



Permanente Abstracts

Abstracts of articles authored or coauthored by Permanente clinicians.

From Northern California:

Assessing costs and cost effectiveness of pneumococcal disease and vaccination within Kaiser Permanente

Black S, Lieu TA, Ray GT, Capra A, Shinefield HR. Vaccine 2000 Dec 8; 19 Suppl 1:S83-6

OBJECTIVE: To review studies of the costs of pneumococcal disease and the cost effectiveness of pneumococcal conjugate vaccination conducted in association with the Kaiser Permanente Pneumococcal conjugate Efficacy Trial.

RESULTS: For each birth cohort of 3.8 million infants, routine pneumococcal conjugate vaccination program for healthy infants would prevent more than 12,000 (78% of potential) meningitis and bacteremia cases, 53,000 (69% of potential) pneumonia cases, and one million (8% of potential) otitis media episodes. Before accounting for vaccine costs, the vaccination program would reduce the costs of pneumococcal disease by \$342 million in medical and \$415 million in work-loss and other costs. Vaccination of healthy infants would result in net savings for society if the vaccine cost less than \$46 per dose, and net savings for the health care payer if the vaccine cost less than \$18 per dose.

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From Northern California:

An evaluation of a nurse case-managed program for children with diabetes

Carvalho JY, Saylor CR. Pediatr Nurs 2000 May-June; 26(3):296-302

This study evaluates an integrated model of care for children with diabetes that was developed at a health maintenance organization (HMO). This model program of 56 subjects included a nurse case manager, a multidisciplinary clinic team, and educational and counseling interventions to empower

families to improve self-management of the children's diabetes. The purpose of the program was to improve diabetes self-management as measured by pre- and post intervention glycosylated hemoglobin values, quality of life, and self-efficacy ratings. There were improvements in means of all measures of self-management and a statistically significant improvement in self-efficacy beliefs of the parents. The higher quality of life and self-efficacy ratings are related to adherence to a complex diabetic regimen that is critical to effective self-management. This model provides comprehensive, effective care to a service-intensive population.

From Colorado:

Assisted reproductive interventions and multiple birth(1)

Lynch A, McDuffie R, Murphy J, Faber K, Leff M, Orleans M. Obstet Gynecol 2001 Feb; 97(2):195-200

OBJECTIVE: To investigate the contributions of ovulation-inducing drugs and assisted reproductive technologies to multiple birth.

METHODS: This historic prospective study was conducted in a cohort of 13,151 women who delivered after 20 weeks' gestation between October 1996 and December 1999. The study setting was a Colorado health maintenance organization. Cases were women who were pregnant as a result of exposure to treatment with either assisted reproductive technologies or ovulation induction in the absence of assisted reproductive technologies. The main outcome measure was multiple birth.

RESULTS: There was a significant association between assisted conception and multiple birth. Compared with women with naturally conceived pregnancies, there was a 25-fold likelihood (95% confidence interval 18, 35, $p < .001$) of multiple birth among women exposed to any of those treatments. In the total cohort the proportion of multiple births attributable to those treatments was 33%. After adjusting for the use of assisted conception and other covariates, we found no association between advanced maternal age and multiple birth.

CONCLUSION: In this cohort, assisted repro-

ductive interventions were strongly associated with multiple birth. Although a higher proportion of older women sought assisted reproductive technologies, we did not find an independent relationship between advanced maternal age and multiple birth. The increasing number of multiple births attributable to assisted conception raises public health concerns regarding multiple gestation-related maternal and infant morbidities.

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From Northern California: Ultrasound availability in the evaluation of ectopic pregnancy in the ED: comparison of quality and cost-effectiveness with different approaches

Durston WE, Carl ML, Guerra W, Eaton A, Ackerson LM. Am J Emerg Med 2000 Jul; 18(4):408-17

The liberal use of ultrasonography has been advocated in patients with first trimester cramping or bleeding to avoid misdiagnosis of ectopic pregnancy in the emergency department (ED). The cost-effectiveness of different approaches to ultrasound availability has not been previously reported. In this study, we investigated measures of quality and cost-effectiveness in detecting ectopic pregnancy in the ED over a six-year period, divided into three approximately equal epochs with three distinct approaches to ultrasound availability. The study retrospectively identified 120 cases of ectopic pregnancy seen in the ED over six years. There was significant improvement in the percentage of patients with ectopic pregnancy who were documented to have absence of intrauterine pregnancy (IUP) at the first visit from 76% during Epoch 1, when there was limited availability of ultrasound through medical imaging (MI Sono), to 88% in Epoch 2, when MI Sono was readily available, to 96% in Epoch 3, when both MI Sono and ultrasound by emergency physicians (ED Sono) were readily available ($p = .02$). The estimated



number of MI Sonos ordered by emergency physicians in patients at risk for ectopic pregnancy increased from 5.2 per ectopic pregnancy in Epoch 1 to 11.8 per ectopic pregnancy in Epoch 2, and declined to 5.5 per ectopic pregnancy in Epoch 3, when 19.9 ED Sonos per ectopic pregnancy were also done. The cost of ED Sono in Epoch 3 was more than offset by savings from avoiding calling in ultrasound technicians after regular medical imaging department hours. The specificity of ED Sono in ruling in an IUP was 100% (95% CI 98.3 to 100%), but analysis of secondary quality indicators reflecting times from first ED visit to treatment in Epoch 3 raised the possibility that an adnexal mass or signs of tubal rupture may have been missed on some ED Sonos. We conclude that increased availability of ultrasonography leads to improved quality in the detection of ectopic pregnancy in the ED, but at the expense of a disproportionate increase in the number of ultrasound studies done per ectopic pregnancy detected. Our study suggests that the most cost-effective strategy is for emergency physicians to screen all patients with first trimester cramping and bleeding with ED Sonos, and to obtain MI Sonos at the time of the initial ED visit in all cases in which the ED Sono is indeterminate or shows no IUP.

From Southern California:
Evaluation of a breast cancer patient information and support program

Geiger AM, Mullen ES, Sloman PA, Edgerton BW, Petitti DB. *Eff Clin Pract* 2000 Jul-Aug;3(4):157-65

CONTEXT: Women with newly diagnosed breast cancer seek answers to many questions about their disease, treatment options, and prognosis. Failure to meet these needs may cause dissatisfaction with the care process.

OBJECTIVE: To evaluate the impact of a support and information program for women with newly diagnosed breast cancer.

INTERVENTION: A support and information program that featured a program coordinator, information resources, and mentoring from a breast cancer survivor.

DESIGN AND OUTCOME MEASURES: Women in whom breast cancer was diagnosed at program sites (n = 111) and a random sample of women whose breast cancer was diagnosed at non-program sites (n = 277) were surveyed by mail to ascertain their level of satisfaction with various aspects of their medical care. The response rates were 74% and 81%, respectively.

RESULTS: 75% of women at program sites used the information resources, and 60% requested a patient mentor. Demographic characteristics and satisfaction with non-breast cancer care were almost identical among program and non-program site respondents. For overall breast cancer care, 71% of program site respondents but only 56% of non-program site respondents were very satisfied. More than half of program site respondents rated presurgery care, provision of information, and support received as excellent, versus about 40% of non-program site respondents. Program site respondents were consistently more likely to rate the amount of reassurance and support provided by physicians and nurses as excellent and were less likely to want a second opinion (35% vs 51%).

CONCLUSIONS: The support and information program appears to have had a positive impact on satisfaction with breast cancer care.

From Northern California:
Concomitant medication use in postmenopausal women using estrogen therapy

Small R, Friedman GD, Ettinger B. *Menopause* 2001 Summer;8(2):120-6

OBJECTIVE: To determine whether long-term postmenopausal estrogen therapy is associated with use of other prescription medications.

METHODS: Using computer pharmacy records from 1969 to 1973 for members of the Kaiser Permanente Medical Care Program in San Francisco, we identified the 215 most commonly used prescription medications in the pharmacy database and recorded their use by 232 postmenopausal long-term estrogen users and by 222 postmenopausal age-matched nonusers. These medications were grouped

into 39 therapeutic classes. Classes of medications used by estrogen users and nonusers were compared.

RESULTS: A statistically significant difference in use was seen for 21 of the 39 medication classes; of these 21 classes, 20 (95%) were used more frequently and 1 less frequently by estrogen users. Differences between estrogen users and nonusers were greatest for thyroid hormone preparations (estrogen user/nonuser multivariate odds ratio = 25.6, 95% confidence interval 5.9-112) and antimigraine preparations (11 recipients among estrogen users, none among nonusers). Postmenopausal women using estrogen were more likely than nonusers to use additional medications.

CONCLUSION: Greater use of certain prescription medications by estrogen users than by nonusers should be considered in studying the health effects of estrogen replacement therapy.

From the Northwest:
Long-term weight loss and changes in blood pressure: results of the Trials of Hypertension Prevention, phase II

Stevens VJ, Obarzanek E, Cook NR, et al. *Ann Intern Med* 2001 Jan 2;134(1):1-11 *Comment in: Ann Intern Med* 2001 Jan 2;134(1):72-4

BACKGROUND: Weight loss appears to be an effective method for primary prevention of hypertension. However, the long-term effects of weight loss on blood pressure have not been extensively studied.

OBJECTIVE: To present detailed results from the weight loss arm of Trials of Hypertension Prevention (TOHP) II.

DESIGN: Multicenter, randomized clinical trial testing the efficacy of lifestyle interventions for reducing blood pressure over three to four years. Participants in TOHP II were randomly assigned to one of four groups. This report focuses only on participants assigned to the weight loss (n = 595) and usual care control (n = 596) groups.

PATIENTS: Men and women 30 to 54 years of age who had nonmedicated diastolic blood pressure of 83 to 89 mm Hg and systolic blood pressure less than 140 mm Hg



and were 110% to 165% of their ideal body weight at baseline.

INTERVENTION: The weight loss intervention included a three-year program of group meetings and individual counseling focused on dietary change, physical activity, and social support.

MEASUREMENTS: Weight and blood pressure data were collected every six months by staff who were blinded to treatment assignment.

RESULTS: Mean weight change from baseline in the intervention group was -4.4 kg at six months, -2.0 kg at 18 months, and -0.2 kg at 36 months. Mean weight change in the control group at the same time points was 0.1, 0.7, and 1.8 kg. Blood pressure was significantly lower in the intervention group than in the control group at 6, 18, and 36 months. The risk ratio for hypertension in the intervention group was 0.58 (95% CI, 0.36 to 0.94) at six months, 0.78 (CI, 0.62 to 1.00) at 18 months, and 0.81 (CI, 0.70 to 0.95) at 36 months. In subgroup analyses, intervention participants who lost at least 4.5 kg at six months and maintained this weight reduction for the next 30 months had the greatest reduction in blood pressure and a relative risk for hypertension of 0.35 (CI, 0.20 to 0.59).

CONCLUSIONS: Clinically significant long-term reductions in blood pressure and reduced risk for hypertension can be achieved with even modest weight loss.

From the Northwest:

Health care costs associated with escalation of drug treatment in type 2 diabetes mellitus

Brown JB, Nichols GA, Glauber HS, Bakst AW, Schaeffer M, Kelleher CC. *Am J Health Syst Pharm* 2001 Jan 15;58(2):151-7

The cost of different intensities of therapy in HMO patients with type 2 diabetes mellitus was studied. Health care utilization data from 1995 were obtained for 12,200 registrants from the Kaiser Permanente Northwest Diabetes Registry who had type 2 diabetes mellitus. The data were used to determine costs associated with the escalation of antidiabetic therapies in persons with type 2 diabetes mellitus. The total annual costs (in 1993 dollars) associated

with no drug therapy, a sulfonylurea only, metformin, a sulfonylurea plus insulin, and insulin alone were \$4400, \$4187, \$4838, \$8856, and \$7365, respectively. Per patient total costs were higher for patients who had received antidiabetic therapy in 1995 or previously than for those who had not (\$5303 versus \$4365) and for patients who had received insulin therapy than for those who had not (\$7379 versus \$4117). Macrovascular complications accounted for 62-89% of the cost associated with inpatient treatment of diabetes-related complications. The total cost of treating patients with type 2 diabetes mellitus at an HMO increased as antidiabetic therapies escalated.

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From Northern California:

Association of outpatient alcohol and drug treatment with health care utilization and cost: revisiting the offset hypothesis

Parthasarathy S, Weisner C, Hu TW, Moore C. *J Stud Alcohol* 2001 Jan;62(1):89-97

OBJECTIVE: This study examines the hypothesis that treatment reduces medical utilization and costs of patients with substance use problems.

METHOD: Adult patients (n = 1011; 67% men) entering the outpatient chemical dependency recovery program at Sacramento Kaiser Permanente over a two-year period were recruited into the study. Medical utilization and costs were examined for 18 months prior and 18 months after intake. To account for overall changes in utilization and cost, an age, gender and length-of-enrollment matched nonpatient control group (n = 4925) was selected from health-plan members living in the same service area. Multivariate analyses controlling for age and gender were conducted using generalized estimating equation methods, allowing for correlation between repeated measures and nonnormal distributions of the outcome variable.

RESULTS: The treatment cohort was less likely to be hospitalized (odds ratio [OR] = 0.59;

p < .01) and there was a trend for having spent fewer days (rate ratio [RR] = 0.77; p < .10) in the hospital in the posttreatment period compared to pretreatment period. These patients were also less likely to visit the emergency room (ER) (OR = 0.64; p < .01) and had fewer ER visits (RR = 0.81; p < .01) following treatment. Inpatient, ER and total medical costs declined by 35%, 39% and 26%, respectively (p < .01). Reductions in cost were greater for the treatment cohort when compared with the matched sample (p < .05). Among women, there were significant reductions (p < .05) in inpatient, ER and total costs for the study cohort when compared with the matched sample; among men, the reductions in inpatient and ER cost (but not total cost) were significantly larger (p < .05) for the study cohort when compared with the matched sample. For the treatment cohort, the change in medical cost was not significantly different by gender. Changes in cost were significantly different across the various age groups (p < .05) for the study cohort and the matched sample. Among those in the group aged 40-49 years, the decline in cost for study cohort was significantly larger (p < .05) than for the matched sample.

CONCLUSIONS: For patients with substance use disorders entering treatment, there was a substantial decline in inappropriate utilization and cost (hospital and ER) in the posttreatment period. The disaggregated pattern of posttreatment decline in utilization and cost is suggestive of long-term reductions that warrant a longer follow-up.

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From Ohio:

Improved cholesterol management in coronary heart disease patients enrolled in an HMO

Khoury AT, Wan GJ, Niedermaier ON, et al. *J Healthc Qual* 2001 Mar-Apr;23(2):29-33

The purpose of the study was to describe the effect of physician reminders on the measurement of low-density lipoprotein



cholesterol (LDL-C) levels and treatment to achieve an LDL-C goal of ≤ 100 mg/dL in coronary heart disease (CHD) patients. After reminders were initiated, the number of CHD patients without a documented LDL-C was reduced from 30% to 18%, between January 1997 and July 1998, and the percentage of CHD patients achieving the LDL-C goal improved from 10% to 27%. Thus, reminders can be an effective tool in improving cholesterol management of CHD patients. In contrast, a cholesterol-lowering clinic made available to some physicians, in addition to the reminders, was rarely used.

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**From Northern California:
Do surrogate decision makers provide accurate consent for intensive care research?**

Coppolino M, Ackerson L. Chest 2001 Feb;119(2):603-12

CONTEXT: ICU patients are often rendered incapable of making decisions as a result of their illness. The accuracy with which patients' surrogates consent to research on their behalf is not known.

OBJECTIVE: To determine if surrogate decision makers provide accurate consent for intensive care research.

DESIGN: Cross-sectional, paired, face-to-face interviews.

SETTING: A large, managed-care, cardiac surgery service.

PATIENTS AND PARTICIPANTS: One hundred elective cardiac surgery patients and their self-appointed surrogates were enrolled.

INTERVENTION: Patients agreed or declined to provide informed consent to two hypothetical research trials. One trial represented minimal risk to those enrolled; the other trial represented greater-than-minimal risk. Surrogates attempted to predict the patients' responses.

MAIN OUTCOME MEASURES: The accuracy of

surrogate consent was analyzed in a fashion analogous to the evaluation of a diagnostic test. Predictors of accuracy were evaluated using multiple logistic regression.

RESULTS: Overall surrogate positive predictive value for the low-risk study was 84.0% and for the high-risk study was 79.7% ($p = 0.72$, McNemar test). Predictors of accurate consent were not consistent across the two studies.

CONCLUSIONS: Surrogate decision makers for critical-care research resulted in false-positive consent rates of 16 to 20.3%. Further assessment and evaluation of the practice of surrogate consent for intensive care research is, therefore, recommended.

**From the Northwest:
Satisfaction, commitment, and psychological well-being among HMO physicians**

*Freeborn DK. West J Med 2001 Jan;174(1):13-8
Comment in: West J Med. 2001 Jan;174(1):18-9*

OBJECTIVE: To identify the factors that predict professional satisfaction, organizational commitment, and burnout among physicians working for health maintenance organizations (HMOs).

METHODS AND PARTICIPANTS: Data came from mail surveys of Kaiser Permanente physicians in the Northwest and Ohio regions. The average response rate was 80% ($n = 608$).

RESULTS: The single most important predictor for all three outcomes was a sense of control over the practice environment. Other significant predictors included perceived work demands, social support from colleagues, and satisfaction with resources. The relative importance of these predictors varied, depending on the outcome under consideration. All three outcomes were also related to physician age and specialty. Older physicians had higher levels of satisfaction and commitment and lower levels of burnout. Pediatricians were more satisfied and committed to the HMO and were less likely to burn out.

CONCLUSIONS: Physicians who perceive greater control over the practice environment, who perceive that their work de-

mands are reasonable, and who have more support from colleagues have higher levels of satisfaction, commitment to the HMO, and psychological well-being. Interventions and administrative changes that give physicians more control over how they do their professional work and that enhance social supports are likely to improve both physician morale and performance.

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**From Northern California:
The health care crisis: impact on surgery from a chief executive officer's perspective**

Pearl RM. Arch Surg 2001 Feb;136(2):147-50

Kaiser Permanente, in conjunction with the surrounding academic institutions, trains 64 surgical residents annually in Northern California. Although the current health care crisis has made resident education increasingly difficult, we are committed to maintaining and expanding our programs. The current health care crisis reflects the effect that for-profit health plans, hospitals, and pharmaceutical groups have had on medicine. Their negative impact has not been simply the extraction of resources from the delivery system to their equity shareholders, but the implementation of an authorization process designed to frustrate and deny. As executive director and chief executive officer of the Permanente Medical Group, I believe that resident training allows us to attract outstanding clinicians, train the physicians of the future, and improve the clinical care of our patients. The multispecialty nature of our medical group and our size allows us to work collaboratively, offer evidence-based approaches, preserve professional independence, and implement innovative programs to increase quality and service. Although it is uncertain how health care will evolve in the future, we at Kaiser Permanente are committed to maintaining and expanding our involvement in the education of the next generation of surgeons. *Copyrighted 2001, American Medical Association. ♦*