PROGRAM
and
ABSTRACTS

<u>25th Annual Meeting</u>

American Society of Preventive Oncology

March 11-13, 2001

The Roosevelt Hotel
New York, New York

ASPO
Silver Anniversary
Meeting

The American Society of Preventive Oncology is celebrating 25 years of providing information and educational opportunities to those who have decided to dedicate their careers to research in the areas of cancer prevention and control.

Program Chair: **James R. Marshall, PhD**
University of Arizona
Arizona Cancer Center

This meeting is sponsored by The American Society of Preventive Oncology, The Cancer Research Foundation of America, SmithKline Beecham, and a conference grant from the National Institutes of Health/National Cancer Institute.

The **American Society of Preventive Oncology** is an active and growing organization that is striving to: 1) promote the exchange and dissemination of information and ideas relating to cancer prevention and control; 2) identify and stimulate research areas in cancer prevention and control; and 3) foster the implementation of programs in cancer prevention and control.

Meetings of the **American Society of Preventive Oncology** are organized for professionals in clinical, educational or research disciplines who appreciate the challenges of a multidisciplinary scientific forum and who are committed to a comprehensive approach to cancer prevention and control.

Special Acknowledgements

The ASPO Executive Committee offers special thanks to Program Chair, **Dr. Jim Marshall**, for his extraordinary commitment in facilitating the development of the program for this meeting.

The Executive Committee also wishes to thank the co-sponsors of this 25th Annual Meeting. The sponsors have given the Program Committee complete latitude in choosing the speakers and topics which are underwritten by their contributions.

ASPO – 2001

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Herbert Irving Comprehensive Cancer Center

AFTER NEW YORK. . .

Immediately following the 2001 Meeting, **Mary Daly** will assume the Presidency, and **Al Neugut** will step down and become "Past President". **Bob Hiatt** will replace Mary as "President-elect", and **Deb Watkins-Bruner** will replace **Rodger Winn** on the Board of Directors.

Heidi Sahel will be taking over as Executive Director of ASPO as of July 1, 2001. The office will remain at the University of Wisconsin. Her phone number is (608) 263-9515. **Judy Bowser** will be working with Heidi part time to help plan the 2002 meeting and to facilitate the transition.

PLEASE HELP US PLAN FOR THE FUTURE. . .

At the close of the meeting please take a few minutes to complete the questionnaire at the back of this program. This will help future Program Committees and conference staff to better meet your professional and logistical needs.

The 2002 Meeting is scheduled for March 10-12, 2002, at the Hyatt Regency, Bethesda, Maryland.

Condensed Meeting Program
(Greater detail is available in the following pages)

Sunday, March 11

8:30 am - 5:00 pm	**Registration**
9:00 am - 12:00 pm	**General Meeting for NCI/K07 Fellows**
1:00 - 4:00 pm	**New Investigators' Workshop**

        Organizer: **Alfred I. Neugut, MD, PhD**
        Columbia University School of Public Health
        (Open only to those who have been notified of their selection)

2:30 pm - 4:30 pm	**Career Development for Junior Faculty/Researchers**
5:00 pm - 6:30 pm	**Cancer Center Associate Directors/Cancer Prevention & Control**
5:30 pm - 7:00 pm	**Mixer**
6:30 pm - 10:00 pm	**ASPO Executive Committee Meeting** (Working Dinner)

Monday, March 12

6:45 am - 5:00 pm	**Registration**
7:00 am - 8:45 am	**Concurrent Study Group Breakfasts** (Chemoprevention & Cancer Screening)
8:45 am	**Welcome and Introduction of ASPO Past Presidents**

        Daniel G. Miller, MD, Strang Cancer Prevention Center

9:00 am	**Keynote Presidential Address: Alfred I. Neugut, MD, PhD,** ASPO President

10:00 - 11:45 am	**SYMPOSIUM:** *Twenty-five Years of Preventive Oncology*

        Chair: **Margaret R. Spitz, MD,** The UT M. D. Anderson Cancer Center
Distinguished Achievement Address #1 by **I. Bernard Weinstein, MD,**
Columbia Univ., Herbert Irving Cancer Center will be part of this symposium

11:45 am - 12:15 pm	**NCI Listens**

Lunch on your own/Poster Set-up

11:45 am – 1:15 pm	**Career Development Seminar for Junior Faculty/Junior Researchers/Trainees**

(advance tickets required – 50 will be available Monday morning at Registration)

1:15 – 2:45 pm	**Symposium:** *The Future of Questionnaire-based Research in Physical Activity: Is the Method up to the Challenge?*

        Chair: **Leslie Bernstein, PhD,** Univ. of Sourthern California

3:00 pm	**Distinguished Achievement Address #2**

        Ellen R. Gritz, PhD, The UT M. D. Anderson Cancer Center

3:45 – 5:15 pm	**Plenary Paper Session**
5:15 – 5:45 pm	**ASPO Business Meeting**
6:00 pm	**Poster Session and Reception**
7:45 pm	**Presentation of "Best Poster" Award**
7:45 pm	**Presentation – 2001 CRFA/ASPO Cancer Prevention Research Fellowship**

Tuesday, March 13

7:00 am - 3:00 pm	**Registration**
7:15 – 8:45 am	**Concurrent Study Group Breakfasts** (Molecular Epidemiology & Behavioral Oncology and Cancer Communications – "BOCC")
9:00 am	**Joseph W. Cullen Memorial Award Lecture: David M. Burns, MD,** University of California, San Diego
10:00 am	**Symposium:** *Genomics in Preventive Oncology*

        Chair: **John D. Potter, MD, PhD,** Fred Hutchinson Cancer Research Center

11:45 am – 1:00 pm	Lunch on your own
1:00 – 2:30 pm	**Two Concurrent Paper Sessions**
2:45 – 4:45 pm	**Symposium:** *Responsible Communication with the Public About Health Risks: Views From Science, Government, Media, and Law*

        Chair: **Judith Jacobson, DrPH,** Columbia University School of Public Health

4:45 pm	Conclusion of Program

ASPO 2001 - Program Details

Sunday, March 11

8:00 am -- 5:00 pm
Mezzanine Level

Registration

9:00 am -- 12:00 pm
Plaza Suite

General Meeting for NCI/K07 Fellows

1:00 pm -- 4:00 pm
Promenade Suite

New Investigators Workshop -- (Open only to accepted applicants)

Organizer: **Alfred I. Neugut, MD, PhD**
Columbia University School of Public Health

Workshop Faculty: **Steven Stellman, PhD**
Mailman School of Public Health
Department of Epidemiology

Roshan Bastani, PhD
University of California, Los Angeles
Jonsson Comprehensive Cancer Center

Colleen McBride, PhD
Duke University
Cancer Prevention & Control Research

Christine Ambrosone, PhD
Mt. Sinai School of Medicine
Derald Ruttenberg Cancer Center

2:30 pm -- 4:30 pm

Plaza Suite

Career Development for Junior Faculty/Junior Researchers & Trainees

SESSION I: *"Get Funded! A close look at the NIH Study Section"*
SESSION II: *"www.NETWORKING: The 'How To' Guide"*

5:00 pm -- 6:30 pm
Plaza Suite

Cancer Center Associate Directors for Cancer Prevention & Control

5:30 pm -- 7:00 pm
Madison Lounge

Mixer

6:30 pm -- 10:00 pm
State Suite

ASPO Executive Committee Meeting (Working dinner)

ASPO 2001 -- General Session

Monday, March 12

6:45 am – 5:00 pm **Registration**
Mezzanine Foyer

7:00 - 8:30 am **Hot Topics Breakfast Sessions** -- (two concurrent sessions)

Ballroom Foyer CHEMOPREVENTION
Mezzanine Level

Chair: **Robin Bostick, MD, MPH**
University of South Carolina
South Carolina Cancer Center

Presentation:

"Inhibition of Cyclooxygenase-2: A Novel Approach to Cancer Prevention"

By:

Andrew J. Dannenberg, MD
New York Presbyterian Hospital – Cornell

Plaza Suite CANCER SCREENING
Mezzanine Level

Chair: **Anthony J. Alberg, PhD, MPH**
Johns Hopkins School of Public Health

Presentation:

"The Lung Screening Study: A Randomized Study of Spiral CT"

By:

Pamela Marcus, MS, PhD
National Cancer Institute – Division of Cancer Prevention

8:45 am
Terrace Room
Lobby Level

Welcome and Introduction of ASPO Past Presidents:
Daniel Miller, MD
Strang Cancer Prevention Center
First ASPO President, (1976-1979)
Founding Member of ASPO, 2001 Program Committee Member

Nathaniel Berlin, MD, PhD, University of Miami (1980-81)
Joseph Fraumeni, MD, National Cancer Institute (1982-83)
Anthony Miller, MB, University of Toronto (1984-85)
Nicholas Petrakis, MD, Univ. of California, San Francisco (1986-87)
David Schottenfeld, MD, MSc, University of Michigan (1988-89)
W. Thomas London, MD, Fox Chase Cancer Center (1990-91)
Thomas Moon, PhD, Chiron Corporation (1992-93)
Ellen Gritz, PhD, UT M. D. Anderson Cancer Center (1994-95)
Richard Love, MD, MS, University of Wisconsin (1996-97)
Margaret Spitz, MD, UT M. D. Anderson Cancer Center (1998-99)
Alfred Neugut, MD, PhD, Columbia University (2000-01)

9:00 am
Terrace Room

Keynote Presidential Address

Alfred I. Neugut, MD, PhD
Columbia University

*"AGG – An Economic Model for Resource Allocation in Cancer
Research and Preventive Oncology"*

9:45 am

Break

10:00 am

Symposium: -- *Twenty-five Years of Preventive Oncology*

Chair: **Margaret R. Spitz, MD**
The University of Texas M. D. Anderson Cancer Center

"Historical Perspective on Cancer Prevention"
David Schottenfeld, MD, MSc
University of Michigan School of Public Health

"Has There Really Been Any Progress in Cancer Prevention & Control?"
John C. Bailar, III, MD, PhD
University of Chicago, Health Studies

Distinguished Achievement Award Presentation #1:
*"Advances in Molecular Carcinogenesis and Their Relevance to
Cancer Prevention"*
I. Bernard Weinstein, MD (co-recipient)
Columbia University, Herbert Irving Cancer Center

11:45 am – 12:15 pm   **NCI Listens**

The Board of Scientific Advisors (BSA) of the National Cancer Institute (NCI) believes it is important to interact with and receive Feedback from the clinical, population science and laboratory research communities affected by NCI policies. BSA Members and NCI Staff invite conference participants to join them for this session. A brief presentation will be given by NCI Staff emphasizing the status of grant funding, the By-Pass budget, and the status of several new initiatives. The brief presentation will be followed by an open question and answer period. The NCI is committed to providing a written response to the Society concerning issues raised during the session. The BSA hopes that conference participants will take advantage of this opportunity to raise their concerns.

Chair: **Mary Beryl Daly, MD, PhD**
                Director, Cancer Control Science Program
                Fox Chase Cancer Center

Speakers: An Overview of NCI Programs & Initiatives

                Barbara Rimer, PhD, Director
                Division of Cancer Control & Population Sciences
                National Cancer Institute, National Institutes of Health

                Peter Greenwald, MD, Director
                Division of Cancer Prevention
                National Cancer Institute, National Institutes of Health

Participants: Questions & Answers

                David S. Alberts, MD
                Professor of Medicine, Pharmacology & Public Health
                Director, Cancer Prevention & Control, Arizona Cancer Center

                Hoda Anton-Culver, PhD, Professor and Chief
                Department of Medicine, University of California, Irvine

                Paulette S. Gray, PhD, Deputy Director
                Division of Extramural Activities
                National Cancer Institute, National Institutes of Health

12:15 pm   **Lunch on your own (Poster Set-up in Grand Ballroom)**
Grand Ballroom

11:45 am – 1:15 pm **Special Session on Career Development for Junior Faculty/**
Plaza Suite **Junior Researchers and Trainees** (Tickets required*)
Mezzanine Level

*Work Cycle Regulators: preventing uncontrolled growth of duties
by finding balance, learning how and when to say "no",
and avoiding common pitfalls*

A special panel presentation with:

Leslie Bernstein, PhD
Senior Associate Dean, Faculty Affairs, Keck School of Medicine
Professor, Preventive Medicine, University of Southern California

Christine Ambrosone, PhD
Director, Cancer Epidemiology Program
Derald H. Ruttenberg Cancer Center, Mt. Sinai School of Medicine

Timothy Rebbeck, PhD
Associate Professor, University of Pennsylvania School of Medicine

Naoko Ishibe, ScD
National Cancer Institute

Sponsored by the Cancer Research Foundation of America
(*50 tickets will be available at Registration Monday morning; first come basis)

1:15 – 2:45 pm **Symposium:** *The Future of Questionnaire-Based Research*
Terrace Room *in Physical Activity: Is the Method Up to the Challenge?*

Chair: **Leslie Bernstein, PhD**
University of Southern California Medical School

"Measurement of Physical Activity in the Occupational Setting"
David H. Garabrant, MD
University of Michigan

"Validation of Physical Activity Reports"
Barbara Ainsworth, PhD, MPH
University of South Carolina, School of Public Health

*"Correcting for Bias in Estimates of the Effects of Physical Activity
on Health due to Error in Physical Activity Assessment"*
Donna Spiegelman, PhD
Harvard School of Public Health

Discussion

2:45 pm **Break**

3:00 pm – 3:45 pm **Distinguished Achievement Award Lecture #2**

Ellen R. Gritz, PhD (co-recipient)
The University of Texas M. D. Anderson Cancer Center

"2001 – The Monolith of Cancer Prevention: Promise and Challenge for Humanity"

3:45 – 5:15 pm
Terrace Room

Plenary Paper Session

Chair: **Jim Marshall, PhD**
University of Arizona, Arizona Cancer Center

3:45 pm **Kirsten Moysich, PhD**
Roswell Park Cancer Institute
"Chernobyl-related Radiation Exposure and Leukemia Risk in Ukraine"

4:00 pm **David Thomas, MD, DrPH**
Fred Hutchinson Cancer Research Center
"Predictive Value for Subsequent Breast Cancer of Calcifications, Parenchymal Patterns, and Densities in Screening Mammograms From Women Under Age 50"

4:15 pm **Anna Lillico, PhD**
University of Arizona, Arizona Cancer Center
"Subgroup Analysis of the Nutritional Prevention of Cancer with Selenium Trial: A Randomized Clinical Trial"

4:30 pm **Colleen McBride, PhD**
University of Michigan, Dept. of Family Medicine
"Impact of Office Interventions to Increase Cancer Screening"

4:45 pm **Joanne Dorgan, MPH, PhD**
Fox Chase Cancer Center
"Serum Hormones Potentially Mediate the Alcohol – Breast Cancer Association in Postmenopausal Women"

5:00 pm **Anthony Alberg, PhD, MPH**
Johns Hopkins School of Public Health
"Influence of Morbidity on Smoking Cessation in a Cohort of Smokers"

(See abstracts on following pages)

Kirsten Moysich
3:45 pm

Chernobyl-related radiation exposure and leukemia risk in Ukraine. KB Moysich, A Noschchenko, A Bondar, P Zamostyan, V Drostova, S Fry, J Wactawski-Wende, P McCarthy, and AM Michalek.

Results from several ecological studies have suggested that individuals residing in areas contaminated by radiation exposure stemming from the Chernobyl nuclear accident were at higher risk of childhood leukemia. We conducted a population-based case-control study to investigate the effect of Chernobyl-related radiation exposure on childhood leukemia risk in Ukraine. Cases were 116 individuals from the Rivno and Zhytomir oblasts in Ukraine, aged 0 to 20 at the time of the Chernobyl accident, and diagnosed with acute leukemia between 1986 and 1997. Controls included 179 healthy individuals recruited from the same geographic areas, and matched to cases on age, sex, and oblast. In-person interviews were conducted in the participants' homes to obtain information on demographics, parental exposures, medical history, and relevant information for dose reconstruction. Total estimated doses were lower than originally projected for cases and controls (6.81 mSv vs. 3.07 mSv, respectively), but significantly higher among cases (p<0.01). Results from logistic regression analyses indicated that risk of leukemia increased four percent for each mSv of radiation exposure (adjusted odds ratio (OR)=1.04; 95% confidence interval (CI) 1.01-1.07). Compared to participants with very low doses (< 1 mSv) risk elevations were observed for those with intermediate doses (1-19.9 mSv; OR=1.87; 95% CI 1.13-3.10) and those with higher doses (> 20 mSv; OR=4.39; 95% CI 1.56-12.32). These associations were still apparent when the sample was stratified by sex, although the risk elevations were more pronounced among females. Results from our preliminary analyses suggest that radiation exposure associated with the Chernobyl accident appears to be associated with excess risk of acute leukemia in Ukraine.

Predictive Value for Subsequent Breast Cancer of Calcifications, Parenchymal Patterns, and Densities in Screening Mammograms from Women Under Age 50

Thomas DB, Carter RA, Bush Jr. WH, Ray RM, Stanford JL, Lehman CD, Daling JR, Malone K, Davis S

The purpose of this population-based study was to assess the predictive value of mammograms for subsequent breast cancer. Prior screening mammograms taken before age 50 in 547 women with breast cancer and 472 controls were reviewed by a single radiologist. The relative risk (RR) of subsequent breast cancer increased with the percent of the area of the mammogram that was mammographically dense (RR in succeeding quartiles of density = 1.0, 1.7, 3.3, and 4.0); in relation to Wolfe parenchymal pattern class P2 (RR = 3.1) or DY (RR = 5.6); and in relation to calcifications of class 1 (pleomorphic of any distribution) or class 2 (various morphologic types that are regional, grouped, clustered, segmental, or linear in distribution) (RR = 3.0 and 1.8, respectively). Women with radiographically dense mammograms who also had class 1 or 2 calcifications, were at over 10- and about 6-fold greater risk, respectively, than women with radiolucent breasts and no calcifications. Densities and parenchymal patterns were most strongly associated with breast cancer being diagnosed in the next 3 years. Class 1 and 2 calcifications were most strongly predictive of an increased risk in 3 to 6 years. Class 1 calcifications were strongly predictive of the breast in which the subsequent cancer occurred, and their biopsy was associated with a reduction in risk. Women under age 50 with class 1 or 2 calcifications or mammographically dense breasts, or both, should receive high priority for regular mammographic screening. Pleomorphic calcifications on mammograms represent lesions that should be considered for biopsy or removal.

Anna Lillico
4:15 pm

SUBGROUP ANALYSIS OF THE NUTRITIONAL PREVENTION OF CANCER WITH SELENIUM TRIAL: A RANDOMIZED CLINICAL TRIAL.

Clark, L.C., M.P.H., Ph.D.; Combs, G.F., Jr., Ph.D.; Turnbull, B.W., Ph.D.; Slate, E.H., Ph.D.; Fischbach, L., Ph.D.; Duffield-Lillico, A.J., Ph.D.; Marshall, J.R., Ph.D.; Dalkin, B.L., M.D.; Reid, M.E., Ph.D.; for the Nutritional Prevention of Cancer Study Group.

This report evaluates the effectiveness of selenium (Se) supplementation in the Nutritional Prevention of Cancer (NPC) trial within subgroups of baseline characteristics. The NPC trial was a double-blind, placebo-controlled randomized cancer prevention trial conducted in regions of the United States with relatively low Se intakes. 1,312 participants with a history of basal cell or squamous cell carcinoma of the skin were randomized to ingest daily either 200 μg Se as selenized yeast or a matched placebo. This paper extends results previously reported (1983-1993) through 1 February 1996, the end of the blinded treatment phase. Total cancer incidence rates in the treatment groups are compared within subgroups of age, gender, smoking status and baseline plasma Se. Among participants in the lowest tertile of baseline plasma Se concentration, Se supplementation decreased cancer incidence by approximately 49%; among those in the middle tertile, Se supplementation decreased incidence by around 36%. No effect was observed for participants in the highest tertile of baseline plasma Se. Males, participants over 65 years, and never smokers showed the greatest benefit with Se supplementation although these effects within subgroups were not statistically significant. The promising results of this trial require replication in further well-controlled cancer prevention trials.

A randomized trial to evaluate genetic susceptibility feedback to motivate smoking cessation.

C McBride, G Bepler, P Lyna, G Samsa, I Lipkus, L McIntyre, K O'Briant, J Albright, B Rimer.

Purpose of study: To evaluate the impact of providing feedback of genetic susceptibility to lung cancer to increase motivation and likelihood of cessation among African American smokers.

Methods: Described is a two arm randomized trial in which 557 smokers were recruited and randomized in a 1:2 ratio to either: Enhanced Usual Care (EUC, n=185) or a Biomarker feedback (n=372) arm that received results of a blood test for the Glutathione S transferase enzyme an indicator of genetic susceptibility to lung cancer. 7-day prevalent abstinence was compared by arm at 6- and 12-month follow-ups. Smoking status was biochemically confirmed at 12-month follow-up.

Summary of results: Rates of smoking cessation were significantly higher among smokers who received biomarker feedback compared to EUC at the 6-month follow-up (19% vs. 10%, p=.006; respectively) and marginally significant at 12-month follow-up (15% vs. 10%, p=.10). Rates of sustained abstinence between the 6- and 12-month follow-ups also were significantly higher for smokers in the Biomarker arm than for those in the EUC arm (11% vs. 5%, p=.02).

Conclusions: Interventions that personalize risk messages to include genetic susceptibility to the harms of smoking could increase the efficacy of smoking cessation interventions.

Joanne Dorgan
4:45 pm

Serum Hormones Potentially Mediate the Alcohol – Breast Cancer Association in Postmenopausal Women

JF Dorgan[1], JT Judd[2], P Albert[3], ED Brown[2], D Corle[3], WS Campbell[3], D Baer[2], TJ Hartman[4], A Tejpar[3], BA Clevidence[2], CA Giffen[3], PR Taylor[3] ([1]Fox Chase Cancer Center, Philadelphia, PA; [2]Beltsville Human Nutrition Research Center, Beltsville, MD; [3]National Cancer Institute, Bethesda, MD; [4]Pennsylvania State University, University Park, PA)

Background: Alcohol ingestion is positively related to breast cancer risk in most epidemiologic studies, but results are heterogeneous at lower levels of intake and the causal nature of the association remains controversial. We performed a controlled feeding study to evaluate the effect of chronic moderate alcohol ingestion on serum levels of hormones that have been related to an increased risk of breast cancer.
Methods: Participants included 51 healthy postmenopausal women not using hormone replacement therapy. Each participant consumed 15 gm alcohol/day, 30 gm alcohol/day, or a placebo beverage during one of three 8-week dietary periods. The order of assignment to the three alcohol levels was random. Each dietary period was preceded by a 2-5 week washout period. All food and beverages were supplied by the study during the dietary periods, and energy intake was adjusted to keep body weight constant. Estradiol, estrone, estrone sulfate, testosterone, androstenedione, progesterone, dehydroepiandrosterone (DHEA), DHEA sulfate, and androstenediol were measured in serum collected at the end of each dietary period.
Results: When consuming 15 gm and 30 gm alcohol/day, respectively, participants' estrone sulfate concentrations increased by 7.5% (95% confidence interval (CI) = -0.3, 15.9) and 10.7% (95% CI = 2.7, 19.3) and their DHEAS concentrations increased by 5.1% (95% CI = 1.4, 9.0) and 7.5% (95% CI = 3.7, 11.5). None of the other hormones measured changed significantly when women consumed alcohol.
Conclusions: Results from this study suggest a mechanism by which consumption of 1-2 alcoholic drinks/day by postmenopausal women could increase their risk of breast cancer.

Influence of Morbidity on Smoking Cessation in a Cohort of Smokers

Landrigan J, Alberg AJ, Hoffman SC, Helzlsouer KJ, Comstock GW. Johns Hopkins School of Public Health, Baltimore, MD.

The possible influence of being diagnosed with a serious illness on smoking cessation has implications for tobacco control strategies, but has not been fully explored.

We examined the impact of morbidity on smoking cessation in a cohort established in 1989 in Washington County, Maryland, that was followed up with a questionnaire mailed in 1998. The 2,033 respondents who were current smokers in 1989 and provided data in 1998 on smoking habits and disease history were included in the study.

Compared to persons with no personal history of cancer, stroke, myocardial infarction, angina, or diabetes, those who reported being diagnosed with at least one of these conditions between 1989 and 1998 were significantly more likely to have stopped smoking during follow-up (52% versus 35%, $p<0.0001$). When the diseases were considered separately, each type of diagnosis was associated with quit rates 17% to 24% higher than observed among those who reported no history of these diagnoses ($p<0.05$ for each comparison). Smokers who had a personal history of any of these diseases prior to 1989 and did not have any new diagnoses during follow-up, were only slightly more likely to quit smoking than those who reported no personal history of these diseases (42% versus 35%, $p>0.05$).

Smokers who were newly diagnosed with the illnesses studied during the follow-up were more likely to quit smoking than those who remained "disease free." This, along with a weaker association in those who had a personal history of disease prior to the follow-up, suggests that cessation rates could be accelerated even further by smoking cessation programs delivered near the time of diagnosis.

5:15 pm – 5:45 pm *Terrace Room*	**ASPO Business Meeting**
6:00 pm – 7:45 pm *Grand Ballroom* **Mezzanine Level**	**Poster Session & Reception**
7:45 pm	**Presentation of "Best Poster" Award**
7:45 pm	**Introduction of 2001 Recipient of the Cancer Prevention Research Fellowship**

Carolyn Aldige'
President, Cancer Research Foundation of America

7:00 am - 3:00 pm   **Registration**
Mezzanine Foyer

7:00 am - 8:30 am   **Hot Topics Breakfast Sessions** -- (Two Concurrent Sessions)

Ballroom Foyer   *BEHAVIORAL ONCOLOGY &*
                        CANCER COMMUNICATIONS

Chair: **Robert D. Croyle, PhD**
              National Cancer Institute

Part I
7:00 Continental Breakfast
7:05 ASPO Overview: **Alfred Neugut, MD, PhD**
7:10 Background Remarks: **Suzanne M. Miller, PhD**

Part II
7:15-8:15 AM Symposium on Translating Basic Science into the Public
            Domain: The Role of Social & Behavioral Sciences in
            Cancer Prevention & Control
            Robert C. Croyle, PhD

7:15   *"Clinical Research Connections in Cancer Prev. & Control"*
            Caroline Gotay, PhD

7:35   *"Communication to Promote Decision making and Behavior in
            Cancer Prevention & Control"*
            Peter Salovey, PhD

7:55   *"Psychoneuroimmunology in Cancer Prevention & Control"*
            Dana Bovberg, PhD

Part III
8:15 – 8:45   *"Future Directions and Plans for Behavioral Oncology
               Interest Group"*
               Robert C. Croyle, PhD

Plaza Suite   *MOLECULAR EPIDEMIOLOGY*

Chair: **Bruce Trock, PhD**
              Georgetown University Medical Center
              Lombardi Cancer Center

Speaker: **William G. Nelson, MD, PhD**
              Johns Hopkins University
              Departments of Oncology & Urology

"Epigenetic Changes and Etiology of Prostate Cancer"

9:00 – 9:45 am   **<u>Joseph W. Cullen Memorial Award Lecture</u>**
Grand Ballroom

David M. Burns, MD
University of California, San Diego
Head of Tobacco Control Policies Project

"Low Tar Cigarettes: Failed Expectations"

The Joseph W. Cullen Award is given annually to memorialize the many contributions of Joe Cullen.
Dr. Cullen was an active ASPO member and Program Coordinator for the National Cancer Institute's
Smoking Tobacco and Cancer Program. ASPO is grateful to SmithKline Beecham for underwriting this award.

9:45 am   **Break**

10:00 am   **<u>Symposium:</u>** *Genomics in Preventive Oncology*

Chair: **John D. Potter, MD, PhD**
Fred Hutchinson Cancer Research Center

"Genomics and Public Health: Some Quantitative Issues"

Alice Whittemore, PhD
Stanford University

"Implications for Cancer Epidemiology"

Montserrat Garcia-Closas, MD, DrPH
National Cancer Institute

"Tobacco, Risk Reduction and Genetics"

Peter Shields, MD
Georgetown University, Lombardi Cancer Research Center

*"Genomes in the Garden – Public Elf Implications: The View from
Hogwarts Academy"*

John D. Potter, MD, PhD

11:45 am – 1:00 pm   Lunch on your own

1:00 – 2:30 pm	**Two Concurrent Paper Sessions**

Plaza Suite   SESSION I:
Cancer Epidemiology/Chemoprevention/Biomarkers/Genetics

Chair: **Zuo-Feng Zhang, MD, PhD**
U C L A School of Public Health

1:00 pm   **Thomas L. Vaughan, MD, MPH**
Fred Hutchinson Cancer Research Center
"NSAID use, BMI, and Anthropometry in Relation to Genetic and Cell Cycle Abnormalities in Barrett's Esophagus"

1:15 pm   **Thomas A. Sellers, PhD, MPH**
Mayo Clinic

"Alcohol, Folate, and Risk of Hormone Receptor-Defined Postmenopausal Breast Cancer"

1:30 pm   **Patrick P. Koty, PhD**
University of Pittsburgh

"Transient Transfection of Bax Induces Spontaneous Programmed Cell Death in Lung Cancer Cells: A Promising Approach for Prevention"

1:45 pm   **Helen Swede, PhD**
Roswell Park Cancer Institute

"Epidemiological Risk Factors for Breast Cancer and HER-2/neu Overexpression"

2:00 pm   **Xifeng Wu, PhD**
The UT M. D. Anderson Cancer Center

"Mutagen Sensitivity and Risk of Oral Premalignant Lesions (OPL)"

2:15 pm   **Mary E. Reid, PhD**
University of Arizona

"Daily Supplementation at 400µg of Selenium: Are there Potential Toxic Effects"

(See abstracts on following pages)

Thomas Vaughan
1:00 pm

NSAID use, BMI, and anthropometry in relation to genetic and cell cycle abnormalities in Barrett's esophagus. *Vaughan TL, Kristal AR, Blount PL, Rabinovitch PS, Reid BJ.*

This study evaluated body mass index (BMI), fat distribution, and use of NSAIDs, as predictors of genetic and cell cycle abnormalities in Barrett's esophagus (BE), a precursor of esophageal adenocarcinoma (EA). We examined aneuploidy, increased 4N fraction, 17p and 9p loss of heterozygosity (LOH), and high grade dysplasia (HGD) in a cross-sectional study of 420 persons with BE. Increasing abdomen:thigh ratio was related to increasing risk of elevated 4N (trend p=0.01), and 17p LOH (trend p=0.038). The odds ratios (ORs) comparing highest to lowest quartiles were 6.2 (CI=1.3-29) for 4N, and 3.7 (CI=0.8-17) for 17p LOH. A suggestive trend was also observed for aneuploidy; whereas no association was found for HGD or 9p LOH. After control for fat distribution, there was little association between BMI and any of the markers. ORs for current NSAID use, compared to never use, were 0.7 (CI = 0.3-1.5) for increased 4N, 0.6 (CI=0.3-1.2) for aneuploidy, 0.5 (CI = 0.2-1.0) for 17p LOH, and 0.7 (CI=0.4-1.3) for HGD. There was no association between NSAID use and 9p LOH. We conclude that an abdominal distribution of body fat, which is more common in men and termed male-pattern obesity, is a strong predictor of risk of neoplastic progression among persons with BE, and may account in part for the male predominance in BE and EA. We also conclude that NSAID use may reduce the risk of cancer in this population.

Alcohol, folate, and risk of hormone receptor-defined postmenopausal breast cancer. TA Sellers, RA Vierkant, CM Vachon, JR Cerhan, SM Gapstur, VS Pankratz, LH Kushi. *Mayo Foundation, Rochester, MN; Northwestern University, Chicago, IL; Columbia University, New York, NY.*

Alcohol intake is an established risk factor for breast cancer, but the underlying mechanism remains unknown. Four recent studies have shown that the risks associated with alcohol are limited to women with low folate intakes. We examined the joint effects of alcohol and folate on the risk of postmenopausal breast cancer stratified by tumor receptor status for estrogen and progesterone. The Iowa Women's Health Study is a prospective cohort study of 37,105 at-risk women. Alcohol use and folate intake from diet and supplements were estimated at baseline in 1986 through a semi-quantitative food frequency questionnaire. Through 1998, 1874 cases of breast cancer were identified through linkage to the Iowa SEER registry. Compared with folate intakes above the 50th percentile, intakes in the lowest 10th percentile were associated with a RR of 1.19 (0.99 – 1.42). Compared to non-drinkers, alcohol intake above the median of 4 grams per day was associated with a RR of 1.09 (0.97-1.23). The combination of low folate and high alcohol was associated with a RR of 1.49 (1.08-2.07). When stratified by tumor receptor status for estrogen (ER) or progesterone (PR), the risks for low folate/high alcohol were 2.3, 1.2, 1.4, and 1.4 for ER-, ER+, PR+ and PR- tumors, respectively. Because the results were limited primarily to ER- tumors, one plausible interpretation of these data is that alcohol influences breast cancer through its metabolite – acetaldehyde, rather than through effects on estrogen levels and receptor-mediated pathways.

Transient transfection of bax induces spontaneous programmed cell death in lung cancer cells: a promising approach for prevention. Koty PP, Ramos R, Balanchandran R, Gao W, Day BW, Keohavong P, Levitt ML.

Lung cancer, the leading cause of cancer-related deaths in the United States, remains resistant to current treatment regimens resulting in a poor prognosis. Abnormal genetic regulation of programmed cell death in lung tumors has been implicated in this resistance. Preneoplastic lung lesions also have aberrant regulation of programmed cell death which may contribute to their progression to malignancy. Therefore, manipulation of programmed cell death regulatory genes in lung cancer cells may allow them to reenter this death pathway. Similarly, manipulation of preneoplastic lung lesions may result in programmed cell death, thereby preventing the development of lung cancer. To test this approach we transiently transfected ten human non-small cell lung cancer cell lines with *Bax*, whose protein induces programmed cell death. We determined the effect of this treatment on programmed cell death using an ELISA-based assay to detect cytosolic, fragmented oligonucleosomes. All ten cell lines had an increase in the amount of spontaneous programmed cell death within 24 hrs after transfection as compared to controls. This Bax-induced death appears to be independent of p53 and p21 mutation and expression status within these cell lines. These results suggest that *Bax* treatment alone may be a promising approach to lung cancer prevention.

Epidemiological Risk Factors for Breast Cancer and HER-2/*neu* Overexpression - *Swede H. Moysich K, Freudenheim J, Quirk J, Muti P, Hurd T, Edge S, Winston J, Michalek A.*

OBJECTIVE: This investigation examined associations between HER-2/*neu* (HER2) overexpression in breast cancer and epidemiological risk factors. METHODS: We conducted case-case comparisons from a hospital-based study of 156 women, aged 24-84 years, diagnosed with invasive ductal carcinoma during 1983-1995. HER2 status of tumors was determined by immunohistochemistry on archived tissue. Unconditional logistic regression was used to estimate case-case odds ratios (ORs) and 95% confidence intervals (CIs) for breast cancer that overexpressed HER2 (HER2+) *versus* HER2-breast cancer in relation to self-reported epidemiologic risk factors. RESULTS: Multivariate ORs and 95% CIs suggested that a history of benign breast disease might be associated with HER2+ breast cancer (OR, 2.1; 95% CI, 1.1-4.1). We did not observe etiologic heterogeneity in relation to other commonly recognized risk factors for breast cancer including later age at first birth, having one or more first degree relatives with breast cancer, or never having breastfed a child. CONCLUSIONS: Our findings merit consideration in light of evidence of HER2 amplification or overexpression in breast carcinoma and benign breast disease, but typically not in normal tissue. Should the link to subsequent breast cancer be established, HER2 in benign breast disease could serve as an early target for preventive intervention.

Mutagen Sensitivity and Risk of Oral Premalignant Lesions (OPL). Wu X, Lippman SM, Wei Q, Thomas M, Hong WK, and Spitz MR. *Supported by grant CA 86390-01.*

Background: OPLs are tobacco related; associated epidemiologically, geographically and clinically with head and neck cancer squamous cell carcinoma (HNSCC) and mark individuals at high risk for HNSCC development. Induced mutagen sensitivity is an in vitro assay used as a measure of susceptibility to upper aerodigestive tract cancers. Benzo[a]pyrene diol-epoxide (BPDE), a metabolite of the tobacco smoke carcinogen benzo[a]pyrene, forms DNA adducts requiring nucleotide excision repair. Bleomycin, a radio-mimetic agent, causes oxidative damage requiring base-excision and recombinational DNA repair. In this case-control study, we examined whether these two mutagen sensitivity assays (BPDE and bleomycin sensitivity) were biomarkers of risk of developing OPLs. *Methods:* Lymphocytes from two parallel primary blood cultures of 82 patients with OPL and 89 matched controls were treated with 2 μM BPDE for 24 hours and 0.03 U/ml bleomycin for 5 hours, and the frequency of induced chromatid breakage was determined in Giemsa-stained slide preparations. *Results:* The mean BPDE-induced chromatid breaks per cell were higher in the case subjects (1.05 ± 0.40) and lower in the control subjects (0.55 ± 0.27) ($P<.001$). The mean bleomycin-induced chromatid breaks per cell were 0.78 ± 0.37 in the case subjects and 0.57 ± 0.31 in the control subjects ($P<.001$). Significantly elevated odds ratios (OR) of 13.02 for BPDE sensitivity and 3.32 for bleomycin sensitivity were noted for risk of OPLs. A linear dose-response was observed for both assays by quartiles of the number of breaks per cell. The adjusted ORs for subjects with increasing numbers of breaks per cell were 2.48, 9.24, and 55.96 for BPDE sensitivity, 1.91, 3.33 and 7.13 for bleomycin sensitivity, respectively. Subjects who exhibited sensitivity to both test mutagens were found to be at a more than 40-fold increased risk for OPLs. *Conclusions:* There is a joint effect between BDPE sensitivity and bleomycin sensitivity in assessing risk of OPLs. Utilizing BDPE and bleomycin sensitivity assays in parallel may be useful biomarkers to identify high risk populations for OPLs and therefore in early detection.

DAILY SUPPLEMENTATION AT 400µg OF SELENIUM:
ARE THERE POTENTIAL TOXIC EFFECTS? Results from
a Double-Blind, Placebo-Controlled, Randomized Clinical
Trial

Fischbach, L., Ph.D., Reid, M.E., Ph.D., Clark, L.C., M.P.H.,
Ph.D., Combs, G.F. Jr., Ph.D., Turnbull, B.W., Ph.D.,
Marshall, J.R., Ph.D.

This report evaluates the safety of daily supplementation of
400 µg of selenium as observed in the NPC trial. 424
participants with a history of basal cell or squamous cell
carcinomas of the skin were randomized between 1989 and
1992 to ingest daily either 400µg Se as selenized yeast or a
matched placebo. Toxicity was defined as new, lost or
abnormal hair or nails, dermatitis, elevated liver function tests,
liver failure, elevated white blood cell levels, prolonged or
delayed prothrombin time, and lower hemoglobin levels. Self-
reports of cataracts, bradycardia, nervousness, impaired nerve
conduction, minor aches and pains, dyspepsia, nausea and
vomiting were also evaluated. There were no differences in
the incidence of early signs of acute selenosis, abnormally
high liver function, hemoglobin levels, and the incidence of
most symptoms associated with selenosis in the selenium
versus placebo group. The rate of anemia was greater,
although not statistically significantly, in the selenium versus
placebo group. Results of this study show that 400 µg/day of
selenium supplementation is not associated with an increase in
signs of selenium toxicity. The effect of higher doses of
selenium supplementation in controlled clinical trials are
necessary to determine the safety of longterm supranutritional
supplementation with selenium compounds.

1:00 – 2:30 pm
Grand Ballroom   SESSION II:
Screening/Diet & Nutrition/Behavioral Science/Tobacco

Chair: **Mary E. Reid, PhD**
                University of Arizona, Arizona Cancer Center

1:00 pm   **Alan Kristal, DrPH**
                Fred Hutchinson Cancer Research Center

                "Dietary Fat is Associated with Risk of Regional/Distant but not Localized Prostate Cancer"

1:15 pm   **Maria Elena Martinez, PhD, RD**
                University of Arizona, Arizona Cancer Center

                "Adenoma Characteristics at Baseline Colonoscopy as Risk Factors for Recurrence of Advanced Adenomas"

1:30 pm   **Constance Wang, MS**
                University of Texas-Houston, School of Public Health

                "Smoking and Helicobacter pylori Seroprevalence in the U.S."

1:45 pm   **Crystale Purvis Cooper, PhD**
                University of Arizona

                "Is the News Media's Coverage of Cancer Research a Public Health Threat?"

2:00 pm   **Carolyn M. Rutter, PhD**
                GHC – Center for Health Studies

                "Changes in Breast Density Associated with Initiation, Discontinuation, and Continuing Use of HRT"

2:15 pm   **Susan T. Mayne, PhD**
                Yale University School of Medicine

                "Longitudinal Analysis of Plasma Carotenoids, Retinol, Alpha-Tocopherol and Mortality"

(See abstracts on following pages)

Alan Kristal
1:00 pm

Dietary Fat is Associated with Risk of Regional/Distant but not Localized Prostate Cancer

Alan R. Kristal, Jennifer H. Cohen, Janet L. Stanford

Fred Hutchinson Cancer Research Center, Seattle, WA

There is an emerging consensus that dietary fat is associated with risk of prostate cancer (CaP), but conflicting evidence about whether this risk is specific to types of fat or to later stages of disease. This population-based, case-control study in King County, WA examined diet using a food frequency questionnaire in 628 incident CaP cases (ages 40-64) identified from the SEER registry, and 602 controls recruited using random-digit dial sampling. Mean fat consumption in the year before diagnosis was 74.4 g (37.4%) in cases and 72.2g (37.1%en) in controls. Polychotomous logistic regression analyses controlled for age, race, education, family history of CaP, body mass index, vegetable consumption, supplement use, energy intake, and most importantly number of PSA tests in the previous 5 years. There was a 20% [95% CI 1%-41%] increase in risk of regional/distant CaP with every percentage point increase in percentage of energy from fat, but no association with localized disease. In an alternative statistical model using the same covariates, total energy from fat but not energy from other sources was associated with increased risk of regional/distant disease (odds ratio for highest vs. lowest quartile was 2.18 [95% CI 1.11-4.28]). Energy from fat was not associated with localized disease. In both models, risks were similar among types of fat (poly, mono and saturated), and there were no associations with other fat-related nutrients found in some previous studies (α-linolenic acid, calcium or vitamin D). These results are consistent with a hypothesis that dietary fat promotes the growth of latent CaP to more aggressive disease, and support further investigation of fat reduction as adjunct treatment for localized disease.

Maria Elena Martinez
1:15 pm

Adenoma Characteristics at Baseline Colonoscopy as Risk Factors for Recurrence of Advanced Adenomas. María Elena Martinez, Richard Sampliner, James R. Marshall, A.B. Bhattacharyya, Mary E. Reid, David S. Alberts. Arizona Cancer Center, University of Arizona, Tucson, AZ 85724 and Southern Arizona VA Health Care System, Tucson, AZ 85723.

The link between adenoma characteristics at index colonoscopy and adenoma recurrence has not been adequately investigated. We assessed whether number, size, location, and histology of resected adenomas were related to the probability of recurrence of advanced lesions. Analyses were based on 1287 men and women in the Wheat Bran Fiber (WBF) study, a randomized, double-blind trial of WBF as a means of decreasing the probability of adenoma recurrence over a period of 3 years. Multiple logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs). Recurrence of advanced adenomas (>1 cm or tubulovillous/ villous histology) was higher among individuals with adenomas >1 cm compared with those with adenomas <0.5 cm (OR=2.69; 95% CI=1.34-5.42). Proximal adenomas at baseline were associated with a higher risk of recurrence of advanced lesions (OR=1.65; 95% CI=1.02-2.67) as was the presence of adenomas in both locations (OR=2.69; 95% CI=1.34-5.42). No association was observed for adenoma number or histology. A shift in location from the distal colon and rectum at baseline (27.2%) to more proximal recurrent adenomas (45.2%) including advanced lesions (42.8%) was observed. Large or proximally located adenomas at baseline are important indicators of recurrence of advanced lesions. Since the majority of recurrences were detected in the proximal colon, careful surveillance of this area (i.e., complete colonoscopy) is warranted.

Constance Wang
1:30 pm

Smoking and *Helicobacter pylori* seroprevalence in the U.S. C Wang, EE Fox, KJ Goodman.

Helicobacter pylori causes chronic gastritis and peptic ulcers and probably gastric cancer. Studies of the relation between smoking and *H. pylori* infection have yielded inconsistent findings. This analysis describes the association between smoking and *H. pylori* seroprevalence using data from 6,496 adults (ages >=18) in the United States National Health and Nutrition Examination Survey (NHANES III). A commercial enzyme immunoassay was used to detect *H. pylori* IgG antibodies. Odds ratios (OR) and 95% Confidence Intervals (CI) adjusted by NHANES III sample weights were estimated by logistic regression using STATA (cluter sample data svylogit). After adjusting for age, sex, ethnicity, birthplace, education, household crowding, household income, and alcohol intake status, the ORs (95%CI) with never smokers as the referent were 0.85 (.71-1.0) for former cigarette smokers, 1.0 (.81-1.2) for current cigarette smokers, .85 (.48-1.5) for current cigar smokers, and 1.5 (.60-3.7) for current pipe smokers. Duration of cigarette smoking did not appear related to *H. pylori* seroprevalence, but increased odds of *H. pylori* seropositivity were observed among current heavy smokers (31+ cigarettes/day) compared to never smokers 1.5 (1.1-2.1). Among NHANES III adults, smoking shows little relation to *H. pylori* seroprevalence, although an effect of current heavy smoking cannot be ruled out.

Is the News Media's Coverage of Cancer Research a Public Health Threat?

Cooper, C.P. and Burgoon, M.

Purpose. This study investigated the magnitude of misinformation generated by two recent news reports about cancer research and whether the inclusion of cautionary caveats improved public understanding.

Methods. 535 residents of Pima County, Arizona participated in a randomized 2 (story topic: "Peeling after a sunburn eliminates damaged skin cells" v. "Stomach cancer risk increases with meat doneness") × 2 (no caveat v. caveat) experiment.

Results. 9% participants who read the sunburn story without the caveat (RR, 5.24; 95% CI, 1.89-14.52) and 12% of participants exposed to the sunburn story with the caveat (RR, 6.81; CI, 2.55-18.14) incorrectly agreed that "it is better to get sunburned than trying to avoid it" compared with 2% of those who read the meat doneness story. Similarly, 53% of participants exposed to the meat doneness story without the caveat story (Relative risk [RR], 6.75; 95% confidence interval [CI], 4.28-10.65) and 31% of those who read the story with the caveat (RR, 3.97; CI, 2.42-6.50) incorrectly agreed that "grilled meat should be served rare" compared with 7% of those who read the sunburn story.

Conclusions. The news media's coverage of cancer research can generate widespread and dangerous misconceptions—even when cautionary caveats are provided.

Carolyn Rutter
2:00 pm

Changes in Breast Density Associated with Initiation,
Discontinuation, and Continuing Use of HRT

Rutter CM, Mandelson MT, Laya MB, Seger DJ, Taplin S

Background: Initiation of HRT has been shown to increase breast density. Several lines of evidence indicate that breast density is strongly related to breast cancer risk and that increased density decreases mammographic sensitivity.
Objective: To examine the effect of initiation, discontinuation, and continuing use of HRT on breast density using population based data.
Design: Observational cohort study.
Setting: Women enrolled in a large HMO in western Washington state.
Participants: 5212 naturally postmenopausal women 40 to 96 years old who had two screening mammograms between 1996 and 1999.
Measurements: HRT use was assessed using automated pharmacy data. Breast density was assessed using clinical radiologists' BI-RADS^{TM} ratings.
Results: Women who initiated HRT were more likely than nonusers to show increases in density (RR=2.56, 95% CI (2.12,3.08)), while women who discontinued were more likely show decreases in density (RR=1.81, 95% CI (1.06,2.98)), and women who continued use of HRT were more likely to show both increases in density (RR=1.33, 95% CI (1.13,1.55)) and sustained high density (RR=1.45, 95% CI (1.33,1.58)).
Conclusions: These results provide strong evidence that breast density changes associated with HRT are dynamic, increasing with initiation and decreasing with discontinuation.

Longitudinal Analysis of Plasma Carotenoids, Retinol, Alpha-Tocopherol and Mortality.

ST Mayne, B Cartmel, H Lin, and W. J. Goodwin, Jr. Dept. of Epidemiology and Public Health, Yale University School of Medicine, and Dept. of Otolaryngology, University of Miami School of Medicine.

The association between plasma beta-carotene and all-cause mortality has been studied, but there is a paucity of information on the association between other plasma carotenoids and mortality. Blood samples were collected longitudinally from 259 participants in a chemoprevention trial aimed at the prevention of second cancers of the oral cavity, pharynx, or larynx. All samples were analyzed by HPLC in one laboratory for beta-carotene, alpha-carotene, lycopene, lutein/zeaxanthin, retinol and alpha-tocopherol. A total of 61 deaths occurred over a follow-up time of up to 90 months. Cox proportional hazards models with time-dependent covariates were used for data analyses. Only plasma lycopene was significantly inversely associated with mortality in this cohort. The hazard ratio for death, adjusted for age, plasma cholesterol, smoking, treatment arm, study site, and gender, for those with above median lycopene concentrations versus those with below median lycopene concentrations in plasma at baseline was 0.53 (95% CI 0.30-0.93). Corresponding hazard ratios for cardiovascular and cancer deaths were 0.42 (CI 0.14-1.30) and 0.63 (0.30-1.32) respectively. This study adds to a growing body of literature suggesting possible health benefits associated with greater lycopene consumption. Supported by CA42101 and CA64567 from the National Cancer Institute.

2:30 pm   **Break**

2:45 – 4:45 pm   <u>**Symposium:**</u>
Grand Ballroom

"Responsible Communication with the Public About Health Risks: Views from Science, Government, Media, and Law"

       Chair: **Judith Jacobson, DrPH**
                         Columbia University School of Public Health

"Persistent Complacency, Honest Deception, and the Pascal Paradigm"

        Alvan R. Feinstein, MD
        Yale University School of Medicine

"Dealing with an Angry Public"

        G. Iris Obrams, MD, PhD
        NCI, Cancer Control & Population Science (EGRP)

"The Public Interest in Scientific Communication"

        Carolyn Aldige'
        President, Cancer Research Foundation of America

"Toxic Environmental Exposure Cases: Experiences Representing Government, Industry and the Public"

        Marshall Miller, JD
        Baise & Miller, Washington, DC
        (Environmental Law Specialist, former acting head of the EPA)

Conclusion of Meeting Program -- Poster Abstracts Follow

Poster Directory

Serum levels of dehydroepiandrosterone and dehydroepiandrosterone-sulfate among a population of community-dwelling men and women

Anthony J. Alberg, Gary B. Gordon, Kathy J. Helzlsouer, George W. Comstock. Departments of Epidemiology and Oncology, The Johns Hopkins Medical Institutions, Baltimore, Maryland.

There is great interest in the possible protective role that dehydroepiandrosterone (DHEA) and its sulfate conjugate, dehydroepiandrosterone sulfate (DHEAS), may have on the risk of cancer. To assess the possible influence these steroids may have on human health, a firm understanding of sources of inter-individual variation is essential. A cross-sectional study was conducted to investigate the associations between factors such as age, sex, and cigarette smoking and serum levels of DHEA and DHEAS. The study population was made up of 755 residents of Washington County, Maryland.

The results showed that age was strongly inversely associated with serum concentrations of DHEA and DHEAS, with average annual decreases of 2.6% to 3.0%. DHEA levels were similar between the sexes, but men had adjusted mean serum concentrations of DHEAS that were 52% higher than women (p<.001).Compared tononsmokers, current cigarette smokers had higher concentrations of both DHEA and DHEAS; these differences were statistically significant among women, but not men. Menopause did not affect DHEA/DHEAS levels independently of age.

Age is such a strong determinant of serum concentrations of both DHEA and DHEAS in both men and women that studies of these steroids that do not carefully account for age will be essentially uninterpretable.

1

Serum dehydroepiandrosterone and dehydroepiandrosterone sulfate and the subsequent risk of developing melanoma or squamous cell carcinoma of the skin

Alberg AJ, Gordon GB, Genkinger J, Hoffman SC, Comstock GW, Helzlsouer KJ.Departments of Epidemiology and Oncology, The Johns Hopkins Medical Institutions, Baltimore, MD

Dehydroepiandrosterone (DHEA) and its analogs have potent chemoprotective actions in mouse skin tumorigenesis models. We tested whether this association was present in humans by assessing whether serum concentrations of DHEA and its sulfate conjugate dehydroepiandrosterone sulfate (DHEAS) were associated with subsequent risk of developing malignant melanoma (MM) and squamous cell carcinoma of the skin (SCC) in residents of Washington County, Maryland.

In 1974, the CLUE I cohort was established when 20,305 residents of Washington County volunteered to donate blood for research purposes. Serum stored at -70° C was assayed for DHEA and DHEAS for 28 SCC cases and 23 MM cases and for controls (2 per case) matched by age, sex, and race. There were no strong case-control differences in mean serum DHEA and DHEAS concentrations for either SCC or MM. In the SCC study, compared to those with serum DHEA concentrations in the lowest third, the middle and highest thirds had odds ratios of 0.8 (95% CL 0.3, 2.7) and 0.5 (95% CL 0.1, 1.9), respectively (p-for-trend=0.32). No other consistent trends were observed between serum concentrations of these steroids and the risk of skin cancer.

This is a first step toward assessing the relevance of DHEA and DHEAS to human skin cancer. The results do not strongly support the hypothesis that physiologic concentrations of DHEA or DHEAS protect against skin cancer in humans.

Knowledge, attitudes and behaviors toward skin cancer among Maryland youths.

Alberg AJ, Herbst R, Genkinger J, Duszynski K. Department of Epidemiology, Johns Hopkins School of Public Health and MedChi, The Maryland State Medical Society.

3

Skin cancer, by far the most common form of cancer in the U.S., is largely preventable by protecting the skin from exposure to sunlight. Interventions that target youth hold the greatest promise for preventing skin cancer in the long-term.

To collect baseline data prior to implementing a CDC-funded skin cancer prevention project, Maryland middle school students from 6 counties were surveyed in 1999 to assess knowledge, attitudes, and behaviors concerning sun exposure and skin cancer. 2,790 youths ages 10-16 completed the in-school survey. During the previous summer, 30% of youths had 2 or more painful sunburns and, when out in the sun, 37% rarely or never used sunscreen and 43% never wore a hat. Approximately one-third (32%) felt a tan looked healthy, and even more (51%) felt a tan looked attractive. 36% agreed/strongly agreed that sun protection was "cool." In responses to knowledge-related items, 64% correctly answered 3 or fewer out of 7 multiple choice items and 51% correctly answered 8 or fewer out of 13 true/false questions. Compared to boys, girls were significantly less likely to have worn a hat when out in the sun but were significantly more likely to report using sunscreen and to correctly answer above the threshold number of knowledge items (p<0.05 for all comparisons). Boys and girls were equally likely to have been sunburned.

A substantial proportion of youths were not adequately protecting themselves from sunlight. This may in part stem from the observed deficiencies in knowledge about sun protection and skin cancer. These results emphasize the need to promote skin protection behavior early in life to help curb the epidemic of skin cancer.

4

Racial Differences in Ovarian Cancer Survival
J. Barnholtz-Sloan, N. Levin, M.A. Tainsky, A.G. Schwartz
Karmanos Cancer Institute, Detroit, Michigan
An estimated 23,100 new cases of ovarian cancer will be diagnosed and 14,000 deaths will occur from ovarian cancer in the United States in the year 2000 (ACS, 2000). Ovarian cancer causes the most deaths of any female reproductive system cancer. There are substantial differences in age-adjusted ovarian cancer incidence rates among Caucasians and African-Americans in the United States, with Caucasian women at the highest risk. Survival, however, is poorer among African-American women. The purpose of this study was to examine the effect of race on ovarian cancer survival using data from the population-based National Surveillance, Epidemiology and End Results (SEER) Program. Subjects were 15472 Caucasian and 1108 African-American women diagnosed with primary ovarian cancer between 1988-1997. Patient age, tumor histology, tumor stage at diagnosis, extent of disease variables, laterality, marital status at diagnosis and survival were compared by race category. African-American women had significantly shorter average survival as compared to Caucasian women (30.20 vs. 34.09 months – p<0.0001). African-American women were younger than Caucasian women at the time of diagnosis (56.17 vs. 59.54 years - p<0.0001). After adjusting for age, histology and AJCC stage, the risk for dying for women age 50 or less was increased by 51% for African-Americans as compared to Caucasians. For women over age 50, the risk of dying was increased by 35%. Extent of disease variables within each stage category will be studied to more fully evaluate racial differences in survival by age.

6

Physical Activity (PA), Body Mass Index (BMI), and Cancer Mortality among Never-Smokers in the American Cancer Society CPS II Cohort. Breslow RA, Calle E, McKenna M, Coates R, Patel A, Teras L, Thun M. Institution of 1st author: Division of Cancer Prevention and Control, CDC, Atlanta, GA.
Purpose: Little is known about the joint effects of PA and BMI on cancer mortality (mortality) in never-smoking adults.
Methods: 106,949 men and 289,634 women, never-smokers, free of cancer (excluding non-melanoma skin) and cardiovascular disease at baseline (1982), were followed for mortality through 1998. PA at "work or play" was categorized as none/slight, moderate, or high. BMI (kg/m^2) was categorized as normal (<25), overweight (25-29.9), or obese ($30+$). Cox Proportional Hazard models were adjusted for age, race, education, alcohol, and aspirin; and menopausal status and hormone replacement (in women).
Results: Deaths from cancer were observed in 5189 men and 11,935 women. PA/BMI interactions were not significant. *In men*, low levels of PA (none/slight versus high) and high BMI (obese versus normal) were independently associated with mortality: PA relative risk (RR)=1.2, 95% confidence interval (CI)=1.1-1.3, p for trend (p) <0.0004; BMI RR=1.4, 1.2-1.5, p <0.0001. The highest mortality rates were associated with combined low PA and high BMI (RR=1.7, CI 1.4-2.1). *In women*, PA was not independently associated with mortality rates (RR=1.04, CI 1.0-1.1, p=ns); however, BMI was (RR=1.4 CI 1.3-1.5, p<0.0001). The highest mortality rates were observed in those with BMI ≥ 30 regardless of PA level.
Conclusions: Current guidelines encourage PA and healthy weight. This study supports the independent effects of both. Men who were sedentary and obese had the highest cancer mortality. Women who were obese had the highest cancer mortality.

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Modification of the Calcium-Incident Sporadic Colorectal Adenoma Association by Vitamin D Receptor Genotype and NSAID Use
Bostick R, Boyapati S, McGlynn K

Although a recent randomized, placebo-controlled clinical trial found reduced adenoma recurrence with calcium supplementation, findings from observational epidemiologic studies have not been entirely consistent and have only suggested a modest decreased risk for colorectal cancer with higher calcium consumption. To investigate whether polymorphisms of the vitamin D receptor gene (VDR) or the use of nonsteroidal anti-inflammatory drugs (NSAIDs) modifies the calcium-colon neoplasm association, we analyzed data from a colonoscopy-based case-control study of incident sporadic adenomas in 30-74 year old men and women (n = 175 cases and 228 controls). The multivariate-adjusted odds ratios (OR) across the middle and upper tertiles of total calcium intake were 1.01 (95% confidence interval [CI] 0.61-1.7) and 0.66 (CI 0.36-1.05), respectively. ORs for adenomas for the Bsm I VDR polymorphism BB and Bb genotypes relative to bb genotypes were 1.11 (CI 0.66-1.88) and 1.2 (CI 0.71-2.04), respectively. ORs for adenomas for those in the upper tertile of calcium intake according to VDR genotype were 0.81 (CI 0.24-2.74) among those who were BB, 0.24 (CI 0.08-0.80) among those Bb, and 0.57 (0.18-1.82) among those bb. ORs for the upper tertile of calcium intake according to NSAID use were 1.26 (CI 0.52-3.04) among NSAID users and 0.34 (CI 0.14-0.81) among nonusers. These data suggest that 1) inconsistencies in findings in the observational literature on calcium and colorectal neoplasms may be due to inattention to genetic and other modifiers of the association, and 2) a higher calcium intake is associated with lower risk for incident sporadic colorectal adenoma, especially among those with the VDR Bsm I b allele and those who do not take NSAIDs.

The *Guide to Community Preventive Services* will also identify research gaps. Breslow RA, Kerner J, Briss P, George P, Lee N. *Institution of 1st author*: Division of Cancer Prevention and Control, CDC, Atlanta, GA.

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Purpose: The cancer chapter of the *Guide to Community Preventive Services* will provide systematic reviews of and evidence-based recommendations for interventions to increase cancer screening and identify gaps in evidence. The purpose of this preliminary analysis was to determine frequencies of intervention studies and assess implications for future research.
Methods: We performed a systematic review of interventions to promote appropriate breast, cervical, and colorectal cancer screening. Published studies were first broadly categorized as interventions to improve screening-related: 1) behaviors in communities/clients; 2) access/follow-up in communities/clients; 3) provider behaviors; and, 4) behaviors in clients in health care systems. Next, studies were classified by intervention type.
Results: Of 259 studies, 36% were in category #1, 10% in #2, 24% in #3, and 30% in #4. In #1, among 7 specific intervention types (n=7), small media were studied most (26% of studies in the category) and incentive programs least (2%). In #2, (n=5), screening in non-clinical settings was studied most (37%), and legal requirements least (7%). In #3, (n=5), provider reminders were studied most (59%); and incentives least (5%). In #4, (n=4), client reminders were studied most (84%) and patient incentives least (6%). Overall, client or provider reminders accounted for 41% of all studies.
Conclusions: While an evaluation of the effectiveness of interventions to improve use of cancer screening will be one outcome of the Community Guide, the identification of gaps in evidence is a key additional product. These preliminary data suggest a relative excess of intervention studies on client and provider reminders and a relative deficit in other areas. Reviews will be completed in 2001 and should be a useful resource to funding agencies and researchers in prioritizing their research.

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Exposure to Dietary Heterocyclic Amines (HCAs) Among Blacks and Whites in a Population-Based Study of Colon Cancer. Butler L, Sandler R

Purpose: Increased consumption of well-done or charred meat, especially chicken may be associated with increased exposure to heterocyclic amines (HCAs), or carcinogens thought to be associated with an increased risk of colon cancer. Meat consumption and possibly dietary exposure to HCAs vary by race, which may contribute to the racial disparity of colon cancer in the U.S.
Methods: We used data from a population-based case-control study with equal numbers of blacks and whites in North Carolina (665 cases, 1063 controls). In-person interviews were conducted, using an 150-item food frequency questionnaire. HCA exposure was assessed by meat consumption (type, frequency, cooking method, and degree of doneness).
Results: The greatest differences were illustrated by meat doneness, where black controls consumed well-done (p=0.0001) and charred meat (p=0.0001), more often than white controls. Cooking methods differed by race. For example, black controls ate pan fried chicken (p=0.0001) more often than whites, but whites ate broiled (p=0.0008) and grilled chicken (p=0.0001) more often. Overall, only meat doneness variables significantly differed by case-control status.
Conclusions: There are differences in cooking practices by race in this population-based sample. These differences might explain some of the racial differences in colon cancer incidence and mortality seen in the U.S.

Chen Z, Maskarinec G, Staten L, Marshall J

The objective of this pilot study is to assess ethnic variations in mammographic density (MD) and associations between MD and body composition. Study participants were 44 Hispanic and 23 white women recruited from community centers in Tucson. Women with medical conditions that affect body composition and bone mineral density (BMD) were excluded. MD assessments were performed with a computer-aided method, in which left breast cranio-caudal mammograms were scanned using a Cobrascan CX612T x-ray digitizer from Radiographic Digital Imaging, Compton, CA. Dual-energy X-ray Absorptiometry (DXA, Hologic 4500w) was employed in measuring total body composition, including percent body fat (%fat), lean tissue mass (LTM), fat tissue mass (FTM), total bone mineral content (total BMC), and BMD at spine (SPBMD) and at the left hip (HIPBMD). Compared with Hispanic women, white women were heavier. White women showed greater mammographic percent density and larger dense area in comparison to Hispanic women, but these differences were not statistically significant. MD was adversely associated with DXA-derived weight, FTM and %fat ($p<0.05$), while LTM, total BMC and the BMDs did not have significant relationship with MD in the linear multiple regression analysis. In summary, increased weight, FTM and %fat were associated with low risk MD patterns in the linear models. Ethnic difference in MD was observed, but was not statistically significant. Because of the standard deviation in MD, the ethnic variation in MD deserves further investigation in a larger sample size.

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ADHERENCE TO AICR CANCER PREVENTION GUIDELINES AND SUBSEQUENT MORBIDITY AND MORTALITY IN THE IOWA WOMEN'S HEALTH STUDY COHORT.

Cerhan JR (Mayo Clinic, Rochester, MN), Potter JD, Gilmore JME, Janney CA, Kushi LH, Lazovich DA, Anderson KE, Sellers TA, Folsom AR.

The American Institute for Cancer Research (AICR) has suggested 14 guidelines for individuals to reduce cancer incidence. We operationalized ten of these guidelines (body mass; weight gain; physical activity; fruit/vegetable, starch, alcohol, red meat, fat, sodium and supplement intake) in a cohort of 29,564 women aged 55-69 years at baseline in 1986 who had no history of cancer or heart disease at that time. The cohort was followed through 1998 for incident cancer (N= 4,253), cancer (CA) mortality (N=1,385), cardiovascular disease (CVD) mortality (N=1,080) and total mortality (N= 3,267). The average number of guidelines followed was 4.6 ± 1.5, and the cohort was divided into women who followed 0-2 (7.5%), 3-4 (42.6%), 5-6 (38.3%), or 7-10 (11.5%) guidelines. We observed graded, inverse associations between the number of guidelines followed and risk of each endpoint. We estimated the proportion of cancer incidence and mortality that theoretically would have been avoidable if the entire cohort had followed 7-10 guidelines using the population attributable risk (PAR, 95% confidence intervals). Among never smokers, the PAR was 12% (0-19%) for CA incidence, 19% (0-33%) for CA mortality, 35% (11-46%) for CVD mortality, and 23% (11-32%) for total mortality. Among ever smokers, the PARs were somewhat stronger: 17% (0-27%) for CA incidence, 23% (4-45%) for CA mortality, 49% (32-67%) for CVD mortality, and 34% (22-48%) for total mortality. Our results suggest that these guidelines may have a greater impact on cancer mortality than incidence, and a strong impact on CVD mortality.

Physical Activity and Lung Cancer Risk in a Cohort of Male Smokers

Colbert L, Hartman T, Tangrea J, Pietinen P, Virtamo J, Taylor P, and Albanes D; National Cancer Institute, Bethesda, MD; National Public Health Institute, Helsinki, Finland.

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We prospectively examined the association between physical activity and lung cancer in a cohort of 27,087 male smokers, ages 50-69 years, enrolled in the Alpha-Tocopherol, Beta Carotene Cancer Prevention Study. After an average of 10 yrs of follow-up, 1442 lung cancer cases were documented. Cox proportional hazards models were used to estimate the relative risk (RR) and 95% confidence intervals (CI) of lung cancer associated with occupational or leisure-time activity, adjusted for covariates. Neither occupational nor leisure-time activities were associated with lung cancer risk; however, age appeared to modify the effect of leisure-time activity (p=0.02). Compared to sedentary men in the oldest quartile of age, the RR for older active men was 1.06 (CI= 0.91-1.24), while the RR's in the lowest age quartile were 0.52 (CI=0.33-0.82) for sedentary men and 0.38 (CI=0.24-0.60) for active men. Age was clearly more associated with lung cancer risk than was physical activity. These data suggest that among smokers, neither occupational nor leisure-time activity is associated with lung cancer risk. There may, however, be some modest risk reduction associated with leisure activity among younger smokers.

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SECOND-HAND SMOKE EXPOSURE AMONG FEMALE LUNG CANCER PATIENTS. de Andrade M (Mayo Clinic, Rochester, MN), Miller DL, Bass E, Marks R, Croghan G, Jatoi A, Sellers TA, Yang P.

Effect of second-hand smoking or enviornmental tobacco exposure (ETS) among female lung cancer patients has not been fully understood and studied. **Methods:** We investigated complete tobacco exposure history of all female lung cancer patients seen at the Mayo Clinic over a four-year period (1997-2000). Detailed information on ETS history was collected regarding the source (spouses, parents, co-workers), level (light, <1 pack/day; moderate, 1-2 pack/day; heavy, >2 pack/day of the source smoker), and duration (years). **Results:** From a total of 1473 female lung cancers newly diagnosed, 435 had been interviewed and had a detailed data on ETS. Among these 435 females, 25%, 62% and 12% were never, former, and current smokers, respectively. Overall, 97% of ever-smokers and 80% of never-smokers had a history of ETS. Over 75% of these patients had been exposed to at least two sources of ETS. Among those with an ETS history, the mean-year of exposure to a smoking spouse (29) was higher than to parents (19) and to co-workers (18). Among the smoking spouses, 66%, 23% and 11% were heavy, moderate, and light smokers, respectively. In addtion, 70% of smoker patients had a smoking father and 85% of smoker patients had a smoking spouse. **Conclusions:** For female lung cancer patients, the cumulative amount of tobacco smoke exposure may be significantly underestimated if only personal smoking history is considered. It is important to include ETS history when assessing carcinogen dose and gene-environmental interaction in studies of tobacco-related diseases.

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Prostate cancer, acne and male pattern baldness: an Australian case-control study
Giles G, Severi G, McCredie M, English D, Johnson W, Hopper J, Boyle P.

Purpose: To examine the risk of moderate- and high-grade adenocarcinoma of the prostate in relation to facial acne scarring and male pattern baldness.

Methods: A population-based case-control study was conducted in Melbourne, Sydney and Perth between 1994 and 1998 in men below 70 years of age. Cases were recruited from the cancer registries and controls were selected from electoral registers. Subjects were interviewed in person. Data were analyzed by unconditional logistic regression, adjusting for age, study center, year of recruitment, family history of prostate cancer and country of birth.

Results: Altogether 1,498 cases and 1,434 controls were interviewed; the response rates being 68% and 50% respectively. Vertex baldness was associated with an increased risk, OR 1.45 (1.10-1.92) for moderate-grade and 2.03 (1.35-3.07) for high-grade cancer. The association increased with age, especially for men with high-grade disease: the OR for men aged over 59 and having high-grade tumors was 2.91 (1.59-5.32). The interviewers' assessment of facial scarring due to acne was negatively associated with PCa risk OR 0.67 (0.45-1.00), especially for high-grade disease OR 0.46 (0.21-1.00).

Conclusions: Baldness, especially vertex baldness is associated with PCa and more so with high-grade disease occurring at a later age. This association suggests that vertex baldness and prostate cancer have common androgenic pathways.

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Squamous Cell Skin Cancer and the Risk of Subsequent Cancer

Efird JT, Friedman GD, Tekawa IS, Nelson LM
Stanford University School of Medicine

Purpose: Determine the risk of subsequent cancer following squamous cell skin cancer.

Methods: Using computerized surgical pathology records and membership data from a health maintenance organization, we retrospectively identified 822 persons with primary squamous cell carcinoma of the skin (SCSC) and 3,662 comparison subjects matched for age, sex, race, residence area, and length of membership. Patients were included in the study if they had no prior history of cancer, and received at least one multiphasic health checkup (MHC). Patients were followed for up to 24 years, with a mean follow-up time of 7.8 years.

Results: SCSC patients had a significantly greater risk (adjusted for body mass index (BMI) and education) for subsequent cancer overall (excluding non-melanoma skin cancer), and for basal cell skin cancer, digestive and genitourinary cancers. A statistically significant elevated risk was also observed for the papillary transitional cell subset of bladder cancer, and for pancreatic cancer. An elevated ($\geq$2.0), but not statistically significant, risk ratio was observed for non-cutaneous squamous cell carcinoma, skin melanoma, rectal and oropharyngeal cancer. No increased risk was observed for breast, uterine, or ovarian cancer: and the risk elevation for prostate cancer was small and not statistically significant. Addition of smoking status (cigarettes, pipe, cigars), marital status, alcohol, race and occupational exposure to the multivariate model did not negate any significant positive associations with SCSC.

Conclusions: Patients with SCSC are at moderately increased risk of some internal cancers.

Kidskin: an intervention to reduce sun exposure in children in Perth, Australia

English D, Milne E, Cross D, Giles-Corti B, Costa C, Johnston R, Borland R. University of Western Australia, Curtin University and Anti-Cancer Council of Victoria.

Purpose: To design, implement and evaluate a school-based intervention to reduce sun exposure in elementary school students.

Methods: Fourteen control schools, 11 'moderate' intervention schools and 8 'high' intervention schools were recruited. Participants were in grade 1 (five to six years of age) at the beginning of the study in 1995 and in grade 5 at the end. Control schools received the standard health education curriculum, while intervention schools received a specially designed curriculum on sun protection. Children in the high intervention group also received program materials over the summer vacation and were offered sun-protective swimwear at low cost. The intervention was primarily evaluated by counting nevi at the start and end of the study. Skin color, to assess tanning, and parent-reported sun exposure were measured at the end of the second summer.

Results: At the end of the study, children in the high intervention schools had 0.96 (CI 0.89-1.03) as many nevi on the back as controls and those in the moderate intervention schools had 0.94 (CI 0.88-1.00) times as many (p = 0.10). Children in the intervention groups – especially the high group – were less tanned at the end of the second summer; this effect was greater for the back (p = 0.004) than for the forearms (p = 0.08).

Conclusion: The intervention appeared to reduce sun exposure but has not resulted in a definitive reduction in nevi.

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Determinants of DNA Yield and Quality from Buccal Cell Samples Collected with Mouthwash. HS Feigelson, EE Calle, C Rodriguez, EJ Jacobs, AS Robertson, M J Thun. Department of Epidemiology and Surveillance Research, American Cancer Society, Atlanta, GA.

Buccal cells are becoming an important source of genomic DNA in epidemiologic studies. Several collection methods exist, but few data are available about the quality and yield of DNA that can be obtained under different collection conditions. In a pilot study of collection methods, we used a "swish and spit" mouthwash protocol to collect 6 daily buccal cell samples from 24 individuals (144 total samples) to determine whether "swish" time (30 seconds (sec) versus 60sec), tooth brushing before collection, or lag time to DNA extraction (1 day versus 5, 10, or 30 days at room temperature) would affect sample quality and yield. Total DNA, human-specific DNA (hDNA), degradation, and ability to amplify by PCR were determined. The median amount (and range) of hDNA in the sample "swished" for 60sec and extracted within 48 hours (Sample 1) was 34µg (4-189) compared to 32µg (4-196) for a 30sec swish. The hDNA yields for samples that were held for 5, 10 and 30 days before extraction were 32µg (2-194), 23µg (3-80), and 21µg (3-56), respectively. The 10 and 30 day samples had significantly less hDNA than Sample 1 (p=.002). The PCR success rates for fragments of length 268bp, 526bp and 989bp were 94% or better, and high molecular weight DNA was found in all but 1 sample. These results suggest that buccal cell collection using mouthwash provides a relatively large volume of high quality DNA under typical collection conditions.

Serum Sex Hormones and Breast Cancer Risk Factors in Postmenopausal Women. Lamar CA[1], Dorgan JF[2], Longcope C[3], Stanczyk FZ[4], Falk RT[1], Stephenson HE[5] ([1] DCEG, National Cancer Institute, Bethesda MD, [2]Fox Chase Cancer Center, Philadelphia PA, [3]Univ. Massachusetts Medical School, Worcester MA, [4]Univ. of Southern California School of Medicine, Los Angeles CA, [5]Missouri Health Sciences Center, Columbia MO)

Purpose: Postmenopausal women with elevated serum estrogens and androgens are at an increased risk of breast cancer. We evaluated associations of serum estrogen and androgen levels with age, anthropometry, and reproductive history to assess whether these characteristics could potentially modify breast cancer risk through hormonal mechanisms. *Methods:* A cross-sectional study was conducted among 133 postmenopausal women who donated blood to the Columbia, MO Serum Bank and served as controls in a previous pro-spective nested case-control study of serum hormones and breast cancer risk. Linear regression was used to calculate adjusted means and to test for trends in relationships of serum hormone concentrations with breast cancer risk factors. All analyses were performed on the log scale and all models included assay batch, date and time of blood collection. *Results:* Serum levels of estradiol, non-SHBG bound estradiol, estrone, and estrone sulfate increased significantly with increasing body mass index (BMI), while SHBG levels decreased. Serum testosterone levels also increased signifi-cantly with increasing BMI; geometric mean concentrations were 0.5 nM and 0.8 nM, respectively, in the leanest and heaviest women. After adjusting for BMI, nulliparous women tended (p=0.05) to have higher testosterone levels compared to parous women. Dehydroepiandrosterone (DHEA), its sulfate (DHEAS), and androstenediol decreased significantly with increasing age. *Conclusions:* While BMI and parity could potentially modify breast cancer risk through hormonal mechanisms, age related increases in breast cancer incidence do not appear to be mediated through the hormones evaluated.

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Geographical Information Systems (GIS) Analysis Of Socioeconomic Factors Affecting Prostate Cancer Relative Survival In Pennsylvania. Hayran M, Weissfeld J
Purpose: Use regression models and GIS techniques to identify the socioeconomic factors affecting 5-year prostate cancer relative survival in Pennsylvania. **Methods:** We used 1985-1995 Pennsylvania Cancer Registry data and the Ederer method (1961) to calculate zip code specific prostate cancer 5-year relative survival. We collapsed neighboring zip code areas (N=1468) to form geographic units (N=420) containing at least 100 incident prostate cancer cases each. Corresponding geographic measures used as explanatory variables included census derived socioeconomic measures (median household income, percent urban, percent high school graduate or equivalent, percent over age 18 living in poverty and percent white) and percent of prostate cancer cases diagnosed at distant stage. Multiple regression analysis (SPSS 7.0) used the 420 geographic units to examine the associations between the explanatory variables and relative prostate cancer survival. ArcView GIS 3.2 software was used to map the 5-year survivals and the residuals from the regression model. **Results:** High and low relative survival rate areas tended to cluster on the Pennsylvania map. The regression model identified median household income (p<0.001, positive association) and percent distant stage (p<0.001, inverse association) as the significant factors explaining 32.5% of the total variation. After adjusting for income and stage, the map of residuals showed that elimination of geographical clustering was more prominent in the eastern part of the state when compared with the middle and western parts. **Conclusions:** In addition to stage, median household income was the best predictor of survival after prostate cancer diagnosis. Persistent geographic clustering of residuals implies existence of a yet to be discovered geographic factor which explains variability in prostate cancer survival. Future research should examine the eastern, central and western parts of Pennsylvania separately.

Recreational physical activity and endometrial cancer risk
A. Littman, L. Voigt, S.A.A. Beresford, N. Weiss

Objectives: To investigate the association between recreational physical activity and endometrial cancer risk in a population-based case-control study.

Methods: 822 incident cases of endometrial cancer diagnosed between 1985 and 1991 and 1111 randomly selected population-based controls provided detailed information on recreational physical activities as well as other endometrial cancer risk factors in a structured, in-person interview. Unconditional logistic regression, adjusted for age, county, energy intake, unopposed estrogen use, income and, in separate models, for body mass index (kg/m^2), was used to estimate the odds ratios (OR) and their 95% confidence intervals (CI), relating endometrial cancer to each level of physical activity.

Results: A greater proportion of controls (49.3%) than cases (40.5%) reported doing regular exercise (any *cf.* none: adjusted OR=0.62, 95% CI 0.51-0.76) in the 2-year period prior to diagnosis date. There was little evidence of a trend of decreasing risk with increasing duration or increasing intensity of recreational physical activity.

Conclusions: These results provide support for an association between the lack of recent recreational physical activity and endometrial cancer risk. However, the absence of a difference by duration or intensity level, and the inconsistent results from other studies, suggest caution before interpreting this association as causal.

Associations of dietary fat and plant foods with endometrial cancer
A. Littman, S.A.A. Beresford, E. White

Objectives: To examine the associations between dietary fat, selected plant foods and endometrial cancer in a population-based case-control study.

Methods: 679 incident cases of endometrial cancer and 944 population-based controls completed a 98-item semi-quantitative food frequency questionnaire in addition to a detailed, in-person interview which collected information on endometrial cancer risk factors. Logistic regression was used to estimate odds ratios (OR) of endometrial cancer, adjusted for age, county, energy intake, hormone use, smoking and, in separate models, for body mass index (BMI: kg/m^2).

Results: Percent energy from fat was associated with an increased risk of endometrial cancer (highest quintile *cf.* lowest: OR = 1.79, 95% CI 1.26-2.55). There was also evidence of a stronger association between dietary fat and endometrial cancer among groups with higher circulating estrogen levels (i.e., higher BMI, unopposed estrogen users, and non-smokers). Consumption of fruits and vegetables (highest quintile *cf.* lowest: OR= 0.65, 95% CI 0.46-0.93 and OR = 0.61, 95% CI 0.43-0.88, respectively) was inversely related to endometrial cancer risk.

Conclusions: These results provide support that a low-fat, high fruit and vegetable diet may reduce the risk of endometrial cancer and these dietary factors may act independently of the effect of BMI.

Title: Abdominal Obesity, Blood Insulin and Glucose Levels and Breast Cancer Incidence
Authors: Mink PJ, Shahar E, Rosamond W, Alberg A, Folsom AR.

We examined the association of breast cancer with abdominal obesity and other anthropometric variables, and evaluated the hypothesis that fasting insulin and glucose levels are involved in breast cancer etiology. This is the first study to evaluate prospectively the role of insulin. We followed 8,109 women, age 45-64, cancer-free at baseline, in the Atherosclerosis Risk in Communities (ARIC) Ancillary Cancer Study. At baseline, weight, height, and waist and hip circumferences were measured by trained staff and a fasting blood sample was drawn to measure serum insulin and glucose levels. Over an average follow-up of 7.1 years, 190 incident breast cancer cases were ascertained. After adjustment for age, race and study site, women in the highest body mass index (BMI) quintile had a 1.7-fold greater breast cancer incidence than women in the lowest quintile (95% confidence interval (CI): 0.95-3.06). There was no association of breast cancer with waist/hip ratio or fasting insulin level. Further multivariate adjustment did not materially change these results. Although diabetic women (fasting glucose >126 mg/dl or previous clinical diagnosis) had a 60% increase in risk compared to women with fasting glucose of less than 100 mg/dl (95% CI: 1.02-2.50), this association was attenuated after adjustment for BMI (RR= 1.5; 95% CI: 0.93-2.36). Our findings suggest that abdominal obesity is not a better predictor of breast cancer incidence than overall obesity. Although insulin level was correlated with BMI, it was not an independent risk factor for breast cancer. The link between diabetes and breast cancer was partially mediated by BMI, but a modest independent influence cannot be ruled out.

Burden of Cancer in the United States Assessed Using Disability Adjusted Life-Years (DALY)
McKenna M, Michaud C, Murray CJL

Background: The World Health Organization has adopted the DALY as a primary measure for assessing the health burden of various diseases in order to inform health policies and priorities. The DALY combines the impact of premature mortality and disability associated with health conditions into a single metric to estimate the number of healthy life years lost attributable to individual diseases. Methods: Data from the Surveillance, Epidemiology and End Results System and mortality rates from the National Center for Health Statistics were combined with cancer specific disability weightings from the *Global Burden of Disease Study* to estimate the number of DALYs attributable to 18 separate cancers in the United States in 1996. Spearman correlation coefficients (SCC) were used to compare the relative burden associated with each cancer using DALYs with traditional methods of epidemiologic burden measurement such as incidence, numbers of deaths, and years of life lost prior to age 75 years. Results: Cancers of the lung, breast, colon and prostate as well as non-Hodgkins Lymphoma were the leading sources of cancer related DALYs. Cancer associated disability contributed little in comparison to the burden from premature mortality. Therefore, the numbers of deaths (SCC = 0.942) and years of life lost prior to age 75 years (SCC=0.891) provided similar burden assessments when compared to DALYS. Conclusions: The DALY methodology provides similar results to simpler measures such as relative mortality when assessing the burden for individual cancers. The burden from other health conditions should be compared with the impact of all cancers as well as individual malignancies using this methodology.

Reproductive Risk Factors for Epithelial Ovarian Cancer According to Histologic Type. F. Modugno, R. Ness and J. Wheeler. University of Pittsburgh, (FM, RN) and University of Pennsylvania (JW).

Differences in histology among the subtypes of epithelial ovarian tumors suggest possible differences in their etiologies. **Aim:** We determined whether reproductive risk factors for epithelial ovarian cancer vary according to histologic subtype. **Methods:** We conducted a population-based, case-control study of associations between reproductive risk factors and epithelial ovarian cancer in the Delaware Valley from 1994-1998. Cases age 20-69 years with a recent diagnosis of epithelial ovarian cancer (n=767) were compared to community controls (n=1367) frequency matched by age. A standardized 1.5 hour in-person interview provided detailed information on a subject's reproductive history. **Results:** Tumors were classified as serous (46.5%), mucinous (14.6%), endometrioid (18.1%), and other (clear cell, mixed cell, undifferentiated). Reproductive risk factors were examined in a multivariate model controlling for age, family history of ovarian cancer, and ethnicity. We found a significant risk reduction for each histologic subtype of epithelial ovarian cancer by using oral contraceptives (ORs for each year of use: 0.93, 0.94, 0.93, for serous, mucinous, and endometrioid tumors, respectively); bearing children (ORs for each live birth: 0.79, 0.75, 0.78); and having a tubal ligation (ORs: 0.52, 0.47, 0.48). There was also a significant increased risk associated with a family history of the disease for serous (OR=4.31) and mucinous (OR=3.08) tumors, but not for endometrioid (OR=1.90). There were no significant differences between any two subtypes in the magnitude of the odds ratios for OC use, parity, breastfeeding, tubal ligation, hysterectomy, use of non-contraceptive estrogens, age at menarche and age at menopause. **Conclusion:** Reproductive risk factors for epithelial ovarian cancer appear to be the same

Body Mass Index and Fat Distribution Differentially Associated with Histologic Types of Lung Cancer: Evidence from a Cohort of Older Women. JE Olson (*Mayo Clinic, Rochester, MN*), P Yang, K Schmitz, RA Vierkant, JR Cerhan, G Petersen, TA Sellers.

A previous report from the Iowa Women's Health Study (IWHS) described an increased risk of lung cancer (LCa) associated with decreasing body mass index (BMI) and increasing waist/hip ratio (WHR). However, risk by histologic subtype of LCa was not examined. Additionally, recent reports suggest that waist circumference (WC) is a better indicator of central adiposity than WHR. The IWHS is a prospective cohort study of 41836 Iowa women aged 55-69 years at baseline in 1986. Through 1998, 596 cases of LCa were identified (123 small cell, 115 squamous cell, 234 adenocarcinoma and 124 other). After adjustment for established risk factors, women in the upper quintile of BMI were at decreased risk of all LCa subtypes. The most striking association was noted for squamous cell carcinoma, in which the highest vs. the lowest quintile of BMI was associated with a relative risk (RR) of 0.22, p-trend=0.005. In contrast, WC was positively associated with small cell and squamous cell LCa (RR=3.31 and 3.05, respectively, for highest vs. lowest quintile of WC). The test for trend was statistically significant only for small cell carcinoma (p=0.02). There was no association of WC with risk of adenocarcinoma of the lung (RR=0.78, for highest vs. lowest quintile, p trend=0.69). This report raises the possibility that waist circumference may be differentially associated with histologic subtypes of LCa. However, there were too few cases among non-smokers to eliminate the possibility that these results are due to the residual effects of smoking.

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PHYSICAL ACTIVITY AMONG SMOKERS IS INVERSELY ASSOCIATED WITH LUNG CANCER INCIDENCE IN THE IOWA WOMEN'S HEALTH STUDY (IWHS). Petersen GM (Mayo Clinic, Rochester, MN), Schmitz K, Cerhan JR, Vierkant R, Yang P, Sellers TA.

Association of physical activity (PA) with lung cancer risk by smoking category has not been fully examined in postmenopausal women. **Methods:** IWHS is a prospective cohort study of 41,836 Iowa women aged 55-69 years at baseline in 1986. After exclusions for prevalent cancer and/or missing data, we studied 36,393 women, including 565 lung cancer cases. Using high (H), moderate (M), or low (L) PA assignment based on moderate and vigorous free time PA baseline questions, Cox proportional hazards regression were used to estimate relative risks (RR) and 95% confidence intervals (CI). **Results:** Overall, PA was associated with decreased lung cancer risk. For M and H PA, respectively, RR were 0.82 (0.67, 1.00) and 0.67 (0.53, 0.84) (trend test $P<.001$). By smoking category, PA was not associated with lower risk among never-smokers (NS). However, PA was inversely associated among those with the greatest pack years (PY) tobacco use. For women with 40+ PY, M and H PA had RR of 0.64 (0.46, 0.90) and 0.51 (0.35, 0.75), respectively, trend test $P<.001$. *Within* smoking categories, incidence rates were lower among women who reported H PA compared to those who had L PA, except among NS. Age adjusted incidence among H PA NS was 0.29/1000 person years. For 40+ PY smokers, incidence was 8.81, 5.78, and 4.55 per 1000 person years, respectively. **Conclusions:** PA is inversely associated with lung cancer risk in smoking postmenopausal women. For smoking women, M and H PA might modify lung cancer risk; PA and smoking cessation should be encouraged.

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Alcohol Consumption and Risk of Renal Cell Carcinoma in a Population-based Case Control Study in Iowa. AS Parker (Mayo Clinic, Rochester, MN) CF Lynch, JR Cerhan, KP Cantor.

The role of alcohol consumption in the development of renal cell cancer is poorly understood. A positive association was reported in one study, with the majority of studies reporting no association. Investigators from the largest population-based case-control study of incident RCC (International Renal Cell Cancer Study) reported a protective effect of alcohol in females only, with some indication of an association with wine specifically. We report data from a population-based case-control study conducted in Iowa from 1986-1989. RCC cases (261 males; 145 females) were identified through the Iowa Cancer Registry, while controls (1,598 males; 831 females) were randomly selected from the general population, matching on age and sex. Subjects provided detailed information on a mailed questionnaire regarding demographic, anthropometric, lifestyle, dietary and medical history risk factors. In age-adjusted analysis there was a decrease in risk for women who reported consuming > 3 servings (median among users) of alcohol per week [Odds Ratio (OR)= 0.5; 95% Confidence Interval (CI) 0.2-0.9]. No evidence of an association among males was noted [OR=1.1; 95% CI 0.8-1.5]. Multivariate adjustment for anthropometric, lifestyle, smoking and dietary factors did not alter the findings. Analysis by type of alcohol suggested that the effect may be strongest for beer consumption, but due to limited case numbers, estimates were imprecise. These findings are consistent with a protective effect of alcohol consumption among women but not among men. In contrast with the International Renal Cell Cancer Study, the strongest effect here was seen with beer and not wine.

Relationship Between IGF-1 and IGFBP-3 and Adipose Tissue Distribution in Men and Women. J Schragin, J Weissfeld, FL Thaete, C Rosen, LH Kuller, RE Schoen. University of Pittsburgh and The Jackson Laboratory, Bar Harbor, ME

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Introduction: Insulin-like growth factor-1 (IGF-1), IGF binding protein-3 (IGFBP-3) and obesity, and in particular visceral obesity, are putative cancer risk factors. Little is known however about the relationship between IGF-1 and obesity.
Aim: To investigate the relationship between adipose tissue distribution and IGF-1 and IGFBP-3. **Methods:** Single slice abdominal CT scanning was used to measure visceral (VAT) and subcutaneous (SQ) adipose tissue (cm^2) on 247 community-based subjects (156 men, 91 women; age 55-77), participating in a cancer screening trial. Radioimmunoassays measured IGF-1 and IGFBP-3 blood levels. IGF-1, IGFBP-3 and the ratio of IGF-1/IGFBP-3 were compared to age, BMI, absolute and relative visceral and subcutaneous adipose tissue, and total fat. **Results:** In men and women, IGF-1, IGFBP-3 and the ratio IGF-1/IGFBP-3 did not correlate to VAT. In women only, there was a small association between IGFBP-3 and BMI (Pearson correlation (r) =0.11, p=0.03) and IGFBP-3 and total fat (r=0.22, p=0.04). Men had a higher mean IGF-1 (132.3 ng/ml vs.112.1, p=0.0005) and more visceral adipose tissue (204.6 cm^2 vs. 167.4 cm^2, p=0.001) than women. **Conclusion:** A significant relationship between adipose tissue distribution and the IGF axis was not observed in men or women. Men had a higher IGF-1 level and more visceral adipose tissue than women.

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Stability of Transvaginal Ultrasonographic Measurement of Endometrial Thickness in Asymptomatic Post-menopausal Women

A.Sit, L.M. Hill, J.Martin, J.L.Weissfeld
Purpose: Transvaginal ultrasonographic endometrial thickness measurements (TUETM) in post-menopausal women may be a biomarker of risk for estrogen-related cancer, including breast cancer. We studied the stability of TUETM in a group of asymptomatic post-menopausal women over one-year period.
Method: 178 asymptomatic post-menopausal women undergoing annual transvaginal ultrasound examination were studied as part of a national cancer screening trial.
Results: 178 women had duplicate TUETM separated by about a year. The mean endometrial thickness at the first and second visits was 0.43cm and 0.40cm, respectively (p=0.19, paired t-test). The proportion of total variance in endometrial thickness due to inter-individual differences was 0.68. For 89.9 percent of the women, the difference in endometrial thickness between visits was less than 0.3cm. For 97.2 percent of the women, the difference was less than 0.5cm.
Conclusion: There was generally good agreement between endometrial thickness measurements among individuals from year-to-year. Further investigation is warranted to evaluate the use of TUETM as a biomarker of risk for estrogen-related cancers in a large population of asymptomatic post-menopausal women.

Mailing Strategies and Recruitment into an Exercise Intervention Trial
Slate S, Ulrich C, Yasui Y, McTiernan A
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We used mass mailings and media to recruit women aged 50 to 75 to a randomized clinical trial of exercise and breast cancer biomarkers. We mailed a letter, brochure and interest survey to 103,619 women in western Washington using a Department of Motor Vehicles list. We sent multiple mailings to about 20% of the women living in areas closest to the study site, for a total of 140,740 mailings. Just over 7000 women responded to a mailing, while 922 responded to media promotions. We also conducted a randomized trial of 4999 women to determine the effectiveness of four mailing strategies. Of 376 eligible responses, we found a significant difference between first class and bulk mailings (p=0.02, χ^2), with response rates of 8.1% and 6.9% respectively. There was no significant change in response rates when including a personal invitation letter (p=0.93, χ^2). Mass mailing is a feasible strategy for recruitment into exercise trials; first-class may give higher yields than bulk mailing in this population.

Predicting Risk of Prostate Cancer with Bayesian Networks
Jian-Rong Shi, Bostick R, Dawen Xie, Marco Valtorta
South Carolina Cancer Center, University of South Carolina, Columbia, SC 29203

Bayesian networks represent a promising technique for clinical decision support and provide a number of powerful capabilities for representing uncertain knowledge. They provide a flexible representation that allows one to specify dependence and independence of variables in a natural way through the network topology. We report here on a Bayesian network model of prostate cancer constructed on the basis of information collected from a community-based case-control study on prostate cancer in the Piedmont region of North Carolina during 1994-1996. In order to simplify the calculation of conditional probabilities of the variables, we assumed that the model typically behaves like a Noisy-OR-gate with discrete binary nodes. The model calculated the probability of prostate cancer based on probabilities of input variables in the model. The Hugin graphic interface was used to construct and test the probabilistic network model. We found that our subjects have 50.24% probability of prostate cancer while there was no evidence. However, the probabilities of prostate cancer will be 98.62% and 98.96%, respectively when they have high serum PSA levels or abnormal results from biopsy. Our study suggests that Bayesian networks may be useful as an initial screening tool for predicting risk of prostate cancer with available risk information and laboratory results.

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HELICOBACTER PYLORI SEROPOSITIVITY AND EXOCRINE PANCREATIC CANCER, A NESTED CASE-CONTROL STUDY IN MALE SMOKERS. RZ Stolzenberg-Solomon*, PJ Limburg, G Perez-Perez, MJ Blaser, J Virtamo, PR Taylor, D Albanes. (National Institutes of Health, Bethesda, MD, 20892)

We investigated the association of *H. pylori* and exocrine pancreatic cancer in a nested case-control study within the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study cohort of 29,133 male Finnish smokers, aged 50 to 69 years at baseline. Cases (n=121) were matched on date of baseline serum collection, study center, age, trial intervention, and completion of the dietary questionnaire to 226 controls who were alive at the time the case was diagnosed and free of cancer, during a mean ($\pm$SD) follow-up of 8.5 ± 3 years. Enzyme-linked immunosorbent assays determined IgG antibodies to *H. pylori* whole cell and CagA+ antigens. Smoking-adjusted odds ratios and 95 percent confidence intervals were determined using conditional logistic regression. Seroprevalence for *H. pylori* was 82 and 73 percent among cases and controls, respectively. Compared to seronegative subjects, those with *H. pylori* or CagA+ strains were at significantly elevated risk of pancreatic cancer (odds ratio, 1.87; 95 percent confidence interval, 1.05 to 3.34, and odds ratio, 2.01; 95 percent confidence interval, 1.09 to 3.70, respectively). Our findings support a possible role for *H. pylori* in the development of pancreatic cancer.

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Review of Intestinal Carcinogenesis from Carrageenan in Animal Models. Joanne K. Tobacman, M.D.

Although the International Agency for Research on Cancer determined that there was sufficient evidence to cite degraded carrageenan as a carcinogen in 1982 and degraded carrageenan has a TD_{50} of 2310 mg/kg/d for mice in the Carcinogenic Potency Database, it continues as a likely constituent of the diet. Two major sources are: 1) contamination of higher molecular weight food-grade carrageenan by lower molecular weight components during processing; and 2) acid degradation during normal digestion leading to availability of lower molecular weight degraded carrageenan. The daily carrageenan consumption for the population over 2 years of age in the United States has been estimated to be 100 mg. Data indicate that gastric acid hydrolysis will lead to production of 9% low MW products (<20,000 MW) and that contamination of food-grade carrageenan includes 25% with MW under 50,000. Hence, estimating consumption of 10 mg/day of degraded carrageenan, the intake of degraded carrageenan is about seventy times that permitted by Delaney, if the mouse dose is extrapolated to a carcinogen dose of 138 gms for a 60 kg person and then divided by a million. Although the Food and Drug Administration considered a minimum average molecular weight for carrageenan in a 1972 regulatory amendment, this was withdrawn in 1979, with a reference to a Food Chemical Codex standard for viscosity. Since native carrageenan may have molecular weight in the millions, a viscosity standard may not eliminate low molecular weight contaminants. Additional evaluation is needed of the appropriateness of continued dietary exposure to carrageenan.

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Polymorphic Length of CA Repeats in the IGF-I Gene and Breast Cancer Risk.
Herbert Yu, Benjamin Li, Mylinh Smith, Runhua Shi, Hans Berkel, Ikuko Kato. (Feist-Weiller Cancer Center, Louisiana State University Health Sciences Center, Shreveport, LA 71130)

Insulin-like growth factor (IGF)-I has strong mitogenic and anti-apoptotic effects on breast cancer cells. High circulating levels of IGF-I are associated with increased risk of breast cancer in pre-menopausal women. The IGF-I gene contains polymorphic cytosine-adenine (CA) repeats in the promoter region and the length of the repeats is suspected to be involved in the transactivation of the gene. To examine the role of this polymorphism in the development of breast cancer, we conducted a case-control study to compare the CA repeat length in the IGF-I gene between breast cancer patients and their matched controls. Fifty-three newly diagnosed breast cancer patients were selected consecutively from a breast clinic at LSU Health Sciences Center. For each case, one age- and race-matched control women was selected. Blood samples were collected from the study subjects. Genomic DNA, extracted from peripheral blood cells, was amplified by PCR for the IGF-I CA repeat region. The PCR products were sequenced to determine the number of CA repeats by automated DNA sequencing. Results from our study showed that patients with breast cancer had a higher percentage of 19 CA repeats when compared to the controls (OR=2.57, 95%CI=1.11-5.99). There were no differences observed between the cancer cases and the controls with respect to shorter or longer CA repeats. The association of breast cancer with 19 CA repeats was more evident in post-menopausal women (OR=3.45, 95%CI=1.19-10.05) or in women with low IGFBP-3 in blood (OR=3.71, 95%CI=1.09-12.54). Additionally, the odds ratio for cancer was substantially increased in women with higher plasma IGF-I and 19 CA repeats when compared to those without either conditions (OR=4.73, 95%CI=1.36-16.44). This may suggest an interaction between local production of IGF-I and circulating IGF-I. Large studies are needed to confirm this finding and to further clarify the association.

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Reliability of Self-Reported Medication Use. Trentham-Dietz A, Newcomb PA, Egan KM, Storer BE, Titus-Ernstoff L, and Stampfer M. University of Wisconsin Comprehensive Cancer Center, Madison, WI 53706.

Most population studies of medication use in relation to disease rely on self-reports. Participants in a multicenter case-control study were reinterviewed to assess the reliability of self-reported medication histories. In 1992-1995, 5685 incident cases of invasive breast cancer (84% of eligible women) and 5951 population controls (78% of eligibles) were interviewed by telephone in Wisconsin and Massachusetts. A sequential sample of 208 cases and 199 controls was reinterviewed after an average of three months. Use of hormone replacement (HRT), oral contraception (OC), and medication for infertility, threatened miscarriage, and depression was ascertained. The kappa and 95% lower confidence limit (LCL) for ever/never use of HRT was 0.83 (LCL 0.75) among case women and 0.87 (LCL 0.79) among controls. The intraclass correlation coefficient (ICC) for duration of HRT was 0.89 (LCL 0.83) among cases and 0.83 (LCL 0.74) among controls. The kappa value for ever/never use of OCs was 0.96 (LCL 0.92) among cases and 0.92 (LCL 0.85) among controls. The ICC for duration of OC use was 0.89 (0.83) and 0.94 (0.90) among cases and controls, respectively. Kappa values for the three other medications indicated similar levels of reliability. With kappa values ranging from 0.75 to 0.96, these results demonstrate that this study instrument obtained self-reported medication use with a high degree of reliability.

THE BREAST CANCER SCREENING
CONTROVERSY AND PUBLIC HEALTH POLICY

To understand the controversy it is necessary to review the HIP study question, the design, the results and how the results were reported. The question- was would women respond to an invitation to participate in a screening program of an initial and three annual screens and whether this would reduce the mortality? In 1963 60,000 women were randomized ½ to usual care. 20,000 responded, at the 4th screening there were 13,000 participants. For the entire group there was approximately a 30% mortality decrease, but the first sub set analysis of the women under 50 at entry was inconclusive. In 1982 the HIP investigators reported a benefit in the younger women (under 50) as did two independent analyses of the data in 1986 the last in 1997 by the HIP showed a benefit in the younger women equivalent to that in the older women. Conferences were held in 1993 and 1997 to evaluate the data and from the published data, these conferences and other studies there emerged conflicting recommendations.

However, the improvement in screening technology in the younger women that was known by 1970 was not considered. The conclusion-early subset analyses led some to not consider the reported benefit in the younger women and the improvement in mammography. Public health policy should not be based on out-moded technology. There remains the question when to report research data that has the potential for substantial impact on policy and practice.

Decreasing Risk of Complications of Colonoscopic Polypectomy over the 10-Year National Polyp Study.
MDA Carlson, AG Zauber, F Schnoll-Sussman, J Waye, J Bond, M Schapiro, SJ Winawer. NPS Coordinating Center: MSKCC, NY.
Purpose: The most frequent neoplastic finding in colorectal cancer screening are adenomatous polyps, the removal of which results in a lower than expected incidence of colorectal cancer. However, colonoscopic polypectomy is associated with complications. The magnitude of these complications needs to be evaluated in order to determine the net benefit of colonoscopic polypectomy. Using data from the National Polyp Study we assessed the occurrence and trend in the risk of complications over the 10-year study period.
Methods: We prospectively recorded complications in 3778 patients undergoing 4001 baseline colonoscopic polypectomies over the period 1980-1990. Experienced endoscopist investigators in 7 participating centers performed all exams.
Results: The risk of complications declined by 18% per year over the 10-year study period (Odds Ratio=0.82; $p<0.0001$, 95% confidence interval 0.76 to 0.89). This decline in risk persisted after controlling for age, sex, prior abdominal surgery, number of polyps, use of cautery snare, and polyp shape. The risks of complications over the period were: perforation 0.1%, major and minor bleeding 1.6%, postpolypectomy syndrome 0.1%, cardiopulmonary event 0.3%, adverse drug reaction 0.1%, nausea and vomiting 0.6%, phlebitis 0.3%, and abdominal pain 0.1%.
Conclusions: The risks of colonoscopic polypectomy complications were minimal and were found to significantly decline over the period 1980-1990. This result persisted when controlled for potential risk factors for complications. The decrease in risk of complications implies an increase in the net benefit of colonoscopic polypectomy in many settings, including screening, diagnosis, and surveillance.

CLASSIFICATION OF PSA TESTS: AN ALGORITHM TO DIFFERENTIATE SCREENING & DIAGNOSTIC TESTS

PK Dhillon, NS Weiss, SK Van Den Eeden

PURPOSE: The purpose of this study was to develop, as part of a case-control study on the efficacy of prostate-specific antigen (PSA) screening, an algorithm for determining whether PSA's were or were not intended as screening tests. METHODS: Cases (n=297) include men aged 50-84 years who were members of Kaiser Permanente in Northern California who died of prostate cancer between 1996-1997. Age-matched controls (n=297) include men who were alive and free of prostate cancer on the diagnosis date of the fatal case. Outpatient medical records were reviewed to obtain a subject's screening history during a 10-year reference period. RESULTS: *(Results available on 54 cases and 54 controls at this time).* We developed an algorithm that includes selection of a reference date and factors such as, previous test results, signs/symptoms over time (new, stable or worsening), digital rectal exam findings, and clinical suspicion. Based on the algorithm, PSA tests were classified into one of four categories: routine screen, probable screen, unlikely screen and non-screen. Among all men, a much larger percentage of unlikely and non-screens were found in cases than controls (37% and 4%, respectively). CONCLUSIONS: It is important to reliably distinguish whether a test was done for screening or for diagnosis, since failing to do so will result in a spuriously high frequency of screening tests. Applying this algorithm while blinded to case-control status can minimize misclassification of exposure (screening tests). Studies of PSA screening efficacy may benefit from consideration of such an algorithm.

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A REVIEW OF RESEARCH AND EVALUATION ON CERVICAL CANCER SCREENING IN THE WORKPLACE.

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The workplace has increasingly become an important site for disseminating health information and implementing health promotion activities including cervical cancer screening. However, relatively few programs for Papanicolau (Pap) testing in the workplace have been evaluated or had their evaluation results published. The benefits and effectiveness of worksite programs for Pap testing have been little studied. This presentation reviews and critically evaluates published studies of worksite cervical cancer screening programs. Most of these studies consisted of cross-sectional surveys with an observational study design, carried out as part of program evaluation. These studies are often limited by a lack of suitable comparison groups, the use of a non-randomized design, and the lack of a clearly defined theoretical or empirical framework for the intervention. The extent to which results obtained in selected localities and industrial settings are generalizable to other settings is uncertain. Although incentives for employers may include reducing costs due to medical treatment and lost productivity, the costs of Pap testing in the workplace are largely unknown. It is unclear from studies carried out to date whether the provision of cervical cancer screening in the workplace is more likely to prevent cervical cancer than alternative approaches outside of the workplace.

Increasing mammography use among older, rural, African-American women: results after 6 years of a Lay Health Advisor intervention

JA Earp, GH Rauscher, MS O'Malley UNC Lineberger Comprehensive Cancer Center, UNC-CH, North Carolina.

Purpose: To determine if a lay health advisor intervention was able to sustain an increase, over 6 years, in self-reported mammography use among African American women ages 50 years and older in eastern North Carolina.

Methods: Since 1994, 166 trained lay health advisors (all African American women over age 50) have promoted breast cancer screening in 5 rural intervention counties but not in five comparison counties. We previously reported an effect after 2-3 years of the intervention. Here we compare the change from baseline (1993-94) to 2nd follow-up (1999-2000) for 289 women from the intervention counties and 334 from comparison counties (76% and 78% response rates from baseline, respectively).

Results: The increase in screening rates after 6 years among intervention county women was 6% greater than that for comparison county women. Those without any history of mammography screening at baseline showed intervention-related gains in use only at the time of the second follow-up survey (6%). Low income women sustained the significant gains (8%) reported previously.

Conclusion: Unadjusted results after 6 years of this on-going controlled trial suggest that a lay health adviser intervention may be effective in increasing breast cancer screening for several years among African-American women. No previous trial has documented effects of such long duration. To convince women without any screening history to get mammograms may take even longer.

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Colorectal Cancer Screening Rates: Reports from Patients Enrolled in a Managed Care Health Plan

Farmer MM, Bastani R, Belman M, DaCosta I, Garcia C, and Ganz PA

Purpose: This study examined colorectal cancer (CRC) screening rates and potential barriers to screening for patients enrolled in a managed care health plan. **Methods**: A telephone interview was conducted in the summer of 2000 on a cohort of patients aged 50+ who were enrolled in a large managed care health plan in California (N=450 *preliminary results presented on subsample N=199) Screening was based on patient report of having had a fecal occult blood test (FOBT) and/or an endoscopy (sigmoidoscopy/colonoscopy). **Results**: Only 43% of patients had been screened according to national guidelines with an FOBT and 22.6% with endoscopy. Of the patients who had not been screened, a majority had never heard of an FOBT and an MD or RN had recommended the test to only 14%(FOBT) and 19.7%(endoscopy). There were no differences in age, race, income or health status between those screened or not. **Conclusion:** The majority of patients had not been screened for CRC according to guidelines and had limited knowledge about CRC screening tests. Recommendation for CRC screening was significantly associated with higher screening rates and represents a critical target for specific intervention in achieving CRC screening goals.

Physicians' Attitudes Toward Use of Genetic Tests for Inherited Cancer Susceptibility in the United States

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[1]National Cancer Institute (NCI) and [2]Abt Associates Inc.

PURPOSE: Physicians' attitudes and beliefs about genetic testing for inherited cancer susceptibility will greatly influence the diffusion of this new technology into medical practice. The NCI recently conducted a national survey to assess physicians' attitudes toward the use of these genetic tests. METHODS: A nationally representative sample of 1250 physicians in primary care (n=820) and four selected specialties (n=430) responded to the survey (response rate=70.9%). RESULTS: Results indicate that 35% of physicians believe genetic tests for inherited cancer susceptibility have too many false positive, false negative, or ambiguous results, and 25% think that genetic testing even of patients with a family history of cancer is not cost-effective. Forty-five percent of physicians believe that the risk of cancer in patients who have a positive genetic test is unclear, and 74% feel clear guidelines are not available for managing these patients. Only 29% of physicians consider themselves qualified to provide genetic counseling to their patients, and 44% believe they are qualified to recommend genetic testing. Analyses of physicians' attitudes toward genetic testing by physician specialty, medical training, practice characteristics, and demographics will be presented. CONCLUSIONS: A notable proportion of U.S. physicians expressed concerns about the accuracy and interpretation of genetic tests for inherited cancer susceptibility. Results suggest that physician uncertainty about the clinical utility and effectiveness of these tests must be overcome before this new technology can be effectively translated into clinical practice.

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Improving Colorectal Cancer Screening in a Managed Care Health Plan: Opportunities and Challenges in Recruitment of Provider Organizations from the Community

Ganz PA, Farmer MM, Belman M, Malin J, Bastani R, Kahn KL, Dietrich A, and Fielding J.

This is a report of our experience working with a major HMO health plan to recruit provider organizations (POs) to participate in a multi-phase study which includes an RCT to test the efficacy of a quality improvement intervention program targeting an increase in colorectal cancer screening. The first two phases of the study included surveys of medical directors, primary care providers and patients. For phase three, participating POs were assigned to either an early or delayed intervention. The facilitated intervention will be delivered over 2 years, after which time (phase four), a second patient and provider survey will be conducted. The intervention program will be evaluated by comparing the screening rates in the intervention and control POs. Recruitment was a central issue because all phases required organizational and individual participation. Other issues such as the difficulties of working within the unstable health care environment in California in 1999-2000, the critical role of the collaboration with the health insurance plan, and other challenges of attempting this type of real world research will be discussed. We believe that the preliminary findings will be of interest to others planning community based research aimed at enhancing the utilization of evidence-based preventive services.

Melanoma Tumor Thickness, Metropolitan Atlanta, 1981-1996: Evidence of a Decline in Incidence of Intermediate Thickness Lesions and Reductions in Melanoma Mortality. R.T. Greenlee, E.W. Flagg, J. Liff, B. McAlpine, D.G. Kleinbaum (Emory University; American Cancer Society; Atlanta, GA)

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A reduction in population mortality is a key objective of early detection, although mortality based on death certificates does not allow evaluation of extent of disease at diagnosis among cancer deaths. This study augmented Metropolitan Atlanta Surveillance, Epidemiology, and End Results data with tumor thickness measurements for cases diagnosed before 1988. We then estimated incidence-based mortality from 1981-1996, a time period of substantial growth in early detection efforts for melanoma. Incidence trends by tumor thickness were also evaluated to identify possible influences on mortality. After increasing, the melanoma death rate declined 13% between 1985-1988 and 1989-1992, from 4.5 to 3.9 per 100,000 (p=0.0174). Stratification by gender revealed the decline was limited to women, who are known to be more responsive to early detection efforts. The mortality reduction followed an increase in incidence rates of the thinnest tumors (t1, <0.76mm) and corresponding reductions in incidence of intermediate thickness tumors (t2, 0.76-1.50mm; t3, 1.51-4.00mm) among women. Patients with the thickest lesions (t4, >4.00mm), despite poor survival, contributed less to overall mortality (18.7%) than patients with t2 (24.4%) and t3 (41.3%) tumors. Early detection of melanoma, particularly efforts that prevent progression from thin to intermediate thickness lesions, may have some beneficial population impact.

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Breast and Cervical Cancer Screening Among Appalachian Women
Hall HI, Uhler RJ, Coughlin SS, Miller DS. Division of Cancer Prevention and Control, NCCDPHP, CDC, Atlanta, GA

Purpose: To determine the rates of breast and cervical cancer screening in Appalachia and to identify the factors associated with screening.
Methods: The Appalachian region is geographically defined by the Appalachian Regional Commission. Data from the Behavioral Risk Factor Surveillance System, 1996 to 1998, were analyzed to determine the percentage of women aged ≥40 years who had had a mammogram or clinical breast examination (CBE) within the past 2 years and the percentage of women aged ≥18 years who had had a Pap test within the past 3 years. Screening rates were further assessed according to demographic, socioeconomic, and health factors. Multiple logistic regression analyses were conducted to examine the independent predictors of screening.
Results: Among Appalachian women, 68.8% (95% confidence interval [CI] 67.8-69.9) had a mammogram and 75.1% (95% CI 74.1-76.1) a CBE in the past two years, and 82.4% (95% CI 81.5-83.3) had a Pap test in the past three years. These rates were about 3% lower than those for women living elsewhere in the United States, and these differences were statistically significant. Older women, women with less education or income, and women who had not visited a doctor within the past year were less likely to have been screened.
Conclusions. Additional interventions are needed to increase breast and cervical cancer screening rates for all Appalachian women to meet the goals of Healthy People 2010.

Perceived Benefits and Barriers to Colon Cancer Screening
James, A.S. & Campbell, M.K.

Screening can reduce incidence and mortality from colon cancer, yet many people are not regularly screened. This study examines perceived benefits and barriers to screening, and their association with screening behavior among a sample of 852 African American church members in North Carolina who are participating in the WATCH (Wellness for African Americans through Churches) Project. Less than a quarter of people age 50 and older reported having a fecal occult blood test (FOBT) within the previous year and less than 10% had had a sigmoidoscopy (SIG) or colonoscopy (COL). The most common barriers were that the doctor had not recommended testing (55% agreed) and screening would be painful (45%). Respondents agreed with most benefits, such as setting a good example for family (86%). Responses to barrier and benefit items were each summed to create scaled scores. Analysis of variance tests demonstrated significant differences in FOBT by barriers ($F_{(1,304)} = 9.95$, $p<.05$), but not benefits ($F_{(1,304)}=0.67$, $p>.05$). Both barriers ($F_{(1,244)} = 7.49$, $p<.05$) and benefits ($F_{(1,305)} = 5.91$, $p<.05$) were significantly associated with SIG. Higher agreements with barriers were associated with not being screened and benefits were positively associated with screening. Because people tend to agree with most of the benefits of screening, perceived benefits may be a weaker predictor of colon cancer screening behavior than perceived barriers. Reducing perceived barriers may be one path to increasing screening behavior.

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Oral cancer risk perceptions among participants in an oral cancer screening program
Hay JL, Ostroff JS, Cruz GD, LeGeros RZ, Kenigsburg H, Franklin M.

Oral cancer screening provides an opportunity for earlier detection, and education to tobacco and alcohol users who are at highest risk. We assessed factors related to risk perceptions among participants in a free oral cancer screening held at the New York University College of Dentistry. Participants (N=803) were racially and ethnically diverse and older; 43% had a history of smoking and 9% had a history of alcohol abuse. Those with a history of smoking or alcohol abuse had higher risk perceptions than those without such a history (all $ps<.01$); men felt more at risk than women, and Asians felt least at risk compared to all other ethnic groups (Blacks, Hispanics, Whites; all $ps<.05$). Age and oral cancer risk factor knowledge were each unrelated to risk perceptions (all $ps>.05$). Current smoking status remained the only significant independent predictor of heightened risk perceptions in a multiple regression equation where all significant predictors were considered simultaneously (Beta=.30; $p<.001$; $R^2=.09$). Smokers appear most aware of their higher risk status; those with alcohol abuse histories may need increased education. Ethnic and gender differences in oral cancer risk perceptions need further exploration. Oral cancer screening could help motivate tobacco and alcohol cessation and repeated screening in higher-risk individuals.

Current "Pap" testing and HPV risk in a county jail

James, A.S. & Mullen, P.D.

"Pap" screening for cervical cancer is recommended annually for high risk women. Risk factors for cervical cancer include HPV infection. Women in a large metropolitan county jail were surveyed about sexual practices and partners, contraceptive use, condom use, and alcohol and drug use as part of Project CHOICES, an intervention to reduce risk for alcohol-exposed pregnancies. 95% had ever had a Pap test; of those, 55% had been tested in the past year. Many reported multiple partners; about 20% had traded sex for drugs or money in the month before incarceration. Logistic regression indicated that having a Pap smear in the past year was significantly associated with age and income but not high-risk behaviors such as trading sex or not using condoms. Women reporting at least one main partner had lower odds of a recent Pap than women reporting only trading or casual partners. These results suggest that incarcerated women who "appear" to have less risk in that they report a main partner may not be more likely to have cervical cancer screening. Screening efforts need to be targeted at the whole population, not just those exhibiting risky sexual behaviors such as trading sex for money or drugs.

Outcomes of Familial Risk Assessment in a Cancer Screening and Wellness Program

Kelly B., Greene J., Scheuer L., Milazzo C., McGovern B., Offit K.

Family history was evaluated on individuals presenting to a cancer prevention and wellness program. Of approximately 800 patients who underwent consultation, 115 were identified as needing a formal family history evaluation. These patients completed a questionnaire detailing their family histories of cancer. Individualized screening recommendations were discussed with 30 (26.1%) who were identified as high risk and referred for cancer risk counseling. Thirty-six (31.3%) were determined to be at intermediate risk and given appropriate screening recommendations. Forty-nine (42.6%) were considered to be at average risk. Of those identified as high risk, 10 (33.3%) were seen for a clinical genetics consultation. Three (33.3%) of those at high risk underwent cancer susceptibility testing. Review of family history allows for screening recommendations to be tailored to individuals according to their level of risk. Evaluation of familial risk is therefore an integral component of any cancer prevention and wellness program.

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PREDICTORS OF FAILURE OF CLINICAL BREAST EXAMINATION (CBE). Oestreicher N, Lehman CD, Mandelson MT, Porter PL, Taplin SH, White E. Fred Hutchinson Cancer Research Center; University of Washington, Seattle, WA 98105.

CBE is an important breast cancer detection modality, but factors that affect its sensitivity are not well understood. We examined the association between tumor, breast and personal characteristics and CBE sensitivity in 468 women 40 years and older diagnosed with invasive breast cancer in a screening program between 1988 and 1994. The risk of a false negative (FN) vs. true positive CBE was analyzed in a logistic regression model, with the odds ratio (OR) as the measure of association, adjusted for age, tumor size and body weight octiles. Odds of FN CBE increased with higher body weight (OR highest to lowest quartile: 5.0, 95% CI (CI) 2.6-9.5) and lower parenchymal breast density (ACR categorization) (OR for almost entirely fat vs. heterogeneously/extremely dense: 1.7, CI 0.8-3.6). Asian women appeared to be at reduced risk for FN CBE (OR for asian vs. white: 0.1, CI 0.0-0.9), but greater numbers are needed to appropriately investigate this question. The difficulty of palpating large breasts in a clinical setting may partially explain our results.

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Transtheoretical Model of Behavior Change and Colorectal Cancer Screening. Ling B, Trauth J, Schoen R, Weissfeld J. **Purpose:** The Transtheoretical Model (TTM) has been applied toward the adoption of preventive behavior such as screening mammography. Little work has been done using this model in colorectal cancer (CRC) screening. This study applies a component of the TTM (i.e., stages of change) in evaluating the readiness to perform CRC screening in age-appropriate individuals. **Methods:** A telephone survey of persons aged 50-79 from two Western Pennsylvania communities was conducted. A subject's readiness to adopt specific colorectal cancer screening behavior (i.e., fecal occult blood testing, flexible sigmoidoscopy) was evaluated. Integrating past and current behavior with future intention, the following stages were identified: *Unaware* (never heard of test), *Precontemplation* (never had test, not intending to), *Contemplation* (never had test, intending to), *Relapse* (had test, off schedule, not intending to have test), *Relapse Risk* (had test, on schedule, not intending to have test), and *Compliant* (on schedule, intending to have test). **Results:** There were 414 respondents with no history of colorectal neoplasia. For fecal occult blood testing, 13.5% were *unaware* of it, 19.1% *precontemplation*, 17.4 *contemplation*, 18.1 *relapse*, 14.0 % *relapse risk*, and 17.9% *compliant*. For flexible sigmoidoscopy, 48.6% were *unaware*, 21.0% *precontemplation*, 10.6% *contemplation*, 6.5% *relapse*, 8.2% *relapse risk*, and 5.1% *compliant*. **Conclusions:** The readiness to perform fecal occult blood testing in the study population distributed uniformly across all behavioral stages. In addition, a large proportion of the population was unaware of flexible sigmoidoscopy. Future work should assess whether tailored interventions targeted at one's behavioral stage are more effective than generalized interventions in overcoming the lack of awareness and resistance toward CRC screening.

A Pilot Intervention to Increase Adherence with Skin Self-Examination (SSE) in Patients at High Risk for Skin Cancer. Oliveria SA, Christos PJ, Phelan DL, Ostroff JS, Hay JL, Halpern AC. <u>Purpose:</u> To assess the impact of two interventions on patients' adherence to performing SSE, knowledge of SSE, and psychosocial factors. <u>Methods:</u> Patients at high risk for skin cancer were recruited from the outpatient clinic at Memorial Sloan-Kettering Cancer Center. All participants had baseline whole-body digital photography as part of their clinical evaluation. Patients were randomized: Group A received a teaching intervention (physician encounter and nurse education module) with a photobook (personal whole-body photographs compiled in the form of a booklet with nurse instruction) and Group B received the teaching intervention only without a photobook. A self-administered questionnaire was given to the patient at three time points: baseline, after the delivery of the interventions at the baseline visit, and at 4 months post baseline visit. <u>Results:</u> We report results from the baseline visit on patient acceptability of the interventions and effect of the interventions on patient knowledge of skin cancer and SSE. Both groups were very/mostly satisfied with the intervention (Group A: 96% v. Group B: 91%). There was an overall increase in the median knowledge score after the delivery of both interventions compared with baseline scores (86.3 v. 94.9, p=0.001). There was a significant improvement in knowledge in patients who received the teaching intervention with photobook (Group A) compared with those who received the teaching intervention only (Group B) (+13.9 versus +7.2, p=0.01). <u>Conclusions:</u> The feasibility of this study design and acceptability of the interventions has been demonstrated. Our results suggests that there is an opportunity to increase knowledge of skin cancer and SSE in high risk patients.

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Associations between Female Breast Cancer rates and Mammography utilization by region in New York State. Vinod Ravi, Andrew Hyland, PhD, Michael Cummings, PhD, MPH, and Martin Mahoney, MD, PhD Roswell Park Cancer Institute.
OBJECTIVE: The primary objective of this project is to illustrate the association between female breast cancer incidence and mortality rates and mammography utilization by region in New York State. This information will be useful to the public, the county health departments and researchers. METHODS: Cancer incidence data were obtained from the New York State Cancer Registry (1975-1994). Cancer Mortality data came from the New York State Vital Statistics (1980-1994). Mammography utilization data are from the Centers for Disease Control and Prevention's annual Behavioral Risk Factor Survey (1987-1998). A Geographic Information System (GIS) was used to illustrate the trends in breast cancer rates and mammography utilization on maps and correlations are used to determine the association between mammography and Cancer rates. RESULTS: Female breast cancer incidence has increased by 19% over the study period (1975-1994); however, breast cancer mortality decreased by 5% from 1980 to 1994. The percentage of women 50 years and older who have had a mammogram in the past 2 years increased from 31.7% in 1987 to 77.0% in 1997-1998. CONCLUSION: Mammography utilization and breast cancer incidence rates by region were positively correlated. These data are consistent with reports that breast cancer screening increases breast cancer incidence rates and decreases breast cancer mortality. Regions with highest mammography utilization in the state have high incidence rates but mortality rates comparable to the rest of New York.

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DIET AND SURVEILLANCE FOR BREAST CANCER AMONG HARLEM WOMEN. *S Sheinfeld Gorin, J. Jacobson, Mailman School of Public Health of Columbia University, NY, NY*

Purpose. The purpose of this study is to assess eating a healthful diet, including fruit and vegetable consumption, weight, and breast cancer surveillance by age group among a population-based survey of Harlem women.

Method. We conducted a population-based household survey of 372 Harlem women, age 40-65, using a structured interview, and self-report of diet and weight.

Results. Results of a multiple linear regression analysis revealed that older women who ate a healthful diet were less likely to have had a recent breast cancer screen with either mammography or CBE than were women who had poorer eating habits (p<.01). Among younger women, recent mammography screening was associated with employment (p<..02). Younger women who were overweight had more recent screening than those who were of normal weight (p<.01) No significant predictors of CBE were uncovered among the women aged 40-49.

Discussion. Relative to New York State, the Harlem women in this sample are not receiving screening frequently enough. Despite the ubiquity of overweight in both populations, older women, those age 50-65, are more likely to eat a healthful diet than younger women. A strength of this survey is that it is population-based, that it had a reasonable 72% response rate, the dietary items reflected cultural sensitivity, and that it included persons who did not have working telephones. Given these initial intriguing findings on the relationship of dietary patterns and surveillance, however, additional research on these associations in relation to breast cancer is suggested.

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Colorectal Cancer Screening by Primary Care Physicians in Texas. Hawley, ST, Levin B, Vernon SW, Foxhall L, Young J,

Purpose: To determine knowledge, attitudes and practices of colorectal cancer (CRC) screening among rural and urban primary care physicians (PCPs) in Texas.

Methods: We conducted a survey of 3,380 PCPs affiliated with the Texas Medical Association (TMA) stratified by specialty and geographic location. We compared physicians' attitudes and self-reported practices of CRC screening, by specialty and geographic location, using chi-square and Fishers' exact tests.

Results: We obtained a 26% response rate (n=871). Most respondents were family physicians (48%), followed by internists (26%), and OB-GYNs (16%). Over 90% reported thinking that CRC was preventable and 34% reported complete agreement with ACS screening guidelines. Few respondents thought that CRC screening was "not at all effective" in the reduction of cancer mortality. These proportions did not vary by geographic location. Overall, 83% of respondents reported screening with fecal occult blood testing (FOBT) and 71% with flexible sigmoidoscopy (FS); significantly more rural than urban respondents reported the practice of FOBT. In general, PCPs reported CRC screening practices consistent with those recommended by the ACS, but there was considerable variation in screening initiation age and interval. Respondents perceived some test-specific barriers to making recommendations and to patient compliance with recommendations that varied by specialty and geographic location.

Conclusions: CRC screening practices by PCPs in our study were generally consistent with those supported by ACS. Variation in reported screening practices suggests the need for interventions to improve PCPs' knowledge of appropriate screening guidelines and follow-up. PCPs' perceptions of CRC screening barriers should be confirmed in further research.

Physician Preferences for Informed Consent for Prostate Cancer Screening

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[2] The University of Texas-Houston School of Public Health

Because screening for prostate cancer with prostate specific antigen (PSA) is controversial, informed consent is recommended. To determine how important physicians believe 17 key facts about PSA are to disclose to asymptomatic men, we conducted a nationwide survey of urologists (247), family physicians (250), and internists (281). Physicians rated the importance of each fact on a 5-point Likert scale ranging from 'not at all important' to 'extremely important.' The response rate was higher for urologists (61%), than family physicians (51%) or internists (37%). We compared responses among specialists by the Wilcoxon rank-sum test. Compared to internists and family physicians, urologists placed less importance on disclosing the controversial nature of regular PSA screening and its unproven net benefit on reducing the mortality from prostate cancer. Internists and family physicians rated the importance of each fact similarly except for one: family physicians believed it more important to disclose that done together, a digital rectal exam and PSA best screen for prostate cancer. Urologists were more likely to support regular PSA screening than other specialists. Our results show that the quality of informed decision making between physicians and patients differs by physician specialty and may be associated with support of regular PSA screening.

HPV assays for cervical cancer screening in low resource vs. high resource settings.

Womack SD, Blumenthal PD, Robinson JC, Shah KV. We compared the utility of assays for high-risk genital human papillomavirus (HPV) as a cervical screening tool in low (Zimbabwe, Africa) and high (Baltimore, MD/Washington, DC area) resource settings. Pap smears and HPV DNA testing were performed among 2,140 Zimbabwe women, aged 22-55 yrs, who were recruited from urban primary care clinics. Similarly, 1,127 women from the Baltimore, MD/Washington, DC area, aged 34-87 yrs, were recruited from gynecology clinics and received pap smears and HPV DNA testing. In both settings, final diagnosis was based on colposcopy, and biopsy when indicated. Self-reported cervical cancer screening history was significantly lower in Zimbabwe (15%) compared to the US (94%). The prevalence of HPV infection was significantly higher among Zimbabwe women compared to US women (28.7% vs 6.7%), which is in part, a result of the high prevalence of HIV infection among our Zimbabwe women (approximately 50%). Women in Zimbabwe had a much higher prevalence of cervical cancer precursor lesions compared to US women: LGSIL (16% vs 1.1%) and HGSIL (10% vs 0.46%). A comparison of the test characteristics of the HPV test and pap smears revealed that in both settings, HPV assays had greater sensitivity (64.7% vs 30.2%), lower specificity (80.5% vs 95.9%) and lower positive predictive value (33.9% vs 58.1%) than pap smears. Screening by HPV assays may be useful in both low and high resource settings and may be particularly applicable in areas where pap smear technology is not widely available.

Recruitment and Retention to a Cervical Dysplasia Treatment Trial

JM Bailey; ME Bieniasz; D Underwood; DE Brenner; MT Ruffin,

Recruitment of young women with cervical dysplasia to clinical trials poses a number of difficulties related to chaotic lifestyle, financial instability, perception of illness and infrequency of disease. Our experiences accruing participants to *Retinoids and Intermediate Biomarkers for CIN II and III* yielded important insights in recruitment and retention of this population. This study required a 12-week deferral of standard treatment of cervical intraepithelial neoplasia II/ III to attempt a topical retinoid therapy. Though our accrual has been markedly lower than predicted (161 participants over 4 years, instead of over 2 years), our participation rate of qualified individuals was 90% and retention rate was 99%. A preliminary error was assuming clinicians' estimates of frequency of disease; estimates were generally elevated 3-4 times above actual statistics. Factors that contributed to our successes were persistent follow-up, participant-need focused care and flexible appointment times. Additionally, cultivating positive clinician- research staff relations enhanced referral rates and patient satisfaction.

Beliefs and behaviors on breast cancer screening among Korean American Women.

Youngshook Han, Ph.D., RN; R. Williams, Ph.[

The purpose of this study was to examine breast cancer screening beliefs and behaviors among Korean American women. The study design was a cross-sectional survey. The sample consisted of 133 Korean American women, 35 to 80 years of age, living in a mid-sized Southeastern city. Based on the Health Belief Model, a set of culturally sensitive instrument was developed for Koreans through individual interviews and focus groups. The data were collected through mailed questionnaire. The results showed that only 12% of the subjects performed breast self-examination monthly. Percentages of subjects ever having had a clinical breast examination and mammography were 67% and 58%. Perceived barriers was the most important domain in predicting all three screening practices. The subjects reported higher barrier scores in items such as not knowing BSE technique, language, embarrassment, cost and discomfort. With the demographic and health-related variables, having a Caucasian American husband, having a regular checkup and social influence (family or physicians) were identified as being significant predictors of CBE/mammography utilization. These findings suggest that providing culturally sensitive breast health education designed to improve knowledge and awareness about breast cancer and breast cancer screening may improve the preventive health practices of Korean American women.

Recruiting Participants to a Chemopreventive Study Involving Barrett's Esophagus. T. K. Eaton, D. Normolle, H. Appelman, R. Moseley, P. Backoff, T. Nostrant, S. Spechler,, L. Kresty, U. Sundaram, J. Fromkes, A. Rustgi, G. Stoner, D. Brenner, M. Ruffin. Depts. Internal Medicine, Univ of Michigan, Ohio State Univ, Univ of Pennsylvania, Univ Texas Southwestern; Dept of Environmental Health Sciences, Ohio State Univ. School of Public Health, VA Medical Center, Dallas and Ann Arbor, MI.

Recruitment is an essential component of chemoprevention trials. Since 1996, 70 subjects have been randomized on a Phase IIb chemoprevention trial of DFMO for Barrett's esophagus. A total of 621 subjects have been screened, with approximately 11% of those screened proceeding to randomization. 20% of the participants withdrew. Barriers to recruitment were: participant refusal (35%); lack of histological confirmation of Barrett's diagnosis (12.5%), transportation barriers (12.5%), and excluding diseases (10.34%). Current recruitment rates suggest an overestimation of available subjects by medical professionals along with an underestimation of the impact of exclusion criteria on recruitment. More quantitative measures of potential recruitment success are necessary prior to new chemoprevention initiatives.

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Use of non-steroidal anti-inflammatory drugs, potential chemopreventive agents, in the general population
Huang H-Y, Alberg AJ, Hoffman SC, Comstock GW, Helzlsouer KJ, Johns Hopkins School of Hygiene and Public Health

Non-steroidal anti-inflammatory drugs (NSAIDs) are being actively investigated as potential cancer chemopreventive agents. We assessed the prevalence of NSAIDs use and associated factors in a follow-up survey in 1996 among persons who previously donated blood samples for a specimen bank in Washington County, Maryland.

A total of 16,337 persons, with a median age of 57 years, responded to the questionnaire (70% response rate). The prevalence of aspirin and/or other NSAIDs use (≥ 1 tablet/week) was 55%. Among those who reported aspirin use, the distribution of the frequency(tablet/week) of use (<1, 1-6, 7, and 14+) was 64%, 14%, 17%, and 5%, respectively; 34% reported a duration of use of ≥ 10 years. Similarly, the distribution of frequency of other NSAIDs use was 69%, 17%, 3%, and 11%, respectively; 20% had a duration of use of ≥ 10 years. An increased trend with age in the use of aspirin, but not other NSAIDs, was observed (8% to 57% for age <30 to >70 in 10-year intervals, p-trend<0.0001). Men were more likely to use aspirin (43% vs 31%, p<0.0001), whereas women were more likely to use other NSAIDs (37% vs. 23%, p<0.0001). Use of aspirin, but not other NSAIDs, was more common in persons who ever smoked cigarettes. Compared to non-users, aspirin users had higher prevalence of cardiovascular disease (31% and 9%, p<0.0001) and colorectal cancer and/or polyps (11% and 6%, p<0.0001), whereas users of other NSAIDs had higher prevalence of migraine (21% vs. 11%, p<0.0001) and rheumatoid arthritis (12% vs. 4.6%, p<0.0001). Among persons who reported a history of gastric or duodenal ulcer, 35% still had aspirin use.

The high prevalence of NSAIDs use and the differential use by factors such as age, gender, smoking and disease history has important implications for the conduct of prevention trials and observational studies carried out to determine the long-term impact of NSAIDS use in the general population.

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SELECT: The selenium and vitamin E cancer prevention trial -- rationale and design. E Klein, I Thompson, S Lippman, P Goodman, D Albanes, <u>P Taylor</u>, and C Coltman.

Prostate cancer is the most common visceral malignancy in North American males. Recent evidence suggests that selenium and vitamin E may be active agents in preventing the development or progression of this tumor. SELECT, the Selenium and Vitamin E Cancer Prevention Trial, is a double-blinded, placebo-controlled, population-based phase III clinical trial designed to test the hypothesis that these agents alone or in combination can decrease the clinical incidence of prostate cancer in 32,400 healthy men over a 12-year study period. This overview highlights the scientific rationale for the use of selenium and vitamin E as preventive agents, reviews available supporting data from controlled human clinical trials, and outlines the SELECT study objectives, design, and analyses projected for this trial.

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EFFECTS OF ISOFLAVONES ON ESTROGEN LEVELS IN PREMENOPAUSAL WOMEN.
G Maskarinec, AA Franke, JS Inouye, C Guo, F Stanczyk. Cancer Research Center, Honolulu, Hawaii 96813.

Isoflavones, phytoestrogens contained in soy foods, may play a role in breast cancer prevention through a decrease in estrogen levels as reported by some studies. This randomized double-blinded trial with 17 premenopausal women per group investigated the hypothesis that 100 mg isoflavones per day *vs.* placebo affect levels of reproductive hormones. Compliance to the study treatment was confirmed by urinary isoflavone excretion measured using HPLC. Blood samples were taken 5 days after ovulation as determined by an ovulation kit at baseline and after 1 and 3 months of the intervention. Hormone assays for estrone (E1), estradiol (E2), and estrone sulfate (E1-S) were performed using a radioimmunoassay. FSH and LH levels were determined with the help of an immuno-radiometric method. After log transformation of non-normally distributed variables, we applied analysis of variance to test for an intervention effect. Except for mean age which was 1.77 years higher in the intervention than in the control group, the two groups did not differ significantly at baseline. We found no significant changes in levels of E1, E2, E1-S, FSH, or LH after 3 months of intervention. Exclusion of the 5 cycles with progesterone levels below 5 ng/ml indicating a non-ovulatory cycle did not change the results of the analysis of variance. The results of this study do not support the hypothesis that isoflavones affect circulating hormone levels in premenopausal women over a 3-month period. However, it may be possible that isoflavones alone have different effects on the reproductive cycle than isoflavones present in soy foods.

Moderate Exercise Slows Mammary Tumor Growth in Adolescent Rats. K Westerlind, H McCarty, M Baier, R Strange. AMC Cancer Research Center, Denver CO 80214

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Exercise during adolescence may confer a protective effect on breast cancer development. The purpose of this study was to evaluate the effects of moderate exercise training on mammary tumor development in adolescent rats. Ninety female SD rats were randomized to baseline (n=10), exercise (EX; n=40), or sham-exercise (SHAM; n=40). MNU was injected (50 mg/kg bw) at 21 days of age (doa) and training started at 28 doa. Exercise consisted of treadmill running (20-25 m/min, 15% grade, 30 min/d, 5 d/wk). Sham rats were placed on a stationary treadmill (15% grade, 30 min/d, 5 d/wk). Animals were weighed and palpated for tumors 2x/wk. Ten animals at baseline (28 doa) and groups of 10 EX and 10 SHAM were sacrificed every 2 wks for 8 wks to evaluate tumor and mammary gland development. Growth of the animals and day of vaginal opening did not differ between EX and SHAM. Latency of first tumor development was delayed in EX [35.8 days post-carcinogen (dpc)] vs. SHAM (33.1 dpc) (p=.05). No difference in time to median tumor free survival was observed in the EX (35 dpc) vs. SHAM (34 dpc) nor were there differences in multiplicity. Tumor growth rate (tumor weight/days between detection and isolation of tumor at necropsy) was less in the EX (0.083 ± 0.011 g/d) than the SHAM (0.122 ± 0.014 g/d) (p=.03) despite 90-100% of the animals having an average of 5 tumors at the 6 and 8 wk time points. Total tumor weights, available at 6 and 8 wks, tended to be lower in the EX (3.78 ±1.80g and 7.27 ± 2.40g, respectively) than the SHAM (6.59 ± 1.89g and 10.02 ± 2.65g, respectively). The data suggest that tumor growth is slowed in response to moderate exercise training.

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FACTORS ASSOCIATED WITH CANCER-SPECIFIC PSYCHOLOGICAL DISTRESS IN WOMEN WITH A FAMILY HISTORY OF BREAST CANCER

L. Azzarello, M.A., P. Jacobsen, Ph.D., R. Sutphen, M.D., and T. Ferlita, M.S.

Women at familial risk for breast cancer vary considerably in their levels of psychological distress. We sought to identify the relationship of perceived risk and social constraint to individual differences in distress among women at familial risk of breast cancer scheduled for risk counseling. Participants (N = 67, mean age = 46 years) completed the Impact of Event Scale, two items assessing perceived risk, and a measure of social constraint in discussing family history or personal risk of cancer with others. As expected, greater distress was related to greater perceived risk of developing breast cancer (r = .37, p ≤ .01) and of carrying a gene mutation (r = .40 p ≤ .001) and more social constraint (r = .57, p ≤ .0001). Additional analyses indicated that perceived risk and social constraint each accounted for significant (p ≤ .003) unique variability in distress (11% and 27%, respectively). The findings confirm and extend previous research on distress in women at familial risk. Findings highlight the importance of assessing the social environment of women presenting for risk counseling, as well as their perceived risk, in order to identify factors that may be contributing to heightened psychological distress.

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Title: STEM CELL DONORS: AN ASSESSMENT OF THEIR WILLINGNESS TO DONATE TO UNRELATED PATIENTS OR STEM CELL BANKS

Authors: Chan FA, Korbling M, Strom SS
Institution: U.T.M.D. Anderson Cancer Center, Houston, Texas

A follow-up study to assess long-term health effects of stem cell (SC) donation was conducted with healthy donors registered at U. T. M. D. Anderson Cancer Center. As part of this study, we asked donors if they would be willing to donate SCs for a family member, an unrelated recipient, or an SC bank. Of the 339 eligible donors, 280 were interviewed by phone (83%). Donors were all blood relatives of the SC recipients. The mean age at donation was 44 (range 5-77 years), and 53% were females. Overall, 85% of the donors said they would donate again for a family member, 48% would donate to an unrelated recipient, and 42% would donate SC for banking. The most common reasons for unwillingness to donate to a SC bank included personal health problems/age (33%), hardships due to lost time at work, travel and other personal costs (18%), and discomfort or other problems encountered with their previous SC procedure (17%). These issues will need to be addressed through educational interventions and logistical strategies if SC banking is to be successfully implemented in the future.

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Health Behaviors of Testis Cancer Survivors
K. Basen-Engquist, E. Shinn, B. Thornton, E. Gritz, C. de Moor, A. Pollack, R. Amato

Despite high cure rates, survivors of testis cancer remain at heightened risk for second primary tumors and for cardiovascular disease. Certain behaviors also affect risk of developing cancer and cardiovascular disease. In the Testis Cancer Survivors' Adjustment and Health Behaviors Study the prevalence of these behaviors among testis cancer survivors and a control group of male relatives will be compared.

In preliminary data from the first 27 survivors and 13 controls, 19% of the survivors and 23% of the controls report being current smokers, while 19% of the survivors and 31% of controls report smoking in the past. Survivors reported more current use of smokeless tobacco than controls (11% vs. 0%) but similar levels of using smokeless tobacco in the past. Survivors were more likely to report any alcohol use in the past month than controls (70% vs. 54%), but slightly less likely to report having 5 or more drinks on one occasion (18% vs. 31%) and driving under the influence of alcohol (7% vs. 15%). More survivors than controls report being told by a physician that they have high cholesterol (42% vs. 0% of those who have been tested for cholesterol). Similar percentages of survivors and controls reported eating less than 5 servings of fruits and vegetables each day (82% vs. 85%, respectively) and being sedentary or irregularly active (60% vs.78%, respectively). The preliminary findings suggest increased risk behaviors among testis cancer survivors in some areas. Additional results will be presented with implications for health behavior change interventions.
(Study funded by the National Cancer Institute grant #R03 CA83348-02)

Science Writers' Reactions to a Cancer "Breakthrough" Story That Wasn't

Cooper, C.P., Burgoon, M., and Yukimura, D.

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Purpose. This study explored science writers' reactions to a controversial *New York Times* story that inflated the hopes of thousands of cancer patients.

Methods. More than 60 science writers in the U.S., Canada, and Great Britain participated in a 12-day email discussion triggered by the *Times* article. We analyzed 255 of these postings and coded 1) positive and negative critiques of the *Times* story, 2) concern about public misunderstanding of medical research news, 3) opinions about who is responsible for this misinformation, and 4) suggestions for improving the public's understanding of medical research news.

Results. In general, the participating science writers responded negatively to the controversial article. Furthermore, they were cognizant and concerned about the impact of their work on the public, and accepted the largest share of the responsibility for the premature and false hope created by the media's coverage of medical research. Finally, the suggestions offered by science writers to improve the public's understanding of medical research news were similar to those proposed by the scientific community.

Conclusions. The gulf between scientists and science writers may not be as wide as either party suspects. Collaborative initiatives to improve the news media's coverage of medical research should be explored.

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DO BASELINE "REASONS FOR JOINING" PREDICT RETENTION RATES?

Dahlgren J, Hartline J, Anderson K, Borkowsky J, Barnett M, Bowen D.

Retention of participants throughout the follow-up period is critical to the success of randomized clinical trials. Assessing participants' motivations for joining such trials may help guide recruitment and retention efforts. The Carotene and Retinol Efficacy Trial (CARET) randomized 16,469 participants between May 1989 and September 1994. At baseline, we asked the following multiple response question:

"Why have you chosen to be in this study?"

1. It may help others in the future.
2. It may help me be more healthy.
3. It may prevent lung cancer.
4. My husband, wife or others in my family want me to participate.
5. It allows me to keep smoking.
6. It makes me feel proud to be part of a study like this.
7. It gives me a chance to see someone about my health.
8. Other.

We examined the percentage of participants who remained active through the end of intervention (January 1996) for each of the responses to this question. After adjusting for multiple comparisons, the percentage of participants who inactivated early was significantly lower among those who said at baseline they joined CARET because "it may help others in the future" versus those who gave other reasons for participating. This relationship was observed in all but two subgroups and was statistically significant among males (21% vs. 26%, p=0.02), participants in the 55-65 age group (23% vs. 30%, p=0.0004), and participants in the heavy smoker cohort (24% vs. 29%, p=0.001). No other comparisons were significant. In conclusion, participants who report altruistic reasons for joining CARET are more likely to remain on study. This finding helps guide selection of recruitment messages.

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Title: Decision Making about Prophylactic Oophorectomy

Author(s): C.Y. Fang, S.M. Miller, M. Longacre, K. Hurley, and M.B. Daly

Institution of 1st Author: Fox Chase Cancer Center

Purpose: The purpose of this study was to examine psychosocial factors that influence decision making about prophylactic oophorectomy among women at increased risk for ovarian cancer. **Methods:** Participants were 68 women at increased risk for ovarian cancer due to a family history of the disease and who were enrolled in a Family Risk Assessment Program (FRAP). Psychological assessments were collected upon entry into FRAP and included measures of monitoring coping style, perceived risk, psychological distress, and intention to undergo the surgery. **Results:** Analyses indicated that ten women had made their decision regarding prophylactic oophorectomy, while 53 women had not made a decision at the time of the assessment. Among the 10 women who had made the decision, 5 had already undergone the surgery. Of the 53 women who were still in the decision-making process, 25% reported that they were likely to have a prophylactic oophorectomy. As in previous studies, high monitors perceived themselves to be at greater risk for ovarian cancer. In addition, regardless of objective and perceived risk levels, high monitoring was associated with greater interest in undergoing prophylactic oophorectomy within the next 6-months. **Conclusion:** The findings suggest the need to consider not only objective risk level, but also monitoring coping style, when presenting ovarian cancer prevention options.

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Strength of Spiritual Beliefs and Cancer Specific Distress
L Ellington, PhD, University of Utah*, LM Nail, RN, Oregon Health Sciences University, PhD, BL Walker, RN PhD,* & RT Croyle, PhD, formerly of University of Utah

The end of radiation treatment (RT) can be a stressful time for cancer patients. We explored whether strength of spiritual beliefs exerted a protective effect on distress levels among a group of breast cancer patients (BC) at the end of RT.

Ninety-three outpatients diagnosed with BC completed questionnaires during their second to last week of RT. The sample was predominantly Caucasian (85%), middle aged (M = 56.3), and married (68%). The System of Belief Inventory (SBI) was used to measure participants' religious/spiritual beliefs. The SBI was not associated with general distress or positive affect (PANAS-State). However, the SBI showed an inverse relationship with BC-specific distress (Impact of Events Scale, Intrusion; $r = -.28$, $p = .01$). That is, stronger spiritual beliefs were associated with less intrusive thoughts about BC. With further exploration, we found an age by SBI interaction. Older women, regardless of the strength of their spiritual beliefs, and younger women with strong spiritual beliefs experienced low BC-specific distress; whereas younger women with low spiritual beliefs exhibited high levels of intrusion ($F = 3, 89$) 6.73, $p = .01$). These results remained unchanged when perceptions of support from religious/spiritual community were covaried.

In summary, at the end RT for BC patients, spiritual beliefs were unrelated to general distress but were inversely associated with BC-specific distress. In particular, younger women who had strong spiritual beliefs appeared to suffer from significantly less cancer-related intrusive thoughts than younger women with low spiritual beliefs. Our findings have implications for screening for post RT adjustment problems.

Title: Women's Self-Reported Knowledge about Cancer Risks, Risk Assessment Programs and Genetic Testing: Preliminary Findings

Authors: Fleisher, L., Schnoll, R., Miller, S., McKeown-Conn, N., Brower, L.

Affiliation: Fox Chase Cancer Center, Atlantic Region Cancer Information Service

Purpose: To evaluate two educational telephone interventions to inform and prepare women for seeking risk assessment/genetic testing for breast/ovarian cancer.

Methods: Women (n=200) calling the National Cancer Institute's Cancer Information Service (CIS) about personal breast/ovarian cancer risk, risk assessment or genetic testing are asked to consent to a randomized study comparing two educational interventions (standard v. enhanced). The Cognitive-Social Health Information Processing (C-SHIP) model, targeting key psychosocial variables found to be associated with adherence to cancer-relevant health-protective behaviors, guides the interventions. Three follow-up interviews will test the effectiveness of the CIS in increasing knowledge of cancer risk and the process of risk assessment.

Results: At more than 50% enrollment, preliminary analysis indicates that the randomization has been successful. Early results highlight the need for more education around breast cancer risks, and the hallmarks of inherited disease regardless of educational level. Almost 90% of study participants did not know that genetic testing should involve more than a blood test, showing the need for increased awareness of the risk assessment/genetic screening process.

Conclusions: Preliminary analysis of baseline measures supports the rationale for this study. Findings support current literature demonstrating women's lack of knowledge about cancer genetics and risks for inherited disease.

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Evaluation of the Reach and Effects of a Prostate Cancer Media Campaign – R Packianathan, A Hyland, PhD, P Celestino, M Mahoney, MD, PhD, M Cummings, PhD, MPH

OBJECTIVE: To determine the reach of a prostate cancer awareness media campaign and its effectiveness of prompting behavior change. METHODS: The media campaign was conducted in September 1999 in Erie County, New York and consisted of a press conference, paid TV-spots, distribution of an educational newsletter, newspaper coverage, and a web site posted with relevant information. The reach of the campaign was assessed by a brief random-digit dialed telephone interview administered to approximately 400 men age 40 and over shortly after the campaign was initiated. To assess the impact of the campaign on behavior change, a follow-up telephone interview was administered nine months later. In addition, administrative claims data before and after the campaign from an area HMO were examined to assess changes in the utilization of PSA tests. RESULTS: Fifty-five percent of sampled men age 40 and over reported exposure to some aspect of the campaign. Twelve percent of those who reported being exposed to the media campaign but had never spoken with their doctor about screening options from the baseline interview reported with their physician about prostate cancer screening options at follow-up. The number of per-capita PSA tests ordered increased by 10% and 13% in the third and fourth months following the campaign, respectively, compared with levels in the same month in the previous year; however, per-capita PSA utilization was at a comparable level in the fist, second, and fifth month. CONCLUSIONS: The media campaign effectively reached its target audience. Some indicators of behavior change also demonstrate a positive effect after the media campaign.

Patients' Concerns Prior To Undergoing Diagnostic Medical
Procedures For Colon, Ovarian, And Prostate Cancer

Katz ML, Ruzek SB, Miller SM

Growing numbers of patients undergo diagnostic tests
for cancer as the population ages. To meet patient education
needs, it is important to understand patients' concerns prior
to undergoing diagnostic medical procedures.

A self-administered survey of 129 outpatients was
conducted prior to their undergoing colonoscopy and
ultrasound diagnostic procedures for colon, ovarian, or
prostate cancer. Ninety percent (115/128) of the patients
were concerned about the results of the test. Concern about
encountering physical discomfort (89%, 115/129), pain (84%,
107/128), or loss of a bodily function (71%, 92/129) during
the procedure was also reported. The embarrassment
associated with probe/tubing insertion was reported by 63%
(80/127). Although male and female patients had similar
emotional concerns, there was a significant difference
between patients undergoing a test for a sex specific cancer
(ovarian, prostate) versus a non-sex specific cancer (colon).
These differences reflect patients' beliefs about possible
subsequent complications associated with cancer that affect
relationships (p=0.001), reproductive capacity (p=0.001), and
sexuality issues [appeal (p=0.002), feeling less masculine/
feminine (p=0.001), desire (p=0.003), performance difficulty
(p=0.003), less activity (p=0.001)]. Notably, 46% (56/123)
of the patients reported receiving inadequate information
about the test from their healthcare providers.

These data provide an empirical basis for developing
patient-provider health education materials which may reduce
anxiety and improve patient care.

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**Exercise Effect On Body Fat In Postmenopausal
Women In A Cancer Biomarker Clinical Trial**

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Obesity and a sedentary lifestyle are associated with an
increased risk for postmenopausal breast cancer. Several
mechanisms may explain these associations including
increased estrogens, androgens, insulin, and IGF in obese
women.

Purpose: To examine the effects of a yearlong aerobic
exercise intervention vs control on body fat amount and
distribution in postmenopausal women.

Methods: Participants are from the greater Seattle area,
aged 50 to 75 years, who are at above-average risk for
breast cancer. The exercise intervention consists of at least
30 minutes of moderate-intensity aerobic activity 5 days per
week for 12 months. Baseline and 12 month measures of
body fat (DEXA, CTscan, and bioelectrical impedance) are
collected.

Results: A total of 173 women were randomized as of July
2000. A total of 66 women have completed the yearlong
exercise intervention. Significant mean losses of total and
abdominal body fat have been observed in the aerobic
exercise group from baseline to 12 months (p < .05). A
3.7% and 6.7 % decrease in total- and intra-abdominal body
fat was observed after 12 months of aerobic exercise.

Conclusions: Exercise may decrease total and intra-
abdominal body fat and might explain the physical activity-
breast cancer association.

Attitudes Toward Genetic Testing Among Patients with Familial Adenomatous Polyposis

Kinney AY, Marshall E, Hoyle C, Venne V, and Burt R.

Purpose: The present study examined risk perceptions, attitudes toward *APC* mutation testing, and willingness to communicate test results to their relatives. **Methods:** 43 patients with familial adenomatous polyposis (FAP) participated in a structured computer-assisted telephone interview. **Results:** The mean age of the study sample was 45 ±13 years. 65% were female, 37% were Mormon, and 35% were college graduates. In relation to perceived susceptibility to extracolonic malignancies, 79% of respondents believed that they were at increased risk of cancers of the upper gastrointestinal tract, while only 28% believed that they were at increased risk of thyroid cancer, and 29% believed that their risk of brain cancer was increased. 44% had genetic counseling and 61% had genetic testing. The most commonly cited reasons for wanting (having had) genetic testing included: to help family members make decisions about whether to have a genetic test and/or undergo enhanced screening (93%); to "know" genetic risk (86%); and to reduce uncertainty about carrier status (74%) The most commonly cited reasons for not wanting (having had) testing included: potential health and/or life insurance discrimination (38%) potential loss of confidentiality (26%); and the belief that colorectal cancer can not be prevented (14%). 88% reported that sharing test results with family members would help their relatives make family planning decisions. 26% reported that they would (did) not want to share their genetic test results with their relatives because their family may have problems with health or life insurance. Most believed that colorectal cancer screening (91%) and genetic testing (93%) should begin in childhood or adolescence. **Conclusion:** These preliminary results underscore the importance of educating patients about risks of extracolonic malignancies as well as the risks, benefits and limitations of genetic testing. More needs to be learned about screening behaviors among minors who have first-degree relatives with FAP and communication of genetic test results within families.

Increasing Diversity in Cancer Control Research

R Pasick, R Otero-Sabogal, M Nacionales and P Banks

There is little association between the race/ethnic distribution of populations bearing the greatest burden of cancer and that of scientists seeking to understand and change these disease disparities. The field of cancer control research is notably lacking in ethnic diversity, much like the doctoral programs that produce these scientists. The same cannot be said, however, for master's degree programs in health sciences in many regions including the San Francisco Bay Area where there is significant diversity at the master's level. From the numbers, it is evident that these students traditionally do not go on for doctoral training.

These observations spawned the Minority Training Program in Cancer Control Research (MTPCCR), a partnership between the Northern California Cancer Center and 4 academic institutions, the University of California at Berkeley, the University of California, San Francisco, San Francisco State University, and San Jose State University. The goal of this NCI-funded training grant is to encourage minority masters students in health sciences to go on for a doctorate and to pursue a career in cancer control research. The program has three components: a 5-day summer institute, taught by role model minority cancer researchers from many disciplines, designed to showcase the needs, opportunities, and resources available in this field; internships; and doctoral incentive awards to offset some costs associated with doctoral program applications.

Now in its third year, the MTPCCR has met its goals for recruitment of students (25-30 per year) and has exceeded expectations in student response and number applying/accepted to doctoral programs (4 expected to apply; 7 accepted to doctoral programs). Program components will be detailed along with results from qualitative and quantitative evaluations.

The knowledge, attitude and practice (KAP) regarding prostate cancer in 50-75 years old males
Shi, R, Berkel, H and Sartor, O

Purpose: To investigate the relationship between males ever got a prostate cancer test (PCT) and their knowledge, attitude and barrier regarding prostate cancer. To compare the racial difference in proportion of males ever got a PCT.
Methods: A cross-sectional quota survey about KAP regarding prostate cancer was conducted from 09/93-10/97. The association between the knowledge, attitude, barrier and practice has been tested.
Results: In univariate analysis, 70% of white males said they ever got a PCT, while 58% of black males did so (p <0.01). 68% of participants with insurance ever got PCT compare to 55% of those did not have insurance (p<0.01). Overall, the proportion of males getting a PCT increases with income and age increases. The more knowledge the people have regarding the prostate cancer, the higher proportion of people get a PCT. However, in multivariate logistics regression analysis, age, routine checkup, heard of DRE, PSA, and think of getting PCT next year, and want to know if they had a prostate cancer are significant at 0.05 level to predict males getting a PCT.
Conclusion: People of older age, routine checkup, more knowledge and have positive attitude about prostate cancer are likely to get a PCT.

Lymphedema in Young Breast Cancer Survivors
E. Paskett, M. Naughton, J. Robertson, J. Petrek

As advances are made in the treatment of cancer, the number of patients who will become "survivors" will increase. This is especially the case among women with breast cancer where it is estimated that there are nearly two million breast cancer survivors in the United States. An area that has been understudied among breast cancer survivors is lymphedema, a condition that causes swelling and/or pain in the arm and/or hand on the side of the breast cancer. Good estimates of lymphedema incidence, prevalence, duration and causative factors are lacking. As part of a study to follow young (age 45 and under) breast cancer patients to assess the effects of chemotherapy-induced amenorrhea, questions about arm swelling and pain were asked at baseline (up to 8 months post-diagnosis) and every six months thereafter in a cohort of 372 women. Approximately 42% of the women reported an incidence of arm and/or hand swelling by the six-month follow-up survey. Most of the cases of swelling occurred in the upper arm (39%) or hand (19%). Factors associated with lymphedema included the number of lymph nodes removed (≤ 9, 28% vs >9, 47%, p=.001) and axillary node dissection vs sentinel node removal only (43% vs 24%, p=.08). These data indicate that lymphedema occurs among a large proportion of young breast cancer survivors. Effects of lymphedema on health related quality of life are being evaluated. These results provide insight into interventions needed in terms of prevention, early diagnosis and treatment of lymphedema in order to improve health-related quality of life for cancer survivors.

USE OF SKIN CANCER PREVENTION STRATEGIES
AMONG NON-MELANOMA SKIN CANCER PATIENTS
Strom SS, Yamamura Y, Rojas-Sosa A, Duvic M, Lippman
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Based on the evidence that sun exposure is a cause of skin
cancer and that patients with non-melanoma skin cancer
(NMSC) are at greater risk of developing multiple lesions we
investigated the use of sunscreen and hats among 391
patients skin cancer of the head and neck who are part of a
case series at M. D. Anderson Cancer Center. Overall, 41%
never used sunscreen, and of the 231 who used it, 40% did
so always and 60% only seasonally. Patients who reported
using sunscreen tended to have fairer skin (p= 0.001), be
more educated (p < 0.0001), and non-smokers (p = 0.001).
No differences were found by sex, age, or history of
previous NMSC or other tumors. Frequency of hat use was
reported by 58% of the participants as always, occasional by
29% and never by 13%. Hats were used more often by men
(p = 0.0001), who were older (p = 0.03) and those with
previous NMSCs (p = 0.003). No differences were found by
education, history of previous solid or hematopoietic cancers
or smoking. These data show that the rate of use of sun
protection strategies in this high-risk population is in the
range reported for healthy adult groups and highlight the
need for health education programs tailored to NMSC
patients. Health professionals should play a pivotal role in
educating patients about secondary skin cancer prevention in
this susceptible population. (Supported by NIH grant
CA68233)

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Using Formative Research to Determine the Foci for Cancer Education on the Internet
Sutherland LA, Campbell MK, Goldovsky A.

Purpose: The main objective of the study is to increase
patient health literacy through the incorporation of health
education video clips into a multimedia Internet-based
program.

Methods: A convenience sample of sixty-nine patients from
the two study sites completed a survey that measured cancer
knowledge. Participants were 63% African-American, 68%
female with a mean age of 39 years old. The survey was
conducted as formative research to determine what
specifically should be focused on in the video clips.
Questions asked about issues related to colorectal, cervical
and testicular cancers.

Results: The majority of patients surveyed did not know the
correct screening recommendations and tests or signs and
symptoms for colorectal cancer. Knowledge was also low in
screening, risk factors and preventive measures for cervical
cancer. Patients had the best knowledge for testicular
cancer, although risk factors presented an area for increasing
health literacy.

Conclusion: The information gained from the formative
work helped guide the development of the on-line video
clips. Because this is an Internet-based project each clip will
only be 3-4 minutes. Therefore it is crucial that we
understand what information to give patients in a limited
timeframe to increase their health literacy for the cancers
addressed.

BIOBEHAVIORAL RESEARCH ON OBESITY AMONG MEN: TESTING FEASIBILITY AT THE YMCA. Touillaud MS, Chang S. The University of Texas M. D. Anderson Cancer Center, Houston, Texas 77030. **Purpose:** While much has been learned about obesity from independent approaches in behavioral, genetic and hormone research, recent directives from the NCI suggest that multidisciplinary studies are more likely to yield greater advances about the determinants of obesity. However, the feasibility of conducting large-scale biobehavioral studies of obesity is untested. **Methods:** To simulate recruitment conditions, we conducted a pilot study among adult men at a YMCA center in Houston, TX, where there are 29 YMCA centers with over 200,000 members (52% men). Among members, there were more white men (75% vs. 41%) and fewer African-Americans (AA) and Hispanics (9% vs. 27% for both groups separately) compared to the ethnic distribution of Houston. On a weekday morning (6-9am) in February 2000, male YMCA members completed a 4-page questionnaire about height, weight, diet and physical activity, as well as willingness to provide medical history, tobacco use and a blood sample. **Results:** Despite comments from some non-respondents about the lack of warning about our pilot study, 107 (55%) of 192 approached men completed our survey (89 whites, 11 AA, 7 Hispanics). Most were willing to provide personal data (85% whites, 73% AA, 100% Hispanics) and blood (61% whites, 64% AA, 100% Hispanics) for research. Prevalence rates of overweight/obesity in YMCA members were higher than US rates (whites 64% vs. 60%, AA 88% vs. 57%), except among Hispanics (57% vs. 67%). Over the winter holiday season, a large proportion of men reported changes in diet (21%), physical activity (31%) and weight gain [18 (25%) whites, range 1-11 lbs; 5 (46%) AA, range 3-10 lbs]. **Conclusions:** Our pilot study showed that sufficient numbers of men of a variety of body sizes and ethnicity willing to provide information and blood for research can be recruited at YMCA. Moreover, despite their interest in physical activity, a substantial proportion of male YMCA members reported weight gain over the winter holiday season.

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Cancer-related health behaviors of female caregivers of elementary school children

Tilson E, McBride C, Albright J, Sargent J.

Purpose – To examine the prevalence of and factors associated with cancer-related health behaviors of mothers of rural elementary school children.
Methods –501 surveys were mailed to children's caregivers to assess health behaviors, related attitudes, and demographic characteristics. Risk behaviors were defined as eating <5 fruits and vegetables/day, exercising <20 minutes 3 times/week, and being a smoker.
Results – 244 of the 261 adults (93%) who completed the survey were female, with a mean age of 37 years, 55% had high school or less education, 89% reported at least one risk behavior and 57% reported 2 or more risk behaviors. Mothers with multiple risk behaviors had lower educational levels (p<0.007) and placed less importance on children's healthy behaviors (p<0.009) than other mothers. Mothers were relatively confident they could change one or more risk behaviors.
Conclusion –The majority of mothers of elementary school children in this rural population engaged in and modeled multiple health risk behaviors for their children. Appropriate health promotion activities targeted to young families in rural communities are needed to extend prevention efforts to present and future generations.

PLASMA INSULIN-LIKE GROWTH FACTORS (IGFs) IN MEN : A CLOSER LOOK AT THE RELATIONSHIP WITH BODY SIZE. **Chang S**, Wu X, Yu H, Spitz MR. The University of Texas M. D. Anderson Cancer Center, Houston, Texas. **Purpose:** Height and IGF-1 levels are correlated. Increased prostate cancer risk has been associated with elevated plasma IGF-1 levels but inconsistently so with obesity as measured by body mass index (BMI=kg/m^2). Scrutinizing the relationship between IGFs and the components of BMI may improve our understanding of biobehavioral disease mechanisms. **Methods:** We evaluated height and weight as predictors of plasma levels of IGF-1, IGF-2, and IGF binding protein (BP)-3 among 192 healthy men enrolled as controls in on-going case-control studies. **Results:** Using NHLBI/NIH categories of body size, we observed, as others have, an inverse dose-response relationship between BMI categories and mean plasma concentrations of IGF-1 and IGF-2, although less consistently so with IGF BP-3. The mean levels of plasma IGF-1, IGF-2 and IGF BP-3 increased with categories of increasing height but not weight. In separate age-adjusted multiple linear regression models, plasma IGF-1 and IGF-2 levels were significantly associated with weight and height, and for IGF-2, high levels of weekly physical activity as well. Although these models predicted less than 10% of IGF-1 and IGF-2 variances, they predicted more variance than models using only BMI. Further adjustment for daily total calorie intake, smoking, and for IGF-1, physical activity, did not alter these associations. No factors evaluated were associated with either plasma IGF BP-3 levels or the molar ratio of IGF-1 to IGF BP-3. **Conclusions:** While height and weight were associated with plasma IGF-1 and IGF-2 levels in men, they do not explain most of the variation in plasma concentrations of these growth factors. Further research is needed to characterize the specific aspects of weight and physical activity that relate to determining IGF levels, as weight and physical activity are behaviorally modifiable.

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Altered Global Methylation of DNA: An Epigenetic Difference in Susceptibility for Lung Cancer is Associated with Its Progression. Piyathilake CJ, Frost AR, Bell WC, Weiss H, Oelschlager D, Johanning GL, Niveleau A, Heimburger DC, Grizzle WE. The University of Alabama at Birmingham.

Alterations in global DNA methylation have been widely observed in cancers, but whether this represents a difference in susceptibility for the disease is unknown. Global DNA methylation also has not been reported in intact or specific types of cells. Thus, we evaluated global DNA methylation by using a monoclonal antibody specific for 5-methylcytosine (5-mc), in lung specimens of sixty smokers who developed squamous cell carcinoma (SCC) and thirty smokers who did not. 5-mc immunostaining scores of DNA of SCC (0.61 ± 0.42) and associated hyperplastic lesions (0.82 ± 0.27) were significantly lower compared to DNA of histologically normal bronchial epithelial cells (0.99 ± 0.52) and hyperplastic lesions (1.2 ± 0.22) of non-cancer specimens. The ratios of 5-mc scores of SCC and uninvolved bronchial epithelial cells of the same patients were inversely associated with advanced stage and size of the tumors. These results suggest that alterations in global DNA methylation are an important epigenetic event that affects susceptibility for the development of lung cancer. The reduced global DNA methylation in SCC compared to epithelial hyperplasia and its association with tumor size and stage of the disease is suggestive of its involvement in the progression of SCC. The results also indicated that normal methylation of DNA in epithelial hyperplastic lesions in smokers without cancer may be involved in preventing the transformation of these lesions to invasive cancer. The possibility of identifying smokers who are at-risk of developing lung cancer by the evaluation of global DNA methylation status in hyperplastic lesions is discussed in light of these findings.

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Gender differences in levels of urinary biomarkers of exposure to nicotine and carcinogens in cigarette smoke. <u>S.D. Stellman</u>, M.V. Djordjevic, J.E. Muscat, and John P. Richie, Jr. American Health Foundation, Valhalla, NY 10595.

Purpose: To assess gender differences in intake and metabolism of tobacco carcinogens, especially NNK, as possible explanations for higher lung cancer relative risks in women at given numbers of cigarettes per day. Methods: Intake dosages of "tar", nicotine, and NNK were measured in 68 female and 62 male smokers of low-yield (≤ 0.8 mg FTC-nicotine/cigt.) and medium-yield (0.9-1.2 mg nicotine) cigarettes; puffing data were measured via a pressure transducer and then progammed into a piston-driven smoking machine fitted with a Cambridge filter to capture particulates. Results. Daily intake of "tar", nicotine, and NNK differed by cigarette yield but not by gender. However, the levels of urinary cotinine and NNAL (an NNK metabolite), adjusted for creatinine, body mass index, and number of cigarettes per day, were significantly higher (p < 0.01) among women, but did not differ by cigarette yield. Conclusion: Gender differences in risk of lung cancer may be due in part to higher susceptibility to tobacco carcinogens in women.

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Long-term smoking patterns in relation to military combat in a cohort of Vietnam veterans. <u>S.D. Stellman</u>, J.M. Stellman, K.C. Koenen, and J.F. Sommer, Jr. Mailman School of Public Health, Columbia University, New York, NY 10032.

Background: Lung cancer is reportedly elevated among Vietnam veterans. Prevention of future cases requires an understanding of factors that contribute to continued tobacco use. Purpose: To determine past and current prevalence of smoking in Vietnam veterans in relation to their combat experience. Methods: 3,056 male Vietnam-Era American Legion members in 6 states (1,474 with Vietnam service) were surveyed by mail in 1984 and 1998. A standard combat exposure scale classified Vietnam veterans as low (lower 40%), medium (next 40%), and high (upper 20%). Results: In 1984 the smoking prevalence was the same (38%) in the non-Vietnam and low-combat groups but increased to 43% in medium- and 54% in high-combat veterans. Fourteen years later all groups smoked less than in 1984, but 36% of medium-combat veterans smoked, compared with 24-26% of low-combat and non-Vietnam veterans; high-combat veterans continued to be the heaviest smokers (41%). Conclusion: cigarette smoking, which is often seen as a stress-relieving behavior, remains strongly dose-related to combat stress experience long after the War's end. Smoking intervention strategies for Vietnam veterans need to consider past exposure to combat stress.

Cigarette Smoking and Gelsolin Loss in Non-small Cell Lung Cancer Patients. J Yang, DF Tan, KB Moysich, H Swede, G Bepler, J Weiner, AM Michalek, and H Asch, Roswell Park Cancer Institute and University at Buffalo, Buffalo, New York

Gelsolin, an actin-binding protein important in maintaining cell motility and morphology, has been found to be down-regulated in a variety of cell lines and tumor tissues. Only one study has examined gelsolin loss in non-small cell lung cancer patients (NSCLC's) in relation to cigarette smoking so far. In this pilot study, we evaluated the association of self-reported cigarette smoking and gelsolin loss in 38 NSCLC's at Roswell Park Cancer Institute (1992-1999). Immunohistochemistry staining was utilized to determine gelsolin expression on archival tissues. Overall, 76% (29/38) of tumors showed gelsolin loss. Among patients who had ever smoked, 73.5% (25/34) showed gelsolin loss. Current smokers were more likely to display gelsolin loss compared to ex-smokers (88.9% vs. 68%). After dividing the sample into tertiles according to pack-years of smoking, we observed an increase in prevalence of gelsolin loss as a function of increasing pack-years. Gelsolin loss was found in 64.3%, 77.8% and 83.3% of patients in 1st, 2nd and 3rd tertile of pack-years, respectively. These results confirm the earlier reports that gelsolin loss is common in non-small cell lung cancers and suggest that gelsolin might be a target of cigarette smoking during carcinogenesis.

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Can the losses in muscle and gains in body fat that occur with adjuvant chemotherapy for breast cancer be prevented? Wendy Demark-Wahnefried,[1] Anne Jacobs Kenyon,[1] Pam Eberle,[1] Ann Skye,[1] Doug Case[2] and William Kraus[1] [1]Duke University Medical Center and [2]Wake Forest University, NC.

Weight gain is a common side effect of adjuvant chemotherapy for breast cancer. Some patient groups gain more than others, e.g. 25% of premenopausal patients will gain >11 kg over the course of treatment. Previous studies suggest that this weight gain may decrease both disease-free & overall survival, & decrease quality of life. This weight gain also is distinct, since patients lose lean body mass as their weight increases.

We explored whether a clinic-based exercise program, which promoted aerobic exercise & a specialized program of strength training, & dietary change (≤20% fat; fruit, vegetable & calcium-rich diet) could prevent body composition change among Stage I/II premenopausal breast cancer patients who would receive adjuvant chemotherapy. Dual energy x-ray absorptiometry was used to assess body composition at base-line & 6 months; mean change (SE) for historic patient controls (N=36) & intervention participants (N=9) is reported below:

Variable	Historic Controls	Intervention Participants
Body Weight	+2.2 (.4) kg	-2.1 (1.3)
Lean Mass	-0.1 (.01) kg	+0.1 (1.5)
Fat Mass	+2.0 (.3) kg	-1.9 (1.5)
% Body Fat	+1.82 (1.64)%	-1.2 (1.15)%

Findings of this small pilot study suggest that exercise + diet interventions may yield promise in preventing adverse chemotherapy-induced weight & body composition changes among young women who receive adjuvant chemotherapy for breast cancer. and that further study is needed.

Development of a Questionnaire, Database and Computer Program For Assessing Intake of Black Tea Polyphenols in Epidemiological Studies

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Most large-scale epidemiological studies use regular food frequency questionnaires to estimate tea intake. However, nationally available nutrient analysis databases do not include black tea polyphenols. The development of the Arizona tea questionnaire (ATQ) was undertaken to provide a tool for collecting dietary information on tea consumption. Forty black tea samples (brewed, instant and sun tea) were analyzed to develop a preliminary black tea composition database. The questionnaire was tested for reproducibility of estimates of black (hot and iced) and green (hot and iced) tea consumption and tea polyphenols intake among 120 individuals. We developed a computer analysis program to combine dietary data from ATQ with the upgraded tea polyphenols database. Correlation coefficients between 2 administrations of the questionnaire (2 month) ranged from 0.72 for black hot tea to 0.86 for black sun tea. Mean intakes (range) of total flavonoids from black tea among consumers were 80.8 (3.0 – 588.0) mg/day and 102.4 (4.5 – 802.3) mg/day (r= 0.83, P<0.001). The ATQ provided highly reproducible estimates of tea beverages and tea polyphenols intake. This instrument may be a useful tool in studies of the associations between tea consumption, tea polyphenols intake, and risk for chronic disease.

ADDITION OF CAROTENOIDS TO NCI DIET AND HEALTH QUESTIONNAIRE DATABASE

LB Dixon, AF Subar, FE Thompson. National Cancer Institute, Rockville, MD.

Food frequency questionnaires (FFQ) like the Diet and Health Questionnaire (DHQ), developed by researchers at the National Cancer Institute, are commonly used in studies of diet and cancer. To add carotenoid values to the DHQ database, we used the USDA-NCC Carotenoid Database for U.S. Foods–1998 (http://www.nal.usda.gov/fnic/foodcomp/) that provides values for five carotenoids (a-carotene, b-carotene, b-cryptoxanthin, lutein, lycopene) in ug/100 g units for 215 foods. These foods were matched to food groups listed on the DHQ. Using dietary data from the 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII), we counted the number of times each carotenoid-containing food was reported (# FOOD MENTIONS) and the number of times all foods in the associated DHQ food group were reported (# TOTAL MENTIONS) (e.g., frequency of cooked spinach was 149 out of 232 counts for cooked greens). Certain DHQ food groups represent mixed dishes with food components that contain carotenoids (e.g., pumpkin in pumpkin pie). Recipe files from the 1994-96 CSFII were used to determine the fraction of carotenoid-containing foods in those mixed dishes (FRACTION). For each DHQ food group, weighted mean values of each carotenoid were calculated by: 1) multiplying FRACTION by # FOOD MENTIONS by carotenoid value; 2) summing across all foods within each DHQ food group; 3) dividing by # TOTAL MENTIONS.

Toenail Selenium Concentration and Prostate, Lung, and Colorectal Cancer. *T Hartman[1,2], P Taylor[1], G Alfthan[3], R Fagerstrom[1], J Virtamo[3], S Mark[1], M Virtanen[3], and D Albanes[1]. [1]The National Cancer Institute, [2]Penn State University, [3]The National Public Health Institute(Finland).*

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We conducted 3 nested case-control studies within the Alpha-Tocopherol Beta-Carotene (ATBC) Study cohort to evaluate the association between toenail selenium and incidence of lung (n=250), prostate (n=233) and colorectal cancer (n=127). Controls were matched 1:1 on age, intervention group, and date of trial randomization. Finland began fortification of agricultural fertilizers in the fall of 1984; thus, the present analyses were based on the calculated residual of toenail selenium after regressing it on date of randomization. Odds ratios (ORs) and 95% confidence intervals (CIs) were determined using conditional logistic regression. The selenium residual and the interaction of the residual with date of randomization were included in models with smoking and body mass index as covariates. We observed no association between toenail selenium and prostate cancer. For lung cancer, we observed a suggestion of a protective association for higher selenium status among men who entered the trial early (when the range of selenium values included very low levels). We found this relationship to be predominantly among men who received the trial alpha-tocopherol supplement. Overall, for lung cancer, the OR for men with adjusted toenail selenium concentrations at the 75th percentile compared to those at the 25th percentile was 0.53 (95% CI=0.24-1.18). The results for colon cancer had a similar pattern, but were not significant and less convincing than for lung. These results suggest that low selenium status may be associated with increased risk for lung cancer.

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Serum IGF-1 Following Soy Supplementation
Lee WR, Cramer SD, Crouse JR, Terry JG, Case LD, Vitolins M, Burke G, Paskett E
Purpose: To determine the effect of daily diets containing soy isoflavones (ISO) on serum IGF-1 levels in humans.
Materials/Methods: A total of 156 men and women were enrolled in a double-blind randomized parallel trial to identify the agent(s) responsible for the cholesterol lowering effect of soy. Five diets were fed: 1) 25 mg casein protein, 0 mg ISO; 2) 25 mg soy protein, 3mg ISO; 3) 25 gm soy protein, 27 mg ISO; 4) 25 gm soy protein, 37 mg ISO; 5) 25 gm soy protein, 62 mg ISO. In 103 participants, fasting serum obtained before and after the 9-week dietary intervention was available allowing for measurement of IGF-1. For the purposes of analysis three groups were defined according to isoflavone content of the daily diet: control (0 mg ISO), low (3-27 mg ISO) and high (37-62 mg ISO).
Results: The mean serum IGF-1 levels were not significantly different between the three groups prior to the dietary intervention or following nine weeks of the daily diet. After adjustment for age, smoking status, gender and baseline IGF-1 levels, however, a trend towards lower IGF-1 levels after the dietary intervention was observed for the high ISO groups compared to the low ISO and control groups (p=0.09).
Conclusions: After adjusting for potential covariates, a trend towards decreased IGF-1 levels was observed in the high ISO group. This result with a small sample supports the need to conduct larger prospective studies examining ISO intake and serum IGF-1 levels.

The performance of the AFFQ, a 153 item questionnaire designed to be sensitive to regional and ethnic dietary patterns, was assessed in a randomly selected sample cohort of the Women's Healthy Eating and Living Study (WHEL) (N=400). Women from the intervention and control arms of the WHEL dietary study completed the AFFQ at baseline (pre-randomization) and at year 1 (post-randomization). Within 4 weeks of completion of each AFFQ, participants also completed four telephone 24-hour recalls. Recalls included intake on two weekdays and two weekend days within a 2 week time period. The validity of the AFFQ was assessed using unadjusted nutrient values, nutrients adjusted for total energy, and nutrient values de-attenuated for within-person variability in intake, as estimated from the 24-hour recalls. The unadjusted crude Pearson correlations between baseline AFFQ and the 24-hour recalls ranged from 0.10 for lycopene to 0.61 for α-carotene and for the 1-year AFFQ with the 24-hour recalls ranged from 0.11 for lycopene to 0.65 for vitamin A. The de-attenuated correlations of energy-adjusted nutrients were higher overall. The reliability of the AFFQ was assessed using correlations between baseline and 1 year AFFQs for the control diet group only. The unadjusted Pearson's correlational coefficients ranged from 0.54 for lycopene to 0.77 for both fiber and alcohol. These results compare favorably with other published studies of the validity and reliability of food frequency questionnaires and demonstrate its utility in a dietary intervention trial among breast cancer survivors.

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Plasma Antioxidants: Association with Human Papillomavirus Persistence

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Persistent human papillomavirus (HPV) infection has been identified as a necessary but insufficient cause of cervical carcinoma. Data have suggested that higher levels of antioxidants are protective against HPV persistence and cervical dysplasia.

In this prospective study, we evaluated the role between circulating carotenoids, tocopherols, and HPV persistence in women age 18 to 35 years. Enrolled women were followed for a 9-month period with 3 clinic visits. Multivariate logistic regression analysis was used to determine the risk for persistent HPV infection associated with each tertile of circulating antioxidant level and to determine linear trends. Analyses were conducted using women who were persistently positive for HPV infection versus those women who had an intermittent infection (n=157). A decreasing trend in persistent risk was observed with increasing levels of circulating *cis*-lycopene (p for trend, 0.023) after adjustment for age, race, cigarette smoking, age at first intercourse, and marital status.

Cis-lycopene may influence HPV persistence through its antioxidant role preventing damage due to oxidative stress caused by free radical molecules that produce a decrease in immune function and an increase in viral load. These data suggest that circulating levels of *cis*-lycopene may be protective against HPV persistence.

Title: Adherence to Dietary Behavior Change: Patterns of Relapse and Recycling in the Women's Intervention Nutrition Study (WINS). *Authors*: Lillington L, Chon Y, Winters B (presenter), Chlebowski R. *Affiliation of 1st Author*: Harbor-UCLA Research and Education Institute

Although prior studies have demonstrated that dietary interventions can reduce average fat intake, little is known about individual patterns of dietary adherence which often involve periods of relapse and recycling over time. This study examined adherence patterns of a subset of 91 postmenopausal women with early stage breast cancer participating in the WINS nutrition intervention to identify rates of maintenance, relapse, and recycling between 12 and 24 months. The conceptual framework was based on Marlatt & Gordon's Relapse Prevention Model (1985). Dietary fat intake was determined via 4-day food records. Levels of adherence were defined as high (<= 18% calories from fat), middle (> 18% and <= 25% calories from fat) and low (> 25% calories from fat). Sample characteristics included: 89% Caucasian, 77% >= 12 yrs. education, 75% taking tamoxifen, mean baseline BMI = 26.55, mean baseline dietary fat intake = 34.1%. Adherence rates at 12 and 24 months respectively were, 41.7% and 39.6% high adherers, 34.1% and 33% middle adherers and 24.2% and 27.4% low adherers. Although mean fat intake was stable over time (20.13 and 20.83 percent fat cal. at 12 and 24 months respectively) individuals moved across the levels of adherence during this time period. In this select sample, 50% (11/22) low adherers improved dietary behavior while 31.6% (12/38) high adherers and 38.7% (12/31) middle adherers relapsed. Findings demonstrate the dynamic process involved in dietary behavior change and provide support for continued assessment and counseling to promote adherence and prevent relapse beyond the initial intervention period.

CIGARETTE SMOKING AMONG ADOLESCENTS AND ADULTS IN 24 U.S. STATES AND THE DISTRICT OF COLUMBIA IN 1997 AND 1999 - WHAT EXPLAINS THE RELATIONSHIP?

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Parental smoking is a key predictor of adolescent uptake. Additionally, tobacco control policies such as price and clean indoor air laws can influence smoking behaviors among both adolescents and adults. We compared state-specific estimates of several smoking behaviors among adolescents and adults. Data were derived from the CDC's Youth Risk Behavior Surveillance System (YRBSS) and Behavioral Risk Factor Surveillance System, and SAMHSA's National Household Survey on Drug Abuse (NHSDA). States were selected based on participation in the 1997. Adolescent and adult prevalences in 1997 were directly related overall (ß=1.198, p=0.005); and for males, females, whites, and several adult age groups. No relationship was observed between African American adolescent and adult prevalences. These relationships were attenuated, but remained statistically significant after adjusting for state-specific prices and clean indoor air laws in multivariate analysis. We also examined data from the 1999 NHSDA for all 50 states and found similar relationships for adolescent and adult smoking (18-25 years old, >26 years old) prevalence overall (ß=0.46, p<0.001, ß=0.732, p<0.001). This relationship remained after adjusting for 1999 state-specific prices of cigarettes.

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Purpose: To examine if residents address smoking differently based on the patients' race, and if differences can be reduced.

Method: 90 residents, from diverse ethnicities, participated in a 2 (intervention vs. control) x 3 (race of a lower-income female patient: White, Black, Hispanic) between-subjects experiment. Residents (read a patient's chart (indicating the patient smoked) and saw a video of a patient-provider interaction. The intervention included a written statement about potential physician bias and the impact residents can have on their patients' behavior. Residents completed a survey about how they would address preventive health with that patient. The main outcome variable was whether residents listed smoking as a topic they would address. Mediating variables were outcome expectancies, self-efficacy, barriers, and stereotyping.

Results: Most listed smoking (78%) as a topic they would address, regardless of the patient's race. Residents who had higher outcome expectancies that the patient would listen to their advice were 2.9 times ($\underline{CI}$ = 1.4-6.5) more likely to have listed smoking. A mediation model shows that, due to a reliance on stereotypes, residents felt that, compared to the Black or Hispanic patient, the White patient would be less likely to follow their advice. The intervention affected residents' expectancies about whether patients would listen to their advice.

Conclusions: Past studies of racial bias actually may indicate class bias. Outcome expectancies seem amenable to change.

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Effects of Education on Perceptions of a Genetic Contribution to Smoking. J. Houfek, J. Atwood, G. Reiser, G. Schaefer, S. Rennard. University of Nebraska Medical Center

Studies have identified specific genes believed to contribute to smoking initiation and maintenance (e.g., DRD2, SLC6A3, CYP2A6). Future risk communication for smoking will likely include information about genetic contributions to this behavior. Because such information may be used to tailor smoking cessation and prevention, it is important to understand cognitive and affective responses to information about a genetic contribution to smoking. The purpose of this on-going, pilot experimental study is test the effects of an educational session about genetics and smoking on consumers' cognitive and affective responses. Current or former smokers are randomly assigned to the intervention (group education) or control (written smoking cessation information) group. Data are collected at baseline (T1) and 7 to10 days (T2) and 3 months (T3) postintervention. Instruments include the IES, CES-D, the Fagerstrom Test for Nicotine Dependence (FTND), and investigator-developed knowledge and attitude questions about genetics and smoking. To date 46 persons (22 males; 34 females; age: $\overline{X}$=44) have participated. Repeated measures ANOVA using T1-T2 data showed a significant increase (p <.01) in the experimental group's knowledge about genetics and smoking and awareness of genetic tests. There was a significant time by group interaction (p <.02) for FTND scores, with the control group reporting more and the intervention group less dependence postintervention. The control group also reported significantly (p<.01) higher IES avoidance scores postintervention. There were no significant changes in attitudes about genetics and smoking or in genetic risk perceptions.

Educating Health Care Providers about the Importance of Smoking Prevention and Cessation Counseling: The Texas Tobacco Outreach Education Program

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This study will profile the continuing medical education (CME) preferences of health care providers (HCPs) who participate in the Texas Tobacco Outreach Education Program (TOEP). Using Tobacco Settlement funds, M. D. Anderson Cancer Center developed the TOEP, a CME program designed to teach and encourage HCPs in four rural areas in Texas to deliver effective tobacco prevention and cessation counseling. Training is provided by nationally recognized tobacco control experts from M. D. Anderson and other institutions and is offered in three formats: live presentations, videotaped presentations, and web-based training. We will gather data from participants to refine the TOEP and maximize future participation. First, using a mailed survey, we will assess HCPs' access to the Internet, past CME experiences, and preferred CME format. Second, we will determine which method of advertising the TOEP (mail, postcard, e-mail, and combinations) produces the highest participation rate. Third, after they complete training, we will survey participants regarding their preferred CME format and the perceived advantages and disadvantages of the CME format in which they participated. The first live presentation was held in June 2000, and the 23 physician participants generally agreed that the presentations were current, clear, and met the stated objectives. Data will be collected between October 2000 and March 2001, and conclusions will be presented soon afterwards.

Longitudinal Predictors of Continued Smoking Among Cancer Patients

Schnoll, R., Malstrom, M., James, C., Rothman, R., Miller, S., Ridge, J., Langer, C., Movsas, B., Unger, M., & Goldberg, M.

This study examined longitudinal predictors of continued smoking among head and neck and lung cancer patients (N = 45). Multivariate analyses indicated that baseline measures of psychosocial and addiction variables predicted 7-day point prevalence smoking status assessed at a 3-month follow-up (Λ = .59, $\underline{F}$ [7,37] = 3.71, $\underline{p}$ < .01). Post-hoc analyses showed that smokers exhibited lower baseline levels of self-efficacy (e.g., "I have confidence that I can quit for good"), risk perceptions (e.g., "continued smoking will increase my risk of a recurrence"), and nicotine addiction (i.e., as measured by the Fagerstrom scale), as well as higher levels of the cons of quitting (e.g., "smoking relieves tension"). Baseline measures of psychosocial and addiction variables also predicted patients' intention to quit smoking assessed at a 3-month follow-up (Λ = .28, $\underline{F}$ [28,124] = 1.88, $\underline{p}$ < .05). Post hoc analyses indicated that patients exhibiting a lower level of intention to quit reported lower levels of self-efficacy and risk perceptions and higher levels of cons of quitting and nicotine addiction. Lastly, the duration of time between diagnosis and assessment was predictive of smoking status and intention to quit. Patients who continued to smoke and patients with less intention to quit had a lower duration of time since the diagnosis than abstainers ($\underline{F}$[1,38] = 7.47, $\underline{p}$ <.01) and patients intending to quit ($\underline{F}$[4,35] = 5.17, $\underline{p}$ < .01). These findings support the use of smoking cessation interventions for cancer patients that utilize behavioral counseling, provide nicotine replacement therapy, and include relapse prevention.