



**Eleventh Annual Meeting of the
American Society of Preventive Oncology**

March 11–13, 1987

Cathedral Hill Hotel

San Francisco, California

MASTER AGENDA

Wednesday, March 11

MORNING

AFTERNOON

EVENING

Registration
12:00 - 5:00 pm

Free evening

Symposium -
Cancer in Minorities
2:00 - 5:00 pm
JAPANESE PAVILION

Thursday, March 12

MORNING

AFTERNOON

EVENING

Registration
8:00 am - 4:30 pm

Symposium -
Cancer Prevention and
the Primary Care Physician
2:00 - 4:30 pm

Reception
6:30 - 7:30 pm
EL DORADO ROOM

Welcoming Remarks
8:30 - 9:00 am
JAPANESE PAVILION

Banquet
The Role of the Media
in Cancer Prevention
7:30 - 10:30 pm
EL DORADO ROOM

Poster Session Open
9:30 am - 3:00 pm

Symposium
Status Report:
"Prostate Cancer"
9:00 - 11:00 am

Selected papers
11:00 am - 12:30 pm

Friday, March 13

MORNING

MORNING

AFTERNOON

Distinguished Achievement
Award
8:30 - 9:00 am
JAPANESE PAVILION

Selected papers
9:00 - 10:00 am

Adjourn

Poster Session Open
9:30 am - 12:30 pm

Public Health Forum:
Controversies in Preventive
Oncology - Dietary Fat and Cancer
10:15 am - 12:15 pm

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PROGRAM AND SELECTED PAPERS

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Welcome to San Francisco

Program Chairpersons: Elizabeth Holly, Ph.D., M.P.H.
Robert Day, M.D.

sponsored by:

American Society of Preventive Oncology

American Cancer Society

Conference information

This eleventh annual meeting of the American Society of Preventive Oncology focuses on some of the current major issues in cancer prevention: Cancer in minorities, prostate cancer, cancer prevention and the primary care physician and controversies in preventive oncology - dietary fat and cancer. The program chairpersons, Drs. Elizabeth Holly and Robert Day and the Executive Committee of ASPO have brought together what promises to be an extraordinary series of presentations by leaders in their fields of scientific inquiry. This meeting is supported by ASPO and by a grant from the American Cancer Society.

ASPO

In its eleventh year ASPO is striving to:

- promote the exchange and dissemination of information and ideas relating to cancer prevention and control;
- identify and stimulate research areas in cancer prevention and control;
- foster the implementation of programs in cancer prevention and control.

A growing and active membership facilitates achievement of these goals. The Executive Committee and council members listed below are very interested in hearing from prospective or current members.

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The National Office for ASPO is at the University of Wisconsin, where the executive secretary, Mrs. Joan Subach, may be contacted for any information or assistance: 1300 University Ave. - 7C, Madison, WI 53706, (608)263-6919.

CME Credit

Forms may be picked up for continuing medical education credit at the registration desk.

Messages

Please see Joan Subach at the registration desk if you wish to leave or expect a message.

Banquet

Please let Joan Subach know immediately of your plans to attend the banquet on Thursday evening.

Dining and discovering San Francisco

Booklets regarding tourist information is available at the registration desk.

Special acknowledgement

The Executive Committee of ASPO wishes to offer special thanks to Drs. Elizabeth Holly and Robert Day, the program chairpersons for their tireless efforts in arranging this meeting.

Wednesday, March 11

12:00 pm - 5:00 pm

REGISTRATION

2:00 pm - 5:00 pm

SYMPOSIUM

Cancer in Minorities

JAPANESE PAVILION

Moderator: Alice S. Whittemore, PhD

Cervical Cancer in Hispanic and Non Hispanic Women in Los Angeles

Ruth K. Peters, ScD

Cancer Incidence, Mortality and Survival among American Indians in New Mexico

Charles R. Key, MD, PhD

Differences in Lung Cancer Risk Associated with Smoking and Diet among Ethnic Minorities in Hawaii

Loic Le Marchand, MD

3:15 pm - 3:45 pm

REFRESHMENT BREAK

Colorectal Cancer in Chinese and Chinese-Americans

Marion L. Wu, PhD

Cancer Awareness Among Black Americans in Northern California

Anna H. T. Wu, PhD

Thursday, March 12

8:00 am - 4:30 pm		REGISTRATION
8:30 am - 9:00 pm		WELCOMING REMARKS
JAPANESE PAVILION		Nicholas L. Petrakis, MD President, ASPO
9:30 am - 3:00 pm		POSTER SESSION OPEN
9:00 am - 11:00 am		SYMPOSIUM Status Report: "Prostate Cancer" Moderator: Ronald K. Ross, MD Clinical Significance of Prostate Cancer Volume: Early Detection and Relation to Autopsy Incidence Thomas A. Stamey MD Demographic Risk Factors: Clues to Etiology Brian E. Henderson, MD
10:00 am - 10:15 am		REFRESHMENT BREAK The Role of Diet in Prostate Cancer Etiology: Implications for Prevention Laurence N. Kolonel, MD The Evidence for a Hormonal Etiology Ronald K. Ross, MD Panel Discussion
11:00 am - 12:30 pm		SELECTED PAPERS Moderator: David Schottenfeld, MD
11:00 am - 11:20 am	1*	Sun Exposure and Malignant Melanoma among Susceptible Individuals Neil Dubin, PhD
11:20 am - 11:40 am	2*	Estrogens and Obesity in Familial Breast Cancer Lisa Begg, RN, DrPH
11:40 am - 12:00 pm	3*	Cancer Prevention and Screening Activities in Primary Care Practice James E. Davis, MD, MS

*Number refers to the abstract printed in the selected paper section of this program.

12:00 pm - 12:20 pm	4*	Diagnostic Radiography as a Risk Factor for Chronic Myelogenous Leukemia Susan Preston-Martin, PhD
12:20 pm - 12:40 pm	5*	A Prospective Study of the Development of Breast Cancer in 13,978 Women with Benign Breast Disease Christine Carter, MD
12:40 pm - 2:00 pm		LUNCH
2:00 pm - 4:30 pm		SYMPOSIUM Cancer Prevention and the Primary Care Physician Moderator: Thomas E. Davis, MD Cancer Prevention: Lessons from Cardiovascular Disease Prevention Trials Stephen P. Fortmann, MD Cancer Screening Recommendations: The View from Washington Robert Fried, MD
3:15 pm - 3:30 pm		REFRESHMENT BREAK Cancer Screening Recommendations: Implementation by the Primary Care Physician Stephen J. McPhee, MD Drugs and Diet: Role of the Primary Care Physician in Cancer Prevention Trials Frank L. Meyskens, Jr., MD Panel Discussion
4:30 pm - 5:30 pm		BUSINESS MEETING
6:30 pm - 7:30 pm		RECEPTION
EL DORADO ROOM		
7:30 pm - 10:30 pm		BANQUET The Role of the Media in Cancer Prevention David Perlman
EL DORADO ROOM		

Friday, March 13

8:30 am - 9:00 am
JAPANESE PAVILION

ASPO DISTINGUISHED ACHIEVEMENT AWARD

PRESENTATION

1987 Award recipient:

Lester Breslow, MD, MPH

Presentation of award:

David Schottenfeld, MD

Awardee Address

Awardee

9:30 am - 12:30 pm

POSTER SESSION OPEN

9:00 am - 10:00 am

SELECTED PAPERS

Moderator: Guy R. Newell, MD

9:00 am - 9:20 am 6*

A Randomized Trial of Vitamin C and E Supplementation in the Prevention of Recurrence of Colorectal Polyps

Gail E. McKeown-Eyssen, PhD

9:20 am - 9:40 am 7*

Dietary Risk Associated with Colon Cancer in a Low Risk Population

Dee W. West, PhD

9:40 am - 10:00 am 8*

Serum Carotenoids, Vitamin E and Selenium as Predictors of Cancer Death

Lewis Kuller, MD, DPH

10:00 am - 10:15

REFRESHMENT BREAK

10:15 am - 12:15 pm

Public Health Forum: Controversies in Preventive Oncology - Dietary Fat and Cancer Questions and Answers

Moderator: Laurence Kolonel, MD

Fat and Cancers of the Colon and Breast: the Epidemiologic Evidence

Roland L. Phillips, MD, DrPH

The Role of Calories and Energy Expenditure

Saxon Graham, PhD

A Statistical View of the Evidence

Ross L. Prentice, PhD

Are We Ready for Intervention Trials?

Joseph L. Lyon, MD

Panel Discussion

12:30 pm

ADJOURNMENT

INVITED SPEAKERS

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Joan R. Bloom, PhD
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Berkeley, California

Thomas E. Davis, MD
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Marion L. Wu, PhD
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SELECTED PAPERS

These papers are being published in the journal
Preventive Medicine, Vol. 16, No. 2, 1987

Sun Exposure and Malignant Melanoma among Susceptible Individuals. N. DUBIN, PH.D., M. MOSESON, M.P.H., AND B. S. PASTERNAK, PH.D., New York University Medical Center, Institute of Environmental Medicine, 341 East 25th Street, New York, New York 10010.

The purpose of this case-control study was to identify susceptible subgroups at especially high risk for melanoma when exposed to the sun (2-5). We interviewed 289 melanoma patients and 527 randomly selected controls without cancer (1). Among subjects with poor tanning ability, the risk for melanoma associated with outdoor occupation was over fivefold ($RR = 5.6$) compared with that with indoor occupation. By contrast, the analogous relative risk was barely elevated among subjects with good ability to tan ($RR = 1.2$). Mixed indoor and outdoor job exposure was protective among good tanners ($RR = 0.41$) but not among poor tanners ($RR = 1.9$). A similar pattern was seen for recreational sun exposure, but quantitative measurement of average hours of sun exposure did not prove to be a good indicator of melanoma risk, even among susceptible individuals. A history of severe sunburn with blistering was associated with increased risk among poor tanners ($RR = 1.9$) and also among subjects 20-39 years of age ($RR = 5.7$), but appeared protective among good tanners ($RR = 0.46$). A history of nonmelanoma skin cancer or solar keratosis was a very strong risk factor ($RR = 10.8$) but did not significantly differ in magnitude among susceptibility subgroups. In general, the risk of melanoma associated with sun exposure was greater for individuals expected to be susceptible on the basis of poor ability to tan, but not for other pigmentary traits.

REFERENCES

1. Dubin, N., Moseson, M., and Pasternack, B. S. Epidemiology of malignant melanoma: Pigmentary traits, ultraviolet radiation and the identification of high-risk populations. *Recent Results Cancer Res.* 102, 56-75 (1986).
2. Elwood, J. M., Gallagher, R. P., Hill, G. B., and Pearson, J. C. G. Cutaneous melanoma in relation to intermittent and constant sun exposure—The Western Canada Melanoma Study. *Int. J. Cancer* 35, 427-433 (1985).
3. Graham, S., Marshall, J., Haughey, B., Stoll, H., Zielezny, M., Brasure, J., and West, D. An inquiry into the epidemiology of melanoma. *Amer. J. Epidemiol.* 122, 608-619 (1985).
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5. Lew, R. A., Sober, A. J., Cook, N., Marvell, R., and Fitzpatrick, T. B. Sun exposure habits in patients with cutaneous melanoma: A case-control study. *J. Dermatol. Surg. Oncol.* 9, 981-986 (1983).

Estrogens and Obesity in Familial Breast Cancer. LISA BEGG, R.N., DR.P.H.,* LEWIS H. KULLER, M.D., DR.P.H.,* JAMES P. GUTAI, M.D.,† ARLENE G. CAGGIULA, PH.D.,* NORMAN WOLMARK, M.D.,‡ AND CHARLES G. WATSON, M.D.§ *Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pennsylvania 15261, †School of Medicine, East Carolina University, Greenville, North Carolina 27834, ‡Department of Surgery, University of Pittsburgh, 3459 Fifth Avenue, Pittsburgh, Pennsylvania 15213, and §Falk Clinic, Room 571, 3601 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

In a cross-sectional study, the relationship between obesity and endogenous estrogens in 39 postmenopausal sisters of postmenopausal breast cancer patients and 40 age-matched controls was evaluated. The serum estrone levels were significantly higher in the sisters than in the controls (58.9 vs 47.8 pg/ml, $P = 0.005$). Estradiol levels were also higher in the sisters compared with those in controls (7.9 vs 5.4 pg/ml, $P = 0.02$). Androstenedione levels were higher in the sisters (111 vs 92.8 ng/dl, $P = 0.07$), as was testosterone (54 vs 38 ng/dl, $P = 0.05$). The differences in estrone levels persisted after adjustment for body weight and other risk factors. There was a strong direct relationship between obesity and both the estrone and estradiol levels for the sisters as well as for the controls. The estrone and estradiol levels were also highly correlated. Estrone levels correlated with androstenedione, while estradiol was associated with testosterone levels. This is the first study to demonstrate higher hormonal levels among siblings of postmenopausal breast cancer patients, even after adjustment for obesity. Genetic studies of breast cancer should probably focus on hormonal parameters rather than on clinical end points. Determinants of these hormone levels are most likely a function of interaction between genetic and environmental factors, such as diet and obesity. Finally, the response of breast tissue to these hormonal differences may also be genetically determined.

REFERENCES

1. Kelsey, J. L. A review of the epidemiology of human breast cancer. *Epidemiol. Rev.* 1, 74 (1979).
2. Kirschner, M. A., Ertel, N., and Schneider, G. Obesity, hormones, and cancer. *Cancer Res.* 41, 3711 (1981).
3. Siiteri, P. K., Murai, J. T., Jammond, G. L., Nisker, H. A., Raymoure, W. J., and Kuhn, R. W. The serum transport of steroid hormones. *Recent Prog. Horm. Res.* 38, 457 (1982).

Cancer Prevention and Screening Activities in Primary Care Practice. JAMES E. DAVIS, M.D., M.S.,* DANIEL L. MEYER, PH.D.,* AND RICHARD R. LOVE, M.D., M.S.,† *Department of Family Medicine and Practice, University of Wisconsin Medical School, 777 South Mills St., Madison, Wisconsin 53715, and †Departments of Oncology and Family Medicine and Practice, University of Wisconsin Medical School, 1300 University Ave.-7C, Madison, Wisconsin 53706.

Previous studies of preventive oncology services in primary care have relied on physician estimates of performance (1, 3) or audit of health maintenance visits (2). The practices of 20 Wisconsin family physicians in five group practice settings were examined using three methods. First, medical records of young adults (ages 21–40 years) and older adults (ages 53–65 years) were randomly selected, and a 3-year longitudinal audit of preventive services was performed. A total of 272 records were audited, representing 816 patient-years. Physician performance was highly variable; e.g., patients' smoking status was recorded in 65% of the charts, but in individual practices the range was from 19 to 100%. Similarly, evidence of at least one Pap test over the 3 years among female patients ranged from 33 to 100% with a mean of 77%. However, performance was fairly consistent among physicians within each group practice. Second, physician questionnaires provided estimates of performance and perceived barriers to preventive activities. There was little correlation between individual physicians' performance and their performance estimates. Third, a structural inventory of practice sites was conducted to identify medical record and clinic systems that affect delivery of preventive services. The structural inventories suggest a number of deficiencies, e.g., lack of health maintenance flowsheets or protocols, no systematic reminder system. Potential interventions to improve preventive oncology activities in primary-care practices must address structural barriers and focus on group as well as individual physician behavior.

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1. Battista, R. N., Williams, J. I., and MacFarlane, L. A. Determinants of primary medical practice in adult cancer prevention. *Med. Care* 24, 216–244 (1986).
2. Romm, F. J., Fletcher, S. W., and Hulka, B. S. The periodic health examination: Comparison of recommendations and internists' performance. *South. Med. J.* 74, 265–271 (1981).
3. Survey of physicians' attitudes and practices in early cancer detection. *CA Cancer J. Clin.* 35, 197–213 (1985).

Diagnostic Radiography as a Risk Factor for Chronic Myelogenous Leukemia. SUSAN PRESTON-MARTIN, PH.D. AND DUNCAN C. THOMAS, PH.D., Department of Preventive Medicine, School of Medicine, University of Southern California, 2025 Zonal Avenue, Los Angeles, California 90033.

The aim of this study was to investigate whether diagnostic X rays to the trunk in the 20 years prior to diagnosis were associated with the development of chronic myelogenous leukemia (CML). A standard questionnaire was used to interview 136 Los Angeles County residents, ages 25–69 years, with CML diagnosed from 1980 to 1984, and 136 neighborhood controls individually matched by sex, race, and birth year (within 5 years). Published estimates were used to assign a dose to the active bone marrow for various radiographic procedures (3). Odds ratios (OR) were estimated for cumulative marrow doses for each of four time periods (2–5, 6–10, 11–20, and 2–20 years prior to the diagnosis of the case). The OR's for exposure to 10–99, 100–1,999, and $\geq 2,000$ mrad in the 6–10 years prior to diagnosis were 1.0, 1.3, and 2.4, respectively. The association was strongest for this period; the slope of the linear dose–response relationship was estimated to be 0.544 per rad ($P < 0.05$), and the attributable risk per 10^6 person-year rad was 10.20 ($P < 0.01$). The effect of radiation exposure during this period remained significant after consideration of other risk factors (e.g., job as a welder, farm residence) in a logistic regression analysis. These findings and others that suggest an excess of adult-onset myelogenous leukemia after low-dose radiation exposure (1, 4) suggest that currently accepted models may underestimate the effect of diagnostic X rays (2). The contention that extrapolation from data on high-dose exposures may underestimate effects at low doses is supported by recent experimental work (5).

REFERENCES

1. Caldwell, G., Kelley, D., and Heath, C., Jr. Leukemia among participants in military maneuvers at a nuclear bomb test: A preliminary report. *JAMA* 244, 1575–1578 (1980).
2. Evans, J. S., Wennberg, J. E., and McNeil, B. J. The influence of diagnostic radiography on the incidence of breast cancer and leukemia. *New Engl. J. Med.* 315, 810–815 (1986).
3. Schleen, B., Tucker, T. T., and Johnson, D. W. The mean active bone marrow dose to the adult population of the United States from diagnostic radiography. *Health Phys.* 34, 587–601 (1978).
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A Prospective Study of the Development of Breast Cancer in 13,978 Women with Benign Breast Disease CHRISTINE L. CARTER, PH.D.,* DONALD K. CORLE, M.S.,† MARC S. MICOZZI, PH.D.,* ARTHUR SCHATZKIN, M.D., DR.P.H.,* AND PHILIP R. TAYLOR, M.D.,* *Cancer Prevention Studies Branch, Blair 6A01, and †Biometry Branch, National Cancer Institute, National Institutes of Health, Bethesda, Maryland 20205.

We studied the relation of benign breast disease (BBD) to breast cancer among 13,978 women with biopsy-diagnosed BBD who participated in the Breast Cancer Detection Demonstration Project. Women were classified into one of four BBD categories and were followed for a median of 8.4 years for the development of breast cancer. BBD categories were atypical hyperplasia (AH), proliferative disease without atypia (PDWA), nonproliferative disease (NP), and other. Proportional hazards analysis was used to estimate breast cancer risk by BBD group while controlling for age. The relative risk of women with PDWA was 1.4 [95% confidence interval (C.I.), 1.1–1.7] compared with that of women with NP, while for women with AH the risk was 2.2 (95% C.I., 1.6–3.0). The risk among women with PDWA and a positive family history was 2.5 times that of women with NP without a family history (95% C.I., 1.8–3.5), while the risk among women with AH and a positive family history was 3.3 (95% C.I., 1.9–5.6). We conclude that the risk of developing breast cancer differs for the various categories of BBD and that the highest risk is associated with women having a positive family history and atypical hyperplasia of the breast.

A Randomized Trial of Vitamin C and E Supplementation in the Prevention of Recurrence of Colorectal Polyps. GAIL E. MCKEOWN-EYSEN, PH.D.,*† CATHY HOLLOWAY, M.Sc.,* VARTOUI JAZMAJI,* PETER DION, PH.D.,* AND W. ROBERT BRUCE, M.D., PH.D.,‡ *Ludwig Institute for Cancer Research, Toronto Branch, 9 Earl Street, Toronto, Ontario M4Y 1M4, †Department of Preventive Medicine & Biostatistics, University of Toronto, McMurich Building, 4th Floor, 12 Queen's Park Crescent West, Toronto M5S 1A8, and ‡Department of Medical Biophysics, University of Toronto, 500 Sherbourne Street, Toronto, Ontario M4X 1K9, Canada.

Because supplements of vitamins C and E had reduced the level of fecal mutagen in stool (1, 3), a double-blind randomized trial was designed to examine the effects of vitamins C and E on the rate of colorectal polyp recurrence in persons who had had at least one adenomatous polyp removed by polypectomy (2). Two hundred patients who were free of polyps after polypectomy were randomized to receive either a supplement of 400 mg each of ascorbic acid and α -tocopherol or a placebo. After 2 years, patients were examined by colonoscopy to establish whether polyps had recurred. Polyps were observed in the second colonoscopy in 30.2% of eligible subjects who had received vitamins and 38.2% of those who had received placebos, leading to a relative risk estimate of 0.79. After adjustment for differences between groups in dietary factors before study entry, the relative risk of polyp recurrence was 0.82 with 95% confidence limits from 0.61 to 1.33. These findings suggest that polyp recurrence may be reduced by about 20% with vitamin supplementation, but a larger study would be required to rule out the possibility that this was a chance finding.

REFERENCES

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2. Bruce, W. R., McKeown-Eyssen, G., Ciampi, A., Dion, P., and Boyd, N. Strategies for dietary intervention studies in colon cancer. *Cancer* 47, 1121-1125 (1981).
3. Dion, P. W., Bright-See, E. B., Smith, C. C., Furrer, R., Eng, Z., and Bruce, W. R. The effect of dietary ascorbic acid and α -tocopherol on fecal mutagenicity. *Mutat. Res.* 102, 27-37 (1982).

Dietary Risk Associated With Colon Cancer in a Low-Risk Population. DEE W. WEST, PH.D.,* KATHARINA SCHUMAN, PH.D.,* LINDA ROBISON, M.S.P.H.,* MARTY SLATTERY, PH.D.,* ANN SORENSEN, PH.D.,† ART MAHONEY, PH.D.,‡ AND JOSEPH L. LYON, M.D., M.P.H.,* *University of Utah, Department of Family and Preventive Medicine, University of Utah School of Medicine, 50 North Medical Drive, Salt Lake City, Utah 84132, †Johns Hopkins University, School of Hygiene and Public Health, Department of Epidemiology, Baltimore, Maryland 21205, and ‡Utah State University, Department of Nutrition and Food Sciences, Logan, Utah 84322.

A population-based case-control study was conducted in Utah's low-risk population (1, 2) to identify dietary risk and protective factors for colon cancer. White men and women, ages 40-79, were interviewed. Cases were histologically confirmed first primary colon cancer cases; 231 cases were interviewed (71% of those identified). Controls were identified through random-digit dialing with 391 being interviewed (74%). A complete dietary history (3) was collected with the data later converted to nutrients. Data were analyzed by anatomical site and sex. Multiple logistic regression analysis was used to control for confounding. A protective effect was seen for fiber regardless of anatomical site but was significant only for men (OR = 0.34). Fiber was also an important confounder for other variables and was controlled in other analyses where appropriate. No dietary variables were important for women. Among men, fat was the strongest risk factor, but mostly for patients with cancer in the ascending colon. The risks were highest for unsaturated fats (OR = 6.2 and 8.8 for monounsaturated and polyunsaturated, respectively). A twofold risk was seen for both calories and protein, but only in the descending colon for protein. No effect was seen for carbohydrates, vitamin A, or vitamin C. A slight protective effect was seen for cruciferous vegetables. Alcohol and caffeine were slight risk factors regardless of tumor location. It is concluded that dietary effects on colon cancer may be sex-specific and vary by location of the tumor in the colon.

REFERENCES

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Serum Carotenoids, Vitamin E, and Selenium as Predictors of Cancer Death. JOHN E. CONNETT, PH.D.,* MARCUS KJELSBURG, PH.D.,† LEWIS KULLER, PH.D.,† D.P.H., AND GARY COLLINS.†
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Serum samples from participants (men ages 35–57 with elevated levels of risk factors for coronary heart disease) in the Multiple Risk Factor Intervention Trial (MRFIT) were collected at baseline and stored at -50°F . Subsequently (1973–1983), 156 of these men died from cancer. A case-control study was undertaken with two controls matched to each case on the basis of age, smoking status, MRFIT clinic, date of randomization, and treatment group. Assays were done of serum specimens for total carotene, β -carotene, retinol, retinol-binding protein, α -tocopherol, and selenium for both cases and controls. Mean levels of total carotene were significantly lower in lung cancer cases ($n = 65$) than in their associated controls. A similar but weaker trend was seen for β -carotene. Matched logistic analyses, controlling for alcohol use, cigarettes per day, and serum cholesterol, also indicated inverse relationships between total carotene ($P = 0.009$) and β -carotene ($P = 0.04$) and lung cancer risk. For other cancer sites and for all sites combined there were no significant case-control differences in total carotene or β -carotene. There was no evidence of associations between risks of cancer and levels of serum retinol, retinol-binding protein, α -tocopherol, or selenium.

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SELECTED POSTERS

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These papers are being published in the journal
. Preventive Medicine, Vol. 16, No. 2, 1987

Behavior Change among Homosexual College Students to Decrease the Risk for Acquired Immune Deficiency Syndrome. JEAN L. RICHARDSON, DR.P.H.,* JACQUELINE SCHOTT, PH.D.,† KIMBERLY A. MCGUIGAN,* AND ALEXANDRA M. LEVINE, M.D.,‡ *Department of Preventive Medicine, University of Southern California, Los Angeles, California 90033, †604 S. Saltair Ave., Los Angeles, California 90049, and ‡Department of Medicine, University of Southern California, 1995 Zonal Ave., Ste. 500, Los Angeles, California 90033.

It is important to assess the changes in behaviors shown to increase the risk for acquired immune deficiency syndrome (AIDS) and to develop effective ways to influence these behaviors (1-3). The purposes of this study were, first, to assess the beliefs among homosexual college students about and extent of changes in sexual behavior to decrease the risk of AIDS. Second, we examined the influence of knowledge, mood, demographic characteristics, and social interactions on behavior change. We surveyed 95 homosexual college students. The questionnaire consisted of approximately 70 closed-ended questions. A *t* test for difference in risk behaviors indicated no decrease in rectal/anal sexual practices ($t = 1.45$, n.s.) but a significant difference in anonymous sexual relations ($t = 4.59$, $P < 0.0001$). Subjects who reduced or did not engage in anonymous sexual interactions had higher levels of social support, had less disturbed mood, and overestimated the number of AIDS cases in the United States (Wilks $\lambda = 0.763$, $P = 0.0091$). Subjects who reduced or did not engage in rectal/anal sexual practices viewed this behavior as higher risk, had higher levels of self-efficacy, had higher levels of social support, overestimated the number of AIDS cases in the United States, and had lower levels of personal fear/susceptibility (Wilks $\lambda = 0.742$, $P = 0.0090$). There is a low level of personal concern and a modest level of behavior change among homosexual college students to reduce the risk of AIDS. Changes in rectal/anal sexual relations seem to be related more to cognitive beliefs, and changes in anonymous sexual relations seem to be more related to affective states. These findings should be used as a basis for planning interventions to reduce the risk for AIDS among college populations.

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Cholecystectomy and Colorectal Cancer: A New Large Study. GARY D. FRIEDMAN, M.D., M.S., MARILYN K. GOLDBABER, M.P.H., AND CHARLES P. QUESENBERRY, PH.D., Division of Research, Kaiser Permanente Medical Care Program, 3451 Piedmont Avenue, Oakland, California 94611.

To determine whether cholecystectomy predisposes to large bowel cancer we performed a case-control study among subscribers of the Kaiser Permanente Medical Care Program in Northern California. Cases and controls were identified in the years 1971 and 1984 and numbered 5,898 and 27,677, respectively. Conditional logistic regression analysis was conducted within strata defined by age, residence area, membership during year of cancer diagnosis, and year of joining the program. Cholecystectomy was sought in a virtually complete file of these operations (numbering 28,095) in the program between 1948 and 1982. Cholecystectomy had been performed in the following percentages of subjects: all cases, 3.0%; right colon, 3.6%; left colon, 3.1%; rectum, 2.2%; and all controls, 2.8%. Confidence intervals for sex- and site-specific relative risks all included 1.0. We could not confirm the more-often-reported increased risk for right-sided colon cancer in women (odds ratio 1.1, 95% confidence limits 0.8, 1.6). The discrepant results from several studies (1-5) need explanation. Many persons with gallstones do not undergo cholecystectomy. We propose that a propensity among either patients or care providers to pursue diagnosis and treatment of abdominal symptoms aggressively may explain the apparent association in some settings. This could be tested in studies showing the association by restricting attention to fatal cases of cancer.

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13. *Variations in Lung Cancer Cell Type among Women*. HEATHER G. STOCKWELL, SC.D.,* GARY H. LYMAN, M.D., M.P.H.,† AND JOHN T. PETERS,* *College of Public Health, 13301 N. 30th Street, and †College of Medicine, 12901 N. 30th Street, University of South Florida, Tampa, Florida 33612.

It has been suggested that the distribution of lung cancer cell types varies between male and female cigarette smokers (1-3). To investigate this possibility, all cases of carcinoma of the lung occurring among Florida residents from 1981 to 1983 were identified. In total, 8,351 cases of carcinoma of the lung were diagnosed among female, and 17,047 cases among male, residents of Florida. Of the women, 1,313 were nonsmokers, as were 1,478 of the men. Among women, 47% of the nonsmokers and 30% of the smokers developed adenocarcinomas. Small-cell carcinomas showed the greatest increase among smoking women, from 12% among nonsmoking women to 24% among smokers. Little variation in squamous cell carcinomas was observed. Among male nonsmokers, squamous cell carcinoma and adenocarcinoma appeared with equal frequency. Among men who smoked, squamous cell carcinomas became the predominant cell type (39%) with small-cell carcinomas (17%) less important. Little variation was observed by race, number of cigarettes smoked, or currency of smoking for either sex. These data suggest a differing response to cigarette smoke among women compared with that among men. Women develop adenocarcinomas much more frequently than do men, regardless of the number of cigarettes smoked. Among men, squamous cell carcinomas appear to be the predominant cell type developing in response to cigarette smoke. Among women, small cell carcinomas, rather than squamous cell carcinomas, become more frequent.

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Sigmoidoscopy and Mortality from Colorectal Cancer: The Kaiser Permanente Multiphasic Evaluation Study. JOE V. SELBY, M.D., M.P.H., AND GARY D. FRIEDMAN, M.D., M.S., Division of Research, Kaiser Permanente Medical Care Program, 3451 Piedmont Avenue, Oakland, California 94611.

The Kaiser Permanente Multiphasic Evaluation Study (2, 4) is often cited as evidence that screening sigmoidoscopy lowers mortality from colorectal cancer (1, 3). Because previous reports have not clearly established that sigmoidoscopy was the effective agent in reducing study group mortality, we reviewed the 110 incident cases of colorectal cancer occurring in the cohort from randomization in 1965 through 1982 for tumor location, stage, mode of discovery, and present mortality status. We also reanalyzed chart review data for each cohort member for the years 1965-1974 to determine exposure to sigmoidoscopy among study and control group members. Study group members had both a lower incidence ($P = 0.10$) and a better stage distribution ($P = 0.01$) than control group members for tumors within reach of the sigmoidoscope. However, chart review data showed that only 25% of study group members were ever exposed to a screening sigmoidoscopy compared with 18% of controls. This small difference does not explain the study group's improved stage distribution or lower mortality. No difference between groups was found in the rate of removal of colorectal polyps. The Multiphasic Evaluation Study was not designed to evaluate the effectiveness of screening sigmoidoscopy, and its results should not be used for this purpose.

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Computers in Cancer Control. THOMAS A. MARCINIAK, National Cancer Institute, Division of Cancer Prevention and Control, Bethesda, Maryland 20892-4200.

Computers can contribute to cancer control. We are developing practical, integrated, and flexible computer systems for the following subdivisions of cancer care: (a) *education*: PDQ/MUMPS (1) is a stand-alone version of the Physician Data Query System, the National Cancer Institute's state-of-the-art cancer information data base; (b) *evaluation*: the Tumor Registry Automation Program (TRAP) (2) is a flexible computer program for the tumor registry that satisfies all American College of Surgeons' and SEER requirements; (c) *research*: researcher is a computer system for clinical research data management, statistical analysis, and graphics based on CLINFO (4); and (d) *practice*: we are expanding TRAP to provide more extensive support for ongoing cancer care through medical oncology, radiation oncology, and cancer surgery subsystems (3). All of the systems described above are demonstrable now, are run on inexpensive personal computers, and use public domain software.

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Methodology of Dietary Fiber Supplementation to Lower Colon Cancer Risk. E. E. HO, PH.D., C. ABRAMS, R.N., AND F. MEYSKENS, JR., M.D., Arizona Cancer Center, 1501 N. Campbell Ave., Room 6335, University of Arizona, Tucson, Arizona 85724.

Sequential studies were designed to evaluate the feasibility of dietary fiber supplementation for colon cancer prevention in the elderly (a population at high risk due to increased age). The first study involved a randomized mail survey ($n = 329$) in a retirement community adapted from Dillman's method (2). Valid and reliable instruments were developed to assess knowledge, attitude, and behaviors related to prevention behavior based on a compliance prediction model (1). The second study was a 3-month fiber supplementation trial in three groups ($n = 60$ in each): group A, supplements plus education; group B, supplements only; and group C, control. Results from the mail survey showed that current knowledge about colon cancer was the best predictor of a subject's willingness to participate in the prevention program ($P < 0.001$) and self-perceived success in such a program ($P < 0.001$). Findings from the supplementation trial demonstrated the cost effectiveness of a well-planned intervention program (3).

	Group A (suppl. + edu.)	Group B (suppl. only)	Group C (control)
Compliance to regimen intake (% subjects)	93%	48%	7%
Operational cost per regimen complier with >50% dose daily	\$51	\$66	\$91

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Acceptance of Mammography among Minorities in Los Angeles. SARAH A. FOX, ED.D.,* AND NANCY J. WORTHEN, M.D.,† *Department of Family Medicine, BH 134, CHS, University of California, Los Angeles, 10833 Le Conte Ave., Los Angeles, California 90024, and †Department of Radiology, Harbor-UCLA Medical Center, 1000 W. Carson So., Torrance, California 90509.

Screening mammography is currently one of the most underutilized technologies in cancer detection (2, 4). The reasons behind this underutilization are complex and related to both the physician's and the patient's understanding and appreciation of mammography (1, 3). One frequently cited reason by physicians for low referral rates is uncertainty about how patients experience mammography and whether there is a problem with the patient's acceptance of the procedure (3, 5). This cross-cultural survey of women immediately postmammogram explores the issue of acceptance among 224 users at a large county facility. Thirty-minute bilingual interviews documented the mammogram experience with a sample of white (28%), black (28%), Hispanic (32%), Asian (2.2%), and mixed-race (8.9%) women. The respondents were most likely (33%) to describe the overall experience as "necessary" and "good for them," something akin to a 6-month dental checkup. Only 20% of the responses were negative, i.e., "frightening" (9.8%) or "uncomfortable" (11.2%). Fifty percent of the sample had no concerns. Two-thirds described it as positive or as a typical doctor's appointment. Only 4% of the sample labeled the appointment a negative experience. Another indication of the overall high acceptability of mammography was that 80% of the respondents did not identify any disadvantages of mammography and instead identified many advantages, including early detection, identification of problems, and reassurance. In sum, this survey clearly supports the hypothesis that the low utilization of mammography has to do more with physicians' than with patients' issues. The patients in this survey find the experience of mammography acceptable or even positive, and 75% of them plan future mammograms.

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Self-Examination Practices among Women Frequently Screened for Breast Cancer. RUBIE T. SENIE, PH.D.,*† JOYCE HAUSDORFF, ED.D., R.N.,‡ LOUIS VENET, M.D.,*†§ AND PHILLIP STRAX, M.D.,§ *Mount Sinai School of Medicine, 1 Gustave Levy Place, New York, New York 10029, †Beth Israel Medical Center, First Avenue and 16th Street, New York, New York 10003, ‡Downstate Medical Center, State University of New York, 450 Clarkson Avenue, Brooklyn, New York 11203, and §The Guttman Institute, 3 West 35th Street, New York, New York 10001.

Prior to initiating a study of breast self-examination (BSE) methodology, a survey to obtain baseline parameters of breast cancer screening behavior was conducted among women attending the Guttman Institute of New York. Questionnaires were returned by 71% of the 1,200 women randomly selected from 30,000 who had received mammography, clinical exam, and instruction in self-examination within the preceding 24 months. Multiple breast cancer screenings at Guttman Institute were reported by 75% of the respondents; of these, 78% indicated additional annual clinical breast evaluations by a personal physician. All but 10% indicated some exposure to BSE instruction with 34% having been taught both privately and through mass media. Only 49% of this well-screened population reported performing BSE either monthly (34%) or occasionally (15%), frequencies comparable with population-based surveys. Responses to questions with diagrams revealed that 55% correctly identified the use of finger pads for palpation; 68% selected the correct hand and arm positions. Respondents who performed BSE competently and confidently were more likely to have received reinforcement through multiple exposures to BSE instruction and frequent breast cancer screening. Our current studies of BSE are directed at decreasing complexity of the procedure to increase acceptance of self-examination as an adjunct to mammography and clinical evaluation in the early detection of breast cancer.

A Colorectal Cancer Prevention and Screening Program in Community Black Churches. KELLY L. CHOI, MARY E. MITCHELL-BEREN, M.S., AND MAX E. DODDS, M.D., Hurley Medical Center, One Hurley Plaza, Flint, Michigan 48502.

Black Americans have had a significantly higher increase than whites of colorectal cancer incidence and related mortality (1). The black church has been identified as a means of promoting health issues and intervention programs (2, 3). The purpose of this study was to implement and evaluate a colorectal cancer prevention and screening program developed at a midwestern community medical center. The program consisted of educational, screening, and evaluation components. The screening component distributed 1,488 Coloscreen III kits. A telephone survey was conducted to examine demographic profiles, attitudes, and behaviors of returners (17.5%) and nonreturners (82.5%) of the Coloscreen III test. The survey revealed that the majority of returners and nonreturners felt that the test could detect bowel cancer and that early detection could result in cure. The returners were significantly older and reportedly less likely to smoke. The low response was attributed primarily to the test's dietary requirements. In response to the educational component, both groups reportedly made changes in their lifestyles, that is, they increased fiber intake and decreased fat intake, alcohol consumption, and smoking. Even with low response, educational benefits were found; however, if colorectal screening programs in black churches are to be effective, diet-related issues must be addressed.

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Risk-Related Patient Recruitment Increases Cancer Yield. MARILYN HALPER, M.P.H., AND KAREN DIEMER, M.P.H., Preventive Medicine Institute/Strang Clinic, 55 East 34th Street, New York, New York 10016.

Previous high-risk recruitment strategies based on age alone at a nurse-conducted, multisite cancer screening clinic yielded six major cancers per 1,000 patients screened. Although these cancer detection rates compared favorably to physician-conducted diagnostic examinations which yielded only four major cancers per 1,000 patients screened, we hypothesized that recruitment of high-risk individuals, as defined by their family history of cancer, would yield improved detection rates (3). Studies of site-specific cancer report a two- to fourfold increase in colorectal, breast, and other cancers when one first-degree relative is affected (1, 4). There is no information about the frequency with which screening should be performed in first-degree relatives or about expected cancer detection rates when a multisite cancer screening clinic screens a high-risk family history population (2). Patients were recruited and screened over a 12-month period if they reported a family history of cancer. Those who reported two first-degree relatives with a major form of cancer were given preferential appointments. Seven hundred thirty-four patients screened yielded increased cancers detected when compared with previous in-house experience. Major cancers detected rose to 12.26 per 1,000 patients screened. This represents a doubling of the rate of major cancers detected as compared with nurse-conducted multisite screening of a high-risk population based on age, and a threefold increase when compared with detection rates by a physician's diagnostic examination. Our results suggest that cancer detection rates can be considerably improved by selective screening of high-risk individuals who report first-degree relatives with a major form of cancer.

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Endometrial Cytohistology by Pistol Aspiration: Clinical and Screening Applicability. C. BOUCHARDY, M.D.,* P. VASSILAKOS, M.D.,† AND G. RIOTTON, M.D.,‡ *Registre Genevois des Tumeurs, Bd. de la Cluse 55, CH-1205 Geneva, †Centre de Cytologie et de Dépistage du Cancer, Bd. de la Cluse 51, CH-1205 Geneva, and ‡Ch. de la Grabelle 20bis, 1224 Geneva, Switzerland.

It has been shown over the past few years that early detection of cancer of the cervix uteri by cytology, if well conducted, induces a decrease in mortality and incidence of invasive cancers (1, 3). For cancer of the uterine corpus, feasibility is yet to be determined (4). The purpose of this study is twofold: first, to assess the value of the endometrial pistol aspiration technique as an office procedure for preliminary diagnosis of cancer of the corpus uteri in symptomatic women, and second, to discuss the applicability of this procedure to screening asymptomatic women. This study of 3,000 pistol aspirations in symptomatic outpatients during 1974–1981 in Geneva shows that this method (which has both a high specificity and a high sensitivity) can be used for such women as a preliminary diagnostic procedure. A study of resident incident cases shows that 82% were localized to the uterus, and more than 85% of these were already symptomatic. Older women, who are at higher risk, represent particularly difficult cases, in terms of both technical (cervical stenosis) and recruitment problems. Furthermore, the nomenclature and the natural history of these precancerous lesions are not yet well established (2, 5). The application of this method to systematic population screening of asymptomatic women is therefore questionable.

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U.S. Healthcheck: IPA/HMO-Based Breast Cancer Screening and Detection. R. MYERS, P. ENGSTROM, AND J. ROSAN, Fox Chase Cancer Center. Philadelphia, Pennsylvania 19111.

This paper reports on U.S. Healthcheck, a program developed by Fox Chase Cancer Center (FCCC) and HMO PA/NJ to reduce breast cancer morbidity and mortality among 84,000 women 40 years of age and older who are members of HMO PA/NJ, and IPA/HMO. In U.S. Healthcheck, a breast cancer risk assessment questionnaire and reminder card is mailed; a mammography authorization form is provided; women who return the questionnaire and their primary physicians are notified of results; and abnormal mammography findings are followed up by FCCC and the primary physician. Between April and July 1986, U.S. Healthcheck mailed 7,874 risk assessment questionnaires. Of these, 2,538 (32.2%) were returned, with 1,142 (45.0%) of the returns generated through reminder card mailings. Of 1,997 mammogram authorizations provided, 792 (39.7%) were used to have mammograms done. Thirty (3.9%) of the mammograms were abnormal. These data show that participation, i.e., level of questionnaire return, is comparable with that found with other "no precontact" mailed questionnaires (2). As expected, the effect of reminder cards on participation was strong (3). Finally, the level of mammogram compliance was only slightly lower than that found with direct physician referrals (1). HMO PA/NJ and FCCC is conducting research to improve participation and compliance in the screening program.

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