

Permanente Abstracts

The fifteen abstracts included in this issue testify to the quality, breadth, and significance of research undertaken in Kaiser Permanente. Six studies reinforce the importance of epidemiological studies to determine innovative strategies for cancer prevention. In these, the role of clinician as educator and counselor is of primary importance. Others demonstrate the nuances of patient satisfaction and the role of gender in health care utilization. One study highlights the effectiveness of physician and patient education in managing adolescent depression. A medical anthropology study examines busy women's use of prescription and over-the-counter medicines to provide quick symptom relief for themselves and their children. These research results, published in leading medical journals, emphasize the special contributions that research undertaken in the living laboratories of Kaiser Permanente contributes to the science and art of medicine.

Decreasing Antibiotic Use in Ambulatory Practice: Impact of a Multidimensional Intervention on the Treatment of Uncomplicated Acute Bronchitis in Adults

Gonzales R; Steiner JF; Lum A; Barrett PH Jr; *JAMA* 1999 Apr 28;281(16):1512-9.

Context: The emergence and spread of antibiotic-resistant *Streptococcus pneumoniae* in US communities is due, in part, to the excessive use of antibiotics for acute respiratory tract infections.

Objective: To decrease total antibiotic use for uncomplicated acute bronchitis in adults.

Design: Prospective, nonrandomized controlled trial, including baseline (November 1996—February 1997) and study (November 1997—February 1998) periods.

Setting: Four selected primary care practices belonging to a group-model health maintenance organization in the Denver, Colorado, metropolitan area.

Participants: Consecutive adults diagnosed as having uncomplicated acute bronchitis. A total of 2462 adults were included at baseline and 2027 adults were included in the study. Clinicians included 56 physicians, 28 physician assistants or nurse practitioners, and 9 registered nurses.

Intervention: The full intervention site received household and office-based patient educational materials, as well as a clinician intervention consisting of education, practice-profiling, and academic detailing. A limited intervention site received only office-based educational materials, and control sites provided usual care.

Main Outcome Measure: Antibiotic prescriptions for uncomplicated acute bronchitis during baseline and study periods.

Results: Antibiotic prescription rates for uncomplicated acute bronchitis were similar at all four sites during the baseline period. During the study period, there was a substantial decline in antibiotic prescription rates

at the full intervention site (from 74% to 48% [P = .003]), but not at the control and limited intervention sites (78% to 76% [P = .81] and 82% to 77% [P = .68], respectively). Compared with control sites, changes in nonantibiotic prescriptions (inhaled bronchodilators, cough suppressants, and analgesics) were not significantly different for intervention sites. Return office visits (within 30 days of the incident visit) for bronchitis or pneumonia did not change significantly for any of the sites.

Conclusions: Antibiotic treatment of adults diagnosed as having uncomplicated acute bronchitis can be safely reduced using a combination of patient and clinician interventions.

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Choice of a Personal Physician and Patient Satisfaction in a Health Maintenance Organization

Schmittiel J; Selby JV; Grumbach K; Quesenberry CP Jr; *JAMA* 1997 Nov 19;278(19):1596-9. [Published erratum appears in *JAMA* 1998 Mar 4;279(9):656.]

Context: Being able to choose one's health care plan has been shown to increase subsequent patient satisfaction with the plan, but it is not known whether choosing one's own primary care physician affects patient satisfaction with the physician.

Objective: To compare satisfaction with care between members of a group-model health maintenance organization (HMO) who chose their primary care physician and members who were assigned a physician.

Design: Cross-sectional mailed survey with response rate of 71.4%.

Setting: A large group-model HMO in northern California.

Main Outcome Measure: Nine questions on satisfaction with the primary care physician.



Subjects: Random sample of HMO members 35 to 85 years of age who were impaneled with a primary care physician.

Results: Among the 10,205 survey respondents, patients who chose their personal physician (n=4748) were 16 to 20 percentage points more likely to rate their satisfaction as "excellent" or "very good" than patients who were assigned a physician (n=5457) for nine satisfaction measures (P<.001 for each comparison). The association of choice with satisfaction was not due to physicians with higher patient satisfaction being chosen more often, or to differences in patient demographic or socioeconomic characteristics, health values, or health beliefs, or to differences in physician demographics or specialty. In a logistic regression model that adjusted for all of these characteristics, having chosen one's physician was the single predictor most strongly related to having high overall satisfaction (odds ratio, 2.18, 95% confidence interval, 1.95-2.42).

Conclusion: These results suggest that even in a setting of limited physician choice, the opportunity to select one's personal physician may influence subsequent satisfaction.

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Public Health in Managed Care: A Randomized Controlled Trial of the Effectiveness of Postcard Reminders

Clayton AE; McNutt LA; Homestead HL; Hartman TW; Senecal S; Am J Public Health 1999 Aug;89(8):1235-7.

Objectives: This study evaluated the effectiveness of an annual public health intervention in a managed care setting.

Methods: Managed care organization members 65 years and older who received influenza immunization in 1996 were randomized to an intervention group (mailed a postcard reminder to receive an influenza vaccination in 1997) or a control group (no postcard). Vaccination rates for both groups were assessed monthly.

Results: Members receiving the intervention were no more likely to be immunized (78.6%) than members of the control group (77.2%, P=.222). Members were vaccinated at the same pace regardless of vaccination history and postcard intervention status.

Conclusions: Postcard reminders were not an effective intervention among seniors who had been vaccinated the previous year.

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Gender, Psychosocial Factors and the Use of Medical Services: A Longitudinal Analysis

Green CA; Pope CR; Soc Sci Med 1999 May;48(10):1363-72.

Many researchers have reported gender differences in levels of reported symptoms, morbidity, mortality and medical care utilization, but the debate continues about the underlying causes of these differences. Some have argued that women use more medical services because they are more sensitive to symptoms and interested in health, while others believe that women's greater service utilization arises from the fact that women experience more morbidities than do men. To date, these questions have not been studied prospectively. Using data from a household interview survey carried out in 1970-1971 and linked to 22 years of health services utilization records, we explored the effects of gender, self-reported health status, mental and physical symptom levels, health knowledge, illness behaviors and health concerns and interest on the long-term use of health services. After controlling for the aforementioned factors, female gender remained an independent predictor of higher utilization over the 22-year period studied, and psychosocial and health factors measured at the initial interview predicted service use even 19-22 years later. Controlling for factors identified as likely causes of gender-related differences in healthcare utilization, gender remains an important predictor of medical care use before and after removing sex-specific utilization. In addition, the consistent predictive ability of attitudinal and behavioral factors, combined with the finding that health knowledge did not predict utilization, indicates that efforts to help patients assess their service needs should target the attitudinal and behavioral factors that vary with gender, rather than health-related knowledge alone.

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Fast Relief: Buying Time with Medications

Vuckovic N; Med Anthropol Q 1999 Mar;13(1):51-68.

The experience of time famine in contemporary US culture affects household decisions about self-care and the use of pharmaceuticals for self-medication. This article examines the manner in which time demands shape lay interpretations of medi-

cine efficacy and drive increases in medication use for adults as well as children. Medicines, like other time-saving commodities, appear to shift the time-power differential in favor of individuals, placing them in control of how time is spent. When there is "no time to be sick," allopathic medicines become time-saving devices that enable women to fulfill responsibilities at work or home while they attend to sick children or to being ill themselves. Medicines are used to beat the clock by increasing one's own capacity to be productive.

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Differences in Resource Use and Costs of Primary Care in a Large HMO According to Physician Specialty

Selby JV; Grumbach K; Quesenberry CP Jr; Schmittiel JA; Truman AF; Health Serv Res 1999 Jun;34(2):503-18.

Objective: To determine if primary care physician specialty is associated with differences in use of health services.

Data Sources: Automated outpatient diagnostic, utilization, and cost data on 15,223 members (35-85 years of age) of a large group model HMO.

Study Design: One-year prospective comparison of primary care provided by 245 general internists (GIMs), 60 family physicians (FPs), and 55 subspecialty internists (SIMs) with case-mix assessed during a nine-month baseline period using Ambulatory Diagnostic Groups.

Principal Findings: Adjusting for demographics and case mix, patients of GIMs and FPs had similar hospitalization and ambulatory visit rates, and similar laboratory and radiology costs. Patients of FPs made fewer visits to dermatology, psychiatry, and gynecology (combined visit rate ratio: 0.86, 95% CI: 0.74-0.96). However, they made more urgent care visits (rate ratio 1.19, 95% CI: 1.07-1.23). Patients of SIMs had higher hospitalization rates than those of GIMs (rate ratio 1.33, 95% CI: 1.06-1.68), greater use of urgent care (rate ratio: 1.14, 95% CI: 1.04-1.25), and higher costs for pharmacy (cost ratio: 1.17, 95% CI: 0.93-1.18) and radiologic services (cost ratio: 1.14, 95% CI: 1.01-1.30). The hospitalization difference was due partly to the inclusion of patients with specialty-related diagnoses in panels of SIMs. Radiology and pharmacy differences persisted after excluding these patients.

Conclusions: In this uniform practice environment, specialty differences in primary care practice were small. Subspecialists used slightly more resources than generalists. The broader practice style of FPs may have created access problems for their patients.

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Effect of Cigar Smoking on the Risk of Cardiovascular Disease, Chronic Obstructive Pulmonary Disease, and Cancer in Men

Iribarren C; Tekawa IS; Sidney S; Friedman GD; N Engl J Med 1999 Jun 10;340(23):1773-80

Background: The sale of cigars in the United States has been increasing for the past six years. Cigar smoking is a known risk factor for certain cancers and for chronic obstructive pulmonary disease (COPD). However, unlike the relation between cigarette smoking and cardiovascular disease, the association between cigar smoking and cardiovascular disease has not been clearly established.

Methods: We performed a cohort study among 17,774 men 30 to 85 years of age at baseline (from 1964 through 1973) who were enrolled in the Kaiser Permanente health plan and who reported that they had never smoked cigarettes and did not currently smoke a pipe. Those who smoked cigars (1546 men) and those who did not (16,228) were followed from 1971 through the end of 1995 for a first hospitalization for or death from a major cardiovascular disease or COPD, and through the end of 1996 for a diagnosis of cancer.

Results: In multivariate analysis, cigar smokers, as compared with nonsmokers, were at higher risk for coronary heart disease (relative risk, 1.27; 95 percent confidence interval, 1.12 to 1.45), COPD (relative risk, 1.45; 95 percent confidence interval, 1.10 to 1.91), and cancers of the upper aerodigestive tract (relative risk, 2.02; 95 percent confidence interval, 1.01 to 4.06) and lung (relative risk, 2.14; 95 percent confidence interval, 1.12 to 4.11), with evidence of dose-response effects. There appeared to be a synergistic relation between cigar smoking and alcohol consumption with respect to the risk of oropharyngeal cancers and cancers of the upper aerodigestive tract.

Conclusions: Independently of other risk factors, regular cigar smoking can increase the risk of coronary heart disease, COPD, and cancers of the upper aerodigestive tract and lung.

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Predicting Advanced Proximal Colonic Neoplasia with Screening Sigmoidoscopy

Levin TR; Palitz A; Grossman S; Conell C; Finkler L; Ackerson L; Rumore G; Selby JV; JAMA 1999 May 5;281(17):1611-7.

Context: Indications are not well defined for follow-up colonoscopy for all patients with distal colonic tubular adenomas (TAs) found at screening sigmoidoscopy.

Objective: To determine whether distal adenoma size, number, and villous histology, along with family history and age, are predictors of advanced proximal colonic neoplasia.

Design: Cross-sectional analysis conducted between January 1, 1994, and December 31, 1995.

Setting: Large group-model health maintenance organization in northern California.

Patients: A total of 2972 asymptomatic subjects aged 50 years or older undergoing colonoscopy as follow-up to a screening sigmoidoscopy.

Main Outcome Measure: Based on sigmoidoscopy, colonoscopy, and pathology reports, occurrence of advanced proximal neoplasia, defined as adenocarcinoma or TAs 1 cm or larger or with villous features or severe dysplasia located beyond sigmoidoscopic view.

Results: The prevalence of advanced proximal neoplasia was similar among patients with no TAs at sigmoidoscopy, those with TAs less than 1 cm in diameter, and those with TAs 1 cm in diameter or larger (prevalence, 5.3%, 5.5%, and 5.6%, respectively). Of patients with a distal tubulovillous or villous adenoma, 12.1% had advanced proximal neoplasia. In multivariate analyses, having a distal tubulovillous adenoma or villous adenoma was the strongest predictor of advanced proximal neoplasia (odds ratio, 2.30; 95% confidence interval, 1.69-3.14). Age of 65 years or older, having more than 1 adenoma, and a positive family history of colorectal cancer were also significant predictors. Distal adenoma size was not a significant predictor in any multivariate analyses.

Conclusions: Advanced proximal neoplasia is not uncommon in subjects with or without distal TAs, but subjects with advanced distal histology and those older than 65 years are at increased risk. Age-specific screening using sigmoidoscopy starting at ages 50 to 55 years and colonoscopy after age 65 years may be justified.

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Identifying Women with Cervical Neoplasia: Using Human Papillomavirus DNA Testing for Equivocal Papanicolaou Results

Manos MM; Kinney WK; Hurley LB; Sherman ME; Shieh-Ngai J; Kurman RJ; Ransley JE; Fetterman BJ; Hartinger JS; McIntosh KM; Pawlick GF; Hiatt RA; JAMA 1999 May 5;281(17):1605-10.

Context: A Papanicolaou (Pap) test result of atypical squamous cells of undetermined significance (ASCUS) presents a clinical challenge. Only 5% to 10% of women with ASCUS harbor serious cervical disease, but more than one third of the high-grade squamous intraepithelial lesions (HSILs) in screening populations are identified from ASCUS Pap test results.

Objective: To determine whether human papillomavirus (HPV) DNA testing of residual material from liquid-based Pap tests and referral of cases found to be HPV-positive directly to colposcopy could provide sensitive detection of underlying HSILs in women with ASCUS Pap results, compared with repeat Pap testing.

Design and Setting: Natural history of women with ASCUS Pap smear results, all of whom had liquid-based cytology, HPV testing, and subsequent repeat Pap tests and colposcopy with histologic evaluation, conducted at 12 gynecology clinics in a large managed care organization between October 1995, and June 1996.

Participants: From a cohort of 46,009 women who had routine cervical examinations, 995 women with Pap test results of ASCUS who consented to participate were identified.

Main Outcome Measures: Cervical histology, HPV test results, and repeat Pap smear results, and sensitivity of HPV testing to identify patients found to have HSIL+ histology.

Results: Of 995 participants with ASCUS Pap test results, 973 had both a definitive histologic diagnosis and HPV result. Sixty-five (6.7%) had histologic HSIL or cancer. For women with histologic HSIL+, the HPV test was positive in 89.2% (95% confidence interval [CI], 78.4%-95.2%), and the specificity was 64.1% (95% CI, 60.9%-67.2%). The repeat Pap smear result was abnormal in 76.2% (95% CI, 63.5%-85.7%). Triage based on HPV testing only or on repeat Pap testing only would refer similar proportions (approximately 39%) to colposcopy. The sensitivity of HPV DNA testing for HSIL was equivalent to, if not greater than, that of the repeat Pap test. We further estimated that an HPV-based algorithm including the immediate colposcopy of HPV-positive women, and then repeat Pap testing of all others, would provide an overall sensitivity of 96.9% (95% CI, 88.3%-99.5%).

Conclusions: For women with ASCUS Pap tests, HPV DNA testing of residual specimens collected for routine cervical cytology can help identify those who have underlying HSIL. By testing the specimen collected at initial screening, the majority of high-risk cases can be identified and referred for colposcopy based on a single screening.

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Advance Directives are More Likely among Seniors Asked about End-of-Life Care Preferences

Gordon NP; Shade SB; Arch Intern Med 1999 Apr 12;159(7):701-4.

Objectives: To estimate the proportion of seniors in a large health maintenance organization (HMO) who had been asked about their end-of-life care preferences (EOLCPs) by a clinician and who had completed an advance directive (AD). To examine the association of having had an EOLCP discussion and AD completion.

Subjects and Methods: A random sample of HMO members aged 65 years or older were asked to complete a mailed survey about health and health-related issues in 1996. Data provided by 5117 seniors (80% response rate) were used to estimate the prevalence of EOLCP and AD among seniors overall and in specific risk groups. Bivariate and multiple logistic regression models were used to identify predictors of AD completion, especially having been asked about EOLCP.

Results: One third of seniors reported having an AD on file with the HMO, but only 15% had talked with a clinician about EOLCP. Both having been asked about EOLCP and having an AD were positively associated with age, but not significantly associated with sex, race/ethnicity, marital status, or self-rated health status. Having been asked by a clinician about EOLCP was significantly associated with completion of an AD.

Conclusion: Clinicians can play an important role in increasing AD completion rates among seniors by bringing up the subject of EOLCPs.

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Cognitive-Behavioral Treatment of Adolescent Depression: Efficacy of Acute Group Treatment and Booster Sessions

Clarke GN; Robde P; Lewinsohn PM; Hops H; Seeley JR; J Am Acad Child Adolesc Psych 1999 Mar;38(3):272-9.

Objective: This trial examined the effects of both

acute and maintenance cognitive-behavioral therapy (CBT) for depressed adolescents.

Method: Adolescents with major depression or dysthymia (N=123) were randomly assigned to one of three eight-week acute conditions: adolescent group CBT (16 two-hour sessions); adolescent group CBT with a separate parent group; or waitlist control. Subsequently, participants completing the acute CBT groups were randomly reassigned to one of three conditions for the 24-month follow-up period: assessments every four months with booster sessions; assessments only every four months; or assessments only every 12 months.

Results: Acute CBT groups yielded higher depression recovery rates (66.7%) than the waitlist (48.1%), and greater reduction in self-reported depression. Outcomes for the adolescent-only and adolescent + parent conditions were not significantly different. Rates of recurrence during the two-year follow-up were lower than found with treated adult depression. The booster sessions did not reduce the rate of recurrence in the follow-up period but appeared to accelerate recovery among participants who were still depressed at the end of the acute phase.

Conclusions: The findings, which replicate and expand upon a previous study, support the growing evidence that CBT is an effective intervention for adolescent depression.

Maternal Placental Abnormality and the Risk of Sudden Infant Death Syndrome

Li DK; Wi S; Am J Epidemiol 1999 Apr 1;149(7):608-11.

To determine whether placental abnormality (placental abruption or placenta previa) during pregnancy predisposes an infant to a high risk of sudden infant death syndrome (SIDS), the authors conducted a population-based case-control study using 1989-1991 California linked birth and death certificate data. They identified 2,107 SIDS cases, 96% of whom were diagnosed through autopsy. Ten controls were randomly selected for each case from the same linked birth-death certificate data, matched to the case on year of birth. About 1.4% of mothers of cases and 0.7% of mothers of controls had either placental abruption or placenta previa during the index pregnancy. After adjustment for potential confounders, placental abnormality during pregnancy was associated with a twofold increase in the risk of SIDS in offspring (odds ratio = 2.1, 95% confidence interval 1.3-3.1). The individual effects of placental abruption and placenta previa on the risk of SIDS did not differ significantly. An im-

paired fetal development due to placental abnormality may predispose an infant to a high risk of SIDS.

Alcohol Consumption and Breast Cancer Oestrogen and Progesterone Receptor Status

Enger SM; Ross RK; Paganini-Hill A; Longnecker MP; Bernstein L; *Brit J of Cancer* 1999 Mar; 79(7-8):1308-14.

We examined the role of alcohol on the risk of breast cancer by the joint oestrogen receptor (ER) and progesterone receptor (PR) status of the tumour using data from two case-control studies conducted in Los Angeles County, USA. Eligible premenopausal patients were 733 women aged \leq 40 years and first diagnosed from 1 July 1983, to 1 January 1989. Eligible postmenopausal patients were 1169 women aged 55-64 years and first diagnosed from 1 March 1987 to 31 December 1989. Patients were identified by the University of Southern California Cancer Surveillance Program. Neighbourhood controls were individually matched to patients by parity (premenopausal patients) and birth date (\pm 3 years). ER and PR status were obtained from medical records for 424 premenopausal and 760 postmenopausal patients. The analyses included 714 premenopausal and 1091 postmenopausal control subjects. Alcohol use was generally not associated with premenopausal risk of breast cancer, regardless of hormone-receptor status. Among the postmenopausal women, those who consumed, on average, \geq 27 g of alcohol/d experienced an odds ratio (OR) of 1.76 [95% confidence interval (CI) 1.14-2.71] for ER-positive/PR-positive breast cancer relative to women who reported no alcohol consumption. Alcohol use was less clearly associated with risk of other receptor types among postmenopausal women. These data suggest that alcohol may preferentially increase risk of ER-positive/PR-positive breast cancer in postmenopausal women.

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Relationships Between Duration of Asthma and Asthma Severity among Children in the Childhood Asthma Management Program

Zeiger RS; Dawson C; Weiss S; *J Allergy Clin Immunol* 1999 Mar; 103(3 Pt1):376-87.

Background: Many factors, including heredity, atopic status, and environment, have been implicated in the determination of asthma severity. Relatively

little is known about the degree to which asthma duration influences asthma severity.

Objective: The Childhood Asthma Management Program (CAMP), consisting of 1041 children (age 8.9 \pm 2.1 years at enrollment) with mild-to-moderate asthma, offers an opportunity to examine the relationship between asthma duration and asthma severity.

Methods: By using the extensive CAMP baseline cross-sectional data on asthma duration, spirometry, bronchial responsiveness, symptomatology, and markers of atopy, univariate and multivariate regression models were used to evaluate whether asthma duration is associated with asthma severity.

Results: Duration of asthma in the study cohort from time of diagnosis until randomization into CAMP ranged from 0.3 to 12.1 years (mean, 5.0; SD, 2.7; median, 4.8). Asthma duration is associated in univariate analyses both with lower levels of several lung functions ($P < .001$), including methacholine bronchial reactivity (natural log [ln] FEV1 PC20, mg/mL; $r = -0.112$), prebronchodilator and postbronchodilator percent predicted FEV1 ($r = -0.176$ and $r = -0.130$, respectively), and prebronchodilator and postbronchodilator FEV1/forced vital capacity (FVC) (%) ($r = -0.237$ and $r = -0.211$, respectively), as well as higher levels of symptoms (symptom score: $r = 0.147$, $P < .001$) and borderline greater use of albuterol for symptoms ($r = 0.058$, $P = .064$) during a 28-day screening period before randomization. Simple linear regression detected the following differences in lung functions per year of asthma duration: ln FEV1 PC20, -0.050 mg/mL/y; prebronchodilator FEV1, -0.907 percent predicted/y; and prebronchodilator FEV1/FVC, -0.729 percent predicted/y. After controlling for potential explanatory variables (atopy, inflammatory markers, household Der p 1 levels, anti-inflammatory medication use, and clinical center), regression models revealed that the duration of asthma remained significantly and independently associated with ln FEV1 PC20 ($P = .004$), prebronchodilator percent predicted FEV1 ($P = .043$), and prebronchodilator and postbronchodilator FEV1/FVC (%) ($P < .001$), as well as being positively associated with mean daily symptom score ($P < .001$) and albuterol use for symptoms ($P = .003$) during a 28-day screening period. Duration was also found to be significantly associated with physician/nurse assessment of asthma severity and other historical measures of medication use.

Conclusions: These data demonstrate that asthma duration is associated with lower lung function, greater

methacholine responsiveness, more asthma symptomatology, and greater use of as-needed albuterol, which are all measures of asthma severity. As such, early diagnosis and intervention may be necessary to ameliorate these adverse effects of persistent asthma.

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Computer-Assisted Health Counselor Visits: A Low-Cost Model for Comprehensive Adolescent Preventive Services

Paperny DM; Hedberg VA; Arch Pediatr Adolesc Med 1999 Jan; 153(1):63-7.

Objective: To evaluate a low-cost strategy for providing preventive health services to adolescents using computerized health assessments with individualized educational videos, trained health counselors, and nurses.

Design: Feasibility study, cost analysis, and comparative evaluation of health problems identified, guidance delivered, and patient satisfaction.

Setting: Eleven sessions at nontraditional sites including schools, universities, shopping malls, and after-hours clinics on Oahu, Hawaii.

Participants and Intervention: Adolescents (N=258, mean age 17 years) completed confidential computerized health assessments, received individualized feedback, and viewed automatically selected educational videos on a laptop computer. The computer additionally printed a prioritized problems list for the graduate student-level health counselor to

review with the adolescent. The counselor subsequently reviewed each encounter with a nurse-educator who performed further counseling and physical examinations when indicated.

Results: Visit length averaged 44 minutes. Subjects spent an average of 21 minutes completing the automated health assessment and viewing interactive multimedia and 15 minutes with the health counselor. One third of subjects required further evaluation and counseling by the nurse (average, 8 minutes). A team of two counselors and one nurse provided comprehensive screening, health counseling, and physical examinations to one patient every ten minutes at a salary cost of \$7.46 per visit. This model identified risk behaviors at levels consistent with local behavioral data, and addressed and documented them significantly more often than do physicians in traditional settings. Subjects (71%) preferred the computer-assisted visits to standard office visits, and 92% felt the amount of time spent was acceptable.

Conclusions: Computer-assisted delivery of adolescent preventive services using nonphysician health counselors is a feasible, economical, and acceptable alternative to traditional clinical practice for screening young people for health-compromising behaviors and providing individualized health education and routine physical examinations. This model would likely increase adolescents' access to needed preventive services at a very modest cost.

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The Checkered Flag

Desire is the key to motivation, but it's the determination and commitment to an unrelenting pursuit of your goal—a commitment to excellence—that will enable you to attain the success you seek.

Mario Andretti