 – 1.06)
2 drinks or less per week	1.00 (0.99 – 1.01) reference group
3-6 drinks per week	1.02 (1.00 – 1.03)
7-14 drinks per week	1.05 (1.03 – 1.07)
15 or more per week	1.15 (1.11 – 1.18)

P trend < .001

Allen et al. *JNCI* (2009;101), Table 2, p. 300.

Washington Post: "A Drink a Day Raises Women's Risk of Cancer"

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Problem: Weak Associations in Epidemiology

- What is a weak association?
- What do weak associations "say" about causation?
- Should public health recommendations be made on the basis of weak associations?

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Problem: Weak Associations in Epidemiology

- What is a weak association?
 - Relative Risks (or Odds Ratios) less than 2.0?
- What do weak associations "say" about causation?
- Should public health recommendations be made on the basis of weak associations?

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Problem: Weak Associations in Epidemiology

- What is a weak association? $RR < 2.0$
- What do weak associations “say” about causation?

A SCIENTIFIC PROBLEM

- Should public health recommendations be made on the basis of weak associations?

A PUBLIC HEALTH or POLICY PROBLEM



Science and the Application of Science

These are Fundamentally Different Activities

- Explanation (science) vs Intervention (application)
- Understanding vs Action
- Testing Causal Hypotheses vs Public Health Policies



Science and the Application of Science

- *Fundamentally Different Activities*
- Explanation vs Intervention
- Understanding vs Action
- Testing Hypotheses vs Policies
- Does eating or drinking “something” cause disease?
versus
- What should people eat (or drink) and how much, how often, are foods “safe”etc.



Epidemiology

The study of the causes of disease and what should be done to prevent (and control) diseases.

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An Epidemiologist

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When a Nutritional Epidemiology Study is published....

- **What are its scientific findings, and what do they “mean?”**
 - What do they explain about the causes of diseases?
 - What hypotheses have they tested and how well did they test them?
 - What do we now understand that we did not understand before?
 - What consensus exists (or not) in the scientific community regarding a causal relationship?
- **What should be done, given the findings?**
 - What are the current dietary recommendations and on what are they based?
 - Should those recommendations be changed?
 - Should the public be immediately warned or reassured?
 - Should laws be enacted and policies changed?
 - Should lawsuits be filed?

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When a Nutritional Epidemiology Study is published....

- **No claim about causation should be made...**
- **...without a careful and comprehensive account of previous scientific findings and the “consensus” (or not) of the scientific community.**

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When a Nutritional Epidemiology Study is published....

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- **Evidence-based Reviews in “Authoritative” Reports and the Peer-Reviewed Literature**

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- ### The Methods of Causal Inference
- Systematic Narrative Review
 - Meta-Analysis
 - Causal Criteria

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The Methods of Causal Inference

- No claim about causation should be made...
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 - Evidence-based Reviews in "Authoritative" Reports and the Peer-Reviewed Literature
- ### The Methods of Causal Inference
- Systematic Narrative Review
 - Meta-Analysis (when appropriate)
 - Causal Criteria ("Hill's Criteria" 1965)
 - Strength of Association (Strong NOT WEAK Associations)
 - Consistency of Association
 - Dose Response
 - Biological Plausibility
 - Temporality
 - 4 More (Coherence, Experimentation, Specificity, Analogy)

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When a Nutritional Epidemiology Study is published....

- No recommendation should be made...without:
- A careful and comprehensive account of previous scientific findings
- The "consensus" (or not) of the scientific community
- How the new study changes that consensus (or not)
- Understanding the current recommendation
- The impact of a change in recommendation

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When a Nutritional Epidemiology Study is published with a “weak” association....

- **No recommendation should be made without:**
- A careful and comprehensive account of previous scientific findings
- The “consensus” (or not) of the scientific community regarding those findings
- **Understanding how the new study changes the scientific consensus (or not)**
- Knowledge of the current recommendation
- **The impact of a change in recommendation including the benefits and risks of the action**

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An Example

▪ **Moderate Alcohol Intake and Cancer Incidence in Women**
(Allen NE, et al., JNCI 2009;101:296-305.)

A cohort study of 280,296 middle-aged women in the United Kingdom enrolled in the “Million Women Study” routinely followed for incident cancer.

Adjusted relative risks (RR) and 95% confidence intervals (CI) were calculated according to the amount and type of alcoholic beverage consumed.

Results: Increasing alcohol consumption was associated with increased risks of cancer.

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Results: Increasing alcohol consumption was associated with increased risks of cancer.

All Cancers: 6% increase in risk for each increase in drinks per day (95% CI 4% to 7%)

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“Dose Response” of Alcohol and All Cancers

	RR (95% CI)
Nondrinkers	1.04 (1.02 – 1.06)
2 drinks or less per week	1.00 (0.99 – 1.01) reference group
3-6 drinks per week	1.02 (1.00 – 1.03)
7-14 drinks per week	1.05 (1.03 – 1.07)
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Relative Risks of Cancer in the Study

All Cancers: 6% increase in risk for each increase in drinks per day (95% CI = 4% to 7%)

Oropharynx: 29% increase in risk (95% CI = 14% to 45%)

Esophagus: 22% increase in risk (95% CI = 8% to 38%)

Larynx: 44% increase in risk (95% CI = 10% to 88%)

Rectum: 10% increase in risk (95% CI = 2% to 18%)

Liver: 24% increase in risk (95% CI = 2% to 51%)

Breast: 12% increase in risk (95% CI = 9% to 14%)

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Risk for All Cancers elevated (as a Weak Association) only because the risks of specific cancers are elevated.

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A Good Example of Differing Interpretations for the Same Results

- **Moderate Alcohol Intake and Cancer Incidence in Women**
(Allen NE, et al., JNCI 2009;101:296-305)
- **Alcohol, Cardiovascular Disease, and Cancer: Treat with Caution (editorial)**
(Lauer MS and Sorlie P. JNCI 2009;101:282-283)
- **A Drink a Day Raises Women's Risk of Cancer, Study Indicates**
(Stein R. Washington Post, February 25, 2009, page A1)

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What the Newspaper Reporter Said...

Washington Post Article (opening paragraph)

Stein R: "For years, many women have been buoyed by the news about one of life's guilty pleasures: That nightly glass of wine may not only take the edge off a day but also improve their health. Now it turns out that sipping pinot noir might not be such a good idea after all." (p. A1)

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What the Study Author Said...

JNCI Article

Allen NE: "In conclusion, regular consumption of low to moderate amounts of alcohol by women increases the risk of certain cancers of the upper aerodigestive tract, rectum, liver, and breast, all of which have been classified by the IARC to be causally linked to alcohol intake. No statistically significant increases were found between increasing alcohol intake and cancer at other organ sites." (p. 304)

Washington Post Article

Allen NE: "That's the take-home message," said Naomi E. Allen of the University of Oxford, who led the study being published March 4 in the JNCI. "If you are regularly drinking even one drink per day, that's increasing your risk for cancer." (p. A1)

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Allen NE: "That's the take-home message," said Naomi E. Allen of the University of Oxford, who led the study being published March 4 in the JNCI. "If you are regularly drinking even one drink per day, that's increasing your (*individual*) risk for cancer." (p. A1)

	All Cancer RR (95% CI)	
Nondrinkers	1.04 (1.02 – 1.06)	
2 drinks or less per week	1.00 (0.99 – 1.01)	reference group
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What the Editorialists Said...

Washington Post Article

Lauer and Sorlie: "Among women, the major cause of death by far during the middle age years is cancer," Michael S. Lauer and Paul Sorlie of the National Heart, Lung and Blood Institute noted in a editorial accompanying the study. "For this large group, the only reasonable recommendation we can make is there is no clear evidence that alcohol has medical benefits." (p. A14)

JNCI Editorial

Lauer and Sorlie: "From a standpoint of cancer risk, the message of the report could not be clearer. There is no level of alcohol consumption that can be considered safe."

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What the Scientists (Allen et al.) Said But Neither the Editorialists nor the Newspaper Reporter Mentioned

JNCI Article

Allen et al. "Compared with the many studies that have reported increased risks of various forms of cancer with alcohol intake, far fewer studies have reported that alcohol drinking appears to be associated with a reduced risk of certain other cancers. Further investigations of the possibility that alcohol reduces the risk of thyroid cancer, non-Hodgkin lymphoma, and renal cell carcinoma are warranted." (p. 304)

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	<u>Thyroid Ca</u>	<u>NHL</u>	<u>Renal Cell Ca</u>
Nondrinkers	1.10	1.03	1.12
2 drinks or less per week	1.00	1.00	1.00
3-6 drinks per week	0.90	1.02	1.01
7-14 drinks per week	0.70	0.86	0.77
15 or more per week	0.54	0.77	0.94

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And what about Alcohol and Cardiovascular Disease?

What the JNCI editorialists said:

“Even if there are modest beneficial cardiovascular effects of alcohol...if the women who are asking physicians about any possible safe effects of alcohol are middle aged; for this large group, the only reasonable recommendation we can make is that there is no clear evidence that alcohol has medical benefits.” (JNCI, 2009;101:283)

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And what about Alcohol and Cardiovascular Disease?

What the JNCI editorialists said:

“Even if there are modest beneficial cardiovascular effects of alcohol...if the women who are asking physicians about any possible safe effects of alcohol are middle aged; for this large group, the only reasonable recommendation we can make is that there is no clear evidence that alcohol has medical benefits.” (JNCI, 2009;101:283)

Right...but exactly the same condition “NO CLEAR EVIDENCE” applies to the proposition that alcohol doesn’t have medical benefits.

Bottom line: “Mixed Messages come from the Experts too”

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Where Things Stand

- Alcohol “increases the risk” and is “associated” with “all cancers” only because some selected cancers had increased risks.
- All “significant” findings were already widely-accepted in the scientific community. Scientifically, there’s nothing new here.
- No clear distinction between the science and the application of the science (especially the editorialists and the newspaper reporter).
- There is no new information here upon which to base public health (nutrition) recommendations.
- Alcohol raises the risk of some cancers, may reduce the risk of others, and lowers the risk of cardiovascular disease.

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Questions & Answers

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10:00 am – 11:15 am PDT

Presenters: **Carol Dweck, PhD and Lola Coke, PhD, APRN-BC, CNS**

Register at: <http://eo2.commpartners.com/users/pcna/>

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