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A Focus on the Electronic Medical Record

25 Obesities in the Kaiser Permanente Patient Population and Positive Outcomes from Online Weight-Management Programs

Keith H. Bachman, MD, Trina M. Halton, PhD, Carol Ronnen, MPH

The effects of obesity in the Kaiser Permanente population are reviewed and two nationally available online self-care weight management programs are discussed with assessment of potential problems and recommendations.

31 Decreasing Medication Discrepancies Between Outpatient and Inpatient Care Through the Use of Computerized Pharmacy Data

Charles S. Salter, MD, MPH; Nonella Singleton, BS

This study provides an example of a positive impact of modern computer technology and upon the quality of medical care.

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Implementing the Electronic Medical Record in the Exam Room: The Effect on Physician-Patient Communication and Patient Satisfaction

Vivian Tong Ngyi, PhD, Michael H. Katter, MD

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The Permanente Journal, 500 NE Multnomah St, Suite 100, Portland, Oregon 97232

www.kp.org/permanentejournal

ISSN 1552-5767

Circulation: 30,000 print readers per quarter
300,000 Web readers per year worldwide

Mission: The Permanente Journal is published for physicians and nurses to create and deliver superior health care through the principles and benefits of Permanente Medicine.
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**Erratum**

In Janisse T. A next step: reviewer feedback on quality improvement publication guidelines. Perm J 2007 Winter;11(1):72, Paul Batalden, MD, was incorrectly listed as Peter Batalden, PhD. Our apologies to Dr Batalden.
Doctors and Patients Using an Electronic Health and Medical Record: Research Studies Offer Multiple Views of 21st Century Health Care

By Tom Janisse, MD

“I already know you better (after several e-mails) than the internist I was seeing since 1990,” wrote a new patient of Chuck Kilo, MD, MPH, at Portland’s Greenfield Health, who believes that the relationship between doctors and patients is built on continuous communication, requiring multiple modes and encounters. With the developing electronic capability that doctors and patients now have, to complement their traditional forms of interaction—the office visit, the hospital visit, the telephone—they can form quicker and deeper relationships than previously possible; and both can access data in a common electronic medical record. All of the Original Articles in this issue represent a research and applications view of various components of this developing integrated electronic capability.

Patients can now contact their physician by secure e-mail online—a new physician-patient e-communication—which resulted in Kaiser Permanente patients sending more than one million electronic messages to their physicians in 2006. E-communication will develop along the same continuum as have personal visits: from simple e-data to e-mail exchange to e-encounter to e-correspondence to e-conversation. The question becomes: How easily can doctors translate their patient-satisfying, personal office visit behaviors into a satisfying e-visit? Can doctors write a subjective, personal piece of e-correspondence? (MyChart—A New Mode of Care Delivery: 2005 Personal Health Link Research Report, page 14; see Figure 1 #1.)

With the electronic medical record available in the exam room, “it” could disrupt the personal visit. The effect that “it” has on patients depends on the doctor, though its intrusion can be positive, and, through involvement and by improved understanding, can enhance communication and relationship between patient and doctor. (Implementing the Electronic Medical Record in the Exam Room: The Effect on Physician-Patient Communication and Patient Satisfaction, page 21; see Figure 1 #2.)

Online features accessible to patients at home include interactive, health e-programs, such as weight management, with positive outcomes of healthy behavior change. With a health e-program as part of the treatment plan, connection between patient and doctor builds without additional office visits. (Obesity in the Kaiser Permanente Patient Population and Positive Outcomes of Online Weight-Management Programs, page 25; see Figure 1 #3.)

As patients transition from home to the medical delivery system and back home, doctors and patients will be able to rely on an electronic reconciliation system to ensure that current outpatient medications continue when s/he becomes an inpatient, and inpatient medication changes continue when s/he becomes an outpatient again. (Decreasing Medication Discrepancies

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Between Outpatient and Inpatient Care Through the Use of Computerized Pharmacy Data, page 31; see Figure 1 #4.

Surgical Intensive Care Unit glycemic control after Bariatric Surgery, reported from the Henry Ford Health System, exemplifies use of multiple hospital database and analytical systems that aid cycles of quality improvement work to advance clinical outcomes in the inpatient setting. (Perioperative Tight Glycemic Control: The Challenge of Bariatric Surgery Patients and the Fear of Hypoglycemic Events, page 36; see Figure 1 #5.)

Patients can benefit from doctors matching their health assessments with their documented medical histories through using a data warehouse to access information essential for understanding how adverse childhood events can result in unhealthy adult behaviors. (Adverse Childhood Experiences and Smoking Persistence in Adults with Smoking-Related Symptoms and Illness, page 5; see Figure 1 #6.)

This connection of electronic components becomes a web of electronic capability—a whole system of integrated data, information, programs, and communication—to enhance traditional in-person care, offering people a more complete health care experience.

By developing an eHealth Service, physician leaders define a new realm of health and medical care that is interactive, convenient, low cost, and personal. With its addition, medical and nursing care is now practiced in a whole-system context, without singular dependence on the office visit and the doctor as the only way to assess and treat a condition, or to improve health. Use of this electronic capability will transform medical care. ❖

Change

Change is hard because people overestimate the value of what they have—and underestimate the value of what they may gain by giving that up.

Adverse Childhood Experiences and Smoking Persistence in Adults with Smoking-Related Symptoms and Illness

Abstract

Objectives: Little is known about why people continue to smoke after learning that they have diseases and conditions that contraindicate smoking. Using data from the Adverse Childhood Experiences (ACE) Study, we examined the relation between ACEs and smoking behavior when smoking-related illnesses or conditions are present, both with and without depression as a mediator.

Methods: Participants were more than 17,000 adult HMO members who retrospectively reported on eight categories of ACEs (emotional, physical, and sexual abuse; witnessing interparental violence; parental divorce; and growing up with a substance-abusing, mentally ill, or incarcerated household member). The number of maltreatment categories was summed to form an ordinal variable called the ACE Score. We measured current smoking, conditions that contraindicate smoking (heart disease, chronic lung disease, and diabetes), and symptoms of these illnesses (chronic bronchitis, chronic cough, and shortness of breath). Logistic regression models compared the ACE Score of smokers with smoking-related illnesses to participants who reported these illnesses but were not current smokers (n = 7483).

Results: Significant dose–response relations between the ACE Score and smoking persistence were found (odds ratio = 1.69; confidence interval = 1.34–2.13 for participants with ≥4 ACEs). Depression was a significant independent predictor of smoking persistence as well as a mediator. Depression only slightly attenuated the relation between the ACE Score and persistent smoking, however.

Conclusion: Medical practitioners should consider the maltreatment history and depression status of their patients when a smoking-related diagnosis fails to elicit smoking cessation. Programs should be developed that better address the underlying motivations for continuing to smoke in the face of health problems that contraindicate smoking.

Introduction

Although nicotine addiction is a prima facie reason for continued smoking, being diagnosed with a smoking-related illness or experiencing smoking-related symptoms are strong motivations for smoking cessation. Even so, practitioners encounter patients who continue to use tobacco despite having conditions that contraindicate smoking. Quit rates among those with cardiovascular disease do not exceed quit rates for the general population. Similarly, about one-third of patients with cancer continue to smoke after diagnosis. Understanding why some patients seem to have greater difficulty quitting may improve the practice of medicine.

Some researchers refer to persistent smokers as “hard-core” smokers who may never attempt to quit, regardless of their health status. They have been found to be younger, less well educated, and from less-advantaged socioeconomic groups. In addition, having other smokers in the household, attributing one’s symptoms to aging rather than to smoking, and having weaker self-efficacy beliefs about one’s ability to quit are related to lower rates of smoking cessation. Thus, it appears that health beliefs and demographics, as well as the social environment, may interfere with stop-smoking messages.
Mental illness is another potential barrier to smoking cessation. A recent study found that adults with psychiatric disorders are almost twice as likely as those without such disorders to be smokers.17 The interference of depression with quitting attempts has been well documented.18–21 Depressed smokers are more likely than nondepressed smokers to relapse.22,23 In addition, depression has been found to maximize withdrawal-related symptoms and discomfort.24

Maltreatment in childhood may lead adults to adopt risky behaviors in a variety of domains, including smoking,25 alcohol abuse,26,27 illicit drug use,28,29 and sexual behavior.30,31 Although child abuse has been shown to lead to higher rates of medical care use,32,33 survivors of abuse use preventive medical services such as Pap tests and other examinations less frequently.34–36 In addition, abuse survivors are less likely than adults who were not abused to follow medical regimens appropriately.37,38 Because a history of trauma is often antecedent to depression39–41 and other forms of psychological impairment,42–43 we investigated whether continuing to smoke cigarettes despite the presence of illness or symptoms often caused by smoking or conditions that are exacerbated by smoking is associated with retrospective reports of childhood trauma.

Using data from the Adverse Childhood Experiences (ACE) Study, we hypothesized that people with smoking-related illness or symptoms who persist in smoking would be substantially more likely to report childhood trauma than people with the same illnesses who are not current smokers. Furthermore, we hypothesized that depression is both directly related to smoking persistence and that it reduces the strength of association between ACEs and smoking persistence. Current thought in psychology links violence and other traumatic experiences in childhood to poorer socioemotional functioning and indeed to neurobiologic changes.45,46 The ACE Study was undertaken to assess how these experiences lead to the development of risk factors that in turn affect disease, disability, and early mortality. The conceptual framework of the study is depicted in Figure 1.

**Methods**

ACE Study participants were members of a large, metropolitan health maintenance organization (HMO) who were undergoing a comprehensive physical examination. A more detailed description of the ACE Study design and methods can be found elsewhere.47 The ACE Study was approved by the institutional review boards of the Southern California Permanente Medical Group, Emory University, and the National Institutes of Health Office of Protection from Research Risks.

We mailed a questionnaire to HMO members asking for sensitive information on childhood abuse and family dysfunction, as well as current health behaviors related to smoking, alcohol, and exercise (the Family Health History) after they had undergone their clinical examination. Information on their present health status, including their experience of a wide range of chronic diseases and disease-related symptoms, was obtained from a separate self-report previously completed by each patient (the Health Appraisal Questionnaire). During two survey periods (August to March 1996 and June to October 1997), 18,175 of 26,824 patients returned a Family Health History, for a composite response rate of 68%. Bias due to nonresponse was explored in the first survey wave48 and did not negatively impact the study’s validity. We eliminated data for 280 respondents who did not provide complete demographic information and purged the second response data set for an additional 658 study subjects who participated in both survey waves. The analysis sample was a subset from this pool of 17,337 unique observations with complete demographic information and consisted of only those respondents who reported at least one of the ten smoking-related diseases or symptoms described in more detail below (n = 7483).

**Definition of Persistent Smoking**

We obtained current smoking status by asking, “Do you smoke cigarettes now?” (with the response being yes or no), and we determined the number of cigarettes smoked per day by asking, “If ‘yes,’ on average,
Adverse Childhood Experiences and Smoking Persistence in Adults with Smoking-Related Symptoms and Illness

Persistent smokers were defined as those participants who indicated that they were current smokers and who self-identified as having at least one of ten diseases or symptoms that are exacerbated by smoking. Seven of the ten are directly related to or often caused by smoking: chronic bronchitis or emphysema, asthma or wheezing, chronic cough, shortness of breath, heart attack, lung cancer, or stroke. The remaining three conditions are contraindications to smoking rather than illnesses that are a result of smoking per se: diabetes mellitus, high blood pressure, and currently taking cholesterol-lowering medication. The exact questions used to elicit the presence or absence of these diseases and conditions are listed in Table 1.

Table 1. Prevalence of smoking-related diseases and symptoms by sex

<table>
<thead>
<tr>
<th>Questions asked of respondent</th>
<th>N (%)</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever been told you have asthma?</td>
<td>701 (8.8)</td>
<td>1079 (11.6)</td>
<td>1780 (10.3)</td>
<td></td>
</tr>
<tr>
<td>Have you ever been told you have chronic bronchitis or emphysema?</td>
<td>324 (4.6)</td>
<td>457 (5.5)</td>
<td>781 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Do you have a frequent cough for any reason?</td>
<td>824 (10.4)</td>
<td>1217 (13.1)</td>
<td>2041 (11.9)</td>
<td></td>
</tr>
<tr>
<td>Do you have shortness of breath?</td>
<td>1180 (15.1)</td>
<td>1767 (19.2)</td>
<td>2947 (17.3)</td>
<td></td>
</tr>
<tr>
<td>Have you ever had lung cancer?</td>
<td>24 (0.3)</td>
<td>22 (0.2)</td>
<td>46 (0.3)</td>
<td></td>
</tr>
<tr>
<td>Have you ever had or ever been told you had high blood pressure?</td>
<td>2335 (29.6)</td>
<td>2328 (25.0)</td>
<td>4663 (27.1)</td>
<td></td>
</tr>
<tr>
<td>Have you ever had or ever been told you had a heart attack (coronary)?</td>
<td>374 (4.7)</td>
<td>100 (1.1)</td>
<td>474 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Have you had or ever been told you had to take medicine to lower your cholesterol?</td>
<td>866 (11.0)</td>
<td>596 (6.4)</td>
<td>1462 (8.5)</td>
<td></td>
</tr>
<tr>
<td>Have you ever had a stroke or a “small stroke”?</td>
<td>271 (3.4)</td>
<td>246 (2.7)</td>
<td>517 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Has a doctor ever treated you for or said you had diabetes?</td>
<td>421 (5.3)</td>
<td>361 (3.9)</td>
<td>782 (4.5)</td>
<td></td>
</tr>
</tbody>
</table>

a Total N value for each question varies due to missing responses.
b p < .005.
c p < .01.

about how many cigarettes a day do you smoke? Persistent smokers were defined as those participants who indicated that they were current smokers and who self-identified as having at least one of ten diseases or symptoms that are exacerbated by smoking. Seven of the ten are directly related to or often caused by smoking: chronic bronchitis or emphysema, asthma or wheezing, chronic cough, shortness of breath, heart attack, lung cancer, or stroke. The remaining three conditions are contraindications to smoking rather than illnesses that are a result of smoking per se: diabetes mellitus, high blood pressure, and currently taking cholesterol-lowering medication. The exact questions used to elicit the presence or absence of these diseases and conditions are listed in Table 1.

Adverse Childhood Experiences

The Family Health History asked respondents about a variety of experiences in two broad domains: child abuse and family dysfunction. Specifically, we asked participants whether they had experienced physical, sexual, or emotional abuse; if they had witnessed interparental violence; whether their parents had separated or divorced; whether they had grown up with drug- or alcohol-abusing family members; had a family member go to prison; or had a family member who was mentally ill. In Table 2, we list the questions used to measure each of the eight domains and the response necessary to meet criterion for that category. Respondents who did not report an ACE were considered not to have had that experience. This most likely biases our results toward the null, by potentially misclassifying those who may have been exposed to an ACE as unexposed.

Because these experiences tend to cluster rather than to occur independently, we summed the number of ACEs that each person reported (range, 0 to 8) to form an ordinal variable referred to here as the ACE Score. We combined the upper end of the distribution to ensure adequate group size so that the ACE Score contained five levels (0, 1, 2, 3, and ≥4 ACEs).

Depression

Because of the known association between depression and smoking, we investigated whether depression would mediate the relation between ACEs and smoking persistence. Respondents were considered depressed if they answered affirmatively to the question “Have you ever had or do you now have depression or feel ‘down in the dumps’?”

Statistical Analysis

We used the Statistical Package for the Social Sciences (SPSS; Chicago, IL) for all analyses. Logistic regression was used to compute adjusted odds ratios (ORs) and 95% confidence intervals (CIs) to assess the association between ACEs and smoking among people with a smoking-related illness or condition. We tested for trend in the ORs by using the summed ACE Score as an ordinal variable with five levels (0, 1, 2, 3, and ≥4 ACEs). We also modeled the relation of depression to persistent smoking, and then constructed a model including both the ACE Score and presence or history of depression to test for mediation. An analysis of variance was calculated using the ACE Score as a predictor, and the number of reported smoking-related symptoms or illnesses as the dependent measure.

Results

The ACE Study sample was composed of 9367 women (54%) and 7970 men (46%) with a mean age of 54.8...
years (standard deviation [SD] = 15.7) among women and 57.5 years (SD = 14.6) among men. More than three-quarters of the participants (78.5% of the women and 81.6% of the men) described themselves as white; 34.5% of women and 45% of men were college graduates; another 37.5% of the women and 34% of the men had some college education.

The current smoking prevalence was 8.8%; men were slightly but not significantly more likely to be current smokers than were women (9.1% vs 8.6%, χ²[1, 17,160] = 1.47, not significant). On average, smokers smoked 15 cigarettes per day (SD = 10.3). Of the 1518 current smokers in the sample, 51.2% (776) reported one or more of the tobacco-related illnesses or symptoms. Table 1 lists the prevalence of each of the selected disease conditions and symptoms by sex, of which one or more were reported by 43.6% (7554) of the sample. The most frequently reported condition was high blood pressure, reported by >27% of the sample. Lung cancer was the rarest condition reported, having an overall prevalence of 0.3%.

ACEs were common among participants (Table 3). Only 36.1% of individuals reported no ACEs. In contrast, 37.9% of all respondents reported ≥2 ACEs. For all ACEs except physical abuse, female respondents reported significantly higher prevalences than did men.

To examine the relation between ACEs and smoking persistence, we performed a series of analyses among

| Table 2. ACE questions and response categories |
|---|---|---|---|
| ACE category | Question | Response options | Criterion |
| Physical abuse | Did a parent or other adult in the household: | Push, grab, shove, or slap you? | Never, once or twice, sometimes, often, very often | Sometimes or often |
| | | Hit you so hard that you had marks or were injured? | Never, once or twice, sometimes, often, very often | Once or twice |
| Psychological abuse | Did a parent or other adult in the household ever: | Swear, insult, or put you down? | Never, once or twice, sometimes, often, very often | Often |
| Sexual abuse | Did an adult five years older than you: | Touch or fondle you in a sexual way? | Yes/no | Yes |
| | | Have you touch his/her body in a sexual way? | Yes/no | Yes |
| | | Attempt intercourse (oral, vaginal, or anal) with you? | Yes/no | Yes |
| | | Have intercourse (oral, vaginal, or anal) with you? | Yes/no | Yes |
| Witnessing maternal battering | Did your father or stepfather or mother’s boyfriend ever: | Push, grab, slap, or throw something at your mother or step mother? | Never, once or twice, sometimes, often, very often | Sometimes or often |
| | | Kick, bite, or hit her with a list or something hard? | Never, once or twice, sometimes, often, very often | Sometimes or often |
| | | Repeatedly hit her over at least a few minutes? | Never, once or twice, sometimes, often, very often | Once or twice |
| | | Threaten or hurt her with a knife or gun? | Never, once or twice, sometimes, often, very often | Once or twice |
| Household mental illness | Was someone in your household: | Depressed or mentally ill? | Yes/no | Yes |
| Household substance abuse | Was someone in your household: | A problem drinker or alcoholic? | Yes/no | Yes |
| Household criminal activity | | Did you live with anyone who used street drugs? | Yes/no | Yes |
| Parental divorce or separation | | Were your parents ever divorced or separated? | Yes/no | Yes |

ACE = adverse childhood experience.
those participants who reported any of the diseases or symptoms listed in Table 1 and whose smoking status we knew (n = 7483). Within this group, the smoking prevalence was somewhat higher (n = 776; 10.4%) than in the total ACE sample. In addition, respondents in this group were significantly more likely to report physical, sexual, or emotional abuse (29.2% vs 27.0%; $\chi^2[1, 14,643] = 3.97; 21.7\%$ vs $19.6\%$, $\chi^2[1, 14,643] = 9.72$; and $11.3\%$ vs $9.8\%$, $\chi^2[1, 14,643] = 9.38$, respectively) at the .05 level. However, they did not report statistically higher prevalences of the other ACEs.

We first constructed a logistic model with the ACE Score as an ordinal predictor, adjusting for sex and age (Table 4) and current smoking as the dependent variable. The ORs and 95% CI for smoking are displayed in Table 3, under the “Separate Model” heading. The overall test for trend was significant ($p < .001$). Strong, graded relations were found between the ACE Score and the likelihood of continuing to smoke despite having health problems that contradicted smoking. The adjusted likelihood of being a current, persistent smoker rose from 1.08 in individuals reporting one ACE to 1.69 in individuals reporting $\geq 4$ ACEs. The prevalence of persistent smoking rose in a dose–response fashion as the number of reported ACEs increased, rising from 7.8% in participants with no ACEs to 16.6% in those reporting $\geq 4$ ACEs.

Next, we tested the relation between past or current depression and persistent smoking among those with smoking-related diseases and conditions. The adjusted odds ratio (OR) is also shown in Table 4 in the column labeled “Separate Model.” Those who reported past or current depressed affect were 1.59 times more likely to be persistent smokers than those who did not affirm past or current depression ($p < .001$). Strong, graded relations were found between the ACE Score and the likelihood of continuing to smoke among patients with diabetes and patients with heart disease. Although we cannot

### Table 3. Prevalence of individual ACEs and ACE score by sex

<table>
<thead>
<tr>
<th>ACE</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental separation or divorce</td>
<td>1738</td>
<td>2293</td>
<td>4031</td>
</tr>
<tr>
<td>Household substance abuse</td>
<td>1896</td>
<td>2759</td>
<td>4655</td>
</tr>
<tr>
<td>Household mental illness/suicide</td>
<td>1179</td>
<td>2180</td>
<td>3359</td>
</tr>
<tr>
<td>Mother/stepmother treated violently</td>
<td>920</td>
<td>1281</td>
<td>2201</td>
</tr>
<tr>
<td>Family member went to prison</td>
<td>324</td>
<td>485</td>
<td>809</td>
</tr>
<tr>
<td>Psychological abuse</td>
<td>602</td>
<td>1227</td>
<td>1829</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>2382</td>
<td>2530</td>
<td>4912</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>1276</td>
<td>2310</td>
<td>3586</td>
</tr>
<tr>
<td>ACE score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3027</td>
<td>3228</td>
<td>6255</td>
</tr>
<tr>
<td>1</td>
<td>2221</td>
<td>2293</td>
<td>4514</td>
</tr>
<tr>
<td>2</td>
<td>1308</td>
<td>1450</td>
<td>2758</td>
</tr>
<tr>
<td>3</td>
<td>682</td>
<td>968</td>
<td>1650</td>
</tr>
<tr>
<td>$\geq 4$</td>
<td>732</td>
<td>1428</td>
<td>2160</td>
</tr>
</tbody>
</table>

ACE = adverse childhood experience.

### Table 4. ACES and the prevalence and risk* (adjusted OR) of smoking among adults with smoking-related diseases or symptoms

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Prevalence (%)</th>
<th>Separate model adjusted OR (CI)</th>
<th>Single model adjusted OR (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (referent)</td>
<td>211 (7.8)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>1</td>
<td>175 (9.1)</td>
<td>1.08 (0.89–1.36)</td>
<td>1.05 (0.85–1.31)</td>
</tr>
<tr>
<td>2</td>
<td>129 (10.9)</td>
<td>1.26 (1.00–1.60)</td>
<td>1.19 (0.93–1.50)</td>
</tr>
<tr>
<td>3</td>
<td>103 (14.3)</td>
<td>1.61 (1.24–2.10)</td>
<td>1.49 (1.15–1.93)</td>
</tr>
<tr>
<td>$\geq 4$</td>
<td>158 (16.6)</td>
<td>1.69 (1.34–2.13)</td>
<td>1.52 (1.19–1.92)</td>
</tr>
</tbody>
</table>

Past or current depression

| No (referent) | 429 (8.5) | 1.00 | 1.00 |
| Yes          | 337 (14.3) | 1.59 (1.36–1.87) | 1.49 (1.27–1.76) |

ACE = adverse childhood experience; CI = confidence interval; OR = odds ratio.

*Adjusted for age and sex.
rule out genetic influences on smoking persistence, earlier research with the ACE Study sample indicated that parental smoking had no impact on the association between ACEs and smoking initiation in the overall ACE sample.25

Despite the cross-sectional nature of these findings, it is evident that ACEs play a role in the development of health risk behaviors. The psychoactive properties of nicotine and other addictive substances may temporarily ameliorate negative affective states and thereby serve an adaptive function in coping with the aftermath of childhood trauma, regardless of the health risk involved.57 Certain psychological outcomes associated with childhood maltreatment, such as poor self-esteem,58,59 low self-efficacy,60,61 and an external locus of control,62,63 may be mechanisms by which these early negative experiences result in maladaptive patterns of health behavior later in life.

The smoking prevalence of 8.8% in this sample was far below the current US prevalence of 22.5% in 2002.64 Possible explanations for this include the average age, educational attainment, and geographic location of the sample. Therefore, even though the number of persistent smokers in this sample was small, if we extrapolate these findings to the overall US population, the implications are substantial and indeed disturbing. More than 50% of current smokers in our study reported one or more conditions or symptoms that contraindicate smoking, a result that clinicians as well as smokers should keep in mind. Smoking cessation is the best treatment for reducing mortality among patients with heart disease65 and is associated with improved health among patients with other chronic conditions. Our study indicates that many current smokers are damaging their health by continuing to smoke, and for many, the current smoking-cessation strategies available are no doubt insufficient.

Limitations on these findings must be pointed out. We could not verify that the ACEs reported by participants actually occurred, because they were retrospectively assessed. However, the prevalence of each of the individual ACEs obtained here is similar to that obtained in other large samples with nonclinical populations.66,67 In addition, we relied on self-reports for smoking status as well as symptoms and disease conditions; however, the accuracy of this type of data has been established.66,70 Because our measure of smoking did not allow us to compute pack-years (= 20 cigarettes per day, per year), we could not determine smoking history, only current smoking levels. Furthermore, we were unable to determine when an individual quit smoking and whether the timing of their smoking cessation was in some way linked to a smoking-related diagnosis. Finally, our depression measure consisted of a single dichotomous question and cannot be considered a clinical diagnosis. However, sensitivity analyses performed by Dube et al71 indicated that this item achieved acceptable levels of sensitivity, specificity, and positive predictive value (83%, 60%, and 87%, respectively) when compared with a screening tool developed by the Rand Corporation72 to test for lifetime prevalence of major depression or dysthymia.

Current thinking on further reducing smoking rates includes acknowledgement of the need to better tailor smoking-cessation programs to the needs of the remaining smokers who have not yet been reached by traditional stop-smoking messages.22,73 Our findings suggest that practitioners may need to consider the abuse history and presence of depression in patients who persist in smoking despite having conditions that contraindicate smoking, when traditional smoking-cessation programs prove ineffective. Programs that address the underlying emotional problems caused by childhood maltreatment may prove more useful than traditional cessation strategies in reaching this difficult-to-treat population. To this end, we believe that universal screening for a history of ACEs as well as for depression should be part of a comprehensive medical record. Available evidence indicates that patients are comfortable with screening for childhood abuse24,25 and believe that physicians can assist them in dealing with issues arising from early maltreatment. Addressing the underlying motivations for continued smoking in the face of adverse health consequences may lead to further reductions in smoking-related illness. ❖

Programs that address the underlying emotional problems caused by childhood maltreatment may prove more useful than traditional cessation strategies...
The findings and conclusion in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention or of the Kaiser Permanente Medical Care Program.

Acknowledgment
This research was funded by cooperative agreement TS-44-10/11 between the Centers for Disease Control and Prevention and the Association of Teachers of Preventive Medicine.

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The Essential of Medical Practice

The real work of a doctor is only faintly realized by many lay people. It is not an affair of health centres, or public clinics, of operating theatres, of laboratories, or hospital beds. These techniques have their place in medicine but they are not medicine. The essential unit of medical practice is the occasion when, in the intimacy of the consulting room or sick room, a person who is ill, or believes himself to be ill, seeks the advice of a doctor whom he trusts. This is a consultation and all else in the practice of medicine derives from it. The purpose of a consultation is that the doctor, having gathered his evidence, shall give explanation and advice. … but the purpose of the consultation is not the diagnosis or the technical treatment, it is the explanation and advice, with the diagnosis acting as a means to those ends.

— Sir James Spence, MD, 1892-1954, British medical philosopher, founder of the Newcastle Babies’ Hospital and developer of social pediatrics.
MyChart—A New Mode of Care Delivery:
2005 Personal Health Link Research Report

Introduction
MyChart is one of the new, innovative features of Kaiser Permanente (KP) HealthConnect—the comprehensive, integrated, organizational, and personal electronic health and medical record. MyChart, an Epic Systems Corporation (Verona, WI) product, is a secure member Web site where registered patients can view portions of their medical record, and exchange secure messages with their primary care physician (PCP) and other recently visited clinicians.

The KP Northwest (KPNW) Region, in Portland, Oregon, was the first KP Region to implement MyChart. Starting in late 2002, KPNW initiated a pilot project of MyChart as a stand-alone Web address in two medical offices. KPNW named this feature Personal Health Link (PHL). By early 2005, all adult primary care physicians and affiliated clinicians (both groups are PCPs in this paper) were trained and set up to use PHL. Patients who registered for PHL could send secure e-mail messages directly to their primary care clinician, incurring no copayment or fees. MyChart is now available to KP patients in all Regions, except Ohio, through KP HealthConnect online at www.kp.org.

Methodology
In 2005, a comprehensive evaluation of the PHL secure messaging between adult KP patients and 263 PCPs was conducted with Institutional Review Board approval. There were three sources of information for this evaluation.

eEncounter Survey
Patients’ perceptions of e-mail encounters with their PCP were collected using an e-mail encounter survey (eEncounter) developed for this study (Table 1). In this study an e-mail “encounter” began with a message from a patient to his or her PCP, and included any follow-up messages sent by the patient or the PCP as a result of that first message.

Table 1. eEncounter survey measures
The key outcome measure was satisfaction with the e-mail exchange. The measures in the four subsections were:

1. Attributes of eEncounter
   • Completeness of PCP’s responses
   • Timeliness of PCP’s responses
   • PCP’s use of hard-to-understand medical terms
   • Courtesy of PCP’s responses
   • Whether e-mail exchange yielded the results the member wanted
   • Amount of influence member had in decisions

2. Profile of eEncounter
   • Primary and secondary reasons for e-mailing PCP
   • What member would have done if not possible to e-mail their PCP
   • Number of messages sent and received
   • Who sent e-mail to PCP
   • Preference if PCP is out of office

3. Demographic and Health Status Information
   • Overall health status
   • Have chronic disease
   • Current number of prescriptions
   • Visits to PCP in prior 12 months
   • Age, gender, and education

4. Overall Opinion of KP (Questions taken from the KPNW Medical Office Visit Survey)
   • How likely to recommend KP to family or friends
   • Satisfaction with ability to get needed care from KP
   • Rating of PCP’s knowledge of member’s medical history

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who had e-mailed their PCP during the period of July 2005 through September 2005. Each sampled patient received an invitation within two weeks of the completed e-mail encounter with his or her PCP. A link to the online questionnaire was embedded in the invitation e-mail along with reference to a specific e-mail exchange: name of recipient’s PCP and date of first e-mail message. The survey had a 64% response rate, with 1711 returned questionnaires.

Content Analysis of E-mail Encounters

The e-mail encounters of 476 randomly selected eEncounter Survey respondents were analyzed to better understand the elements of e-mail exchanges that explain the differences in patients’ satisfaction. The encounters analyzed were those about which the patients were surveyed, and consisted of nearly 690 patient messages and 750 PCP messages. Patients reporting lower satisfaction with their e-mail encounter were oversampled to support a comparison of lower- and higher-satisfied patients. The coding form used for the evaluation in the PHL 2003 Pilot was refined for this study; coding was conducted by four Registered Nurses, from the KPNW Center for Health Research, who were specially trained to build inter-rater reliability (Table 2).

### Table 2. Content of analysis of e-mail encounters

<table>
<thead>
<tr>
<th>Elements of patient messages to their primary care clinician:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• New versus existing problem</td>
</tr>
<tr>
<td>• Definite or diffuse requests or complex, open-ended questions</td>
</tr>
<tr>
<td>• Desired action: clinical assessment, clinical decision, or clinical action</td>
</tr>
<tr>
<td>• Update on their current condition (eg, blood sugar levels)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elements of PCP responses to their patients:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Responses involved nonclinical, low-clinical or high-clinical answers</td>
</tr>
<tr>
<td>• Responses addressed all or part of patients’ questions and requests</td>
</tr>
<tr>
<td>• Patients received what they requested</td>
</tr>
<tr>
<td>• Tone and style of PCP responses</td>
</tr>
<tr>
<td>• Patient-centered behaviors</td>
</tr>
</tbody>
</table>

PCP-Recorded Encounters

To estimate the time it takes clinicians to complete e-mail and telephone encounters, 22 KPNW PCPs in Oregon agreed to keep logs of all their patient encounters, and the work activity related to these encounters, for a period of two to four days. The 11 Portland PCPs were active PHL users, with at least 20% of their panel registered for PHL and receiving at least three messages per day. The 11 Salem PCPs, who practiced in a medical office 40 miles from Portland, were infrequent PHL users, with fewer than 15 e-mail encounters per month; or at least 40 e-mail encounters per month. The remaining 30% of PCPs were “medium adopters”—at least 15% of their panel registered for PHL but they received only 15 to 40 e-mail encounters per month; or at least 40 e-mail encounters but less than 15% of their panel registered for PHL (Figure 1). It is interesting to note that PCPs who have historically scored higher on the ongoing, Art of Medicine survey (ie, office-visit patient satisfaction) were not more likely to use secure messaging.

Results

**PCP Users of PHL**

In 2005, 263 KPNW adult PCPs in Portland and Salem, OR, and Southwest Washington, had PHL available for use. The majority of these PCPs (65%) were low-level adopters, with fewer than 15 e-mail encounters per month. Only 7% of PCPs were “high adopters”—at least 15% of their panel registered for PHL and they received at least 40 e-mail encounters per month. The remaining 30% of PCPs were “medium adopters”—at least 15% of their panel registered for PHL but they received only 15 to 40 e-mail encounters per month; or at least 40 e-mail encounters but less than 15% of their panel registered for PHL (Figure 1).
Patient Users of PHL

During the study period patients who were paneled with a PCP were eligible to register for PHL. As of September 30, 2005, there were 16,990 PHL users representing 5% of all 337,423 adult paneled patients in the KPNW Region. Older patients—women 45-64 years old, and men over 45 years—were more likely to register for PHL than other age groups; these age groups comprised 44% of paneled patients, but 62% of PHL users. Patients with chronic diseases were also more likely to register than other groups; for example, patients with diabetes represented 8.7% of paneled patients, but 13.6% of patients registered for PHL.

Women were somewhat more likely than men to register with PHL (5.6% vs 4.4%). However, there was no difference in the rate of messaging between men and women after adjusting for age and health status. Of those who were registered with PHL, 62% had sent at least one message to their PCP.

Profile of Patient-Initiated E-mail Encounters

Slightly more than two-thirds (68%) of e-mail encounters involved one member message and one clinician response. Another 20% of e-mail encounters consisted of two member messages and two or more PCP responses. Often the reason for multiple clinician responses is that the initial response was an out-of-office automatic reply. Less than 10% of e-mail encounters had three or more member messages.

Reasons Patients E-mailed PCPs

Slightly less than half (45%) of encounters began with a clear request—the patients knew what they wanted. However, 34% of the encounters began with diffuse, open-ended or complex questions. The vast majority (75%) of e-mail encounters were for ongoing medical problems or care plans, while nearly one quarter were concerning a new medical event, condition, or symptom.

When patients e-mailed their PCP they typically reported more than one reason for the e-mail. Nearly one-third (31%) reported that they had two reasons for e-mailing their PCP and 38% reported three or more reasons. The five leading primary reasons for patients to e-mail their PCP were: report a change in a condition, 16%; discuss lab results, 14%; discuss a new condition, 12%; discuss changes in prescription dose, 11%; and discuss need for new prescription, 10%.

E-mail messages from patients were clinically relevant; 63% of patient-initiated e-mail encounters required clinical assessments or decisions. Another 24% of e-mail encounters were requests that required clinical actions (orders, tests results). Less than 5% of patients mentioned a nonmedical reason for e-mailing (Figure 2).

Member Satisfaction with PHL

Overall patients were extremely satisfied with e-mail exchanges they had with their PCP; the vast majority (85%) rated their encounters 8
or 9 on a 9-point satisfaction scale (70%-9; 15%-8). Satisfaction was positively associated with whether all of the patient’s questions were answered, completeness of answers, timeliness of PCP response, whether the e-mail exchange yielded the results the patient wanted, courtesy of PCP response, and the amount of influence the patient wanted and had in decisions (all statistically significant at p < 0.01).

Satisfaction was not associated with the specifics of patients’ requests, such as whether the member e-mailed about a new or ongoing problem, and whether the requests were complex or open-ended. Satisfaction was not associated with the following characteristics of PCP responses: clinical intensity of the assessments or actions, use of slang (eg, abbreviations commonly used in e-mails), grammar and spelling errors, or whether the exchange included an out-of-office auto reply. Almost none of the patients (2%) reported that their PCP used medical terms that they did not understand. Interestingly, PCPs’ historic Art of Medicine scores are not a predictor of patients’ satisfaction with their e-mail encounters. This suggests that the skill set required for a successful e-mail encounter is not the same skill set required for a successful in-person office visit.

PHL and Overall Satisfaction with KP

Patients less satisfied with their e-mail encounters were also less satisfied with KP in general. For example, only 34% of patients who were less satisfied with their e-mail encounter (gave a score of 6 or lower on a 9-point scale) indicated that they would definitely or very likely recommend KP. This evaluation was not designed to study the causal relationship between patients’ overall satisfaction with KP and satisfaction with e-mail encounters. Over time one would expect that repeated positive experiences with e-mail encounters would increase patients’ overall satisfaction with KP. On the other hand, one would expect that patients who were very satisfied with KP, and liked their PCPs, would be more likely to give high ratings to their PCPs’ performance in e-mail encounters.

However, the content analysis of e-mail encounters provides some insights into this relationship. The content analysis found no substantive or significant differences between high- and low-satisfaction e-mail encounters, in either the member messages or PCP responses. Therefore, the ratings of e-mail encounters appear to be more a function of patients’ perceptions of the e-mail encounters, than of observable differences between encounters. Patients’ perceptions of these encounters are possibly influenced by their prior experiences with their PCP and KP, and not just by what occurred during these encounters. Patient satisfaction scores may be subject to inertia—eg, it may take several positive, better than expected experiences before a patient who has been somewhat dissatisfied will give a PCP a higher rating.

Timeliness of PCP Responses

Patients sending secure messages to their PCP were told that they would receive a response from their PCP within two business days. Forty percent of patients reported receiving their PCP’s responses within eight hours, and nearly 75% of patients reported receiving responses within 24 hours. Only 4% reported waiting over 48 hours. Nearly nine out of ten patients rate their PCP’s response times as excellent if the responses come within 24 hours. Patients’ ratings of PCPs’ response times

![Figure 2. Reasons patients e-mailed their PCP. Rx = prescriptions.](image-url)
begin to fall sharply after 24 hours; although the vast majority of patients still rate response times as good or excellent if they receive their PCPs’ responses within 48 hours (Figure 3).

Impact On PCP Workload

Number of Messages Sent

On average, PHL users sent their PCP 0.35 messages per user per month, or approximately 4.2 messages per year. This represents about 2.9 e-mail encounters per PHL user per year—the average e-mail encounter with a PCP involves about 1.4 member messages. Although older patients were somewhat more likely to register for PHL, they tended to send fewer messages. PHL users age 35 years or less sent 0.42 messages per month; PHL users age 45 years or older sent 0.33 messages per month.

PHL Effect on Office Visits and Telephone Visits

One concern expressed regarding e-mail messaging is that it will lead to a large, and often inappropriate increase in the demand for care.6,8 This study found strong evidence that e-mail encounters reduced office visits and telephone calls to KP.

Patient Perspective

From the patient perspective, many thought using PHL did substitute for office visits. When asked what they would have done if e-mailing their PCP had not been available, 25% said they would have scheduled an appointment and 3% stated they would have walked in for unscheduled medical care. Although many of these calls for appointments might have been resolved on the phone by the doctor or an advice nurse, this high percentage reflects the high value patients have for secure messaging. In addition, 44% of patients said they would have called their PCP’s office for advice and 18% stated they would have called the advice nurse. Eleven percent of patients indicated they would not have contacted KP for care if e-mail had not been available. These patients’ e-mails contained fewer questions and requests than other patients’ e-mails, but their reasons for e-mailing were similar and clinically relevant. (Table 4)

PCP Perspective

PCPs who kept time logs of all patient encounters observed that the profile of patients’ requests was very similar for e-mail encounters and patient-initiated phone calls. These PCPs indicated that nearly all low clinical intensity e-mails, and most of the higher clinical intensity e-mails, would have been patient-initiated phone calls if PHL had not been available.

Utilization Data

A separate component of the 2005 PHL Evaluation compared primary care office visit rates and phone call rates by PHL users prior to and after registering for PHL, with those from a matched control group.9 This analysis found a 7-10% reduction in primary care office visits for PHL users (statistically significant at p < 0.005). This finding is based on patients who accessed any of the PHL features at least once, but not necessarily secure messaging.

In addition, PHL substituted for some of the scheduled telephone visits and other telephone calls documented in KP’s electronic medical record system (KP HealthConnect). While the overall number of documented calls increased during the evaluation period (due to administrative changes at the call center), the documented calls for PHL users increased half as much as the control group—16% versus 30%. One limitation of this analysis is that only a fraction of phone calls to PCPs are documented in HealthConnect, although the clinically relevant calls are more likely to be documented.

Of note, PHL users are sicker than the general KPNW membership; the prediction of visit substitution amount needs to be adjusted according to the patient mix as well as the level of secure messaging use.

Efficiency: PHL Compared to Phone Calls

An important factor for determining the workload impacts of secure messaging is the relative efficiency of e-mail and phone encounters. This study found little difference in the average time for clinicians to complete an e-mail encounter and a simi-
lar patient-initiated phone encounter. The estimates of how long it took PCPs to answer an e-mail encounter are based on time log data recorded by 22 PCPs—11 high-volume PHL users, and 11 infrequent PHL users. Total resolution of e-mail encounters took the PCPs an average of 5.7 minutes, including research and other work involved in the response. Total resolution of telephone encounters took the PCPs an average of 5.4 minutes. Because of the small number of PCPs in this case study and the wide variation in clinician practice styles, the average times reported here may not be predictive of overall PCPs. The particular value of this case study is the comparison of times to answer e-mail encounters and telephone encounters.¹

Factors Affecting Efficiency

Work time per e-mail encounter increases as clinical intensity increases: high clinical intensity encounters took over eight minutes to complete. Work time per telephone encounter showed a similar increase with clinical intensity. The work time per telephone encounter was also higher when the PCP directly talked with the patient, rather than relaying a message through a nurse or medical assistant. In this case study, there was no difference in the work time for e-mail encounters and the telephone encounters in which the PCP spoke directly with the patient.

Conclusions and Recommendations

Use of Secure E-mail Messaging

During the first year that secure e-mail messaging was available to all PCPs in KPNW, the majority of PCPs were cautious about encouraging their patients to use e-mail messaging. At the end of the first year of PHL’s widespread availability, over 60% of PCPs had less than 15 e-mail encounters with patients per month, and only 5% of eligible patients (adult patients paneled with a PCP) were registered for PHL. This low level of adoption may in part be explained by the concerns of many PCPs that patients would overwhelm them with e-mails—many inappropriate—and without compensating declines in demand for office visit and telephone encounters. In addition, patient registration was also a barrier, as system design issues prevented PCPs from registering patients during an office visit.

Low use of PHL also reflects weak patient demand for e-mail encounters, in part from lack of awareness of this new service. Furthermore, many patients were discouraged from registering for PHL because of delays in the registration system. Patients wanting to e-mail their PCP for the first time must wait at least one week after registering online to receive a secure password, which is mailed to their home address.¹ Frustrated, many patients call or come in for an office visit, without completing their online registration. Not surprising, patients most likely to register for PHL and use secure e-mail messaging, had greater health care needs—older age, chronic conditions, and higher office visit utilization.

In contrast to PCP concerns, this study found that patients used e-mail messaging appropriately—seeking answers to clinically relevant questions. Nearly all patient-initiated e-mail encounters inquired about an ongoing medical problem or care plan, or a new medical problem. Less than 5% of e-mail encounters contained nonmedical requests or questions. On average PHL users sent 4.2 messages to their PCP per year—less than three e-mail encounters per year—the vast majority not new demand. This study found strong evidence that patients who message through PHL reduced their primary care visit rate, and that PHL messages largely replaced phone calls. Furthermore PCPs could complete e-mail encounters in a time comparable to patient-initiated phone encounters. However, patients reported 11% of the encounters represented new demand—they would not have contacted KP otherwise.

What is the effect of secure e-mail messaging on PCPs’ workload? Although this study found evidence that secure e-mail messaging could save PCPs’ time, a definitive answer requires more information: 1) the precise extent that e-mail encounters substitute for office visits or telephone encounters, and 2) the actual time for PCPs to complete e-mail encounters versus comparable office visits or telephone encounters. Both of these depend on how PCPs work with their support staff to handle patients’ calls, and which calls shift to e-mails. In particular, do patients’ e-mails to their PCP cover the types of requests that the PCP would hand-off to their support staff?

Variation in PCP preferences and practice style, and confidence in their support staff, will determine the answers to these questions. Furthermore, secure e-mail messaging will have a changing impact over time on PCP workload, because of wider

| Table 4: Patient description of potential action if e-mail encounter had not been available |
|-----------------|--------------------------|
| Demand          | Reason                   |
| 44%             | Called PCP’s office for advice |
| 25%             | Scheduled an office visit  |
| 18%             | Called KP advice nurse    |
| 11%             | Would make no contact     |
| 3%              | Walk in for unscheduled medical care |

Note: Percentages do not add up to 100% due to rounding.
adoption among patients and PCPs, and changes in how patients and PCPs use this new communication technology. For example, current users of secure e-mail messaging are sicker than the general population; so their current experiences may not accurately predict visit substitution for the general population. Finally, the answer will also depend on institutional parameters, such as the ease of telephone access to PCPs.

**Secure E-mail Messaging and Patient Satisfaction**

Patients were highly satisfied with the e-mail exchanges they had with their PCP. They were particularly satisfied that e-mail messaging allows them to conveniently communicate directly with their PCP. The most important factors associated with higher satisfaction are: all of their questions were answered; completeness of answers; timeliness of PCP responses; the e-mail exchange achieved the results the patient wanted; courtesy of responses; and the amount of influence they wanted and had in decisions.

Satisfaction was not associated with: the specifics of patients’ requests—new versus ongoing problem; or whether complex or open-ended requests. Satisfaction was also not associated with the following characteristics of PCPs’ responses: clinical intensity of the assessments or actions, use of slang (eg, abbreviations commonly used in e-mails), grammar and spelling errors, or whether the exchange included an out-of-office auto reply.

Interestingly, PCPs’ scores on office visit patient satisfaction were not predictive of their patients’ satisfaction with e-mail encounters. This suggests that the skill set required for a successful e-mail encounter is not the same skill set required for a successful office visit. This evaluation reflects the experience of early-adopter patients (who were sicker than average patients), and of early-adopter PCPs. These findings are the best information available about the impact of secure e-mail messaging for KP patients, PCPs, and the KP care delivery system. However, these findings may not be predictive of future impacts, as secure e-mail messaging is used more broadly by patients, and as PCPs and support staff become more efficient and creative. Continuing to measure how much secure e-mail messaging substitutes for office visits and phone calls is crucial, as well as evaluating possible shift of work between PCPs and support staff. Finally, this evaluation was limited to adult primary care; similar evaluations should be considered as e-mail messaging spreads to pediatrics and specialty care departments.

**Acknowledgments**

We are grateful to Yvonne Zhou, PhD, and the many other KP staff members who served as sponsors, advisors, and colleagues during this evaluation. This work was partially funded by KP’s Internet Services Group and Clinical Systems Planning and Consulting.

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Patients were highly satisfied with the e-mail exchanges they had with their PCP. They were particularly satisfied that e-mail messaging allows them to conveniently communicate directly with their PCP.
Implementing the Electronic Medical Record in the Exam Room: The Effect on Physician-Patient Communication and Patient Satisfaction

By Vivian Tong Nagy, PhD
Michael H Kanter, MD

Abstract

With the implementation of the electronic medical record—called HealthConnect—in all exam rooms throughout the Kaiser Permanente health care delivery system, how computers in the exam room affects physician-patient communication is a new concern. Patient satisfaction scores were obtained for all primary and specialty care physicians in a large medical center in Southern California to determine how scores changed as physicians started using HealthConnect in the exam room. Results show no significant changes in patient satisfaction for these physicians. Although concerns were not realized that patient satisfaction might decrease after HealthConnect was introduced, there was also no evidence that introducing an electronic medical record in outpatient clinics increased patient satisfaction.

HealthConnect significantly changes the work processes of physicians while the patient is in the exam room. These changes can potentially affect the communication between physician and patient as well as patients’ overall satisfaction. When introduced broadly throughout KP, computers in the exam room may have a far-reaching and significant effect on patient perceptions of their outpatient visits. Given the importance of this issue and some methodologic issues with previous studies, we were motivated to study the effect of implementation of a computerized medical record in the exam room with a large number of providers in multiple specialties.

Methodology

This study presents results of patient satisfaction scores for physicians in the Baldwin Park Medical Center—a large KP medical center in Southern California. Baldwin Park patient encounters totaled 1,575,000 in 2005; about 56% of the encounters were with physicians. HealthConnect was implemented in the exam rooms of all clinical departments at this medical center from October 2004 through November 2005. All ambulatory care physicians were involved in and included in this study. The few exceptions were emergentologists and physicians in hospital office visit departments (HOV departments).
The patient satisfaction survey for the Southern California Permanente Medical Group is the Member Appraisal of Physician/Provider Services (MAPPS). It has been administered since 1994 and is very similar to the Art of Medicine surveys used in other regions. There are eight questions related to the clinician–patient interaction. The response to each question is assigned a score from 1 to 10, with 10 being the most favorable response (Table 1). The combined mean score (CMS) is the calculated arithmetic average of the responses to the eight questions.

The MAPPS survey is sent to patients who have had recent interactions with physicians. Patients who had an office visit are randomly selected to receive a survey, with the caveat that patients are not surveyed more than once every two months (and no more than once every six months for the same physician). Surveys are mailed out each week to approximately six patients for each physician, with a response rate of about 30%.

For this study, MAPPS data were used from 11,297 patients who were seen by physicians at the Baldwin Park Medical Center from October 2004 through November 2005. Each survey received was placed in one of three categories relative to the point in time when the physician who treated the patient went live with ambulatory HealthConnect. The three categories were “pre 1–3 months” (physician treated the patient 1 to 3 months before the physician went live with HealthConnect), “post 1–3 months” (physician treated the patient 1 to 3 months after the physician went live with HealthConnect), and “post 4–6 months.” Surveys from the actual month the physician went live with HealthConnect were not included in the study. For the physicians in the study, 4140 surveys were obtained for pre 1–3 months, 3980 surveys were obtained for post 1–3 months, and 3177 surveys were obtained for post 4–6 months.

The MAPPS CMS and the scores for each of the individual MAPPS questions were analyzed for the three time periods.

**Analyses**

Analyses were conducted separately for primary care and specialty care physicians. There was significant nonhomogeneity of variance for some of the MAPPS questions, indicating that one of the basic assumptions of the F-test (analysis of variance) was not met. As a result, a nonparametric statistic, the Friedman two-way analysis of variance by ranks, was used to analyze the data. In this study, the Friedman analysis evaluated ranks to test the null hypothesis that the samples from the three time periods were drawn from the same population. The statistic used in the Friedman analysis is distributed approximately as $\chi^2$.\(^{10}\)

**Results**

The Friedman test required that each physician have data for each of the three time periods. Of the 184 physicians, 168 physicians—115 physicians in primary care (internal medicine, family practice, obstetrics and gynecology, and pediatrics) and 53 physicians in specialty care (such as allergy and ophthalmology)—had a complete set of data.

Results of the statistical tests show that no significant differences were found in the ranks of the mean scores among the three time categories for the CMS for physicians in either primary care or specialty care. In addition, there were no significant changes in the responses among the three time categories for any of the individual MAPPS questions for either group of physicians (Table 2).

**Discussion**

For both the primary care physicians and the specialty care physicians, there were no significant differences in patient ratings of physician–patient communication among the three time periods: 1 to 3 months before implementation of HealthConnect, 1 to 3 months after implementation, and 3 to 6 months after implementation.

On the one hand, decline in patient satisfaction did

---

Table 1. Member Appraisal of Physician/Provider Services (MAPPS)

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>How courteous and respectful was the doctor or health care provider?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>How well did the doctor or health care provider understand your problem?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>How well did the doctor or health care provider explain to you what s/he was doing and why?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Did the doctor or health care provider use words that were easy for you to understand?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>How well did the doctor or health care provider listen to your concerns and questions?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Did the doctor or health care provider spend enough time with you?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>How much confidence do you have in the ability or competence of the doctor or health care provider?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Overall, how satisfied are you with the service you received from the doctor or health care provider?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
Implementing the Electronic Medical Record in the Exam Room: The Effect on Physician-Patient Communication and Patient Satisfaction

not materialize, as some had feared. Learning how to use the HealthConnect computer system in the exam room requires considerable changes in how some of the work of physicians is done. New tasks include learning how to enter data, move among the computer screens, make requests for tests or consults, and coordinate with other providers online. However, results show that in the six months after implementation, these considerable changes in work flow did not have a detrimental effect on the ability of physicians to communicate effectively with patients.

On the other hand, there was also no indication of improved patient satisfaction when computers were introduced into the exam room. This is contrary to the positive results of the earlier studies in the KP Northwest and Colorado Regions.1 It is likely that methodologic differences between the current study and these other studies explain the different results. The current study used a sample of all physicians in a larger medical center, with each provider serving as his/her own control. This latter feature would eliminate any bias in selecting more physicians with greater communication skills in the study group. The number of surveys returned was substantially larger in the current study as well. It is also possible that the already high scores (CMS of 9.34 out of 10 in the preimplementation period aggregating across all physicians in the study) precluded any significant improvement.

One limitation to our study was that we did not obtain any information about why changes in patient satisfaction were not observed. However, earlier studies did obtain such information.1 The studies found that some key physician behaviors promoted the patient’s involvement with the computer during the visit and established the physician’s familiarity with the patient. Physician behaviors that contributed to patient satisfaction included maintaining eye contact, explaining to the patient what the physician was entering in the computer, showing information from the medical record to the patient (such as lab results), and indicating awareness of the purpose of the patient’s visit and previous history. In addition, if the patient felt actively involved and perceived that the physician liked the computer, high levels of satisfaction were reached. Finally, it was

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Table 2. Results of Friedman Tests: Primary Care Physicians

<table>
<thead>
<tr>
<th>MAPPS question</th>
<th>Pre 1–3 mean</th>
<th>Post 1–3 mean</th>
<th>Post 4–6 mean</th>
<th>χ²</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courteous and respectful</td>
<td>9.47</td>
<td>9.51</td>
<td>9.48</td>
<td>4.05</td>
<td>NS</td>
</tr>
<tr>
<td>Understood your problem</td>
<td>9.30</td>
<td>9.35</td>
<td>9.35</td>
<td>2.05</td>
<td>NS</td>
</tr>
<tr>
<td>Explained what she was doing</td>
<td>9.26</td>
<td>9.33</td>
<td>9.30</td>
<td>2.50</td>
<td>NS</td>
</tr>
<tr>
<td>Used words that were easy to understand</td>
<td>9.53</td>
<td>9.54</td>
<td>9.53</td>
<td>3.10</td>
<td>NS</td>
</tr>
<tr>
<td>Listened to concerns, questions</td>
<td>9.28</td>
<td>9.34</td>
<td>9.32</td>
<td>0.65</td>
<td>NS</td>
</tr>
<tr>
<td>Spent enough time with you</td>
<td>9.11</td>
<td>9.22</td>
<td>9.18</td>
<td>1.82</td>
<td>NS</td>
</tr>
<tr>
<td>Confidence in ability</td>
<td>9.19</td>
<td>9.23</td>
<td>9.25</td>
<td>3.11</td>
<td>NS</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>9.20</td>
<td>9.27</td>
<td>9.27</td>
<td>3.16</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Combined mean score (CMS)</strong></td>
<td><strong>9.29</strong></td>
<td><strong>9.35</strong></td>
<td><strong>9.33</strong></td>
<td><strong>2.71</strong></td>
<td><strong>NS</strong></td>
</tr>
</tbody>
</table>

*For primary care physicians, n = 115. MAPPS = Member Appraisal of Physician/Provider Services; NS = not significant.

Table 3. Results of Friedman Tests: Specialty Care Physicians

<table>
<thead>
<tr>
<th>MAPPS question</th>
<th>Pre 1–3 mean</th>
<th>Post 1–3 mean</th>
<th>Post 4–6 mean</th>
<th>χ²</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courteous and respectful</td>
<td>9.56</td>
<td>9.55</td>
<td>9.57</td>
<td>1.43</td>
<td>NS</td>
</tr>
<tr>
<td>Understood your problem</td>
<td>9.45</td>
<td>9.45</td>
<td>9.44</td>
<td>1.40</td>
<td>NS</td>
</tr>
<tr>
<td>Explained what she was doing</td>
<td>9.39</td>
<td>9.42</td>
<td>9.44</td>
<td>4.11</td>
<td>NS</td>
</tr>
<tr>
<td>Used words that were easy to understand</td>
<td>9.58</td>
<td>9.60</td>
<td>9.60</td>
<td>1.61</td>
<td>NS</td>
</tr>
<tr>
<td>Listened to concerns, questions</td>
<td>9.44</td>
<td>9.44</td>
<td>9.46</td>
<td>1.42</td>
<td>NS</td>
</tr>
<tr>
<td>Spent enough time with you</td>
<td>9.32</td>
<td>9.37</td>
<td>9.36</td>
<td>1.11</td>
<td>NS</td>
</tr>
<tr>
<td>Confidence in ability</td>
<td>9.36</td>
<td>9.37</td>
<td>9.38</td>
<td>0.80</td>
<td>NS</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>9.40</td>
<td>9.37</td>
<td>9.41</td>
<td>0.26</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Combined mean score (CMS)</strong></td>
<td><strong>9.44</strong></td>
<td><strong>9.45</strong></td>
<td><strong>9.46</strong></td>
<td><strong>1.40</strong></td>
<td><strong>NS</strong></td>
</tr>
</tbody>
</table>

*For specialty care physicians, n = 53. MAPPS = Member Appraisal of Physician/Provider Services; NS = not significant.
suggested that if physicians demonstrated how privacy and security can be maintained for patient health information, patient satisfaction scores may not be negatively affected.11

These suggested key physician behaviors were known to the physicians at the Baldwin Park Medical Center, and they were encouraged to implement these behaviors when HealthConnect was introduced in the exam rooms. However, because there was no direct observation of the physician–patient interactions during this period, the extent to which these behaviors were practiced is unknown. Encouraging physicians to establish the key behaviors that are associated with patient satisfaction when computers are in the exam room may result in improved MAPPS scores.

In summary, patient satisfaction scores for all ambulatory care physicians in a large KP medical center—both primary care and specialty care physicians—did not significantly increase or decrease in the short period after computers were introduced into exam rooms. Concerns were not substantiated that patients would be less satisfied with the interaction with their physician when computers changed the workflow processes in the patient visit and, potentially, the dynamics of physician–patient interactions. However, the advantages that the computerized medical record can bring to ambulatory care were also not realized in the one to six months after ambulatory HealthConnect was implemented in the medical center. It will be important to emphasize to physicians the steps they can take to demonstrate how computerized technology can contribute to developing trust and confidence in the physician ...

**Acknowledgments**

The authors would like to thank the MAPPS Steering Committee, KP Southern California, for their support. For assistance with data analysis, the authors thank Tonya Premisrith, Organizational Research, and Raoul Burchette, Research and Evaluation. For assistance with literature review, the authors thank Amisha Gupta, SCMPG Technology Assessment & Guidelines Unit, Clinical Analysis. Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.

**References**


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**Goodness of the Physician**

Some patients, though conscious that their condition is perilous, recover their health simply through their contentment with the goodness of the physician.

— Hippocrates, 460-400 BCE, Greek physician known as the father of modern medicine
Obesity in the Kaiser Permanente Patient Population and Positive Outcomes of Online Weight-Management Programs

Abstract
We review what is known about the effects of obesity in the Kaiser Permanente (KP) population and discuss outcomes for two nationally available effective online programs, HealthMedia Balance® (Balance) and 10,000 Steps®. Obese KP patients often have health problems related to overweight and report difficulties with self-care, yet with the proper support, they can avail themselves of effective treatment to manage both obesity and associated conditions that affect quality of life. Clinicians should be aware of potential problems with functional status and self-care in their obese patients, provide brief assessment and advice, and refer obese patients to effective national and regional weight-management programs.

Obesity at Kaiser Permanente: Prevalence, Effects on Quality of Life, and Costs
Nationally representative statistics indicate the prevalence of obesity (body mass index [BMI] > 30 kg/m²) in adults to be 32.2% and the prevalence of extreme obesity (BMI > 40 kg/m²) to be 4.8%. Seventeen percent of children in the United States are now overweight, triple the prevalence in 1975. In the Kaiser Permanente (KP) Northwest and Colorado Regions that have established BMI data in the electronic record, the prevalence of obesity in adults and the prevalence of overweight in children are similar to those seen in national statistics. Extrapolating to the KP population from US data, we can estimate that approximately two million adult KP patients are obese and more than 350,000 are extremely obese, making obesity the most common chronic condition affecting adult patients and more common than diabetes, coronary disease, and depression combined. In both national and KP-based surveys, African-American and Latina women are disproportionately affected by obesity (unpublished data, Nancy Gordon, DSc, personal communication 2006). Given the high prevalence of overweight among youth and adolescents nationally, it is likely that the clinical problem of obesity and related disease will be with us for years to come.

Obesity is associated with an increased prevalence of many chronic health conditions, including diabetes, coronary artery disease, cerebrovascular disease, certain malignancies, and depression. Similar findings are observed in KP settings. More than 40% of KP patients with asthma, chronic pain, and congestive heart failure are obese. The 2003 KP Care Management Institute (CMI) measurement report data revealed that 57% of those with diabetes are obese and 15% are severely obese (unpublished data). Fifty-three percent of obese and 62% of severely obese patients report the presence of three or more comorbid chronic conditions. Depression is also more common in obese patients with chronic diseases. Not surprisingly, the high prevalence of chronic conditions result in lower quality of life and worse functional status in obese patients. The 2005 CMI Self-Care Shared Decision-Making survey revealed that functional status is impaired, with only 18% of severely obese patients and 29% of obese patients with chronic conditions reporting high functional status (unpublished data).

Obesity is costly to the health care system, and the proportion of health care dollars spent on obesity-related...
chronic medical conditions is increasing. Because of the increased population prevalence of obesity and more aggressive treatments of obesity-related comorbidities such as dyslipidemia and hypertension, the overall health care costs attributed to obesity in patients with private health insurance has increased from 2.0% in 1987 to 11.6% in 2002.5 Obese individuals spend 36% more on health care services and 77% more on medications than people of normal weight and incur costs greater than those of smokers or problem drinkers.3 KP researchers have observed similar findings.5–7 The costs of care for obese KP Northern California (KPNC) patients with a BMI of 30 to 40 kg/m² are 25% higher than for patients of normal weight, and costs of care for patients with a BMI of 40 to 50 kg/m² (extreme obesity) are 78% higher.4 Over an eight-year period, obese KP Northwest (KPNW) patients also have increased health care costs and use. The number of primary care visits was 39% higher and the number of inpatient days was 49% higher in obese patients as compared with patients of normal weight.5 Pharmacy costs for obese patients were double those for patients of normal weight, and particularly noteworthy was a finding of a threefold increase in costs of cardiovascular medications and a 13-fold increase in costs of diabetes medications.5 Weight gains of ≥20 pounds are associated with medical care cost increases of >$500 over the following three years.8 Data from CMI indicate that costs of health care for patients with chronic conditions such as diabetes or congestive heart failure complicated by obesity increased 30% to 50% as compared with patients with either of those chronic conditions not complicated by obesity (unpublished data).

Less information is available about how weight-management services impact the cost of health care. However, preliminary results in the KP setting appear to indicate that behavioral weight management may actually be cost-saving from the perspective of the health plan. A study from KPNW8 indicates that modest weight loss of 5%, attained by participation in a KP health education program, resulted in cost savings from the perspective of the health care system of more than $400 per patient per year.9 Despite regain of weight in many of the study subjects, health care cost reductions were sustained throughout five years of observation.

Kaiser Permanente’s Model for Weight Management

The KP model for weight management is based on recommendations from the US Preventive Services Task Force9 and best communication practices developed in the KPNC Health Education Department. On the basis of evidence of effectiveness for behavioral weight-management programs for obese patients, the US Preventive Services Task Force 2003 obesity screening guidelines recommend routine assessment of BMI. When BMI is found to be ≥30 kg/m², clinicians should recommend participation in formal weight-management programs. Modest weight loss of 5% to 7% is associated with significant health benefits, including diabetes prevention, improved blood sugars in established diabetes, improved levels of blood pressure control, and decreased dyslipidemia, and is considered a good initial goal for weight-loss efforts.

The KP model of care relies on clinical assessment of BMI, brief positive conversations between patient and clinician, agreement on a next-step behavior change or program referral, and arrangement of follow-up. Although time is limited during office visits, our experience is that effective conversations can take fewer than five minutes. These motivating conversations are critical, as individuals who are given clinician advice to manage their weight are two to ten times more likely to report a behavior change or weight-loss attempt than those who report not being given this advice.10

Outside the office-visit setting, patients can access weight-management information, message boards, and regional and national program listings at www.kp.org/weight.

Although physician advice is essential, it is often insufficient to result in the long-term behavior changes necessary to promote weight loss and maintenance. Data from a recent CMI survey of patients with chronic medical conditions shed light on this issue. Obese patients with chronic conditions report that they know the lifestyle changes they need to make but that they have difficulty following these recommendations and actually making the changes needed to better manage their chronic illness. They are much less likely than normal-weight patients with chronic conditions to report regular activity, maintaining healthy eating patterns such as eating adequate fruits and vegetables, or adhering to a low-fat diet. Critically, the CMI Self-Care Shared Decision-Making survey also revealed that obese patients with chronic conditions report lower self-confidence in their ability to follow their physicians’ recommendations, particularly under times of stress. Structured behavioral programs offer appropriate support to patients struggling with self-care or self-efficacy problems...
and maximize the probability of weight loss and maintenance.

**Weight-Management Programs Available to KP Patients**

KP patients are fortunate to have a wide variety of regional and national programs available. Most KP regions have behavioral weight-management and activity promotion programs in health education settings. Some regions offer obesity pharmacotherapy or intensive meal-replacement programs outside the primary care setting (Table 1). Online and community-based programs broaden the reach of these regional programs by their wide availability, convenience, and low cost compared with standard behavioral group programs or individual counseling. All KP patients receive discounts for community and worksite Weight Watchers programs and the 10,000 Step Program and free access to online healthy lifestyle programs, including Balance. KP patients also have access to weight-management information and tools included in the online KP health encyclopedia. The discounted community- and worksite-based Weight Watchers group programs have been evaluated more comprehensively than other commercial weight-loss programs.11

**Evaluation: KP Healthy Lifestyles: HealthMedia Balance Program**

Balance is an online weight-management program that uses tailored messages to provide customized motivational behavior-change advice to support weight loss. Messages are tailored on the basis of data that participants provide during completion of a baseline questionnaire. For instance, if a participant indicates a personal or family history of hypertension, the program will advise the participant of the beneficial effects of weight loss on blood pressure. Development of a personalized action plan, e-mail reminder prompts, and the option for naming a support person to facilitate behavior change. Because of its online format, the program is available in every KP region and community

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**Table 1. Kaiser Permanente regional weight-management programs**

<table>
<thead>
<tr>
<th>Region</th>
<th>Behavioral weight management</th>
<th>Activity programs</th>
<th>Pharmacotherapy programs</th>
<th>Bariatric preparation programs</th>
<th>Pediatric/teen program</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>+</td>
<td>+</td>
<td>*</td>
<td>+</td>
<td>+</td>
<td>Spanish-language program</td>
</tr>
<tr>
<td>Georgia</td>
<td>+</td>
<td>+</td>
<td>#</td>
<td>+</td>
<td>+</td>
<td>Single-session introductory class; “Art of Cooking Healthy” class</td>
</tr>
<tr>
<td>Hawaii</td>
<td>+</td>
<td>+</td>
<td>#</td>
<td>+</td>
<td>+</td>
<td>“Overcoming Emotional Eating” class</td>
</tr>
<tr>
<td>Mid-Atlantic States</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>Emphasis on community-clinician partnerships</td>
</tr>
<tr>
<td>Northern California</td>
<td>+</td>
<td>+</td>
<td>#</td>
<td>+</td>
<td>+</td>
<td>Weight-maintenance newsletter; Spanish-language classes; diet class targeted to African Americans</td>
</tr>
<tr>
<td>Northwest</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Phone-based triage counseling available</td>
</tr>
<tr>
<td>Ohio</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emphasis on community-clinician partnerships</td>
</tr>
<tr>
<td>Southern California</td>
<td>+</td>
<td>#</td>
<td>*</td>
<td>+</td>
<td>+</td>
<td>Medically supervised weight-management programs that use meal-replacement products</td>
</tr>
</tbody>
</table>

* Formal programs using pharmacotherapy are available in Colorado and Southern California.
* Georgia, Hawaii, Northern California, and Southern California have limited coverage for pharmacotherapy when certain conditions are met.

Data from Care Management Institute WM Web site; accessed January 21, 2006.

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**Description of Methods for the Care Management Institute Self-Care Shared Decision-Making Study**

At Kaiser Permanente, 4108 patients with chronic conditions such as asthma, heart disease, diabetes, heart failure, and chronic pain completed a survey on how well they can manage their own condition(s), how satisfied they are with their health care, and about their quality of life and functional status. Persons with chronic conditions were identified during 2002 using administrative data sources and surveyed during the fall of 2003. Weight and height were self-reported in the survey. Chi-square estimates were computed to determine a level of significance. Of the 97% of respondents who reported their weight and height, 38% were obese (body mass index [BMI] ≥ 30 kg/m²) and 8% were extremely obese (BMI ≥ 40 kg/m²).
and is delivered free to patients. Since August 2004, more than 65,000 KP patients have participated in the Balance weight-management program, and six-month outcome data are available for 7% of initial participants. Eighty-one percent of participants are female, 53% are obese, and 13% are extremely obese, indicating that program participants are more likely to be obese and more likely to be female than in a typical KP population. At six months after program entry, 26.0% of obese participants (BMI = 30–39 kg/m²) have lost >5% of their starting body weight and 8.6% have lost more than 10% of their initial body weight. Fourteen percent of participants with a BMI >40 kg/m² have experienced a weight loss of ≥10%. During program participation, 43% of participants reported improving their physical activity and 51% reported improving their eating habits. Seventy-eight percent of participants rated their satisfaction with their result as excellent or good. Data from more than 3000 participants with diabetes and 16,000 participants with hypertension show similar weight loss and satisfaction outcomes (unpublished data from HealthMedia, April 2006).

The effectiveness of this intervention was studied in a multicenter, randomized, controlled trial performed in four KP Regions involving 2800 patients. This study compared participation in Balance to a control intervention of self-selected weight-management information in the KP online health encyclopedia. At six months, participants in the Balance intervention significantly lost more weight on average (6.2 pounds) than did participants in the control intervention (2.4 pounds) (Figure 1).12

Participant Comments on Balance

My name is Sheri Olivas. I was about to turn 40 and decided I needed to do more for my health. I was looking at the new Thrive site on Kaiser Permanente’s Web page and followed a few links to the Healthy Lifestyles page.

The first thing I did was to take the Nourish questionnaire. I learned what I was not eating right—and what I could do to change it. So a few weeks ago I started actively making better food choices. And I began drinking nothing other than water—no more soda pop or sugared beverages. Funny, but the more I drank water, the more I was thirsty. I have never been very thirsty and was a huge soda drinker.

That was going so well that the next week I took the Balance questionnaire and discovered I was over my ideal BMI [body mass index] and needed to lose 27 pounds. I took that to heart and started walking on the treadmill during my lunch hour. I started with just 30 minutes and only managed three days the first week. Over the next few weeks I was able to increase to a 45-minute weight loss program on the treadmill.

After four weeks I did my measurements and weight again. I was surprised to find I had already lost five pounds and two inches off my waist and three inches off my hips. Now I know this doesn’t sound like much, but I have tried lots of diets, Herbalife, Slim-Fast, etc … and never had much as far as results. I might lose a little weight, but then I gained more back. I have been overweight since 1999 when I developed Hashimoto’s thyroiditis and have gained more over the last few years. This is the first time I have had fast and easy results. And I feel better. I think it is wonderful that Kaiser Permanente is offering these options to its patients and employees.

Sincerely,
Sheri Olivas, RN
Medical/Surgical Arena Nurse at Kaiser Sunnyside Medical Center,
Clackamas, Oregon

Source: http://internal.kpnw.org/insidekpnw/center/spotlight/stories/thrive_sheri_olivas.html
satisfaction with KP (unpublished data from the randomized control trial data collected by HealthMedia). Although follow-up rates in this study were low (20%), telephone calls to nonrespondents indicate that they achieved weight-loss levels similar to those of respondents.

Evaluation of the 10,000 Steps Program

Improved daily activity is a key activity to prevent weight gain and is critical to maintaining weight loss. The 10,000 Steps® Program is a physical activity pedometer program promoting increased daily steps as a route to improved fitness and weight control. After enrollment, participants are mailed a pedometer and gain access to online support resources, tips on healthy living, and electronic ways of tracking their progress. As of August 2006 more than 20,000 KP patients had participated in this program. The average age of participants is 49 years and the average BMI at the start of program participation is 32 kg/m². The average increase in participants’ daily step count was 1749 steps, nearly a mile per day. Obese and severely obese participants were found to take fewer steps daily but to have higher relative increases in daily steps as compared with normal-weight participants. Daily steps in normal-weight participants increased by 9.8% and in obese participants by 18.8% and 20.9%, respectively (Figure 2). Small daily lifestyle changes such as this are critical to helping participants balance their daily “energy in-energy out” equation, thereby preventing weight gain or assisting with weight loss and weight-loss maintenance.

Where to go for more information about weight management at Kaiser Permanente

- Member and public site for weight management resources: kp.org/weight
- Care Management Institute Weight Management Initiative site on the Kaiser Permanente Intranet: http://cl.kp.org/pkc/national/topics/cmi/wmi/index.htm

Figure 2. Daily steps taken by participants who completed the 10,000 Steps Program.

... 16% of participants report that the main benefit has been that they “fit into clothes better,” whereas 31% report their main benefit being that they are “more fit” after program participation.

Conclusions

Obesity is common in the KP environment and adversely affects quality of life and health care costs. Regional and national weight-management programs support obese patients’ self-care and confidence in their ability to make lifestyle changes to better manage their health. On the basis of the data presented here, KP physicians can confidently refer their patients to the many effective KP weight-management programs.

Acknowledgments

The authors acknowledge the support of colleagues at CMI, particularly William Caplan, MD, and Denise Myers, RN, MPH. The partnership and assistance of Nico Pronk, PhD, and staff of HealthPartners’ 10,000 Steps Program and Sally Petersen of HealthMedia in providing KP-specific data has been critical in helping us assess program effectiveness. Further information about Balance can be obtained at www.healthmedia.com, and information about 10,000 Steps can be obtained at www.10k-steps.com/.

Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.
References


An Opportunity

To have lived through a revolution, to have seen a new birth of science, a new dispensation of health, recognized medical schools, remodeled hospitals, a new outlook for humanity, is an opportunity not given to every generation.

—Sir William Osler, MD, 1849-1919, physician, professor of medicine, and author
Quality Improvement

Decreasing Medication Discrepancies Between Outpatient and Inpatient Care Through the Use of Computerized Pharmacy Data

By Charles S Salemi, MD, MPH
Norvella Singleton, BS

Abstract

**Context:** The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) instituted a new regulation in 2006 to improve patient safety by decreasing medication errors. This requires a process for obtaining and documenting a complete list of each patient’s current medications at hospital admission and communicating this list to the next clinician (“Medication Reconciliation”).

**Objective:** We sought to determine whether medication discrepancies between outpatient and inpatient care can be decreased through the use of computerized pharmacy data.

**Method:** We evaluated outpatient medication prescriptions in 2000 and 2004 using computer-generated data for patients admitted from an Emergency Department to a medical ward. The hospital records and pharmacy data were reviewed to determine which ambulatory medications were ordered at admission, continued as an outpatient, and refilled three months after discharge. In 2004 additional computerized pharmacy data were provided to attending physicians. Ambulatory care “essential prescription medication groups” (cardiac, chronic obstructive pulmonary disease, asthma, diabetes, and neurologic) were also evaluated. Medication discrepancies for the years 2000 and 2004 were compared in several categories.

**Results:** Medication discrepancies were found in all evaluated categories in 2000. The follow-up study showed a decrease in discrepancies for nearly all categories.

**Conclusion:** Results show that use of outpatient pharmacy data can decrease medication discrepancies in compliance with current JCAHO requirements.

Introduction

As noted in the Institute of Medicine report, *To Err is Human*, medication errors have been a major cause of morbidity and mortality in the United States. Studies of hospitalized patients have estimated that medication errors have caused approximately 40,000 deaths annually. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) issued a new regulation in 2006 intended to improve patient safety by decreasing medication errors. Called “Medication Reconciliation,” it requires health care organizations to develop a process for obtaining and documenting a complete list of the patient’s current medications at admission to the hospital and communicating this list to the next clinician. The Kaiser Permanente (KP) Fontana Medical Center performed an initial medication discrepancy (medication error) study in 2000 and a follow-up study in 2004, prior to the JCAHO regulation of medication reconciliation. The goals were to show the scope of medication discrepancies and the improvements with use of computerized medication information. These studies were approved by the institutional review board of Kaiser Permanente Southern California.

Methods

The Fontana Medical Center had 422 licensed beds during the study years. The major variable used for study of medication discrepancies was outpatient prescription medications. This was obtained from a computerized data system, the KP Patient Data System (KPDS), available to clinicians in the years 2000 and 2004. Hospital
**Care Management Summary Sheet—Printed**

<table>
<thead>
<tr>
<th>Rx date</th>
<th>Drug</th>
<th>Qty</th>
<th>Refd</th>
<th>Date</th>
<th>Type</th>
<th>Result</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/30/03</td>
<td>Albuterol aer 90 mcg</td>
<td>2</td>
<td>7</td>
<td>07/26/03</td>
<td>CR</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>08/30/03</td>
<td>One Touch Test Strips</td>
<td>200</td>
<td>2</td>
<td>09/23/02</td>
<td>CR</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>08/30/03</td>
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<td>400</td>
<td>2</td>
<td>07/26/03</td>
<td>K</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>05/08/03</td>
<td>Cheratussin AC syp AC</td>
<td>240</td>
<td>1</td>
<td>09/23/02</td>
<td>K</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>05/08/03</td>
<td>Erythromycin 500-mg tab</td>
<td>28</td>
<td>1</td>
<td>07/26/03</td>
<td>MAU</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>03/04/03</td>
<td>Allegra cap 60 mg</td>
<td>50</td>
<td>2</td>
<td>09/23/02</td>
<td>MAU</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>09/26/02</td>
<td>FE-Tinic cap 150 mg UD</td>
<td>100</td>
<td>1</td>
<td>07/26/03</td>
<td>A1C</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>09/23/02</td>
<td>ALT</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>07/26/03</td>
<td>ALT</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>09/23/02</td>
<td>ALT</td>
<td>31</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Chol</th>
<th>Trig</th>
<th>HDL</th>
<th>LDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/13/02</td>
<td>157</td>
<td>94</td>
<td>63</td>
<td>75</td>
</tr>
<tr>
<td>03/22/02</td>
<td>177</td>
<td>263</td>
<td>51</td>
<td>73</td>
</tr>
</tbody>
</table>

---

**Recommendations:**

Patient in high risk category for pneumonia. No record for Pneumovax in KITS.

Asthma: High beta-agonist use. Check inhaled anti-inflamm (IAI) adherence, increase IAI dose or potency, and consider adding Serevent.

HF: Patient never attended a heart failure class. Refer to heart failure class.

Diabetes: Retinal exam may be overdue.

Diabetes: Very high risk, Glucose Rx not optimal/check compliance.

CAD: Should be on aspirin (81–325MG) daily unless contraindicated.

CKD: Near ESRD. Consider Nephrology referral.

High CVD risk: Start lisinopril (target 10–40 mg/d). If HF, target highest tolerated dose in range (max 40 mg/d).

High CVD risk and increased creatinine: Start lovastatin 10 mg daily (carefully increase dose if needed to lower LDL to <100 mg/dl).

post-MI: Start beta-blocker (eg, atenolol, lopressor, carvedilol).

CVD risk: Order lipid panel (LDL is missing).

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*Electronic point data and guidelines suggest the above (your case review is required to confirm)*

*If member does not have disease, please circle incorrect disease and fax to XXX-XXXX.*

ASTHMA  | CHF  | DM  | CAD  

---

Figure 1. Example of Care Management Summary sheet showing one patient's medication details.
admissions from the Emergency Department (ED) to a specific general medical ward were reviewed to compare prescribed medications at admission with prior outpatient medications. Outpatient medical records were not reviewed for these studies. Ambulatory care “essential prescription medication groups” (cardiac, chronic obstructive pulmonary disease, asthma, diabetes, and neurologic) were also evaluated.

The follow-up study in 2004 provided admitting physicians with additional computerized pharmaceutical data. These were from an outpatient data system called Care Management System (CMS), which used KPDS pharmacy data (Figure 1). The hospital medical records were reviewed to determine which ambulatory medications were ordered at the time of admission, continued as discharge medications, and refilled three months after discharge. Nursing-home patients were excluded from this study. The term medication discrepancies was used rather than medication errors because outpatient medication records were not reviewed to determine whether a dosage or medication was changed. When these data were collected, 90% of KP patients used KP pharmacies for their outpatient medications. Only the hospital-discharged patient records that contained a CMS sheet were included for this study. The use of the computerized CMS sheets was an option for the admitting and attending physicians. There were no preceding e-mailed instructions or in-service programs prior to availability of the CMS sheets in the ED.

**Results**

The data from the tabulations before and after providing CMS sheets (Table 1) show improvement in all categories: 1) admission orders, 2) discharge summaries, and 3) three-month prescription refills. The largest medication discrepancy noted was an omission of the patient’s previous ambulatory medication. There were discrepancies in both essential and nonessential medications. Statistical evaluation of the data by the z test showed that p was < 0.05 for all categories tested except for admission orders of essential medications (Table 2). Figure 2 shows the improvements in graphic form.

**Discussion**

There are relatively few reports in the literature about medication discrepancies. Most studies were conducted by pharmacists and focused primarily on admission medication orders compared with previous outpatient

<table>
<thead>
<tr>
<th>Table 1. Medication discrepancy* percentages in 2000 and 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Admission orders</td>
</tr>
<tr>
<td>Discharge summary</td>
</tr>
<tr>
<td>Three-month prescription refills</td>
</tr>
</tbody>
</table>

*p < 0.01.

*b p < 0.001.

* See text for definitions.

CMS = Care Management System; KPDS = Kaiser Permanente Patient Data System; Rx = prescriptions.

<table>
<thead>
<tr>
<th>Table 2. Z-testing of differences between baseline and follow-up studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>All prescription medications</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Admission orders</td>
</tr>
<tr>
<td>Discharge summary</td>
</tr>
<tr>
<td>Three-month prescription refills</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All essential medications</th>
<th>Baseline 2000</th>
<th>With CMS sheet 2004</th>
<th>Percentage difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission orders</td>
<td>34%</td>
<td>22%</td>
<td>12</td>
<td>&lt;0.111 (NS)</td>
</tr>
<tr>
<td>Discharge summary</td>
<td>47%</td>
<td>20%</td>
<td>27</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* CMS = Care Management System; NS = not significant.
medication. The admission medication discrepancy ranged from 11% to 46%. A report from the Kaiser Foundation Health Plan of Colorado focused on outpatient medication discrepancies (range, 14%–83%) and found that poor handwriting was the most frequent culprit. That report showed a higher readmission rate at 30 days for patients with medication discrepancies. A Dutch study used computerized outpatient pharmacy data similar to ours and showed that computerized outpatient pharmacy data were more accurate than physician-obtained medication histories.

**Conclusion**

Our study demonstrates the value of providing pharmaceutical computerized data to clinicians to decrease medication discrepancies. The data supports the 2006 JCAHO regulations to decrease medication errors by using a medication reconciliation process. Having pharmaceutical data available to clinicians is not sufficient to improve medication discrepancies. The information should be printed and automatically provided to admitting and attending physicians.

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**Acknowledgment**

Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.

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**References**


“Grounded in Richness”
Acrylic and glass bead texture gel on canvas
12”x16”
By Angelique B Sow

Angelique B Sow is a Patient Services Clerk/Scheduler at the Cleveland Heights Medical Center in Ohio. Ms Sow is a licensed visual art teacher.
Quality Improvement

Perioperative Tight Glycemic Control: The Challenge of Bariatric Surgery Patients and the Fear of Hypoglycemic Events

By Bellal Joseph, MD
Jeff Genaw, MD
Arthur Carlin, MD
Jack Jordan, MS
Jean Talley, RN, BSN, MSN, APRN
Ilan Rubinfeld, MD, MBA

Abstract

Background: Tight glycemic control (TGC) is rapidly becoming a standard of care for all hospitalized patients. However, fear of hypoglycemia has proven a potent barrier to adoption of such initiatives by physicians and medical staff. Henry Ford Hospital has pursued aggressive glycemic control for all hospital patients. Because the initial standard TGC protocol (TGCP) was insufficient to improve glycemic control in our bariatric surgery patients, we hypothesized that a more intensive protocol would be necessary to improve glycemic control for this group.

Methods: As part of an institutional quality control project involving TGC, we reviewed medical records for the bariatric surgery patients at our hospital. We divided the populations into three subgroups: prior to TGC (A), initial hospital rollout TGC (B), and intensive bariatric TGC protocol (C). Patient populations were compared using hospital administrative databases and clinical chart review. Metrics for successful glycemic control included percent hypoglycemia (glucose <50 mg/dL), in-range percent (glucose 80–150 mg/dL), mild hyperglycemia (glucose 151–250 mg/dL), and major hyperglycemia (glucose >250 mg/dL).

Results: The percent in range for group C improved to 71% but was not statistically different from the values for groups A and B. The incidence of hyperglycemia was significantly decreased in group C as compared with groups A and B at both the minor (20% vs 31% and 27%) and major levels (1% vs 4% and 2%) (p < 0.001). There were no differences in the rates of hypoglycemia.

Conclusion: As an ongoing quality improvement process, our institution has pursued TGC for all of its patients. Glucose control in bariatric surgery patients is resistant to standard TGCPs. An initial intensive TGCP can be safely implemented in bariatric surgery patients with no increase in the number of hypoglycemic events. This work represents follow-up of several plan, do, check, act (PDCA) cycles related to improvement with a hospital-wide TGCP.

Introduction

Glycemic control in both diabetic and nondiabetic hospitalized patients is a major therapeutic focus. Reversal of hyperglycemia is now linked to better clinical outcomes in medical and surgical patients. Initial studies of tight glycemic control (TGC) were first reported in specialized centers. Because of improved clinical outcomes, tight glycemic control protocols (TGCPs) have been disseminated throughout the hospital setting, especially for patients having acute myocardial infarction, cardiac surgery, infections, and critical illness. There is a nationwide institutional pursuit of implementation of improved glycemic control for all inpatients. A standardized method for application of TGC in inpatients outside the previously established patient populations is still emerging.

Redefining the standard of care with TGC has added an exciting new aspect to improved quality of care. The Joint Commission on Accreditation of Healthcare Organizations has listed insulin as one of the five highest-risk medications in an inpatient setting. The fear of hypoglycemia is an important barrier to successful implementation of TGC. The aim of improving patient care while minimizing adverse effects is challenging in
Perioperative Tight Glycemic Control: The Challenge of Bariatric Surgery Patients and the Fear of Hypoglycemic Events

TGC. Acknowledging, accepting, and applying what we have learned over the past few years will broaden the application of TGC for specialty populations. The absence of a single standard system for TGC in variable patient populations makes it necessary to establish quality improvement measures.

Our objective was to correlate TGC in bariatric surgery patients with system-wide quality improvement initiatives. Our records revealed that the initial standard TGCP for bariatric surgery patients did not lead to an improvement in glycemic control. Glucose level in subset of patients was found to be more difficult to control than in our other postoperative patients. Therefore, we hypothesized that a more intensive TGCP would be necessary to improve glycemic control in bariatric surgery patients.

Methods

We collected data on 461 patients undergoing bariatric surgery at our institution between June 2003 and June 2005. The project was approved by our hospital institutional review board. Data from postoperative bariatric surgery patients were collected concurrently and entered into a database. Information collected included blood glucose measurements, demographics, body mass index, surgical technique, wound infections, and length of hospital stay. The patient populations were divided into three subgroups. These included Group A: prior to TGCP, Group B: initial hospital roll out of TGCP, and Group C: intensive protocol for bariatric surgery patients. Administrative databases were used to perform chart reviews of our patient populations. Minitab version 13 software (Minitab Inc, College Station, PA) and Microsoft Office Excel (version 11, Microsoft, Seattle, WA) were used for data analysis. We defined the metrics of successful glycemic control by defining the ranges as hypoglycemia (glucose <50 mg/dL), in-range (glucose 80–150 mg/dL), mild hyperglycemia (glucose 151–250 mg/dL), and major hyperglycemia (glucose >250 mg/dL). These were the quality metrics chosen for monitoring, levels between 50 and 79 m/dL were not considered “in range” but were not counted as hypoglycemia. The sliding-scale insulin dosing was performed with Insulin Aspart (NovoLog, Novo Nordisk, Princeton, NJ), administered by subcutaneous injection. Initially all patients were started on level 1 TGCP, as seen in Table 1. Blood sugar levels were measured before meals and at bedtime or if patients were not allowed to eat or drink, their blood sugar levels were measured every six hours. The sliding-scale protocol was reassessed after two consecutive blood glucose measurements exceeding 150 mg/dL or for two consecutive blood glucose measurements less than 100 mg/dL. The TGCP was increased or decreased, respectively, by one level if glucose measurements met the above criteria. The intensive bariatric surgery protocol was initiated after it was noted to be inadequate when reviewed by the system quality improvement committee. It was noted that unlike all other surgical subgroups, bariatric surgery patients demonstrated no significant change in control (based on chosen metrics above) with the standard hospital protocol. A new approach was formulated, and consisted of the same protocol listed in Table 1. However, treatment for all postoperative bariatric surgery patients whose care followed the intensive protocol were initiated at level 2 instead of level 1. Data was summarized using Excel and Access (Microsoft, WA). Discrete variables were compared using c² analysis with two degrees of variability. Statistical significance was assumed at p < 0.05.

Results

Data for a total of 461 postoperative bariatric surgery patients, divided into groups A, B, and C, were reviewed. Of these, 379 (82%) were women. The mean body mass index values for groups A, B, and C were 51, 58, and 51 kg/m², respectively. The majority of operations performed in protocol groups B and C were laparoscopic, whereas only open operations were performed in group A. The observed increase in length of stay and incidence of wound infections in group A is likely secondary to changes in surgical technique (Table 2). Both wound infections in group C involved the only two open operations in that group.

Metrics of successful TGC were measured for each group (Table 3). We found no difference in the incidence of hypoglycemia (blood sugar <50 mg/dL) in group C compared with the other two groups. The incidence of hypoglycemia in group C was observed to be 2/591 blood draws (0.31%). The incidence of in-range

<table>
<thead>
<tr>
<th>Blood glucose level (mg/dL)</th>
<th>Insulin U level 1</th>
<th>Insulin U level 2</th>
<th>Insulin U level 3</th>
<th>Insulin U level 4</th>
<th>Insulin-sensitive level IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>120–150</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>151–200</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>201–250</td>
<td>6</td>
<td>8</td>
<td>14</td>
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<tr>
<td>251–300</td>
<td>8</td>
<td>10</td>
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</tr>
<tr>
<td>301–400</td>
<td>10</td>
<td>12</td>
<td>22</td>
<td>26</td>
<td>8</td>
</tr>
</tbody>
</table>

U = units, IS = insulin-sensitive.

Level 1 is the initial starting level for the vast majority of patients. The “insulin-sensitive” designation is for those patients with a diagnosis of proven disposition to hypoglycemia or previous issues with hypoglycemia under protocol level 1.
readings (blood sugar 80–150 mg/dL) for group C was 71%, compared with 64% and 63% for groups A and B, respectively. The incidence of mild and major hyperglycemia was significantly lower in group C than in groups A and B (Table 3). The incidence of mild hyperglycemia was 20% in group C, 31% in group A, and 27% in group B; the incidence of major hyperglycemia was 1% in group C, 4% in group A, and 2% in group B.

**Discussion**

Improved glycemic control has become a benchmark for optimal patient care.1 This report demonstrates process improvement in glycemic control of a special group of patients. As our hospital implemented a TGCP in phases, it became clear that the bariatric surgery patient group was an outlier. Glycemic control was not adequate in this group with the initial level 1 protocol. Given our goal of achieving TGC in perioperative patients, we decided to intensify the protocol. A barrier to instituting a TGCP is the fear of hypoglycemia.1 Starting bariatric surgery patients on a level 2 TGCP required educating physicians and nurses to break down their resistance to the idea. With an initial level 2 TGCP, we were able to demonstrate significantly fewer mild and major hyperglycemic episodes, with no increase in hypoglycemic episodes.

Others have demonstrated improved clinical results with better glycemic control. Van den Berghe et al reported a reduction in mortality of the critically ill patients with a decrease in both time spent in an intensive care unit and hospital length of stay with even minor improvements in glucose control.2 Farnary et al have shown a significant improvement in deep sternal wound infections with continuous insulin infusion in diabetic patients undergoing cardiac surgery.6 Although Farnary et al used continuous infusions of insulin, the endpoint was a blood sugar level <150 mg/dL, which is consistent with our in-range values. We presume that with follow-up studies in morbidly obese patients after bariatric surgery, we will see improvements also in morbidity, length of stay, infection rates, and possibly mortality from an intensive TGCP.

This report focuses on bariatric surgery patients, all of whom are morbidly obese. The failure to control glucose levels in these patients with the initial level 1 TGCP may be related to insulin resistance, which is known to be common in morbidly obese patients.7 A review of the literature did not reveal any studies of TGC in this subset of patients. The pandemic of obesity in the United States has led to an increased number of hospitalizations for morbidly obese patients. The failure to control glucose levels in these patients with the initial level 1 TGCP may be related to insulin resistance, which is known to be common in morbidly obese patients.7 A review of the literature did not reveal any studies of TGC in this subset of patients.

**Conclusion**

The evidence that TGC leads to improved patient outcomes has been derived from multiple clinical studies.3–6 Performance metrics for special populations are in evolution. The work reported here represents sev-
eral PDCA cycles in the optimization of perioperative glycemic control in this population. Although glucose control in bariatric surgery patients is resistant to a standard TGCP, an initial intensive TGCP can be safely initiated in these patients, with improvement in glycemic control and no increase in hypoglycemic events.

References

Those That Survive

Great ceramics are not made by putting clay in the sun; they come only from the white heat of the kiln. In the firing process some pieces are broken, but those that survive the heat are transformed from clay into porcelain and are objects of art. And so it is with people, those who, through medical skill, opportunity, work, and courage, survive illness or overcome their handicap and take their places back in the world have a depth of spirit that you and I can hardly measure. They haven’t wasted their pain.

Caring for the Adult with Congenital Heart Disease: Management of Common Defects

By Reema Chugh, MD, FACC

Introduction

Congenital heart defects (CHDs) are common birth defects, with major ones occurring in nearly 1% of live births. Many are diagnosed with CHD in infancy and childhood, whereas others are not diagnosed until adulthood. Advances in pediatric medicine and surgery since the 1940s have made it possible for nearly 85% of infants born with CHDs to survive into adulthood.

Primary care physicians, obstetricians, and cardiologists are now seeing patients in transition to adulthood from the pediatric cardiology clinics. In addition, there are those who were lost to follow-up monitoring for several years because of problems with insurance or the belief that they did not need follow-up care because their defect was “repaired.” All patients do need follow-up monitoring because there are long-term residual and sequelae associated with repair of nearly all the defects. Routine follow-up care allows prevention, early identification, and appropriate management of these problems. Women with CHDs may be at risk for maternal and fetal complications during pregnancy and should have preconception counseling.

Since 1980, the care of CHD in adults has developed into a subspecialty of cardiovascular diseases. The Bethesda conferences held in 1990 and 2000 and the Canadian Cardiovascular Society Consensus Conference 2001 updated established guidelines for the care of the adult with congenital heart disease.

The first part of this article reviews some of the challenges posed by some of the relatively common “simple” heart defects seen in my practice. The second part details management of the more “complex” CHDs (Table 1). The aim of this article is to provide an outline of practice guidelines for primary care physicians, nurses, and allied health professionals providing care for adults with CHDs.

Patent Foramen Ovale

Patent foramen ovale (PFO) is a slit-shaped tunnel-like defect in the atrial septum, a residual from the fetal circulatory system caused by the failure of the primum and secundum atrial septa to fuse postnataally. It is the most common CHD, with an autopsy-derived incidence of about 27% for probe-patent PFO.

Atrial septal aneurysm is another defect of atrial morphogenesis and is characterized by a redundant, undulating, interatrial membrane in the region of the fossa ovalis. The diameter of the base exceeds 15 mm, and the amplitude of the interatrial septum excursion is 10 mm to 15 mm (Figure 1). Atrial septal aneurysm is associated with PFO in 50% to 85% of cases.

The PFO has caught recent clinical interest because of its clinical manifestations (Table 2). Of special importance is the association with paradoxic embolism, especially in adults age <55 years with cryptogenic stroke. However, the clinical diagnosis of paradoxic embolism is presumptive and is based on the presence of a right-to-left shunt in the absence of a left-side thromboembolic source. An adequate Valsalva maneuver is essential while assessing the presence of a right-to-left shunt by an agitated saline contrast study with transthoracic echocardiography.
The association of recurrent stroke rate for patients with atrial septal aneurysm and PFO was 15.2% compared with 4.2% in the absence of these two defects. However, the PFO in Cryptogenic Stroke Study (PICSS), a prospective population-based study, suggested that after correction for age and comorbidity, an isolated PFO is not an independent risk factor for future cerebrovascular events in the general population. It must be noted that the patients in this study were not representative of the patient population with PFO and ischemic stroke. Therefore, although all the PFOs in the general population need not be medically treated or closed, adults age <55 years with cryptogenic stroke still need evaluation for consideration of medical therapy or closure, now possible by a percutaneous device.

With respect to selection of medical therapy versus device closure, the present data are even more controversial. In the Warfarin-Aspirin Recurrent Stroke Study, 2206 patients were randomized to aspirin or warfarin (international normalized ratio, 1.4 to 2.8), with no significant benefit shown from either treatment at two years. Another prospective study evaluated 140 consecutive patients with transcranial Doppler after PFO device closure for cryptogenic stroke and demonstrated a residual detectable shunt in 9% at one-year follow-up evaluation after successful implantation. Thus, there is controversy about the choice of management options for PFO. New trials are being conducted to address these questions.

Meanwhile, current guidelines do not specifically recommend one therapy over another. There is consensus that long-term anticoagulation is favored in most patients with high-risk features, including atrial septal aneurysm, a PFO with major shunt, Eustachian valve anatomy favoring right-to-left shunt, presence of venous thrombus or hypercoagulable states, and stroke involving multiple territories. Percutaneous closure is indicated for high-risk patients with recurrence despite therapeutic anticoagulation or in high-risk patients in whom long-term anticoagulation is contraindicated.

**Bicuspid Aortic Valve**

Bicuspid aortic valve (BAV) is defined as an aortic valve with (effectively) two instead of three valve leaflets. Of many variations in the pattern, the most common has fusion of the right and left aortic valve cusps.
BAV occurs in 1% to 2% of the population, and diagnosis is usually suspected on physical examination (Table 2) and confirmed by an echocardiogram. In the parasternal short-axis view, a BAV opens as an oval (football) in contrast to the triangle of a trileaflet valve. A transesophageal echocardiogram may be required when the aortic valve morphology cannot be visualized clearly in the parasternal short-axis view in a transthoracic echocardiogram.

Unfortunately, BAV is diagnosed in a substantial proportion of affected adults only when they present with infective endocarditis (Figure 3), which is responsible for many cases in which the presentation is severe aortic regurgitation. Because of the high incidence of endocarditis and its associated complications, antibiotic prophylaxis is recommended in all patients, even in the absence of associated stenosis or regurgitation.

### Table 2. Findings, manifestations, and associated defects of congenital heart defects

<table>
<thead>
<tr>
<th>Heart defect</th>
<th>Salient findings on cardiac examination</th>
<th>Clinical manifestations</th>
<th>Commonly associated defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent foramen ovale</td>
<td>None</td>
<td>Paradoxical embolus</td>
<td>Atrial septal aneurysm</td>
</tr>
<tr>
<td>Bicuspid aortic valve</td>
<td>Systolic ejection click</td>
<td>Infective endocarditis</td>
<td>Coarctation of aorta</td>
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<tr>
<td></td>
<td>Early peaking systolic flow murmur</td>
<td>Aortic dissection</td>
<td>Aortic root dilation</td>
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<td></td>
<td></td>
<td>Aortic stenosis</td>
<td>Sub- and supra-aortic stenosis</td>
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<tr>
<td>Secundum atrial septal defect</td>
<td>Prominent right ventricle</td>
<td>Atrial arrhythmias</td>
<td>Ventricular septal defect</td>
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<tr>
<td></td>
<td>Left parasternal impulse</td>
<td>Right heart failure</td>
<td>Anomalous pulmonary venous return</td>
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<tr>
<td></td>
<td>Wide fixed splitting of S2</td>
<td>Pulmonary hypertension</td>
<td></td>
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<tr>
<td></td>
<td>Pulmonary ejection systolic at left upper edge</td>
<td>Left ventricular dysfunction</td>
<td></td>
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<tr>
<td></td>
<td>Accented P2</td>
<td>Paradoxical embolism/stroke</td>
<td></td>
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<tr>
<td>Venticular septal defect</td>
<td>Pansystolic murmur</td>
<td>Infective endocarditis</td>
<td>Atrial septal defect</td>
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<td></td>
<td>Precordial thrill</td>
<td>Left ventricular</td>
<td>Aortic root dilation</td>
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<tr>
<td></td>
<td>Accented P2 (in pulmonary hypertension)</td>
<td>dysfunction</td>
<td></td>
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<tr>
<td>Patent ductus arteriosus</td>
<td>Continuous “machinery” murmur at the left upper sternal border with radiation to the back</td>
<td>Infective endocarditis/endoarteritis</td>
<td>Bicuspid aortic valve</td>
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<td></td>
<td></td>
<td>Pulmonary hypertension</td>
<td>Aortic aneurysm</td>
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<td></td>
<td></td>
<td>Heart failure</td>
<td>Intracranial aneurysms</td>
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<tr>
<td>Coarctation of aorta</td>
<td>Thrill in the suprasternal notch</td>
<td>Hypertension</td>
<td>Bicuspid aortic valve</td>
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<td></td>
<td>Loud aortic closure sound</td>
<td>Infective endocarditis/endoarteritis</td>
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<td></td>
<td>Recoarctation</td>
<td>Aortic aneurysm</td>
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<td></td>
<td>Aortic aneurysm</td>
<td>Subaortic stenosis</td>
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<td></td>
<td></td>
<td>Premature coronary artery disease</td>
<td>Subaortic stenosis</td>
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<td>Mitral stenosis</td>
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<tr>
<td>Pulmonary stenosis</td>
<td>Systolic ejection click at left upper sternal border louder during expiration</td>
<td>Right ventricular hypertrophy</td>
<td>Patent foramen ovale</td>
</tr>
<tr>
<td></td>
<td>Harsh crescendo–decrescendo systolic ejection murmur radiating to the back and varying with respiration</td>
<td>Pulmonary regurgitation</td>
<td>Atrial septal defect</td>
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<tr>
<td></td>
<td></td>
<td>Pulmonary artery dilation/aneurysm</td>
<td>Peripheral pulmonary stenosis</td>
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</table>

**Figure 3.** Transthoracic echocardiogram showing bicuspid aortic valve (BAV) with infective endocarditis. LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle.
A complete echocardiographic examination should define the morphology, determine the degree of aortic stenosis and regurgitation, and include assessment of associated defects that may occur in 20% to 50% of patients (Table 2). Because of inherent aortic structural wall abnormalities, BAV is associated with aortic root dilation and risk of aortic dissection. The risk of aortic aneurysm and dissection is markedly increased when BAV is associated with coarctation of the aorta. Hypertension control and avoidance of heavy lifting and isometric exercises are essential in preventing progression of aortic root dilation. Although aortic root dilation occurs more commonly in Marfan syndrome, there are more patients with aortic dilation associated with BAV because it is a more common defect. Serial echocardiography assesses aortic root dimensions (Figure 4). Computed tomography scanning or magnetic resonance imaging (MRI) is required when aneurysm of the arch or descending aorta is suspected in patients with coexistent coarctation of the aorta.

Aortic stenosis due to calcification develops at an earlier age in men with BAV than in women with BAV. On average, the aortic valve gradient increases approximately by 18 to 27 mm Hg for each decade of life, depending on the anatomy of the cusps as well as acquired risk factors. The development of left ventricular dysfunction may mask the degree of stenosis assessed by valve gradients. The risk factors for atherosclerosis, such as hyperlipidemia, obesity, and smoking, may contribute to the age-related deterioration of the aortic valve. Hence, especially intensive cardiovascular risk reduction should be advised at an early age.

Aortic valvuloplasty is preferred in children, whereas aortic valve surgery (repair or replacement) is performed in adults. Emergency surgery is often required for those presenting with infective endocarditis and new-onset severe aortic regurgitation or aortic root abscess.

Long-term follow-up monitoring is mandatory for this possibly preventable and potentially life-threatening condition. The rate of familial recurrence is approximately 9%, with an autosomal-dominant pattern of inheritance and incomplete penetrance and variable expression. Echocardiographic screening of first-degree relatives is recommended.

Atrial Septal Defect

Atrial septal defect (ASD) is a direct communication between the cavities of the atrial chambers that permits shunting of blood. The secundum defect is the most common form of ASD (Figure 5). Associated defects occur in nearly 30% of cases (Table 2). In one in six patients, ASD is likely to be first diagnosed in adulthood and present with palpitations due to atrial arrhythmias or increasing shortness of breath. On physical examination, the characteristic findings are a prominent right ventricular parasternal lift, persistent or wide fixed splitting of the second heart sound, and a pulmonary systolic ejection murmur at the left upper sternal edge due to increased pulmonary flow. In the presence of pulmonary hypertension, there is accentuation of the pulmonary component of the second heart sound. The electrocardiogram may show sinus rhythm or atrial fibrillation, right axis deviation (left axis deviation in primum ASD), and a bifid notch on the ascending limb of the R wave in inferior leads (“crochetage”).

The diagnosis is usually confirmed by transthoracic echocardiography, which may demonstrate a discontinuity of the interatrial septum on two-dimensional echocardiography and an intracardiac shunt at the atrial level with color Doppler. In addition, there may

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Figure 4. Aortic root. Schematic representation of the aortic root in the long axis view showing the points of measurement during TTE or TEE.

A = aortic annulus; B = mid-sinus level; C = sinotubular junction; D = 2 cm distal to the sinotubular junction; TEE = transesophageal echocardiography; TTE = transthoracic echocardiography.

Figure 5. Types of atrial septal defects (ASDs).
be right heart enlargement and elevated pulmonary artery pressure in patients with a long-standing right-to-left shunt. When the defect is not clearly defined by transthoracic echocardiography in the presence of right heart enlargement, further evaluation with transesophageal echocardiography is warranted.

The three major reasons for deterioration with age are as follows: 1) age-related decrease in left ventricular compliance may lead to augmentation of the left-to-right shunt; 2) heart failure may be precipitated by atrial arrhythmias; and 3) persistence of left-to-right shunt may lead to mild-to-moderate pulmonary hypertension and consequent right ventricular pressure and volume overload. Delayed closure has been shown to be associated with a higher likelihood of long-term complications, including atrial arrhythmias, pulmonary hypertension, right heart failure, paradoxical embolism, and stroke.

The consensus is to close defects associated with symptoms or right heart enlargement. Percutaneous transcatheter device closure is presently the method of choice for defects within the fossa ovalis, with an adequate rim (4–5 mm) between the defect and the aortic valve annulus, atrioventricular (AV) valves, and pulmonary and systemic veins, to avoid distortion of these surrounding structures. In the presence of pulmonary hypertension, the defect may be safely closed if pulmonary artery systolic pressure is less than 50% of the systemic arterial pressure. Right heart catheterization to assess the pulmonary vascular resistance may be required for those with higher pulmonary artery pressures. In general, all defects should be considered for early closure unless there are specific contraindications.

**Ventricular Septal Defect**

Ventricular septal defect (VSD) is a communication between the two ventricles resulting from failure of the components of the interventricular septum to fuse. Perimembraneous VSD is the most common form (Figure 6). Long-term complications depend on the size and the location of the VSD and any associated defects (Table 2).

The direction and the volume of a shunt are dictated by the size of the defect and the ratio of pulmonary vascular resistance to systemic vascular resistance. The left heart is volume-loaded, and depending on the size of the defect, the right heart may become pressure-loaded. In a small, restrictive VSD, right ventricular systolic pressure is less than half of the left ventricular systolic pressure, whereas in a large, unrestrictive VSD, there is equalization of right and left ventricular pressures due to free communication between the two chambers, leading to increased pressures to systemic levels in the pulmonary arteries and the development of irreversible pulmonary vascular disease. This leads to bidirectional or reversed (right-to-left) shunt through the large VSD and severe pulmonary hypertension with systemic pulmonary artery pressures, originally described by Victor Eisenmenger in 1897. This was later described with its distinctive clinical and physiologic characteristics as Eisenmenger syndrome by Paul Wood in 1958. A VSD may usually be diagnosed on physical examination by the presence of a precordial thrill and a pansystolic murmur. The pulmonic component of the second heart sound may be accentuated in the presence of pulmonary hypertension.

Echocardiography defines the VSD location, degree of shunt, and associated defects. Most large VSDs are diagnosed and closed in childhood. Although nearly 10% of small VSDs may spontaneously close, a persistence of these to adulthood is associated with a 25% likelihood of serious complications. These complications may include infective endocarditis in 11%, heart failure, conduction blocks, and arrhythmias. In patients with a supracristal (subpulmonic) VSD, there is progressive aortic regurgitation, due to prolapse of the aortic valve leaflet into the defect, resulting from
the Venturi effect. Therefore, antibiotic prophylaxis and long-term follow-up monitoring are needed.

**Patent Ductus Arteriosus**

Patent ductus arteriosus (PDA) is a residual fetal communication between the proximal left pulmonary artery and the descending aorta distal to the left subclavian artery. During fetal life, the communication allows the diversion of blood from the right ventricle to the descending aorta, thus bypassing the pulmonary circulation (Figure 7). Patients with a small PDA are usually asymptomatic, whereas those with a moderate to large PDA may present with dyspnea or palpitations. Sometimes PDA is diagnosed on physical examination by the continuous “machinery” murmur at the left upper sternal border with radiation to the back, whereas in others it is detected only with echocardiography.

The long-term residua and sequelae and the type of intervention depend on the size and shape of the PDA. The risk of endarteritis is present in all patients, and therefore antibiotic prophylaxis, early closure, or both are recommended. Heart failure and pulmonary hypertension are likely to develop with a moderate-size or larger PDA. Device closure is preferred for the majority of these PDA patients. Indications for surgical closure include a PDA that is too large for device closure or presence of ductal aneurysm. Increased pulmonary vascular resistance at the time of closure may also present with late pulmonary hypertension. Severe, irreversible pulmonary vascular disease is a contraindication for PDA closure. Endocarditis or endarteritis prophylaxis is recommended for six months after device closure and for life for residual PDA.

**Coarctation of the Aorta**

Coarctation of the aorta is congenital narrowing of the aorta at the junction of the distal aortic arch and the descending aorta, below the origin of the left subclavian artery (Figure 8). It represents up to 8% of all CHDs. The discrete coarctation is not just limited to focal stenosis but is one variant of a diffuse arteriopathy and associated structural abnormalities of the great arterial walls. It is therefore no longer really considered to be a “simple” heart defect. Moderate to severe coarctation is usually diagnosed in infancy or childhood. In adulthood, the diagnosis is suspected in a person presenting with hypertension. A brachial and femoral blood pressure recording may demonstrate upper-body arterial hypertension. Characteristic physical findings include weak, delayed femoral pulses; a prominent left ventricular impulse; a loud aortic closure sound; a thrill in the suprasternal notch; and a vascular murmur between the shoulder blades, beginning in midsystole and persisting beyond the second heart sound. Continuous murmurs due to collaterals may be present.

Echocardiography confirms the diagnosis and screens for commonly associated defects such as BAV (75%–85%), aortic root dilation/aneurysm, VSD, and mitral valve abnormalities. MRI shows the site of stenosis, the extent and degree of narrowing, the pressure gradient across the stenosis, aortic arch anatomy, and aortopulmonary collaterals and assesses left ventricular mass and function. It is especially of use for delineating aneurysms after surgery.

Patients with coarctation of the aorta are at increased risk for aortic aneurysms and dissection. Hypertension often persists after surgery, and ambulatory blood pressure monitoring may detect uncontrolled hypertension in many who are normotensive at rest during office visits. Adequate blood pressure control decreases the incidence of long-term complications such as premature coronary artery disease and heart failure that are common in these patients.

In addition, intracranial aneurysms occur even in normotensive patients with coarctation of the aorta, presenting as headaches or even hemorrhage due to rupture. All patients with coarctation of the aorta must receive endocarditis prophylaxis because they are at risk for endarteritis and endocarditis involving associated lesions.

Resection of the coarctation of the aorta with end-to-end anastomosis is the procedure of choice in most adults. Surgery done early on reduces long-term complications. Angioplasty with or without stenting is an option for coarctation, recoarctation, or residual stenosis in the absence of any paracoarctation aneurysms.
Pulmonary Stenosis

Pulmonary stenosis is the most common form of right-side obstruction. It results from fusion of valve leaflets and may occur as an isolated heart defect in up to 10% of patients with CHDs. On an echocardiogram, it may appear as a dome-shaped valve with fusion of the leaflets, narrow valve orifice, and increased likelihood of calcification in adulthood. Another form of pulmonary stenosis is a dysplastic valve with thickened leaflets. The former subtype is more likely to be associated with pulmonary artery dilation and aneurysms due to associated connective tissue disorder.

Pulmonary stenosis has been associated with maternal rubella, Noonan’s syndrome, Williams syndrome, and Alagille syndrome. Most patients with mild stenosis are asymptomatic. Echocardiography confirms the diagnosis and assesses the severity of the transvalvular gradient, right ventricular systolic pressure, right ventricular size and function, and associated defects (Table 2). Percutaneous balloon valvuloplasty should be performed for moderate to severe pulmonary stenosis (characterized by a peak transvalvular gradient >50 mm Hg) even if the patient is asymptomatic. Surgical valvotomy or pulmonary valve replacement is considered when there is significant calcification, a thickened stiff dysplastic valve, and a concomitant pulmonary artery aneurysm. Pulmonary valve replacement should also be considered for severe pulmonary regurgitation following an intervention.

Conclusion

All adults with CHDs, unrepaired or repaired, require long-term follow-up monitoring for residua and sequelae. Long-term survival and quality of life depend on appropriate advice regarding bacterial endocarditis prophylaxis, risk-factor reduction, and early detection of complications.

Acknowledgment

Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.

References

This is a graphic rendition of blood cells and diseases. The upper section represents a stem cell in the bone marrow giving rise to myeloid, lymphoid, erythroid, and megakaryocytic series of cells. The dynamic nature of these cells producing granulocytes, lymphocytes, red cells, and platelets represented in compartments in spiral movement. The section to our left shows the coagulation factors in the blood in the form of threads weaving for hemostasis. The spleen is depicted on the right with its nature to enlarge in the disease process. The lower section represents a lymph node and Hodgkin’s lymphoma. The classic Reed-Sternberg cell with “owl’s eye” feature and radiation ports, the “mantle” and “inverted-Y” are included. Red cells in their unique diagnostic forms for many hematological diseases are shown.

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Introduction

In the early years of the 21st century, the US health care system is in a state of both feast and famine. New scientific breakthroughs and advances in technology have cured diseases and extended lives beyond what was imaginable even a decade ago. Yet despite these riches, the health care system is fundamentally broken. It fails on three measures of care, especially in the treatment of older persons.

The first measure is cost. In 2004, the cost of health care in the United States grew at a rate of 7.7%, compared to the overall consumer price index of 4.4%. In fact, many US economists have accepted—but do not like—that health care spending will rise at a rate of 2% to 3% higher than the general economy.

The second measure indicating failure is patient satisfaction. When elderly patients were asked in a recent survey about their physicians, they reported that physicians listen carefully 65% of the time, explain things clearly 59% of the time, and spend enough time with them only 54% of the time. Of course, patient satisfaction will never be 100%, but it should be 80% to 90%.

The third measure on which health care fails is quality. In a study published in 2003, performance on quality indicators for 30 conditions and preventative care was measured. Only 55% of recommended care was provided—and there was tremendous variation in the quality of care provided. For cataracts, 80% of recommended care was provided, whereas for hip fractures, it was only 23%. The Assessing Care of the Vulnerable Elderly (ACOVE) study began by developing an instrument to identify vulnerable elders—older people at higher risk of dying or having functional decline within two years. The ACOVE team then created quality indicators, on the basis of literature review and evaluation by an expert panel, for 22 conditions (eg, coronary artery disease, dementia, falls, urinary incontinence). Finally, they performed a medical records review and structured interviews for each condition for patients enrolled in two health plans—on the East and West Coasts. The overall results were virtually identical to those of the first study. Only 55% of quality indicators were met. However, they also found that the care for geriatric conditions such as falls, urinary incontinence, and dementia was much worse than for general conditions such as atrial fibrillation and stroke. For geriatric conditions, only 31% of recommended care was provided, again with high variability in quality of care; for example, 82% of recommended stroke care was delivered, but only 9% of end-of-life quality indicators were met.

Physicians say they could provide better care if there was more money and more time. However, data from the Centers for Medicare and Medicaid Services demonstrate that across the states, as more money is spent, the quality of care is worse.

To address these failings, it is important to review the current state of health care to identify barriers to good health care and to review individual and systems efforts to improve health care.

Barriers to Good Care

Insufficient Cognitive Capacity

Despite extensive training and the availability of continuing education for physicians, it is almost impossible for physicians to keep current. There is simply too much to know. During 2001, the US National Library of Medicine added more than 12,000 articles to its collections per week. To maintain current knowledge, a general internist would have to read 20 articles per day, 365 days a year. They also found that the care for geriatric conditions such as falls, urinary incontinence, and dementia was much worse than for general conditions such as atrial fibrillation and stroke. For geriatric conditions, only 31% of recommended care was provided, again with high variability in quality of care; for example, 82% of recommended stroke care was delivered, but only 9% of end-of-life quality indicators were met.

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care for a patient with heart failure, there are ten angiotensin-converting enzyme inhibitor options, seven angiotensin-receptor blockers, three beta-blockers, and two aldosterone antagonists. Each medication has a different starting dose, target dose, and dose titration schedule. It is unreasonable to expect a physician to remember all of this information.

The Health Care System Is Not a System
The first principle of health care delivery is that the American health care system is not a system. Rather, it is a collection of providers and vendors that is fraught with inefficiency and waste. By some estimates, one-third of all health care spending is waste.

- The first waste is duplication. How many medical histories and physical examinations does a patient really need? For example, at many teaching hospitals, there are four different sets of medical histories and physical examinations for each patient—one from a medical student, one from an intern, one from a senior resident, and one from an attending physician.

- A second area of waste is reordering tests rather than looking for results. This is frequently caused by the unavailability of clinical information at the time it is needed. For example, consultation notes are not on the chart, and neither are procedure reports, inpatient records, discharge summaries, or emergency department records. This problem may occur less often in a group or staff-model managed-care system, but medical records are very fragmented in most clinical settings.

- A third waste issue is the wrong person doing the job. The most expensive employees are physicians, much more costly than office staff. The time that physician and patient are in a room together is the most expensive time. The second most expensive time is during the office visit—before and after the patient sees the physician. The least expensive time is the time that patients spend at home preparing for the visit, such as completing a previsit questionnaire. This is an excellent way to collect needed information at minimal cost. To run an efficient practice, physicians must delegate tasks whenever they can and reserve the physician–patient visit time for the elements of care that require a physician.

The next sign that health care is not a system is the work-around—fixing the situation but not fixing the problem. For example, a patient does not receive a test in a timely manner. The physician makes a phone call, insists that the test is done promptly, and it is performed the next day. The same problem occurs the next week. The physician has not fixed the basic underlying problem. Telltale signs of a systems problem include clinicians, schedulers, and technicians making frequent exceptions; physicians pulling rank to get tests or consultations performed; and covering physicians deferring treatment decisions until the primary team returns.

Finally, the health care system is far behind the times. As noted by the American Geriatrics Society, “information technology and the electronic health record hold great promise for improving patient care. Yet, this promise largely remains unfulfilled. Only a minority of health care providers currently has access to systems that truly facilitate care … Electronic documentation of the content of patient visits remains behind that of most American commerce.” In fact, the most common use of the electronic health system is for billing, not to improve care.

The Rewards Are Wrong
In a 2003 survey of physicians by the Commonwealth Fund, physicians reported that productivity and billing was the most commonly reported (by 72%) factor affecting their compensation. Physicians are paid for the number of visits they complete and the complexity level of those visits. The least commonly cited (by 19%) factor affecting compensation is a quality bonus. Few reported being paid for doing the right thing—improving quality.

Improving Health Care
Given the current situation and barriers to change, what can be done to improve health care? There are two broad categories: individual changes, which a physician can initiate, and systems changes, which require an organized delivery system.

Individual Practitioner Approaches
At the individual practitioner level, several small steps can yield big dividends. First, delegate data collection; second, run a more efficient office; and third, delegate plan implementation.

Delegate to Office Staff
For some reason, many physicians have difficulty delegating clinical care tasks to office staff. Perhaps they fear that the staff are not conscientious enough, have too much to do, or do not want to perform functions outside their usual roles. In fact, many staff welcome the notion of being more instrumental in facilitating office visits. Physicians can
delegate tasks such as screening and case identification, history gathering, recording current medications and allergies, taking orthostatic blood pressure readings, testing visual acuity, and providing patient education.

**Delegate to Patients**

In addition to delegating tasks to staff, physicians can delegate activities to patients. For example, the University of California, Los Angeles (UCLA) Geriatrics Practice uses a 15-page, previsit questionnaire for elderly patients. This reduces the physician’s history-gathering time from 30 to 40 minutes to 8 to 10 minutes. Also, patients can prepare a list of what they want to discuss (if it is not on the list, it is probably not important) and a patient diary—a calendar on which the physician writes the symptom to monitor and the patient returns it, completed, at the next visit. Frequently when patients keep symptom diaries, the symptoms go away. If the symptoms persist, these diaries can illustrate a pattern, and sometimes this helps clinicians discover the reason.

**Minimize Data Recording Time**

Dictation is the most efficient means of recording information but has the drawbacks of transcription expenses and the inability to easily link the content of the dictation to monitoring the process of care rendered and to quality-improvement efforts. Many offices use paper-and-pencil templates that allow the physician to document care quickly, often using check boxes. Contrary to popular belief, electronic health records do not check boxes. Contrary to popular belief, electronic health records do not check boxes. Electronic health records do not check boxes. Electronic health records do not check boxes.

**Keep Readily Available Information Needed for Decision Making**

Every time a physician leaves the examining room, the flow of patient care is interrupted. Once outside the room, the physician may be further distracted by staff or colleagues and may be delayed in returning to caring for that patient. Physicians can be more efficient by staying in the examining room until the patient leaves. Thus, information needed for clinical decision making needs to be available in the examining room, including pocket guides, such as *Geriatrics at Your Fingertips* (The American Geriatrics Study, published annually); personal digital assistant programs that provide drug doses, interactions, and side effects; and computerized reference systems. However, the latter tend to be too slow for use in the context of an office visit and may be more useful as homework for the physician to seek information during unscheduled time.

**Delegate Plan Execution**

Efficient physicians establish a network of allied health professionals such as social workers, dietitians, physical and occupational therapists, and health educators. They use the same people over and over again, people they can trust. They build a team.

**Systems Approaches**

Systems approaches are more comprehensive methods overcoming problems in providing health care. They often require multiple levels of change, such as recrafting job descriptions, making changes in work flow, and integrating a variety of information sources into clinical care. For example, a systems approach may begin with identifying frequent users of health care through any of several paper-and-pencil scoring systems or administratively calculated hierarchical classification systems. Systems approaches may employ alternative methods of delivering health care such as group visits, an innovation that was pioneered in Kaiser Permanente (KP) and that has had rapid diffusion, in-home assessments by nurses, including preventive and posthospital discharge visits; disease management programs; and health care self-management classes.

**Quality Improvement**

Quality improvement focuses on the process of care and emphasizes standardization. If health care providers are delivering care the same way every time, even if it is not perfect, care processes can be systematically addressed and error rates and costs will decrease. When everybody is doing something different, it is very difficult to improve health care. Quality improvement requires measurement—the physician needs to know how s/he is doing—and frequently use protocols. To get started with quality improvement, physicians should select a care process problem that will be useful to improve and simple, work with small representative samples, and then build measurement into the physician’s daily work. Physicians must ask themselves, “What do we want to improve? Which care processes do we want to ensure that all persons with specific diseases receive? What is the care product we—the organization—want to deliver?” For example, to create the KP formulary, physicians agreed on...
the drugs that are the first line of treatment for each condition. But when treating individual patients, if a physician wants to depart from the list, s/he can order different medications. The guiding principle is to eliminate variation among clinicians but allow variation, when indicated, among patients.

There are limitations to quality improvement. The targets are typically easy-to-change, low-lying fruit. Quality improvement focusing on frail, elderly patients is particularly difficult because their conditions, often multiple, and the systems to support their care are so complicated. Quality improvement also takes a considerable amount of effort, and some of the results have been less impressive than hoped for.

Redesign of Care

The second phase of the ACOVE project (ACOVE-2) created an intervention that fundamentally changes the office visit for geriatric conditions. In addition to changing what happens in the physician’s office, the intervention is characterized by different roles for patients and their families, and partnership with community-based organizations. The ACOVE-2 project identified a target population of outpatients aged 75 years with untreated conditions—urinary incontinence, falls, and cognitive impairment. If a condition was detected, a standard multicomponent intervention was triggered, including medical record prompts that encouraged performance of essential care processes and collection of condition-specific clinical data by office staff. Some practices also allowed office staff to perform simple procedures, such as urinalysis for urinary incontinence, before the physician saw the patient.

Medical History and Physical Examination

For each condition, a structured visit note led the physician through the appropriate data-collection and care processes. The structured visit note (Figure 1) was one page with check boxes, so the physician could quickly and legibly document the care provided. On the same note, office staff completed some medical history items and simple procedures (eg, obtaining orthostatic blood pressures, conducting visual acuity testing). For example, the history of present illness for a patient who has fallen requires asking a series of questions to obtain important clinical information and satisfy quality indicators for falls. All of these questions can be, and have been, delegated to office staff so that the physician sees the structured visit note with the appropriate boxes already checked. Physicians then collect more detailed clinical data (eg, a gait and balance examination and a brief neuromuscular examination).
In 2011, the first baby boomers will be 65 years old; 75 million will follow.

System Approaches to Improve Quality, Performance, and Efficiency in the Care of Older Adults

**Patient Education and Involvement**

The next component of the multicomponent intervention was getting the patient more involved through patient-education materials and in an active role in follow-up care. These materials, assembled for each condition, were available for the physician in the examining room.

Patient-education materials included general lay-language summaries and other resources from organizations such as the National Institute on Aging and the Alzheimer's Association. The materials also included names and addresses of local community resources, such as tai chi programs to help prevent falls. These summaries were particularly useful because the specific referral information was at hand when the physicians needed them.

In addition, patients were given follow-up questionnaires developed for each condition that were to be completed before the next visit to indicate whether the treatment was working and prompt the physician to take the next steps if it was not. The top part included instructions for the patient, and the bottom part included questions such as “Did you have any problems with the treatment that your doctor prescribed? Have you fallen since that last visit? Is this treatment working?” These forms keep the patient involved and active.

**Decision Support**

Finally, the intervention included decision support for the physicians, small-group working sessions that were not traditional lectures. Rather, they focused on how to use the structured visit notes and supporting documents and how to get these care processes incorporated into their visit in two minutes or less.

**Effectiveness of the ACOVE-2 Intervention**

The ACOVE-2 practice redesign intervention was implemented and evaluated at two sites in California: a desert and a coastal community. As a result of the intervention, the care provided for falls and incontinence was much better compared to that provided by other physicians within the same groups. However, the quality provided was still less than optimal. Why? First, the physicians did not want to delegate data collection, as for orthostatic blood pressure. Some believed they needed to do everything themselves. Second, the intervention did not provide enough early feedback on changes that were not effective at improving care. The physicians did not know that the care was suboptimal and did not take steps to modify it. Third, there was not enough patient empowerment. Many physicians did not like patient follow-up sheets. They were afraid of patients asking questions about these conditions because it would add more time to the visit.

Building on the lessons of the ACOVE-2 study, several new studies, in conjunction with the American College of Physicians and the Alzheimer’s Association, are in progress to develop products for physicians to use in their offices to improve quality of care. In another study at UCLA, the intervention has been modified by delegating management of five conditions—falls, incontinence, depression, dementia, and heart failure—to a nurse practitioner. All of the other elements of the ACOVE-2 intervention remain intact and the physician continues to manage the overall care of the patient. Physicians love it, and patients love it.

**The Future Demographics**

In 2011, the first baby boomers will be 65 years old; 75 million will follow. Several important trends will affect their health care.

**Population-Based Health Care**

Health care in the 21st century increasingly will be delivered by health care systems—some will be exclusively managed care and others will be a blend. Today, more than 50% of internal medicine practices consist of five physicians or fewer. Over the coming decades, this will likely change so that the vast majority of physicians will be part of larger-practice groups.

Medical practice will increasingly be consumer oriented and consumer driven. Baby boomers are more empowered than their parents were and will demand more from their health care.

The future of health care will be focused on populations. There will be three distinct populations of older persons: people who are not sick but may have chronic diseases, people who are sick and have multiple chronic diseases (and are functionally impaired), and people at the end of life. These populations will be cared for in three settings of care—hospital, nursing home, and community (including assisted living). Because people transition in and out of different care settings and have specific diseases that will be managed differently, the challenge will be to build systems of care for each of these groups.

People who are not sick but who may have chronic diseases need good preventive care—as compre-
hensive and inexpensive as possible—and good episodic care. In the future, most preventive care will be out of the physician’s hands entirely. Episodic care, such as treatment of a minor injury or a urinary tract infection, will increasingly be provided by the health care system and not necessarily the patient’s personal physician. This will require patients to trust the health care system rather than just the individual clinicians. KP probably most closely approximates this model at the beginning of the 21st century. People with chronic diseases, whether sick or not, need team care—with an identifiable physician on the team—employing principles of disease management, health care self-management, and shared decision making.

For people who are sick and functionally impaired, the physician will have to be intimately involved with the care management team. The health care system has to adopt these people—they are our responsibility and we cannot let them stray off the beaten path. An important part of their care is ongoing active discussions about prognosis, quality of life, and preferences for care.

End-of-life care should begin early, identifying people who are in the last couple of years rather than last couple of weeks or months of their lives. KP is again in the lead. Patients need to trust that their physicians will not deprive them of needed care. They must feel confident that the care provided will be comprehensive and aggressive, albeit with different goals. For these patients, care will have to be so well orchestrated that when the patient dies, everyone—the patient, the physician, the team, and the family—would say that everything was done right.

Finally, care for all three of these populations will require a flow of clinical information such that care is seamless among all health care providers.

**Technology**

Technology is still a genie in the bottle—the full use of technology has not been realized. The electronic health record is the most prominent and most imminent. However, many other kinds of technology are also coming, particularly those that use remote monitoring and telemedicine (eg, robotic surgery and virtual intensive care units) and those that use machinery to perform human functions (eg, artificial retina, hepatic dialysis). All of these will change the way physicians practice medicine.

**Physicians’ Roles**

Medicine has been on a relentless march toward specialization, which has been a core economic principle for centuries. As Adam Smith said in 1776, “Each individual becomes more expert in his own peculiar branch, more work is done upon the whole, and the quantity of science is considerably increased by it.” In plain English, that means that we do well what we do often, and we cannot keep up with everything. In the future, there will more specialists—both traditional specialists and emerging disciplines such as palliative care, which received approval for American Board of Medical Specialties certification in 2006. In the future, there may be certification or focused recognition for new specialties such as women’s health and HIV diseases and for care focused on specific settings. The hospitalists are the first of these, but skilled nursing facility specialists and home-careists may follow. Moreover, primary care physicians (PCPs) are specialists. Coordinating care of the entire patient and being the patient’s advocate is a unique and special discipline.

While continuing to provide some direct one-on-one care, in the future, more PCPs will be leading teams that are comanaged with other clinicians. In these care models, physicians will focus on the tasks that they do best. They are very good at determining the patients’ objectives, collecting and synthesizing selective data, determining the medical realities, negotiating a treatment plan, monitoring and revising a treatment plan, and being the patient’s advocate. The last of these tasks is particularly important. For frail older persons, sometimes the PCP will call the surgeon to argue for an operation on a patient and at other times will call the surgeon to argue against an operation.

Consultants will increasingly advise on extremely complicated and rare cases, provide support for PCPs by placing consultant notes on the chart, help PCPs and teams develop protocols, give curbside consults, and perform procedures.

**Conclusion**

Current health care is lacking. Reorganizing health care is not only possible but also necessary to achieve better outcomes. Physicians’ roles will be very different over the next two decades: they need to think differently, be more innovative, encourage experimentation, and fail. It is okay to fail. If you experiment and fail, you can learn what did not work, and then you can try again. Eventually, you get it right. If you stop experimenting, if you stop innovating, you can never get any better.

**Acknowledgment**

Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.
References


In All Things

In necessariis, unitus;
In necessary things, unity;
In dubiis, libertas;
In doubtful things, liberty;
In omnibus, caritas.
In all things, compassion.

— Augustine of Hippo, 354-430,
Catholic saint and preeminent Doctor of the Church
Clinical Evidence Review: Best Practice

Heart Failure

Introduction
Heart failure has emerged as a major public health challenge. The condition is common, affecting about 2% of Americans as well as 6-10% of the US population aged 65 years or older. Remarkably, one in five of us will develop heart failure some time before we die. Despite advances in therapy, nearly half of heart failure patients are dead within five years of diagnosis. Heart failure is the most common cause of hospitalization among Medicare beneficiaries and is the single costliest Medicare diagnosis. Heart failure also has large impact within Kaiser Permanente (KP) Northern California. Patients with heart failure are 3.5 times as likely to die, spend 6 times as many days in the hospital, and incur 4 times the health care costs compared with patients of the same age and sex. (Unpublished data, B Fireman, 2006.)

Heart failure can be caused by a variety of cardiac conditions, most commonly coronary artery disease. In 40% to 50% of patients with heart failure, ventricular contractility is normal as measured by the left ventricular ejection fraction (LVEF). As many as half of elderly heart failure patients have a normal LVEF. During the past decade, several forms of therapy have been shown to prolong survival, prevent hospitalization, and improve quality of life for patients with heart failure and reduced LVEF. Because studies have shown that these forms of therapy are often underused, programs have been developed to ensure optimal care for patients with heart failure. Optimal treatment of heart failure requires correct diagnosis, identification of potentially reversible causes, appropriate use of medication, and patient education on self-care.

In this article, a vignette based on a single case presents an overview of the recently updated Care Management Institute (CMI) Heart Failure Management Guidelines, available by request through the CMI Product Information Line, 510-271-6426; by e-mail at CMIproducts@kp.org; or at CMI’s Web site: http://pkc.kp.org.

Vignette
A woman age 78 years states that for the past two months, she has had gradually progressive fatigue, occasional cough, dyspnea during exertion, orthopnea, ankle edema, and a ten-pound weight gain. She denies chest discomfort, fever, or chills. She has hypertension treated with diltiazem; she quit smoking 20 years ago; and she rarely drinks alcohol.

Physical examination shows an afebrile female patient with heart rate 105 beats per minute, blood pressure 130/70 mm Hg, respiratory rate 16 per minute, and oxygen saturation 94% on room air. The jugular veins are elevated with positive abdominojugular reflux. Pulmonary examination shows expiratory wheezing. The heart rate is regular without murmur, and the apical impulse is displaced and sustained. The patient has mild hepatomegaly and 2+ ankle edema. Electrocardiograms show sinus tachycardia and left ventricular hypertrophy. Chest x-ray films show cardiomegaly and pulmonary venous congestion. Levels of thyroid-stimulating hormone, albumin, ferritin, and serum creatinine are normal as are results of complete blood count. Echocardiography shows moderate left ventricular dilation with global hypokinesis, LVEF of 30%, left ventricular hypertrophy, left atrial enlargement, mild mitral and tricuspid valve regurgitation, and pulmonary artery systolic pressure ranging from 45 mm Hg to 50 mm Hg. Angiography in this patient shows normal coronary arteries and confirms the finding of reduced LVEF of 30%.

The patient begins a daily regimen of 20 mg oral furosemide, 10 mEq potassium, and 10 mg lisinopril. We phone her after three days to ensure that she is losing weight and improving. At a clinic visit one week later, she has lost seven pounds, and her symptoms have improved. (This typical response to diuretics, ie, weight loss and improved symptoms, is final confirmation that the patient does indeed have heart failure.) Despite this improvement, the patient still has orthopnea and...
elevated neck veins—findings that indicate hypervolemia and a need for additional diuresis and vasodilation. We double her dose of furosemide and lisinopril. One week later, she has lost an additional three pounds, denies orthopnea, and no longer has elevated neck veins.

After the patient becomes euvolemic, she starts a regimen of low-dose carvedilol (a beta-blocker) at a dosage of 3.125 mg orally twice daily. During beta-blocker titration, we monitor her closely for signs of worsening symptoms and weight gain and double the dose of carvedilol every two weeks as tolerated. When the dose of carvedilol is increased to 12.5 mg twice daily, the patient reports a three-pound weight gain and return of orthopnea. This decompensation must be addressed before we can further increase the dosage of beta-blocker. Options for therapy include diuresis and increasing vasodilation. We choose to double the dose of furosemide. A week later, the patient has lost three pounds, and the orthopnea has resolved. Her heart rate is 70 beats/minute, and her blood pressure is 110/70 mm Hg. We increase the dosage of carvedilol to 25 mg twice daily in patients who remain tachycardic.

The patient is now taking lisinopril (20 mg once daily), carvedilol (25 mg twice daily), furosemide, and potassium. Her heart rate is 60 beats/minute, and her blood pressure is 105/70 mm Hg.

**Comment**

**Diagnosis**

What is the diagnosis in the vignette presented? Which findings are most important for establishing the diagnosis? Which tests should be ordered? If the patient has heart failure, what caused it? What treatment should be given?

Heart failure is a clinical syndrome in which symptoms occur because the heart is either 1) unable to pump blood adequately to meet the body’s needs or 2) able to do so only at high intracardiac pressure. The diagnosis of heart failure is suggested by presence of characteristic symptoms (Figure 1). Because no single symptom or sign is pathognomonic, clinicians must weigh multiple pieces of evidence and must consider conditions that mimic heart failure. However, studies have shown that, when considered together, the patient’s medical history as well as results of physical examination, electrocardiography, and chest x-ray imaging can accurately indicate the diagnosis in more than 90% of cases.12

In the vignette presented, the clinical presentation is highly suggestive of heart failure. Results of physical examination and chest x-ray imaging show evidence

<table>
<thead>
<tr>
<th>Presentation suggestive of Heart Failure (HF)</th>
<th>Findings suggestive of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dyspnea • Orthopnea • PND • ↑JVP, edema</td>
<td>More specific:</td>
</tr>
<tr>
<td>• Unexplained fatigue, weakness, anorexia, or mental disturbances may indicate HF in older adults</td>
<td>• Orthopnea • PND • Neck-vein distention • Abdominojugular reflux • Third heart sound • Cardiomegaly • Displaced apical impulse • Pulmonary vascular congestion seen on chest x-ray film • Acute pulmonary edema • Weight loss ≥ 4.5 kg in response to diuretics</td>
</tr>
<tr>
<td>Physical exam ECG, CXR, labs</td>
<td>Less specific:</td>
</tr>
<tr>
<td>HF likely</td>
<td>• DOE • Ankle edema • Hepatomegaly • Pleural effusion • Tachycardia (rate ≥ 120 beats/min) • Nocturnal cough • Rales</td>
</tr>
<tr>
<td>Yes</td>
<td>Optional BNP assay</td>
</tr>
<tr>
<td>Maybe</td>
<td>Other causes?</td>
</tr>
<tr>
<td>No</td>
<td></td>
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![Figure 1. Diagnosing heart failure.](http://cl.kp.org) Reproduced with permission of the publisher from: Kaiser Permanente Medical Care Program, Care Management Institute. Guide to Heart Failure Management, 2006.)
of abnormal pump function (pulmonary and systemic venous congestion resulting from elevated intracardiac pressure and cardiomegaly). Two of the most suggestive findings for heart failure—an abnormal apical impulse and elevated jugular venous pressure—are often overlooked. If these physical signs had not been sought, this former smoker who was wheezing might have been diagnosed with chronic obstructive pulmonary disease and been treated with bronchodilators. In this case, pulmonary venous congestion caused “cardiac asthma.” More commonly, the lung examination is normal in patients with chronic heart failure. Rales, sometimes mistakenly believed to be a sensitive indicator of heart failure, are absent in more than 80% of patients with chronic heart failure. Similarly, patients with chronic heart failure may have normal chest x-ray films. Because jugular venous pressure is one of the most useful physical findings for diagnosing heart failure and is essential for assessing volume status in response to treatment, skill in examining the neck veins is important.

## Examining the Neck Veins for Jugular Venous Pressure

Jugular venous pressure is estimated by measuring the vertical height of the internal jugular vein above the sternal angle (the junction of the manubrium and sternum). In a well-lit room, place the patient at 45 degrees from horizontal. Position the head to relax the neck muscles, and spread the skin smoothly—but not tautly—across the right side of the neck. Locate the pulsations of the right internal jugular vein, which runs between the heads of the sternocleidomastoid muscle (Figure 2). Normal pressure is located less than 4 cm vertically above the sternal angle or only about 1 inch above the clavicle when the patient is positioned at 45 degrees from the horizontal.

Observing the external jugular vein is another way to locate the venous pressure. Although the external jugular vein may be compressed by the neck muscles and thus be falsely elevated, more often the external jugular mirrors the internal jugular vein. The external jugular vein can be located easily by compressing its base (causing the vein to fill) and then observing how the vein collapses when released. Table 1 contains clinical clues that can help differentiate jugular venous pulsations from carotid pulsations.

## Echocardiography Used to Search for Structural Heart Disease

When heart failure is suspected on the basis of the patient’s medical history and results of physical examination, evidence of abnormality in the heart should be sought. This examination usually consists of echocardiography, which assesses the structure and function of the ventricles and valves. Although heart failure rarely occurs in structurally normal hearts (eg, as occurs with high-output heart failure), abnormal results of echocardiography often provide evidence supporting the diagnosis and help identify the responsible form of cardiac dysfunction and thus allow therapy to be directed appropriately. The normal range for LVEF is 50% to 70%. Systolic dysfunction is defined as LVEF...
less than 45%. Valvular dysfunction should be considered a potential cause of heart failure when the echocardiogram shows moderate or severe valvular stenosis or regurgitation. Mildly elevated pulmonary pressure (40-60 mm Hg) is characteristic of heart failure and does not necessarily suggest a pulmonary disease process.

Cardiac dysfunction sufficient to cause heart failure can exist even when the echocardiogram appears normal. This situation is seen most often in diastolic dysfunction. Echocardiography is not mandatory if valvular and left ventricular systolic function has been assessed by other measures, such as by cardiac catheterization.

An Assay Used to Diagnose Heart Failure

Recently, heart failure has been accurately diagnosed by using an assay for B-type natriuretic peptide (BNP), a hormone released from the ventricles in response to stretch and pressure overload.\(^1\) The assay is most useful when heart failure is suspected but remains unconfirmed by the medical history, physical examination, electrocardiography, and radiography of the chest. Since diagnoses other than heart failure can be associated with elevations of BNP, its level must be interpreted in light of other clinical findings.

Causes of Systolic Heart Failure

The echocardiogram for the 78-year-old woman in the vignette shows a reduced LVEF (systolic dysfunction) without clinically significant valve disease. Moderate elevation of pulmonary pressure helps to confirm heart failure. After heart failure is diagnosed, the cause must be identified by focusing on a short list of conditions that are common or potentially treatable (Table 2). In addition to basic laboratory tests (Figure 1), measurement of the plasma ferritin level may be used to screen for hemochromatosis, a condition that is potentially treatable. Other tests, such as rheumatologic serology, should be obtained only if the medical history and results of physical examination suggest a specific diagnosis.

Screening for Coronary Artery Disease

All patients with heart failure should be screened for coronary artery disease because it is the most common cause of reduced LVEF. However, no consensus exists on the best screening strategy.\(^2\) Options include clinical assessment consisting of medical history, physical examination, noninvasive cardiac imaging, or coronary angiography. In general, proceeding directly to angiography should be considered for heart failure patients who have typical angina, flash pulmonary edema, or multiple coronary risk factors (eg tobacco use combined with diabetes). Angiographic results for the 78-year-old woman in the vignette—normal coronary arteries and confirmation of the 30% LVEF—were consistent with nonischemic cardiomyopathy.

Criteria for Hospital Admission

Should this patient be admitted to the hospital? Common reasons to consider admission are listed in Table 3.\(^3\) Admission often depends on how ill a patient appears. In this vignette of a 78-year-old female patient with gradual onset of symptoms, outpatient management was appropriate.

Treating Systolic Heart Failure: Countering Compensatory Reflexes Gone Astray

Our understanding of the treatment for systolic heart failure has been greatly advanced by understanding its pathophysiology. When ventricular function is compromised, neurohormones (including norepinephrine

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### Table 2. Causes of heart failure in patients with reduced left ventricular ejection fraction

<table>
<thead>
<tr>
<th>Cause</th>
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<tr>
<td>Coronary artery disease</td>
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<tr>
<td>Alcohol use</td>
</tr>
<tr>
<td>Valve dysfunction, especially mitral and aortic regurgitation</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Tachycardia-induced cardiomyopathy</td>
</tr>
<tr>
<td>Hypothyroidism</td>
</tr>
<tr>
<td>Hemochromatosis</td>
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<tr>
<td>Idiopathic cardiomyopathy</td>
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</table>

### Table 3. Indications for hospital admission for patients with heart failure

<table>
<thead>
<tr>
<th>Indication</th>
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<tbody>
<tr>
<td>Abrupt onset of heart failure</td>
</tr>
<tr>
<td>Coexisting pneumonia</td>
</tr>
<tr>
<td>Evidence of ischemia</td>
</tr>
<tr>
<td>Severe exacerbation of chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>Oxygen saturation &lt;90%</td>
</tr>
<tr>
<td>Poorly tolerated cardiac arrhythmia</td>
</tr>
<tr>
<td>Severe respiratory distress</td>
</tr>
<tr>
<td>Severe hypertension</td>
</tr>
<tr>
<td>Hypotension</td>
</tr>
<tr>
<td>Acute renal failure</td>
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<tr>
<td>Syncope</td>
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and the renin-angiotensin-aldosterone system) are activated. These hormones lead to vasoconstriction and fluid retention—reflexes which are meant to counteract dehydration but which tend to worsen heart failure. Gradually, these neurohormones cause myocyte death and fibrosis, a process called remodeling, which can further worsen ventricular function. Untreated ventricular dysfunction tends to progress, causing worsening heart failure and, eventually, death.

Countering these reflexes with diuretic agents and vasodilators has emerged as a main component of heart failure management. Moreover, agents that block the damaging neurohormones have proved more beneficial than agents that merely correct the hemodynamic derangement that occurs in heart failure. For example, angiotensin-converting enzyme (ACE) inhibitors affect survival more favorably than direct-acting vasodilators such as calcium channel blockers. Similarly, norepinephrine-antagonist beta-blockers (formerly contraindicated because of their negative, inotropic effects) actually improve survival more than any other drug class. In patients with systolic heart failure, survival has been improved by three categories of medication, sometimes referred to as “triple therapy”: vasodilators (especially ACE inhibitors, which can lead to 23% relative reduction in mortality); beta-blockers (which can lead to a 35% relative reduction in mortality); and spironolactone (which can lead to a 30% relative reduction in mortality).

**Sequence of Medication Titration**

Initially, diuretic agents and vasodilators should be used to stabilize the condition of patients with decompensated heart failure (Figure 3). ACE inhibitors are the vasodilators preferred on the basis of multiple clinical trials that showed mortality benefit. Use of angiotensin receptor blockers is an alternative for patients who have intolerance to ACE inhibitors (eg, because these patients have cough, angioedema, or allergy). Patients with renal dysfunction or hyperkalemia should be treated with hydralazine and isosorbide dinitrate.

After the patient’s condition has stabilized, beta-
blockers are added. Beta-blockers may initially worsen heart failure and therefore must be initiated at a low dose and titrated slowly—and only after volume overload is corrected. In patients with mild heart failure without congestion, beta-blockers can be initiated before vasodilators or used alone.20 Patients should be instructed that although beta-blockers may initially worsen symptoms, this effect is almost always transient and correctable. Patients can be told that their long-term quality and quantity of life will be improved. Teaching patients the signs and symptoms of deterioration before beta-blocker titration is begun can help prevent problems during titration. Because some studies have suggested that all beta-blockers may not be equally effective,21 the preferred agents for systolic heart failure are carvedilol, bisoprolol, or long-acting metoprolol CR/XL.

For patients with LVEF less than 35% and severe symptoms (such as fatigue or dyspnea with minimal activity) or patients with LVEF less than 40% and a recent myocardial infarction, aldosterone blockers (spironolactone or epleronone) also decreased mortality.20,21 Because of its lower cost, spironolactone is preferred over epleronone, unless breast tenderness or gynecomastia develop. Renal insufficiency and hyperkalemia are contraindications to aldosterone antagonists, and potassium levels of patients receiving spironolactone must be monitored closely.18

Digoxin does not improve survival but has been shown to reduce hospitalization rates slightly.23

**Anticoagulation**

Accepted indications for warfarin anticoagulation therapy in patients with heart failure include atrial fibrillation, left ventricular thrombus, and previous diagnosis of thromboembolism.23 Routine use of warfarin in patients with severely reduced LVEF does not appear to decrease risk of stroke.26

**Patient Education: Self-Care for Heart Failure**

The vignette illustrates the essential role of patient self-care during medication titration. The patient helped guide medication adjustments by weighing herself daily and by reporting worsening symptoms. The importance of patient education in treating heart failure cannot be overstated. Education alone, independent of any changes in medical therapy, has shown reduced rates of rehospitalization by 39%27 and gives patients a sense of empowerment and control over their health. Among the most valuable teaching points is that sudden weight gain—two pounds in one day or five pounds in one week—is the earliest sign of fluid retention. To prevent hospitalization resulting from bowel edema (which may impair absorption of oral medication), patients with heart failure should respond to fluid-based weight gain by increasing their dose of diuretic agents. Other important components of patient education for heart failure are listed in Table 4.

**Considerations for Patients with Advancing Illness**

Frank discussion of prognosis is an important aspect of patient education. Heart failure has a high mortality rate, and half of deaths occur suddenly and unpredictably. Therefore, planning for the end of life is essential even when the patient feels well. Patients should be told that heart failure is a serious disease that is often not curable. Although treatment can improve both

**Monitoring Response to Treatment**

During medication titration, the clinician must assess response to treatment, particularly the patient’s volume status. Examining the neck veins for jugular venous pressure and monitoring for weight loss in response to diuretics is particularly useful. Elevated venous pressure indicates the need for further diuresis. Orthopnea suggests continued elevation of pulmonary wedge pressure and the need for further diuresis, vasodilation, or both. Treatment can be monitored by phone and occasionally at clinic visits as long as the patient is doing well and has vital signs checked and blood tests drawn.

<table>
<thead>
<tr>
<th>Table 4. Important educational components for patients with heart failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early recognition of signs and symptoms of decompensation</td>
</tr>
<tr>
<td>Understanding the importance of medication compliance</td>
</tr>
<tr>
<td>Sodium intake ≤2 g daily (requires teaching to read food labels)</td>
</tr>
<tr>
<td>Flexible diuretic dosing on basis of patient’s weight (measured daily)</td>
</tr>
<tr>
<td>Physical activity</td>
</tr>
<tr>
<td>Smoking cessation</td>
</tr>
<tr>
<td>Alcohol in moderation</td>
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</table>
quality and length of life, many patients die of heart failure nonetheless. Health decline in heart failure may be sudden or gradual, and timing of deterioration is often unpredictable; therefore, planning early for advancing illness—including medical, financial, legal, and personal needs—is important.11 Advance Directives for Health Care, surrogate decision makers, prehospital and hospital DNR orders, and hospice care should be described.

### Patients with Refractory Symptoms

Hemodynamic state should be reassessed in patients who remain severely symptomatic despite medical therapy. If the jugular venous pressure is normal (indicating adequate diuresis), additional vasodilation to reduce vascular resistance and to improve cardiac output should be considered. After the dose of ACEI is maximized, a second vasodilator may be required. The vasodilator combination of hydralazine and isosorbide added to an ACEI has been found to markedly reduce mortality and hospitalizations in African-Americans with heart failure and LVEF < 35%.28 In contrast, adding angiotensin receptor blockers or calcium channel blockers to ACEIs has not improved survival.29-31 Thus, for systolic heart failure hydralazine/isosorbide is the preferred second vasodilator to add to ACEIs.

As mentioned above, digoxin does not improve mortality32 but necessitates close monitoring of potassium levels (because potassium loss is exacerbated by addition of the thiazide diuretic agent). Spironolactone also acts on the distal tubule and can potentiate loop diuretics while potentially increasing potassium.

Medication-related causes of refractory or worsening systolic heart failure are listed in Table 5.

### Device Therapy

For some patients with LVEF ≤35%, implantable cardioverter defibrillators (ICDs) may reduce risk of sudden death,33 while for others, cardiac resynchronization therapy (CRT) with biventricular pacing can improve survival and symptoms.34,35 Consider referral for ICD assessment if 1) LVEF ≤35% and is not expected to improve, 2) prognosis >1 year, and 3) avoidance of sudden death is desired. Consider referral for CRT if 1) LVEF ≤35%, 2) severe symptoms despite optimal therapy, and 3) LBBB ≥120 msec.

### Referral to Heart Failure Programs

KP has developed heart failure programs that provide many of the components of management described in this article, including patient education and medication titration. These disease management programs are supervised by physicians, conducted by nurses and clinical pharmacists, and modeled on programs shown to reduce rates of hospitalization while improving quality of care. Interested patients who meet local eligibility criteria should be referred to these programs.

### Heart Failure in Patients with Normal Left Ventricular Ejection Fraction

The 78-year-old woman in the vignette was based on an actual patient but was altered in one important respect: The actual echocardiogram revealed normal chamber sizes, left ventricular hypertrophy, mildly el-

<table>
<thead>
<tr>
<th>Medication to avoid in patients with systolic heart failure</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsteroidal anti-inflammatory drugs and COX-2 inhibitors</td>
<td>May promote fluid retention and worsen renal function</td>
</tr>
<tr>
<td>Calcium channel blockers (except felodipine and amlodipine)</td>
<td>May accelerate heart failure progression and increase exacerbation</td>
</tr>
<tr>
<td>Antiarrhythmic drugs (except amiodarone and dofetilide)</td>
<td>Can increase risk of sudden death</td>
</tr>
</tbody>
</table>

**Use with caution:**
- Metformin: Must be discontinued when serum creatinine level >1.5 mg/dL (132.6 µmol/L)
- Thiazolidinediones (eg, pioglitazone, rosiglitazone): Can cause fluid retention (usually mild) requiring additional diuresis

<table>
<thead>
<tr>
<th>Key to Heart Failure Programs</th>
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heart failure with normal LVEF should be sought. Common causes are listed in Table 6.

To date, no medication or therapy has been shown to improve survival in heart failure with preserved systolic function. Thus, therapy is empirical and is aimed at relieving symptoms and treating exacerbating conditions.

Principles of management are listed in Table 7, and key points of heart failure management are summarized in Table 8.

Many patients with heart failure and normal LVEF receive some of the same medications as those with systolic heart failure: loop diuretics, ACE inhibitors, and beta-blockers. However, beta-blockers may be titrated more rapidly in patients with normal systolic function. Spironolactone has not been studied in patients with normal LVEF.

**Conclusion**

The past decade has seen many advances in the treatment of heart failure, and these advances offer our patients improved survival and quality of life. Heart failure is a clinical diagnosis, made after weighing multiple pieces of evidence. Examination of the neck veins for jugular venous pressure is useful both for diagnosing heart failure and for monitoring response to therapy. Once heart failure is diagnosed, treatable causes should be sought.

Three classes of medication—beta-blockers, vasodilators (especially ACE inhibitors), and spironolactone—have shown improved survival in patients with heart failure caused by reduced LVEF. Treatment for patients with heart failure and preserved systolic function is empirical but ultimately includes many of the same medications used to treat systolic heart failure. For all patients with heart failure, education on prognosis and self-care is essential.

**Acknowledgments**

The author would like to thank Suzanne Shore, MPH, and Donna Schaffer, RD, MPH, for their contributions in rewriting and updating the original manuscript.

**References**

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Heart Failure

We will see more advances in treatment of advanced heart failure, but a longer view of the future should look elsewhere. Molecular genetics will continue to cast light upon predisposing factors and prevention of some cases, most notably those due to certain factors of cardiomyopathy. Control of heart failure risk factors, especially hypertension and atherosclerotic coronary disease, would seem obvious keys to progress. We know much about how to do this, but, ironically, we are fighting a growing epidemic of obesity and diabetes in young people. Because increasing numbers of people with damaged hearts will survive into old age, we will be managing heart failure for a long time to come.

Presentation of Osteitis and Osteomyelitis Pubis as Acute Abdominal Pain

By Diane V Pham, MD
Kendall G Scott, MD

Abstract
Osteitis pubis is the most common inflammatory condition of the pubic symphysis and may present as acute abdominal, pelvic, or groin pain. Osteomyelitis pubis can occur concurrently and spontaneously with osteitis pubis. Primary care physicians should consider these conditions in patients presenting with abdominal and pelvic pain. A thorough history, including type of physical activity, and a focused physical examination will be useful, and imaging modalities may be helpful. A biopsy and culture of the pubic symphysis will usually confirm the diagnosis. Treatment for osteitis pubis generally involves rest and anti-inflammatory medications. Failure with this conservative treatment should alert the physician to the possibility of osteomyelitis, which needs treatment with antibiotics. Prognosis for recovery is excellent with definitive diagnosis and treatment.

Introduction
Abdominal pain may be the presenting symptom in a wide range of diseases. This proposes a difficult challenge for the primary care physician. Acute pain often requires emergency surgical intervention, but unnecessary invasive procedures can be avoided when a good history is taken and thorough physical examination is conducted. Osteitis pubis is a common but often undiagnosed condition causing pain in the pubic area, groin, and lower rectus abdominal muscle. Osteomyelitis pubis is an infectious disease with clinical manifestations similar to those of osteitis pubis. These conditions are often overlooked as or masked by abdominal pain, which may lead to unnecessary tests and procedures. This case report discusses the onset of acute abdominal pain in an athlete with both osteomyelitis and osteitis pubis. It is important to recognize that both conditions may occur simultaneously in one patient. Failure to identify both disease processes could lead to inaccurate treatment and lifelong complications.

Case Presentation
A previously healthy male, age 17 years, presented with a three-day history of severe right lower quadrant abdominal pain. Initial workup findings, including those for a computed tomography scan of the abdomen and pelvis, were normal, and he was treated with nonsteroidal anti-inflammatory drugs (NSAIDs). He returned two days later with a fever of 38.3°C and worsening sharp, constant abdominal pain, radiating to the suprapubic area and exacerbated by movement. He was nauseated and anorectic and vomited nonbilious, nonbloody material once. His past medical history and a review of systems provided no new insights.

His abdomen was soft and nondistended, but he exhibited right lower quadrant tenderness with involuntary guarding and rebound tenderness. The psoas, obturator, and Rovsing's signs were positive; rectal examination findings were normal. The leukocyte count was 12,400 cells/mL, with a polymorphonuclear leukocytosis. Diagnostic laparoscopy showed no definitive intra-abdominal pathology, although a long, mildly engorged retroperitoneal appendix was removed; the pathologist found no inflammation.

Fever and worsening abdominal and suprapubic pain persisted, with pain radiating to both groins and precluding ambulation. Additional detailed history uncovered the information that the patient was an avid college soccer and tennis player and had participated in a soccer tournament the previous week. Examination now showed tenderness in the right lower quadrant and suprapubic and bilateral groin areas, tenderness of the pubic symphysis, and worsening pain with abduction of either hip. He developed bilateral inguinal lymphadenopathy, with no evident skin lesion. He had negative findings on blood tests including total protein, albumin, liver tests, complement components 3 and 4, creatine kinase, aldolase, beta-2-microglobulin, anti-DNA, and antinuclear antibody panel. His erythrocyte sedi-

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mentation rate (ESR) was 109 mm/h and C-reactive protein (CRP) level was 11.6 mg/dL; his leukocyte count remained elevated.

A pelvic radiograph showed slight deformity of the right suprapubic ramus at the level of the pubic symphysis, with irregularity of the iliac wing at the anterior iliac spine region. A 99mtechnetium methyl diphosphonate bone scan showed increased radiotracer activity in the left superior pubic ramus, left anterior iliac crest, and right posterior iliac crest. A pelvic magnetic resonance imaging (MRI) scan revealed multiple enlarged right inguinal lymph nodes and an increased signal in the right inferior pubic ramus and right ilium bone marrow, with muscular changes. These findings were consistent with osteomyelitis and osteitis pubis. It was decided that a confirmatory pubic biopsy was not needed.

The patient was treated with intravenous cefazolin, ibuprofen, and bed rest. Over a week his condition improved markedly; he became afebrile and he was able to ambulate with assistance. His white blood cell count normalized; his ESR and CRP level were descending. He was discharged to complete a six-week antibiotic regimen via a peripherally inserted central catheter, plus ibuprofen and physical therapy. His ESR and CRP level normalized, but he was not completely asymptomatic until three months later, at which time he returned to his normal soccer and tennis training.

Discussion

Background

Edwin Beer first described osteitis pubis in 1924 in patients undergoing suprapubic surgery. It is the most common inflammatory disease of the pubic symphysis. It can be seen in any patient population but is more prevalent in men ages 30 to 49 years. Although the precise etiology of osteitis pubis remains unknown, trauma during surgery or childbirth is responsible for most cases.

Although the precise etiology of osteitis pubis remains unknown, trauma during surgery or childbirth is responsible for most cases.

Anatomy and Pathomechanics

The pubic symphysis is a rigid, fibrocartilaginous joint between the pubic rami. The abdominal muscles, consisting of the rectus abdominus and external and internal oblique muscles, attach distally to the inguinal ligament, conjoint tendon, and pubic symphysis. The adductor muscles, consisting of the pectineus, adductor longus, adductor brevis, adductor magnus, and gracilis, arise from the superior and inferior rami of the pubis. These two muscle groups act antagonistically to stabilize the symphysis. Any muscle imbalances between the abdominal and hip adductor muscles may cause osteitis pubis.

Clinical Findings and Diagnosis

A detailed medical history, including the actual motions the patient repeats during sports activity and a familiarity with the possible mechanisms of injury, can lead the physician to a more accurate diagnosis. Through examination of the groin, abdomen, hips, spine, and lower extremities is crucial. Patients with osteitis pubis can present with vague unilateral or bilateral complaints of abdominal, pelvic, or groin pain. Usually insidious in nature, it can occasionally be acute, sharp, burning pain in athletes after prolonged activity. Use of the abdominal or adductor muscles (eg, running, pivoting, and kicking) exacerbates the pain. The patient may also report weakness or difficulty ambulating.

A waddling gait may be observed. On examination, hip motion will exacerbate pain, and its range can be

Although the precise etiology of osteitis pubis remains unknown, trauma during surgery or childbirth is responsible for most cases.
restricted. The most obvious and specific finding is tenderness of the pubic bone, superior pubic rami, or inferior pubic rami.14

When osteitis pubis is associated with fever, lymphadenopathy, nausea, vomiting, and anorexia, one must consider the concurrent diagnosis of osteomyelitis pubis. These symptoms can be easily mistaken for those of acute appendicitis.

Laboratory data are not required for the diagnosis of either osteitis or osteomyelitis pubis. In the latter there may be an increased leukocyte cell count and an elevated sedimentation rate, similar to data found with acute abdominal pain.

Imaging

Pelvic radiographs may show irregular borders over the pubic symphysis and rami. Varying degrees of articular surface irregularity, erosion, sclerosis, and osteophyte formation may be present. These findings are not specific to osteitis pubis and may not be detectable early. Symphysography, injection of the symphyseal cleft with noniodine contrast, is used to view morphology and potentially provoke symptoms. This procedure can confirm osteitis pubis15 (Figure 1).

A 99mtechnetium methyl diphosphonate bone scan may show increased uptake in the area of the pubic symphysis15 (Figure 2). However, scan findings may be negative.

MRI may show bone marrow edema in the pubic bones early in the course of osteitis pubis. The presence of fluid should raise suspicion for an underlying infection, such as osteomyelitis15 (Figure 3).

Distinguishing between osteitis and osteomyelitis pubis can be difficult with bone scans and MRI alone. Although a definitive diagnosis often requires biopsy and culture, a biopsy was not performed in the patient discussed here. Lack of improvement with rest and NSAIDs plus a good response to antibiotics confirmed the diagnosis of osteomyelitis pubis.

Management

Treatment of osteitis pubis aims to reduce inflammation with rest and oral NSAIDs. Ice or heat may provide additional symptomatic relief. Sometimes glucocorticoid medications may be needed. After pain and inflammation are alleviated, progressive physical therapy is recommended. Athletes are instructed to avoid any type of sporting activity that may exacerbate symptoms.

Although use of intra-articular glucocorticoid injections is controversial, such injection in athletes with acute symptoms (<2 weeks) has been reported to re-
sult in a more rapid recovery. Thus, these injections may help athletes who need to return to competition within one to two weeks.

Surgery is rarely indicated and should be reserved for patients with severe pain or pubic instability nonresponsive to conservative therapy. Wedge resection of the symphysis can improve early symptoms but may lead to later posterior pelvic instability, requiring another surgical procedure. Video-assisted placement of an extraperitoneal retropubic synthetic mesh may support the damaged area and accelerate the rehabilitation process for osteitis pubis.

Osteomyelitis pubis requires identification of the organism and treatment with the appropriate antibiotic. Initially antibiotics are given intravenously for two weeks, followed by oral antibiotics for at least six weeks or until the ESR is normalized. Surgical debridement may be required if there is no response to medical therapy. Rest, NSAIDs, and physical therapy are prescribed just as they are for osteitis pubis.

Prognosis
Osteitis pubis is a self-limiting condition, but time until full recovery in athletes ranges from three weeks to 32 months. Osteomyelitis pubis is not self-limiting, but when it is treated adequately with antibiotics, the prognosis for recovery is excellent. Data about the disease’s recurrence rate in athletes are not available.

Conclusion
Abdominal pain can be a challenging problem with an extensive differential diagnosis. Acute pain can be misleading and can result in unnecessary invasive procedures. Osteitis pubis should be considered in the differential diagnosis when any patient complains of abdominal, pelvic, or groin pain. When pain occurs with fever, osteomyelitis should be suspected. To correctly diagnose these conditions, the primary care physician must maintain a high index of suspicion. When the conditions are recognized, specific conservative treatment can produce quick relief and good results.

Acknowledgment
Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.
“At Home in the Clouds, Picos de Europa, Spain”
photograph
By David Clarke, MD

Dr Clarke was alone on the trail ascending through a cloud when this mountain goat appeared ten feet away.
Dr Clarke’s photograph is also on the cover.
In 1992, Oregon Health and Sciences University (OHSU) introduced the Principles of Clinical Medicine (PCM) course with the intent of providing medical students early in their training with a patient-centered care context. Students are enrolled in this two-year longitudinal course at the same time they are learning basic sciences. PCM consists of two components: a weekly preceptorship in which students spend four hours each week with a community physician and four hours in classes focusing on the knowledge, skills, and attitudes involved in providing patient-centered care.

One of the goals of this curriculum is to help students develop cultural sensitivity. This is not an easy task. To do this we must walk a fine line between teaching salient characteristics of various cultures, which may be regarded as “stereotyping,” and giving vague advice about the importance of treating all patients with equal respect and trying to understand their worldviews.

Another goal is to develop students’ ability to reflect thoughtfully on key issues affecting their future practice of medicine. Students engage in group discussions with their peers and physician group leaders; they also are required to write a quarterly essay to encourage self-reflective thinking and writing.

We have also developed the assignment of an “ethnographic interview.” Students are given the opportunity to interview a patient from an ethnic or cultural background other than their own. They are then asked to relate the patient’s situation and to reflect upon the experience within the context of what was learned during the PCM quarters, including a discussion of US health care policy and economics. This assignment moves the students out of their comfort zone and enables them to learn things about patients and cultures that they never would otherwise. We consider it to be the best opportunity we offer to promote the practice of culturally sensitive medicine. Our faculty continue to be amazed not only that students learn so much, but that they often write so eloquently about these experiences.

The Ethnographic Interview

The Presenting Situation

Kathy is a 58-year-old Caucasian woman living in a 55-bed transitional facility for women, most of whom have escaped from domestic violence household or have crossed paths with the judicial system. I met with Kathy through the volunteer coordinator of a program to “help serve people’s basic needs as they transition from homelessness to housing.”

With a group of students I volunteered to make dinner at a transitional facility for men. We had a chance to talk with a few of the residents there. They were very open and shared their lives with us. Hidden in their stories are the secrets of how they became homeless. For many of them only minimal health care need is met. Since I haven’t had much experience with this subset of our population, I thought it would be a great learning opportunity to chat with one of them more in depth. The volunteer coordinator gave me a choice between a men’s facility and a women’s. I chose the women’s.

The Informant

Kathy was a friendly and pleasant woman. She clearly indicated that she would only volunteer her own information and no details of her family would be shared. She was born in Portland, OR, and her family moved to Albany, OR, when she was eight years old. She lived in Alaska and in California; returning to Portland 28 years ago.

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Divorced, she raised two children by herself. Her son, age 25, is in the military. Her daughter, age 22, is studying psychology in college. Kathy also has an older sister who lives in Lincoln City, OR.

Kathy seemed attentive and willing to share her story with me. She mentioned that she has a hard time concentrating if too many questions are asked at once. Nevertheless, she answered the questions appropriately and rarely seemed to have problems focusing.

**Household Composition**

Kathy lives in a 55-bed facility for women transitioning from homelessness to housing. It is organized into three levels. Six women share a room (a “pod”) in level 1. In addition, there are a few “correctional pods” for those who are going in or out of the justice system. Everyone enters the facility at level 1, and must complete a set of requirements before moving to level 2. Level 1 residents may not stay out overnight. Level 2 consists of two-person rooms. They share a small space and may stay away overnight for two nights each month. There are 40 residents in Levels 1 and 2. Level 3 is apartment-like. The residents in level 3 have much more freedom and may stay out overnight for up to five days per week. Fifteen people stay in this level. The maximum length of stay is 11 months.

According to Kathy, the facility is strictly regulated with a lot of rules. Everyone must be ready for the day by 7:30 am, and lights are out at 10:30 every night. This is not a problem for Kathy who sleeps only four to five hours a night. Each resident supports the house with required chores. A big-screened TV is shared among the residents: each resident may sign up for a one-hour block per week but are free to join the others in television viewing. No visitors are allowed. When planning an overnight stay away—an option available only to Level 2 or 3 residents—residents must arrange to be picked up three blocks from the house. All incoming calls are taken by a message system, and each resident is allowed one personal phone call per month.

Kathy moved in two and a half months before our interview and was recently promoted to Level 2. She enjoys living in the Level 2 room and gets along well with her roommate. They keep their room very clean.

**Material Possessions, Transportation, and Family Support**

Although their living space is small, residents in Levels 2 and 3 may have a small TV or any other furniture that fits. When Kathy first moved into the facility, she had only two backpacks and two paper bags of clothes and belongings. She now has a small black-and-white TV and a small table her daughter made for her. As for food, all residents receive monthly food stamps and food baskets from a central food bank. Most residents use public transportation.

Kathy saw her son when he was back from Afghanistan and she is close to her daughter whom she sees about every two months. She hopes to see her daughter more when she finds her own place. The strict visitation and overnight rules limit their ability to meet. The immediate support system she has includes staff and residents. Each resident is assigned a case manager with whom she meets once a week to discuss immediate and long-term goals: employment and housing. Kathy’s goals also include mental and physical health. She is taking classes about renting and looking for jobs. Kathy is disabled from previous health problems and can only work 20 hours per week. Her disability and age make finding a job more difficult.

**Housing Costs**

Level 1 and 2 are free; employed Level 3 residents pay one third of their income for rent. Unemployed Level 3 residents pay no rent. Kathy is on the waiting list for a subsidized apartment complex funded by the Housing Authority of Portland; the cost structure is the same as for Level 3 residents in the housing facility. Kathy looks forward to regaining her independence. She is also trying to access Social Security benefits to help with housing and medication needs.

**Family Work History and Income**

Kathy has never had health insurance, but sees a physician regularly because of health issues. In the past two years, because of increased stress Kathy’s physical symptoms have been aggravated.

Kathy’s last job was at the airport. She provided no specific details, other than lack of benefits. She was fired because of a 13-day absence due to a physical illness. She appealed and will receive unemployment benefits in March 2007. This will certainly be spent on medications.

**Health Problems and Medications**

Kathy has a list of medical and mental issues. She was diagnosed as partially bipolar, with major depression and anxiety disorders. Her medications for mental health included Abilify 10 mg qd ($175/month), Cymbalta 60 mg qd, and Trazodone 100 mg qPM.

Her general physical health issues are: congestive heart failure because of valve abnormality, angina, hypertension, asthma, emphysema, right kidney dysfunction (with
CASE STUDY

35% functional capacity), and gastroesophageal reflux disease. Her medications include advair inhaler ($300/month), albuterol, diltiazam 180 mg qd, hydrochlorothiazide 25 mg qd, spironolactone 100 mg qd, diphenhydramine 25 mg, protonix ($102/month), and Zantac.

About a year ago, Kathy, involved in a 20-year relationship with a man who had emotionally and mentally abused her, first attempted suicide, which led to a long hospital stay. When social workers were unable to find her a shelter, she returned to the same environment. During the next four months, things got worse and she attempted suicide a second time. She was hospitalized for two weeks. She was then placed in the women's transitional housing facility.

Kathy's lifestyle has changed dramatically. She must ration food stamps and the food basket and thus eats more vegetables and less meat. Because she uses public transportation, she has increased her exercise level by walking to and from the bus stops. She has lost 53 pounds since last July. Her weight loss has been a great help to her physical and mental health.

Kathy has now been seeing the same physician for four months and has developed a relationship. She receives financial aid for her mental health medications. However, these resources were not enough to cover everything on her medication list. She has considered stopping Advair and Protonix.

Folk Medical Beliefs and Practices

Kathy has never tried complementary or alternative medicine, cost being a major concern. Because of a recent diagnosis of internal shingles and impaired renal function, Kathy now relies on morphine-related drugs for pain. She doesn't want to become dependent and her primary care physician suggested that she consider acupuncture.

Health Hazards In and Around the Home

I did not ask to visit Kathy's room but she described it and the general house area as being free from hazardous contents. Strict visitor rules allow her to feel safe. She walks around the block after dinner but she doesn't walk far after dark.

Risk Factors for Inadequate Health Care

Kathy has never had employer-provided insurance benefits and she has never purchased individual health insurance. Therefore some underlying health issues have gone unnoticed. With her first suicide attempt she discovered her failing kidney and heart were the cause of many of her symptoms.

Kathy has few resources and therefore must constantly make decision regarding medications. When her medication financial aid ends next year, those decisions will become even more difficult.

My Personal Reflection on this Interview

A number of issues led to Kathy's becoming “homeless”: her abusive relationship, mental illness, lack of employer-provided health insurance, medication expense, and her inability to work more than a 20-hour week because of disability and illness.

Although different trigger events bring the homeless to the street, they all share the same need for food and shelter. Health care and medications are of little concern until a catastrophic event occurs. After all, what was the point of staying “healthy” when starvation and hypothermia are real possibilities?

Upon moving into the women's facility, Kathy came close to mental break down. After completely severing the connection with the life she knew for the past 20 years and after having two near-death experiences, a 55-person house was too much for her. Kathy thought that she and her roommate excessively cleaned their room because this was the only place in the world that belonged to them. “The only thing you have control over is your own room. The world is changing, life is moving along, surroundings are ever different, and you need to stay strong to maintain sanity.” Eventually, what helped her through this transition period were rules and routines. They added certainty to Kathy's life.

Before Kathy left her “home,” she could not afford individual health insurance; thus, she did not have routine physical checkups. Some important underlying health problems, such as valve abnormality and renal function impairment, went unnoticed. When evaluating the access and quality of medical care for Kathy, she got the minimum to stay relatively stable.

During her suicide attempts, Kathy's needs exceeded her resources, creating debt she was unable to repay. Tracking these numbers added to her depression. She is now working with payment assistant programs at various hospitals that previously cared of her.

Kathy is one of the lucky ones. Unfortunately, thousands of homeless people are still on the waiting list for the limited number of transitional homes. Meeting the food and shelter needs of this population is an unimaginable task—to say nothing of addressing their...
physical and mental health needs. How much of their illness is picked up only at the Emergency Department?

To be fair, the homeless problem is not only a health care issue, it is also a social issue. They are interrelated and must be addressed together. Nonetheless, our current system is hardly “health” care, but closer to “disease” care. According to the Medicare and Health Care Chartbook,1 40% of the health premium is spent on hospitalization, yet only 10% is spent on primary care. We treat people when they are sick, but not to prevent them from getting sick. Sometimes, we even forget to find out why people are sick. We depend on medications to control diseases like diabetes and hypertension, but we rarely asked why some people end up with these diseases. Surely, there could be genetic dispositions, but what about social problems, financial struggles, and educational opportunities that contribute to the manifestation of diseases? Perhaps “the wealthy being healthier than the poor” was not only because they had better access to our “disease” care system, but they also have the financial resources and educational background to learn about the necessary prevention that makes up for what the system lacks. If we deliver health education and preventive health care to this subpopulation, some underlying conditions could be treated more readily both medically and financially. I could not help but wonder if it would be more cost effective for the city, the state, and the nation as a whole if the focus were shifted to prevention.

When asked her views about the current health care system, Kathy was concerned about a government-run national health care system because “no one seems to agree on any one thing and it just takes forever for a decision to be made.” The main issues for Kathy are the high premiums and the scary costs of medication. Kathy feels that only physicians should be involved in decision making about the delivery of health care.

On the first day of medical education, I took the Oath of Geneva. I vowed that “the health of my patient will be my first consideration” and “will not permit considerations of religion, nationality, race, party, politics, or social standing to intervene between my duty and my patient.” Physicians, by definition, are advocates for their patients. When we care for a patient, we try our best to relieve his or her discomfort using all available resources. When no financial problem prevents the clinic’s doors from opening, we gladly treat anyone in need of our services. However, in this ever more technology-driven health care system, diagnostic devices and treatment modalities cost a tremendous amount. When physicians can no longer fulfill the needs of patients, they turn to public and private resources for support— one of which is pharmaceutical companies. Most pharmaceutical companies have community benefit programs to help needy populations.

Ironically, the assistance Kathy receives is probably funded in part or in whole by the very pharmaceutical companies that set the unaffordable prices that cause her frustration. Pharmaceutical companies are in the delicate position of profiting on the misfortune of others, yet their efforts to make new and improved medications and disease treatments are indispensable. Hundreds of thousands of scientists work for these companies, not to become millionaires, but in hopes of curing diseases and relieving suffering. As an undergraduate bioengineering major, I worked on a drug delivery project with a post-graduate doctor who received funding from a pharmaceutical company. The only thing that got me through the boring days of lab work was the hope that one day this machinery would work and HIV might be eliminated, patients with diabetes might have a better quality of life, and septic patients might hold a better prognosis. Perhaps “do well by doing good” was true for some or most pharmaceutical companies.

Pharmaceutical companies must continue their support for the scientific research. Physicians must continue to filter information distributed by sales representatives. As Walt Whitman wrote in the Leaves of Grass, “You shall no longer take things at second or third hand, nor look through the eyes of the dead, nor feed on the spectres in books … You shall listen to all sides, and filter them for your self.” We can only diagnose a murmur when we hear one. We come to a conclusion only on the basis of evidence. Part of our education is learning the skills to discern the quality of information we are given and to act accordingly.

As I reread the Oath of Geneva, I feel privileged to be entrusted by society to carry out such a sacred job— along with this privilege comes responsibility. Despite my belief that health care is a right, I cannot ignore the fact that a subset of our population doesn’t have the chance to exercise this right. I must acknowledge that if I cannot change the system, I must learn to work within it. There may be a way to practice medicine in the imbalanced system by holding strong to our morals and beliefs.

Reference

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In Search of Home: From Home to Homeless to Housing

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Corridor Consult

Hemorrhoids: Modern Remedies for an Ancient Disease

By Herman Villalba, MD
Maher A Abbas, MD, FACS, FASCRS

Introduction
A patient arrives at your office with a chief complaint of hemorrhoids. Is it really hemorrhoids, or is it something else? How are hemorrhoids best treated? And when should you send the patient to see a surgeon?

Hemorrhoids have plagued humankind since ancient times and might have even influenced world history. The emperor of France, Napoleon Bonaparte, suffered from hemorrhoidal disease. On the day of the decisive battle at Waterloo, Napoleon was in pain because of a severe case of thrombosed hemorrhoids, which impaired his battlefield conduct.1 Today hemorrhoids remain the most common anorectal disorder and are frequently seen in primary care clinics, emergency wards, gastroenterology units, and surgical clinics.1,1 More than half of all people will at some point develop symptomatic hemorrhoids. However, half of those seeking care for hemorrhoids may in fact have another disorder, such as fissure, anal abrasion or irritation, or a skin tag.

Pathophysiology and Presentation
Hemorrhoids are vascular cushions in the lower rectum and anus. The role of hemorrhoids is not entirely clear, but it has been proposed that they contribute to sensation and continence. There are two types of hemorrhoids: internal and external. Internal hemorrhoids are inside the anal canal and are covered by anal mucosa. In most patients, one can identify three columns of hemorrhoids, two on the right and one on the left. However, several variations exist, and some patients have more than three bundles. External hemorrhoids occupy the inferior aspect of the anal canal and are covered by anoderm and skin. External hemorrhoids can be present in one or more quadrants or can be circumferential.

The exact cause of hemorrhoids is unknown. Several contributing factors have been implicated, including the upright posture of humans, aging, pregnancy, heredity, constipation or chronic diarrhea, and spending excessive periods of time on the toilet (ie, reading, straining). Patients often complain, “Doc, I have hemorrhoids,” equating any anorectal symptoms with hemorrhoidal disease, including bleeding, lumps, masses, and pain. It is important to keep in mind that although hemorrhoids are common, the differential diagnoses for anorectal disorders include dermatologic diseases such as pruritus ani, abscess and fistula, fissure, sexually transmitted diseases, warts, HIV, atypical infections such as tuberculosis, inflammatory ulcers such as Crohn’s disease, and malignancy. The symptoms of internal and external hemorrhoids are summarized in Table 1. Although severe anal pain is often attributed to hemorrhoids, they are rarely the cause. In the absence of visible, thrombosed external hemorrhoids (blood clot and swelling), severe pain is frequently secondary to anal fissure, not an internal hemorrhoid. Table 2 presents other causes of severe anal pain.

Evaluation and Management
The medical history should include the duration and nature of the symptoms, bowel habits, comorbid conditions, prior abdominal or anal surgeries, medications including nonsteroidal anti-inflammatory drugs (NSAIDS) and anticoagulants, prior endoscopic examination, and family history of gastrointestinal disorders. The physical examination should include visual inspection of
Hemorrhoids: Modern Remedies for an Ancient Disease

The cornerstone of conservative management is avoidance of constipation and hard stool. Dietary modification with an emphasis on increasing fiber consumption is crucial. The diet of the average American contains 10-15 grams per day. For treatment of hemorrhoids, the recommendation is 30-35 grams of daily fiber. Dietary sources include beans, fruits, vegetables, and whole grains. Dried figs, prunes, blackberries, boysenberries, raspberries, pears, chickpeas, kidney and pinto beans, lentils, brown rice, and oat bran cereals have a high fiber content. Numerous fiber supplements are available (Table 3). Most fiber products are bulking agents that soften the stool by absorbing water. Psyllium is a natural source of pure fiber, sold in powder form from the husks of seeds from the psyllium plant. Patients who are unable to tolerate psyllium-based products because of excessive gas or bloating can try FiberCon or Benefiber. Patients should be advised to increase fiber supplementation gradually and in conjunction with adequate fluid intake (six to eight glasses of a noncaffeinated beverage daily) and increase in daily activity so as to avoid constipation. To promote patients’ compliance with fiber supplementation, it is important to explain the other health benefits of fiber, such as decreasing the incidence of colon cancer and diverticular disease, controlling blood cholesterol levels, improving control of diabetes, and aiding in weight control.

Behavioral modification, such as avoidance of prolonged sitting on the toilet, reading while defecating, and excessive straining can alleviate some of the symptoms. Sitz baths (warm water, ten minutes, twice a day, no additives in the water) are helpful to patients with anal itching, eating, or burning and those with thrombosed hemorrhoids.5 Numerous over-the-counter creams and products are available, but most are ineffective or provide little relief. Many patients will benefit from zinc oxide cream or Calmoseptine, which is available over the counter, applied as needed once or twice a day inside and outside the anus. Short courses of hydrocortisone 1%/pramoxine hydrochloride 1% (local anesthetic) cream or 25-mg hydrocortisone suppositories once or twice a day can be helpful.

Patients with bleeding and prolapsing internal hemorrhoids refractory to conservative treatment can undergo ablation. Several office-based procedures are available, including injection sclerotherapy, infrared coagulation, and rubber-band ligation. All procedures accomplish shrinkage and scarring of the internal hemorrhoids. Rubber-band ligation has been the most effective of these modalities. Patients should refrain from taking NSAIDS or anti-coagulation for one week prior to and one week after rubber-band ligation to minimize the risk of bleeding. At the initial office visit, it is preferable to ligate one hemorrhoid; if the procedure is well tolerated, the patient can undergo multiple ligations at subsequent visits. The procedure should be relatively painless as long as the internal hemorrhoid is ligated above the dentate line. If the patient experiences sharp or severe pain when the bundle is grasped, then a different hemorrhoid should be tried; if pain persists, the procedure should be abandoned. It is our practice to ligate the hemorrhoid that looks most inflamed or irritated at time of the visit. Some patients have a vasovagal reaction immediately after the proce-

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<th>Table 2. Possible causes of severe anal pain</th>
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<td>Anal fissure</td>
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<td>Anal abscess</td>
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<td>Acute herpetic ulceration or other sexually transmitted diseases</td>
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<td>Crohn’s ulceration and inflammation</td>
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<td>Anal, rectal, or pelvic cancer</td>
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<th>Table 3. Fiber products</th>
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<td>Guar gum</td>
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Treatment should be reserved for symptomatic hemorrhoids only.
dures, so care must be taken to gradually get the patient off the procedure table. Patients are instructed to take Tylenol and use sitz baths as needed for the dull ache after ligation that usually lasts for 24 to 48 hours. Although ligation is a safe procedure, severe bleeding and sepsis have been reported to result in some patients. Patients should seek immediate care if any of the following symptoms develop: fever, chills, abdominal or pelvic pain, continuous rectal bleeding, purulent anal drainage, and urinary retention. The rubber band can fall off soon after the procedure or up to three weeks later. Patients can usually return to work or normal daily activities after the procedure. They are usually seen back in the office three to four weeks later.

**When Should the Patient See a Surgeon?**

Most of the time, hemorrhoidal disease will respond to conservative measures as long as the patient complies with the prescribed regimen. Surgical intervention for hemorrhoids is less frequently undertaken today than in the past.

Surgery can be considered in patients with incarcerated and gangrenous hemorrhoids (a rare condition), acutely thrombosed external hemorrhoids, or recurrent or chronic symptomatic external hemorrhoids; in those in whom conservative management, rubber-band ligation, or both failed; and in those who have heavy bleeding with anemia. Surgery can be considered also for some patients taking anticoagulants over the long term who have bleeding hemorrhoids refractory to medical therapy. Surgery in this latter group can relieve the problem with one intervention, alleviating the need to disrupt anticoagulation multiple times for several sessions of rubber-band ligation.

**Conclusion**

Hemorrhoids are common, affecting millions of Americans. It is important to distinguish this disease from other anorectal diseases. Avoidance of constipation is key in treating hemorrhoids. Most patients can be effectively treated with fiber supplementation and local ointments. Surgical intervention is now less frequently undertaken than in the past but can be considered for patients with acute complications of hemorrhoidal disease or those in whom conservative treatment has failed.

**Acknowledgment**

Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.

**References**


**Suggested Reading**


**Suffering**

People have a hard time letting go of their suffering. Out of a fear of the unknown, they prefer suffering that is familiar.

— Thick Nhat Hanh, b 1926, Vietnamese activist, writer and Buddhist monk
Since the Halsted radical mastectomy was introduced in 1894, breast cancer treatment has undergone major changes. More than a century later, breast conserving surgery is now accepted in the treatment armamentarium of early breast cancer. However, the role of axillary lymph node dissection (ALND) in breast cancer treatment continues to be controversial. The persistent question in this debate is whether we should abandon axillary lymph node evaluation in breast cancer management; I believe we cannot.

Axillary lymph node disease status is considered the most significant prognostic factor for patients with early-stage breast cancer. Surgical resection and histopathologic examination of the lymph nodes are the gold standard for evaluating the disease status of the axillary lymph node. Unfortunately, ALND is associated with lymphedema, nerve injury, shoulder dysfunction, and other morbidities that compromise quality of life in about 20% of patients. To lessen morbidity associated with ALND, sentinel lymph node biopsy (SLNB) was developed in the 1990s. The definition of sentinel lymph node (SLN) is the first lymph node into which cancer cells would spread from the primary tumor before involving further lymph nodes within that basin. In theory, the result of the SLNB reflects the remainder of the nodal basin for metastases. SLNB is a less invasive procedure and more accurate since it allows a pathologist to study a lymph node in greater detail. Thus, SLNB has become the standard of care in clinically node-negative patients. SLNB has also been shown to be a reliable tool after patients receive preoperative systemic treatment in locally advanced breast cancer.

Currently, it is accepted that ALND is indicated when a patient presents with clinically positive axillary lymph node disease. As stated above, there is also agreement that no further ALND is indicated when the SLNB shows no disease. The major point of debate now is what to do with positive SLN in patients with otherwise clinically negative regional disease in early breast cancer. Studies have shown that the SLN is the only positive lymph node in 38% to 67% of cases when completion ALND was followed. This reflects dramatically changed presentation over the last decade of breast cancer with decreasing primary tumor size and lymph node positivity in patients with invasive breast cancer. Unfortunately, there is no proven method other than ALND that can identify the group with additional axillary nodal disease.

There is no clear indication that ALND provides a survival benefit. In the National Surgical Adjuvant Breast and Bowel Project (NSABP) B-04, ALND did not show survival benefit in patients without clinical evidence of axillary adenopathy. With 25 years of follow-up, no significant survival differences have emerged. Proponents of ALND argue that B-04 did not have enough patients in the trial to see a survival benefit. A meta-analysis of six trials evaluating the impact of ALND on breast cancer survival showed an average survival benefit of 5% with ALND (95% CI=1.7-8.0%, probability of survival benefit >99.5%). It warrants mention that these patients received no adjuvant therapy and that tumor size was larger in these studies than the tumor size we see now. This exemplifies a common problem in evaluating the issues surrounding breast cancer treatment. The problem is that only a small benefit can be seen many years after the studies are started, and that demonstration of the benefit requires large numbers of patients as in a meta-analysis. Thus, the data may no longer be applicable because of improved survival from other new treatment modalities.

Although ALND has not been shown to give a clear survival benefit, proponents of ALND argue that it provides better prognostic information and locoregional control. ALND can also provide additional information...
that might change the treatment course for a select few; in women with more than four positive lymph nodes, postmastectomy radiation is recommended. The importance of the number of positive axillary lymph nodes is reflected in the new American Joint Committee on Cancer staging system for breast cancer published in 2002.12

More recently, in the International Breast Cancer Study Group (IBCSG) Trial 10-93, older patients (defined as those >60 years of age) who were treated with tamoxifen regardless of nodal status were randomly assigned to ALND or no surgical intervention in the axilla after either mastectomy or lumpectomy.13 There were no differences in disease free or overall survival, but there were only 473 patients in the study and the median follow-up was just 6.6 years. Because of poor accrual of subjects for the study, goals were amended to focus on quality of life issues. Avoidance of ALND in this trial showed similar efficacy with better early quality of life in women older than 60 years who had clinically node-negative disease and received tamoxifen for endocrine-responsive disease. The poor accrual probably reflected the belief of many practitioners in the value of evaluating the axillary nodes even in this group of low-risk women.

The American College of Surgeons Z-11 sentinel node trial also was designed to ask the pivotal question whether ALND is necessary in patients with positive SLNB. The trial was suspended because of low accrual. Again, the failure of this trial to recruit patients reflects uncertainty by the patients and physicians about abandoning ALND in breast cancer treatment. The most recent American Society of Clinical Oncology (ASCO) Guideline recommends SLNB in clinically node-negative patients as the initial evaluation. In patients with positive SNB, the ASCO recommends ALND.5 Unless and until a new prospective, randomized trial is done to readdress the issues of the therapeutic value of ALND in breast cancer treatment, I feel that the ASCO guideline should be followed.

With the advent of molecular technology, we are moving toward an era of personalized treatment in part on the basis of genetic traits. For example, the Oncotype DX (breast cancer assay, Genomic Health, Redwood City, CA) has recently been clinically validated in the Kaiser Permanente database and is used to predict the likelihood of breast cancer recurrence in women with newly diagnosed, early stage invasive cancer.14 Tests like the Oncotype DX are increasingly tailoring the breast cancer treatment to each individual patient so that we can maximize the benefit and minimize the risk of each therapy. Decisions regarding appropriate adjuvant therapy in breast cancer now increasingly involve molecular biology and genetics. Yet, a century of debate on the therapeutic value of ALND continues. As physicians in a large, successful health maintenance organization or as physicians in a university practice, we embrace medical evidence and foster scientific research. ALND has not been shown to confer a clear survival benefit. If and when another trial comes up that asks the question of whether we should proceed to ALND in an SLNB-positive patient, each surgeon should be ready to consider enrolling his or her patients into the trial. Otherwise, we might continue to subject our patients to unnecessary morbidity without medical evidence for its benefit. At this point, however, and until this needed clinical trial becomes available, the standard of care for positive SLNB will continue to be ALND. ♦

References


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**Pure Science**

We must not forget that when radium was discovered no one knew that it would prove useful in hospitals. The work was one of pure science. And this is a proof that scientific work must not be considered from the point of view of the direct usefulness of it. It must be done for itself, for the beauty of science, and then there is always the chance that a scientific discovery may become, like the radium, a benefit for humanity.

— Marie Curie, 1867-1934, Polish chemist and early pioneer in the field of Radiology, 1903 Nobel Laureate in Physics, 1911 Nobel Laureate in Chemistry
The inspiration for this painting was Mr. Sanchez’s love of sunsets and as a gift for his son. Mr. Sanchez has always loved sunsets and has a private collection of sunsets over water in Paraguay, Brazil, the Great Lakes, the Atlantic coast from Virginia to Florida and the open seas near Hawaii.

Mr. Sanchez is a Family and Marriage Therapist at the Parma Medical Center in Ohio. He is the 2004 individual recipient of the RJ Erickson Diversity Award.
Introduction

Every physician is familiar with the impact that findings from studies published in scientific journals can have on medical practice, especially when the findings are amplified by popular press coverage and direct-to-consumer advertising. New studies are continually published in prominent journals, often proposing significant and costly changes in clinical practice. This situation has the potential to adversely affect the quality, delivery, and cost of care, especially if the proposed changes are not supported by the study’s data.

Reports about the results of a single study do not portray the many considerations inherent in a decision to recommend or not recommend an intervention in the context of a large health care organization like Kaiser Permanente (KP).

Moreover, in many cases, published articles do not discuss or acknowledge the weaknesses of the research, and the reader must devote a considerable amount of time to identifying them. This creates a problem for the busy physician, who often lacks the time for systematic evaluation of the methodologic rigor and reliability of a study’s findings.

Critical Appraisal of Clinical Studies: An Example from Computed Tomography Screening for Lung Cancer

By Nicholas P Emptage, MAE
Marguerite A Koster, MA, MFT
Joanne E Schottinger, MD
Diana B Petitti, MD, MPH

Critical Appraisal: The I-ELCAP Study

In its October 26, 2006, issue, the New England Journal of Medicine published the results of the International Early Lung Cancer Action Program (I-ELCAP) study, a large clinical research study examining annual computed tomography (CT) screening for lung cancer in asymptomatic persons. Though the authors concluded that the screening program could save lives, and suggested that this justified screening asymptomatic populations, they offered no discussion of the shortcomings of the study. This report was accompanied by a favorable commentary containing no critique of the study’s limitations, and it garnered positive popular media coverage in outlets including the New York Times, CNN, and the CBS Evening News. Nevertheless, closer examination shows that the I-ELCAP study had significant limitations.

Important harms of the study intervention were ignored. A careful review did not support the contention that screening for lung cancer with helical CT is clinically beneficial or that the benefits outweigh its potential harms and costs.

Critical appraisals of published studies address three questions: 1. Are the study’s results valid? 2. What are the results? 3. Will the results help in caring for my patient?

We discuss here the steps of critical appraisal in more detail and use the I-ELCAP study as an example of the way in which this process can identify important flaws in a given report.

Are the Study’s Results Valid?

Assessing the validity of a study’s results involves addressing three issues. First, does the study ask a
clearly focused clinical question? That is, does the paper clearly define the population of interest, the nature of the intervention, the standard of care to which the intervention is being compared, and the clinical outcomes of interest? If these are not obvious, it can be difficult to determine which patients the results apply to, the nature of the change in practice that the article proposes, and whether the intervention produces effects that both physician and patient consider important.

The clinical question researched in the I-ELCAP study of CT screening for lung cancer is only partly defined. Although the outcomes of interest—early detection of lung carcinomas and lung cancer mortality—are obvious and the intervention is clearly described, the article is less clear with regard to the population of interest and the standard of care. The study population was not recruited through a standardized protocol. Rather, it included anyone deemed by physicians at the participating sites to be at above-average risk for lung cancer. Nearly 12% of the sample were individuals who had never smoked nor been exposed to lung carcinogens in the workplace; these persons were included on the basis of an unspecified level of secondhand smoke exposure. It is impossible to know whether they were subjected to enough secondhand smoke to give them a lung cancer risk profile similar to that of a smoker. It is also not obvious what was considered the standard of care in the I-ELCAP study. Although it is common for screening studies to compare intervention programs with “no screening,” the lack of a comparison group in this study leaves the standard entirely implicit.

Second, is the study’s design appropriate to the clinical question? Depending on the nature of the treatment or test, some study designs may be more appropriate to the question than others. The randomized controlled trial, in which a study subject sample is randomly divided into treatment and control groups and the clinical outcomes for each group are evaluated prospectively, is the gold standard for studies of screening programs and medical therapies. Cohort studies, in which a single group of study subjects is studied either prospectively or at a single point in time, are better suited to assessments of diagnostic or prognostic tools and are less valid when applied to screening or treatment interventions.

Screening evaluations conducted without a control group may overestimate the effectiveness of the program relative to standard care by ignoring the benefits of standard care. Other designs, such as nonrandomized comparative studies, retrospective studies, case series, or case reports, are rarely appropriate for studying any clinical question. However, a detailed discussion of threats to validity arising within particular study designs is beyond the scope of this article.

The I-ELCAP study illustrates the importance of this point. The nature of the intervention (a population screening program) called for a randomized controlled trial design, but the study was in fact a case series. Study subjects were recruited over time; however, because the intervention was an ongoing annual screening program, the number of CT examinations they received clearly varied, and it is impossible to tell from the data presented how the number of examinations per study subject is distributed within the sample. With different study subjects receiving different “doses” of the intervention, it thus becomes impossible to interpret the average effect of screening in the study. In particular, it is unclear how to interpret the ten-year survival curves the report presents; if the proportion of study subjects with ten years of data was relatively small, the survival rates would be very sensitive to the statistical model chosen to estimate them.

The lack of a control group also poses problems. Without a comparison group drawn from the same population, it is impossible to determine whether early detection through CT screening is superior to any other practice, including no screening. Survival data in a control group of unscreened persons would allow us to determine the lead time, or the interval of time between early detection of the disease and its clinical presentation. If individuals in whom stage I lung cancer was diagnosed would have survived for any length of time in the absence of screening, the mortality benefit of CT screening would have been overstated. Interpreting this interval as life saved because of screening is known as lead-time bias. The lack of a comparable control group also raises the question of overdiagnosis; without survival data from control subjects, it cannot be known how many of the lung cancers detected in I-ELCAP would have progressed to an advanced stage.

The types of cancers detected in the baseline and annual screening components of the I-ELCAP study only underscore this concern. Of the cancers diagnosed at baseline, only 9 cancers (5%) were small cell can-
cancer, 263 (70%) were adenocarcinoma, and 45 (22%) were squamous cell cancer. Small cell and squamous cell cancers are almost always due to smoking. Data from nationally representative samples of lung cancer cases generally show that 20% of lung cancers are small cell, 40% are adenocarcinoma, and 30% are squamous cell. The prognosis for adenocarcinoma is better even at stage I than the prognoses for other cell types, especially small cell cancer. Small cell and squamous cell cancers are the predominant histologies in lung cancer, and 45 (22%) were squamous cell cancer, 263 (70%) were adenocarcinoma, and 4 (2%) were other cell types.

Diagnostic workups in the study were not defined by a strict protocol (protocols were recommended to participating physicians, but the decisions were left to the physician and the patient). This might have led to variation in how a true-positive case was determined.

**What Are the Results?**

Apart from simply describing the study’s findings, the results component of critical appraisal requires the reader to address the **size of the treatment effect** and the **precision of the treatment-effect estimate** in the case of screening or therapy evaluations. The treatment effect is often expressed as the average difference between groups on some objective outcome measure (eg, SF-36 Health Survey score) or as a relative risk or odds ratio when the outcome is dichotomous (eg, mortality). In cohort studies without a comparison group, the treatment effect is frequently estimated by the difference between baseline and follow-up measures of the outcome, though such estimates are vulnerable to bias. The standard errors or confidence intervals around these estimates are the most common measures of precision.

The results of the I-ELCAP study were as follows. At the baseline screening, 4186 of 31,567 study subjects (13%) were found by CT to have nodules qualifying as positive test results; of these, 405 (10%) were found to have lung cancer. An additional five study subjects (0.015%) were found at baseline CT to have lung cancer. At the first annual CT screening, 1460 study subjects showed new noncalcified nodules that qualified as significant results; of these, 74 study subjects (5%) were given a diagnosis of lung cancer. Of the 484 diagnoses of lung cancer, 412 involved clinical stage I disease. Among all patients with lung cancer, the estimated ten-year survival rate was 88%; among those who underwent resection within one month of diagnosis, estimated ten-year survival was 92%. Implied by these figures (but not stated by the study authors) is that the false-positive rate at the baseline screening was 90%—and 95% during the annual screens. Most importantly, without a control group, it is impossible to estimate the size or precision of the effect of screening for lung cancer. The design of the I-ELCAP study makes it impossible to estimate lead time in the sample, which was likely substantial, and again, the different “doses” of CT screening received by different study subjects make it impossible to determine how much screening actually produces the estimated benefit.

**Will the Results Help in Caring for My Patient?**

Answering the question of whether study results help in caring for one’s patients requires careful consideration of three points. First, **were the study’s patients similar to my patient?** That is, would my patient have met the study’s inclusion criteria, and if not, is the treatment likely to be similarly effective in my patient? This question is especially salient when we are contemplating new indications for a medical therapy. In the I-ELCAP study, it is unclear whether the sample was representative of high-risk patients generally; inso-
far as nonsmokers exposed to secondhand smoke were recruited into the trial, it is likely that the risk profiles of the study’s subjects were heterogeneous. The I-ELCAP study found a lower proportion of noncalcified nodules (13%) than did four other chest CT studies evaluated by our group (range, 23% to 51%), suggesting that it recruited a lower-risk population than these similar studies did. Thus, the progression of disease in the presence of CT screening in the I-ELCAP study might not be comparable to disease progression in any other at-risk population, including a population of smokers.

The second point for consideration is whether all clinically important outcomes were considered. That is, did the study evaluate all outcomes that both the physician and the patient are likely to view as important? Although the I-ELCAP study did provide data on rates of early lung cancers detected and lung cancer mortality, it did not address the question of morbidity or mortality related to diagnostic workup or cancer treatment, which are of interest in this population.

Finally, physicians should consider whether the likely treatment benefits are worth the potential harms and costs. Frequently, these considerations are blunted by the enthusiasm that new technologies engender. Investigators in studies such as I-ELCAP are often reluctant to acknowledge or discuss these concerns in the context of interventions that they strongly believe to be beneficial. The I-ELCAP investigators did not report any data on or discuss morbidity related to diagnostic procedures or treatment, and they explicitly considered treatment-related deaths to have been caused by lung cancer. Insofar as prior research has demonstrated that few pulmonary nodules prove to be cancerous, and because few positive test results in the trial led to diagnoses of lung cancer, it is reasonable to wonder whether the expected benefit to patients is offset by the difficulties and risks of procedures such as thoracotomy. The study report also did not discuss the carcinogenic risk associated with diagnostic imaging procedures. Data from the National Academy of Sciences’ Seventh report on health risks from exposure to low levels of ionizing radiation suggest that radiation would cause 11 to 22 cases of cancer in 10,000 persons undergoing one spiral CT. This risk would be greatly increased by a strategy of annual screening via CT, which would include many additional CT and positron-emission tomography examinations performed in diagnostic follow-ups of positive screening results. Were patients given annual CT screening for all 13 years of the I-ELCAP study, they would have absorbed an estimated total effective dose of 130 to 260 mSv, which would be associated with approximately 150 to 300 cases of cancer for every 10,000 persons screened. This is particularly critical for the nonsmoking study subjects in the I-ELCAP sample, who might have been at minimal risk for lung cancer; for them, radiation from screening CTs might have posed a significant and unnecessary health hazard.

In addition to direct harms, Eddy and other advocates of evidence-based critical appraisal have argued that there are indirect harms to patients when resources are spent on unnecessary or ineffective forms of care at the expense of other services. In light of such indirect harms, the balance of benefits to costs is an important consideration. The authors of I-ELCAP argued that the utility and cost-effectiveness of population mammography supported lung cancer screening in asymptomatic persons. A more appropriate comparison would involve other health care interventions aimed at reducing lung cancer mortality, including patient counseling and behavioral or pharmacologic interventions aimed at smoking cessation. Moreover, the authors cite an upper-bound cost of $200 for low-dose CT as suggestive of the intervention’s cost-effectiveness. Although the I-ELCAP study does not provide enough information for a valid cost-effectiveness analysis, the data imply that the study spent nearly $13 million on screening and diagnostic CTs. The costs of biopsies, positron-emission tomography scans, surgeries, and early-stage treatments were also not considered.

**Summary**

Using the example of a recent, high-profile study of population CT screening for lung cancer, we discussed the various considerations that constitute a critical appraisal of a clinical trial. These steps include assessments of the study’s validity, the magnitude and implications of its results, and its relevance for patient care. The appraisal process may appear long or tedious, but it is important to remember that the interpretation of emerging research can have enormous clinical and operational implications. In other words, in light of the stakes, we need to be sure that we understand what a given piece of research is telling us. As our critique of the I-ELCAP study report makes clear, even high-profile studies reported in prominent journals can have im-
important weaknesses that may not be obvious on a cursory read of an article. Clearly, few physicians have time to critically evaluate all the research coming out in their field. The Technology Assessment and Guidelines Unit located in Southern California is available to assist KP physicians in reviewing the evidence for existing and emerging medical technologies.

Acknowledgment
Katharine O’Moore-Klopf of KOK Edit provided editorial assistance.

References

Perfection
You know you’ve achieved perfection in design not when you have nothing more to add, but when you have nothing more to take away.
— Antoine de Saint-Exupéry, 1900-1944, pioneer aviator, poet and novelist
Is Abstinence from Red Wine Hazardous to Your Health?

By Arthur L Klatsky, MD

A Very Public Message

Hardly a month goes by without the appearance of a research finding suggesting that drinking red wine is good for you. The media publicity is never nuanced or subtle, so the headlines blare. Here are several recent ones: “Procyanidin-rich red wines reduce heart attack and mortality,” “Resveratrol, a red-wine ingredient, improves health and survival in mice on a high-fat diet,” and “Cabernet sauvignon red wine reduces the risk of Alzheimer’s disease.” With the hint of greater longevity what non-red wine drinker wouldn’t feel pressure to start a red wine habit? What person over age 65 years wouldn’t consider a lifestyle change that promised a lower chance of Alzheimer’s? The public has heard the implied message. A 60 Minutes TV broadcast (CBS, 1991 Nov 17) attributed lower heart attack risk in France partially to red wine. This explanation of the “French Paradox” (low coronary disease death rate despite relatively unfavorable lifestyle habits) has become widely known. Red wine sales in the US skyrocketed in the 1990s and remain high. In a recent Kaiser Permanente (KP) survey, 80% of those interviewed had heard of presumed benefit from alcohol and half of these volunteered that this was true only of red wine.

Alcohol and Risk of Coronary Disease

Social and medical harm from heavier drinking has been evident for millennia, but the concept of a safe drinking limit was also accepted. Perhaps better than “safe” is the word “sensible,” since no level is absolutely safe for all persons. Modern population cohort studies confirm the increased risks of heavy drinking, defined as >3 standard-sized drinks/day. The same studies show that light to moderate drinkers have lower risks of coronary artery disease (CAD), ischemic stroke, and type 2 diabetes mellitus. Thus, for total mortality, the composite is a J-shaped curve, with lowest risk among drinkers who take <3 drinks per day, and highest risk from numerous conditions among heavy drinkers. The lower mortality risk of lighter drinkers is due mostly to less CAD.

Light drinkers have about 30% lower CAD mortality risk and an approximately 10% lower total mortality risk. Consistency in studies, relative specificity of benefit for CAD and plausible biological mechanisms for protection by alcohol against CAD, support a causal protective effect. Some earlier studies were unable to separate exdrinkers from lifelong abstainers or to control for baseline CAD risk. Skeptics have repeatedly cited this problem as the explanation of spurious benefit really due to prior movement of high-risk persons into the nondrinking reference group. This “sick quitter” hypothesis has been refuted by a number of studies, including KP analyses. Studies that separate exdrinkers from lifelong abstainers or controlled for baseline CAD risk also consistently show that drinkers have lower CAD risk than lifelong abstainers. Although there have been no randomized, controlled trials of CAD outcome events, many epidemiologists now feel that there is little doubt that alcohol exerts a protective effect against CAD.

Plausible biological mechanisms for CAD protection by alcohol start with higher levels of protective high-density-lipoprotein (HDL) cholesterol in drinkers. The evidence for this effect of alcohol is compelling. Several analyses in different cohorts show that HDL effect explains about 50% of the alcohol-CAD benefit. This is an effect of alcohol, without specificity for wine. Antithrombotic effects, less specifically an alcohol effect, are also supported by substantial data. Less established mechanisms for CAD benefit of alcohol include improved endothelial function and reduced insulin resistance. The evidence that mechanisms of benefit have to do with ethyl alcohol means that any nonalcohol-related benefit from a specific beverage type, such as red wine, would be additional to that from alcohol.
Is Red Wine Better?

Support for the hypothesis that wine may be more beneficial than liquor or beer is of two major types. The first consists of international comparisons showing lower CAD mortality in wine-drinking countries (eg, France) than in countries where beer or distilled spirits are the preponderant alcoholic beverages.3,11

Called ecological studies, these analyses relate mean consumption data to aggregate mortality. Since traits of individuals are not involved, these ecological studies are not well controlled for confounding explanations. The second type of evidence, the type frequently receiving media hyperbole, is the presence of potentially beneficial nonalcohol compounds in wine.11,12

Found usually more concentrated in red wine, these substances are mostly phenolic compounds with antioxidant and antithrombotic properties. Since oxidation of low-density-lipoprotein (LDL) cholesterol is an integral part of development of atherosclerotic plaques, it follows that antioxidant compounds in the diet represent an appealing hypothesis for benefit. Diets rich in natural antioxidants seem to be associated with better health outcomes, although trials of antioxidant supplementation have been disappointing. Many feel that red wine could be considered a fermented food beverage with beneficial antioxidant ingredients.

Epidemiologic studies with data about specific beverage types are fewer in number than those that deal with total alcohol consumption. They do not consistently and convincingly support specific additional benefit from wine.8,13 Important in this regard are good studies in beer-drinking populations showing apparent substantial CAD protection by that beverage.13 A series of studies in Denmark show that wine drinkers have lower risk of total mortality, cancer, and stroke, but the Danish investigators point out that, compared to beer/liquor drinkers, wine drinkers have a healthier drinking amount and pattern.14 The Danish wine drinkers smoke less, exercise more, eat healthier diets, have higher socioeconomic status, and score higher on intelligence tests. It is well known that in epidemiologic studies “healthy” traits tend to cluster in the same individuals. In observational studies there may be residual confounding by uncontrolled or incompletely controlled traits. KP studies show evidence of CAD benefit from each major beverage type, with apparent benefit greatest for wine, next for beer, and least for spirits.8,15 Importantly, the apparent effect was the same for white wine as for red wine. As in Denmark, our California wine drinkers had the healthiest lifestyle habits.

Wine has been called the “beverage of moderation.”26 To some extent this seems true in Denmark and in California, both of which include substantial numbers of persons that drink each beverage type. Yet in countries in which wine drinking predominates most heavy drinkers drink the prevalent, usually inexpensive beverage. Resultant wine-induced pathologies include liver cirrhosis, systemic hypertension, cardiomyopathy, and peripheral neuropathy.17

Organ damage from chronic heavy drinking is related primarily to lifetime ethyl alcohol intake, not beverage choice. In the appropriate cultural milieu, some wine drinkers readily progress to heavy drinking. In the US, for low cost some alcoholics choose wine. The pejorative term “wino” arose because a proportion of down-and-out alcoholics drink cheap fortified wine or jug wine.

The acceptance of the specific benefits of red wine for CAD involves interpretive stretching of the data. For example, the truly fascinating resveratrol—longevity story involves up-regulation of a genetic system (the sirtuin genes) that influence metabolic processes promoting longevity.18 Resveratrol has this effect and has shown the ability to increase longevity in several species. Extrapolation from the doses used in the mouse study to humans indicates that a comparable human resveratrol dose from drinking red wine would involve >1000 glasses per day, hardly a practical proposition. In the oligomeric procyanidins (OPC) report19 correlations were done between OPC content of wines and longevity in several areas, with the finding that both were highest in certain areas of France and Sardinia. Found largely in grape seeds, the OPC’s are said by the authors to be the wine polyphenols with the strongest endothelial relaxant effect. These analyses were not controlled for other potential confounders; in the view of this commentator these data do not suggest that wine drinkers would do well by switching to Sardinian wines. The Alzheimer’s report20 was another mouse study.

Problems When Giving Advice

In view of the major health problems of heavier drinking, there are legitimate concerns about any medical advice that encourages drinking. Although it is likely that few heavy imbibers drink to improve their health, the concerns are based on the fear that some persons might not be able to handle the knowledge of benefit responsibly, and deliberately or inadvertently indulge in heavier drinking. Advice to persons already heavy drinkers needs no risk/benefit individualization. Since nothing
Most moderate drinkers are more interested in the sensory pleasures and relaxing effect than in health benefit.

in the medical literature justifies heavier drinking and increased risks predominating, albeit heavier drinkers should reduce intake or abstain.

The advice problem can be ameliorated by individualization of advice to light drinkers and abstainers, taking into account risk/benefit factors like age, sex, personal and family history of problem drinking, and risk of CAD, certain cancers or other illnesses. Advice to drink must be weighed very carefully for nondrinkers. Abstainers usually have a valid reason for abstinence. Alcohol drinking is not at or near the top of the list of ways to reduce CAD risk; it comes well after smoking avoidance, proper diet and exercise, and attention to lipids, hypertension, diabetes and obesity. However, the case that lighter drinking in a healthy pattern has health benefits has become compelling. Thus it is as inappropriate for public health officials to promote general abstinence as to advise the entire population to drink. Most adults already are established light-moderate drinkers. Except for special reasons an established light-moderate drinker at average less than average CAD risk should not be advised to abstain. Studies have shown that this applies to those with and without pre-existent CAD, hypertension, and diabetes. Most medication-alcohol interactions are documented only with heavy alcohol intake; this should not be too readily generalized to a prohibition of all alcohol for these patients.

Conclusion

But what about the abstinence from red wine issue in the title? The short answer is that the question of additional benefit from nonalcohol ingredients is unresolved. Red wine is obviously fine for the light-moderate drinker who prefers it, but the scientific knowledge offers insufficient basis for urging the man or woman who prefers another beverage to switch. Most of the CAD benefit derives from ethyl alcohol. If small amounts are taken in the optimal pattern, slowly and with food, it is likely that beer, liquor, white wine, and red wine would have fairly similar benefit. Most moderate drinkers are more interested in the sensory pleasures and relaxing effect than in health benefit. One hopes that the number of people who drink red wine when they would prefer something else is not too large.

References

A while ago, I celebrated a birthday at a National Product Council meeting. My colleagues learned of the birthday and had a small ceremony to recognize the birthday. It was the usual good-natured few minutes, with some special people saying some nice things. Then another special person read the lines above, which she had parodied from the KP Thrive ad, some years of knowing me, and some research into my writings. I have not had a greater professional honor or recognition. I will feel fortunate the rest of my life knowing that my efforts and their meaning to me were recognized by some others.

There are many ways to ‘recognize’ people in society. We give pieces of paper, engraved pieces of glass, plaques and various other honoraria. I have received these and have bestowed many on others. Many times they seem obligatory; the person being recognized and their specific efforts almost secondary. Most of these things will hang on a wall or gather dust somewhere. Fortunately, the wonderful words my friend wrote, spoke, and scribbled on a nondescript piece of paper were not discarded. I was able to get the text from her and print it in a form, which now is framed on my wall. The effect of the effort and the personal thought that went into it were immediately felt. That feeling and appreciation remains. I believe it taught me important insights into myself. I suspect those insights are valid for others too. There is the old saying, “It’s the thought that counts.” I appear to be one of those who truly appreciates that sentiment.

On another occasion several years ago, the founding Chair of an important group within our Medical Group was retiring. At that group’s meeting no one said anything when the announcement was made. After waiting some time as the meeting progressed, I broke in and announced that I was incredulous that we were not or had not thought it was necessary to ‘recognize’ this person’s important contributions. The upshot was a ceremony and gift to recognize that person. Afterwards the honoree said to me “You all didn’t have to do that!” I told him I considered that viewpoint to be in error and that we absolutely did have to do “that.” This began a tradition: since then, we have repeated that effort whenever a member of the group steps down or retires. Now, years later, the repetition of that recognition effort has become mechanical. The original recognition was for over 20 years of work. The most recent one was for three. A colleague sitting next to me stated the person had served such a relatively short time that we almost didn’t know who it was we were ‘recognizing.’

For me, the counterplay of the forms of recognition causes some inner conflict. We should be recognized for our efforts that exceed our societal or organizational norms in a positive manner. When such recognition is mechanical, however, its meaning is diminished. I submit that most of the time our intent in recognition is to generate a personal positive emotion in the target. It seems to me that goal cannot be met by a ‘one-size-fits-all’ gift or ceremony. Recognition ideally should be tailored to the individual. When the object is for society to gain appreciation for a particular person, then other additional forms of recognition are appropriate. I suspect that, in 2006, few Los Angeles drivers know that Rosecrans Boulevard, a major thoroughfare, is named after a Civil War General. They could look it up, however, and that may achieve the original goal of recognition.

I don’t anticipate having any streets or buildings or any other lasting monuments named for me. The few lines of meaningful words written and spoken by a sincere friend achieved a target goal for me. I think many others would appreciate and profit by a recognition form specifically appropriate to them.❖
On The Use of Rapid Diagnostic Test Kits for Malaria

By David J Witt, MD

Since I wrote in *The Permanente Journal (TPJ)* (Fall 2005) about post-tsunami malaria in Indonesia, there have been several requests from *TPJ* readers regarding access to and anticipated availability of rapid diagnostic test kits (RDTs) for malaria. It is with regret that I relate that there is no intent to market these in the United States. There are several reasons for this, some valid, some not. Worldwide, the use of RDTs is a vital part of the World Health Organization’s program for malaria control, to preserve the use of newer, more expensive regimens for actual malaria cases.

The Centers for Disease Control and Prevention (CDC) often opposes the use of these kits for diagnosis of malaria. In a conversation with the malaria officer on duty, my suggestion that they were of use was disparaged. Unfortunately, as is sometimes the case, an organization such as the CDC does not respond to the requirements of actually delivering care. When an organization has ready availability of world-class parasitologists, there is little need for RDTs. On the other hand, few of us practice in such an environment. Kain et al described an average delay of three days between the time of ordering a malaria smear and confirmation of the diagnosis in nonspecialist Canadian medical centers.

In view of the rarity of malaria in this country, our best laboratory technicians are inexperienced in making this diagnosis and even experienced parasitologists can make errors in their reading of blood smears. Our average hospital laboratory is likely inferior in sensitivity to RDTs and probably in specificity as well, particularly if we consider only *P. falciparum*, the only species that is rapidly fatal. One published small series from Bethesda Naval Hospital reviewed the diagnostic accuracy of these two modalities among Marines with febrile illness evacuated from Liberia. Ten of 32 cases were accurately identified by RDTs and the same ten by thick smear. One of 32 patients had a positive RDT and a thin smear that was originally read as negative, but confirmed subsequently to have been positive.

In 2004, in the US there were only 1324 reported cases, 49% of these were *P. falciparum*. This seems to be a strong argument that our local labs will not be able to enhance their expertise in this disease. This would be even more significant for smaller hospitals in areas with less foreign travel among their patients.

Different RDTs have been studied in various studies in nonimmune returning travelers from malarious areas. The accuracy of various tests does vary, but later generation tests for *P. falciparum* routinely demonstrate sensitivities greater than 90% (88-99%) and specificities that are 95-100%. The conclusion of the meta-analysis by Marx and colleagues is that “rapid testing will lead to the detection of most clinically relevant *P. falciparum* cases, with considerably better accuracy than that expected from routine microscopy in nonspecialist settings.”

The arguments against the test are: the accuracy is not perfect; it is heat sensitive and it does not monitor the level of parasitemia, nor confirm efficacy of treatment. I believe these are false arguments. RDTs are certainly, at a minimum, grossly comparable to an experienced microscopist and confirmation by a reference laboratory can be readily arranged after a diagnosis is suspected.

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References

The Future of Employer-Based Health Insurance

By Michael J Pentecost, MD

America honors four presidents with monuments on the National Mall in Washington, DC, and Franklin D Roosevelt didn’t get his by chance. Leadership out of the Depression, triumph in World War II, and the New Deal are just part of his immense legacy.

But President Roosevelt didn’t do it all. In 1935, forced to choose between his highest domestic policy priorities—a minimum guaranteed income for the elderly and a national health insurance program—he picked the former (ie, Social Security) putting medical coverage on temporary hold. (“Temporary” stretched to 30 years until the passage of Medicare legislation in 1965.)

President Roosevelt’s dream of a national health insurance program was never realized as the next decade brought World War II and a severe domestic labor shortage. The resultant inflation spawned wage controls and, to remain competitive, employers offered health insurance as a substitute for salary increases.

That precedent and a post-war economic boom contributed to enormous growth in employer-based health insurance. Between 1940 and 1950, the number of Americans with such coverage grew from 21 million to 142 million.1,2

In 1954, the pre-eminence of employer-provided health coverage was further cemented by the Internal Revenue Service decision confirming the tax deductibility of such premiums.1 A tax break, a popular employee benefit, a distinguishing feature in recruitment and retention … all at a modest cost. What was not to like for American business?

Unfortunately, the moderate costs didn’t last. And now, with the relentless growth of health care expenditures, many American companies, faced with increasing competition due to globalization, have had to restrict or even jettison medical insurance coverage for their employees and retirees.

Every fall, in an unwelcome annual rite, corporate benefit managers nervously await the survey of premium increases. On September 26, 2006, right on cue, the Kaiser Family Foundation delivered this year’s bad news:3 Between 2000 and 2006, premiums had risen 87% while wages had increased 20% and inflation 18% (Figure 1). Overwhelmed by these costs, for the first time the percentage of employees receiving insurance coverage dropped below 60% to 59% (Figure 2).

No employers, not even corporate giants and governments, escaped the squeeze. General Motors, Intel, Costco; the states of New York, Maryland, and Nevada; San Diego county and the city of Arlington, Texas all...
What steps has the business community taken to mitigate this escalation in expenses?

One mechanism employers, particularly large companies, have used to rein in costs is the self-funding of health insurance coverage. In this strategy, the employer accepts the financial risk (and reward) and pays insurance companies a straightforward, fixed management fee.

Self-funding has two big attractions: The first is straight out of Economics 101. In California, Kaiser Permanente has an overhead of 7% (93% of premiums go directly to patient care) compared to 21.1% for Blue Cross, or WellPoint. This difference allows, at least in theory, for a savings of 14% in medical expenses to go from the insurer’s bottom line to that of the self-funded employer.

Self-funding has two big attractions: The first is straight out of Economics 101. In California, Kaiser Permanente has an overhead of 7% (93% of premiums go directly to patient care) compared to 21.1% for Blue Cross, or WellPoint. This difference allows, at least in theory, for a savings of 14% in medical expenses to go from the insurer’s bottom line to that of the self-funded employer.

Secondly, thanks to the passage on the Employer Retirement Income Security Act (ERISA) in 1974, self-funded plans have become a substantial book of business.

Figure 2. Percentage of all workers covered by their employers’ health benefits in firms both offering and not offering health benefits, 1999-2006.


At the time of its founding in 1993, Governor Pete Wilson proclaimed, “The promise is of a new way, a better way, a less expensive way for small business to buy health insurance.”

Not everyone was as optimistic. Some underwriters predicted that, with only voluntary rather than firm contractual ties, such alliances would founder over time as individual businesses understandably placed their own interests ahead of the group.

Early on, HPIC looked like a winner, dramatically increasing, sometimes tenfold, the number of health plans available to companies with 2-50 employees. But the anticipated purchasing clout and administrative savings proved more imagined than real.8

And 13 years later, the skeptics finally proved correct. In spite of a peak participation of 147,000 clients in 2002, HPIC fell victim to the bane of such efforts—adverse selection bias as employers with healthier workers inevitably left the cooperative.

On August 12, 2006, HPIC, by then doing business as PacAdvantage, closed its doors with considerably less fanfare and press than when it started.

Parenthetically, despite this history, another state has its eye on the consortium concept, albeit with a different population. In April 2006, the commonwealth of Massachusetts passed legislation that assures health insurance coverage to all its citizens. For companies with fewer than 50 employees, one element of this plan is a new, private, state-chartered clearinghouse called the Commonwealth Care Health Insurance Connector, or simply the Connector.10

Unlike HPIC, which functioned as an insurance underwriter, the Con-
The Future of Employer-Based Health Insurance

Employer will act as a stock exchange—matching buyers and sellers, collecting premiums and billing employers. Time will tell whether this iteration of a purchasing cooperative will be successful.

The third and newest mechanism employers have used to constrain costs is consumer-directed health care.

Consumer-directed health care is somewhat of a catchall, a term that includes high-deductible and high copay policies as well as health savings accounts, a tax-free vehicle for accumulating funds for out-of-pocket medical expenses.

The principle of such plans is that consumers, forced to spend their own money up to the deductible limit, will be prudent shoppers for discretionary health care thereby lowering overall societal costs.

Because of the high deductible (as much as $5000 a year), the overall costs and employee share of premiums can be held very low. As an example, Wal-Mart’s newly announced Value Plan will cost individual workers as little as $22 a month.

Though untested, the policies have gained great favor among conservative economists and the Bush administration. Employers seem to be more timid in their response. In the 2006 Kaiser Family Foundation survey, fewer than 7% offered high-deductible or health savings accounts or both in 2006 and only 6% planned such programs in 2007. The much more common strategy (21%) was to simply charge employees more for the traditional coverage.3

Similarly disquieting, in a Government Accountability Office survey of health savings accounts and high-deductible insurance plans, a minority of employees acknowledged shopping around for the most cost-effective medical services or even funding their savings accounts.11

Though self-funding, purchasing cooperatives and consumer-directed health care are the predominant strategies used by employers, there are others.

Some employers, including Wal-Mart, Freddie Mac and Capital One, have taken things into their own hands and opened workplace medical clinics.12 As many as one-quarter of the Fortune 1000 are planning similar steps. In 2003, General Motors, staggering under a $5.3 billion yearly health care expense, seriously considered building its own hospitals in six cities with large concentrations of employees and retirees.13

So what is the future of employer-based medical insurance? On one hand, not so good. At the current rate, about a 1% loss per year, by 2015 fewer than half of Americans younger than age 65 years will receive health insurance through their employer.

On the flip side, employers like the competitive advantage and control that providing health care coverage allows, not to mention the $126 billion annual tax break. And in the absence of a proven alternative, the 160 million Americans with employer-based coverage are unlikely to have much taste for political experimentation.

References

The Walk-In Patient

By Gary Huffaker, MD

“What brings you in today, Mr Toland?” I asked politely. It was a busy afternoon at the office and I was not really expecting a “walk-in.” Not being on call and being very busy with my own schedule, the addition of Mr Toland was not a welcome turn of events.

As I spoke, I sat down on the small rolling physician’s chair in room #5 and looked at Mr Toland, trying not to convey my mild annoyance. He was tall, large-boned and balding with an obviously red right eye. His lashes were sticky with secretions, and he seemed to me to be an obvious case of conjunctivitis.

“Well, Doc” he began, “my right eye has been red and painful now for two days.” I resisted the impulse to ask any questions and allowed him to continue.

“In the morning, my lids are stuck together and I have to soak my right eye with a warm wet washcloth in order to get my eye open.”

He paused.

“Anyone else in your family with a similar problem?” I asked.

“No, but my racquetball partner had a red eye last week. I think his doctor ended up treating him for pinkeye.”

“Well,” I said. “It sure looks as if you’ve got the same thing your partner had. I think we can help you.”

“Great!” responded Mr Toland.

“Issue anything else I should know about this problem?” I inquired. I had just finished a course in clinician-patient communication and remembered that this is a good question to help elicit the patient’s perspective.

Mr Toland hesitated. I reached in the top drawer to pull out my prescription pad, and glanced briefly back at Mr Toland.

“Well, Doc, I guess it isn’t important, but, um, well, two months ago today, my father died unexpectedly.”

I laid the pad down on my desk quietly and looked directly at Mr Toland’s face. His hair was gray but had some blonde streaks, indicating the color it had been in his youth. His manner was hesitant; his eyes looked at me carefully.

“It was tough” he said. “But last night he came back to see me in a dream. He assured me that he was OK and that he didn’t want me to worry about him.”

Mr Toland brightened.

“That dream really was just what I needed.”

I looked at him now in a new light. As he stood to leave, we looked at each other, then hugged.

He thanked me and left with his prescription. For the rest of the day, I felt completely enlivened. Mr Toland and I had unexpectedly become more fully human at a walk-in appointment.
African Americans have been vastly underrepresented in studies of diabetes-depression comorbidity. The purpose of this study is to evaluate associations between depression and diabetes outcomes in a racially balanced sample of participants.

**METHODS:** The data for this analysis were drawn from baseline of a longitudinal study of depression in diabetes being conducted within a large urban health care system. African-American and Caucasian primary care patients, ≥18 years of age with Type 2 DM, were eligible to participate. Recruitment letters were sent to potentially eligible patients, followed by telephone screening and informed consent. Participants completed a measure of depression (Patient Health Questionnaire – 9 [PHQ-9]) along with other self-report measures assessing diabetes self-care patterns, treatment perceptions, and diabetes-related quality of life. Glycemic control was assessed using HbA1c assays. Data were analyzed by frequency analysis, student’s t-test, and multiple regression analysis.

**RESULTS:** Between January 2005 and December 2005, 208 participants were enrolled (57% African American and 43% Caucasian; 55% male). Mean (± SD) participant age was 56.0 ± 8.8 years and mean HbA1c was 7.6% ± 1.7 (slightly higher than the reference range). Using PHQ-9 guidelines, 18.3% of participants were classifiable as having probable depressive disorder, which was not significantly associated with ethnicity. However, compared to Caucasians, African Americans reported significantly more barriers to glucose self-testing (p < .01), reported significantly more negative illness perceptions (p < .05), and demonstrated significantly poorer glycemic control (p < .05).

**CONCLUSIONS:** Compared to Caucasians with diabetes, African Americans with diabetes experience more barriers to blood glucose testing, view themselves as having more severe diabetes, and demonstrate poorer glycemic control. These findings imply that efforts to improve African-Americans’ diabetes outcomes should be culturally tailored, and should address barriers to glucose testing as well as negative perceptions of having diabetes. Although the study is limited by its cross-sectional design, future studies of its longitudinal extension will consider how depression and self-care behaviors interact over a six-month period to impact long-term outcomes.

**From Group Health Center for Health Studies, Group Health Community Foundation Identifying the barriers to optimal healing in primary care.**

**Hawkes RJ, Sherman KJ, Wiese CJ, Hsu CW, Cherkin DC.**

**BACKGROUND:** The current method of reimbursement for physician services encourages a focus on the procedural and technical aspect of medicine and discourages development of skills necessary to provide truly patient-centered care. These emphases on prescriptive services coupled with increased patient loads and diminished resources have left many primary care providers exhausted and dispirited. Beleaguered clinicians are unlikely to cultivate effective healing relationships with patients.

In order to restore healing to health care, clinicians will need to reconnect with patients and their passion for the art of medicine. This study attempts to elucidate the barriers to more effective healing from the perspectives of both patients and providers.

**METHODS:** Focus groups were conducted with Group Health Cooperative Physicians (MDs), Registered Nurses (RNs), Licensed Practical Nurses (LPNs) and Medical Assistants (MAs) working in primary care clinics in western Washington and with patients who had utilized primary care. Focus groups lasted two hours and were conducted with 23 MDs, 44 nursing staff (RNs, LPNs, and MAs) and 28 patients. The proceedings were recorded and transcribed. The ethnographic software, ATLAS.ti, is being used to analyze the data.

**RESULTS:** Preliminary results indicate that both patients and primary care team members have a broad view of healing that includes emotional, spiritual, and physical aspects. Providers and patients view time as an important barrier to providing healing care and providers believe that major changes that have occurred in recent years have exacerbated their stress levels. Many providers noted that the inefficient functioning of primary care teams contributed to both patient and provider dissatisfaction. Finally, providers often commented that for meaningful change to occur, it is important to empower local teams to identify ways to improve the care they provide.

**CONCLUSIONS:** Primary care is in crisis and transformative changes will be necessary if primary care is to survive as a viable professional role and as the foundation of rational health care systems. This study elucidates the barriers that will need to be overcome if primary care providers are to reconnect with their original passions for medicine and healing and to be able to provide care that is truly healing.
From Meyers Primary Care Institute, Worcester, MA; Kunin-Lunenfeld Applied Research Unit, Toronto, ON, Canada; Masonicare, Wallingford, CT; Brigham and Women’s Hospital, Boston, MA; University of Toronto, Toronto, ON, Canada; University of Massachusetts Medical School, Worcester, MA

**Effect of computerized physician order entry with clinical decision support on adverse drug events in the long-term care setting.**


**BACKGROUND:** Adverse drug events (ADEs) occur frequently among nursing home residents, and preventable events are most commonly associated with errors in drug ordering and monitoring. The purpose of this study was to evaluate the efficacy of computerized physician order entry with clinical decision support for preventing ADEs in the long-term setting.

**METHODS:** We performed a randomized controlled trial in two large long-term care facilities for up to one year. Resident care units of the two facilities were randomized to computerized physician order entry with and without clinical decision support. Computer alerts included warnings to reconsider specific drug orders, recommendations for laboratory monitoring, and alerts to monitor closely for selected drug side effects. On the intervention units, the alert messages were displayed in a pop-up box to prescribers in real-time when a drug order was entered. We assessed the numbers and rates of adverse drug events, as well as preventability.

**RESULTS:** The overall rate of ADEs was 10.8 per 100 resident-months in the intervention units and 10.4 in the control units (rate ratio = 1.04; 95% CI 0.89-1.29). The rate of preventable ADEs was 4.0 per 100 resident-months in the intervention units and 3.9 in the control units (rate ratio = 1.03; 95% CI 0.81-1.32).

**CONCLUSIONS:** Use of computerized physician order entry with clinical decision support was not found to reduce the occurrence of preventable ADEs in the long-term care setting.

Further refinement of computerized clinical decision support systems for use in the long-term care setting is essential in order to enhance the impact on medication safety. Such refinements might include improving the specificity of the alerts to reduce alert burden for prescribers, incorporating additional alerts into the clinical decision support system to address a broader range of ADEs, and integrating more clinical and laboratory information into the clinical decision support system.

From Center for Health Research, Kaiser Permanente Northwest, Portland, OR

**Clinician awareness of low health literacy.**

Vuckovic NH, McMullen C, Schneider J.

**BACKGROUND:** Literacy is a large and often under-recognized problem in health care delivery in the US. As many as one in every five Americans are functionally illiterate, and an additional 27% have marginal literacy skills. Health literacy is a term that signifies the skills needed by individuals to understand and carry out medical instructions and preventive care advice. Individuals with low health literacy have difficulty reading and understanding routine health information such as dosage instruction on medication bottles, appointment slips, preprocedure instructions, and consent forms. Low health literacy comprises an individual’s ability to understand and carry out medical instructions, and may lead to medication noncompliance, adverse outcomes, increased outpatient utilization, and preventable hospitalizations. Clinicians may have limited understanding of the presence and impact of low health literacy.

**METHODS:** We conducted eight focus groups with clinicians and medical assistants at clinics in Kaiser Permanente Northwest. Focus group interviews were taped and transcribed, and content analyzed.

**RESULTS:** Clinicians recognized the negative health impacts that could result from low health literacy, but were largely unable to tell which patients had such difficulties. Barriers to screening for low health literacy included lack of time during the clinic visit and potential discomfort on the part of the patient. Clinicians and medical assistants discussed the lack of utility of such assessments if there were no way to document or respond to positive findings.

**CONCLUSIONS:** While clinicians and staff are aware of the negative outcomes of low health literacy, screening for low health literacy is seen as problematic. Systemwide efforts to implement and respond to screening information must be addressed along with developing proper tools to assess low health literacy.
The facts are overwhelming. The Centers for Disease Control and Prevention (CDC) predicts that 5.3 million incidents of intimate partner violence (IPV) occur each year among US adult women and 3.2 million occur among men. Recent data from Group Health Cooperative demonstrates that about 46% of the female members have experienced physical, sexual, or emotional IPV in their lifetime, and data from the Kaiser Permanente Northern California Prevention Program estimates that in the previous year, at least 4% of women patients have experienced physical injury from an intimate partner—that is about 46,000 members in Northern California alone. The social and financial impact is enormous. The CDC estimates that the direct health care costs of IPV are over $4 billion a year. And, evidence has shown that IPV, along with its many comorbidities, is the number one cause of premature death, injury, and illness in women ages 15–44 years.

It is difficult for even the most experienced clinician to recognize which of our patients are victims of IPV. The violence cuts across all socioeconomic and demographic categories. But we do know that routine screening of all patients is an effective way to identify victims and to offer them assistance. And we know that offering support and counseling to victims can improve the quality of their lives.

Now that we understand these facts, how can clinicians begin to care for patients who are victimized by this overwhelming social problem? The first step would be to open The Physician’s Guide to Intimate Partner Violence and Abuse. This book is an essential tool for both experienced and new clinicians. It will help everyone understand the impact of IPV and to start to comprehend the complicated issues that perpetuate the violence.

Patricia Salber, MD, and Ellen Taliaferro, MD, have compiled the definitive handbook for health care professionals. Their chapters, along with those of their expert contributors, help us navigate through the complicated web of social, psychological, and medical issues that lie underneath the surface of IPV. Many clinicians are intimidated by the thought of dealing with IPV: they are unfamiliar with the proper language to use to screen their patients and they dread the time when a patient will acknowledge the violence in their lives—for fear that they won’t have the expertise or enough time to support them effectively. Fortunately, the authors help us realize the therapeutic value of simply asking the questions—even if our patients aren’t able to make immediate changes in their lives. And they help clinicians better understand why immediate changes may be difficult and even dangerous. They provide simple tips for offering support and referral to identified victims. And they help explain the social dynamics and practical realities that limit the speed with which change will happen. The book also outlines effective strategies to set up IPV screening programs in our clinics.

A particularly interesting chapter entitled “What Do We Know About the Perpetrators of Intimate Partner Violence and Abuse” helps us understand the prevalence of alcoholism and personality disorders among perpetrators. There is also inspiring information about the effectiveness of batterer intervention programs—with some data suggesting a re-arrest rate as low as 8% among batterers who completed an intervention program. Some of the chapters will help you better understand information that you already knew or suspected about IPV. But some of the chapters—such as the one on Adverse Childhood Experiences and IPV—will turn everything you thought you knew about medicine upside down.

The book is an extremely well-organized resource. With its easy references, clear bullet points and excellent summary tables, it makes for fascinating reading all the way through—or an easy reference book to take off the shelf for a quick review. Wherever you are in your journey of understanding IPV, I highly recommend this book to take you further down the road.

Reference

More information about the KP response to Intimate Partner Violence Prevention can be found at:
- KP Internet: www.kp.org/domesticviolence/
- Non-KP resource: www.endabuse.org

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What Price Better Health? Hazards of the Research Imperative by Daniel Callahan

Public spending is increasingly devoted to health care and medical research. In his book *What Price Better Health? Hazards of the research imperative*, Daniel Callahan, a founder of the Hastings Center for Bioethics, questions this development. According to Mr Callahan, society’s demand for improved medical treatment can be conceptualized in terms of “the infinity model,” which asserts that there is no limit to the benefits of continued medical research. This assertion invokes a moral duty to do medical research—a “research imperative” … the felt drive to use research to gain various forms of knowledge for its own sake, or as a motive to achieve a worthy practical end.  

The research imperative should stem from the moral obligation we have to help the suffering of today and tomorrow. For the research imperative to be a moral obligation, not only must failing to do medical research harm people, doing research must also be indispensable in avoiding harm. Mr Callahan questions these assumptions. In countering the argument that more medical research is indispensable, Mr Callahan reminds us that this is but one condition for fulfilling our vision of a good society. He also does not accept the second assumption: that we have a duty to develop more effective medical treatment for future generations. He classifies medical research as an imperfect right—a right that no one has a specific duty to fulfill, to justify medical research by treating it as a perfect right, imposing a duty on us to stave off death and to abolish suffering, is tantamount to corrupting medical science. If death is seen as nothing but the consequence of preventable diseases, we might construe a duty to eradicate these in a “war on death.”

The metaphor of war invokes the duty to make sacrifices, thus allowing the pharmaceutical industry to invoke the research imperative to legitimize huge profits. (For more on this see: Callahan D. *Costs, Choice, and Equity: Medicine and the Market.*) This metaphor also makes it easier to compromise basic ethical principles of research.  

Mr Callahan advances a “modest proposal” in which medical research recognizes death as a part of life, focuses its attention primarily on combating early-onset diseases, and aims for compressing morbidity and shortening the period of poor health before death. The title of Mr Callahan’s book can be read both literally—How much of our resources should be spent on health care, and how much profit should the pharmaceutical companies make?—and metaphorically—How much should be sacrificed in the pursuit of better health from research subjects and from a loss of meaning in human vulnerability and mortality? Inherent in these questions are assumptions that must be questioned. Mr Callahan dismisses the thought that we have a duty to do medical research for the benefit of future generations, in the way preceding generations have made our health care system possible. He must then hold either that there never was such a social contract between generations, or that we stand in a radically different relation to our descendants than our ancestors did. Both of these assumptions need more reflection.

The book is easily understood and well written, but it is unfortunately marked by a journalistic style. Although many aspects of the subject are described and fundamental questions are raised, the discussion lacks a thorough philosophical, sociological, economical, or other methodological approach.  

References

Section A.

Caring for the Adult with Congenital Heart Disease: Management of Common Defects

Patients with the following congenital heart defects are at moderate to high risk for bacterial endocarditis and require antibiotic prophylaxis before dental procedures, EXCEPT:

- a. bicuspid aortic valve
- b. secundum atrial septal defect
- c. ventricular septal defect
- d. coarctation of aorta

Aortic root dilatation and potential risk of aneurysm or dissection are associated with the following congenital heart defects, EXCEPT:

- a. coarctation of aorta
- b. bicuspid aortic valve
- c. pulmonary stenosis
- d. ventricular septal defect

Heart Failure

The most specific exam finding for diagnosing heart failure is:

- a. leg edema
- b. crackles on lung exam
- c. elevated neck veins
- d. a systolic murmur

Which drug has not been shown to improve survival in systolic heart failure?

- a. digoxin
- b. carvedilol
- c. lisinopril
- d. spironolactone

Presentation of Osteitis and Osteomyelitis Pubis as Acute Abdominal Pain

What is the proper treatment of osteitis pubis?

- a. physical therapy and ambulation should be initiated immediately to maintain correct anatomical alignment
- b. wedge resection of the symphysis provides good pelvic stability if performed early in the acute phase
- c. athletes with chronic symptoms of >16 weeks have benefited most from glucocorticoid injections
- d. initial treatment should consist of rest and oral NSAIDs to decrease inflammation and provide analgesia

Which of the following symptoms is not consistent with the diagnosis of osteitis pubis?

- a. abdominal pain radiating to the groin
- b. difficulty ambulating
- c. lateral hip, thigh, and buttock pain
- d. tenderness over the pubic rami

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CME Evaluation Form

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Article 4. Critical Appraisal of Clinical Studies: An Example from Computed Tomography Screening for Lung Cancer

It is important to critically appraise newly published studies because:

a. the study’s results may be biased by flaws in its methods
b. the patient population in the study may be very different from your patients
c. the intervention may entail risks to the patient that outweigh its potential benefits
d. all of the above

In the I-ELCAP study of CT screening for lung cancer, which of the following results was not mentioned by the authors?

a. four hundred twelve of 484 lung cancers (85%) identified in the study were detected at clinical stage I
b. over 90% of positive CT screen results were false-positives, meaning that many patients without disease underwent unnecessary diagnostic workups
c. most disease was identified by a single, baseline CT screen; only 79 lung cancers (16%) were detected through routine annual screening
d. all of these results were mentioned by the authors

Objectives

1) to inculcate the use of evidence-based medicine as part of the science of medicine. 2) to stress the art of medicine via enhanced patient physician communication, improved care experience for patients, and more satisfying care giving experience for physicians and staff through better teamwork. 3) to review appropriate updates on the diagnosis and treatment of clinical conditions. 4) to describe infrastructure and systems improvements that lead to improvements in outcomes and patient care experiences.

Section B.

Referring to the CME articles and to the stated objectives, please check the box next to each statement as appropriate.

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The article covered the stated objectives.
I learned something new that was important.
I plan to use this information as appropriate.
I plan to seek more information on this topic.
I understood what the author was trying to say.

Section C.

What change(s), if any, do you plan to make in your practice as a result of reading these articles?

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Section D. (Please print)

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